

**Journal of  
Physical and  
Chemical  
Reference Data**

**Volume 16, 1987  
Supplement No. 1**

**Atomic and Ionic Spectrum Lines  
below 2000 Angstroms:  
Hydrogen through Krypton  
Part III (Finding List)**

**Raymond L. Kelly**



**Published by the American Chemical Society  
and the American Institute of Physics for  
the National Bureau of Standards**

**Atomic and Ionic Spectrum Lines  
below 2000 Angstroms:  
Hydrogen through Krypton  
Part III (Finding List)**

# Physical and Chemical Reference Data

David R. Lide, Jr., Editor

**The Journal of Physical and Chemical Reference Data** (ISSN 0047-2689) is published quarterly by the American Chemical Society (1155 16th St., N. W., Washington, DC 20036-9976) and the American Institute of Physics (335 E. 45th St., New York, NY 10017-3483) for the National Bureau of Standards. Second-class postage paid at Washington, DC and additional mailing offices. POSTMASTER: Send address changes to Membership and Subscription Services, P. O. Box 3337, Columbus, Ohio 43210.

**The objective of the Journal** is to provide critically evaluated physical and chemical property data, fully documented as to the original sources and the criteria used for evaluation. Critical reviews of measurement techniques, whose aim is to assess the accuracy of available data in a given technical area, are also included. The Journal is not intended as a publication outlet for original experimental measurements such as those that are normally reported in the primary research literature, nor for review articles of a descriptive or primarily theoretical nature.

**Supplements** to the Journal are published at irregular intervals and are not included in subscriptions to the Journal. They contain compilations which are too lengthy for a journal format.

**The Editor** welcomes appropriate manuscripts for consideration by the Editorial Board. Potential contributors who are interested in preparing a compilation are invited to submit an outline of the nature and scope of the proposed compilation, with criteria for evaluation of the data and other pertinent factors, to:

David R. Lide, Jr., Editor  
J. Phys. Chem. Ref. Data  
National Bureau of Standards  
Gaithersburg, MD 20899

**One source of contributions** to the Journal is The National Standard Reference Data System (NSRDS), which was established in 1963 as a means of coordinating on a national scale the production and dissemination of critically evaluated reference data in the physical sciences. Under the Standard Reference Data Act (Public Law 90-396) the National Bureau of Standards of the U.S. Department of Commerce has the primary responsibility in the Federal Government for providing reliable scientific and technical reference data. The Office of Standard Reference Data of NBS coordinates a complex of data evaluation centers, located in university, industrial, and other Government laboratories as well as within the National Bureau of Standards, which are engaged in the compilation and critical evaluation of numerical data on physical and chemical properties retrieved from the world scientific literature. The participants in this NBS-sponsored program, together with similar groups under private or other Government support which are pursuing the same ends, comprise the National Standard Reference Data System.

**The primary focus of the NSRDS** is on well-defined physical and chemical properties of well-characterized materials or systems. An effort is made to assess the accuracy of data reported in the primary research literature and to prepare compilations of critically evaluated data which will serve as reliable and convenient reference sources for the scientific and technical community.

## Information for Contributors

Manuscripts submitted for publication must be prepared in accordance with *Instructions for Preparation of Manuscripts for the Journal of Physical and Chemical Reference Data*, available on request from the Editor.

## Editorial Board

Term ending 31 December 1987

Josef Michl, Neil Olien, Thomas G. Trippe

Term ending 31 December 1988

William A. Goddard III, Ronald A. Phaneuf, Alfons Weber

Term ending 31 December 1989

Mostafa A. El-Sayed, Glen A. Slack, Barry N. Taylor

## Management Board

David R. Lide, Jr., Charles R. Bertsch, John T. Scott

*Editorial Staff at NBS:* Julian M. Ives, Joan Sauerwein

*Editorial Staff at AIP:* Kathleen Strum, Managing Editor;

Susan A. Walsh, Chief Copy Editor; Colleen E. Johnson, Copy Editor

**New and renewal subscriptions** should be sent with payment to the Office of the Controller at the American Chemical Society, 1155 Sixteenth Street, N.W., Washington, DC 20036-9976. **Address changes**, with at least six weeks advance notice, should be sent to Manager, Membership and Subscription Services, American Chemical Society, P.O. Box 3337, Columbus, OH 43210. Changes of address must include both old and new addresses and ZIP codes and, if possible, the address label from the mailing wrapper of a recent issue. Claims for missing numbers will not be allowed: if loss was due to failure of the change-of-address notice to be received in the time specified; if claim is dated (a) North America: more than 90 days beyond issue date, (b) all other foreign: more than one year beyond issue date.

**Members of AIP member and affiliate societies** requesting member subscription rates should direct subscriptions, renewals, and address changes to American Institute of Physics, Dept. S/F, 335 E. 45th St., NY 10017-3483.

## Subscription Prices (1987)

(not including supplements)

	U.S.A.	Foreign (surface mail)	Optional air freight Europe Mideast N. Africa	Asia and Oceania
Members (of ACS, AIP, or affiliated society)	\$ 55.00	\$ 65.00	\$ 80.00	\$ 90.00
Regular rate	\$240.00	\$250.00	\$265.00	\$275.00

Rates above do not apply to nonmember subscribers in Japan, who must enter subscription orders with Maruzen Company Ltd., 3-10 Nihonbashi 2-chome, Chuo-ku, Tokyo 103, Japan. Tel: (03) 272-7211.

**Back numbers** are available at a cost of \$70 per single copy and \$270 per volume.

**Orders for reprints, supplements, and back numbers** should be addressed to the American Chemical Society, 1155 Sixteenth Street, N. W., Washington, DC 20036-9976. Prices for reprints and supplements are listed at the end of this issue.

**Copying Fees:** The code that appears on the first page of articles in this journal gives the fee for each copy of the article made beyond the free copying permitted by AIP. (See statement under "Copyright" elsewhere in this journal.) If no code appears, no fee applies. The fee for pre-1978 articles is \$0.25 per copy. With the exception of copying for advertising and promotional purposes, the express permission of AIP is not required provided the fee is paid through the *Copyright Clearance Center, Inc. (CCC), 21 Congress Street, Salem, MA 01970*. Contact the CCC for information on how to report copying and remit payment.

**Microfilm subscriptions** of the *Journal of Physical and Chemical Reference Data* are available on 16 mm and 35 mm. This journal also appears in Sec. I of *Current Physics Microform (CPM)* along with 26 other journals published by the American Institute of Physics and its member societies. A *Microfilm Catalog* is available on request.

**Copyright 1987** by the U.S. Secretary of Commerce; copyright assigned to the American Institute of Physics (AIP) and the American Chemical Society (ACS). Individual teachers, students, researchers, and libraries acting for them are permitted to make copies of articles in this journal for their own use in research or teaching, including multiple copies for classroom or library reserve use, provided such copies are not sold. Copying for sale is subject to payment of copying fees. (See "Copying Fees" paragraph elsewhere in this journal.) Permission is granted to quote from this journal with the customary acknowledgment of the source. To reprint a figure, table, or other excerpt requires in addition the consent of one of the original authors and notification to AIP. Reproduction for advertising or promotional purposes, or republication in any form, is permitted only under license from AIP, which will normally require that the permission of one of the authors also be obtained. Direct inquiries to Office of Rights and Permissions, American Institute of Physics, 335 East 45th Street, New York, NY 10017-3483. The right of the U.S. Government to unrestricted copying for its own use of copyrighted material originating in its laboratories or under its contracts is specifically recognized.

Journal of  
**Physical and  
Chemical  
Reference Data**

Volume 16, 1987  
Supplement No. 1

# **Atomic and Ionic Spectrum Lines below 2000 Angstroms: Hydrogen through Krypton Part III (Finding List)**

**Raymond L. Kelly**

*Spectroscopic Data Center, Code 61,  
Naval Postgraduate School,  
Monterey, California 93943*



Published by the **American Chemical Society**  
and the **American Institute of Physics** for  
the **National Bureau of Standards**



Copyright © 1987 by the U.S. Secretary of Commerce on behalf of the United States. This copyright will be assigned to the American Institute of Physics and the American Chemical Society, to whom all requests regarding reproduction should be addressed.

Library of Congress Catalog Card Number 87-72596

International Standard Book Number  
0-88318-550-4

American Institute of Physics, Inc.  
335 East 45th Street  
New York, New York 10017-3483

Printed in the United States of America

Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes
Kr XXXVI	0.777		P	Co XXVI	1.383		P	Fe XXIV	1.8567		Z
Kr XXXV	0.805		P	Zn XXIX	1.385		P	Fe XXIV	1.8579	13	Z
Br XXXV	0.822		P	Zn XXIX	1.391		F,P	Fe XXIV	1.8589		Z
Br XXXIV	0.853		P	Fe XXVI	1.392		P	Fe XXV	1.8594	6	P
Se XXXIV	0.872		P	Co XXVII	1.392		P	Fe XXIV	1.8609	22	Z
Se XXXIII	0.905		P	Co XXVII	1.393		P	Fe XXIV	1.8620	19	Z
Kr XXXVI	0.918		P	Cu XXIX	1.425		P	Fe XXIV	1.8631	12	Z
Kr XXXVI	0.923		P	Fe XXVI	1.425		P	Fe XXIV	1.8655	43	Z
As XXXIII	0.927		P	Cu XXIX	1.431		P	Fe XXV	1.8680	34	F,P
Kr XXXV	0.946		P	Zn K( $\alpha$ )	1.4352			Fe XXIII	1.8704	2	Z
Kr XXXV	0.952		P	Fe XXV	1.443		P	Fe XXIV	1.8729		Z
Kr XXXV	0.955		F,P	Co XXVI	1.455		P	Fe XXIV	1.8735		Z
As XXXIII	0.963		P	Co XXVI	1.457		P	Fe XXII	1.8754		Q,Z
Br XXXV	0.972		P	Fe XXV	1.461		P	Fe XXII	1.8779		Q,Z
Br XXXV	0.978		P	Cu XXVIII	1.478		P	Fe XXII	1.8794		Z
Kr K( $\alpha$ )	0.9801			Cu XXVII	1.482		P,Z	V XXII	1.882		P
Ge XXXII	0.987		P	Cu XXVIII	1.485		P	Fe XXII	1.8824		Z
Br XXXIV	1.002		P	Cu XXVIII	1.492		F,P	Fe XXII	1.8851		Z
Br XXXIV	1.009		P	Cu XXVII	1.492		P	Fe XXII	1.8867		Z
Br XXXIV	1.012		F,P	Fe XXV	1.495		P	Fe XXI	1.8916		Z
Ge XXXI	1.026		P	Fe XXVI	1.502		P	Fe XXI	1.8942		Z
Se XXXIV	1.031		P	Fe XXVI	1.504		P	Fe XXI	1.8966		Z
Se XXXIV	1.037		P	Mn XXV	1.506		P	Fe XX	1.9051		
Br K( $\alpha$ )	1.0397			Ni XXVIII	1.530		P	Fe XX	1.9051		
Ga XXXI	1.053		P	Ni XXVIII	1.536		P	Fe XX	1.9075		
Se XXXIII	1.064		P	Cu K( $\alpha$ )	1.5406			Fe XX	1.9075		
Se XXXIII	1.071		P	Mn XXV	1.542		P	Ti XXII	1.910		P
Se XXXIII	1.075		F,P	Fe XXV	1.5731		P	Fe XIX	1.918		Z
Zn XXIX	1.087		P	Fe XXV	1.5750		P	V XXIII	1.924		P
Ga XXX	1.096		P	Mn XXIV	1.584		P	Ti XXII	1.924		P
As XXXIII	1.096		P	Ni XXVII	1.588	3	P	Mn XXV	1.925		P
As XXXIII	1.102		P	Fe XXIV	1.588		Z	V XXII	1.925		P
Se K( $\alpha$ )	1.1048			Fe XXIV	1.5926		Z	Mn XXV	1.930		P
Zn XXIX	1.113		P	Ni XXVII	1.596		P	Fe XIX	1.931		Z
Cu XXIX	1.116		P	Fe XXIV	1.5960		Z	Fe XXII	1.936		Q,Z
Zn XXX	1.125		P	Cr XXIV	1.603		P	Fe K( $\alpha$ )	1.9360		
As XXXII	1.132		P	Ni XXVII	1.603		F,P	Ti XXII	1.949		P
As XXXII	1.138		P	Cr XXIV	1.615		P	Ti XXII	1.995		P
As XXXII	1.143		F,P	Mn XXIV	1.621		P	Mn XXIV	2.006	1	P
Cu XXIX	1.143		P	Mn XXV	1.626		P	Mn XXIII	2.013		F,Z
Cu XXVIII	1.166		P	Cr XXIV	1.636		P	Mn XXIV	2.016		P
Ge XXXII	1.167		P	Co XXVII	1.647		P	Mn XXIV	2.025		F,P
Zn XXIX	1.172		P	Co XXVII	1.653		P	V XXII	2.026		P
Ge XXXII	1.172		P	Ni K( $\alpha$ )	1.6579			Ti XXI	2.063		P
As K( $\alpha$ )	1.1759			Cr XXIV	1.675		P	Cr XXIV	2.090		P
Cu XXVIII	1.193		P	Mn XXIV	1.706		P	Cr XXIV	2.096		P
Ni XXVIII	1.198		P	Co XXVI	1.712		P	Mn K( $\alpha$ )	2.1018		
Cu XXIX	1.205		P	Co XXVI	1.720		P	Ti XXII	2.104		P
Ge XXXI	1.206		P	Cr XXIII	1.724		P	Ti XXII	2.105		P
Ge XXXI	1.213		P	Co XXVI	1.728		F,P	Ti XXI	2.111		P
Ge XXXI	1.218		F,P	V XXIII	1.747		P	Sc XXI	2.140		P
Ni XXVIII	1.227		P	V XXIII	1.760		P	Cr XXIII	2.182		P
Ni XXVII	1.238		P	Cr XXIII	1.763		P	Cr XXII	2.190		P,Z
Ga XXXI	1.245		P	Cr XXIV	1.766		P	Sc XXI	2.191		P
Ga XXXI	1.250		P	Cr XXIV	1.767		P	Cr XXIII	2.192	1	P
Ni XXVII	1.254		P	Fe XXVI	1.778		P	Sc XXI	2.192		P
Ge K( $\alpha$ )	1.2541			V XXIII	1.782		P	Cr XXIII	2.203		F,P
Cu XXVIII	1.257		P	Fe XXV	1.7824		P,Z	Ti XXI	2.221		P
Ni XXVII	1.283		P	Fe XXVI	1.784		P	Sc XX	2.245		P
Ga XXX	1.288		P	Fe XXV	1.7866		P,Z	Sc XX	2.272		P
Co XXVII	1.290		P	Fe XXV	1.7875		P,Z	V XXIII	2.278		P
Ni XXVIII	1.293		P	Co K( $\alpha$ )	1.7890			V XXIII	2.283		P
Ga XXX	1.295		P	Fe XXV	1.7913		P,Z	Cr K( $\alpha$ )	2.2897		
Ni XXVIII	1.295		P	Fe XXV	1.7919		P,Z	Sc XXI	2.311		P
Ga XXX	1.300		F,P	V XXIII	1.825		P	Sc XXI	2.312		P
Co XXVII	1.320		P	Fe	1.8283		N	Ca XX	2.314		P
Zn XXX	1.331		P	Fe	1.8309		N	Sc XX	2.324		P
Zn XXX	1.336		P	Fe	1.8344		N	Ca XX	2.331		P
Ga K( $\alpha$ )	1.3401			Fe	1.8389		N	Ca XX	2.361		P
Ni XXVII	1.350		P	Fe	1.8424		N	V XXII	2.3817		P
Co XXVI	1.351		P	Fe XXV	1.8503	90	P	V XXI	2.3856		Q,Z
Ni XXVII	1.352		P	Fe XXIV	1.8520	19	Z	V XXI	2.3888		Z
Co XXVI	1.352		P	Fe XXV	1.8553	19	F,P	V XXI	2.3907		Z
Zn XXIX	1.378		P	Cr XXIII	1.856		P	V XXII	2.3931		P
Co XXVI	1.382		P	Fe XXIV	1.8560	21	Z	V XXI	2.3992		Z

Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes
V XXI	2.4013		Z	Ca XVIII	3.1809		Z	Ar XVI	3.989	260	Z
V XXI	2.4047		Z	Cl XVII	3.181		P	S XVI	3.991		20
V XXII	2.405		F, P	Ca XVIII	3.185		P, Z	Ar XVI	3.992		260
V XXI	2.4140		Z	Ca XIX	3.1889		F	S XVI	3.992		10
Ca XX	2.417		P	Ca XVIII	3.189		P, Z	Ar XVII	3.994		5 F, P
V XXI	2.4210		Q, Z	Cl XVII	3.192		P	S XV	3.998		
Sc XX	2.445		P	Ca XIX	3.1925	4	P	Ar XVI	4.005		P, Z
Ca XIX	2.484		P	Ca XVIII	3.1926		Z	Ar XV	4.010	70	
Ti XXII	2.491		P	Ar XVII	3.200	130	P	Ar XVI	4.010		P
Ti XXII	2.497		P	Ca XVIII	3.2003		Q, Z	Ar XVI	4.012		P, Z
V K( $\alpha$ )	2.5036			Ca XVIII	3.2031		Z	Ar XVI	4.014		F, Z
Ti XXI	2.507		Z	Ca XVIII	3.2058		Z	Ar XVI	4.015		P, Z
Ti XXI	2.510		Z	Cl XVII	3.207		P	Ar XIV	4.058		Z
Ti XXI	2.513		Z	Ca XVIII	3.2097		Z	P XV	4.080		P
Ca XIX	2.514		P	Ca XIX	3.2111	5	F	S XV	4.0883		P
Ti XXI	2.517		Z	Ca XVIII	3.221		P, Z	P XV	4.089		P
K XIX	2.538		P	Ca XVIII	3.223		P, Z	P XV	4.103		P
K XIX	2.544		P	Ca XVIII	3.225		P, Z	P XV	4.123		P
Ca XX	2.549		P	Cl XVII	3.231		P	P XV	4.154		P
K XIX	2.553		P	Ar XVI	3.25	5	Z	Cl XVII	4.185	65	P
K XIX	2.565		P	Ar XVI	3.268	5	Z	Cl XVII	4.191	35	P
Ca XIX	2.571		P	Cl XVII	3.272		P	Ar K( $\alpha$ )	4.1918		
K XIX	2.584		P	Ar XV	3.33	5	Z	S XIV	4.1924		Z
Ti XXI	2.6101			K XIX	3.347		P	P XV	4.207		P
Ti XX	2.6141		Z	Cl XVII	3.351	10	P	S XV	4.2990	1	P
Ti XX	2.616		P, Z	K XIX	3.352		P	S XV	4.3045		P
K XIX	2.617		P	Ca K( $\alpha$ )	3.3584			P XV	4.308	10	P
Ti XX	2.6204		Z	Ar XVII	3.365	190	P	S XIV	4.3705		Z
Ti XXI	2.6229			Ar XVII	3.370		P	S XIV	4.3765		Z
Ti XX	2.6295		Z	Ar XVI	3.392		Z	S XIV	4.3822		Z
Ti XX	2.6319		Z	Ar XVI	3.42	5	Z	S XIV	4.386		Z
Ti XX	2.6355		Z	Ar XVI	3.430	150	Z	S XIV	4.3891		Z
Ti XXI	2.637		F, P	Ar XV	3.45	5	Z	S XIV	4.395		Z
Ti XX	2.6480		Z	Cl XVI	3.481		P	S XIV	4.4013		Z
Ti XIX	2.6540		N	Cl XVI	3.523		P	Cl XVI	4.4442		P
K XIX	2.680		P	K XVIII	3.5316	3	P	Cl XV	4.4474		Z
Ca XIX	2.705	1	P	Cl XVII	3.534	20	P	Cl XV	4.4516		Z
Sc XXI	2.736		P	Cl XVII	3.535	10	P	S XIII	4.454		Z
Sc XXI	2.742		P	K XVII	3.5357		Z	Cl XV	4.4585		Z
Ti K( $\alpha$ )	2.7485			K XVII	3.5411		Z	Cl XV	4.4630		Z
Ca XVIII	2.750		Z	K XVII	3.5456		Z	Cl XV	4.4669		Z
K XVIII	2.763		P	K XVII	3.5484		Z	Cl XVI	4.4677		P
K XVIII	2.797		P	K XVIII	3.5493	1	P	Cl XV	4.468		P, Z
K XIX	2.826		P	K XVII	3.550		P, Z	Cl XV	4.469		P, Z
K XIX	2.827		P	K XVII	3.5614		Z	Cl XV	4.4837		Z
Ar XVIII	2.829		P	K XVII	3.563		P, Z	Cl XV	4.485		P
Ar XVIII	2.836		P	K XVII	3.5657		Z	P XIV	4.485		
Ar XVIII	2.845		P	K XVII	3.5695		Z	Cl XV	4.488		P, Z
Ar XVIII	2.859		P	K XVIII	3.570	2	F, P	S XII	4.490		N
K XVIII	2.861		P	S XVI	3.584		P	Cl XV	4.4925		Z
Sc XX	2.8728		P	K XVII	3.5880		Z	Cl XVI	4.497		F, P
Sc XIX	2.8755		Z	S XVI	3.593			Cl XV	4.4970		Z
Sc XIX	2.8780		Z	K XVI	3.6020		N	P XIV	4.520		
Ar XVIII	2.881		P	Cl XVI	3.603		P	Cl XV	4.5215		Z
Sc XIX	2.8827		Z	S XVI	3.604			P XV	4.543	20	P
Sc XIX	2.8848		Z	S XVI	3.622			P XV	4.544	10	P
Sc XX	2.8867		P	S XVI	3.649			P XIV	4.5745		P
Sc XIX	2.8964		Z	S XVI	3.696			Kr XXVII	4.598		P
Sc XIX	2.8999		Z	Ar XVIII	3.731	65	P	P XIV	4.6779		P
Sc XX	2.903		F, P	Ar XVIII	3.737	35	P	Si XIV	4.685		P
Ar XVIII	2.917		P	K K( $\alpha$ )	3.7414			Kr XXVII	4.690		P
Ar XVIII	2.918		P	S XVI	3.784	10		Si XIV	4.696		
Ar XVIII	2.987	7	P	Cl XVI	3.7896		P	Si XIV	4.712		
Ar XVIII	2.988	3	P	Cl XVI	3.7943		P	S XVI	4.727	65	
K XVIII	3.008		P	Cl XVI	3.8620		N	Cl K( $\alpha$ )	4.7278		
K XVIII	3.012		P	Ar XVII	3.9488	1000	P	S XVI	4.733	35	
Ca XX	3.018		P	S XV	3.949			Si XIV	4.735		
Ca XX	3.024		P	Ar XVI	3.961		P, Z	Si XIV	4.770		
Sc K( $\alpha$ )	3.0309			Ar XVI	3.964		P, Z	P XIII	4.788		Z
Ar XVII	3.095	5		Ar XVI	3.967		P, Z	P XIII	4.807		Z
Ar XVII	3.128	5	P	Ar XVI	3.968		P, Z	Kr XXVII	4.812		P
Ar XVIII	3.150	20	P	Ar XVII	3.9691	550	P	Si XIV	4.831		
Ar XVIII	3.151	10	P	Ar XVI	3.981		P, Z	Kr XXVII	4.911		P
Cl XVII	3.173		P	Ar XVI	3.983		P, Z	P XIV	4.9180		
Ca XIX	3.1769	7	P	Ar XVI	3.985		P, Z	P XIV	4.9245		

Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes
Si XIV	4.947	3		Al XIII	5.605			As XXIV	6.117		
Br XXVI	5.005			Se XXVII	5.643			Kr XXVIII	6.129		
P XIII	5.0126		Z	Br XXVII	5.649			Se XXXI	6.129	10	
P XIII	5.0199		Z	Br XXVI	5.649			Kr XXVIII	6.145		
P XIII	5.0203		Z	Se XXV	5.650			Kr XXVIII	6.145		
S XV	5.0385	3	P	Se XXVII	5.669			P K( $\alpha$ )	6.157		
P XIII	5.0395		Z	Se XXV	5.678			Kr XXVIII	6.166		
S XIV	5.0415		Z	Cu XXIX	5.679		P	Kr XXVIII	6.171		
S XIV	5.0468		Z	Si XII	5.680		Z	Al XII	6.1745		
S XIV	5.0565		Z	Si XIII	5.6805	25	P	As XXVI	6.175		
S XIV	5.0607		Z	Si XIII	5.688		P	Ge XXIII	6.177		
S XIV	5.0648		Z	Se XXV	5.689			Se XXXI	6.177	30	
S XIV	5.066		P,Z	Br XXVII	5.698			Si XIV	6.180	65	
S XV	5.0662	1	P	As XXIV	5.701			Ni XXVIII	6.181		P
S XIV	5.067		P,Z	Se XXVII	5.713			Si XIV	6.186	35	
Cu XXIX	5.078		P	Al XIII	5.739	10		Si XIII	6.1973	1	P,Z
S XIV	5.0861	7	Z	P XIV	5.7600		P	Se XXV	6.201		
S XIV	5.087		P,Z	Cu XXIX	5.761		P	Kr XXVIII	6.214		
S XIV	5.0903		Z	P XIII	5.7642		Z	As XXV	6.217		
S XIV	5.0964		Z	Si XII	5.768		Z	Si XIII	6.224	1	Z
S XV	5.101	2	F,P	P XIII	5.7702		Z	Se XXXI	6.234	30	
S XIV	5.1010		Z	Br XXVI	5.771			As XXV	6.236		
S	5.113		N	Se XXVII	5.781			Se XXXI	6.238	10	
S XIV	5.122		P,Z	Se XXVI	5.781			Si XIII	6.244		Z
S XIV	5.127		P,Z	P XIII	5.7870		Z	Si XIII	6.2517		P,Z
S XIV	5.128	1	P,Z	P XIII	5.7919		Z	Kr XXVIII	6.259		
S XIV	5.130		P,Z	Br XXVI	5.793			Si XIII	6.2664	1	Z
S XIV	5.132	1	P,Z	P XIV	5.7931		P	As XXV	6.274		
S XIII	5.137		Z	Si XII	5.7931			Ge XXIII	6.275		
Cu XXIX	5.144		P	Se XXVI	5.796			Se XXXI	6.308	30	
Br XXVI	5.148			As XXIV	5.801			Al XII	6.3137		
Br XXVIII	5.148			Si XII	5.8031		Z	Se XXV	6.322		
S XII	5.18		Z	Si XII	5.808	6	Z	Se XXXI	6.322	20	
Si XIV	5.217	20		As XXIV	5.811		P	As XXV	6.331		
Si XIV	5.218	10		Si XII	5.8125		Z	Kr XXVII	6.336	45	
Si XIII	5.223		P	Si XII	5.816		Z	Fe XXVI	6.338		P
Br XXVI	5.251			P XIII	5.8169		Z	As XXV	6.344		
Br XXVIII	5.251			P XIII	5.8230		Z	Br XXVII	6.359		
Se XXV	5.252			Se XXVI	5.829			Fe XXIV	6.365	5	P
Kr XXVII	5.277		P	P XIII	5.8316		Z	Se XXV	6.368		
Si XIII	5.2850	5		P XIV	5.836		F,P	Se XXXI	6.368	20	
Br XXVI	5.292			P XIII	5.8365		Z	As XXV	6.376		
Br XXVIII	5.292			P XIII	5.869		Z	Mg XII	6.381		P
Se XXV	5.300			Co XXVII	5.871		P	Kr XXVII	6.385	35	
Br XXVIII	5.305			Se XXVI	5.889			As XXV	6.390		
Br XXVIII	5.305			Se XXVI	5.906			Mg XII	6.396		P
Br XXVI	5.305			As XXVI	5.916			Fe XXVI	6.404		P
Br XXVIII	5.325			Ge XXIII	5.923			As XXV	6.413		
S K( $\alpha$ )	5.3722			Br XXVI	5.928			Mg XII	6.417		P
P XIII	5.3802		Z	Se XXVI	5.930			Kr XXVIII	6.418		
P XV	5.381	65	P	Ge XXIII	5.936			Kr XXVIII	6.428		
P XIII	5.3859		Z	Co XXVII	5.937		P	Mg XII	6.448		P
P XV	5.387	35	P	Se XXXI	5.952	0	N	Kr XXVIII	6.449		
Se XXV	5.395			As XXIV	5.973			Fe XXIV	6.451	40	P
Kr XXVII	5.397		P	As XXVI	5.973			Ge XXIII	6.464		
Br XXVII	5.400			Al XII	5.992			Kr XXVIII	6.466		
Br XXVIII	5.400			Ge XXIII	6.003			Kr XXVIII	6.479		
Si XIII	5.4045	13		Al XII	6.0095			As XXV	6.492		
Br XXVII	5.412			Se XXXI	6.011	0		Mg XII	6.497	3	P
Br XXVII	5.429			Ge XXIII	6.016			Kr XXVIII	6.502		
Al XIII	5.435		P	Al XII	6.0294			Br XXVII	6.512		
Al XIII	5.448		P	Se XXVI	6.045			Kr XXVIII	6.519		
P XIV	5.4485		Z	As XXVI	6.047			Fe XXIV	6.527		P
Ni XXVIII	5.453		P	Se XXXI	6.048	0		Br XXVII	6.531		
Al XIII	5.466		P	Al XIII	6.053	30		As XXIV	6.551		
Br XXVII	5.493			Al XII	6.059			As XXV	6.551		
Al XIII	5.493		P	Se XXVI	6.075			Br XXVII	6.556		
Kr XXVII	5.494		P	Se XXV	6.078			Co XXVII	6.567		P
Br XXVII	5.507			As XXVI	6.081			Br XXVII	6.567		
Ni XXVIII	5.519		P	As XXIV	6.081			Ge XXIII	6.574		
Kr XXVII	5.522		P	Ni XXVIII	6.100		P	Mg XII	6.580	8	P
Br XXVII	5.530			Al XII	6.1005			Fe XXIV	6.583	5	
Al XIII	5.534			As XXIV	6.106			Ge XXIII	6.584		
Se XXVII	5.537			Ge XXIII	6.112			Ge XXIV	6.594		P
Se XXV	5.547			As XXVI	6.117			Br XXVII	6.598		

Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes
Kr XXVIII	6.614			Ge XXIV	6.871			Se XXVII	7.138		
Fe XXIV	6.617		P	Ge XXIX	6.872	10		Se XXVI	7.138		
Br XXVII	6.624			Br XXVII	6.877			Ni XXVI	7.138		P
Br XXVIII	6.624			Cr XXIV	6.877		P	Br XXVII	7.140		
Kr XXVIII	6.626			Br XXVIII	6.877			Fe	7.143	9	N
Br XXVII	6.633			Kr XXVII	6.881	100		Se XXVII	7.150		
Al XII	6.6350	10		Kr XXVIII	6.881			Mg XI	7.156	3	
Kr XXVIII	6.639			Si IX	6.884		N	Mn XXIII	7.158		P
Al XII	6.6444			Ge XXIV	6.886			Kr XXVIII	7.162		
Si XIII	6.6477	227	P	Br XXVII	6.888			Mn XXIII	7.164		P
Co XXVII	6.649		P	Zn XXI	6.898			Br XXVI	7.169		
Si XII	6.6617		Z	Br XXVII	6.905			Br XXVII	7.169		
Kr XXVIII	6.663			Ge XXIX	6.905	10		Br XXVIII	7.169		
Fe XXIV	6.672		P	Br XXVII	6.909			Fe XXIV	7.169	18	
Br XXVII	6.674			Ge XXIV	6.922		P	Se XXVII	7.170		Q
Br XXVIII	6.675			Mn XXIII	6.925		P	Al XIII	7.171	65	P
Br XXVIII	6.675			Br XXVII	6.925			Fe XXVI	7.171		P
As XXIV	6.676			Mn XXV	6.928		P	Al XIII	7.176	35	P
Kr XXVIII	6.678			Kr XXVIII	6.941			Se XXVII	7.177		
Si XII	6.678		P	Kr XXVII	6.958	60		Mg XI	7.177	4	
Si XII	6.681		P, Z	Ge XXIX	6.962	10		Br XXV	7.188		Z
Si XIII	6.6879	3	P	Se XXVI	6.963			Se XXVI	7.190		
Si XII	6.688	66	P, Z	Br XXVII	6.966			Al XII	7.1913		Z
Si XII	6.689		P, Z	Fe XXIV	6.972	5		Kr XXVIII	7.193		
Ga XXII	6.695		P	Br XXVII	6.972			Zn XXI	7.198		
As XXIV	6.699		P	Kr XXVIII	6.975			Br XXV	7.200		Z
Kr XXVII	6.699	95		Br XXVII	6.983			Ge XXIII	7.205		
Kr XXVIII	6.699			Zn XXI	6.983			Ge XXIX	7.205	100	
Ge XXIV	6.709		P	Se XXVI	6.988			Se XXVII	7.207		
Kr XXVIII	6.715			Kr XXVIII	6.997			Mn XXIII	7.208		P
Si XII	6.718	20	P, Z	Fe XXIV	7.000	5	Q	Kr XXVIII	7.209		
Si XII	6.720	12	P, Z	Zn XXI	7.001			Fe	7.210	16	N
As XXIV	6.723			Ge XXIX	7.005	40		Se XXVII	7.214		
Si XII	6.724		P, Z	Ni XXVI	7.006		P	Mg XI	7.225	4	
Fe	6.725	5	N	Ga XXII	7.009			Al XII	7.2282		Z
Ge XXIV	6.727			Ge XXIV	7.010			Ge XXIX	7.230	10	
Si XII	6.727		P	Se XXVI	7.015			Fe	7.230	14	N
Ge XXIV	6.727			Mn XXIII	7.018		P	Br XXV	7.232		Z
Kr XXVIII	6.727			Fe XXIV	7.033	15		Ga XXIII	7.234		
Si XII	6.731		P, Z	Ge XXIX	7.041		P	Se XXV	7.243	100	
Si XII	6.738		P	Ge XXIV	7.043			Br XXVIII	7.246		
Mg XII	6.738	10	P	Cr XXIV	7.044		P	Br XXV	7.246		
Si XIII	6.740		F, P	Ni XXVI	7.048		P	Al XII	7.2518		Z
Si XII	6.742		P, Z	Br XXVII	7.057			Br XXV	7.254		Z
Al XI	6.748		Z	Se XXVI	7.057			Al XII	7.260		Z
Fe XXIV	6.752		P	Fe XXIV	7.066	18	Q	Mn XXIII	7.263		P
Ge XXIV	6.761		P	Br XXVIII	7.071			Ga XXIII	7.264		P
Br XXVI	6.765			Br XXVII	7.071			Kr XXVII	7.269	55	
Ge XXIV	6.768			Zn XXI	7.073			Br XXVIII	7.271		
Si XII	6.779		P, Z	Ge XXIX	7.081	100		Ge XXIII	7.273		N
Al XI	6.780		Z	Ge XXIII	7.081			Ge XXIX	7.274	20	
Si XII	6.781		P, Z	Se XXVI	7.085			Al XII	7.2745		Z
Si XII	6.782		P, Z	Fe XXVI	7.090		P	Ga XXIII	7.275		
Si XII	6.784		P, Z	Se XXVII	7.091			Ga XXIII	7.275		
Si XII	6.785		P, Z	Ni XXVI	7.091		P	Fe	7.277	15	N
Fe XXIV	6.787	5		Br XXVII	7.092			Ge XXIX	7.281		P
Si XII	6.787	7	P	Se XXVI	7.097			Br XXVIII	7.285		
Al XI	6.792		Z	Zn XXI	7.102			Br XXV	7.285		
Ga XXII	6.797			Cr XXIV	7.104		P	Zn XXI	7.287		
Al XI	6.805		Z	Fe	7.106	15	N	Se XXVII	7.290		
Se XXVI	6.808			Mg XII	7.106	20	P	Se XXVII	7.294		
Fe XXIV	6.808	5		Mg XII	7.107	10	P	Se XXV	7.294	80	
Ni XXVI	6.811		P	Br XXVIII	7.110			Se XXVII	7.301		
Br XXVI	6.815			Mn XXIII	7.110		P	As XXV	7.306		
Cr XXIV	6.820		P	Br XXVII	7.111			Mg XI	7.3101	6	
Ni XXVI	6.821		P	Se XXVI	7.116			Se XXVII	7.316		
Ge XXIV	6.823			Br XXVII	7.118			Ga XXIII	7.319		
Al XI	6.824		Z	Ga XXII	7.119			Kr XXVI	7.322		
Al XI	6.83	5	Z	Kr XXVIII	7.123			Se XXVII	7.329		
Br XXVIII	6.834			Br XXVIII	7.123			Br XXVII	7.330		P
Ge XXIV	6.838			Se XXVII	7.124			Ge XXIX	7.333	20	
Si X	6.846	13	Z	Si K( $\alpha$ )	7.1254			Se XXVII	7.340		
As XXIV	6.861			Mg XI	7.128	2		Br XXVII	7.348		P
Mn XXV	6.862		P	Ga XXII	7.130		P	Kr XXVI	7.350		
Br XXVIII	6.866			Br XXVIII	7.132		Q	Br XXVIII	7.351		

Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes
Br XXVI	7.351			Na XI	7.596		P	Se XXVII	7.801		Q
Se XXVI	7.353	12		Se XXVI	7.596	12		Se XXIV	7.805		Z
Se XXVII	7.353			As XXV	7.602			Al XII	7.8067	8	P
Fe	7.355	19	N	As XXVI	7.602			Al XI	7.810		P, Z
Mn XXIII	7.355		P	Kr XXVI	7.604			Al XI	7.811		P, Z
Ge XXIII	7.359			Br XXVII	7.608			Al XI	7.815	11	Z
Co XXV	7.364		P	Se XXVI	7.610	24		Cr XXII	7.817		P
Se XXVI	7.368			Se XXVII	7.610			Se XXVII	7.821		
Br XXVIII	7.370			Fe	7.612	15	N	Se XXIV	7.821		
Fe XXIV	7.370	25		As XXV	7.613			Fe XXIII	7.826	16	
Ga XXIII	7.371			Kr XXVI	7.614			Ga XXII	7.827		P
Co XXV	7.374		P	Na XI	7.614		P	Al XI	7.827	5	
Kr XXVI	7.376			Kr XXVI	7.623			Cr XXII	7.828		P
Ge XXIX	7.377		P	Zn XXIII	7.623			As XXIV	7.829		
Se XXVI	7.379	20		Zn XXIII	7.623			As XXVI	7.829		
Kr XXVI	7.384			Se XXVI	7.623	16		Na XI	7.833		
Ga XXIII	7.386			Se XXVII	7.623			Al XI	7.846	14	P
Mn XXIII	7.387		P	Zn XXI	7.625			Se XXVII	7.846		
Zn XXI	7.390			Co XXV	7.629		P	As XXVI	7.847		
Fe XXIV	7.391		P	Zn XXIII	7.631			Zn XXII	7.847		
Br XXV	7.391			As XXVI	7.632			Al XI	7.849		P
Kr XXVI	7.393			Cu XXIX	7.632		P	Fe XXIII	7.849	37	
Se XXVI	7.400	40		Kr XXVI	7.634			Mg XI	7.8503	44	
Se XXVII	7.400			Se XXVI	7.637	12		Ge XXIX	7.852		P
Br XXVII	7.403			Na XI	7.639		P	Fe XXIII	7.854	32	
Br XXVIII	7.403			Br XXVII	7.651			Al XI	7.856	11	P, Z
Ga XXIII	7.404			As XXV	7.655			Ge XXIV	7.859		
Ge XXIII	7.411			As XXVI	7.655			As XXVI	7.861		
Br XXVIII	7.412			Mn XXIII	7.656		P	Mg XI	7.8629	2	
Br XXV	7.413			Se XXVI	7.658	10		Al XII	7.872		F, P
Mn XXIII	7.413		P	Cr XXII	7.664		P	Se XXVII	7.874		
Se XXVI	7.417	28		As XXV	7.665			Se XXV	7.874	200	
Ga XXIII	7.424			Co XXV	7.667		P	Al XI	7.875	66	P, Z
Ge XXIX	7.428		P	Ga XXII	7.673			Al XI	7.878		P, Z
V XXIII	7.433		P	V XXIII	7.677		P	Zn XXII	7.879		P
Br XXVI	7.436			Na XI	7.677			Cr XXII	7.881		P
Br XXV	7.436			Mn XXV	7.677		P	Fe XXIII	7.883	32	
Br XXVII	7.436			Fe XXIII	7.680	20		Ga XXII	7.887		
As XXV	7.438			Se XXVI	7.685		Q	Zn XXII	7.890		
Fe XXIV	7.438	36		Se XXV	7.685	150		Fe	7.901	28	N
Ge XXIX	7.442		P	Br XXVII	7.685			As XXV	7.902		
Zn XXIII	7.445			Zn XXIII	7.688			As XXV	7.923		
Fe XXIII	7.445	28		Ge XXIX	7.696		P	Fe XXIII	7.935		Q
Cr XXIV	7.452		P	As XXV	7.701			Cr XXII	7.936		P
As XXV	7.459			Br XXVII	7.704			Zn XXVII	7.939	10	
Fe XXIV	7.462		P	Zn XXI	7.710			Zn XXII	7.941		
Se XXVI	7.465	23		Se XXIV	7.718			Se XXIV	7.945		
Fe XXIII	7.472	20		Co XXV	7.718		P	Se XXVI	7.945		
As XXV	7.473			Br XXVII	7.720		P	Ga XXVIII	7.95		P
Br XXVII	7.473			Fe XXIII	7.733	17		As XXV	7.951		
Mg XI	7.4730	10		Na XI	7.735			Cu XX	7.955		
Zn XXIII	7.486			V XXIII	7.737		P	Se XXV	7.967	60	
Se XXVI	7.487	13		Zn XXI	7.738			As XXV	7.969		
Br XXVII	7.488			Zn XXIII	7.741			Se XXIV	7.969		
Br XXVII	7.488			Zn XXII	7.747		P	Se XXVI	7.978	27	
V XXIII	7.489		P	Fe XXIII	7.755	23		Fe XXIV	7.983	34	
Kr XXVII	7.507	80		Se XXIV	7.757		Z	Fe XXIV	7.993	25	
As XXV	7.515			Al XII	7.7571	21	P	Zn XXII	7.993		
Cr XXIV	7.518		P	Mn XXV	7.758		P	Mg X	7.998		Z
Ge XXIX	7.520		P	Al XI	7.765	10	Z	Zn XXVII	7.999	20	
Zn XXIII	7.525			Cu XXIX	7.770		P	Ga XXVIII	8.00		P
As XXV	7.529			Al XI	7.773	10	Z	Zn XXII	8.005		
Kr XXVI	7.538		N	Cr XXII	7.774		P	Zn XXVII	8.009	0	
Se XXVI	7.548	13		As XXIV	7.777			Ge XXIV	8.012		
Kr XXVI	7.554			Fe XXIII	7.778	28		As XXV	8.020		
Ge XXIX	7.562		P	Se XXIV	7.782			Na XI	8.021	10	
Cr XXII	7.562		P	Se XXVII	7.782		Q	Se XXVI	8.026	9	
Se XXVII	7.565			Ga XXVIII	7.79		P	Ge XXIV	8.027		
Se XXVI	7.565	14		Se XXIV	7.790			Ga XXII	8.028		
As XXV	7.569			Br XXVI	7.790			Mn XXIII	8.029		
Kr XXVI	7.570			Ga XXII	7.794			Br XXVI	8.030		
As XXV	7.581			Fe XXV	7.795		Q	Zn XXVII	8.034		P
Zn XXIII	7.583			Al XI	7.796	2	P, Z	Mg X	8.0358	2	Z
Co XXV	7.583		P	Mn XXIII	7.797			Se XXVI	8.042	13	
Kr XXVI	7.594			Al XI	7.800	6	P, Z	Cr XXII	8.042		P
Kr XXVI	7.594										
Mn XXIII	7.595		P								

Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes
As XXV	8.047			As XXVI	8.292			Zn XXVII	8.500	30	
Zn XXII	8.047			Ge XXV	8.302		Q	As XXIII	8.507		Z
Mg X	8.0514		Z	Fe XXIII	8.303	30		Fe	8.510	17	N
Zn XXVII	8.056	20		Cr XXII	8.304		P	Ge XXV	8.512		
Cr XXII	8.066		P	As XXIII	8.312		Z	Ni XIX	8.512		P
Ge XXIV	8.068			Fe XXIV	8.315	58		Ge XXIV	8.512	12	
Mg X	8.0688	4	Z	Ge XXV	8.315			Cr XXII	8.516		P
Zn XXII	8.069			Fe XXIII	8.316			Ni	8.516	0	N
As XXV	8.070			Ge XXV	8.324			As XXIII	8.517		Z
Cu XX	8.070	10		Cu XX	8.330	10		Co	8.518	10	N
Zn XXVII	8.078	10		As XXIII	8.332		Z	Fe XXI	8.521	21	
Fe	8.082	23	N	Cu XXII	8.333			Mg XI	8.5228	1	Z
Zn XXII	8.086			Fe	8.334	15	N	Cu	8.524	10	N
Cu XXII	8.086			Ni XXVIII	8.337		P	V XXI	8.527		P
Mn XXIII	8.090			Cr XXIV	8.339		P	Ge XXIV	8.527	30	
Zn XXVII	8.092	10		Al K( $\alpha$ )	8.3393			Fe XXIII	8.529	24	
Mg X	8.092	3		Zn XXVII	8.340	80		Mg XI	8.5313		P, Z
As XXV	8.097			Zn XXI	8.340			As XXIII	8.534		
Ge XXIV	8.099			As XXIII	8.341		Z	As XXV	8.534		
Cr XXII	8.100		P	Fe	8.348	15	N	Fe	8.543	26	N
Ga XXVIII	8.11		P	As XXIII	8.356		Z	As XXIII	8.543		Z
Ge XXIV	8.110			Cr XXII	8.365		P	Mg XI	8.5487	2	P, Z
Fe	8.118	20	N	Ge XXIII	8.369	100		Ni	8.549	30	N
V XXIII	8.122		P	Fe XXIV	8.371	19	Q	Fe XXIII	8.550	40	
Cu XXII	8.125			Se XXV	8.374	100		Zn XXVII	8.550	10	
Ti XXII	8.130		P	As XXIII	8.374			Cu XXVI	8.551	10	
As XXVI	8.133			Ge XXV	8.379			Cu XXI	8.554		
Ge XXIV	8.136			Cu XX	8.383	10		Fe XXI	8.558	21	
As XXV	8.137			Cu XXII	8.385			Ge XXIV	8.560	40	
Zn XXVII	8.147	10		Zn XXVII	8.389	0		Fe	8.563	17	N
As XXV	8.150			As XXIII	8.392			Zn XXVII	8.566		P
Zn XXII	8.154			As XXVI	8.392			As XXIV	8.567		
Se XXVI	8.156			Ge XXV	8.394			As XXIII	8.567		
Cu XXII	8.158	10		Cu XX	8.395			Ge XXIV	8.567		
Fe XXIII	8.159	15	Q	Ti XXII	8.398		P	Mg XI	8.573	1	Q, Z
As XXV	8.166			V XXI	8.399		P	Cu XXI	8.574	10	
Fe	8.167	21	N	Zn XXVII	8.402		P	Fe XXIII	8.575	22	Q
Cu XXII	8.171			As XXIII	8.406			Zn XXVII	8.576	30	
Ge XXV	8.176			Fe	8.406	23	N, Z	V XXI	8.576		P
Ge XXIV	8.176			Cu XXVII	8.41		P	V XXI	8.582		P
Fe XXIII	8.180	19	Q	Ge XXV	8.410			Fe	8.583	29	N
As XXV	8.181			Zn XXVII	8.414	0		As XXV	8.588		
As XXVI	8.182			Co	8.414	10	N	Ge XXIV	8.588	20	
Ge XXIV	8.182			Cr XXIV	8.419		P	Fe XXI	8.590	26	Q
Ti XXII	8.186		P	Mg XII	8.419	60	P	Cu XXI	8.591		
V XXIII	8.188		P	As XXIII	8.422			Mg XI	8.5983		Z
Se XXVI	8.197	8		As XXVI	8.422			As XXVI	8.600		
Zn XXII	8.198			Ge XXIII	8.423	80		Fe XXIII	8.601	20	Q
Ni XXVIII	8.199		P	Mg XII	8.425	120	P	Ni	8.605	30	N
As XXV	8.200			Ge XXV	8.427			Fe XXI	8.610		P
Ge XXV	8.200			As XXVI	8.437			Fe XXIII	8.614	45	
Fe XXIII	8.210	17	Q	Cu XXI	8.437		P	Ni XIX	8.614		P
Ge XXIV	8.212			Fe	8.439	20	N	Se XXV	8.615	100	
Ge XXV	8.212			Ge XXV	8.439			Ga XXIII	8.617		
As XXV	8.217			Ge XXV	8.439			Fe XXIII	8.630	24	
Cu XXII	8.222			Cu XX	8.444	10		Ga XXIII	8.633		
Fe XXIV	8.231	35		Mg XI	8.445		Z	As XXV	8.641		
Ge XXV	8.233			Ge XXV	8.448			Fe XXIII	8.643	18	
Se XXVI	8.237	15		Cu XXVII	8.45		P	V XXI	8.643		P
Fe	8.240	14	N	Cu	8.450	10	N	Fe XXI	8.643	18	
Ge XXV	8.246			Fe	8.452	21	N	Ge XXIV	8.643	35	
As XXV	8.248			Mg XI	8.458			Ni	8.649	20	N
Zn XXVII	8.249		P	Ti XXII	8.458		P	Cu XXI	8.652	10	
Zn XXII	8.257			Na XI	8.459	20	P	Cu XXVI	8.653	30	
Se XXVI	8.259	5		Na XI	8.460	10	P	Ge XXIV	8.653		
As XXIV	8.271			As XXIV	8.464			Zn XXVII	8.658	30	
Fe XXIII	8.273	40		Ga XXIII	8.466			Zn XXI	8.658		
Ge XXV	8.274			Zn XXI	8.467			As XXV	8.661		
Cu XXII	8.275	10		Fe XXI	8.472	18	Q	Cu XXVI	8.663		P
Cu XXII	8.275	10		Se XXVI	8.483			Fe XXIII	8.664	34	
Cu XXII	8.281			Zn XXVII	8.483	0		Fe XXIII	8.672	61	
Fe XXIV	8.285	25		Ni XIX	8.487		P	Ga XXIII	8.672		
Zn XXVII	8.286		P	As XXVI	8.491			Ge XXIV	8.676	8	
V XXI	8.288		P	Fe	8.494	14	N	Na X	8.686		P
Fe XXIII	8.289			Mg XI	8.4943		P, Z	Mn XXIII	8.689		P

Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes
Cu XXI	8.691	10		Ni XXI	8.886	10	Q	Ge XXII	9.168		Z
Ni	8.694	20	N	Fe	8.900	16	N	Mg XI	9.1685	100	
Mn XXIII	8.699		P	Ga XXIII	8.905			V XXIII	9.169		P
Zn XXVII	8.702	0		Fe	8.908	15	N	V XXI	9.175		P
V XXI	8.703		P	Cu XXI	8.911			Mg X	9.1771	5	Z
Cu XXVI	8.705		P	Fe	8.915	22	N	Fe XXII	9.183	59	
Cu XXI	8.707	10		Ge XXIII	8.916	150		Ga XXIII	9.185		
Ge XXIV	8.710	20		Fe	8.921	16	N	Mg X	9.187	4	Z
Ga XXIII	8.712			Cu XXVI	8.933	0		Ge XXII	9.190		
Fe	8.714	23	N	Fe XXIII	8.935	22	Q	Fe XXII	9.190	31	Q
Co	8.715	20	N	Cu XXI	8.936	0		Mg X	9.1912		Z
Zn XXVII	8.720	40		Fe	8.946	19	N	Ne X	9.194		P
Zn XXI	8.722			Ti XXII	8.950		P	Ni XXV	9.194	2	Q
Fe XXIII	8.723	16	Q	Ni XXI	8.960			Mg X	9.195	3	Z
Ge XXIV	8.724	25		Fe XXII	8.960	44		Fe XX	9.199	28	
Ni XIX	8.725	10		Co	8.966	20	N	Ge XXII	9.200		
Ga XXIII	8.730			Mn XXIII	8.968		P	Ge XXIV	9.200		
Fe XXIII	8.731	35		Co XXVII	8.969		P	Ga XXIII	9.201		
Ge XXIV	8.734	25	Q	Fe XXII	8.977	25		Fe XX	9.208	26	
Fe XXII	8.736	28	Q	Cu XXVI	8.981	0		Fe XXII	9.215	36	
Fe XXI	8.741	22	Q	Na X	8.983		P	Ni XXV	9.215	0	
Fe XXIII	8.752	42		Cu XXI	8.984			Ne X	9.215		P
As XXV	8.753			Na X	8.989		P	Mg X	9.218	4	P, Z
Cu XXI	8.754	10		Fe XXII	8.992	37		Ge XXII	9.220		
Ge XXV	8.754			Fe XXII	9.006	50		Fe XX	9.220	28	
Ge XXIV	8.754	13		Fe XXII	9.013	26	Q	Mg X	9.221		P, Z
Ga XXIII	8.761			Ni XXI	9.016	20		Ge XXIII	9.222	60	
Fe XXIII	8.763	32		Ga XXIII	9.021		P	Ge XXV	9.227		
Ge XXIV	8.767	30		Fe	9.022	21	N	Fe XX	9.231	37	Q
Cu XXVI	8.772	0		Mn XXIII	9.025		P	Mg XI	9.2310	31	
Fe XXIII	8.775	15	Q	Ga XXII	9.027			Ga XXIII	9.233		
Ni XXI	8.775			Co	9.028	20	N	Cu XXVI	9.233	50	
Cu XXI	8.777	0		Fe XXII	9.033	11	Q	Cu XX	9.233	20	
Cr XXII	8.778		P	As XXIV	9.034			Mg X	9.234		P, Z
Ga XXIII	8.786			Ga XXIV	9.038			Mg X	9.235	4	P, Z
Fe XXII	8.786	13	Q	Cu	9.040	0	N	Ni XIX	9.236	30	
Na X	8.788		P	Fe	9.042	17	N	Ni XXV	9.238	5	Q
Ge XXIV	8.788	25		Zn XXVII	9.051	20		Fe XXII	9.241	45	
Co	8.795	20	N	Mn XXIII	9.053		P	Co	9.245	20	N
Fe	8.797	10	N	Fe XXII	9.053	13	Q	Ti XX	9.246		
Ni XXI	8.802			Fe XXII	9.058	17	Q	Ne X	9.246		P
Ge XXIV	8.805	20		Cu	9.060	0	N	Fe	9.248	34	N
Ge XXV	8.805			Ni XXVI	9.061	14		Ga XXIII	9.248		
Ga XXIV	8.807			Ga XXIV	9.064			Ge XXIV	9.257	30	
Ga XXIII	8.807			Fe XX	9.065	38		Cu XXI	9.26		P
Fe	8.807	16	N	Fe XX	9.073	21		Fe XXII	9.262	37	Q
Cu XXI	8.808	10		Ga XXIV	9.081			Ni XIX	9.262		
As XXV	8.810			Ga XXII	9.081			Ga XXIII	9.263		
Fe XXIII	8.814	34		Fe XX	9.082	38	Q	Mg X	9.266	2	Z
Fe	8.823	20	N	Co	9.087	20	N	As XXIV	9.269		
Ge XXV	8.825			V XXIII	9.088		P	Fe	9.271	18	N
Ge XXV	8.825			Fe XXII	9.093	17	Q	Cu	9.280	10	N
V XXI	8.826		P	Cu XXI	9.10		P	Mg X	9.2832	16	Z
Ge XXIV	8.826	20		Cu XX	9.102	20		Mg X	9.285		P, Z
Ga XXIV	8.827			Ni XXVI	9.105	9		Fe	9.287	22	N
Co XXVII	8.831		P	Ge XXIII	9.110	150		Ne X	9.291		P
Ni XIX	8.838	20		Fe XX	9.110	41		Mg X	9.294	13	P, Z
V XXI	8.843		P	V XXI	9.111		P	Ni XXV	9.297	11	
Ga XXIII	8.846			Mn XXIII	9.115		P	Mg X	9.297		P
Ga XXIV	8.846			Fe	9.120	28	N	Fe XXII	9.299	27	Q
Cr XXII	8.847		P	Ti XX	9.128			Zn XXII	9.299		
Ni XXI	8.849			Fe	9.129	24	N	Mg X	9.300		P, Z
Fe	8.850	18	N	Ni XIX	9.130	30		Ni XXV	9.306	16	
As XXV	8.855			Ni	9.135	3	N	Cu	9.309	10	N
Zn XXVII	8.856	20		Ni XXI	9.139			Mg XI	9.314	32	F, P
Fe XXIII	8.862	16	Q	Co	9.139	40	N	Ga XXIII	9.314		
Ga XXIV	8.864			Ni XIX	9.140			Ge XXIV	9.316	12	
Cu XXI	8.870			Ge XXV	9.142		Q	Zn XXII	9.316		
Fe XXIII	8.870	12	Q	Zn XXII	9.145			Ni XXV	9.316	12	
As XXV	8.873			Fe	9.145	40	N	Mg X	9.316	32	P
Co	8.880	20	N	Ni XIX	9.153			Mg X	9.318		P, Z
Ge XXV	8.880			Fe	9.155	31	N	Mg X	9.319		P, Z
Ga XXIV	8.882			Ge XXV	9.156		Q	Fe XXII	9.320	15	Q
V XXI	8.882		P	Fe XXII	9.163	28		Fe XVII	9.324		P
Ti XXII	8.885		P	Fe XX	9.163	28		Ga XXIII	9.325		



Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes
Cu XXVI	9.331	0		Ga XXIII	9.507			Zn XXIII	9.713		
Fe XX	9.331	18	Q	Fe	9.507	0	N	Ga XXI	9.720	5	Z
Ni XX	9.338	10		Zn XXII	9.507			Zn XXIII	9.723		
Ga XXIII	9.339			Ga XXIV	9.508			Fe XIX	9.724	13	
Zn XXII	9.339			Ga XXIV	9.508			Ni XXVI	9.732	4	
Ni XXV	9.340	15		Zn XXII	9.518			Ti XX	9.733		
Ge XXIV	9.340	11		Zn XXIII	9.518		Q	Co XVIII	9.736	20	
Fe XX	9.344	18	Q	Fe XXI	9.518	46		Cu XXVI	9.737	0	
Co XVIII	9.347			Cu XXVI	9.520	0		Ga XXIV	9.739		
V XXI	9.352		P	Cu XX	9.522	10		Ga XXI	9.739	8	
Ni XXV	9.355	30		Ga XXIII	9.529			Ni XXIV	9.74		P
Cu XXVI	9.355	0		Ge XXIV	9.533	12		Co XX	9.742		
Fe XXI	9.355	33		Ti XX	9.534			Ni XXV	9.744	45	
Ga XXIII	9.357			Zn XXIII	9.534			Zn XXIII	9.744		
Zn XXII	9.357			Ni XXVI	9.535	39		Zn XXII	9.751		P
Ne X	9.362		P	Fe XXVI	9.536		P	Ga XXI	9.752	9	
Fe XX	9.364	33	Q	Zn XXIII	9.541			Cu	9.752	0	N
Ni XX	9.366	30		Ni XIX	9.545	15	N	Fe XIX	9.752	17	Q
Cu XX	9.371	10		Fe XIX	9.547	28	Q	Ni XXV	9.753	20	
Co XVIII	9.371			Ga XXIII	9.548			Zn XXIII	9.753		
Cu XXVI	9.373	0		Ni XXVI	9.55	9		Sc XXI	9.759		P
Fe	9.380	32	N	Ge XXIV	9.553	8		Ni XXV	9.759	20	
Ga XXIII	9.381			Zn XXIII	9.557			Zn XXIII	9.761		
Mg X	9.382		P,Z	Ni XX	9.558	30		Ga XXIV	9.761		
Mg X	9.383		P,Z	Fe XXI	9.559	21	Q	Ge XXIII	9.762	90	
Mg X	9.384		P,Z	Zn XXII	9.562			Ge XXIV	9.762		
Ni XX	9.385			Ni XXVI	9.564	2	Q	Zn XXI	9.762	100	
Ni XX	9.385			Fe	9.568	0	N	Fe XIX	9.766	4	Q
Mg X	9.386		P,Z	Zn XXIII	9.568			Cu XXIII	9.772	0	
Fe XX	9.389	41	Q	Ga XXIV	9.575			Ga XXI	9.772	7	
Ni XXV	9.39	8		Ni XX	9.581			Ga XXIV	9.772		
Ni XXVI	9.390	27		Fe XXI	9.581	55		Ni XXV	9.776	45	
Mg X	9.391		P,Z	Cu	9.582	0	N	Ga XXI	9.780	8	Z
Ga XXIII	9.395			Zn XXIII	9.586			Fe XXII	9.785	11	Q
Fe	9.401	22	N	Ti XX	9.591			Ti XX	9.788		
Ti XX	9.405		P	Fe XIX	9.599	35	Q	Ga XXI	9.791	6	Z
Ni XXV	9.407	10		Ni XXV	9.601	18		Cu	9.792	0	N
Fe XXII	9.412	27	Q	Zn XXII	9.601			Zn XXIII	9.794		
Fe XXI	9.421	19		Zn XXIII	9.601			Zn XXII	9.795	70	
Ga XXIII	9.421			Ga XXIV	9.609			Co XXV	9.795		P
Cu XX	9.423	10		Co XVIII	9.609	20		Fe XIX	9.799	10	
Zn XXII	9.425			Fe	9.619	11	N	Cu XXIV	9.802	0	Q
Ga XXIII	9.431			Zn XXIII	9.628			Cr XXII	9.806		P
Fe XXI	9.433	26		Ni XX	9.630	10	Q	Ga XXI	9.812	5	Z
Na X	9.433		P	Co XVIII	9.633			Zn XXI	9.815	80	
Ti XX	9.434			Co XX	9.633			Fe	9.817	32	N
Ge XXIV	9.439	5		V XXI	9.633		P	Ni XX	9.821		
Zn XXII	9.440			Ni XXV	9.633	30		Zn XXIII	9.823		
Fe XX	9.440	37	Q	Zn XXIII	9.635			Sc XXI	9.824		P
Ni XIX	9.441	8	N	Cu	9.640	0	N	Co XX	9.828	20	
Ga XXIV	9.442			Ga XXII	9.643			Co XXV	9.838	25	P
Ga XXIII	9.442			Fe	9.644	28	N	Fe XIX	9.842	20	
Ni XX	9.446	10	Q	Cu	9.653	0	N	Ga XXII	9.842		
Cu	9.448	10	N	Fe XXII	9.663	17	Q	Ca XX	9.853		P
Na X	9.449		P	Ga XXIV	9.668			Co XX	9.856		
Fe XXI	9.451	34		Cu	9.670	0	N	Ga XXIV	9.859		
Ni XX	9.455			Fe XXVI	9.674		P	Ni XXV	9.860	60	
Ti XX	9.459		P	Fe XXII	9.675	19	Q	Cr XXII	9.870		P
Fe XXI	9.460	50		Co XX	9.681			Fe XX	9.871	5	Q
Fe XVII	9.468		P	Ga XXI	9.685	8		Ni XXV	9.873	30	
Zn XXII	9.468			Ga XXIV	9.685			Fe	9.882	12	N
Ga XXIII	9.470			Zn XXIII	9.686			Ni XXIV	9.883	0	Q
Ni XXV	9.471		P	Fe XIX	9.688	13		Mg K( $\alpha$ )	9.8900		
Co	9.475	20	N	Ni XXIV	9.69		P	Cr XXII	9.891		P
Fe XXI	9.475	32	Q	Ni XX	9.693	10		Cu XXI	9.892	0	Q
Ne X	9.481		P	Co XX	9.694			Zn XXIII	9.893		
Ge XXIV	9.481	8		Zn XXIII	9.695			Fe XXII	9.894	5	Q
Ni	9.482	10	N	Ni XXV	9.695	30		Ni XXIV	9.90		P
Fe	9.486	31	N	Fe XIX	9.696	27		Co XX	9.900	20	Q
Ga XXIII	9.486			Fe XVII	9.703		P	Ga XXI	9.905	7	Z
Cr XXII	9.488		P	V XXI	9.704		P	Cu	9.906	0	N
Ni XX	9.497	20		Fe XIX	9.705	14		Ca XX	9.909		P
Cr XXII	9.498		P	Ni XXV	9.707	18		Fe XIX	9.911	1	P
Zn XXIII	9.499		Q	Ne X	9.708	10	P	Cu XXI	9.912	0	
Co XVIII	9.501			Fe XIX	9.713	37	Q	Ni XXIV	9.92		P

Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes
Ga XXI	9.920	6	Z	Fe XX	10.128	52	Q	Fe XVIII	10.352	31	
Co XX	9.924			Co	10.130	30	N	Zn XXII	10.353	40	
Fe XIX	9.926	1	P	Fe XVII	10.134	40		Ni XXV	10.354	20	Q
Ni XXIV	9.933	2		Zn XXII	10.144	65		Cu XXI	10.354	10	
Ni XXV	9.934	20		Co XXIV	10.156	40		Cu XXII	10.356	10	
Fe	9.936	5	N	Ni XIX	10.157			Fe XVII	10.367	18	Q
Ga XXI	9.939	7	Z	Na X	10.157		P	Co XXV	10.367		P
Ti XXII	9.943		P	Zn XXII	10.158	30		Cu XXII	10.371		
Ga XXIV	9.946			Fe XX	10.159	22		Co XIX	10.373	20	
Zn XXII	9.947	6		Co XXV	10.159	8	P	Zn XXIII	10.380		
Fe XX	9.953	11	Q	Na X	10.170		P	Fe XVII	10.386	14	
Cr XXII	9.960		P	Cu XXIV	10.170	0		Cu XXII	10.392		
Ga XXI	9.961	9		Ca XX	10.177		P	Cu XXI	10.392	10	
Cu XXI	9.961	10	Q	Fe XX	10.177	20		Cu XXIV	10.400	10	
Ga XXIII	9.961			Co XVIII	10.182	40		V XXI	10.401		P
Ga XXII	9.961			Co XXIV	10.182	40		Cu XXII	10.406		
Zn XXII	9.962	70		Fe XVIII	10.192	15	Q	Co XIX	10.406	40	
Ni XXIV	9.966	15		Na X	10.193		P, Z	Zn XXII	10.408		P
Ni XXV	9.967	80		Ni XXIV	10.195	20	Q	Fe	10.408	19	N
Ni XIX	9.967	30	P	Ga XXIII	10.198			V XXI	10.411	10	P
Co XXIV	9.974	10		Zn XXII	10.201	60		Ni XIX	10.417	20	
Fe XX	9.981	21	Q	Cu XXI	10.203			Cu XXII	10.422		Q
Cu XXIV	9.982	10	Q	Fe	10.205	21	N	Sc XIX	10.426		P
Fe XX	9.991	27		Co XIX	10.206	40		Co XIX	10.428	20	Q
Zn XXII	9.997	52		Zn XXII	10.206			Fe XVII	10.436	17	
Ni XXIV	10.00		P	Ni	10.215	20	N	Fe XVIII	10.437	26	
Fe XXV	10.003	180	P	Fe XVII	10.221	14		Cu XXII	10.438	10	
Zn XXII	10.007	80		Fe XXV	10.221		P	Sc XIX	10.443		
Fe XX	10.008	20		Fe XX	10.222	22		Co XXIV	10.445	10	
Ge XXIII	10.010	100		Zn XXII	10.229	12		Ni XXIII	10.450	20	Q
Cu	10.010	10	N	Zn XXIII	10.229			K XIX	10.454		P
Ga XXIII	10.013			Cu XXI	10.234	0		Zn XXIII	10.458		N
Co XX	10.020	20	Q	Co XVIII	10.234	4		Fe XVIII	10.460	23	
Zn XXII	10.022	70		Ca XX	10.237		P	Zn XXI	10.462	150	
Ti XXII	10.023		P	Ne X	10.238	20	P	Mn XXV	10.466		P
Na XI	10.023	65	P	Ga XXIII	10.239			Zn XXII	10.472	30	
Co	10.023	30	N	Sc XIX	10.240		P	Zn XXIII	10.474		Q
Na XI	10.029	35	P	Ne X	10.240	10	P	Co XIX	10.477	40	
Co XVIII	10.030			Zn XXII	10.245	65		Sc XIX	10.481		P
Fe XX	10.034	62		Fe XVII	10.252	31	Q	Fe	10.486	19	N
Cu	10.037	10	N	Cu XXI	10.260	10		Ni XXIII	10.49	10	Q
Fe XXV	10.038		P	Ni XXIV	10.261	10	Q	Zn XXII	10.496		P
Mn XXI	10.04		P	Zn XXII	10.262	60		Ni	10.500	10	N
Ti XX	10.046			Co XXIV	10.265	20		Cu XXII	10.501		
Fe XX	10.047	78		Cu	10.267	10	N	Co XXIV	10.503	20	
Co XXIV	10.053	30		Fe	10.269	15	N	K XIX	10.505		P
Co XVIII	10.053	30		Co XIX	10.275			Fe XVII	10.506	28	
Cu XXI	10.057	10		Ni XXV	10.276	10		Cu XXII	10.507	10	
Cu	10.057	10	N	Cu XXII	10.277			Ne IX	10.513	50	
Fe XX	10.058	25		Ti XX	10.278			Fe	10.516	1	N
Na X	10.06		P, Z	Cu XXI	10.282			Cu XXII	10.523		
Fe	10.065	85	N	Zn XXIII	10.285			Fe XVIII	10.529	32	
Co XVIII	10.066	50		Zn XXII	10.285	45		Ni XXV	10.529	20	
Co XXIV	10.066	50		Co XIX	10.290	40		Co XXV	10.533		P
Fe	10.071	36	N	Cu XXI	10.291			Zn XXIII	10.539		
Cu XXI	10.074			Ga XXIII	10.298			Co XXIV	10.543	20	
Co XXIV	10.080		P	Fe XVIII	10.298	10		Fe XVIII	10.543	21	
Ga XXIII	10.083			Co XXV	10.303	30	P	Cu XXII	10.547		
Fe XX	10.095	25	Q	Cu XXI	10.306			Fe XVII	10.550	17	
Zn XXII	10.099	65		Ni XIX	10.306	20		Cu XXII	10.551	10	
Ni XXIV	10.10		P	Zn XXII	10.307	12		Co XXIV	10.552	10	
Ni XIX	10.102	30		Zn XXIII	10.307			K XIX	10.556		P
Ni XXV	10.103	80		Cu XXI	10.316	10		Zn XXIII	10.557		
Cu XXIV	10.103	10		Cu XXII	10.316	10		Zn XXII	10.561		P
Sc XIX	10.104		P	Ga XXIII	10.319			Cu XXII	10.562		
Ti XX	10.109			Fe XX	10.322	27	Q	Fe XIX	10.564	33	
Ga XXIII	10.109			Mn XXV	10.328		P	Ne IX	10.565	70	
Co XXIV	10.115	30		Cu XXII	10.328			Co XIX	10.568		
Fe XX	10.116	42	Q	Fe XVII	10.332	19		Zn XXIII	10.569		
Zn XXII	10.118	60		Ga XXIII	10.333			Co XXIV	10.571	80	
Na X	10.119		P, Z	Fe XVII	10.337		P	Zn XXIII	10.574		
Fe XVII	10.120		P	Cu XXII	10.342		Q	Sc XIX	10.576		
Cu XXI	10.121	10		Fe XX	10.344	27	Q	Ni	10.580	10	N
Fe XX	10.121	25		Ga XXIII	10.347			Fe XIX	10.580	28	
Cu	10.123	10	N	Ni XXIV	10.35		P	Co XXIV	10.582	5	Q

Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes
Co XIX	10.583	30		Sc XIX	10.846			Fe XVII	11.132	32	
Ga XXII	10.583			V XXI	10.850	30	P	Cu XXI	11.136	10	
Co XXIV	10.593	30		Fe XVII	10.851	12		Sc XIX	11.141		
Cu XXII	10.597			Fe XIX	10.851	20	Q	Co XXIV	11.141	20	
Cu XX	10.599	100		Mn XXIV	10.855		P	Fe XXIII	11.145	25	
K XIX	10.608		P	Cu XXI	10.858	40		Na IX	11.154		P, Z
Cu XXII	10.611			Cu XXI	10.863	3		Zn XXII	11.155	35	
Cu XXII	10.611			Zn XXII	10.865	55		Na IX	11.157		P, Z
Fe XIX	10.617	25		Co XXIII	10.875	3		Ni XX	11.158		
Fe XXIV	10.619	103		Fe	10.877	15	N	Ni XXI	11.159	20	Q
Ti XX	10.620			Mn XXIV	10.889		P	Na X	11.16		N
Co	10.624	30	N	Cu XXI	10.893	14		Cu XXI	11.162	7	
Cu XXI	10.625		P	Ni	10.902	20	N	Fe	11.166	61	N
Sc XIX	10.628			Fe XXIII	10.903	76		Ni XXII	11.170		Q
Fe XIX	10.635	38		Fe XIX	10.907			Na IX	11.170		P
Fe XIX	10.644	34		Ni XX	10.918			Fe XXIV	11.171	185	
Co XIX	10.645	30		Co XXIV	10.919	2	Q	Ni XX	11.176		
Ne IX	10.646	120		Sc XXI	10.922		P	Zn XXII	11.183		
Cu XXII	10.653			K XIX	10.925		P	Cu XXII	11.185		
Cu XX	10.653	80		V XXI	10.927		P	Cu XXI	11.185	6	
Fe XVII	10.655	30		Fe XXIII	10.927	94		Fe XXIV	11.187	42	Q
Fe XIX	10.658	36		Cu	10.933	30	N	Na X	11.192		F, P
Zn XXI	10.663	120		Co XXIV	10.933	40		Na IX	11.197		P, Z
Fe XXIV	10.663	80		Fe XIX	10.933	25		Cu XXII	11.198		
Zn XXIII	10.664			Fe XXIII	10.933	25		Na IX	11.199		P
Co XXIV	10.674	10		Ni XX	10.936			Fe	11.199	15	N, Z
Ni XXIV	10.680	10	Q	Ni XXII	10.94		P	Zn XXII	11.200	20	
Fe XIX	10.685	25		Cr XX	10.940	3		Ni XXI	11.203	30	Q
Co XXIV	10.686	1	Q	V XX	10.941	10		Sc XIX	11.204		
Ti XX	10.690			Zn XXII	10.944	14		V XX	11.215	10	
K XIX	10.703		P	Fe	10.964	12	N	Fe XXI	11.219	36	Q
Co XIX	10.704	40		Ni XXIII	10.967	20		Cr XXIV	11.222		P
Co XXIV	10.709	0		Cu XXI	10.971	14		Ni XX	11.226		
Ni XXIII	10.71			Co XXIII	10.974	40		Ni XXI	11.229		
Cr XX	10.712	3		Co XVIII	10.975	50		Cu XXI	11.229	10	Q
Ni XXV	10.724	10	Q	Zn XXII	10.976	20		Zn XXII	11.232		
Cu XXII	10.728	10		Fe XXIII	10.980	53		Fe	11.233	48	N
Fe XIX	10.735	20		K XIX	10.981		P	Co	11.237	50	N
Fe XVII	10.737		P	Ni XX	10.982			Ni XXI	11.239		
Zn XXIII	10.738			Fe	10.987	1	N	V XX	11.243	65	
Co XXIV	10.743	40		Ne IX	11.001	350		Ca XVIII	11.243		P
K XIX	10.757		P	Sc XXI	11.002		P	Fe XVIII	11.253	44	
Co XXIV	10.760	10		Ni XXII	11.002	20	Q	Fe XVII	11.253	44	
Fe	10.762	1	N	Cu XXI	11.002	12		Co XXIV	11.257	50	Q
Ni	10.762	20	N	Co XIX	11.002	10	N	Fe XXIV	11.261	61	
Ne IX	10.765	230		Na X	11.0027		P	Ni XXI	11.262	30	Q
V XXI	10.766	20	P	Ne IX	11.008		P	Cu XXII	11.266		
Ca XX	10.768		P	Cu XXI	11.014	14		Ni XXI	11.272		
Cu	10.769	10	N	Fe XXIII	11.018	88		Cu XXI	11.280	10	P
Fe XIX	10.770	37		Fe XVIII	11.021	2		Fe XVIII	11.280	47	
Fe XVII	10.770	37		Ni XXI	11.023	20	Q	Ni XX	11.282		
Ni XX	10.772			Fe XVII	11.025	4	P	K XIX	11.285		P
Co XIX	10.776			Cu XXI	11.026	14		Zn XXII	11.286		P
Fe XVII	10.782		P	Na IX	11.029		Z	Fe XVII	11.287	26	
Sc XIX	10.785			Cr XX	11.030	5		Ni XXI	11.288		
Co XXIII	10.790	8		Fe XXIV	11.030	120		Fe XXIII	11.298	45	
Ni XXII	10.791	140		Fe XVII	11.041	2	P	Ni XXI	11.302	40	
Zn XXII	10.794	45		Zn XXII	11.049	13		V XX	11.308	30	
Zn XXI	10.796	50		Cu XXI	11.065	12		Fe XVIII	11.309	27	Q
Cu XXII	10.799	30	Q	Na IX	11.067		P, Z	Ni XXI	11.310		
Cu XXI	10.800	15		Na IX	11.070		P	Fe XVIII	11.318	3	
Co XXIV	10.800	40		Fe XXIII	11.070	15	Q	Ni XXI	11.318		
Co XXIV	10.811	10		Ni XXI	11.073	0	Q	Fe XVIII	11.326	57	
Cu XXI	10.813			Na X	11.0830		P	Fe XXIII	11.326	57	
Fe XIX	10.813	54		Na IX	11.090		P	Co XVIII	11.330	50	
Ni XXII	10.820	20		Fe	11.090	21	N, Z	Fe	11.333	125	N
Fe XIX	10.824	12		Na IX	11.092		P, Z	Fe XXIII	11.333		
Fe XXIII	10.83			Zn XXII	11.094	25		Ni XXI	11.336	214	
Ca XX	10.833		P	Cu XXI	11.097	5		K XIX	11.344		P
Ga XXII	10.833			Cu XXII	11.097			Ni XXI	11.345		
V XX	10.838	10		Mn XXIV	11.099		P	Cu XXI	11.352		
V XXI	10.838		P	Co XVIII	11.106	70		F IX	11.353	0	
Co	10.840	30	N	Fe	11.113	5	N	Co	11.357	50	N
Cr XX	10.840	2		Cu XXI	11.114	19		Cr XXIV	11.360		P
Ni XXII	10.841	20	Q	Ni XXI	11.123	20	Q	Fe XXIII	11.361	49	Q

Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes
Sc XIX	11.377			Ni XXI	11.691	20	Q	Fe XXII	11.976	125	
V XX	11.378	10		Fe XXIII	11.692	115		Fe XIX	11.980	19	Q
F IX	11.380	10		Ar XVIII	11.706			Ar XVIII	11.987		P
Fe XVIII	11.384	10	Q	F IX	11.707	60	P	F IX	11.988	55	P
Cu XX	11.386	150		Fe XXII	11.707	14	Q	Fe XIX	11.988	10	
Ca XVIII	11.394		P	Co XIX	11.712	20	Q	Ca XVIII	11.989		
Co	11.399	50	N	Fe XXII	11.718	59	Q	F IX	11.989	25	P
Fe XXIII	11.399	30		Ni XX	11.733	6		Ni XX	11.991		
Ni XXIII	11.403	20	Q	Cu XXI	11.736			Co XX	11.995	30	Q
Zn XXII	11.406		P	Cu XX	11.737	50		Mn XXII	11.997	0	
Ni XXI	11.416			Fe XXIII	11.737	145		Fe XVIII	12.003	23	
Cu XXII	11.416	40		Fe XVIII	11.741	11		Cu	12.003	10	N
F IX	11.418	20		Co XIX	11.744	30		K XIX	12.005		P
Fe XVII	11.420	25		Fe XXII	11.748	130		Ni XX	12.006	8	
Fe XVIII	11.420	49		Fe XXIII	11.748	130		Co XIX	12.015		
Fe XXIII	11.422			Fe XVIII	11.762	10		Fe	12.016	2	N
Fe XXIV	11.426	125		Fe XXII	11.767	100		Mn XXIII	12.018		P
V XX	11.427	110		Ar XVIII	11.769		P	Ca XVIII	12.021		P
Co XXIV	11.430	60		Zn XXI	11.769	100		Fe XXII	12.027	72	
Ni XXI	11.435			Cu XVIII	11.774	20	Z	Cu XXI	12.029		
Fe XVIII	11.440	49		Sc XIX	11.777			Ni XX	12.042	10	
Fe XXIII	11.440			Fe XVIII	11.778	13		Ti XX	12.043		P
Fe XXII	11.440	49		Ni XX	11.779	21		Fe XXII	12.045	150	
Cu XXII	11.440			Ca XVIII	11.780		P	Ca XX	12.052		P
Ti XX	11.451		P	Ni XX	11.787			Fe XXII	12.053	60	
Ni XXI	11.452			Fe XXII	11.789	130		Cu XXI	12.061	7	
Co XVIII	11.456	70		Mn XXII	11.793	10	Q	Co XX	12.067	30	Q
Fe XXII	11.458	28		Fe XXII	11.797	128		Fe XXII	12.077	97	
Fe XVIII	11.458	28		Co	11.801	30	N	Ca XVIII	12.078		
Ti XX	11.462		P	Fe XXII	11.815	82	Q	Ni XXI	12.079		
Cu XXII	11.466			Ni XXI	11.818	60	Q	Ni XX	12.079	10	
Cu XXII	11.468			Cr XXIII	11.82		P	Mn XXII	12.079	0	
F IX	11.473	30		Ar XVIII	11.822		P	Fe XXI	12.088	5	Q
Ni XXI	11.478			Fe XXII	11.823	92		Cr XXIII	12.09		P
V XX	11.478	10		Cu XXI	11.830	8		Fe XXII	12.095	91	
Cu	11.479	40	N	Ni XX	11.832	32		Ni XX	12.112	18	
Fe	11.485	86	N	Ca XVIII	11.836		P	Fe XVII	12.125	63	
Fe XXIII	11.493	138		Fe XXII	11.837	135		Ni XX	12.130	15	
Zn XXI	11.516	80		Sc XIX	11.845	20		Ca XX	12.132		P
Ni XXI	11.517			Ni XX	11.846			Ne X	12.132	65	P
Cu	11.518	50	N	Fe XXII	11.846	82	Q	Ne X	12.138	35	P
Fe XXIII	11.519	135		Co	11.851	20	N	V XIX	12.14		P
V XX	11.523	110		Mn XVI	11.853	20		Cu XXI	12.140	7	
Fe XVIII	11.526	52		Fe XVIII	11.865	20		Co XX	12.144	40	Q
Ni XIX	11.529	90		Fe XXIII	11.870	82		Fe XXI	12.145	1	Q
Ni XXI	11.539			Ti XX	11.872		P	Co XIX	12.155		
Co	11.542	20	N	Ni XX	11.874	18		Ni XX	12.157	8	
Ne IX	11.544	570		Mn XXII	11.876	70		Fe	12.158	25	N
Fe XVIII	11.551	27		Fe XXII	11.886	92		Mn XXIII	12.162	20	P
Mn XXIII	11.554		P	Co XIX	11.892	20		Cu XXI	12.165	4	
F IX	11.560	40	P	Fe XXIII	11.898	78		Co XIX	12.168		
Ne IX	11.568		P	Mn XXII	11.899		P	Ne IX	12.172		P
Cu XXII	11.573	40	Q	Cu	11.904	10	N	Mn XXII	12.172	120	
Fe XVIII	11.575	21	Q	Ne VIII	11.905	40	Z	Fe XXIII	12.174	20	Q
Co	11.581	20	N	Co XIX	11.906			Ar XVIII	12.180		P
Ni XIX	11.587	70		Mn XXII	11.906	30		Ni XXI	12.181		
Fe XXIII	11.594	142		Na K( $\alpha$ )	11.9101			Mn XVII	12.181	20	
Cu XX	11.597	120		Cu XXI	11.920	4		Ni XX	12.181	6	
Mn XXIII	11.597		P	Fe XXII	11.921	120		Cu XXI	12.186		
Co	11.612	20	N	Ar XVIII	11.933		P	Co XIX	12.193	30	
Fe XXIII	11.614	85		K XIX	11.940		P	Fe XXII	12.193	70	
V XX	11.615	10		Ni XXIV	11.946	60	Q	Fe XXI	12.201	23	Q
Ca XVIII	11.621			Fe	11.948	128	N	Cr	12.201	0	N
Cu XXII	11.621			Fe	11.953	24	N	Cu XXI	12.203	10	
Fe	11.632	47	N	Co XIX	11.954			Ni XXI	12.208		
Ni	11.636	20	N	Ti XX	11.954		P	Co XIX	12.212		
Fe XVIII	11.640	17		Cu XXI	11.956	6		Co XIX	12.224		
Fe XXII	11.650	29		Ti XX	11.957		P	Fe XXII	12.231	40	
Ar XVIII	11.655		P	Mn XXII	11.959		P	V XXIII	12.234		P
Ni XXI	11.656			Fe XXII	11.960	90		Ar XVIII	12.236		P
Fe XXIII	11.668		Q	Ni XX	11.961	21		Co XX	12.238	30	
Fe XXII	11.669	59		Fe XXII	11.969	23	Q	Co XIX	12.238		
Co	11.672	20	N	Mn XXII	11.971	10		Ni XXI	12.245		
Ca XVIII	11.675		P	Mn XVI	11.971	10		Fe XXI	12.248	40	Q
Cu	11.678	30	N	Ni XX	11.974	22		Ni	12.250	20	N

Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes
Co XX	12.258			Fe XXI	12.575	30	Q	Co XIX	12.942	10	
Fe XXII	12.259	5	Q	K XVII	12.576			Fe XX	12.946	49	
Ne IX	12.260		P, Z	Mn XXII	12.580	80		Fe XX	12.958		P
Fe XVII	12.264	64		Fe XXI	12.581	40		Fe XX	12.970	60	Q
Fe XXI	12.264	64		Ni	12.581	30	N	Mn XXI	12.973		P
Mn XXIII	12.274	20	P	Ar XVIII	12.582		P	Cr XXI	12.981	10	
Ni XXI	12.277			Fe XXI	12.586	107	Q	Fe XX	12.983	80	
Co XX	12.281	30		Cr	12.589	0	N	Co XIX	12.985	40	
Co XIX	12.281	30		Ni XXI	12.592			Fe XIX	12.990	38	
Fe XXI	12.291	37		Co XVIII	12.596	90		Fe XX	12.995	72	
Fe	12.297	130	N	Fe XXI	12.606	53		K XVII	12.996		
Co XIX	12.300			Co XX	12.606			Fe XVIII	13.001		
Co XX	12.300			Cr XXII	12.613	100	P	Fe XVIII	13.015	38	
Ne IX	12.303	50	A, Z	Fe XXI	12.623	44	Q	Mn XXI	13.016		P
Ne IX	12.309		P, Z	Co XX	12.628			Cr XXI	13.018	0	
Fe XXI	12.312		P	Ca XVIII	12.636	20		K XVII	13.025		
Ni	12.315	0	N	Ar XVIII	12.642		P	Fe	13.030	70	N
Fe XXII	12.322	37		Mn XXII	12.643	110		Ni XX	13.032	5	
Fe XXI	12.322	37		Mn XVII	12.643	40		Fe XVIII	13.049	47	
Fe XVII	12.322	37		F IX	12.643	70	P	Cr XXI	13.060	0	
Ne IX	12.324		P, Z	F IX	12.644	30	P	Fe XX	13.07	60	
Cu	12.328	10	N	Fe XXII	12.653	32	Q	Fe XXI	13.07	60	
Cr	12.329	0	N	Co XVIII	12.654	60		Cl XVII	13.074		P
Co XX	12.331			Ni XIX	12.654	120		Ni XX	13.075	6	
Mn XXII	12.336	30		Mn XXII	12.656	60		K XVII	13.080		
Co XIX	12.338		Q	Ni XXI	12.656			Cr XXI	13.081		P
Ni XX	12.345		Q	Cr XXII	12.656	200	P	Fe XX	13.082	53	
Fe XXI	12.346		P	Sc XIX	12.667	20	P	Co XIX	13.084	50	
Co XX	12.348			Mn XXII	12.670	50		Fe XXII	13.095	1	Q
Ne IX	12.355	50	A	Fe XVII	12.678	75		Co XIX	13.097	12	
Fe XXI	12.355	27		Sc XIX	12.678		P	Cu XIX	13.11		Z
Mn XXII	12.368	50		Fe XXI	12.681	18		Fe XX	13.111		P
Ni XXI	12.370			Co	12.689	40	N	Ca XVIII	13.118	20	
Fe XXI	12.371	5	P	Ni XXIII	12.693	30	Q	Ni	13.120	10	N
V XXIII	12.372		P	Fe XXI	12.699		P	Cr XXI	13.123	0	
Mn XVI	12.373	20		Co XIX	12.700	300		Co XIX	13.123	20	
Fe XXII	12.380	135		Mn XXI	12.705		P	Cl XVII	13.125		P
Co XX	12.382			Mn XXII	12.706	10	N	Mn XXI	13.134	0	Q
Mn XXII	12.385		P	Fe XXI	12.714	22		Ni XX	13.135		
Fe XXI	12.387	54	Q	Fe XXI	12.726	1	Q	Fe XX	13.138	37	
Fe XX	12.393	126	Q	Mn XXII	12.738	20		Cr XXII	13.142	200	P
Fe XXI	12.398	16	Q	Mn XXI	12.742	30	Q	F VIII	13.143	10	
Ca XVIII	12.411			Fe XXI	12.743	32		Fe XXI	13.146	53	Q
Fe XXI	12.411	38		K XVII	12.744			Co XIX	13.151	6	
Co XX	12.42	30	Q	Fe XXI	12.756	1	Q	Sc XIX	13.156	20	P
Mn XXII	12.427	10		Ni	12.759	20	N	Co XX	13.157	6	Q
Fe XXI	12.429	41		Fe XX	12.763	30		Fe XX	13.159	30	
Ni XIX	12.430	150		Fe XXI	12.777		P	Fe XVIII	13.159	30	
Ni XXI	12.435			Cr	12.778	0	N	Ni XX	13.161	7	
Cr	12.435	0	N	Co	12.781	30	N	Mn XXI	13.167		P
Fe XXI	12.436	84		Fe XXI	12.789	52	Q	Co XIX	13.183	40	
Cu	12.439	0	N	Fe XXI	12.796		P	Fe XX	13.183	2	
Mn XXIII	12.439	200	P	Mn XXII	12.800		P	F VIII	13.185	20	
Mn XXI	12.446		P	Ni XIX	12.809	50		Ca XVIII	13.191	20	
Mn XXII	12.447	20		Fe XX	12.812	115	Q	Co XIX	13.192	6	
Fe XXI	12.451		P	Mn XXII	12.816	30		Fe XX	13.194	23	
Fe XXI	12.463	37		Fe XX	12.818	48		Mn XXII	13.199	20	
Co	12.47	30	N	Co XIX	12.828	4		Cr XXI	13.203	0	
Ni XXI	12.472	30		Cu XX	12.830	100		Cl XVII	13.203		P
Ca XVIII	12.478	10		Ni XVII	12.830	30		K XVII	13.204		
Mn XXII	12.488	80		Fe XX	12.834	107		Cr	13.217	10	N
Co XX	12.493	30	Q	Fe XVIII	12.847	48		V XXII	13.22		P
Fe XX	12.494	36	Q	Fe XX	12.857	30		Fe XX	13.232	182	Q
Mn XXI	12.496		P	Mn XXI	12.860		P	Fe XIX	13.237	10	Q
Ni XXI	12.502			Co XIX	12.876	7		Co XIX	13.240	40	
Mn XXII	12.507	0	Q	Mn XXI	12.886		P	Co XX	13.240		
Mn XVI	12.510	50		Fe XX	12.888	44		Mn XXI	13.241		P
Co XX	12.513			Co XIX	12.890	6		Sc XIX	13.241	100	P
Fe XXI	12.519		P	Fe XX	12.909	108		F VIII	13.244	40	
Fe XVII	12.526	31		Cr XXI	12.909	10	Q	Fe XX	13.247	23	
Fe XXI	12.548	36	Q	V XXII	12.91		P	Sc XIX	13.250	100	P
Co XX	12.551	30		Co	12.922	70	N	Cl XVII	13.255		P
Ni	12.552	30	N	Fe XX	12.924	55		Ni XX	13.256	8	
Mn XXII	12.553	80		Ni XX	12.927	9		Co XIX	13.258	7	
Cu XX	12.573	80		Mn XXII	12.935	30		K XVII	13.261		

Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes
Fe XIX	13.264	11		Mn XX	13.604		P	Co XVIII	14.038	50	
Co	13.272	30	N	Fe XIX	13.607	25	Q	Cr XVI	14.039	10	Q
Fe XX	13.279		P	Fe	13.614	33	N	Ni XIX	14.040	100	
Ni XX	13.282	5		Cr XX	13.631		P	Co XIX	14.041	50	
Cr XXII	13.286	200	P	Co XVIII	13.631	150		Fe	14.041	29	N
Co XIX	13.289	6		Fe XIX	13.631	10	Q	Cr XXI	14.041	0	
Fe XX	13.292		P	Co XX	13.634	100		Fe	14.053	0	N
Cr XV	13.294	10		Cr XXI	13.647	0		Fe XX	14.064	30	
Fe XX	13.298	49		Fe XIX	13.648	48	Q	Cr XX	14.065	2	
Fe	13.307	2	N	Ne VIII	13.654	70	Z	Mn XIX	14.067		P
Ni XX	13.309	10		Ni	13.658	10	N	Co XVI	14.080	30	Z
Ar XVIII	13.312		P	Co XX	13.661			Ni XIX	14.081	36	F
Co XIX	13.314	5		Cl XVII	13.664		P	Fe XXII	14.082		Q
Co XX	13.314		Q	Fe XIX	13.669	51		Ca XVIII	14.086	100	P
Cr XXI	13.316		P	Co XX	13.676			Cr XX	14.093	1	
Fe XVIII	13.319	51		Cr XX	13.683		P	Ca XVIII	14.097		P
Fe XX	13.329		P	Cr XXI	13.684	0		Mn XVI	14.098	30	
F VIII	13.334	50		Ne IX	13.700	500	F, P	Mn XIX	14.098	65	
Fe XX	13.335		P	Fe XIX	13.700	45		Ni XVIII	14.10		Z
Sc XIX	13.340		P	Mn XX	13.701		P	Cl XVII	14.115		P
Fe XVIII	13.355	48		Co XX	13.705	20		Fe XVIII	14.121	50	
Co XX	13.356			Ne VIII	13.710	70	Z	Mn XIX	14.122		P
Fe XX	13.361	50	P	Fe	13.719	42	N	V XX	14.125		P
K XIX	13.364		P	Cl XVII	13.720		P	Cr XX	14.129		P
Mn XXI	13.366		P	Mn XXI	13.73		P	V XX	14.134		P
Co XX	13.372			Fe XX	13.735	45		Mn XIX	14.138		P
Fe XVIII	13.374	48		Fe XIX	13.735	45		K XVII	14.147		
Ar XVIII	13.378		P	Fe XIX	13.735	45		Fe XVIII	14.150	40	
Cl XVII	13.386		P	Fe XIX	13.750	0	Q	Mn XIX	14.154		P
Fe XX	13.387	3	Q	Cr XXI	13.752	0		Ti XXI	14.16		P
Ti XXII	13.387		P	Cr XXI	13.760	10	Q	Cr XXI	14.172	2	Q
Ni XX	13.39		P	Fe XX	13.770	51		Cl XVII	14.174		P
Cr	13.394	2	N	Co XX	13.775	40		Co XIX	14.184	30	
Fe XIX	13.397	55		Ni XIX	13.777	80		Fe XVIII	14.202	90	
Fe XVIII	13.397	55		Cr XXI	13.779	10		Mn XIX	14.205	20	Q
K XVII	13.407			Fe XX	13.780	0	Q	Cr XX	14.205	10	Q
Ca XVII	13.41			F VIII	13.781	80		Cr XX	14.214		P
Cr XV	13.416	10		Co XX	13.786			Cr XXI	14.217	2	Q
Co	13.417	30	N	F VIII	13.792		P	V XX	14.229	110	
Fe XIX	13.424	48		Fe XIX	13.795	55		V XX	14.239	0	Q
Co XX	13.425			Fe XX	13.810		P	Cr XXI	14.244		P
Cr XXII	13.428	20	P	Mn	13.814	10	N	Fe XVIII	14.255	60	
Fe XIX	13.440	43		Fe XX	13.818		P	Mn XIX	14.258		P
Cl XVII	13.440		P	V XXI	13.823	60	P	Cr XX	14.261	2	
K XIX	13.445		P	Co XX	13.825	40		V XX	14.279	175	
Ne IX	13.447	1000		Mn XX	13.826		P	Cr XVI	14.29		P
Ti XVIII	13.45		P	Fe	13.829	7	N	V XX	14.291	0	
Mn XX	13.46	250		Fe XVII	13.834	91		Fe XIX	14.293	12	Q
Mn XVI	13.46	60		Cr XXI	13.844	10		Co XIX	14.303	4	
Fe XIX	13.464	59		Co XIX	13.847	100	N	V XX	14.332	0	
Fe XVIII	13.464	59		Fe XIX	13.851	69	Q	Fe XVIII	14.344	52	
Co XIX	13.468	300		Co XVIII	13.862	120		Co XIX	14.355	20	
K XVII	13.475			Cr XV	13.862	20		V XX	14.360	65	
Mn XX	13.483		P	V XXI	13.866	30	P	Fe XVIII	14.361	70	
F VIII	13.488	60		Cr XXI	13.870	0		Mn XIX	14.364		P
F VIII	13.495		P	Fe XVII	13.892	48		Ni XVIII	14.37		Z
Mn XX	13.495		P	Mn XX	13.908		P	O VIII	14.372		P
Co XX	13.496	20		Fe XVIII	13.91	20	Q	Fe XVIII	14.373	70	
Fe XIX	13.504	55		Cr XX	13.910		P	Fe XX	14.387	75	Q
Mn XX	13.514		P	K XVII	13.914			V XX	14.401	30	
Cr XXI	13.514		P	Co	13.921	30	N	O VIII	14.406		P
Co XX	13.517		Q	Fe XIX	13.936	48		Fe XVIII	14.419	60	
Fe XIX	13.520	75		Fe XX	13.945		P	Co XIX	14.423	20	
Ti XXII	13.525		P	Cr XX	13.946		P	V XXI	14.429	100	P
Cr XVI	13.528	3		Cr XXI	13.950	0		Cr XX	14.447		P
K XVII	13.533			Mn XIX	13.950	10	Q	Fe XVIII	14.453	34	
Fe XXII	13.547	1	Q	Cr XVI	13.953	10		O VIII	14.454		P
Cr XXI	13.55	10		Fe XVIII	13.954	30		Cr XXI	14.457		P
Ne IX	13.553	150	P	K XVII	13.977			F VIII	14.458	100	
Fe XIX	13.555	42		Cr XV	13.991	20		Fe XVIII	14.467	30	
Cr XVI	13.556	10		Co	13.997	0	N	Cr XVI	14.47		
Fe XXII	13.578	48	Q	Fe XX	14.009		P	Mn XX	14.47		P
Cr XXII	13.594	200	P	Fe XX	14.014		P	Co	14.476	10	N
Mn XVI	13.602	50		Fe XIX	14.021	43		Fe XVIII	14.485	28	
				Cr XXI	14.029	10	P	F VIII	14.487		P

Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes
V XX	14.503		P	V XX	14.976	175		Cr XVIII	15.501		P
Co	14.513	10	N	F IX	14.982	130	P	Fe XVI	15.508	77	Q,Z
Ti XXI	14.52		P	Ar XVIII	14.982		P	Cr XV	15.509	10	
Cr XX	14.524		P	V XX	14.986	0	Q	Cr XVIII	15.512		P
O VIII	14.524		P	F IX	14.988	70	P	Cr XVIII	15.52	10	
Cr	14.53		N	Sc XVII	14.99		P	Fe XVI	15.536	88	Q,Z
Co XIX	14.534	20		Fe XIX	14.995	53		Cr XVIII	15.550		P
Fe XVIII	14.536	61		Cl XVII	15.000		P	V XX	15.551	0	Q
Fe XVIII	14.551	56		F VIII	15.008	30	A	Co XVII	15.551		
Co XIX	14.557	5		F VIII	15.008	30	A	Fe XVI	15.558	1	Q,Z
V XXI	14.573	80	P	Fe XVII	15.013	112		V XIX	15.560	65	
Fe XVIII	14.581	49		Mn XVIII	15.024	50	Q	Fe XVI	15.567	1	Q,Z
V XXI	14.592			Cr XIX	15.027		P	Mn XVII	15.570	50	
Co XIX	14.594	10		V XIX	15.039	250		V XX	15.580		P
Ne K( $\alpha$ )	14.610			Fe XIX	15.042	5	Q	Ti XIX	15.581		P
Fe XVIII	14.610	37		F VIII	15.046	30	A	Fe	15.585	77	N
O VIII	14.634		P	F VIII	15.046	30	A	Cr XVIII	15.587	20	Q
V XIX	14.636	30		V XX	15.051	0		Fe	15.598	1	N
Cr XX	14.641	0	Q	Cr XX	15.061	30	Q	V XIV	15.61	200	
V XX	14.649	10		Fe	15.070	1	N	Sc XX	15.61		P
Mn XVIII	14.650	20	Q	Fe	15.075	30	N	Fe XVIII	15.611	78	Q
Ca XVIII	14.659	100	P	F VIII	15.076	0	Q,Z	Mn XVII	15.615	30	
Co	14.664	10	N	Fe	15.091	69	N	Fe XVIII	15.623	90	
Fe XIX	14.668	53		Mn XVIII	15.096	40	P	V XIX	15.63	65	
Cr XX	14.669		P	Fe XIX	15.111	11	Q	Fe	15.635	75	N
Mn XVIII	14.698	30		V XX	15.114	350		V XX	15.639		
Fe XIX	14.706	49		S XVI	15.121			Mn XVII	15.670	100	
Sc XXI	14.709		P	Fe XIX	15.138	5		Ti XIX	15.671	0	
V XXI	14.714	110	N	V XX	15.141	175		Cr	15.680	10	N
K XVII	14.715			F VIII	15.155	20	A,Z	Ti XIX	15.685		P
Fe XIX	14.735	38		Fe XVI	15.158	1	Q,Z	Fe	15.686	77	N
Ca XVIII	14.744	300	P	Co XVIII	15.170	80		V XIX	15.702	65	
Fe	14.750	36	N	Fe XIX	15.172	26		Mn XVII	15.732	50	
V XXI	14.750		P	S XVI	15.174			Ti XIX	15.738	0	
Mn XVIII	14.752	110		O VIII	15.176	10	P	Ti XIX	15.742	30	
Co	14.761	10	N	Cr XIX	15.180		P	V XIV	15.748	1	
Ca XVIII	14.767		P	Mn XVIII	15.188		P	O VII	15.750		Z
S XVI	14.768		P	Fe XIX	15.193	26	Q	K XVII	15.755		P
Fe XVIII	14.772	6		Cr	15.21	20	N	Fe XVIII	15.764	16	
Cr	14.775	10	N	Ti XX	15.212	20	P	K XVII	15.765		P
K XVII	14.776			V XX	15.216	30		Cr XV	15.788	20	
Mn XIX	14.782		P	Fe	15.222	1	N	Ti XIX	15.801		P
Co XIX	14.794	100		F VIII	15.224	30	A,Z	Fe	15.806	120	N
Cr XIX	14.802		P	V XX	15.229	30		Mn XVII	15.826	60	
Fe XIX	14.806	21	Q	Fe	15.237	34	N	Fe XVIII	15.826	46	
Cr XIX	14.809		P	Mn XVIII	15.238	30		Co XVII	15.828		Z
Fe	14.812	0	N	Mn XVI	15.238	20		Ti XIX	15.831		P
Mn XVIII	14.816	30	Q	F VIII	15.246	30	A,Z	Cr XVIII	15.835		P
S XVI	14.819		P	Cr XIX	15.251		P	Ti XIX	15.842		P
O VIII	14.821		P	Ti XX	15.255	20	P	Ti XIX	15.865	10	
Co	14.824	10	N	Fe XVII	15.260	96		Fe XVIII	15.869	53	
V XX	14.829	10		F VIII	15.286	40	A,Z	Mn XVII	15.871	70	
Fe	14.833	16	N	Fe	15.289	28	N	V XIX	15.883		P
Cr XIX	14.836	10	P	Fe	15.294	58	N	V XX	15.884		P
Sc XXI	14.847		P	V XIX	15.296		P	Mn XVII	15.889	20	
Ca XVIII	14.857		P	Cr XIX	15.301		P	V XX	15.905		P
Fe XXII	14.859	54		Fe XVI	15.313	17	Q,Z	Cr XIX	15.91		P
Fe XVIII	14.868	25	Q	Mn XVI	15.314	20		Ti XX	15.912	20	P
V XX	14.870	65		V XIX	15.333	65		Fe	15.918	140	N
Mn XVIII	14.877	350		V XX	15.336	30		V XIX	15.924	110	
V XX	14.886	0	Q	Fe	15.339	14	N	Mn XVII	15.926	20	
Cr XXI	14.896		P	Fe	15.360	14	N	S XVI	15.944		P
Ca XVII	14.90			Mn XVIII	15.403	30		Mn XVII	15.946	10	
Fe XIX	14.90	20	Q	Mn XVII	15.404	40		Mn XVII	15.958	10	
Ar XVIII	14.902		P	Fe XIX	15.413	2	Q	Fe	15.979	0	N
Fe	14.908	20	N	V XX	15.427	30		Mn XVII	15.987	10	
S XVI	14.913			S XVI	15.434			Ti XIX	16.002		P
V XXI	14.917		P	O VII	15.439			Fe XVIII	16.003	56	
Cr XIX	14.925	0	Q	Co XVIII	15.439	100		S XVI	16.004		
V XX	14.929	0		Fe XVII	15.449	59		O VIII	16.006	20	P
Fe XIX	14.929	28		V XX	15.455		P	V XIX	16.007	110	
Cl XVII	14.934		P	S XVI	15.490			O VIII	16.007	10	P
Fe	14.942		N	Fe XVIII	15.491	50		Sc XX	16.01		P
S XVI	14.965			V XIX	15.495	65		Fe XVIII	16.024	30	
Fe XIX	14.966	33		Fe XV	15.498	0	Z	Mn XVII	16.041	60	

Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes
Mn XVII	16.054	50		Ca XVI	16.81		Q	Fe XVI	17.337	8	Z
Ti XX	16.056	30	P	Cr XVII	16.811	10		Fe XV	17.345	1	Z
Fe XVIII	16.073	41		Ti XIX	16.811	0		Ti XIX	17.354		P
Fe XVIII	16.087	3		P XV	16.812		P	Ti XVIII	17.365	65	
Mn XVII	16.090	50		V XVIII	16.816	60	Q	Fe XVI	17.366	16	Z
Fe XVIII	16.109	18		Fe	16.819	9	N	Cr XVI	17.370	80	
Mn XVII	16.121	20	Q	Sc XIX	16.820	200	P	V XVII	17.373	110	
Fe XVIII	16.166	14		F VII	16.831	50	Z	Cr XXIV	17.388		P
V XIX	16.172		P	Fe XVI	16.839	7	Z	O VII	17.396	100	
Ti XIX	16.178	0		F VII	16.857	50	Z	Fe XVI	17.399	18	Z
Mn XVIII	16.185	300		Sc XIX	16.863	200	P	V XVIII	17.400	180	
O VII	16.186		Z	P XV	16.863		P	O VII	17.405		P
Mn XVIII	16.20	10	Q	S XVI	16.870			Fe XVI	17.413	14	Z
Cr XVII	16.221	30		Mn XVI	16.879	80		Cr XXIV	17.425		P
Ca XX	16.234		P	Mn XVII	16.880	200		Cr XVI	17.438	60	
Fe	16.236	2	N	Cr XV	16.889	100		V XVIII	17.442	80	
Cr XVII	16.249	30		Fe XVI	16.890	13	Z	Sc XVIII	17.443	30	
Mn XVIII	16.255	250		Ti XVIII	16.90	10		Fe XVI	17.449	16	Z
Fe XVIII	16.270	3		Mn XVIII	16.90		P	Cl XV	17.46	50	
Ti XX	16.277		P	V XVIII	16.915		P	Mn XVII	17.465	30	
Mn XVII	16.278	20		F VII	16.935	0	Q	Fe XVI	17.467	13	Z
Ti XIX	16.288		Q	S XVI	16.935			V XVIII	17.482	160	
Cr XVIII	16.292		P	Fe XX	16.935	7	Q	V XVII	17.490	65	
Fe XVIII	16.306	16		Ti XVIII	16.939	10		Fe XVI	17.498	40	Z
Cr XVII	16.31	30		V XIV	16.939	5		Cr XVI	17.514	30	
V XVIII	16.330	100		F VIII	16.947	60		V XVII	17.536	65	
Fe	16.336	2	N	Fe XVI	16.952	2	Z	Mn XVII	17.541	50	
V XVIII	16.341	100		F VII	16.966	20	Z	V XVIII	17.545	40	
Ca XX	16.372		P	Cr XV	16.971	50		Mn XVII	17.550	50	
V XVIII	16.378	100		P XV	16.977		P	Ti XIX	17.553		P
Ti XIX	16.414	0		Fe XVI	16.993	7	Z	Fe XV	17.555	7	Z
V XX	16.416		P	V XVIII	17.018	40		Fe XV	17.57	0	Q
V XVIII	16.423	40		Fe XVI	17.025	9	Z	Sc XVIII	17.57	10	
Mn XVIII	16.425	150		P XV	17.029		P	P XV	17.572		P
K XVII	16.427			F VII	17.047	0	Z	V XIV	17.575	1	
Ti XIX	16.430	30		Fe XVII	17.051	20		Ti XIV	17.58		
V XVIII	16.431			Cr XVI	17.073	30		Ti XIX	17.583		P
Ti XX	16.443		P	Ti XIX	17.076	0		Ti XVIII	17.587	110	
Mn XVIII	16.451	200		O VII	17.086	1		Cr XVI	17.589	20	
Cr XVII	16.455	90		Fe XVI	17.087	15	Z	Fe XVI	17.59	40	Q,Z
V XVIII	16.467	160		F VII	17.092	40	Z	Fe XV	17.593	19	Z
O VII	16.478		Z	V XIV	17.094	4		Cr XVI	17.603	50	
K XVII	16.497			Mn XVI	17.095	40		Fe XXI	17.617	230	Q
Fe	16.506	1	N	Cl XV	17.10	50		Fe XV	17.620	19	Z
Ti XIX	16.514	65		Fe XVII	17.100	50	F	P XV	17.627		P
Mn XVIII	16.521	200		Cr	17.107	80	N	Ti XVIII	17.630	110	
Mn XVIII	16.540	250		F VII	17.116	40	Z	Sc XIX	17.633	200	P
V XVIII	16.558	140		Fe XVI	17.124	25	Z	Cr XVI	17.633	20	
K XVII	16.559		P	Mn XVII	17.131	20		V XVII	17.644	110	
Ti XVIII	16.561	10		Ti XVIII	17.150	30		Fe XX	17.660	13	Q
Mn XVIII	16.577	150		F VIII	17.153		F,P	Cr XVI	17.671	40	
O VII	16.581		Z	V XVII	17.158	10		V XVIII	17.678	80	
Mn XVI	16.617	100		Fe XVI	17.161	16	Z	V XVII	17.679		P
Ti XVIII	16.624	10		F VII	17.167	50	Z	Cr XVI	17.704	20	
Ti XIX	16.637		P	Ti XIX	17.181	0		Ti XVIII	17.715	30	
Cr XVII	16.64	10		O VII	17.200	50		Mn XVII	17.716	50	
K XVII	16.649		P	Fe XVI	17.206	17		V XVIII	17.717	20	
O VII	16.650		Z	V XVII	17.206		P	Ti XIII	17.727	100	
Cr XVII	16.675	40	P	O VII	17.207		P	Mn XVII	17.729	20	
Fe XVI	16.696	5		P XV	17.214		P	Ti XIV	17.73		
Cr XVII	16.696	10		Ti XVIII	17.22	30		Cr XVI	17.730	30	
Ti XIX	16.70	10		Cr XVI	17.242	50		Fe	17.734	8	N
K XVI	16.70		P	Fe XVI	17.249	10	Z	Ca XIX	17.75		P
Mn XVIII	16.70		P	Cl XV	17.25	50		V XIV	17.754	1	
Cl XVII	16.719		P	V XVII	17.259	250		O VII	17.768	200	
Ti XIX	16.719	0		V XIV	17.26	2		Sc XIX	17.777	300	P
Mn XVIII	16.724	50		P XV	17.267		P	Cr XVI	17.785	50	
Ti XIX	16.736	10		Ca XIX	17.28		P	O VII	17.785		P
O VII	16.770		Z	Ti XVIII	17.28	30		Fe	17.787	8	N
Cr XVII	16.773		P	Cr XXIV	17.281		P	Cr XVI	17.793	20	
Fe XVII	16.775	20		Fe XVI	17.285	3	Z	Mn XVII	17.794	30	
V XVIII	16.777	30		Ti XVIII	17.30	30		Ti XIV	17.80		
Cl XVII	16.799		P	Fe XV	17.300	5	Z	Mn XVII	17.807	0	
Ti XIX	16.802	30		Mn XVII	17.301	50		Fe	17.821	8	N
F VIII	16.807	200		Fe XVI	17.323	2	Z	Cr XVI	17.833	20	



Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes
Cr XVI	17.856	20		Ti XVII	18.651	20		V XV	19.298	300	
Mn XVII	17.862		P	Mn XVI	18.654			O VII	19.301	4	Z
Ti XIII	17.869	50		O VII	18.672		P	Si XIV	19.309		P
Ti XIV	17.88			Ti XVII	18.677			Sc XVII	19.311	550	
Fe XV	17.880	11	Z	N VII	18.682		P	Ca XVII	19.315	20	
Fe	17.901	6	N	V XVI	18.689	110		O VII	19.330	4	Z
Fe XV	17.917	7	Z	Ca XVIII	18.694	500	P	Ca XVII	19.345	20	
Ti XVIII	17.920	30		N VII	18.698		P	Si XIV	19.360		P
Cr XVI	17.931	20		Sc XIII	18.71		P	N VII	19.361		P
Fe	17.944	13	N	N VII	18.717		P	V XV	19.366	500	
Cr XVII	17.957	150		Cr XVII	18.73		P	Ti XIII	19.366	200	
Cl XV	17.96	50		Ca XVIII	18.736	300	P	Ti XVII	19.369	180	
Cr XVII	17.968	50		N VII	18.742		P	Ti XVI	19.370	110	
Mn XVII	17.987	0		Ti XVII	18.757			O VII	19.385	5	Z
Cr XVI	17.993	30		N VII	18.774		P	Ge XXII	19.41	150	
K XIX	18.006		P	Cr XVI	18.775	300		Ca XVII	19.414	30	
V XVI	18.008	250		Sc XVII	18.78	10		Ti XVII	19.415	40	
Cr XVI	18.017	20		V XIV	18.782	7		Cr XVI	19.442	60	
Cr XVII	18.020	150		Cr XV	18.782	200		V XV	19.443	250	
V XVI	18.039			Cr XXIV	18.795		P	Ti XVI	19.45		P
Ti XVII	18.043		P	Ti XVII	18.799	10		Mn XV	19.450		P, Z
V XVII	18.048		P	N VII	18.819		P	Ti XVII	19.459	60	
Sc XIX	18.051		P	Sc XVII	18.83	10		Si XIV	19.499		
Ti XVII	18.056	80		V XXIII	18.831		P	Ti XVII	19.501	40	
V XVI	18.076	200	Q	V XIV	18.870	3		Ca XVII	19.505	200	
V XVI	18.100		Q	N VII	18.882		P	Cr XVI	19.511	100	
V XVI	18.121	65		S XVI	18.887			V XV	19.518	350	
Ti XVII	18.127			V XVI	18.890	200		Cr XVI	19.538	100	
Cl XV	18.13	50		Cr XXIV	18.922		P	Si XIV	19.551		P
Ti XVII	18.134		P	Mn XVI	18.935			Ti XVI	19.551	110	
Ti XVII	18.141	10		V XXIII	18.938		P	Ca XVII	19.558	10	
K XIX	18.144		P	Ti XVII	18.939	20		Ti XVI	19.57		P
P XV	18.153		P	Sc XVIII	18.959			Cl XIV	19.58	50	
Ti XVII	18.154	60		Cr XXIV	18.965		P	V XV	19.589	150	
Ti XVII	18.172	40		S XVI	18.967			Sc XVII	19.598	175	
V XVI	18.181	65		O VIII	18.967	70	P	V XV	19.645	150	
P XV	18.211		P	O VIII	18.972	30	P	Ca XVIII	19.646	600	P
Sc XVIII	18.213	65		V XXIII	18.974		P	As XXIII	19.649	200	
Ti XVII	18.215	40		N VII	18.974		P	Sc XVII	19.651	175	
Sc XIX	18.217		P	Se XXIV	18.98	30		Ti XVII	19.651	20	
Cr XVII	18.219	50		Cl XV	18.99	100		V XV	19.671	90	
V XVI	18.223	50	Q	O VII	18.993	0		Ti XVI	19.71	10	
Ti XVII	18.228			O VII	18.993	0		Cr XVI	19.714	200	
V XVI	18.240	10		Ti XVI	19.01		P	Ti XVII	19.718	40	
V XVI	18.265	90		O VII	19.012	2		V XV	19.725	80	
Ti XVII	18.268	100		O VII	19.012	2		V XVI	19.730	300	
Ti XVII	18.279		P	Cr XV	19.015	50		Sc XVII	19.732	65	
F K( $\alpha$ )	18.32			V XV	19.028	120		V XV	19.757	60	
Cr XVII	18.336	200		Cr XVI	19.038	80		K XVIII	19.77		P
Sc XVIII	18.337	110		O VII	19.045	4		Si XIV	19.771		P
V XVI	18.344	400		O VII	19.045	4		V XV	19.782	100	
Ti XVII	18.350		Q	Sc XVII	19.069	250		Ge XXII	19.79	130	
Ti XVIII	18.38		P	Ti XVI	19.089	110		Ca XVIII	19.790	600	P
Ti XVII	18.387	60		As XXIII	19.090	100		V XV	19.80	50	
Cr XVII	18.389	50		O VII	19.096	1	Z	Cr XVI	19.807	100	
Sc XVII	18.412	10		Ti XVI	19.112	110		Si XIV	19.824		P
Ti XVII	18.426			N VII	19.118		P	N VII	19.826	10	P
Ti XVII	18.461			Mn XV	19.155		P, Z	V XV	19.844	250	
Ca XVII	18.47			Sc XVII	19.16	350		Cr XVI	19.847	10	
Sc XVII	18.48	30		O VII	19.164	2	Z	V XV	19.888	150	
V XVI	18.492	65		Ca XVII	19.195	100		V XV	19.903	180	
Cr XV	18.497	400		V XV	19.203	150		Sc XIII	19.93		
V XVI	18.519	40		Ti XIII	19.204	250		Ti XIII	19.943	50	
Cr XVII	18.52		P	P XV	19.206		P	Cr XVI	19.951	60	
V XVI	18.525	65		O VII	19.207	2		Sc XVII	19.967	65	
V XVI	18.529	400		O VII	19.207	2		V XV	19.988	170	
Cr XVII	18.531	150		Ti XVI	19.210	350		Cr XVI	19.995	20	
Sc XVIII	18.552			Sc XVII	19.22	250		V XVI	20.017	450	
Sc XIII	18.57		P	K XVIII	19.23		P	Ca XVII	20.02	200	
Sc XVIII	18.581	30		Ti XVI	19.24		P	V XVI	20.038	30	Q
Ti XVII	18.623			Ca XVII	19.249	20		Ti XV	20.051	65	
O VII	18.627	500		Cr XVI	19.255	150		V XV	20.078	200	
Cl XIV	18.63	50		P XV	19.271		P	Ar XVIII	20.082		P
V XVI	18.630	600		Ca XVII	19.275	10		V XVI	20.082	600	
Sc XVIII	18.649	65		Ca XVII	19.296	100		Ti XVI	20.101	30	

Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes
Ca XVIII	20.129	100	P	Si XIV	20.849			Ca XVII	21.762	100	
Cl XV	20.13	150		Cr XV	20.863	400		Cr XIV	21.770		Z
Ti XV	20.133	65		K XVII	20.896		P	Sc XV	21.78		Q
Ti XIII	20.135	50		Ti XV	20.897	110		O VI	21.781	3	Z
Sc XVI	20.144			Si XIV	20.908			S XIV	21.79	50	
Sc XVI	20.160	80		N VII	20.910	30	P	V XV	21.800	200	
Ti XV	20.169	100	Q	K XVII	20.938		P	O VII	21.804	300	
Si XIV	20.182		P	Ca XVI	20.95	10		Sc XVI	21.816	40	
Ti XVII	20.183	20	N	Ga XXI	20.956	75		Ti XIV	21.818	600	
Ti XV	20.20		P	Sc XVI	21.017	30		V XV	21.832	200	
Br XXIV	20.21	10		V XIV	21.018			O VI	21.845	4	Z
Ar XVIII	20.219		P	Ca XVI	21.018	10		Ti XIV	21.883	700	
Sc XVI	20.224	20		V XV	21.019	400		V XV	21.909	300	
Ti XV	20.23	110		Ti XIII	21.035	350		K XVI	21.911	10	
Si XIV	20.237		P	Se XXIV	21.07	60		Sc XV	21.924	110	
Sc XVI	20.240			Ti XV	21.094	50		Sc XVI	21.927	40	
Sc XVI	20.251	65		Ca XVII	21.098	20		Sc XII	21.940	250	
As XXIII	20.261	200		Cl XV	21.10	100		Ti XIV	21.958	500	
Mn XXV	20.268		P	Sc XVI	21.114	20		Ca XVI	21.966	30	
V XVI	20.282	400		Ti XIII	21.127	100		Cl XIV	22.00	50	
Sc XVI	20.284	110		As XXII	21.142	10		Cr XXIV	22.012		P
Ca XVIII	20.296	100	P	Ca XVII	21.143	100		Sc XVI	22.016	20	
Sc XII	20.298	100		Cr XV	21.153	300		O VI	22.020	4	Z
Ti XV	20.312	20		Ar XIV	21.17	100	Q	K XVII	22.021		P
Ti XV	20.324	300		Ga XXI	21.175	200		Ca XVI	22.027	110	
Sc XVI	20.330	80	Q	Cl XV	21.18	150		Ge XXII	22.033	150	
Ca XVII	20.34	65		Kr XXVI	21.181			O VI	22.044	3	Z
Ti XV	20.364	10		Ca XVII	21.20	65		Sc XV	22.05		
Ti XV	20.389	30		Cr XV	21.213		F	Si XIV	22.060		
Sc XVI	20.390	450		Sc XV	21.26			Sc XV	22.061	110	
Sc XIII	20.4			Ca XVII	21.267	200		Ti XIV	22.066	600	
Ti XV	20.403		P	V XV	21.285	200		Ca XIV	22.07		Q
Ti XV	20.418	175		V XIV	21.294	10		V XV	22.083	350	
Mn XXV	20.429		P	Zn XX	21.3	100	Q	Ti XIV	22.099	200	
Sc XII	20.438	50		Ca XVII	21.300	200		O VII	22.101	500	F, P
Ca XVII	20.439	175		Ti XIV	21.304	60		Ti XV	22.109	100	
V XVI	20.447	600		Ca XVI	21.33	110		Cl XIV	22.11	50	
Sc XVI	20.458	80		Ti XIV	21.341	400		Ca XVII	22.113	200	
Sc XVII	20.47		P	Kr XXVI	21.350			Sc XII	22.119	200	
Mn XXV	20.482		P	Sc XV	21.372	450		Ca XVI	22.12	30	
V XXIII	20.482		P	Sc XV	21.405	450		O VI	22.120	4	Z
Ca XVII	20.489	100		Cl XV	21.41	50		Si XIV	22.125		
Sc XVI	20.489		P	Sc XV	21.426	110		Ti XIV	22.162	300	
Sc XVI	20.511			Ge XXII	21.438	100		K XVII	22.165		P
V XVI	20.516	400		Ca XVI	21.45	350		Ar XVII	22.17	40	P
As XXIII	20.536	400		Cr XIV	21.467		Z	Cr XXIV	22.173		P
Ti XV	20.538	10		Ge XXII	21.481	150		K XVII	22.189		P
Cl XIV	20.55	50		Sc XV	21.49	175	Q	Ti XIV	22.190	300	
Ca XVI	20.568		P	Zn XX	21.5	270	Q	V XV	22.192	180	
Sc XVI	20.597			Ca XVI	21.50	350		V XV	22.214	120	
Ti XXII	20.597		P	P XV	21.503		P	Ti XIV	22.215	300	
V XVI	20.60		P	Ar XVII	21.52		P	Cr XXIV	22.226		P
V XXIII	20.608		P	Sc XV	21.521	450		V XV	22.232	60	
Ti XV	20.611	65		Ti XIV	21.522	500		Ti XIV	22.248	100	
Sc XVI	20.612		P	V XV	21.568	300		Kr XXVI	22.255		
Ca XVI	20.627		P	Sc XV	21.57			Ti XIV	22.279	400	
V XXIII	20.652		P	P XV	21.582		P	Ge XXII	22.312	300	
V XVI	20.663	250		O VII	21.6020	1000		Ti XIV	22.328	300	
Sc XVI	20.672		P	Ca XVII	21.606	300		Cl XIV	22.37	50	
Ca XVII	20.677	100		Ca XVI	21.609	550		V XV	22.375	160	
Ti XV	20.700	30		Sc XVI	21.637	40		Ca XVI	22.385		
Ti XXII	20.704		P	O VI	21.649	1	Z	Ti XXII	22.404		P
V XIV	20.716			Ti XIV	21.657	700		Al XIII	22.404		P
Ge XXII	20.718	150		Sc XVI	21.670	60		Cl XIV	22.42	100	
Ca XVII	20.72	10		O VI	21.676	4		Ti XIV	22.426	400	
Ti XXII	20.740		P	Ga XXI	21.676	100		Al XIII	22.455		P
Ca XVII	20.748	65		Ca XVII	21.677	100		Ti XV	22.464	900	
Ge XXII	20.764	100		Ar	21.69	125	N	Cu XIX	22.475	1	
Sc XVI	20.787			Sc XV	21.705	10	Q	Ti XV	22.482	450	
V XVI	20.81		P	Ga XXI	21.709	100		Ti XIV	22.486	150	
Sc XVI	20.819			S XIV	21.72			Ti XV	22.518	600	
Ti XV	20.823	110		Sc XVI	21.732	80		Ti XIV	22.518	200	
Ca XVII	20.832	175		Ti XIV	21.732	700		Sc XIV	22.522	20	Q
Cl XIV	20.84	50		K XVI	21.737	65		Ca XV	22.524		Q
Sc XVI	20.842	40	Q	Sc XV	21.74			Ti XXII	22.530		P

Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes
Cl XVII	22.535		P	N VI	23.277	10		K XV	24.328	450	
Sc XV	22.544	65		N VI	23.293		P	V XIII	24.330	30	N
Ga XXI	22.545	120		K XVI	23.315	110		Cl XIII	24.40	50	
Sc XIV	22.558	65		Ti XIII	23.356			S XIV	24.43	150	
Ti XXII	22.574		P	Ca XV	23.385		Q	V XIII	24.440	0	N
K XVII	22.585		P	Ca XV	23.388			Br XXV	24.465	80	
Ga XXI	22.596	100		Ar XIII	23.39	50		Ca XIV	24.480	30	
Ca XV	22.623		Q	K XVI	23.399	175		Sc XIII	24.484	100	
Al XIII	22.625		P	Ti XV	23.41		P	Ca XIV	24.51		Q
P XIII	22.64	50		Ca XV	23.412		Q	V XIII	24.517		Z
Ca XV	22.640			Al XIII	23.417		P	Se XXIV	24.53	60	
Sc XIV	22.650	150		Sc XIV	23.422	110		Fe	24.55	245	N
Cu XIX	22.661	1		Al XIII	23.472		P	Sc XIII	24.560	200	
Cl XVII	22.672		P	V XIV	23.490			S XIII	24.59	10	
Al XIII	22.676		P	Ga XXI	23.500	100		Ti XIV	24.592	750	
Sc XIV	22.697	110		Ca XV	23.500			Ar XIII	24.61	80	
Ti XV	22.724	450		Cu XIX	23.503	10		Ca XIV	24.623	110	
Ca XV	22.725		Q	Sc XIV	23.536	350		Zn XX	24.624	250	
Ca XV	22.730	30		Ga XXI	23.540	200		Sc XIII	24.648	70	
Kr XXVI	22.735			Sc XIV	23.568	100	Q	V XIII	24.654	0	N
Ti XV	22.739	360		Ar XIII	23.57	200		Sc XIII	24.666	90	
Br XXV	22.739	60		K XV	23.588	10		Zn XX	24.674	200	
Ca XV	22.750		Q	Cu XIX	23.599	10		Si XIV	24.699		
K XVII	22.752		P	O K( $\alpha$ )	23.62			Sc XIII	24.715	120	
Sc XIV	22.754	20		Cu XIX	23.621	1		Ti XIV	24.728	700	
N VI	22.765	1		K XV	23.633	10		Se XXIV	24.73	50	
Ca XV	22.779	65		Ca XV	23.660	175		Ca XIV	24.749	110	
Sc XIV	22.810	10	Q	V XIII	23.678	0	N	V XIII	24.758	0	N
K XVI	22.813	65		Ti XIV	23.690	900		K XV	24.77	30	
Ca XV	22.816		Q	Ti XIII	23.698			Si XIV	24.778		
Sc XIV	22.825	50	Q	S XIII	23.70	250		N VII	24.779	70	P
As XXIII	22.828	130		Cu XIX	23.704	10		N VII	24.785	30	P
Sc XII	22.837	50		Sc XII	23.725	350		Cl XIII	24.79	50	
Sc XIV	22.841	110		Sc XIV	23.740	100		Sc XIV	24.791	70	Q
Ca XV	22.845		Q	P XIII	23.75		P	Br XXIV	24.816	30	
Cl XIV	22.86	100		N VI	23.771	10		K XIX	24.836		P
N VI	22.870	4		V XIV	23.794			Cl XIII	24.86	50	
As XXIII	22.887	250		N VI	23.795		P	Ni XVIII	24.881	1	
Ca XV	22.898			P XIII	23.810	10		K XV	24.889	65	
Ca XV	22.902	450		Sc XII	23.821	50		Ti XIV	24.891	600	
Ca XV	22.909		Q	K XVI	23.84	65		Ca XIV	24.895	110	
K XVI	22.921	175		Zn XX	23.87	50	P	N VI	24.898	30	
Sc XIV	22.926	70		Br XXV	23.910	70		Sc XIII	24.899	20	
Ti XV	22.936	540		Zn XX	23.92	100	P	Ti XIV	24.907	700	
Al XIII	22.940		P	Ar XIII	23.93	50		Ge XXII	24.920	300	
Ca XVI	22.95		Q	As XXII	23.95	10		K XIX	24.922		P
Zn XX	22.956	200		V XIII	23.96	20	N	K XV	24.946	30	
Br XXV	22.959	50		Ti XIV	23.960	200		K XIX	24.951		P
Sc XIV	22.964	300		Ca XIV	23.97		P	Ca XX	24.957		P
Ti XV	22.966	360		K XV	23.981	65		N VI	24.962		P
Al XIII	22.994		P	V XXIII	23.989		P	Cl XIII	24.97	50	
Ca XV	22.994		Q	Ti XIII	23.991			Sc XIII	24.970	100	
Ge XXI	23.002	10		Ga XXI	24.042	250	P	Sc XIV	24.971	50	
Ca XV	23.023			Sc XIII	24.061	10		Ge XXII	24.979	400	
N VI	23.024	9		Ca XIV	24.073			Sc XIII	24.998	20	
Ar XIII	23.03	50		V XIII	24.083	20	N	Cl XVI	25.02		P
Ti XV	23.034	180		Cl XIII	24.09	50		Ti XIV	25.025	500	
S XIV	23.04	150		Sc XIII	24.097	90		Ar XII	25.04	10	
Sc XII	23.045	50		Ca XIV	24.110	450		Ar XV	25.05	100	
Sc XIV	23.057	10		K XV	24.13	250		Ca XX	25.063		P
P XIII	23.08	50		V XXIII	24.150		P	Ni XVIII	25.070	3	
Ca XV	23.107		Q	Ca XIV	24.168	65		Ti XIV	25.071	40	
Ca XV	23.112		Q	Al XIII	24.192		P	Sc XIII	25.079	50	
K XV	23.146			K XV	24.20	450		Ti XIV	25.086	200	
Sc XIV	23.156	110		V XIII	24.202		Z	Sc XIII	25.099	60	
Ca XV	23.158			V XXIII	24.203		P	Ca XX	25.100		P
Ti XV	23.177	360		Ca XIV	24.208	110		P XIII	25.103	20	
Zn XX	23.180	200		Cl XVI	24.25		P	Sc XIII	25.133	80	
K XV	23.180	30		Al XIII	24.251		P	Cu XIX	25.142		
Ti XV	23.193	150		S XIV	24.26	100		Sc XIII	25.163	10	
Ti XV	23.20		P	Ca XIV	24.271	550		P XIII	25.169	20	
S XIII	23.24	10		Sc XIII	24.284	90		Cu XIX	25.175	1	
Ca XVI	23.240		Q	Cl XIII	24.29	200		Ar XII	25.19	100	N
K XVI	23.27	30		Ti XIV	24.315	600		Sc XIII	25.200	120	
Sc XIV	23.274	250		Ga XXI	24.326	300	P	Ti XIV	25.206	60	

Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes
Ar XII	25.24	100	N	Sc XIV	26.16		P	Ca XIV	27.110		Q
Sc XIII	25.242	100		Ca XIV	26.180			Ti XII	27.125	10	Z
Ti XIV	25.260	300		Sc XIV	26.197	150		Ca XX	27.149		P
K XV	25.265	30		Ni XVIII	26.218	10		Ti XII	27.151	10	Z
Cu XIX	25.297	100		Ca XIII	26.219	110		Ar XIII	27.17	60	
Ca XI	25.327	100		Ge XXI	26.22	10		Sc XIII	27.170	30	
Sc XIII	25.341	80		Sc XIV	26.224	100		Ar XIV	27.22	50	
Se XXIII	25.36	10		Ti XXII	26.242		P	K XIII	27.22		
Sc XIV	25.392	350		Ca XIV	26.255			Ti XII	27.228	17	Z
Sc XIII	25.40	40		K XIV	26.284		Q	Sc XII	27.260		
Sc XIV	25.403	200		K XIX	26.292		P	Ca XX	27.275		P
Ar XIV	25.42	60		Ar XIII	26.30	100	Q	Zn XIX	27.28	180	
K XIX	25.423		P	Mg XII	26.305		P	K XIII	27.30		
Sc XIV	25.439	300		Ca XIII	26.323	65		Ti XII	27.305	24	Z
Sc XIII	25.440	90		Zn XX	26.340	280		Ga XXI	27.308	320	P
Ca XIV	25.441	30		S XIII	26.35	10		Ca XX	27.318		P
S XVI	25.462			Se XXIV	26.35	80		K XIII	27.337	450	
K XIX	25.513		P	Mg XII	26.355		P	Ti XII	27.346	9	Z
Ca XI	25.517	100		C VI	26.357		P	Ga XXI	27.367	380	P
Cu XIX	25.526	150		Ar XIII	26.36	110		Ca XII	27.379	0	
Ca XIII	25.53	110		Sc XIV	26.37		P	K XIII	27.384	450	
K XIX	25.544		P	Ca XIV	26.372			Ar XV	27.41	120	
C VI	25.559		P	Ca XIII	26.383	110		Ca XII	27.413	50	
Ar XIV	25.58	60		K XIX	26.388		P	Ar XIV	27.42	200	
K XIV	25.583		P	Ti XXII	26.402		P	As XXII	27.432	10	
K XIV	25.592		P	Cu XIX	26.416	20		Ti XII	27.434	4	Z
Al XIII	25.597		P	K XIX	26.420		P	K XIII	27.44	30	
S XVI	25.598			Ca XI	26.442	20		Ti XII	27.459	6	Z
Kr XXVI	25.605			Cu XIX	26.452	20		Ar XIV	27.47	300	
K XIV	25.607		P	Ti XXII	26.455		P	Mg XII	27.495		P
C VI	25.619		P	K XIV	26.456			Ti XII	27.499	20	Z
Sc XIV	25.644	150		Si XII	26.460	3		K XIII	27.507	65	
S XII	25.65	10		As XXIII	26.495	500		Zn XIX	27.510	400	
Si XII	25.655	1		Ca XIV	26.514			S XV	27.53		P
Al XIII	25.662		P	Ar XIII	26.53	60		K XIII	27.53	65	
Ca XIII	25.674	65		Sc XII	26.544			Ti XII	27.537	9	Z
Sc XIV	25.680	100		Ca XIII	26.550			Mg XII	27.550		P
K XIV	25.696		P	Mg XII	26.564		P	Ca XIV	27.571		
K XIV	25.700	110		Ti XII	26.574	3	N	Ti XII	27.584	20	Z
C VI	25.705		P	K XIV	26.591		Q	K XIII	27.586	550	
Ca XIII	25.710	65		P XIII	26.608	10		Ar XIII	27.60	100	
Kr XXVI	25.715			Mg XII	26.616		P	Ti XII	27.601	9	Z
Ar XV	25.72	40		Zn XX	26.632	450		Ca XII	27.608	50	
K XIV	25.726		P	Ca XI	26.639	20		K XIII	27.61		
F VIII	25.74		P,Z	Ti XIII	26.641			Ti XII	27.617	9	Z
K XIV	25.750	175		Cl XV	26.66	350		Sc XIII	27.628	120	
S XIII	25.76	10		Cl XV	26.67	350		Ar XIV	27.63	300	
Ca XIII	25.770	20	Q	As XXIII	26.685	400		Ca XIV	27.638		
K XIV	25.784		P	Ca XIII	26.719	250		Ti XII	27.649	5	Z
P XII	25.788	0		Ar XIII	26.72	40	Q	Cl XIV	27.65	10	
F VIII	25.79		P,Z	Ti XII	26.733	8	N	Br XXV	27.669	750	
K XIV	25.818		Q	Se XXIII	26.76	30		K XIX	27.670		P
S XIII	25.83	50		K XIV	26.816	30		P XII	27.677	0	
Se XXIV	25.83	70		Ar XIII	26.82	40		Ar XVIII	27.688		P
C VI	25.830		P	Ti XII	26.847	10	Z	Ti XII	27.707	6	Z
Ar XV	25.84	60		Ti XII	26.870	8	Z	Ti XII	27.740	10	Z
Zn XX	25.869	200		S XII	26.89	10		Se XXIII	27.75	20	
Ca XIII	25.880	65		Sc XIII	26.893	40		Ti XII	27.758	5	Z
K XIV	25.887		P	Ca XIII	26.920	65		Ar XVIII	27.773		P
K XIV	25.909	350		Sc XII	26.920			K XIX	27.777		P
Zn XX	25.914	300		Mg XII	26.935		P	Br XXV	27.779	1000	
Sc XIV	25.921	300		Ti XIII	26.960			Ar XVIII	27.802		P
Ca XIII	25.964	70	Q	Ca XI	26.962	100		Ti XII	27.803	15	Z
Sc XIV	25.985	300		Si XII	26.98			K XIX	27.813		P
Ca XIII	26.00	175		Mg XII	26.988		P	Ti XII	27.820	14	Z
Ar XV	26.00	80		C VI	26.990	10	P	K XIII	27.835	30	
K XIV	26.018		Q	Zn XIX	27.02	80	Q	Si XII	27.850	3	
Ni XVIII	26.020	6		Cu XIX	27.032	150		Ti XII	27.863	10	Z
C VI	26.026		P	Si XII	27.035	1		Cl XIV	27.88	10	
Si XII	26.03			P XII	27.049	10		Fe XVI	27.88		
Ca XIII	26.033	350		Ca XIV	27.050			K XIII	27.88		
Ni XVIII	26.046	3		Ti XII	27.052	6	Z	S XII	27.89	10	
Sc XIV	26.056	150		Cu XIX	27.075	100		Ca XII	27.894	50	
K XIV	26.107		P	Ca XI	27.079	20		Ar	27.90	50	N
Ca XIII	26.124	10	Q	P XII	27.101	10		Co XVII	27.902	3	

Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes
Si XII	27.909	10		Co XVII	28.85			K XII	29.68	175	
Sc XIII	27.911	100		Ca XII	28.864	40		Ar XIII	29.689	50	
K XIII	27.94			Co XVII	28.874	6		Ca XIII	29.707	150	
Ti XII	27.971	7	Z	Ge XXII	28.900	300		K XII	29.735	350	
Ca XII	27.973	60		Se XXIV	28.907	20		Ge XXI	29.739	10	
As XXIII	27.976	700		Ca XIII	28.916	200		Ar XIII	29.769		
Sc XIII	27.979	80		Ca XII	28.929	30		Ni XVIII	29.779	35	
Ni XVIII	27.98			Cl XV	28.93	200		Al XI	29.793	10	
Ni XVIII	27.982	20		Ca XIII	28.935	150		K X	29.794	50	
Ti XII	28.000	0	N	Ca XIII	28.956	150		Ni XVIII	29.829	20	
K XIII	28.012	110		K XIII	28.958	30		Ca XIII	29.850	150	
P XII	28.017	10		Co XVII	28.960	6		Mn XXV	29.851		P
Ni XVIII	28.018	3		As XXII	28.972	30		Ar XIII	29.873	50	
P XIII	28.044	50		Cu XIX	28.987	180		Ca XIII	29.888	100	
Ar XII	28.05	100		Ca XII	28.989	20		Ar XIV	29.90	50	Q
Cl XIV	28.059	50		P XV	28.993		P	K XII	29.921	175	
Ca XII	28.068	20		Ar XIII	29.016			Fe XVI	29.93		
Ca XII	28.096	30		N VI	29.084	15		Cl XIII	29.940	10	
K XIII	28.10			Cl XV	29.09	200		Mn XXV	29.951		P
Cl XIV	28.113	100		Ar X	29.1	100		Se XXIV	29.960	90	
Ti XII	28.123	10	N	P XV	29.130		P	Ca XIII	29.97		P
P XIII	28.128	70		K XII	29.168	110		P XII	29.970	10	
Sc XIII	28.131	150		Ca XIII	29.168	200		K XII	29.986	110	
Ca XII	28.131	40		Co XVII	29.171	10		P XII	29.996	40	
Ti XII	28.150	2	N	Ar XIII	29.191			Cl XIII	30.010	50	
K XIII	28.160	110		Ar X	29.2	50		Ar XIII	30.014		
S XII	28.18	50		Se XXIII	29.20	10		Cu XVIII	30.019	10	
Ca XII	28.210	40		S XII	29.20	100		Mg XII	30.055		P
S XII	28.22	50		Ca XIII	29.207	100		Ar XIII	30.06	200	Q
Ni XVIII	28.220	35		Ar XIII	29.208	50		P XII	30.060	60	
Cl XV	28.27	300		Ar XIII	29.220			Zn XX	30.066	450	
Sc XIII	28.280	100		S XII	29.24	50		Se XXIV	30.068	90	
P XII	28.304	30		Ar XIII	29.249	50		S XIII	30.08		
Ar XIV	28.32	150	Q	Cu XIX	29.284	200		As XXII	30.084	20	
Sc XIII	28.324	150		Ar XIII	29.304			Cl XIV	30.085	10	
K XIII	28.327	175		Ar XVIII	29.311		P	Fe XVI	30.10		
S XII	28.33	100		Ar XIII	29.32	100		K XIX	30.103		P
Ca XII	28.334	30		K XII	29.342	110		Cu XVIII	30.104	20	
Ar XVIII	28.342		P	Ar XIII	29.352			Mg XII	30.120		P
Mg XII	28.405		P	Br XXIV	29.355	20		Zn XX	30.125	500	
Cl XV	28.42	450		K XII	29.367	110		Si XI	30.126	5	
Ar XVIII	28.432		P	Ar XIII	29.37	500		Cl XIV	30.145	10	
Sc XIII	28.434	40		Cl XIV	29.383	50		P XI	30.15	10	
S XV	28.45		P	Ni XVIII	29.383	3		K XII	30.151	30	
Ar XVIII	28.462		P	Ar XIII	29.403			Ca XIII	30.19		P
Sc XIII	28.463	40		Ar XVIII	29.407		P	K XII	30.202	40	Q
Mg XII	28.463			Al XI	29.416	6		Ar XIII	30.214	50	
C VI	28.466	30	P	Ni XVIII	29.422	3		K XIX	30.229		P
Ca XII	28.478	40		Cl XIV	29.423	150		Ar XIII	30.236	50	
As XXIII	28.479	900		K XII	29.43	65		Cl XIV	30.25	10	
Sc XIII	28.497	10		Ar XVIII	29.439		P	Ar XIII	30.260	10	
Ca XII	28.505	10		Si XII	29.439	10		K XIX	30.272		P
P XII	28.549	10		Ar XIII	29.454			Si XI	30.322	5	
Sc XIII	28.566	30		Br XXIV	29.486	20		Cu XVIII	30.325	35	
As XXII	28.601	10		Ar XIV	29.49	150		Fe XVI	30.33		
Ca XII	28.613	50		K XII	29.493	10	Q	Ar XIII	30.350	50	
Cu XIX	28.631	100		Si XII	29.509	20		K XII	30.351	65	
Sc XIII	28.633	20		Cl XIV	29.529	350		Si XI	30.368	10	
Br XXIV	28.64	40		K XII	29.53	30		Ge XXII	30.373	600	
Ca XII	28.658	30		Ca XIII	29.530	200		Al XI	30.376	20	
P XIII	28.66	150		Mn XXV	29.533		P	Ar XI	30.40	150	
Al XIII	28.661		P	N VI	29.534	19	F, P	S XIV	30.423	100	
Cl XIII	28.665	10		Ar XIII	29.534			Ca XI	30.448	600	
Fe XVI	28.67			K XII	29.559	65		S XIV	30.463	50	
Cu XIX	28.674	150		Ar XIII	29.565	250		Sc XII	30.480		
Ar XIII	28.68	80		Ar XI	29.57	150		K XII	30.571	350	
Ca XII	28.681	20		Si XII	29.574	1		Ar XII	30.58	50	
As XXII	28.699	20		Ar XIII	29.575			Ar XII	30.65	150	
Ge XXII	28.709	450		K X	29.588	100		P XII	30.667	0	
Al XIII	28.740		P	Se XXIV	29.596	40		P XII	30.722	40	
Ca XII	28.744	60		P XII	29.622	10		P XII	30.749	40	
Sc XIII	28.748	40		Ca XIII	29.633	200		Ar XIII	30.77	50	
Ca XII	28.770	20		Ar XIII	29.639			Ca XII	30.774	30	
N VI	28.787	100		Si XII	29.645	3		K XII	30.800	65	
Ga XX	28.83	10		K XII	29.667	110		Mn XV	30.81		

Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes
Sc XII	30.816			Cl XVII	31.791		P	Ca XII	32.657	50	
Ar XIII	30.84	50	N	Ga XX	31.797	20		P XI	32.67	10	
Ar XVIII	30.849		P	Zn XIX	31.80	500		As XXIII	32.680	1000	
Ca XI	30.867	300		Ca XX	31.802		P	Ca XII	32.688	40	
Ge XXII	30.885	800		S XIII	31.829	0		Ge XXI	32.727	20	
K X	30.887	50		Ni XVIII	31.845	20		Na XI	32.734		P
Cl XIV	30.900	50		Se XXIII	31.85	20		Si XI	32.735	10	
Ni XVII	30.91			Ar XIII	31.864	10		Ar X	32.74	50	
Ge XXII	30.926	250		Cl XVII	31.881		P	Ar XII	32.74	100	Q
K X	30.937	20		Ni XVIII	31.890	20		C V	32.7542	10	
Ar XVIII	30.955		P	Cl XVII	31.911		P	C V	32.773		
Ar X	30.96	150		Si XI	31.924	10		Na XI	32.789		P
Ar XVIII	30.991		P	S XIII	31.934	50		K XI	32.808	200	
Cl XIV	30.995	10		Ca XII	31.956	300		Ca XII	32.820	50	
Si XII	31.015	60		Ar XII	31.962	100		Fe XVI	32.84		
S XI	31.04	100		Ca XX	31.963		P	Cl XVII	32.878		P
Fe XVI	31.041	3		Si XI	31.980	20		Si XII	32.888	35	
Ge XXI	31.055	10		Ar XII	31.984	50		Co XVII	32.910	6	
Cl XVII	31.057		P	Se XXIII	32.01	20		S XII	32.926	50	
Ca XII	31.060	40		Ca XX	32.015		P	Co XVII	32.951	6	
K X	31.062	20		Ar XII	32.027	10		K XI	32.956	100	
Ar X	31.08	100		Ni XVIII	32.034	60		Si XII	32.972	90	
P XII	31.090	40		Cl XIII	32.05	150	N	Cl XVII	32.974		P
Ar XI	31.10	200		C V	32.064			Co XVII	32.995	35	
Se XXIII	31.10	40		Al XI	32.068	6		Cl XVII	33.007		P
Cl XIII	31.126	50		Na XI	32.068		P	Al XI	33.007	200	
Cl XVII	31.142		P	Cr XXIV	32.085		P	K XI	33.012	100	
Co XVII	31.142	20		As XXIII	32.088	500		Ca XII	33.014	200	
Cl XVII	31.171		P	K XI	32.099	100		Cl XIII	33.020	50	
Ar XII	31.18	50	Q	Ca XII	32.106	200		K XI	33.028	20	
Ge XXI	31.188	20		Na XI	32.120		P	Ar XIV	33.03	50	Q
K X	31.200	20		Al XI	32.128	10		P XI	33.04	100	
Ga XXI	31.203	500		Ar XII	32.147	100		Fe XVI	33.04		
Fe XVI	31.242	20		Fe XVI	32.166	10		Co XVII	33.046	20	
Cl XIII	31.253	10		K XI	32.178	200		Ga XXI	33.084	500	
Ca XI	31.257	200		C V	32.188			K XI	33.087	100	
Al XI	31.313	35		S XIII	32.191	100		K XI	33.107	80	
Na XI	31.317		P	Fe XVI	32.192	6		Al XI	33.109	10	
P XII	31.327	10		Ar XII	32.20	50		K XI	33.134	30	
Ar XII	31.347	350		Mn XV	32.230	0		P XI	33.15	100	
Ar XI	31.36	300		S XIII	32.236	100		Si XI	33.153	10	
Cl XIII	31.360	50		Ar XII	32.25	200		Al XI	33.172	35	
Cl XIII	31.365	50		K XI	32.278	80		K XI	33.211	60	
Na XI	31.368		P	Ca XII	32.281	200		Si XI	33.222	20	
Mn XV	31.37			P XII	32.304	0		K XII	33.237	400	
Co XVII	31.386	35		K XI	32.318	100		P XI	33.24	150	
Ar XII	31.388	500		Cl XIII	32.32	10		Ni XVII	33.249	6	
As XXIII	31.397	400		Ar XIII	32.34	10		Ni XIX	33.25		P
Ga XXI	31.401	350		Ni XVIII	32.340	90		S XIII	33.252	100	
Al XI	31.426	3		K XI	32.341	180		S XIV	33.259	10	
Cl XIII	31.448	250		Ar XII	32.344	100		Cu XIX	33.266	300	
Ge XXI	31.451	30		C V	32.3998	4		K XII	33.276	0	
K XI	31.457	10		Cr XXIV	32.403		P	K XI	33.285	60	
Ar XII	31.458	100		Ga XX	32.417	10		Si XI	33.298	20	
Cl XIII	31.465	500		Ca XII	32.418	100		Si XIV	33.308		
Ar XII	31.483	50		K XI	32.421	80		Cu XIX	33.320	350	
Al XI	31.483	6		Cl XIII	32.43	10		K XI	33.34	40	
K XI	31.483	100		S XIV	32.430	250		Ni XVII	33.340	3	
Ar IX	31.52	600		Fe XVI	32.433	10		C V	33.4257	30	
P XIV	31.52		P	Cl XIII	32.445	250		S XIV	33.426	50	
P XII	31.527	30		Ar X	32.45	320		Si XIV	33.444		
Ar XII	31.55	100		Ar XII	32.459	50		As XXII	33.445	40	
N K( $\alpha$ )	31.6			Ca XII	32.498	200		C V	33.463		P
Cl XIII	31.620	800		Cr XXIV	32.502		P	K XII	33.486	400	
Na XI	31.626		P	Cl XII	32.531	10		Si XI	33.515	20	
Ar XII	31.643	600		Ar XII	32.546	100		As XXII	33.519	20	
S XIII	31.649	50		Ar X	32.55	50		Ar XI	33.53	100	Q
Ar XII	31.66	350		S XIV	32.554	800		Cl XII	33.531	150	
Ar IX	31.66	700		K XI	32.563	60		Cl XII	33.542	50	
Ca XII	31.661	300		As XXIII	32.574	900		K XII	33.547	150	
Na XI	31.677		P	Ca XII	32.596	60		Mn XV	33.55		
K XI	31.688	90		Ar X	32.61	200		Ar XVIII	33.562		P
S XIII	31.72	10		P XIV	32.64		P	Ni XVII	33.567	3	
Ar XIII	31.74		Q	Ar IX	32.64	400		Si XI	33.573	10	
As XXII	31.765	10		Fe XVI	32.652	35		Cl XII	33.596	100	

Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes
Cl XII	33.597			Ge XXI	34.604	10		K XI	35.563	40	
Ga XXI	33.603	700		S XIII	34.633	0		Ca XI	35.576	800	
Cl XII	33.610			Cl	34.66	200	N	Ar XI	35.58	150	
Cl XII	33.613		P	Ar XII	34.67	250		Fe XVI	35.59		P
Mn XV	33.635	0		S XIII	34.678	100		S XIII	35.614	10	
Ga XXI	33.644	200		C V	34.699	2	Z	Co XVII	35.617	6	
Ar XI	33.65	300		Br XIX	34.7	10		Ge XXII	35.643	1000	
Mg XII	33.654		P	Cl XVII	34.710		P	Si X	35.656	5	
Ar XVIII	33.688		P	S XIII	34.712	150		Co XVII	35.660	10	
Cl XII	33.716			As XXII	34.732	20		S XIII	35.665	100	
Cl XII	33.720		P	Cl XVII	34.747		P	Ar XII	35.68	220	
Ar XI	33.73		P	S XIII	34.771	0		Ni XVII	35.698		
Ar XVIII	33.731		P	Ar XII	34.78	150		Ar XI	35.70	100	
Mg XII	33.733		P	Cl X	34.79	110		Ga XX	35.700	20	
C VI	33.734	65	P	Ar XI	34.80	500		Co XVII	35.707	20	
Cl XII	33.736			Cl XII	34.804	100		Si X	35.709	20	
C VI	33.740	35	P	Zn XIX	34.831	200		Fe XVI	35.71		
Cl XII	33.774	500		S XIII	34.854	150		S XIII	35.751	50	
Ar XI	33.78		P	Fe XVI	34.857	20		K X	35.779	200	
Cl XII	33.789	800		Cl XII	34.857		Q	Na XI	35.783		P
S XIII	33.796	50		Ar XI	34.88	40		Ar IX	35.82	500	
Cl XII	33.802		P	Ar XII	34.88	50		Mg X	35.827	6	
Na XI	33.818		P	Cl XII	34.894	50		Si X	35.838	40	
Ar XI	33.84	200		Si XI	34.910	20		Na XI	35.848		P
As XXII	33.84	40		Ge XXII	34.916	350		K XI	35.865	40	
S XIII	33.843	100		Cl XII	34.958		Q	Al X	35.888	50	
Na XI	33.877		P	C V	34.9728	100		S XVI	35.907		
Ar XI	33.88		P	V XXIII	34.977		P	Cl XI	35.92	70	
Cl XII	33.886			Al XI	34.994	200		Si X	35.932	20	
Ga XX	33.894	20		Ar XII	35.0		P	Co XVII	35.932	20	
C V	33.925	3	Z	Ar IX	35.02	700		S XII	35.955	100	
S XIII	33.945	150		Mn XV	35.04			Ar XII	35.96	100	Q
K XII	33.957	200		Al XI	35.065	250		S XVI	35.996		
Ar XI	33.96	100		Ar XI	35.07	100		Fe XVI	36.01		
Ni XVII	33.96			C V	35.070		P	S XVI	36.027		
Cl XII	34.000	10		S XVI	35.077		P	Mn XV	36.099	2	
Mn XV	34.02			P XIII	35.095	150		Mn XV	36.119	1	
C V	34.022	1	Z	Fe XVI	35.106	60		S XII	36.124	50	
Si X	34.040	5		P XIII	35.136	100		Ar XI	36.16	200	Q
Zn XX	34.044	650		S XVI	35.162		P	Zn XX	36.180	650	
Cl XII	34.047		P	Al XI	35.163	6		Al X	36.188	25	
Cl XII	34.052	600		S XVI	35.191		P	Se XIX	36.2	10	
Ar XI	34.10	100		S XII	35.203	50		K X	36.229	100	
Cl XII	34.101			Ca XI	35.212	800		Si XI	36.238	10	
S XIII	34.118	0		Mn XV	35.229	0		S XII	36.253	100	
K XII	34.126	250		Cu XVIII	35.238	6		Ar XII	36.26	10	
S XII	34.132	10		Al XI	35.239	6		As XXIII	36.277	400	
Cl XII	34.146			Cu XVIII	35.256	6		Cl XI	36.286	350	
K XII	34.200	100		K XIX	35.264		P	Cl XIII	36.30	160	
Fe XVI	34.21			S XII	35.275	50		Ar XI	36.31	200	
Ge XXII	34.213	250		Ar IX	35.28	300		Si XI	36.311	80	
Mn XV	34.22			Cu XVIII	35.294	10		Cl XI	36.334	500	
Cl XII	34.236			V XXIII	35.294		P	S XII	36.335	350	
Si X	34.238			Br XIX	35.3	10		Si XI	36.335	80	
Ar XI	34.24	150		Al X	35.301	10		Al X	36.350	25	
Zn XX	34.245	550		K X	35.307	400		Ar XII	36.39	100	P
Ga XX	34.250	30		Si X	35.310	10		S XIII	36.393	150	
C V	34.283	1	Z	Cl	35.33	40	N	S XII	36.398	500	
S X	34.31	100		Fe XVI	35.333	1		Al X	36.403	50	
Cl	34.31	200	N	Al X	35.340	10		Si XIII	36.43		P
P XI	34.32	10		Si XI	35.353	10		Cl XI	36.441	10	
Ar XI	34.33	300		Si X	35.353	10		Cr XIV	36.466	2	
K XII	34.349	150		Mg X	35.366	3		As XXIII	36.475	200	
Ar XI	34.35	480		Fe XVI	35.368	3		S XIII	36.499	0	
P XI	34.37	10		Ar XI	35.37	200		Mg X	36.518	35	
K XII	34.393	0		Si XI	35.383	60		P XII	36.520	30	
Cl XII	34.422		Q	V XXIII	35.394		P	S XIII	36.559	150	
Al X	34.445	25		Zn XIX	35.423	650		Ar X	36.56	100	Q
Ar XI	34.52	100		K XIX	35.424		P	Ge XXI	36.560	40	
C V	34.520	2	Z	Cl XII	35.429			P XII	36.562	50	
S XII	34.533	50		Si XI	35.446	100		S XII	36.563	800	
Cl XII	34.576			Cr XIV	35.450	0		Cl XII	36.566	10	
S XII	34.586	100		K XIX	35.476		P	Mn XV	36.577	1	
C V	34.598	1	Z	Ge XXII	35.534	900		P XII	36.613	80	
Cl XVII	34.604		P	Ar XII	35.54		P	S XIII	36.642	0	

Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes
P XII	36.655	60		S XII	37.714	250		Ga XXI	39.030	1000	
K XI	36.660	200		P XIII	37.723	20		S XI	39.049	100	
Ar XII	36.67	500	Q	K XI	37.766	50		S XVI	39.086		
Cl XI	36.674	600		Co XVII	37.768			S XI	39.089		P
Al XI	36.675	400		S XI	37.773	10		Al XI	39.091	250	
P XII	36.697	40		Cl XVII	37.776		P	S XI	39.11	100	
Zn XX	36.709	950		Cl XI	37.783	150		S XI	39.131		P
Ge XXI	36.741	20		Ar XI	37.79	150	Q	Zn XIX	39.135	200	
Zn XX	36.748	300		Si XIII	37.81		P	Cl X	39.15	250	Q
Fe XVI	36.749	60		Cl XVII	37.818		P	Si X	39.175	40	
P X	36.75	50		Ga XX	37.849	10		Al XI	39.180	400	
Si XI	36.772	70		K XI	37.871	50		V XIII	39.181	3	
Ar IX	36.78	150	Q	Cl XI	37.88	200		S XVI	39.192		
Ar X	36.78	150		K XI	37.891	10		Si X	39.203	50	
P XII	36.792	70		Se XVIII	37.9	10		S XI	39.214		P
Fe XVI	36.803	20		Ne X	37.907		P	S XVI	39.228		
Mn XV	36.803	2		Ne X	37.958		P	S XI	39.24	150	
B V	36.810		P	B V	37.960		P	Cl X	39.253	10	
Cl XII	36.865	50		Ge XXI	37.994	20		Si X	39.264	50	
B V	36.897		P	Ar XI	38.00	150		Mn XV	39.287	2	
Ge XXI	36.95	40		Mn XV	38.02			Al X	39.291	75	
Ar IX	36.96	100	Q	K XI	38.030	30		Ar XII	39.30	200	Q
K XI	36.968	100		Cr XIV	38.036	8		S XI	39.300	500	
P XII	36.975	100		K XI	38.112	20		Si X	39.305	80	
Ni XVIII	36.990	60		Ga XXI	38.136	400		P XII	39.310	120	
B V	37.020		P	Ge XXI	38.182	20		Ar XVIII	39.318		P
P XII	37.041	10		Ar X	38.23	150		S XI	39.323	800	
Ni XVIII	37.049	60		Al X	38.255	100		S XI	39.336		P
Cl XI	37.05	300		Ti XXII	38.272		P	Ni XVII	39.346	3	
Si XI	37.060	10		Ne X	38.281		P	P XII	39.354	300	
Co XVI	37.070	3		Al X	38.310	125		Ni XVII	39.373	6	
P XII	37.074	10		K XI	38.317	60		S IX	39.383	150	
Zn XIX	37.085	500		S XII	38.32	100		S XI	39.408		P
Fe XVI	37.096	6		Ar XI	38.33	380		Ni XVII	39.415	10	
Ar X	37.10	50	N	Ne X	38.332		P	Cl X	39.422	20	
Mn XV	37.12			Si XI	38.336	20		Si X	39.443	50	
Cl XI	37.123	50		Ar X	38.40	500	Q	P XII	39.456	500	
S XVI	37.135			Cl XIII	38.46	110		Cl VIII	39.462	100	
Fe XVI	37.138	10		Ar X	38.51	420		Ar XVIII	39.478		P
Si X	37.159	20		Mn XIV	38.54			Ar XI	39.49	300	
Co XVI	37.165	6		Ti XXII	38.589		P	S IX	39.516	200	
B V	37.201		P	Se XVIII	38.6	10		Cl X	39.528	1	
Si X	37.206	20		Cl XI	38.603	10		Al XI	39.530	60	
Zn XIX	37.22	200	Q	Cl XIII	38.61	40		Ar XVIII	39.530		P
S XVI	37.231			Ar XI	38.62	400		Al X	39.535	100	
K XI	37.236	60		P XII	38.629	90		Mn XV	39.547	3	
Si X	37.248	10		Ar X	38.64	700	Q	Si X	39.552	70	
Cl XI	37.259	100		Al XIII	38.657		P	S XI	39.555		
S XVI	37.264			Cl X	38.66	40		Cl	39.559	1	N
P XII	37.287	150		Cr XIV	38.679	0		S XI	39.572	50	
Cu XIX	37.293	450		Ti XXII	38.689		P	Ne X	39.623		P
Si XI	37.340	50		P XIII	38.754	30		Al XI	39.623	90	
P XII	37.347	150		Mg X	38.769	60		Al X	39.628	125	
Mn XV	37.36			Ar XI	38.79	300		Cl X	39.634	1	
Co XVI	37.401	10		Al XIII	38.793		P	Ar XI	39.64	300	Q
Ga XXI	37.414	300		Ne X	38.816		P	S XI	39.648	800	
Mn XV	37.42			Mg X	38.823	120		Cl VIII	39.655	10	
Ar X	37.43	250		S XII	38.824	10		P XII	39.664	40	
K XI	37.431	200		Si X	38.830	60		Mg X	39.669	250	
Zn XIX	37.448	700		Co XVI	38.84			Ne X	39.678		P
S XII	37.463	10		Ne X	38.868		P	As XVIII	39.7	10	
Cl XII	37.464	10		Ar XI	38.87	250		V XIII	39.721	3	
B V	37.483		P	B V	38.871	10	P	Cu XIX	39.725	550	
Cu XIX	37.488	350		Cu XVIII	38.876	35		S XI	39.728		P
Cl XI	37.537	150		Ar X	38.88	500	Q	Ge XXII	39.728	300	
P XIII	37.561	150		S XII	38.882	10		Ar XII	39.75	250	Q
K XI	37.564	100		Mn XV	38.89			P XI	39.753	10	
Ar X	37.60	200		Cr XIV	38.899	0		Cl X	39.77	250	Q
S XIII	37.600	150		P XIII	38.921	50		S XI	39.782		P
S XII	37.603	350		Ga XXI	38.922	700		Ar XI	39.79	150	N
Mg X	37.644	60		Fe XV	38.95			Cr XIV	39.796	1	
Cl XVII	37.650		P	Ni XVII	38.96			S XIII	39.8		P
Cl XI	37.673	100		S XI	38.996	100		Fe XVI	39.827		
K XI	37.692	100		Cl X	39.01	250	Q	Al X	39.853	50	
P XIII	37.706	200		S XI	39.025		P	P XI	39.911	10	



Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes
Al X	39.925	100		P XV	40.964		P	Al X	42.310	75	
P XV	39.929		P	Cl X	40.994	10		Zn XIX	42.32	100	P
Ge XXII	39.929	200		Ne X	40.994		P	Al X	42.340	200	
Cl X	39.956	100		P XV	40.994		P	P XI	42.351	100	
Ar XI	39.98	150		B V	40.996	30	P	Mg X	42.363	400	
P XV	40.014		P	Ni XVIII	41.015	125		P XV	42.369		P
Cr XIV	40.018	2		Si X	41.023	30		As XVII	42.4	10	
Cl X	40.019	90		Al IX	41.037	20		P XV	42.401		P
Ar XI	40.02	100		Ar XII	41.08	50	Q	Al X	42.403	350	
Mg X	40.022	120		Zn XX	41.084	300		P XI	42.409	100	
Ar XI	40.04	250	N	Si X	41.086	30		Cl VIII	42.430	100	
P XV	40.043		P	Zn XVII	41.09			Cr XIV	42.453		
Na XI	40.069		P	P XI	41.125	50		P XI	42.471	250	
Mg X	40.080	200		Ni XIX	41.132			P XI	42.483	350	
Cl X	40.085	200		Cu XVIII	41.134	60		S X	42.485	250	
Ga XX	40.100	40		Fe XVI	41.14		P	S X	42.495	350	
S XI	40.103		P	K X	41.148	700		Zn XIX	42.52	70	
Cl X	40.136	1		Cu XVIII	41.173	10		Mg X	42.523	6	
Na XI	40.149		P	Mn XV	41.185	4		S XVI	42.528		P
Mn XV	40.151	1		Ni XVIII	41.218	90		S X	42.543	500	
Fe XVI	40.153			Mn XV	41.243	3		P XII	42.553	20	
P XII	40.157	10		S X	41.357	50		Ar IX	42.56	200	
P XII	40.171	30		Fe XVII	41.37			Al XII	42.59		P
Ar XI	40.19		P	Ar	41.38	150	N	Mg X	42.596	10	
Fe XVI	40.199	10		Ni XIX	41.385			P XI	42.599	500	
Fe XVI	40.245	10		S XI	41.386	50		P XII	42.647	40	
Cu XIX	40.263	650		Cl X	41.390	100		S XVI	42.653		P
C V	40.2680	500		Co XVII	41.404	10		P XII	42.679	20	
Zn XVII	40.27			Co XVII	41.462	10		S XVI	42.696		P
S XI	40.277		P	P XII	41.471	50		S X	42.698	50	
Mn XV	40.285	1		C V	41.472		F	Al IX	42.708	10	
Cu XIX	40.298	200		S XI	41.474	10		Si XI	42.730	40	
P XII	40.301	200		Ar IX	41.48	600		Al IX	42.744	10	
P XII	40.348	50		Mn XIV	41.51			S XI	42.751	10	
Zn XVII	40.38			P XII	41.518	60		P XII	42.763	140	
P XII	40.388	120		Ge XVIII	41.53	10		P XI	42.764	800	
Cl XI	40.392	350		K X	41.541	700		Si XI	42.773	10	
Si X	40.407	10		Al IX	41.543	20		P XII	42.779	20	
Ar XI	40.42	50		S XI	41.543	10		Zn XX	42.815	800	
Al X	40.421	25		Cr XIV	41.556	2		Si XI	42.826	70	
P XII	40.429	150		P IX	41.556	150		Ni XVII	42.855	20	
V XIII	40.477	3		Fe XV	41.559	3		Si XI	42.866	30	
P XII	40.478	20		Ar X	41.57	200		V XIII	42.909		
Zn XVII	40.49			Zn XVII	41.58			Se XVI	42.91	30	
Cl X	40.49	250	Q	Zn XIX	41.581	100		Si XI	42.910	10	
Si X	40.503	5		Cl X	41.589	10		Zn XX	42.924	1000	
Cl XI	40.505	100		V XIII	41.596	5		Al IX	42.928	20	
Ga XX	40.54	40		P XII	41.634	120		Fe XV	42.93		
S XI	40.566	100		Cl VIII	41.636	1		S X	42.937		
Mn XV	40.572	1		P XII	41.661	50		Ar X	42.94	250	
S XI	40.580		P	Fe XV	41.663	10		Cl IX	42.940	100	
Cu XVIII	40.613	6		P XII	41.700	70		Si XI	42.950	20	
P XII	40.613	120		Mn XIV	41.72			Mn XIV	43.00		
Mg IX	40.638	10		Al X	41.730	100		S X	43.002	600	
Ar	40.64	100	N	Cr XIV	41.788	2		Si XI	43.046	20	
Ni XIX	40.650			Ga XX	41.798	20		Zn XIX	43.08	160	P
Cl X	40.660	100		Mg IX	41.803	40		Mg IX	43.087	10	
S XI	40.707	50		Ge XVIII	41.81	10		V XIII	43.103		
C V	40.7306	30		Zn XX	41.824	450		S XI	43.123	150	
Ni XIX	40.731			As XVII	41.84	10		Mg IX	43.138	20	
Zn XVII	40.74			Ar X	41.89	100		Cl IX	43.168	120	
Cu XVIII	40.749	35		Fe XV	41.903	20		Al IX	43.195	40	
Cl X	40.759	40		Fe XVI	41.91			Al IX	43.237	40	
Cu XVIII	40.769	10		Ga XX	41.983	20		Al IX	43.261	80	
Cr XIV	40.782	7		P XI	41.998	100		V XIII	43.268		
Cl XI	40.787	10		Ni XVII	42.0			Ar X	43.27	150	
Cr XIV	40.800	10		Ar IX	42.02	200		Si XI	43.290	10	
P XV	40.875		P	Mn XV	42.152	1		Ne X	43.315		P
Al IX	40.904	10		Cl VIII	42.166	10		Si XI	43.329	10	
Br XVI	40.91	30		Mn XV	42.185	2		V XII	43.358		
Si XII	40.911	200		Cl VIII	42.220	200		V XIII	43.371	8	
Cr XIII	40.92			P XI	42.227	10		Ne X	43.379		P
Ne X	40.936		P	P XV	42.276		P	Si XI	43.385	10	
Si XII	40.951	200		Mg X	42.294	250		Fe XV	43.39		
Zn XVII	40.96			Fe XVI	42.30			Ar XII	43.42	150	Q

Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes
Al X	43.460	75		Cr XIV	44.597	3		Cl IX	45.519	200	
Mg IX	43.481	50		P XV	44.602		P	Co XVII	45.527		
P XI	43.488	50		Cl VIII	44.603	200		Mg XII	45.533		P
P XI	43.529	70		Ar X	44.63	400		Cl IX	45.539	200	
Al IX	43.549	10		Cu XVI	44.63			Se XV	45.56	30	
Al X	43.549	350		P XV	44.637		P	Si X	45.606	5	
Al X	43.577	100		Si X	44.655	30		Cl IX	45.626	15	
Fe XV	43.65			As XVI	44.66	10		Mg IX	45.635	40	
Ga XXI	43.683	250		Cu XVI	44.67			Co XVIII	45.640		
Ar X	43.69	350		Zn XIX	44.67	300		V XIII	45.645	2	
Mn XIV	43.74			C K( $\alpha$ )	44.7			Cl X	45.655	400	
V XIII	43.741	1	Z	Al IX	44.704	60		Mn XV	45.659	2	
Cr XIII	43.75			Zn XIX	44.71	700		Ar	45.67	150	N
Si XI	43.763	10		Si X	44.719	20		Si X	45.684	60	
S X	43.782	100		Na IX	44.723	10		P XI	45.690	10	
P XI	43.809	10		Al IX	44.743	80		Si XII	45.692	20	
Ni XVIII	43.814	200		Zn XIX	44.77	950		Mn XV	45.700	3	
Mg IX	43.843	60		Ar XII	44.79	150		Cl X	45.732	150	
S X	43.854	50		B IV	44.8		Q	Cl IX	45.745	10	
Ge XVII	43.88	10		Mn XV	44.820	3	Z	P XI	45.747	10	
P XI	43.894	10		Si X	44.830	30		Ti XII	45.783		
S XI	43.900	100		Zn XIX	44.84			Sc XX	45.83		P
Ga XXI	43.904	180		Ar X	44.84	300		Cr XIV	45.835	15	
Ar X	43.92	450		Ni XVII	44.850	6		Si XIV	45.856		P
S X	43.984		N	Si X	44.855	30		V XIII	45.873	5	
Cl IX	44.003	200		Cr XIV	44.869	4		Cu XVI	45.90		
V XIII	44.013			Co XVIII	44.869			P X	45.905	75	
Si XII	44.021	200		Al X	44.902	10		P X	45.931	125	
V XII	44.03			V XIII	44.919			Si XIV	45.941		P
P XII	44.044	10		Zn XIX	44.95			Ga XVII	45.96	10	
Ar X	44.05	350		Co XVIII	44.959			P X	45.963	200	
Mg X	44.050	400		Si X	44.979	60		Si XIV	45.969		P
Zn XIX	44.07			Cu XVI	44.98			Mg IX	45.980	20	
Cl IX	44.088	400		Mg IX	44.983	20		P X	45.992		
S X	44.094	350		P XI	44.987	50		P XI	45.997	400	
Cl XVII	44.108		P	Ni XVII	44.995	10		S X	45.997	500	
P XI	44.115	350		Ni XVII	45.018	1		Cr XIV	46.039	1	
Al X	44.136	10		Ar X	45.03	350		P X	46.060		
Si XII	44.165	250		Zn XIX	45.04			P X	46.079		
Zn XIX	44.166	700		Sc XX	45.04		P	Cu XIX	46.090	300	
Cl IX	44.183	200		V XII	45.071			Na IX	46.090	100	
Ar	44.19	100	N	Al IX	45.077	10		Cl IX	46.098	100	
Zn XIX	44.20			Cl IX	45.112	400		Cr XIV	46.125	5	
Si IX	44.215	10		Mn XV	45.154	4		Zn XVII	46.13		
P XI	44.232	250		Ti XII	45.167			V XIII	46.137		P
S X	44.237	150		Zn XIX	45.20			P X	46.199		
Si IX	44.249	10		Cu XVI	45.21			P XI	46.203	450	
Co XVI	44.253			Cu XVI	45.24			S VII	46.212	10	
Cl IX	44.267	300		Zn XIX	45.26			Al X	46.223	75	
Cl XVII	44.268		P	Cl IX	45.261	200		P X	46.233		
Ar X	44.27	450		S VIII	45.279	50		Zn XIX	46.24	200	
Ge XVII	44.29			S VIII	45.290	50		Cl IX	46.242	10	
Al XII	44.32		P	Co XVII	45.319			Ge XVI	46.25	10	
Cl XVII	44.320		P	Cl IX	45.332	100		P X	46.255		
P X	44.336	10		Cu XIX	45.332	200		Ar	46.26	50	N
Zn XIX	44.341	400		Al IX	45.344	40		Si XI	46.264	10	
S VIII	44.350	20		Co XVIII	45.35			P X	46.294	450	
Cl VIII	44.361	200		S VIII	45.370	20		S X	46.298	350	
Ni XVIII	44.365	250		Cl IX	45.378	300		Ga XVII	46.3	10	
S X	44.367	500		Ar XII	45.38	50		Ne IX	46.3		
P X	44.367	10		Ni XVII	45.382	20		Si XI	46.300	50	
Mg IX	44.373	40		Cl X	45.396	300		P X	46.334	450	
S VIII	44.374	100		Mg XII	45.397		P	Mg IX	46.340	40	
V XIII	44.376	2		Si XI	45.398	10		V XIII	46.373		P
Ni XVIII	44.405	35		S X	45.406	10		S IX	46.373	250	
S X	44.406	500		Zn XIX	45.41			Zn XIX	46.383	200	
Mg IX	44.420	60		Ni XVII	45.424	6		Ar	46.39	100	N
Ar X	44.45	450		Cl X	45.431	10		P X	46.399		
Cu XVI	44.47			Co XVIII	45.454			Si XI	46.401	100	
Al X	44.493	75		S VIII	45.458	20		Ca XX	46.406		P
P XV	44.499		P	Cl IX	45.465	10		S IX	46.413	150	
Si X	44.521	30		Ar XII	45.49	100		S X	46.430	100	
Cl IX	44.530	100		Kr XIII	45.5		N	Co XVI	46.433		
S VIII	44.547	50	Q	S VIII	45.508	20		Zn XIX	46.44		
V XIII	44.594	2		Si XII	45.519	10		Zn XVII	46.44		

Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes
V XIII	46.460	8		Si X	47.489	50		S XV	48.58		P
Cr XIV	46.468	55		Si XI	47.489	50		P XV	48.584		P
Cl X	46.477	500		As XV	47.514	20		Ne X	48.584		P
V XIII	46.482	12		S IX	47.518	250		B V	48.586	65	P
S IX	46.514	20		Al IX	47.534	100		B V	48.591	35	P
Co XVI	46.522			Si X	47.545	50		Si X	48.596	20	
Cr XIV	46.527	12		Cr XIII	47.55			S XV	48.61		P
Ar XII	46.53	150	Q	S VIII	47.566	10		Si XIV	48.645		P
S IX	46.549	150		Cu XVIII	47.585	10		S VII	48.647	150	
Si X	46.563	30		S VIII	47.594	10		Si XIV	48.677		P
S IX	46.585	250		Si XI	47.607	50		V XIII	48.682	2	
Mn XVI	46.59		P	S IX	47.616	200		Ga XVI	48.69	10	
S IX	46.624	150		V XIII	47.637	10		Ar IX	48.73	500	
P X	46.636	300		Si XI	47.653	50		Al IX	48.765	20	
Ti XII	46.641			S X	47.655	500		S IX	48.766	100	
Mg IX	46.657	160		Ni XVII	47.663			Cu XVIII	48.783		
Fe XVI	46.661			Mn XV	47.666	2		Mg IX	48.794	10	
Si XI	46.662	40		Mn XIV	47.67			S VII	48.874	100	
Mg IX	46.711	10		Ne IX	47.7			Cu XVIII	48.885		
S IX	46.713	50	Q	P X	47.702	100		Al IX	48.899	2	N
Fe XVI	46.718			Si XI	47.702	5		Zn XVII	48.92		
Ca XX	46.723		P	As XV	47.711	30		P IX	48.925	350	
S IX	46.760	50		Si XI	47.735	20		F IX	48.934		P
P X	46.769	350		S IX	47.740	50		B IV	48.939		
P X	46.777			Al IX	47.755	10		Fe XVI	48.95		P
Cu XVIII	46.781	3		Ni XVI	47.772			Fe XVI	48.98		P
S IX	46.799	100		Na IX	47.776	10		P X	48.986	50	
F IX	46.814		P	S X	47.791	350		F IX	48.989		P
Ca XX	46.823		P	S VIII	47.793	10		Si XI	48.991	20	
S IX	46.843	100		Mg IX	47.818	10		Cu XVIII	49.010		
Cl X	46.845	400		Na IX	47.836	100		Cr XIII	49.03		
F IX	46.864		P	Se XXVII	47.844		P	Si XI	49.052	30	
P X	46.887			Al IX	47.856	50		P X	49.076	10	
Si X	46.895	20		K XIX	47.863		P	Al IX	49.094	40	
Al IX	46.896	40		V XIII	47.884	10		S X	49.102		
Ge XVI	46.9	10		P X	47.896	50		S IX	49.119	300	
S IX	46.906	50		Si XI	47.899	50		Co XVII	49.133		
Cl X	46.908	150		S X	47.905	100		P X	49.145	10	
V XII	46.913			Ti XII	47.906			S X	49.166		Q
Si XIV	46.943		P	Zn XVII	47.92			Co XVII	49.171		
Cu XVIII	47.012	6		Mn XIV	47.93			Ar IX	49.18	500	
Si XIV	47.031		P	F IX	47.936		P	Si XI	49.181	30	
Mg IX	47.041	60		Mg IX	47.947	100		Si X	49.182	10	
Si X	47.043	50		F IX	47.989		P	Ga XVI	49.19		
S IX	47.047	250		Cl	47.990	10	N	S X	49.211		
Si XIV	47.061		P	K XIX	47.997		P	Si XI	49.222	50	
Cl X	47.085	150		Ne IX	48.0			V XII	49.226		
S VII	47.098	50		Mg IX	48.024	10		Cl IX	49.234	100	
Cl X	47.158	50		K XIX	48.043		P	S X	49.255		
Ni XVI	47.184			P X	48.045			Si XI	49.265	10	
S IX	47.188	200		P X	48.113	50		Na IX	49.326	100	
S X	47.190			S X	48.116			S IX	49.328	250	
S X	47.229			Zn XVII	48.13			Na IX	49.386	200	
Mg X	47.231	250		S X	48.157	10		Ni XV	49.39		
S IX	47.249	300		S IX	48.160	400		S IX	49.390	150	
Cr XIII	47.26			Zn XX	48.273	300		Cu XVIII	49.395		
Mn XV	47.270	2		S IX	48.291	40	N	Mn XIV	49.42		
F IX	47.276		P	Al XI	48.297	700		Al VIII	49.436	6	
Si XI	47.293	20		Cr XIV	48.300	2		Si X	49.441	50	
S VII	47.307	50		Cr XIV	48.338	3		Cu XVIII	49.452	10	
Mg X	47.310	400		Al XI	48.338	700		B IV	49.4549		
F IX	47.327		P	Mg IX	48.340	100		Cl VIII	49.487	700	
Cr XIII	47.34			S IX	48.367	200		Fe XV	49.49		
Cu XIX	47.340	850		Si X	48.381	20		Cu XVIII	49.490	20	
P X	47.341			P XV	48.424		P	Ne IX	49.5		
Si XI	47.350	50		Si X	48.440	40		Kr XII	49.5		N
S IX	47.360	50		V XIII	48.441	1		Cu XVIII	49.558	20	
Mn XIV	47.38			Zn XX	48.505	200		Cl IX	49.568	100	
Si XI	47.385	10		Ne X	48.505		P	Ni XV	49.58		
Al IX	47.417	80		P XV	48.544		P	Mg IX	49.586	1	
S IX	47.433	450		Si XIV	48.552		P	Cr XIII	49.59		
Cu XIX	47.445	1000		Si X	48.553	10		Ni XV	49.626		
Si XI	47.453	10		Na IX	48.553	200		Mn XIV	49.63		
Co XVI	47.483	100		Co XVII	48.564			Cu XVIII	49.639		
Al IX	47.489	200		S IX	48.564	250		V XIII	49.642		

Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes
Si X	49.701	100		Si XI	50.617	40		Cl IX	52.055	200	
Ge XV	49.73	10		P IX	50.626	100		Si X	52.070	50	
Al VIII	49.758	5		Al X	50.670	50		Cu XVI	52.08		
P X	49.765	50		P X	50.671	50		S VII	52.097	200	
Cu XVIII	49.769			Ti XII	50.674			Na IX	52.116	100	
Fe XVII	49.787			As XIV	50.68	30		Si X	52.155	100	
P X	49.803	25		Si X	50.691	100		P X	52.158	250	
Co XVI	49.808	100		Cl VIII	50.700	200		P IX	52.160	300	
S XVI	49.824			Al X	50.717	75		Na IX	52.186	200	
Al IX	49.854	100		Al X	50.762	350		Ti XI	52.218	1	N
Cu XVIII	49.862			P X	50.774	10		Ni XVII	52.224	10	
P X	49.865	15		Mg IX	50.777	10		Ga XV	52.27	10	
Ca XIX	49.88		P	Ca XIX	50.79		P	Si XI	52.296	100	
Fe XVII	49.880			Al X	50.802	50		Al XI	52.299	400	
Ti XII	49.912			Cr XIV	50.821	3		Cl IX	52.303	400	
Ni XV	49.914			P X	50.870	10		V XII	52.315		
Al IX	49.916	100		Al X	50.903	50		Cr XIV	52.321	2	
Co XVI	49.958	100		Co XVI	50.94			Cr XIV	52.363	3	
Co XVI	49.979	20		Al X	50.946	10		Mg VIII	52.395	10	
S XVI	49.984			Ni XV	50.947			Ne IX	52.4		
Si X	49.984	60		Zn XVII	50.95			Cu XVI	52.41		
Si VIII	49.987	10		Ni XVII	50.958			Cl IX	52.426	300	
S VII	49.990	120	Q	As XXVI	50.959		P	Al XI	52.446	700	
Si X	50.018	90		Co XVI	51.007			Si X	52.485	100	
Si VIII	50.019	50		Cl IX	51.026	400		Na IX	52.487	1	
S VII	50.027	70		Al X	51.039	10		P IX	52.552	150	
Mn XIV	50.03			Mg VIII	51.040	10		Si VIII	52.554	20	
S XVI	50.036			Ni XVIII	51.042	35		Co XV	52.583	100	
V XII	50.056			V XIII	51.091	10		V XIII	52.590	2	
Fe XV	50.062	1		Mg VIII	51.098	40		P X	52.594	200	
Cu XVIII	50.067			Si XIV	51.106		P	Kr XXVIII	52.6		P
Cl VIII	50.074	500		Si IX	51.113	50		Si X	52.611	50	
Fe XV	50.085	10		P X	51.155	450		Ni XVIII	52.615	200	
K XIX	50.091		P	P IX	51.156	450		Mg VIII	52.628	40	
Cu XVIII	50.118			Cr XIV	51.172	4		Mg XI	52.65		P
Fe XV	50.120	100		V XII	51.208			Si IX	52.671	10	
Si X	50.124	70		Si XIV	51.209		P	Cl IX	52.677	200	
Si X	50.154	50		S VIII	51.227	100		S VIII	52.681	20	
S X	50.164			Co XVI	51.239			B IV	52.6853	330	
Ni XV	50.172			Si XIV	51.244		P	Mg VIII	52.692	80	
Mg VIII	50.219	20		Co XVI	51.279			S VIII	52.702	20	
S X	50.219	50		Cu XVIII	51.287			P IX	52.709	150	
K XIX	50.238		P	Zn XVI	51.3	10		Ni XVIII	52.720	250	
Ni XV	50.249			Na VIII	51.316	10		Cl IX	52.726	300	
Ni XVIII	50.253	20		Al X	51.362	350		S VIII	52.756	300	
Si X	50.254	70		Si IX	51.362	100		S VIII	52.789	300	
Fe XVII	50.262			V XIII	51.376	20		Ni XVII	52.802	6	
K XIX	50.288		P	Cl IX	51.378	300		Si IX	52.810	20	
Ne IX	50.3			Mg VIII	51.389	20		Fe XVII	52.815		Q
Si X	50.305	50		Al X	51.400	1		Si IX	52.838	50	
Cu XVIII	50.306			Ti XII	51.446			S VIII	52.854	100	
Fe XVII	50.33		P	Al X	51.454	1		S IX	52.859	300	
S X	50.332	10		S VIII	51.470	70		V XIII	52.870	20	
Si X	50.333	50		K XIX	51.470		P	Cr XV	52.88		P
Fe XVI	50.350	23		Mg VIII	51.470	40		Ti XII	52.896	1	
Co XVI	50.357	200		Cu XVIII	51.496			Fe XV	52.911	300	
Mg VIII	50.386	20		Mg IX	51.560	10		V XIII	52.928	15	
Si X	50.390	10		Ga XV	51.57	10		Cl IX	52.939	10	
Co XVI	50.393	20		Mg IX	51.591	300		S VIII	52.958	350	
S X	50.397			V XIII	51.620			Cl IX	52.959	1	
Fe XVII	50.397			Si X	51.635	10		Al IX	52.966	10	
Zn XVII	50.41			Mg IX	51.654	400		Mn XV	52.977	4	
B IV	50.4347	100		Ti XII	51.669			P IX	52.980	250	
Mg XI	50.44		P	Si X	51.676	20		S VIII	52.985	70	
Ti XII	50.448			Si VIII	51.718	20		Cr XIII	53.02		
V XIII	50.494			K XIX	51.786		P	Si	53.025	20	N
P IX	50.511	200		Na VIII	51.789	10		Mn XV	53.032	5	
Si X	50.524	50		Zn XVI	51.8	10		Co XVI	53.043		
Si VIII	50.524	50		S VII	51.807	350		Si	53.063	20	N
Si XI	50.524	100		Si VIII	51.819	20		S VIII	53.073	50	
F IX	50.555		P	P IX	51.861	300		Al IX	53.098	10	
Fe XVI	50.555			K XIX	51.886		P	Cl IX	53.108	1	
P IX	50.560	300		P IX	51.889	100		Mg IX	53.112	10	
Fe XVII	50.60		P	Al X	51.979	300		Ti XII	53.140	1	
F IX	50.613		P	Ni XVII	52.000	6		Ge XIV	53.165	20	

Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes
Co XV	53.173	200		Na VIII	54.380	100		Cu XII	55.466	1	
Mg IX	53.188	200		Ni XVII	54.384			Ni XVII	55.511		
Al XIII	53.203		P	S VIII	54.385	100		Si IX	55.511	50	
Mg IX	53.222	200		Al XI	54.388	60		Mn XVI	55.539		
Al IX	53.237	60		Zn XV	54.40	10		K XVIII	55.54		P
S VIII	53.239	30		Si IX	54.403	50	Q	S IX	55.540	250	
Al IX	53.267	60		Zn XII	54.409	10		Br XXVII	55.6		P
V XIII	53.281			S VIII	54.424	150		Ni XVII	55.606		
Al XIII	53.287		P	S IX	54.431	200		Si XIV	55.615		
Al XIII	53.316		P	Ni XVII	54.451			Al IX	55.622	1	Q
V XIII	53.318	4		Al IX	54.457	200		Fe XV	55.635	100	
Sc XI	53.334			Si X	54.462	50		Mn XVI	55.643		
Ar XVIII	53.354		P	Si VII	54.462	50		Al IX	55.667	10	
Al IX	53.376	10		Mg IX	54.463	10		P VIII	55.672	120	
Ge XIV	53.378	30		Al XIII	54.464		P	P VIII	55.710	70	
Cr XIII	53.39			Cu XVI	54.48			Ga XIV	55.72	10	
Al IX	53.412	10	Q	V XII	54.493			Al VIII	55.720	65	
Al IX	53.424	10		S VIII	54.501	20		Al X	55.731	50	
Ti XII	53.433	3		S IX	54.516	50		Mn XV	55.731	1	P
Mg VIII	53.438	20		Si VII	54.522	50		Si XIV	55.735		
Cl IX	53.448	10		Si X	54.522	50		P XIV	55.76		P
Ti XII	53.457	1		Zn XII	54.544	10		Co XIV	55.762		
Si X	53.463	10		Al XIII	54.552		P	Si XIV	55.776		
Mg VIII	53.484	10		S VIII	54.566	50		Si IX	55.781	150	
Ar XVIII	53.488		P	Si X	54.571	50		Co XIV	55.782		
Al IX	53.488	1		Al XIII	54.582		P	Sc XI	55.788		
F IX	53.494		P	Si X	54.599	50		Fe XV	55.793	200	
Kr XI	53.5		N	S VIII	54.604	50		P XIV	55.80		P
Cr XIII	53.506	50		Ni XVII	54.628			Fe XV	55.815	10	
Mg VIII	53.512	100		S VII	54.652	100		Ar XVIII	55.839		P
Ar XVIII	53.534		P	Si X	54.664	10		P VIII	55.876	300	
Al IX	53.554	10		V XII	54.702			Ni XVII	55.887		
F IX	53.558		P	Si X	54.702	10		P VIII	55.926	100	
Si X	53.573	50		P VII	54.708	50		V XIII	55.932	5	
K XIX	53.578		P	Fe XVI	54.728	24		Ni XVII	55.933		
Si X	53.595	50		Fe XVI	54.769			V XIII	55.967	10	
Al	53.598	10	N	Si IX	54.841	100		Ar XVIII	55.985		P
Cu XIX	53.643	200		Mg VIII	54.853	60		Mn XVI	56.017		
Cl IX	53.696	100		Si IX	54.870	100		Co XIV	56.021		
Mg VIII	53.744	10		Mg VIII	54.886	100		Co XVII	56.021		
K XIX	53.746		P	P VII	54.887	100		Si IX	56.027	150	
Na VIII	53.750	10		Si IX	54.907	100		Ar XVIII	56.036		P
Cr XIV	53.760	25		Zn XV	54.91			Ne IX	56.04		P
Cr XIII	53.765	100		S VII	54.938	100		Ne VIII	56.043	320	
Si VIII	53.770	10		Ni XVII	55.007			Cu XVI	56.06		
Al VIII	53.785	10		Ne VIII	55.01	130		Ni XVII	56.08		
Al VIII	53.800	10		Mg IX	55.060	200		S IX	56.081	200	
K XIX	53.803		P	P IX	55.066	100		Mn XVI	56.096		
Ne VIII	53.81	20		Si IX	55.094	50		Co XIV	56.115		
Mg VIII	53.812	10		Si X	55.096	100		S IX	56.125	150	
Al VIII	53.823	10		Co XIV	55.10			Co XIV	56.138		N
Na IX	53.860	300		Si IX	55.116	50		Si	56.145	50	N
Cu XIX	53.889	100		Ni XVII	55.136	6		Al IX	56.150	50	
Mg VIII	53.905	100		Al	55.143	10	N	Ti XII	56.161	2	
Si IX	53.992	10		Ni XVII	55.186	10		P VII	56.174	50	
Mg IX	54.011	200		P IX	55.220	100		Ni XIII	56.18		
Na XI	54.059		P	Mg VIII	55.222	10		Mn XVI	56.189		
S XI	54.108	300	Q	Al X	55.227	150		Fe XV	56.200	300	
Al X	54.115	220		Si IX	55.234	50		Fe XV	56.236	1	
S VIII	54.118	500		Ni XVII	55.258	20		Mn XV	56.270	5	
P IX	54.124	150		Si IX	55.272	150		Al IX	56.274	30	Q
Fe XVI	54.142			Al X	55.272	500		P VII	56.282	10	
Cr XIV	54.164	20		P IX	55.299	50		Al IX	56.304	70	
S IX	54.175	450		Si IX	55.305	50		P VII	56.322	120	
Na XI	54.194		P	Al VIII	55.317	50		Al XIII	56.331		P
Al VIII	54.217	200		Na VIII	55.345	10		S IX	56.332	150	
Cu XVI	54.24			Si IX	55.356	100		Cu XII	56.333	1	
Al VIII	54.258	200		Ni XVII	55.361			Al IX	56.346	70	
Ge XXV	54.263		P	Al X	55.376	750		Mg VIII	56.358	10	
S VIII	54.266	100		Na VIII	55.396	100		Cr XIII	56.37		
Ne VIII	54.31	70		Si IX	55.401	100		Al IX	56.373	65	
Al IX	54.312	10		Co XIV	55.42			Ni XIII	56.39		
Ti XI	54.322	0		Co XIV	55.431			Mg VIII	56.403	10	
Sc XI	54.325			Ti XII	55.443	3		Mn XVI	56.409		
S VIII	54.370	20		Cu XVI	55.46			S IX	56.418	50	

Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes
Al XIII	56.425		P	Al VIII	57.597	87		Fe XVII	58.98		
Al XIII	56.456		P	Al VIII	57.624	10		Al X	58.987	150	
Mn XV	56.484	4		Be IV	57.659		P	Si IX	59.004	100	
Si VII	56.528	50		Al X	57.663	10	Q	Na VIII	59.009	100	
Al	56.545	10	N	P IX	57.683	100		P VII	59.028	15	
Ni XIII	56.57			Mn XIV	57.71			Mg VIII	59.038	200	
V XII	56.588		P	P IX	57.711	50		Na IX	59.042	200	
Al X	56.590	75		Ar XVIII	57.716		P	Si IX	59.077	50	
P X	56.597	150		Mg VIII	57.736	100		V XII	59.092		
K XVIII	56.60		P	Zn XIV	57.74	10		Na VIII	59.101	10	
Si VII	56.645	50	Q	Ne VIII	57.747	470		Al X	59.107	300	
Al X	56.650	10		Ga XXIV	57.765		P	Ti XII	59.133	7	
V XII	56.655			Si IX	57.778	100		Mg VIII	59.153	300	
Si X	56.680	50		Mn XIV	57.81			Ne VIII	59.19	290	
Al X	56.696	75		Ar XVIII	57.816		P	Cl VIII	59.191	900	
P XV	56.721		P	Be IV	57.851		P	Na VIII	59.204	300	
Al X	56.762	10		Mg X	57.876	700		Ni XVI	59.217		
Al X	56.802	200		Ti XI	57.891	0		S VIII	59.236	70	
Si X	56.804	50		Mg X	57.920	700		Na VIII	59.249	10	
Co XVI	56.83			Cu XVI	57.95			Fe XVII	59.26		
Co XVII	56.833			Mn XIV	57.97			O VIII	59.266		P
Mg IX	56.861	10		P VIII	58.018	350		Al XIII	59.296		P
P XV	56.881		P	Cr XV	58.02			Al X	59.298	10	Q
S IX	56.89		P	Al IX	58.060	10		P VIII	59.302	350	
Al IX	56.899	100		Na VIII	58.070	10		O VIII	59.316		P
Co XIV	56.900			Sc XI	58.082			Be IV	59.320		P
Cu XI	56.915	1		Al IX	58.112	50		Mn XIV	59.325	100	
S XV	56.92		P	V XIII	58.116	30		Ni XVI	59.336		
Ge XIII	56.93	30		Co XVI	58.127			Al IX	59.381	10	
P XV	56.933		P	Be IV	58.133		P	Al XIII	59.399		P
Al X	56.945	250		Si IX	58.150	50	Q	F VIII	59.401	3	
Al IX	56.945	250		Mn XIV	58.19			Fe XV	59.404	12	
Cr XIII	56.96			Cr XV	58.20			Al XIII	59.434		P
S XV	56.96		P	Na IX	58.201	500		Ti XII	59.435	15	
Al X	56.964	150		Al IX	58.222	100		Al VII	59.481	10	Q
Al X	57.024	250		Al IX	58.276	1		P VIII	59.516	250	
P VIII	57.042	450		Na IX	58.279	600		Co XIII	59.53		
Cu XI	57.047	1		Mg VII	58.316	10		Fe XIV	59.579	300	
Al X	57.072	10		Ni XV	58.330			Ni XV	59.58		
P IX	57.083	450		Co XVI	58.365			Fe XVII	59.59		
Na VIII	57.096	10		Al VII	58.379	10		S VIII	59.593	20	
Al X	57.116	75		Si VII	58.388	50		Co XVI	59.625		
Na VIII	57.119	10		Ne VIII	58.407	180		K XIX	59.633		P
Ni XVI	57.137			Si VII	58.445	100		Mg VII	59.640	1	
S IX	57.15		P	Ne IX	58.468	100		Ar XVIII	59.728		P
Si IX	57.157	50		V XIII	58.482	50		Na VIII	59.759	200	
Si X	57.209	20		P VIII	58.506	150		Al IX	59.761	300	
Mn XIV	57.224	20		Si VII	58.526	10		Al VII	59.827	10	
P VIII	57.230	350		Mg VIII	58.537	10		K XIX	59.841		P
Na VIII	57.230	10		F VIII	58.573	13		Cl XVII	59.842		P
Cr XIII	57.24			Be IV	58.574		P	O VIII	59.851		P
Al	57.244	50	N	Si VII	58.580	100		Co XIII	59.86		
Ni XVI	57.257			Zn XIV	58.60	10		Al X	59.884	125	N
P IX	57.266	350		Mg VIII	58.614	200		Si VII	59.884	50	
Al	57.271	50	N	Fe XVII	58.62			Ar XVIII	59.896		P
Cu XVI	57.29			Mg VIII	58.667	300		O VIII	59.902		P
Fe XVII	57.32			Cl VIII	58.673	1000		F IX	59.906		P
Si VII	57.325	50		Ni XV	58.715			Al VII	59.911	10	
Al VIII	57.326	80		Si VII	58.719	50		K XIX	59.912		P
P IX	57.339	150		Al VII	58.750	1		Ni XVIII	59.950		
Ni XVII	57.348			Fe XVII	58.76			Ar XVIII	59.953		P
Ni XVI	57.349			P VIII	58.776	50		Al IX	59.960	60	N
Si X	57.365	80		Si VII	58.782	50		Se XXVII	59.962		P
Al X	57.368	350		Se XXVI	58.8		P	Si VII	59.966	100	
Ar XVIII	57.400		P	Al X	58.808	1		Si IX	59.966	100	
Si IX	57.434	50		Co XVII	58.842			Ga XIII	59.975	20	
Si VII	57.434	50		Al X	58.858	100		Cl XVII	59.976		P
Cu XV	57.44	10		Si VIII	58.885	150		F IX	59.984		P
Cu XV	57.52	10		Si IX	58.906	50		Co XIII	59.99		
Be IV	57.522		P	Fe XVII	58.91			Na VIII	59.992	10	
Al VIII	57.553	10		Co XVII	58.948			Ni XII	60.02		
Ni XVII	57.573			Na IX	58.954	100		Cl XVII	60.022		P
Si IX	57.589	50		Co XVI	58.96			Al X	60.052	50	Q
Si VII	57.589	50		Fe XIV	58.963	200		Na VIII	60.053	100	
Mg VIII	57.590	10		P VII	58.972	35		Na VIII	60.073	100	

Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes
Co XIII	60.11			Co XVI	61.192			Na VIII	62.276	100	
Mg VII	60.138	10		Si VIII	61.223	100		Mg VIII	62.291	10	
Si X	60.151	20	Q	Al IX	61.262	10	Q	Al VII	62.292	12	
S VII	60.161	1000		P IX	61.270	50	N	Ne VIII	62.297	350	
Al IX	60.162	10		Ti XII	61.286	1		Sc XI	62.320	20	
Ga XIII	60.171	30		Si VII	61.306	50		Al IX	62.327	250	
Al IX	60.197	50		Mn XV	61.319	30		Al VII	62.330		P
Ni XVIII	60.212			P IX	61.320	50		Co X	62.332		
Si VII	60.221	100		Na VIII	61.347	1		Co XVI	62.334		
Al IX	60.222	10		V XII	61.352			Al VII	62.354	27	
Zn XIII	60.248	20		Si IX	61.355	50		Fe XIII	62.354	60	Q
Al IX	60.262	10		Zn XIII	61.356	10		Ne VIII	62.361	500	
Al IX	60.312	50		Mg IX	61.359	10		Al IX	62.369	150	
B IV	60.3144	1000		Mn XV	61.361	5		Ni XV	62.369		
Mg VIII	60.316	40		Al	61.373	50	N	Cr XV	62.375		
Al IX	60.347	100		Mg IX	61.393	100		Si	62.386	50	N
Ne VIII	60.351	300		Si VIII	61.395	50		Fe XIII	62.387		Q
Mg VIII	60.384	10		Si VIII	61.446	100		Co XVI	62.412		
Ne VIII	60.413	400		V XII	61.455	50		Al VII	62.430	1	
Si	60.421	20	N	Al	61.472	100	N	Ti XII	62.433	1	
Si IX	60.459	20	Q	Zn XXIII	61.482		P	B IV	62.440		F, P
Ne VIII	60.49	10		Mg IX	61.489	200		Si IX	62.454	20	Q
Al IX	60.504	150		Si IX	61.502	50		Mg XII	62.462		P
Al IX	60.549	200		Si IX	61.546	100		Al VII	62.465	8	
Al IX	60.588	300		S VII	61.547	200		Fe XIII	62.466		Q
V XIII	60.596	10		Ca X	61.58		P	Ti XII	62.470	1	
F VIII	60.609	5		Si IX	61.600	50		Al IX	62.474	100	
Al X	60.632	205		S VIII	61.600	500		Cr XV	62.481		
Sc XI	60.637			Co XVI	61.621			F VIII	62.491	12	
Se XXVII	60.639		P	P VI	61.622	50		P VII	62.515	50	
V XIII	60.640	20		Al IX	61.647	10		Ni XIV	62.52		
Al IX	60.645	10		Si IX	61.649	100		Mn XIV	62.526	50	
Na X	60.67		P	Fe XIII	61.659		N	Mg XII	62.546		P
Si VIII	60.673	100		Al VIII	61.694	150		F VIII	62.569	12	
O VIII	60.688		P	Cu XIV	61.70			Mg XII	62.575		P
Cr XIV	60.699	8		V XIII	61.705	2		Ne VIII	62.58	150	
Al X	60.700	10		V XII	61.717	100		Si VIII	62.586	50	
Ti XII	60.701	15		Si VIII	61.798	100		Al IX	62.587	100	
Mn XV	60.720	20		Ni X	61.809	1		Mg VII	62.615	10	Q
O VIII	60.740		P	Si VIII	61.852	100		Cl XVII	62.631		P
Be IV	60.743	10	P	Si IX	61.852	100		Mn XIV	62.694	100	
Cr XIV	60.756	10		P VI	61.869	50		Fe XIII	62.694	100	
Ti XII	60.762	3		Co XVI	61.875	100		Mg VII	62.696	100	
Al X	60.787	250		Fe XIII	61.876		N	Mn XIV	62.713	20	
Ne VIII	60.796	630		Mg VIII	61.891	200		Fe XIII	62.72		Q
S VII	60.804	750		Si VIII	61.895	150		Na VII	62.725	10	
Mg VIII	60.806	10		Al	61.900	10	N	Ni XI	62.730	20	
Al X	60.809	50	Q	Si VIII	61.914	150		Mg IX	62.751	500	
Si VII	60.837	100		Ni X	61.915	1		Cl XVII	62.777		P
Ni XV	60.890			Co XVI	61.916	200		Fe X	62.8		
Al IX	60.896	300		V XII	61.921			Co XVI	62.805		
Al X	60.925	185		Mg IX	61.924	400		Si VIII	62.808	100	
Ti XII	60.971	1		Al VIII	61.933	50	Q	Cl XVII	62.827		P
Si IX	60.989	100		O VIII	61.951		P	Cr XV	62.837		
Si VII	60.989	100		Mg VIII	61.964	100		Si VIII	62.849	150	
Si VIII	60.989	100		Mg IX	61.964	100		Zn XIII	62.87	10	
Co XVI	61.005			P VI	61.970	50		Fe XVI	62.879	20	
Si VIII	61.019	100		S VIII	61.978	250		Si VIII	62.884	50	
Co XVI	61.025			Co XVI	61.982	200		Al IX	62.916	150	
Mg IX	61.038	200		B III	62.0		Q, Z	Si VII	62.940	50	
P IX	61.065	50		O VIII	62.005		P	Al IX	62.948	65	
Al IX	61.069	600		Al VIII	62.016	100		Cr XV	62.951		
Si VIII	61.070	200		Mg IX	62.020	10		As XXIII	62.96	60	
Cu XIV	61.08	10		Al IX	62.070	50	Q	Fe XIII	62.963		
Mg IX	61.088	100		Fe XIII	62.099	60	Q	Si IX	62.974	50	
Na VIII	61.088	200		Co XVI	62.131			Ca X	62.992	1	Q
B IV	61.088			V XIII	62.132	9		Al VII	63.005	65	
Si IX	61.109	50		Sc XI	62.132	35		Co X	63.017		
Ca X	61.12		P	Si VII	62.154	50	Q	Co XVI	63.017		
Mg IX	61.127	300		Mg VII	62.166	10		Al IX	63.025	500	
Ni XV	61.152			Ca X	62.18		P	Al VII	63.025	500	
Mg IX	61.175	200		Ar XVII	62.21		P	S VIII	63.026	50	
F VIII	61.175	1		P VII	62.245	150		Cu XI	63.038	40	
Si VIII	61.175	50		Si X	62.251	100	Q	Cr XV	63.055		
Si IX	61.190	50		As XXV	62.253		P	Al VII	63.056	65	

Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes
Ni XV	63.069			Na VIII	64.205	200		Al VIII	65.298	10	
As XXVI	63.089		P	Co XV	64.229			Si XIV	65.308		
Mn XIV	63.109	200		Mn XIV	64.23			P VI	65.308	150	
Na VIII	63.114	100		Na VIII	64.237	400		P XIV	65.34		P
Al X	63.134	200		Br XXV	64.242	120		Si XIV	65.360		
Mn XIV	63.146	20		Mg VIII	64.246	10		Fe XV	65.370	1	
Mg X	63.152	400		Al X	64.269	10	Q	Al VIII	65.381	50	
Si	63.183	50	N	Si VIII	64.281	100		Na VII	65.388	100	
Na VII	63.185	10		P VII	64.286	150		Cr XIII	65.39		
Fe XIII	63.188			Na VIII	64.302	500		P XIV	65.39		P
Cu XI	63.192	40		S VIII	64.305	20		Ni XIV	65.40		
Al VIII	63.203	10		Si VIII	64.327	150		Ti XI	65.403	10	
Na VII	63.227	10		Al VII	64.328	8		Ni XV	65.415		
Si VIII	63.229	150		Br XXV	64.331	120		V XII	65.425		P
Mn XIV	63.23			P VIII	64.337	100		Cu XXII	65.428		P
Si VIII	63.266	50		Al VII	64.349	25		Ne X	65.446		P
F VIII	63.282	14		Si VIII	64.355	50		Na VII	65.474	100	
Mg X	63.295	700		Co XV	64.356			Al VIII	65.494	50	
S VIII	63.304	500		P VII	64.361	250		Ti XII	65.540	1	
Cr XV	63.31		P	P VIII	64.361	300		V XII	65.557		P
Cr XIV	63.324	70		Mg VII	64.377	100		Ti XII	65.577	3	
Na VII	63.361	10		Mg VIII	64.377	100		Ne X	65.582		P
Mg VII	63.396	100		Cl XVII	64.408		P	Co XIV	65.585		
S VIII	63.431	100		Al	64.418	10	N	Si VII	65.595	50	
Al VIII	63.433	45		Co XV	64.480			Fe XII	65.608	40	P
Na VII	63.442	10		Al VII	64.481	1		Mg IX	65.609	400	
Mn XIV	63.45			Mg VIII	64.488	100		Fe XV	65.612	3	
Ar XVII	63.45		P	As XXVI	64.494		P	Al X	65.632	50	Q
Co XII	63.47			Al VII	64.516	1		P VI	65.640	350	
Si IX	63.478	20	Q	Mg VIII	64.518	100		Mg X	65.672	35	
Kr XIV	63.5		N	Al XIII	64.529		P	Na VIII	65.672	10	
Ni XIV	63.50			Co XVI	64.540			Si	65.711	50	N
Al IX	63.509	500		P VII	64.579	150		Co XIV	65.712		
Cr XIV	63.539	60		F VIII	64.581	8		Na VIII	65.730	10	
Al VIII	63.559	45		P VII	64.587	100		Se XXVII	65.732		P
Fe XII	63.56	60		Al IX	64.625	50		Mg VIII	65.735	100	
Na X	63.57		P	Mg VIII	64.635	200		Al VII	65.770	8	
Si IX	63.586	100	Q	Ni XV	64.635			P VIII	65.788	350	
Co XII	63.60			P VII	64.635	200		Fe XII	65.805		
Al IX	63.632	300		Al XIII	64.649		P	Mg VIII	65.806	200	
Ni XI	63.641	40		Si XIII	64.67		P	Al X	65.821	50	Q
Na VIII	63.695	10		Al XIII	64.689		P	Ne VIII	65.822	600	
Co XII	63.70			Ga XII	64.69	30		Ca X	65.824	40	
S VIII	63.711	50		Al VII	64.698	12		Si VIII	65.833	50	
Al VIII	63.714	100		Sc XI	64.70	10		Mg X	65.847	60	
Fe XVI	63.719	30		Mg VIII	64.702	200		Ne VII	65.85		
Si VIII	63.732	150		Si XIII	64.71		P	Al VII	65.862	18	
Na VII	63.778	10		Cl XVII	64.723		P	V XII	65.867		P
Co XII	63.80			Si X	64.772	50	Q	Al VII	65.882	50	
Si VIII	63.879	50	Q	Co XVI	64.773			Ne VIII	65.895	700	
S VIII	63.886	250		Ni XIV	64.79			Ge XXIV	65.898	350	P
Si VIII	63.903	150		Al VII	64.801	8		Fe XII	65.905		
Al VIII	63.933	10		Mg VIII	64.811	10		Mn XVI	65.91		
As XXIII	63.94	80		Al VII	64.816	9		P VI	65.940	350	
Mg XII	63.943		P	Cl XVII	64.823		P	Cr XIII	65.968	50	
Fe XV	63.96			S VIII	64.874	20		Al IX	66.038	50	
Al VIII	63.965	150		Mg VIII	64.878	100		Fe XII	66.047	10	
Al VIII	64.004	200		Al IX	64.885	150		Co XIV	66.050		
O VIII	64.004		P	Al VII	64.892	27		P VIII	66.051	350	
Cr XIV	64.005	4		Na VII	64.904	10		Na VIII	66.059	200	
Mn XIV	64.03			Al IX	64.904	100		Mg VIII	66.069	300	
Mg XII	64.031		P	V XII	64.920			Al IX	66.092	50	
P VIII	64.051	80		Sc XI	64.98	40		Mn XVI	66.11		
Mg XII	64.061		P	Si VI	65.004	20		F VIII	66.127	28	
Al VII	64.061	1		Ni XIV	65.01			Mg XII	66.136		P
O VIII	64.061		P	Al VII	65.020	12		Al IX	66.142	120	
Be IV	64.064	30	P	Al X	65.032	175	P	Cu XIII	66.18	10	
Al VIII	64.086	10		Cr XIII	65.04			Co XI	66.19		
P VIII	64.100	20		Al VIII	65.128	10		Co XIV	66.195		
Na VII	64.113	10		Cr XIII	65.13			Fe XII	66.225		
S VIII	64.120	50		S VIII	65.149	50		Mg XII	66.229		P
Mg VII	64.122	200		Si XIV	65.149			Fe XV	66.238	3	
Ca X	64.133	10		Si VI	65.211	10		Al IX	66.239	150	
S VIII	64.137	100		Si IX	65.236	10		Ne VIII	66.259	300	
Fe XIII	64.139			Cu XIII	65.24	10		Mg XII	66.261		P



Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes
Fe XVI	66.263	20		Al VIII	67.408	500		Mg VIII	68.580	10	
Al IX	66.275	50		Si VIII	67.408	150		Si VII	68.593	50	
Fe XII	66.297	40		Al VIII	67.437	50		Cr XIV	68.594	10	
Mn XVI	66.30			Mg VII	67.453	10		Mg VIII	68.606	200	
Al VIII	66.321	60		Al VIII	67.464	600		Al VII	68.626	64	
Al IX	66.321	60		Mg VII	67.470	100		Al IX	68.637	50	
Ne VIII	66.330	350		Na VIII	67.478	200		Si VII	68.642	50	
Na VIII	66.358	10		Mg VII	67.497	200		Ge XXV	68.647	50	P
Al VIII	66.363	10		Al VII	67.523	47		P VIII	68.654	100	
Fe XVI	66.368	30		Al VIII	67.529	10		Si VII	68.669	50	
Mn XVI	66.39			Ti XII	67.555	40		Al VII	68.675	30	
Ge XXV	66.390	120	P	Al VII	67.560			Kr XXVIII	68.7		P
Al VII	66.409	27		Al VIII	67.565	150		Si VII	68.715	100	
Fe XII	66.43		Q	Si IX	67.574	50	Q	Al IX	68.722	25	Q
P VII	66.432	150		S XVI	67.585		P	Al IX	68.783	10	Q
Na VIII	66.433	200		P VIII	67.587	300		Si	68.786	100	N
Mn XVI	66.48			Na VIII	67.672	400		Co XIV	68.807		
Ar XVIII	66.482		P	Fe XII	67.702			Al VIII	68.825	50	
P VII	66.488	50		S XVI	67.718		P	Al IX	68.825	50	
Co XI	66.49			O VIII	67.725		P	Si	68.833	20	N
Na VIII	66.498	400		Mg IX	67.731	400		Si VIII	68.853	100	Q
Fe XII	66.526			Mg VIII	67.731	400		Fe XV	68.860		
Ni X	66.542	10		S XVI	67.764		P	Na VII	68.866	10	
Mn XIII	66.574	100		Fe XII	67.78	20	Q	Fe XV	68.884		Q
P VII	66.576	100		O VIII	67.789		P	Fe XV	68.897		
Se XXVII	66.607		P	Ne VII	67.80	50		Al IX	68.904	10	Q
Al IX	66.624	10		Fe XII	67.821			Na VII	68.908	100	
Ni X	66.687	10		Na VII	67.826	100		Ne VII	68.92	100	
Ar XVIII	66.690		P	Al IX	67.828	10		Mg IX	68.949	10	
P VII	66.691	150		Al	67.873	10	N	Al IX	68.958	50	
Al VIII	66.704	150		Na VII	67.877	100		Mg IX	68.986	100	
Mn XVI	66.72			Cu XII	67.882	30		Mg IX	69.009	100	
Al IX	66.724	345		Na VII	67.912	200		Co XIV	69.017		
Si X	66.726	100	Q	Al VIII	67.946	500		Al VII	69.029	16	
Al VIII	66.731	200		Co XI	67.97			Fe XV	69.049		
Ar XVIII	66.761		P	Fe XII	67.972			Mg IX	69.058	10	
Al VIII	66.771	350		P VII	67.989	50		Al VII	69.085	16	
Si VI	66.772	20		Mg VII	67.993	100		Mg IX	69.116	100	
Mg VII	66.788	10		Al VIII	68.000	10	Q	Na VIII	69.120	300	
Si VI	66.796	10		Si VII	68.026	10		P VI	69.121	50	
V XII	66.806			Mg VII	68.064	200		Cu XII	69.128	30	
Co XV	66.819			Mg VII	68.100	200		Al IX	69.135	215	
Al IX	66.836	100		Mg VII	68.144	300		Mg IX	69.161	300	
Si IX	66.912	100	Q	P VII	68.147	50		Al VII	69.165	200	Q
Co XV	66.913			Si VII	68.148	250		Fe XIV	69.176		
Fe XII	66.960			Al VI	68.167	50		Si VI	69.204	50	
Si X	66.977	20	Q	Si VII	68.190	50		Cr XIV	69.213	20	
Cr XIII	66.983	200		Na VIII	68.193	100		Si VI	69.236	250	
Cl XVII	66.995		P	Si VII	68.212	50		Cr XIV	69.247	10	
Al	66.996	10	N	Al VI	68.223	10		Ni XIII	69.25		
Mn XIV	67.02			Si VII	68.270	50	Q	Sc XI	69.252	40	
Na VIII	67.027	100	Q	Zn XII	68.271	40		Al IX	69.258	50	
Al VIII	67.044	10		Ne VII	68.28	160		Na VII	69.314	10	
Co XIV	67.069			Al VI	68.289	1		Mg VIII	69.327	10	Q
Mn XVI	67.09			Si VII	68.340	50	Q	Ni XIII	69.37		
Mg IX	67.090	500		Mg VII	68.352	200		Mg IX	69.374	200	
Al VIII	67.096	100		Al VIII	68.375	750		Al	69.379	50	N
Al VIII	67.121	100		F VIII	68.381	11		Si VII	69.385	150	
Mg IX	67.135	600		Fe XII	68.382			Fe XIV	69.388		
Si VIII	67.157	150		P VIII	68.384	200		Na VII	69.395	10	
Cl XVII	67.162		P	P VIII	68.385	100		Mg IX	69.413	400	
Fe XII	67.164			Si VII	68.408	100		Mg VIII	69.413	400	
Al VIII	67.166	10		Na VII	68.422	10		Al VIII	69.420	50	
Ti XII	67.171	15		Al	68.439	50	N	Si VI	69.421	50	
Se XXVII	67.185		P	Mg VIII	68.450	100		Ge XXII	69.435	60	
Fe XVII	67.21	60	Q	Si VII	68.456	10		F VII	69.448	1	
Mn XIII	67.215	200		Al	68.458	50	N	Si VI	69.448	100	
Cl XVII	67.220		P	Zn XII	68.495	120		Mg IX	69.467	500	
Mg IX	67.239	700		Ca X	68.497	90		Mg VIII	69.467	500	
Al VIII	67.244	150		Si VIII	68.497	50		Al VIII	69.502	100	
Al VIII	67.288	500		Na VII	68.519	100		Mg IX	69.513	100	
Fe XII	67.291			Si VIII	68.522	50		Fe XV	69.534		
Si VIII	67.318	100		Al IX	68.531	100		Sc XI	69.575	100	
Al VIII	67.360	250		Al VII	68.534	60		Mg VIII	69.577	100	
Ne VIII	67.382	770		Mg VIII	68.550	100		Si VII	69.580	100	

Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes
Fe XII	69.60	100	Q	Co XIV	70.698			Sc XI	71.542		
Si VII	69.602	100		Mn XII	70.72			Ti XII	71.545	1	
Al VIII	69.611	200		Al VIII	70.727	250		Si VI	71.561	50	
Mg IX	69.615	300		Si VII	70.730	50		Al	71.590	70	N
Mg VII	69.615	300		S XVI	70.735			V XIV	71.592		
Mg XII	69.618		P	Na VIII	70.741	10		Ti XI	71.603	40	
Ni XXI	69.62	50		As XXVI	70.761		P	Cu XII	71.609	70	
Al VIII	69.631	200	Q	Si	70.771	100	N	Cl XVI	71.61		P
Si VIII	69.632	150		Ca X	70.773	10		Al VIII	71.625	70	Q
Fe XIV	69.636		P	Cr XIII	70.792	100		Si VI	71.644	10	
Fe XV	69.66			Al VIII	70.802	50	Q	Mn XII	71.69		
Si VII	69.663	200		Cu XII	70.804	40		Cu XII	71.700	40	
Fe XIV	69.685		P	As XXIII	70.845	100		Si VI	71.718	10	
As XXVI	69.693		P	Mg VIII	70.878	10	Q	Cr VII	71.744		A, Z
Al IX	69.716	100		S XVI	70.882			Al IX	71.774	10	Q
Mg XII	69.720		P	Mn XII	70.89			Mg VII	71.786	100	
Mg XII	69.755		P	Cu XI	70.895	1	N	V XIII	71.799	60	
Al VIII	69.773	150		Co IX	70.928	0		Cu XI	71.823	10	N
Ga XXIII	69.787		P	S XVI	70.932			Co XIII	71.84		
Si VII	69.790	200		Mg VIII	70.953	100		Mg IX	71.841	100	
Si VIII	69.790	200		Cr XIII	70.973	300		Cu XI	71.847	10	N
Co XIII	69.83			F VII	70.979	10		Cr XIII	71.86		
Al IX	69.850	50		Ti XII	70.986	3		Ca X	71.864	10	
Si VII	69.861	100		Ne VII	70.990	300		Al	71.867	10	N
Si VII	69.872	100		Kr XIII	71.0		N	Fe XIV	71.87	80	Q
Ga XXIV	69.879		P	Mg VIII	71.007	200		Sc XI	71.887	40	
Mg VII	69.900	10		V XIV	71.024			Si VII	71.900	200	Q
Si VIII	69.905	50		Fe XI	71.029		Q	Mg IX	71.901	200	
Fe XV	69.945	200		Ti XII	71.031	7		Mn XV	71.927	1	
Mg IX	69.950	600		Cu XII	71.033	40		Cu XII	71.948	60	
Fe XV	69.987	300		Mn XV	71.038	1		Si VII	71.955	200	
Fe XII	70.01	60	Q	Ne VII	71.038	300		Al	71.987	10	N
Si VII	70.027	250		Mn XII	71.04			Ti XII	71.987	3	
Al VIII	70.040	50	Q	As XXIII	71.050	150		Co XIII	72.02		
Ti XIII	70.05			Co IX	71.053	10		Na VII	72.020	100	
Fe XV	70.054	400		Fe XV	71.062			V XIII	72.025	55	
Ni XIII	70.07			Al	71.077	10	N	Mg IX	72.027	300	
Si VII	70.072	250		Mn XII	71.09			Mg VIII	72.027	300	
Al IX	70.090	100	Q	Mg VIII	71.118	300		S VII	72.029	1000	
F VII	70.120	1		Al	71.139	50	N	Co IX	72.048	10	
Si VII	70.123	20		Mg VIII	71.168	100		Na VII	72.079	100	
Cl XVI	70.14		P	Si VI	71.181	250		Ti	72.083	1	N
Al VIII	70.161	300		V XIV	71.189			Cu XI	72.098	30	N
Mg VII	70.193	100		Br XXVII	71.2		P	Ca X	72.127	40	
Si VII	70.222	200		Ti XI	71.201	1		Cr XIII	72.13		
Fe XV	70.224			Al VIII	71.238	135		Fe XI	72.166		
Si VII	70.250	200		As XXVI	71.238		P	Ni XII	72.17		
Fe XIV	70.251			Fe XV	71.267			Co IX	72.177	20	
V XIII	70.262	50		Si VI	71.273	100		K XIX	72.207		P
Ti X	70.265	0		Al VIII	71.274	125		Al VIII	72.223	200	
Al VIII	70.323	200		Al VIII	71.277	50	Q	Mg IX	72.226	300	
V XIII	70.323	55		V XIV	71.292			Si VIII	72.228	200	
Si VII	70.323	50		Si VI	71.304	10		Ti	72.234	1	N
Al VIII	70.402	1		Mn XII	71.32			Cr XIII	72.27		
F VIII	70.405	29		V XIV	71.320			Al VII	72.282	195	
Si VII	70.427	50		Ti XI	71.323	10		O VII	72.3		P
Sc XI	70.445	200		Si VI	71.340	50		F VII	72.300	16	
Si VIII	70.458	100		Si VI	71.366	150		Fe XI	72.310		
Si VIII	70.473	100		Fe XIV	71.377	10		Mg IX	72.312	400	
Sc XI	70.509	100		Si VI	71.384	200		Al VIII	72.324	200	
Fe XV	70.519			Si VII	71.384	200		Si VIII	72.324	300	
Ca X	70.525	1		Na VIII	71.386	10	Q	Si VII	72.324	300	
Fe XV	70.53			Cr XIII	71.398	300		Cu XI	72.369	2	
Cu XII	70.551	60		Ni XII	71.4			Cu XII	72.373	60	
V XIV	70.573			Cr XIII	71.435	50		Al VIII	72.401	150	
Fe XV	70.59			Mg VIII	71.454	100	Q	Si VIII	72.420	200	
Si VII	70.594	100	Q	Si VI	71.474	50		Mg VI	72.430	100	
Fe XV	70.601			Ni XXII	71.48	10		Mn XIV	72.45		
Fe XIV	70.613			Co X	71.488	30		Co X	72.454	40	
Na IX	70.615	700		Co XIV	71.493			K XIX	72.512		P
Ti X	70.625	1		Ga XXI	71.525	50		Ni XXII	72.52	30	
Na IX	70.653	600		Sc XI	71.527	28		Mg VIII	72.546	10	
Cu XII	70.656	50		Cu XII	71.530	80		Mg VII	72.546	10	
Co XIII	70.68			Si VI	71.534	50		Co XIII	72.56		
V XIV	70.683			Ni XXII	71.54	4		Cr XIII	72.57		

Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes
Ni XII	72.57			Mg VIII	73.825	100		Al VI	74.504	50	
Cu XII	72.572	100		Ca X	73.840	40		Mg IX	74.520	100	
Cu XI	72.580	15		F VIII	73.841	58		Mg IX	74.520	100	
K XIX	72.617		P	V XII	73.856			Ne VIII	74.541	650	
Fe XI	72.635	10		Co XIII	73.86			Mg VI	74.574	200	
Co XIII	72.66			Mg VIII	73.862	200		Cl XVII	74.575		P
S VII	72.663	1000		Al VIII	73.879	200		Ti XIII	74.59		
Al VI	72.674	300	Q	Mg VIII	73.890	100		Al VI	74.592	150	
P VII	72.684	100		F VIII	73.895		P	Fe XIII	74.629		Q
Mg VIII	72.684	100		O VII	73.9		P	Cu XI	74.633	15	
Al VI	72.714	1		Se XXVI	73.9		P	Ne VIII	74.637	650	
Ni XII	72.77			Ge XXV	73.914	30	P	Al VI	74.656	250	
S XVI	72.770			Mg VIII	73.927	100		Ga XXI	74.657	80	
Ti	72.772	1	N	Zn XXII	73.943	775	P	Zn XI	74.669	10	
Mg VII	72.787	100		V XII	73.978			Mg VIII	74.676	100	Q
Cu XI	72.792	5		Mg VIII	73.981	200		Cr XV	74.70		
Fe XIV	72.796			Cu XI	73.982	2		Zn XI	74.724	20	
Al VI	72.810	250		Al VIII	74.016	120	Q	Mg IX	74.738	100	
Mn XII	72.82			Mg VIII	74.021	300		Ti XIII	74.74		
Cu XII	72.821	70		Co XIII	74.03			Cl XVII	74.782		P
Fe IX	72.85	10		Mn XIV	74.063	20		Al IX	74.785	50	
Mg VII	72.852	10		Ni XXIII	74.07	10		Al VI	74.813	50	
Al VI	72.865	50		Ti XIII	74.08			Zn XI	74.836	20	
Na VII	72.865	200		Na VII	74.097	100		Al VIII	74.841	200	
Cr XIII	72.88			Ni X	74.097	20		Fe XIII	74.845	25	
Fe IX	72.891		A	Al VII	74.099	74		Cl XVII	74.853		P
Si VI	72.896	50		Co XX	74.10	50		Cu XI	74.856	1	
Mg VII	72.896	1		Ca X	74.117	90		Mg VIII	74.858	600	
Al VI	72.926	100		Zn XI	74.173	60		Na VII	74.861	300	
Fe XIV	72.95			Na VII	74.180	200		Cr VII	74.875	1	A,Z
Cu XI	72.956	5		Si VIII	74.186	100		Al VI	74.892	100	
Ti	72.991	1	N	Zn XI	74.213	80		Zn XI	74.896	10	
O VII	73.0		P	Na VII	74.217	200		Zn XI	74.940	20	
P VII	73.070	100		Sc XI	74.221			P VI	74.951	400	
Al VI	73.076	100		Ne VII	74.23	80		Na VIII	74.956	300	
Fe XIV	73.08			Na VII	74.255	300		Mn XIV	74.961	100	
S XVI	73.085			V XII	74.257			Ne VII	74.962	380	
Mg VII	73.112	10	Q	Al VI	74.259	10	Q	Al VIII	74.965	150	
Si VII	73.123	500		Ni X	74.266	30		Cr XV	74.97		
Ga XXIV	73.124		P	Na VII	74.268	300		Na VIII	74.980	300	
Ca X	73.159	160		Mg VIII	74.274	200		Na VII	74.980	300	
S XVI	73.185			Mg IX	74.274	200		Mg VIII	75.034	700	
Ca X	73.187	90		V XIII	74.313	30		Na VIII	75.043	400	
Fe XV	73.199			Mg VI	74.319	300		Ca X	75.047	1	
Mg VIII	73.250	400		Mg VIII	74.319	300		Zn XI	75.050	10	
Al VIII	73.278	100	Q	Mg IX	74.319	300		Al VIII	75.058	50	
Ti XI	73.281	1	N	V XII	74.32			Mn XI	75.059		
Cr XIII	73.31			Al VII	74.321	50	Q	Na VIII	75.096	300	
Al VI	73.334	1		Fe XIII	74.327	92		Al VI	75.164	100	Q
Si VII	73.350	250		Mn XIV	74.327	50		Mn XV	75.182		
Co XIV	73.402			Zn XI	74.337	160		Si VII	75.193	200	
Al VIII	73.406	304		Al VI	74.346	50		Si VI	75.193	200	
Si VII	73.433	200		Ne IX	74.35		P	Al VIII	75.226	100	Q
Al IX	73.451	1		Na XI	74.359		P	Mn XI	75.227		
Ne VIII	73.470	700		Mg VIII	74.366	400		Fe XIII	75.241		N
Fe XV	73.471	30		Mg IX	74.366	400		Mg VI	75.248	100	
V XII	73.474			Ni XXII	74.37	4		Ge XXV	75.249	10	P
Cu XI	73.516	1		Si VIII	74.371	20		Cr XV	75.25		
Ne VIII	73.563	750		Co XIV	74.379			Al VII	75.281	215	
V XII	73.576			Co XIII	74.38			Mn XV	75.286		
Zn XXIII	73.578	350	P	Ne VII	74.40			Cr XV	75.29		
Co XIII	73.58			Mg VIII	74.411	100		Al VII	75.313	250	
Fe IX	73.618	20		Mg IX	74.411	100		Cu XI	75.325	25	
Al IX	73.625	1		Zn XI	74.412	10		F VII	75.332	2	
Co XIII	73.66			Ti XIII	74.42			Mg VI	75.334	100	
Co IX	73.665	20		Ni XXI	74.43	10		O VII	75.344	2	
Al VIII	73.703	150		Ni XII	74.44			Al VII	75.367	227	
Mg VIII	73.710	10	Q	Na XI	74.443		P	Na VIII	75.385	100	
Al VIII	73.733	100		Al VI	74.444	300		Al VIII	75.397	70	
Cu XII	73.734	30		Mg IX	74.461	10		Si VI	75.398	150	N
Cu XI	73.735	5		Mg VI	74.461	10		Zn XI	75.406	20	
Al VIII	73.760	10		Na XI	74.472		P	Ti XI	75.415	1	
Mg VIII	73.773	10	Q	F VII	74.481	38		Na VIII	75.428	200	
Co IX	73.798	30		F VIII	74.484			Cr XV	75.44		
Mn IX	73.8			Ni XXII	74.49	10		Se XXVII	75.448		P

Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes
Kr IX	75.45			Ti	76.030	1	N	V XII	76.960	50	
Cu XI	75.472	2		Al VII	76.090	125		Li II	76.98		Z
Mn XI	75.477			Be III	76.096	0	Z	Al IX	76.984	100	Q
Si VI	75.486	50		F VII	76.108	6		Fe XI	77.00	80	Q
Al VIII	75.488	200		Fe XIII	76.117	20		Mg VII	77.033	100	
Ne VII	75.49	130		Na VIII	76.123	500		Al VI	77.052	50	Q
O VII	75.5		P	Na XI	76.123		P	P XV	77.064		P
Zn XXIV	75.50	120		Cr XV	76.14			P XV	77.109		P
Na VIII	75.518	300		Fe XIV	76.152			F VII	77.115	12	
Al VII	75.544	227		Co IX	76.160	30		Mg VII	77.144	200	
Ge XXV	75.548	85	P	Cr XIII	76.17			Al IV	77.18		A, Z
Ne VII	75.55	120		Na VIII	76.173	100		Ca X	77.232	160	
Al VIII	75.577	150		Si VIII	76.198	20		Ne VII	77.25	220	
Si VI	75.587	50		Mg VIII	76.199	100		Na VIII	77.267	600	
Zn XI	75.590	120		Na XI	76.210		P	Mn XI	77.270		
Al XIII	75.595		P	Na VIII	76.217	200		Ge XXII	77.287	80	
Ni XII	75.62			Al VII	76.226	205		Ne VII	77.30	220	
Al VIII	75.623	100		Na XI	76.240		P	Mg VI	77.301	10	Q
Zn XI	75.635	10		Cu XI	76.256	5		Al IX	77.315	10	Q
Li II	75.64		Z	Al VII	76.262	195		Na VII	77.353	100	
P VI	75.648	200		Kr IX	76.29			O VII	77.374	1	
S XVI	75.667			Co IX	76.305	40		Al IX	77.381	150	
Zn XI	75.668	20		V XII	76.307	300		Ni XI	77.393	80	
Ga XXI	75.677	100		Sc X	76.343	100		Mn XI	77.402		
Fe X	75.685			P VII	76.344	200		Mg VI	77.405	200	
Ni XII	75.69			Al VII	76.344	157		Mg VIII	77.405	200	
Cr XV	75.73			Al VII	76.366	140		N VII	77.429		P
Al VIII	75.734	50		Mn XI	76.380			Si VI	77.429	500	
Al XIII	75.754		P	Al VII	76.386	300		Ti	77.435	1	N
Mg XII	75.764		P	Mg VII	76.392	300		Al VII	77.443	215	
Ne VII	75.765	500		Al VII	76.400	215		Al IX	77.448	150	
Al VIII	75.778	250		Al VI	76.402	610	Q	Fe X	77.45		
Si XIII	75.78		P	Ti XI	76.403	0		N VII	77.479		P
Al XIII	75.806		P	Cu XI	76.406	10	N	Ti	77.506	1	N
Al VII	75.809	100		Al VII	76.430	288		Cu XXII	77.509		P
Cr XII	75.815	200		Al VII	76.440	215		Ge XXII	77.510	100	
Mn XI	75.819			Ni XXI	76.45	4		Mg VIII	77.511	100	
Ni XII	75.83			Mg IX	76.459	100	Q	Mg VI	77.511	100	
S XVI	75.834			Be III	76.477	10	Z	Ti	77.541	1	N
Mg VI	75.834	200		Cr XII	76.488	300		Mn XI	77.556		
Si XIII	75.84		P	Ti	76.490	1	N	Na VII	77.558	10	Q
O VIII	75.844		P	Fe X	76.495	30		Mg VIII	77.572	500	
Al VII	75.846	195		Na VII	76.501	10		Fe XII	77.58	60	Q
Cu XI	75.866	2		Fe XVI	76.502	30		Al VIII	77.605	300	
Co XXI	75.87	10		O VII	76.513	1		Fe X	77.627		
Al VII	75.876	195		Ne VII	76.515	140		Mg VI	77.639	10	
Mn XI	75.879			Fe X	76.53			Mg VIII	77.671	500	
Mg XII	75.883		P	P VI	76.534	50		Co XXI	77.69	50	
Mg VI	75.890	10		Al VII	76.557	215		O VII	77.695	3	
S XVI	75.891			Na VII	76.565	10		Si VI	77.718	300	
Fe XIII	75.892	93		Al VII	76.582	225		Fe X	77.728		
Al VIII	75.894	100		Al VI	76.618	200		Mg VIII	77.737	600	
Co XXI	75.90	10		Na VII	76.626	10		Mg IX	77.737	600	
Al XII	75.90		P	F VIII	76.667	25		Na IX	77.764	700	
Al VII	75.903	262		Al VI	76.697	200		Al VII	77.778	91	
As XXIII	75.916	200		As XXV	76.707		P	Al IV	77.79		A, Z
Mg XII	75.923		P	Mg VIII	76.714	100		Al VII	77.809	104	
O VIII	75.923		P	Ti XI	76.731	1		Fe X	77.812		
P VII	75.924	450		Mg VIII	76.740	200		Ti	77.823	1	N
Al VII	75.926	185		Mn XI	76.763			Fe X	77.865	20	
Be IV	75.926	65	P	Mg VIII	76.788	300		Sc XI	77.87		
Be IV	75.931	35	P	Al VI	76.794	200	Q	Al VII	77.906	250	
Mn XIV	75.94			Fe XVI	76.796			Na IX	77.911	800	
Al VII	75.946			Kr IX	76.80			Sc XI	77.917	40	
Al XII	75.95		P	Fe X	76.822	10	P	Ti	77.935	1	N
Mg VII	75.975	400		Na VII	76.827	10		Al VI	77.945	500	
Al VIII	75.985	50		Al VIII	76.853	200	Q	Zn XXIII	77.957	150	P
Si VIII	75.986	50		Mn XI	76.858			Al VII	77.958	166	
As XXIII	76.003	300		Na VII	76.862	10		P VII	77.969	250	
Fe X	76.006			Mg VI	76.908	1		Mn XI	78.056		
Al VII	76.009	205		K IX	76.913	1		V XIII	78.101	50	
Cu XI	76.022	1		Fe X	76.923	20	P	Al VI	78.112	100	
Al VII	76.022	157		Ca X	76.933	90		Zn XX	78.12		P
Fe XIV	76.022	35		P XV	76.934		P	Al VI	78.149	100	Q
Ca IX	76.026	1		Al VI	76.953	50		Fe X	78.151		

Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes
Al VI	78.178	50		Co XX	79.01	10		Mn XIV	80.46		
N VII	78.193		P	Al VII	79.022	314		Al VIII	80.483	10	
Ni XXIII	78.21	4		Ti XI	79.027	0		Si VI	80.491	250	
Al VIII	78.225	1		Mg VI	79.059	10	N	Ti XIII	80.494		
Mg VI	78.239	10		Ti XI	79.076	0		Si VI	80.501	500	
N VII	78.244		P	Mn XIV	79.10			P VII	80.507	50	
Al VIII	78.256	70	Q	Ti X	79.110	3		Ar XVIII	80.509		P
Ne IX	78.26		P	Mg VII	79.131	500		Co XX	80.51	4	
Ni XXI	78.28	30		Mn XIII	79.16			Fe XX	80.51	10	
P VII	78.285	400		Mg VII	79.168	500		Fe XII	80.510	35	
Ne IX	78.300	100		Al VII	79.204	300		P XV	80.525		P
Al VII	78.329	345		Co XII	79.21			Ne VII	80.533	520	
Al VII	78.343	288		Si VII	79.236	250		Co IX	80.544	60	
Mn XIV	78.35			Mg VII	79.248	100		Ni XXII	80.55	50	
Al VIII	78.351	1000		Si VII	79.262	50		Al IV	80.56		A, Z
Al VII	78.365	262		N VII	79.286		P	Mg VI	80.563	100	Q
F VII	78.370	70		Co XII	79.30			Si VI	80.577	600	
Mg VII	78.376	10	Q	N VII	79.338		P	Al IV	80.58		A, Z
Cu XXI	78.395		P	Al VIII	79.455	120		Fe XX	80.59	4	
Se XXVII	78.400		P	Na VII	79.477	200		Ti XIII	80.602		
Mg VII	78.405	10		Fe XII	79.488	30		Na VI	80.645	10	
P VII	78.414	150		Si VII	79.491	100		P XV	80.666		P
Ga XXIV	78.419		P	Si VII	79.523	100		Cu XII	80.666	20	
Mn XIV	78.42			Al VI	79.557	10	Q	Si VI	80.698	500	
Al VIII	78.421	10	Q	Na VII	79.571	100		Al VIII	80.704	100	
Mg VIII	78.446	600		Si VII	79.615	100		P XV	80.714		P
Na VII	78.459	10		Na VII	79.620	100	Q	Mg VI	80.724	10	
Al VI	78.459	70		Al VII	79.637	64		Si VI	80.725	500	
Fe XIII	78.462	80		Cu XXIII	79.65			Na VIII	80.756	10	
Ca X	78.462	1		S XV	79.68		P	Al VI	80.770	70	
Al VIII	78.508	150	Q	Al VII	79.692	215		Mg VIII	80.806	10	
Sc XI	78.509	100		Mg VIII	79.695	200		Si V	80.807	100	
Mg VII	78.521	200		Mn XIV	79.720	100		P VII	80.813	100	
Be III	78.530	40	Z	Ge XXIV	79.750	250	P	Ar XVIII	80.814		P
Mn XIV	78.54			Mn XIV	79.761	200		Si VI	80.821	400	
Cu XI	78.542	120		Na VII	79.761	10		F IX	80.838		P
Fe XIII	78.56			Al	79.783	50	N	Mg VIII	80.889	100	
Al	78.573	70	N	Na VII	79.786	10		V XII	80.896	100	
Mg VIII	78.574	600		Mg VI	79.817	200		Si VI	80.908	400	
Si V	78.611	50		Mn XIV	79.826	300		Cr XIV	80.916	25	
Al VI	78.628	10		Mg VI	79.830	400		Ca IX	80.917	40	
Zn XX	78.63		P	Mg VI	79.857	400		Ar XVIII	80.919		P
Ti X	78.655	1		Mg VIII	79.880	200	Q	As XXVI	80.920		P
Be III	78.662	90	Z	Na VII	79.893	300		Mg VI	80.930	200	
F VII	78.699	29		Al VII	79.928	390		N VII	80.937		P
Co XXI	78.71	10		Al VII	79.960	390		F IX	80.972		P
Al VI	78.712	10		Al VII	79.972	300		N VII	80.991		P
P VII	78.734	250		Ni XXIII	79.99	10		Cr XI	81.02		
Na XI	78.734		P	Na VII	80.008	300		Mg VII	81.024	100	
Ni XI	78.744	60		Al	80.014	10	N	Si VI	81.030	350	
V XIII	78.746	55		Fe XII	80.022	15		Ni XXII	81.04	4	
Fe X	78.769	20		Mg VI	80.032	200		Mn XIV	81.05		
Fe XIII	78.770	20		Mn XIV	80.06			V XII	81.077	200	
Na VII	78.771	10		Mg VI	80.075	200		Ca IX	81.094	1	
Ca X	78.776	40		Ga XXIV	80.083		P	V XII	81.098	50	
V XIII	78.783	45		Na VII	80.133	10		Mg VI	81.106	300	
Cu XI	78.786	130		Ga XXIV	80.139		P	Si V	81.113	100	
Al IV	78.79		A, Z	Co XII	80.14			Ti XI	81.119	1	
As XXVI	78.790		P	Ni XXII	80.16	4		Mg VII	81.133	300	
Na XI	78.827		P	Fe XII	80.160			Ni XI	81.138	30	
Al VIII	78.836	100	Q	Na VII	80.174	10		Ti XIII	81.153		
Na XI	78.859		P	Co XII	80.19			Fe XIII	81.154		Q
O VII	78.884	4		Mg VIII	80.229	400		Na IX	81.175	500	
Co XXI	78.90	10		Fe XII	80.23	120	Q	Al VII	81.176	50	Q
Fe XIX	78.90	50		Na VII	80.245	100		Cr XI	81.18		
K IX	78.902	1		Mg VIII	80.255	400		Ca IX	81.190	1	
Si V	78.903	50		Mn XIV	80.27			Na VIII	81.210	500	
Na VII	78.907	300		Ti XIII	80.290			Ni XI	81.213	50	
Sc XI	78.917	300		Al VIII	80.320	10		F VII	81.222	55	
Be III	78.92	0	Z	Na VI	80.345	10		Cr XI	81.23		
Al VII	78.938	300	Q	Co IX	80.388	50		Al VII	81.234	50	Q
Co XXII	78.98	10		Si VI	80.395	250		Ti XIII	81.255		
Na VII	78.982	200		Al	80.403	10	N	Mg VIII	81.304	100	Q
Kr XII	79.0		N	Mg IX	80.428	100		Ti	81.306	1	N
Zn XXIV	79.00	50		Si VI	80.449	500		Ti XIII	81.318		

Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes
Al VII	81.339	10	Q	Ti XII	82.368	7		Si VI	83.358	400	
Na IX	81.350	500		Be III	82.378	100		Na VIII	83.391	900	
Mg VIII	81.368	10	Q	Ge XXV	82.409		P	Mg VII	83.403	400	
Ne VII	81.37	110		Ni XI	82.417	100		Mg VI	83.403	400	
Ni XI	81.378	40		Al VII	82.423	50	Q	Mn XIII	83.41		
Cr XI	81.39			Fe IX	82.430	30		Fe IX	83.457	40	
Ca IX	81.399	10		Mg VI	82.475	100		Al VIII	83.465	50	
Na VII	81.430	100		Co XX	82.48	4		Mn X	83.518	7	
S XV	81.44		P	Li II	82.49		Z	Mg VII	83.519	300	
Si VII	81.449	50		V XII	82.514			Mg VI	83.519	300	
Ni XI	81.468	70		Na VII	82.516	10	Q	Mn XIII	83.52		
Cr VII	81.491	4	A	Co XI	82.527	70		Si VI	83.526	400	
O VII	81.494	10		Ni XI	82.530	70		Ni XI	83.546	40	
Na VII	81.498	200		Al VIII	82.543	150		Mg VII	83.560	200	
Na VI	81.498	200		Be II	82.58		A, Z	Mg VI	83.560	200	
Co XI	81.507	300		Al	82.582	50	N	Ca X	83.578	5	Q
V XII	81.513	400		Mg VIII	82.598	200		Mg VII	83.587	200	
Na VI	81.543	100		Ca X	82.605	250		Si VI	83.611	400	
Cr XI	81.55			Si	82.622	50	N	Ca X	83.615	8	Q
V XII	81.550	50		Ni XI	82.625	60		N VII	83.619		P
Si VII	81.558	250		Na VII	82.636	10		Mg VII	83.635	10	
Al XI	81.560	100	Q	Na VII	82.685	10		Al VIII	83.635	10	
F VII	81.581	1		Mg VIII	82.709	200		Na VI	83.639	100	
Na VI	81.584	100	Z	Fe XII	82.744			Si VI	83.639	150	
Ti XIII	81.611			Co XI	82.759	200		Ge XXV	83.640		P
Si VII	81.620	600		Cr XIII	82.79			Be II	83.66		A, Z
Fe XII	81.651	80		Ca X	82.798	360		Ni X	83.676	10	
Al VIII	81.667	100	Q	Zn XX	82.812	70		V XII	83.677		
Ni XXI	81.69	250		Mg VIII	82.822	300		N VII	83.677		P
Mg VIII	81.732	300		Mn X	82.828	8		Si VI	83.684	50	
Ni XI	81.732	50		Fe XII	82.837	160		Fe XX	83.69	4	
Al VI	81.738	50		V XII	82.844			Mg VII	83.716	300	
Al VII	81.741	262		Mg VI	82.853	100		Al VIII	83.723	133	
Zn XX	81.758	70		P XV	82.860		P	Si VI	83.729	50	
Al VII	81.774	205		Ca X	82.860	250		Ti XI	83.732	1	
Mg VIII	81.790	200		Na XI	82.880		P	Sc X	83.760	40	
Al VII	81.794	365		Ni X	82.892	2		Mg VII	83.766	500	
Al VII	81.809	380		Al VII	82.908	50	Q	Mn XIV	83.78		
Ca X	81.820	1	Q	Mg VII	82.940	400		K XIX	83.784		P
Cr XIV	81.838	30		Mg VII	82.969	400		Ni XI	83.798	60	
Mg VIII	81.844	400		Ge XXII	82.975	300		Si VI	83.802	300	
Ca X	81.846	1	Q	Na XI	82.982		P	Al VII	83.833	512	
Na VII	81.855	400		Si VI	83.006	200		Co XI	83.861	100	
Be III	81.890	50		Mg VII	83.015	500		Fe XIX	83.89	4	
Si VII	81.895	500		Na XI	83.017		P	Sc X	83.901	100	
O VII	81.914	10		Ni XI	83.02	10		Mg VII	83.910	300	
Sc XII	81.93			Ga XXIII	83.021		P	Fe	83.94	10	N
Mg VIII	81.943	200		Ge XXII	83.058	350		Sc XI	83.958	40	
Fe XII	81.943	93		Mn X	83.068	4		Mg VII	83.959	400	
Mg VIII	81.979	200		Al VIII	83.102	10	Q	Si VI	83.965	10	
Cr VII	81.980	1	A	Ni X	83.108	25		Ca X	83.987		Q
Si VII	81.998	150		Si VI	83.128	750		K XIX	83.995		P
Ne VII	82.01	13	P	V XII	83.134			Al VII	84.005	475	
Fe XIII	82.010		Q	Ni XI	83.139	60		Mg VII	84.025	500	
V XII	82.024			P XV	83.174		P	Co XXI	84.03	4	
K IX	82.036	10		Cu XXII	83.176		P	Co XI	84.039	200	
Cr XI	82.05			Na VII	83.180	100	Q	Mn XVIII	84.05	110	
Al VI	82.082	70		Ni XX	83.180	300	P	Na VIII	84.050	500	
Co XXII	82.09	4		Co XI	83.190	300		Ni XXII	84.06	250	
Al IX	82.105	70	Q	Be III	83.200	200		K XIX	84.066		P
Ti XII	82.121	80		Mn XIII	83.23			Si VII	84.082	600	
Al	82.128	70	N	Zn XXIII	83.233	150	P	Si VI	84.082	600	
Ne VII	82.16	14		Fe XX	83.24	50		Mg VII	84.087	300	
Ne VII	82.198	500		Na VIII	83.240	700		Mg VIII	84.087	300	
Fe XII	82.226			S XV	83.25		P	Mn XIV	84.09		
Mg VIII	82.238	200		Si VI	83.258	250		Ni XI	84.092	70	
Mg VI	82.238	200		P XV	83.274		P	Al VII	84.095	422	
Ca X	82.262	160		Si VI	83.283	50		Sc X	84.116	200	P
Al VI	82.267	50		Na VIII	83.288	800		Mg VII	84.189	10	
Ne VII	82.268	700		F	83.3	20	N	Ni X	84.194	2	
Ti XII	82.307	7		Cr XI	83.31			Mn X	84.21		
Mg VIII	82.317	300		Ni X	83.326	2		Ne VII	84.212	200	
Al VI	82.338	10		S XV	83.33		P	Na VII	84.221	400	
Ti XII	82.344	25		Al VIII	83.335	10	Q	S XVI	84.232		
V XII	82.348			Cu XXIII	83.35			Ni XXII	84.24	110	

Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes
Fe XXI	84.26	4		Na VII	85.297	300		P XV	86.306		P
Ca IX	84.270	1		Ne VII	85.31	20		Ga XXIV	86.331		P
Fe XIII	84.275			Mg VII	85.336	10		Cu X	86.336	140	
Ne VII	84.292	200		Co XXI	85.40	80		Mn XII	86.34		
Mn X	84.292	4		Mg VII	85.407	700		Mg VIII	86.359	100	
Ti XI	84.321	0		Mn XIX	85.41	10		V XIV	86.36		
Sc XI	84.351	40		Ne VII	85.41	20		P XV	86.360		P
Al IV	84.38		A, Z	Al VI	85.423	100		Al VIII	86.360	100	Q
Sc XI	84.393	50		Co XXII	85.43	80		Na VIII	86.361	400	
Ni X	84.418	5		Sc XII	85.44			Al VII	86.393	100	Q
O VII	84.425	1		Ne VII	85.45	27		Na VIII	86.417	500	
Sc XI	84.433	100		Na VII	85.458	400		Mg VIII	86.417	200	Q
Ti XI	84.433	0		Fe XIII	85.461			Cu X	86.422	10	
S XVI	84.439			Fe XII	85.477	50		Al VIII	86.427	100	Q
Fe XII	84.456	4	P	V XIV	85.48			Mg VIII	86.440	200	Q
Al IV	84.48		A, Z	Al VI	85.515	1000		F VII	86.442	17	
Fe XII	84.490	7	P	Ni X	85.523	25		Ni X	86.464	5	
Ca IX	84.500	1		Ca X	85.535	90		Na VIII	86.479	600	
S XVI	84.510			Cr XIII	85.566	300		Fe XI	86.513	100	
Fe XII	84.517	10	P	Al VI	85.569	200		Na VIII	86.530	100	
Ti XI	84.525	0		Mg VI	85.577	200		Ne VII	86.54		P
Fe XII	84.533	5	P	Si V	85.579	300		Al	86.540	10	N
Cr XIII	84.616	50		Si VII	85.584	500		Zn XXII	86.547	150	P
Mg VII	84.642	500		Mn XII	85.59			Ga XXIV	86.582		P
Ga XXI	84.649	250		Mg VIII	85.599	300		Na VII	86.596	400	
Al VI	84.650	100	N	Si	85.614	20	N	V XIV	86.65		
Ni X	84.659	5		Mg VI	85.622	300		Na VII	86.652	500	
Co XI	84.67			Al VI	85.622	300		Co XXI	86.66	4	
Ti XI	84.711	40		Al V	85.662	50		Al VII	86.666	118	
Ti X	84.711	6		Fe XII	85.669			Al VII	86.685	166	
Co XI	84.72			Si VII	85.698	100		Mn XII	86.71		
Mg VI	84.745	200		Mn XII	85.72			Cu X	86.720	10	
Be III	84.754	300		Al VI	85.724	300		F VII	86.746	97	
Fe XII	84.768			K IX	85.732	0		Na VIII	86.758	300	
Sc	84.777	100	N	Mg VIII	85.749	400		Na VII	86.758	300	
Al VI	84.801	20	N	V XIV	85.75			Mg VII	86.762	100	Q
Mg VIII	84.827	10		Ni X	85.753	5		Fe XI	86.772	200	
Al VI	84.828	70	N	Al VI	85.764	400		Cu X	86.776	90	
Na VII	84.832	10		Ni XI	85.798	20	Q	Cr XIII	86.78		
Ti XI	84.835	40		Al V	85.804	350		Cu X	86.792	10	
Sc XII	84.84			F VII	85.808	89		Mg VI	86.807	200	
Fe XII	84.85			Al VI	85.817	350		Ne VII	86.818	190	
Fe XII	84.86			Na VIII	85.826	200		Mg VIII	86.847	200	
Ga XXI	84.867	300		Se XXVII	85.857		P	Ca X	86.860	3	
Ti XI	84.876	0		Ni XXII	85.86	50		Ni X	86.865	2	
Fe XIX	84.89	4		Na VIII	85.861	300		Co XI	86.87		
Cr XIII	84.898	200		Al VI	85.865	100		Si VII	86.88		P
Mg VIII	84.919	100		Na VIII	85.887	300		Al VII	86.884	475	
Al VI	84.928	10	Q	Cu XIX	85.92	20	P	Ca X	86.889	5	
Ca X	84.946	3	Q	Al V	85.922	10		Na VII	86.890	10	Q
Ca X	84.983	4	Q	Na VIII	85.936	100		Cu X	86.907	90	
Ni XXII	85.02	30		Al VI	85.970	10	N	Co XI	86.95		
Zn XXIII	85.034	200	P	Na VIII	85.992	300		Cu X	86.964	0	
Al IX	85.046	1	Q	Al VI	86.020	150		Al VI	86.975	10	Q
Mg VIII	85.064	10		Mg VII	86.032	200	N	Mg VIII	87.017	100	
V VI	85.071	1	A	Na VIII	86.039	500		Cu X	87.018	90	
Mg VII	85.091	10	Q	Cr XIV	86.057	27		Fe XIX	87.02	4	
Ti XI	85.114	0		Al VI	86.070	150		Al V	87.020	100	
Fe XII	85.14			Ne VI	86.09	10		Fe XI	87.025	120	
Mg VIII	85.153	10		Al VI	86.097	150		K IX	87.048	1	
Mg VI	85.153	10		O VII	86.100	29		Al VII	87.058	456	
Ca X	85.169	40		V XIV	86.13			Ni X	87.077	1	
Si V	85.175	500		P XV	86.146		P	V VI	87.106	3	A
Al VI	85.189	10	Q	Mg VII	86.147	10	Q	Mg VII	87.131	500	
Ne VII	85.19	150		Al VI	86.147	200		Cu X	87.135	0	
Mn XII	85.19			Fe XI	86.149	10	N	Na VI	87.141	100	
Si VII	85.219	100		Cu X	86.160	100		Na VII	87.141	100	
Ni XI	85.226	10		Cr XIV	86.164	28		V XIV	87.16		
Mg VIII	85.248	200		Ne VI	86.19	13		Al VII	87.165	422	
Na VII	85.260	300		Co XX	86.19	300		V XI	87.166	600	
Ti X	85.262	10		Cu X	86.204	100		Mg VII	87.175	400	
Zn XXIII	85.279	50	P	Mg VIII	86.234	100		Si VII	87.19		P
Si VII	85.289	500		Fe XXI	86.26	4		Na VI	87.211	700	
Ne VII	85.29	190		Al	86.282	50	N	Na VIII	87.211	700	
Ti XI	85.290	10		Ni X	86.300	60		Co XI	87.27		

Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes
Mn IX	87.27	3		Mn IX	88.258	5		Mn IX	89.448		
Al V	87.279	50		Na VI	88.270	300		Mg VII	89.476	10	
Mn XIII	87.30			Al VI	88.273	750		Zn XXIV	89.49	85	
Ni X	87.317	25		Ti	88.284	1	N	Ca IX	89.555	10	
Al VI	87.334	400		Ca	88.308	90	N	Cr XVII	89.57	150	
K IX	87.337	1		Be III	88.309	500		Ca	89.580	10	N
Co XI	87.35			Al VI	88.325	100		Mn XVIII	89.59	4	
Si XII	87.36		P	Co XIX	88.339	300	P	Mg VI	89.649	10	
V XII	87.363			Na VI	88.340	100		Ca IX	89.672	90	
Ti XII	87.364	1		Ca	88.347	10	N	K IX	89.697	10	
Mn XIII	87.40			Si XIV	88.349		P	Fe XI	89.703	10	Q
Mg VI	87.406	10		Al VI	88.376	750		Ca X	89.720	40	
Ti XII	87.426	1		Na VI	88.387	10		Sc X	89.736	40	
Mn XV	87.47			Cu XXII	88.389		P	Na VIII	89.759	200	
Na VII	87.471	10		Mn IX	88.423	6		Fe XI	89.771	10	N
Co XI	87.49			Al V	88.425	100		Mn IX	89.783	4	
Ni XXIV	87.50	50		Co IX	88.446	70		Zn XXIII	89.788	30	P
Ni XXIII	87.50	50		Na VI	88.460	100		Be II	89.80	10	A, Z
K IX	87.508	40		Al VI	88.469	250		Ca	89.802	10	N
Cu X	87.516	50		Si XIV	88.479		P	Ti	89.814	3	N
K IX	87.534	1		N VII	88.482		P	Na VIII	89.818	300	
Al VI	87.544	350		Co XI	88.52		P	Ti XII	89.844	60	
Mn IX	87.552	8		Si XIV	88.523		P	Mn XX	89.85	10	
Si	87.57		N	Al V	88.539	400		Mn IX	89.914	4	
Al VI	87.592	500		Ni XXIV	88.54	4		Ca IX	89.916	160	
Al VI	87.629	100		N VII	88.546		P	Na VIII	89.948	400	
Al VI	87.655	650		Na VI	88.583	100	Q	Ne VI	89.95	18	
Ni XXIII	87.66	110		Si XII	88.60			Cr XIII	89.99		
Ni X	87.680	15		Co IX	88.636	80		Ne X	90.002		P
Cu X	87.703	100		Al V	88.636	100		Cr XIII	90.02		
Mg VII	87.722	600		Ti	88.642	1	N	Mn IX	90.034	8	
Ti XI	87.725	250		Mg VII	88.680	600		Be II	90.04		A, Z
Zn XXIV	87.73			Al V	88.688	200		Ne VI	90.06	24	
Mg VII	87.767	400		Al VI	88.688	100		Ne X	90.085		P
Ni XXIII	87.77	10		Na VII	88.698	200		Si	90.09		N
Co XI	87.78			Na VII	88.747	300		Ne X	90.114		P
Al VI	87.783	250		Mn XIX	88.75	4		Mn IX	90.134	9	
Mn IX	87.79	2		Mg XII	88.760		P	Cr XIII	90.17		
Mn XV	87.80			Co XXI	88.77	250		Na VII	90.173	100	
Al VI	87.802	250		Mn IX	88.773	4		Na XI	90.199		P
F	87.85	45	N	Ni XXI	88.81	250		Al VI	90.200	1000	
Al VI	87.866	350		Al V	88.817	50		Fe XI	90.205	100	
V XI	87.868	800		Mg VI	88.827	200		Be I	90.21		A, Z
Al VI	87.887	250		Si XII	88.84			Na VIII	90.252	400	
Mg VII	87.889	500		Na VII	88.865	400		Na VII	90.252	400	
Cu X	87.932	100		Na VII	88.914	200		Cu XXII	90.264		P
Al IX	87.932	100	Q	Mg XII	88.918		P	Co XXI	90.31	30	
Mn IX	87.94	6		Mn IX	88.923	4		Na XI	90.318		P
Mn IX	87.958			Al XII	88.93		P	Mg XI	90.32		P
Ti	87.972	6	N	Al V	88.945	1		Cl XVII	90.320		P
Cu X	87.983	40		Mg VI	88.952	200		Mg VII	90.338	100	Q
Fe XI	87.995	10		Ti	88.961	1	N	Fe XI	90.345	10	
Ni XXII	88.00	250		Mg XII	88.971		P	Na XI	90.358		P
Si VII	88.008	150		Co X	88.994	90		Cu XXI	90.360		P
Mg VIII	88.016	200	Q	Kr XI	89.0		N	Mn XII	90.373		
Cu X	88.020	60		Al XII	89.00		P	Mg XI	90.38		P
Al VII	88.027	515		Ne VII	89.02	130		Si V	90.447	200	
Fe XI	88.029	10		Mg VI	89.021	10		Na VI	90.468	300	
Cu X	88.032	120		Mn XVIII	89.03	4		Co X	90.474	80	
Na VI	88.038	100		Ne VI	89.06	22		Ni XXIII	90.49	30	
Co XI	88.07			As XXVI	89.093		P	Ti XII	90.512	80	
Mn XIX	88.08	4		Ne VI	89.10	22		Na VIII	90.536	500	
Ne VIII	88.092	850		Fe XI	89.104	200		Ti XII	90.547	7	
Al IX	88.108	100	Q	Be I	89.16		A, Z	Al VII	90.547	515	
Ni XXIII	88.11	80		Ti	89.181	1	N	Ca	90.552	10	N
Ne VIII	88.13	300	P	Fe XI	89.185	100		Zn XXIII	90.587	50	P
Na VI	88.143	200		Co XXI	89.25	150		Al VII	90.596	185	
Fe XI	88.167	10		Mn XIX	89.26	80		Mn IX	90.599		
Al VI	88.170	1000		Co XI	89.31			Fe XX	90.60	50	
Ca	88.171	10	N	O VII	89.363	10		Cl XVII	90.624		P
Co XI	88.20			Ne VII	89.368	500		Al VII	90.627	185	
Na VI	88.223	100		K IX	89.396	1		Cr XVIII	90.63	50	
Fe XX	88.24	4		F	89.4	100	N	Al V	90.630	250	
Al VI	88.241	10	Q	Mg VII	89.407	200		Al V	90.646	100	
Na VI	88.246	200		Mg VII	89.448	200		P VI	90.647	500	



Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes
Be I	90.67		A, Z	Ti X	91.806	0		Mg VI	93.109	100	
V VI	90.700	6	A	Ni XXIII	91.83	150		Mg V	93.109	100	
Al V	90.701	200		Na VI	91.836	10		Zn XXIII	93.115		P
Mn XII	90.701			Cr XIII	91.855	400		Co XXII	93.12	50	
Mg VII	90.706	400		Ti X	91.855	0		Na VIII	93.120	100	
Cl XVII	90.729		P	F VI	91.9	45	Q	Zn XX	93.122	250	
Na VI	90.746	10		Mn XVIII	91.90	10		Be II	93.14		A, Z
Mn XX	90.76	4		K VIII	91.917	1		Na VIII	93.197	10	
Al VII	90.766	195		Fe XVII	91.96			F VIII	93.238	49	
Mg VII	90.815	300		Na VII	92.003	500		Na VIII	93.242	200	
Na VII	90.830	10		Cr XIII	92.01			Al VII	93.275	420	
Cu XXII	90.847		P	Al V	92.039	10		Cu XXII	93.293		P
Cr XIII	90.85			Mg VIII	92.123	100		Ca IX	93.297	1	
Si V	90.850	200		Cr VII	92.128	1		Al VII	93.298	550	
Al VI	90.858	600		Ne X	92.137		P	Na VIII	93.339	10	
K XIX	90.859		P	Cr XIII	92.16			Zn XX	93.351	400	
Cr XII	90.86			Be I	92.19		A, Z	Cr XVIII	93.36	10	
Mg VI	90.897	600		Ne X	92.224		P	Ca	93.372	10	N
Mg VII	90.897	600		Mn XI	92.240			Sc IX	93.393	100	
Ti XI	90.908	0		Ne X	92.254		P	Na VII	93.393	400	
Al V	90.914	200		Mg VII	92.256	300		Ar XVIII	93.394		P
Ti XI	90.927	10		Ti	92.272	1	N	Ti XI	93.395	40	
Ni XXIII	90.96	10		Ni XXIII	92.32	10		K IX	93.395	40	
Ti XI	90.966	10		Mg VIII	92.324	10		Sc XII	93.397		
Al V	90.982	50		Cr XIII	92.37			Cr XIII	93.42		
Cu XIX	90.990	50		Mg V	92.409	10		Be II	93.42		A
F VI	91.0	60	Q	Mg V	92.428	10		Fe XI	93.433		
Kr XXXIV	91.0		P	Si XIV	92.473			Na VII	93.434	400	
Fe XIV	91.009	20		Sc XII	92.49			P XIV	93.44		P
Mn IX	91.02	8		Mg VII	92.503	10	Q	Fe VIII	93.469	4	
Fe XIX	91.02	250		Mg V	92.534	10	Q	Ca X	93.481	500	
Al	91.023	500		Ge XXV	92.559	10	P	Na VII	93.486	500	
Be II	91.06		A, Z	Ti	92.581	1	N	Ca X	93.490		P
Na VII	91.064	200		Mg V	92.588	10		Mg VI	93.493	300	
Ga XXI	91.071	400		Na VI	92.608	10	Q, Z	Sc XII	93.507		
Al V	91.078	10		Co XXII	92.61	110		Al VII	93.517	420	
O VII	91.078	30		Cr XIII	92.61			Na VII	93.528	100	
K XIX	91.106		P	Be II	92.61		A	Al VII	93.535	343	
Ca IX	91.109	90		Si XIV	92.615		P	Ti XI	93.589	160	
Ga XXI	91.149	450		Al VI	92.626	750		Ar XVIII	93.604		P
Ca	91.190	40	N	Fe XX	92.63	4		Fe VIII	93.616	5	
K XIX	91.191		P	Al VI	92.636	200		Sc XII	93.619		
Ni XXII	91.20	50		Mg V	92.641	10		Ti XI	93.626	90	
Na VI	91.268	100		Si XIV	92.663		P	Al V	93.654	20	
Fe XIV	91.273			Mn XIX	92.71	4		Na VIII	93.670	400	
Fe XXI	91.28	30		Cu XXIII	92.72			Ar XVIII	93.675		P
P XIV	91.29		P	Mn XI	92.75			Sc XII	93.699		
Cr XIII	91.30			Ni XXIII	92.75	10		Mg VIII	93.720	100	Q
Mg VII	91.302	10	Q	Na VII	92.774	200		Al V	93.755	350	
Al VI	91.332	500		Sc XII	92.798			Fe XX	93.78	200	
Ca	91.343	1	N	Na VII	92.809	100		Ni XI	93.85	10	
Be II	91.36		A, Z	Fe XI	92.81			Al V	93.855	200	
Si VI	91.370	200		Na VII	92.843	100		Al V	93.880	70	
Mg IX	91.385	10		Ne VII	92.850	90		Sc IX	93.889	100	
Fe XI	91.394			Fe XI	92.87			Na VIII	93.898	200	
Na VI	91.414	10		Al VI	92.875	500		Co XXIII	93.90	30	
Mg VII	91.460	10		Na VII	92.883	100		Ti XI	93.909	10	
P VI	91.471	500		Mg VII	92.898	200		Ni XXI	93.91	200	
Fe XI	91.472			Na VII	92.930	200		Mg VIII	93.911	10	
Na VI	91.475	10		Mg VII	92.934	200		O VI	93.915	20	
Al VIII	91.487	50		Si	92.957	50	N	Fe XVIII	93.923	400	P
Ni X	91.527	40		Mg VI	92.964	100		Be II	93.93		A, Z
Ne VII	91.564	260		Mg VII	92.964	100		Sc XII	93.930		
Mg VII	91.573	100		Cr VII	92.969	5		Al V	93.955	300	
Fe XI	91.63			Al VI	92.970	250		Mg VIII	93.972	10	Q
Mn XI	91.646			Na VII	92.976	400		Al V	93.981	100	
Fe XI	91.733			Co XXII	93.00	100		V XIII	93.994	45	
Na VI	91.737	10		Co XXI	93.00	300		Fe X	94.012	400	
Be II	91.74		A, Z	Fe XI	93.018			Na VII	94.020	10	
Cr XIII	91.749	200		Co XXII	93.02	200		Mg VIII	94.043	400	
Al V	91.750	50		V XIII	93.025	40		Mg VII	94.043	400	
Co XXI	91.76	50		O VI	93.03	100		Ti XI	94.053	250	
Ni X	91.790	60		Ca X	93.049	360		Ti XI	94.085	10	
Cr XIII	91.792	300		K IX	93.069	10		Al V	94.089	70	
Si VI	91.798	200		Sc XII	93.075			Al V	94.117	120	

Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes
Ca X	94.137	40		Mg VI	95.483	500		Mg VI	96.256	200	
Cr XVIII	94.16	4		Mg VII	95.483	500		V XVII	96.270	1	
Al V	94.160	100		Si XIV	95.502			Ga XXIV	96.280		P
Ca X	94.170	90		Na VIII	95.551	200		Ti XI	96.288	1	
Mg VII	94.174	300		Mg VII	95.556	100		Be I	96.29		A, Z
Al V	94.187	100		Mg V	95.556	100		Co X	96.300	50	
Na VI	94.208	100		P XIV	95.56		P	Mg VI	96.303	200	
V X	94.23			Al IV	95.56		A	Co IX	96.305	5	
Mg VIII	94.276	200		V XII	95.58			Na VI	96.307	100	
Na VII	94.288	600		Mg V	95.592	10		Al VII	96.327	227	
Ne VII	94.29	400		Si XIV	95.602			Mn VIII	96.341	60	
Al V	94.321	10		Ca IX	95.619	1		Cr XII	96.35		
Mn XI	94.327			Cr XIX	95.62	10		Co XXI	96.36	30	
Cr IX	94.33			Al VI	95.624	100	Q	Mg VI	96.388	100	
Ne VII	94.36	500		Mg VII	95.637	300		Al VI	96.442	10	
Al V	94.394	10		Mg VI	95.637	300		Si V	96.442	750	
Ne VII	94.40	400		Ti XI	95.640	3	Q	Mg VI	96.467	10	
Co X	94.431	20		V XVI	95.640	200		Na VI	96.475	300	
F VI	94.45	120	Q	P XIV	95.66		P	Cr IX	96.48		
Na VII	94.468	700		Mg VI	95.675	300		Si VI	96.488	500	
Cr XVII	94.49	10		Al IV	95.68		A, Z	Cr XII	96.50		
Ni XX	94.497	300	P	F VII	95.697	10		Co IX	96.541	10	
Co X	94.517	30		Al	95.720	200	N	Cr IX	96.55		
Ti	94.570	3	N	Ne VII	95.75	700		Mg VI	96.670	200	
Fe XX	94.64	80		Be II	95.76		A, Z	Al VI	96.673	50	
Cr XVII	94.69	4		Cr XVIII	95.77	150		Mg VI	96.704	200	
Co X	94.692	10		F VII	95.775	100		Ti XI	96.731	3	
Mg X	94.721	100	Q	Mg V	95.803	200		Cr VII	96.760	20	
Ti XIII	94.78			Mg VI	95.803	200		Fe X	96.788	200	
Be II	94.78		A	Al V	95.835	30		Ni XXI	96.79	250	
Co X	94.789	60		Ne VII	95.84	250		Mg VI	96.797	100	
Mg V	94.793	10		Ni XXI	95.85	375		O VI	96.840	70	
Na VI	94.827	10		Co IX	95.852	2		Na VII	96.845	100	
Cu XXIII	94.83			Al	95.859	10	N	Mg VI	96.857	100	
Sc XI	94.888	600		Cr XIX	95.88	30		Cr XIII	96.86		
Ne VII	94.890	300		Mg V	95.909	100		Na VII	96.872	200	
Co XX	94.94	200		Ne VII	95.91	27		Co XXII	96.88	200	
V X	94.96			P XV	95.912		P	Ne VI	96.89	20	
Al VII	94.970	150	Q	Cr VII	95.917	5		Mg VI	96.903	10	
Ne VII	94.986	300		Ti XI	95.929	3		Na VII	96.922	300	
Sc X	95.022	40		Na VI	95.933	300		Co XXII	96.93	200	
Mg VII	95.027	400		Ca X	95.933		P	Al	96.939	10	N
Sc X	95.052	40		Ni XXII	95.95	150		Mg VI	96.939	400	
K IX	95.058			Fe XX	95.95	10		Ne VI	96.97	27	
Al VII	95.076	105		Ne VII	95.95	36		Mg VI	96.973	400	
O VI	95.082	40		Mg V	95.965	100		Fe XVII	97.04		Q
Mg VII	95.089	10		Al VII	95.975	440		Ne VI	97.05	23	
Sc X	95.09	40		Ti	96.017	3	N	O VII	97.076	1	
Co X	95.109	20		Mg V	96.019	200		Ne VI	97.09	25	
Sc XI	95.117	500		Mg VII	96.019	200		Ne VI	97.11	25	
Mg VII	95.139	100		Si VI	96.022	500		Fe X	97.122	300	
Co XXIII	95.16	4		Co X	96.047	100		Co X	97.123	30	
Na VI	95.182	100		Al VI	96.071	10	N	Ni XXI	97.13	110	
Si XIV	95.188			Co IX	96.076	40		Ti XI	97.142	1	Q
Cu XXII	95.210		P	Mg VI	96.085	100		Si V	97.143	500	
Mg VII	95.233	100		Mg V	96.085	100		Co XXII	97.16	80	
Mg VII	95.259	200		P XV	96.106		P	Ni XXIV	97.17	110	
Na VI	95.263	100		Cr XII	96.11			Cr IX	97.19		
Ti	95.293	3	N	Fe XXI	96.12		P	Cr XVII	97.20	30	
Ne X	95.298		P	Fe X	96.122	400		Ca XI	97.23		
Na VI	95.319	10		Na VI	96.124	10		Be I	97.24		A, Z
Fe X	95.338	100		O VII	96.126	68		Cr XIII	97.25		
Ne VI	95.37	13		Al V	96.150	20		Mg VI	97.251	500	
Fe X	95.374	300		Mg VI	96.159	100		F VII	97.261	17	
Mg VII	95.385	400		Mg V	96.159	10		Mg VI	97.278	500	
Mg VI	95.385	400		Cr IX	96.17			Co IX	97.355	5	
Mn XI	95.390			Ti XI	96.170	1	Q	F VII	97.360	28	
Ne X	95.390		P	P XV	96.171		P	Mg V	97.391	100	
K IX	95.399	1		Na VI	96.196	100		N VI	97.4		
Al	95.405	10	N	Al VII	96.207	375		Mn VIII	97.411	70	
Mg VI	95.421	400		Co X	96.215	60		Mg V	97.439	200	
Mg VII	95.421	400		Mn XVIII	96.23	300		Be I	97.44		A, Z
Ne X	95.422		P	Mn XIX	96.24	300		Mg VIII	97.465	200	
Al VI	95.436	100		Mg VI	96.240	100		Ne VII	97.502	730	
Ne VI	95.44	12		Ti XI	96.246	1		Mn XX	97.51	30	

Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes
Mg VIII	97.525	10		V XII	98.630	300		Al V	99.614	80	
Mg V	97.563	100		Mg V	98.636	200		Na VI	99.617	100	
Co X	97.575	50		Be I	98.66		A, Z	V XIII	99.625	55	
Co IX	97.587	15		F VIII	98.669		P	Cr XI	99.67		
Fe X	97.591	10		Al VI	98.684	10	N	Na VII	99.680	100	
Mg V	97.606	200		Fe XXI	98.69	30		Na VI	99.680	100	
Mg VIII	97.606	200		F VIII	98.698	74		O VI	99.688	110	
Na VI	97.636	10		Ti XIII	98.76			Kr X	99.69		N
V XII	97.642	50		K IX	98.796	250		Mg VI	99.713	300	
Mg V	97.686	100		F VIII	98.797	62		Mg VI	99.738	300	
Mg VIII	97.686	100		Mg V	98.805	200		K IX	99.761	160	
Sc XI	97.777	300		Fe XIII	98.826			Al V	99.774	10	
Na VII	97.790	100		K IX	98.866	160		Mg V	99.788	100	
K VIII	97.793	10		Mg V	98.872	100		Ca IX	99.813	1	
Sc XI	97.830	400		Sc X	98.889	300		Ti XIII	99.85		
Fe X	97.838	10		Sc X	98.911	100		Kr X	99.86		N
Mn XII	97.85			Ca	98.919	1	N	Ca	99.861	10	N
Co IX	97.854	15		Si XIV	98.931		P	Co XX	99.89	150	
Be I	97.86		A, Z	Cr XI	98.94			Co IX	99.921	90	
Fe XXI	97.88	80		Be I	98.94		A	Ca IX	99.951	40	
Na VII	97.907	200		Ca	98.956	1	N	Ca X	99.951	40	
Co X	97.924	50		Mg VII	98.983	400		Si VI	99.9658	500	
V VI	97.932	4	A	Mg V	98.983	400		Mn XVII	99.995	450	P
V XII	97.938	200		Mg VI	98.983	400		Fe X	100.026	15	
F VI	97.95	80	Q	Na VI	99.004	10		Cr XI	100.09		
Cr IX	97.97			Co XIX	99.005	250	P	Kr X	100.11		N
Be I	97.97		A	Mn XIX	99.01	10		Ni XXII	100.12	80	
Br XXXIII	98.0		P	Mn XI	99.02			Cr XI	100.13		
Sc X	98.010	40		Mg VI	99.025	200		V XII	100.13		
Na VII	98.016	100		Mg V	99.025	200		Co XXII	100.14	10	
Mn XI	98.023			Co IX	99.042	40		Ti XIII	100.16		
Cu XXII	98.029		P	F VI	99.044	10		Mn X	100.173	100	
Mg VII	98.032	300		Fe	99.05	20	N	Ne V	100.2		N
Mn XI	98.064			Kr X	99.06		N	Ti	100.208	6	N
Co XXII	98.07	10		Mg V	99.067	200		Co IX	100.210	15	
Cr IX	98.08			Fe XXI	99.08	30		Ca IX	100.226	40	
Na VII	98.080	300		Ti XIII	99.09			Ni XXI	100.23	150	
Na VIII	98.080	300		Si XIV	99.090		P	O VII	100.254		
Fe XX	98.09	50		N VII	99.093		P	Be III	100.2552	1000	
Ne VIII	98.115	850		Si VI	99.0963	500		Zn XXIII	100.286		P
Be I	98.12		A, ZZ	Cr XI	99.10			Kr X	100.30		N
Fe XIII	98.128			F VI	99.105	15		Ne X	100.318		P
Ne VI	98.13			Cr XI	99.13			Na VII	100.337	100	Q
Ni XXII	98.16	300		Si XIV	99.144		P	Ti	100.359	3	N
Sc	98.180	200	N	Mg V	99.149	10	N	V XII	100.37		
Na VII	98.188	300		Mn XIX	99.17	250		Mg VII	100.374	100	Q
Sc X	98.192	100		N VII	99.171		P	Ca	100.375	1	N
Sc X	98.210	40		Be I	99.19		A, Z	Zn XX	100.410	550	
Si V	98.211	100		Al V	99.200	20		Ne X	100.419		P
Mg V	98.235	100		F VI	99.203	10		Ni XXIII	100.42	80	
Ne VI	98.26			Mg V	99.205	1	Q	Mg VII	100.421	100	Q
Ne VIII	98.260	870		Al V	99.277	10		V XVI	100.440	1	
Co X	98.261	80		Mg VI	99.279	400		Ne X	100.454		P
Mg V	98.271	200		Co IX	99.284	1		Ca X	100.460	90	
N VI	98.3			Al V	99.290	100		Na VI	100.469	200	
Na VI	98.309	20		Mg VI	99.333	400		Zn XX	100.487	650	
V VI	98.319	4	A	Mn XI	99.356			Mn XIX	100.50	110	
Sc X	98.323	300		Ti	99.377	6	N	Ni XXIII	100.50	30	
Fe XXI	98.36	250		K IX	99.394	90		Na VI	100.519	300	
Sc X	98.363	40		Na VII	99.421	400		Mg VIII	100.519	10	Q
Be I	98.37		A, ZZ	Al V	99.425	40		Mg X	100.545	200	Q
Fe VIII	98.371	8		Si VI	99.4595	750		Mn X	100.585	200	
Na VII	98.378	300		Cr XI	99.48			Na VI	100.590	100	
Fe XX	98.38	250		Mn XII	99.49			Ti XI	100.591	40	
Fe XIII	98.387			N VI	99.5			Cr VII	100.593	20	
Ni XXIV	98.39	4	Q	Na VI	99.500	10		Mg VIII	100.597	200	Q
Na VII	98.394	300		V XIII	99.523	50		Ni XXII	100.60	300	
Mg V	98.406	100		Mg V	99.535	100	Q	Ca	100.602	10	N
Ca XI	98.429	10	Q	Al V	99.541	30		Al VI	100.616	600	
Mg V	98.444	100		Na VII	99.556	400		Ca	100.624	1	N
Cr XI	98.47			Kr X	99.57		N	Co IX	100.636	2	
Mg VI	98.508	300		Co X	99.596	40		Ti	100.638	3	N
Fe XIII	98.523			Si VI	99.5991	500		Al VI	100.639	100	
Fe VIII	98.548	10		Ti XIII	99.60			Si VI	100.6403	500	
Ni XXII	98.58	80		Mg V	99.610	200		Sc	100.676	100	N

Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes
Mg VI	100.702	500		Mn X	101.854	50		Kr X	102.72		N
Na VII	100.718	200		Ne VI	101.87	23		Fe X	102.829		
Sc	100.739	100	N	Co XX	101.88	375		Sc	102.835	230	N
Fe XXII	100.78	50		Co XVIII	101.904	50		Si VI	102.846	50	
Ti XIII	100.78			Cr XVII	101.91	250		V XVII	102.854	150	
Sc	100.781	100	N	Ca X	101.917	90		Li III	102.856		P
Mn X	100.787	100		Sc	101.918	200	N	Kr X	102.86		N
Ca IX	100.824	10	Q	Mn XIX	101.92	4		Sc	102.868	100	N
Ti XI	100.835	20		Ni IX	101.932	20		Ca	102.897	1	N
Co IX	100.856	1		Mg VII	101.956	200		Mg VII	102.906	300	Q
Be I	100.86		A, Z	Ca X	101.960	160		Ne VIII	102.911	790	
Na V	100.88	10		Sc X	101.978	600		Cu XIX	102.960	100	
Fe XVII	100.89			S XVI	102.027		P	Sc	102.975	100	N
Al VI	100.894	200		Mn X	102.030	50		Na VI	103.002	10	
Cr XI	100.90			Co VIII	102.033	85		K XIX	103.021		P
Mg VI	100.904	400		Na VIII	102.043	10		Cr VIII	103.03		
Al VI	100.919	200		Sc IX	102.047	50		V XVI	103.043	1	
Sc	100.924	100	N	Mg VII	102.053	10	Q	Ti V	103.059	0	A, Z
Ne	100.94	35	N	Mg V	102.079	200		Al VI	103.062	10	
Na V	100.945	10		Ni XXIII	102.08	300		Ni XXIII	103.07	10	
Mg V	100.949	10		Ca VIII	102.081	1		Na VI	103.078	100	
Si VI	100.953	40		Co VIII	102.086	10		Ne VIII	103.085	830	
Si VI	100.970	10		Fe X	102.095			K VIII	103.086	1	
Al VI	101.027	150		Ti X	102.106	20		Ne VII	103.09		
Cr XIV	101.05	10		Ni XXIV	102.11	300		Co XX	103.16	200	
Co IX	101.107	2		Be I	102.13		A, Z	Si VI	103.163	100	
Ti	101.111	3	N	Mg VII	102.138	100		K IX	103.163	1	
Ni XXIV	101.13	10		Kr X	102.16		N	Fe X	103.164		
Si VI	101.159	10		Mg VI	102.189	500		Cu XIX	103.179	150	
Ca	101.183	10	N	Fe X	102.192			F VI	103.2	180	Q
Kr X	101.20		N	Se XVI	102.2	340		O VI	103.206	5	
Be I	101.20		A, Z	Fe XXI	102.22	150		Na VI	103.210	200	
Na VII	101.201	10	Q	Na VII	102.226	100		Ni XXIII	103.23	110	
Ne VI	101.22	25		Fe XXII	102.23	150		O VI	103.260	20	
Ca	101.223	40	N	Mg VI	102.239	500		Mn X	103.269	300	
Ar XVIII	101.284		P	Kr X	102.24		N	Kr X	103.27		N
Co XXI	101.30	110		Ti XV	102.247	40		Ni XXII	103.31	110	
Ni XXII	101.31	150		Sc	102.251	300	N	Fe X	103.319		Q
Ne VI	101.34	45		Li III	102.272		P	Mg V	103.333	10	Z
Na VI	101.348	10	Q	Ni IX	102.283	10		K XIX	103.339		P
Ti X	101.353	35		Kr X	102.30		N	K VIII	103.351	1	
Kr X	101.39		N	Cr XVIII	102.32	150		Na VII	103.354	100	
Cr XII	101.39			S XVI	102.331		P	Li III	103.359		P
Co XX	101.39	80		Ni IX	102.340	60		Cr VIII	103.36		
Co IX	101.410	2		Fe X	102.348			Ni XXI	103.40	250	
Cr XIV	101.42	12		O VIII	102.355		P	Na VII	103.400	10	
Ne VI	101.42	27		Ni IX	102.364	1		Ni IX	103.428	40	
Fe	101.435		N	Co VIII	102.367	30		Ni XXIV	103.43	250	
N VI	101.46			O VI	102.37	40		K XIX	103.447		P
Cr XII	101.46			Na VII	102.390	100		Cr VIII	103.48		
Mg VI	101.508	200		Ti XVI	102.393	5		Na V	103.482	10	
Ar XVIII	101.530		P	V XVIII	102.410	1		Mn X	103.521	200	
Ne VI	101.54	50		S XVI	102.436		P	Mn XX	103.53	80	
Fe XIX	101.55	200		Co VIII	102.439	30		Ni XXIV	103.53	110	
Mg VI	101.556	300		Na VII	102.448	10		K IX	103.561	10	
Cr VII	101.565	1	A	Cr VIII	102.45			Fe IX	103.566	80	
O VI	101.57	20		Mg VII	102.471	300		Ne VI	103.58	30	
Ar XVIII	101.615		P	Co VIII	102.480	1		N VI	103.6		
Si X	101.64		Q	Ni IX	102.480	80		Kr X	103.60		N
Ni IX	101.657	80		Be II	102.49		A, Z	Ni IX	103.620	80	
Mg V	101.671	300		O VIII	102.490		P	Ne VI	103.65	50	
F VIII	101.689	4		Ca VIII	102.495	10		Ni XXIII	103.67	50	
Be II	101.7		Z	Al XIII	102.498		P	Co VIII	103.699	10	
Ni IX	101.701	80		Ni XXIII	102.50	4		Ne VI	103.71	23	
Fe X	101.733			Li III	102.515		P	Fe X	103.724		
Ne VI	101.75	13		Ni IX	102.539	1		Ti V	103.733	1	A, Z
Mg V	101.782	300		Ti XI	102.576	6	Q	Mg VII	103.743	10	
Na VII	101.785	300		Ne VI	102.59	27	Q	Ti V	103.754	1	A, Z
Ne VI	101.80	18		N VI	102.6			Fe XXI	103.77	30	
Mn X	101.808	50		Se XVI	102.6	430		Na VII	103.779	300	
Na VII	101.816	300		Ni IX	102.602	100		Co XXIII	103.80	10	Q
Fe XX	101.83	30		Al XIII	102.628		P	Al V	103.805	300	
Mg V	101.845	100	Q	Sc IX	102.653	100		Co VIII	103.809	30	
Ni IX	101.846	100		Al XIII	102.672		P	F VIII	103.810	28	Q
Fe X	101.846			Ni IX	102.710	1		Fe XXI	103.83	50	

Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes
Na VII	103.842	200		Ni XXIII	104.70	30		Ni XXII	106.16	80	
Mg VII	103.859	10		Ti V	104.711	1	A, Z	Fe XX	106.173		Q
Ni IX	103.871	60		Ti V	104.732	0	A, Z	K VIII	106.178	10	N
Al V	103.882	400		V XI	104.74			Ne VIII	106.192	800	
Na VII	103.891	400		Cl XVII	104.748		P	Co XXII	106.23	200	
Mg V	103.904	400		Co VIII	104.801	120		Co XXI	106.23	200	
Cr VIII	103.92			Mn X	104.806	50		Na V	106.278	100	
Ni IX	103.926	1		O VI	104.813	220		Fe VII	106.285	1	
Co XXI	103.93	50		Fe VII	104.838	1		Mg III	106.30		A, Z
Fe XVIII	103.937	200	P	Ti	104.861	3	N	Na V	106.302	100	
Al VI	103.940	300		Na VII	104.871	200		Ti V	106.308	0	A, Z
Mg V	103.947	300		F VIII	104.891	6		Fe XIX	106.33	110	
Ni IX	103.981	100		Br IX	104.9		P	Na V	106.399	100	
Al V	103.992	150		Mn XIX	104.90	50		Fe VII	106.418	1	
Ni IX	103.993	100		Ne VI	104.93	23		V XI	106.42		
Na VII	104.000	200		Na VII	104.955	300		C VI	106.453		P
Ti	104.015	6	N	Cl XVII	104.958		P	Mg VII	106.453	200	Q
Na VII	104.036	220		Al VI	104.960	10	Q	Al	106.471	10	N
Al VI	104.047	1000		Fe VII	104.972	1		Cr X	106.49		
Al V	104.072	250		Cr XVIII	104.98	300		Na V	106.490	100	
Ne VI	104.09	66		N VI	105.0			C VI	106.504		P
Mg V	104.100	200		Fe XXI	105.01		P	Mg VII	106.524	200	
Al V	104.122	200		V XI	105.03			F VI	106.55	120	Q
Cr VII	104.127	40		Cl XVII	105.030		P	Sc	106.557	100	N
Mn XIX	104.13	250		Na VII	105.111	300		Na VI	106.580	10	
Mn XX	104.13	250		Cr VII	105.139	40		Cr XVI	106.629	300	P
Co XXI	104.14	250		Sc XI	105.140	600		Sc X	106.655	100	Q
Mg V	104.140	200		Mg VII	105.159	100		Cr VIII	106.68		
Sc XI	104.142	40	Q	Sc XI	105.170	200		Ni XXIV	106.68	30	
Li III	104.142		P	Na VII	105.205	200		F VII	106.7		N
Ne VI	104.17	45		Fe IX	105.208	60		Na VIII	106.703	10	Q
Cr XIX	104.18	110		Mn XX	105.24	30		Mg VII	106.707	100	
Co VIII	104.180	85		Mn IX	105.256	50		Ca	106.718	40	N
Al V	104.181	250		Cr XI	105.26			O VI	106.731	40	
Mg V	104.182	100		Ca X	105.334		P	Co XXI	106.76	300	
Mg V	104.214	100		V XI	105.34			V XII	106.781	200	
Sc XI	104.219	40		Na VII	105.354	400		O VI	106.789	70	
Fe X	104.221		Q	F VI	105.4	90	Q	Mg VII	106.809	10	
Al	104.227	10	N	Mg VI	105.410	200		V XII	106.820	300	
Fe X	104.248			C VI	105.413		P	Cr XVIII	106.84	150	
Ne VI	104.26	37		C VI	105.463		P	Ti XV	106.874	2	
Co XXI	104.27	50		Li III	105.468		P	V XII	106.885	400	
Fe XXI	104.29	30		V XII	105.49			Fe XX	106.98	80	
Mn X	104.310	50		Mg VI	105.502	300		Ni XXIII	107.00	4	
Al VI	104.344	800		Sc	105.578	300	N	Na VI	107.014	200	
Ti	104.348	6	N	Co VIII	105.594	10		Mg III	107.05		A, Z
Al V	104.362	200		Se XXXII	105.6		P	Na VII	107.061	300	
Be II	104.40		A, Z	Si XIII	105.630		P	Na VI	107.061	300	
Mg V	104.432	200		Ca XI	105.636	10	Q	O VI	107.081	5	
Sc XI	104.435	500		Cr XI	105.65			Na VII	107.093	300	
Al V	104.447	100		Na XI	105.676		P	Na VI	107.093	300	
Co XXIII	104.45	10		Cr VIII	105.69			Ne VII	107.099	200	
V XII	104.45			Co XX	105.72	150		Cr X	107.14		
Al VI	104.466	400		V XII	105.74			N VI	107.15		
Ti	104.466	1	N	Mg VI	105.778	100	Q	Na VI	107.158	100	
Al V	104.496	150		Be I	105.80		A, Z	Na VIII	107.158	100	
Ti X	104.516	0		Mg XI	105.83		P	K IX	107.183	1	
Mg VI	104.519	300		Mg VI	105.830	100	Q	Si	107.2	50	N
Be III	104.55		F, P	Na XI	105.835		P	Na VI	107.227	300	
N VI	104.551	1		Ni XXII	105.88	4		V XII	107.25		
Ti X	104.568	0		Na XI	105.887		P	Be I	107.26		A, Z
V XII	104.58			Se XVII	105.9	460		Sc	107.273	100	N
Sc	104.592	300	N	Br XXVIII	105.9		F, P	Al XIII	107.284		P
Mg VI	104.597	500		Cr XVIII	105.92	10		Na VI	107.288	400	
Mn X	104.608	100		Mg XI	105.92		P	V XII	107.29		
O VI	104.612	20		V XI	106.00			Mn X	107.34		
Cu XXII	104.614		P	Ni XXIII	106.02	375		Mn X	107.36		
Fe X	104.638			Ni XXII	106.04	375		Be I	107.38		A, Z
Ni XXIV	104.64	110		Na VI	106.040	300		Fe XIII	107.384		
Sc	104.658	100	N	Ne VII	106.040	300		Mn X	107.39		
Ti	104.659	3	N	Na VI	106.077	300		Al XIII	107.425		P
V XII	104.66			Ne VII	106.086	800		Cr X	107.45		
O VI	104.669	40		Fe XIX	106.12	50		Mn X	107.472		
Be I	104.67		A	Na VI	106.125	400		Al XIII	107.473		P
Mn XX	104.67	10		Ti V	106.154	3	A, Z	Co XXII	107.49	300	

Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes
Na VI	107.535	300		Al V	108.445	50		Na VII	109.362	100	
Na VI	107.553	300		Fe	108.45	90	N	Ti XVII	109.432	1	
V XI	107.57			Al V	108.462	200		K VIII	109.434	10	
Co XXII	107.58	30		Cu XI	108.479	100		Ni XXI	109.44	4	
Ne VI	107.60	37		Ti	108.493	3	N	Ne VI	109.46	66	
Na VI	107.608	400		Fe VII	108.495	1		Fe VII	109.463	4	
Al VI	107.620	700		F VI	108.5	100	Q	Ti XV	109.48		P
F VI	107.65	45	Q	Fe VII	108.519	25		Ti	109.509	3	N
Mg V	107.661	200		Al V	108.530	20		Fe XII	109.509		
Ca XI	107.67			Fe VII	108.533	4		Al VI	109.514	1000	
Mn XIX	107.68	50		Al IV	108.535	50		Na VII	109.519	200	
Na VI	107.683	500		Na VI	108.555	400		Sc XIV	109.528	200	
Cr X	107.70			Fe VII	108.584	10		Fe XXII	109.53	30	N
Al V	107.711	200		Ca IX	108.591	40		K VIII	109.535	90	
Na VI	107.742	200		Fe XII	108.605			Si	109.54		N
Si XI	107.8	50	Q	Ti V	108.611	0	A, Z	Ne V	109.57	18	
Cr X	107.80			Al V	108.617	50		Ti	109.593	3	N
Ti	107.801	3	N	Fe VII	108.620	4		Br IX	109.6		P
Mg VI	107.820	400		Co IX	108.667	100		Al V	109.630	2	
V XII	107.83			Na VI	108.678	10		Cr XIX	109.64	200	
Fe VIII	107.868	25		Ca XI	108.683			Fe XX	109.66	50	
Mn XX	107.89	200		Fe X	108.697		Q	Al V	109.675	5	
Co XXIII	107.91	50		Al V	108.708	200		Co XXIII	109.70	110	
Sc	107.929	200	N	Na VII	108.733	200		K VIII	109.711	40	
Na V	107.934	200		Mn XVIII	108.76	200		Fe XII	109.712		
Na VI	107.934	200		Ca XI	108.828			Al V	109.730	1	
C VI	107.942		P	Na VII	108.829	100		Fe VII	109.742	1	
Ca XI	107.944			Fe XX	108.83	50		Ne VII	109.75		
Fe VII	107.947	1		Co XXII	108.84	10		Na VI	109.763	10	
Al V	107.948	600		Al V	108.849	30		Sc X	109.765	400	
Ne V	107.96	18		Fe XII	108.862			Ne VII	109.78	33	
C VI	107.994		P	Cu XI	108.878	70		Mn XXI	109.78	10	
Li III	107.999	10	P	Ti X	108.886	3	Q	Mn IX	109.783	500	
Cu XI	108.002	5		Ne V	108.89	13		Sc X	109.805	200	
Al V	108.005	150		Al IV	108.907	50		Ne VII	109.81	33	
Ca	108.006	1	N	Mn X	108.93			Mg V	109.812	200	
Mg VI	108.015	300		V XII	108.93			Cr X	109.84		
Na V	108.017	200		Al V	108.941	10		Al VI	109.843	600	
Ca XI	108.025			V XVII	108.952	100		Ne VII	109.87	27	
Sc	108.026	100	N	Mn X	108.97			Na VI	109.896	500	
Co XXIII	108.03	300		F VI	108.975	100		Sc X	109.897	300	
Ca IX	108.032	1		Ca XI	109.003			Se XVIII	109.9	460	
Al V	108.059	300		Fe XII	109.015			Se XVI	109.9		
Ca IX	108.071	90		Al V	109.024	100		Ti XI	109.904	6	Q
Fe VIII	108.077	30		Ne VI	109.03	20		Ne VII	109.93	27	
Na VII	108.079	10		Ni XXIV	109.03	10		Ti	109.963	1	N
Mg III	108.08		A, Z	F VI	109.040	150		Fe XIX	109.97	110	
Ti XII	108.086	15		Ni XXIII	109.06	10		Al VI	109.974	200	
Al V	108.113	300		Ne VI	109.07	20		Ne VII	109.98	250	
Mg VI	108.114	200		Sc X	109.072	100		Ti XI	110.019	1	
Fe XXI	108.12	10		Sc XV	109.084	50		Mg V	110.029	100	
Mn XXI	108.14	50		Se XVIII	109.1	445		Al V	110.045	5	
Mg VI	108.148	100		Ti XII	109.107	40		Ti	110.072	1	N
Na VII	108.159	10	Q	Co XXII	109.14	250		Co XXI	110.08	110	
Co XXII	108.16	30		Co XX	109.14	250		Na VI	110.085	200	Q
V XVI	108.160	500		Ti	109.153	1	N	Fe VII	110.103	1	
Na VII	108.193	200		Fe X	109.160		Q	Mg III	110.12		A, Z
Ca IX	108.208	40		Mg V	109.174	10		Mg V	110.121	10	
Ca XI	108.265	10		Ne X	109.178		P	Mg VII	110.121	10	
Ni XXIII	108.27	150		Sc X	109.202	40		Co XXII	110.14	80	
Si XIII	108.28		P	Cu	109.215	120	N	Si XIV	110.150		P
Sc	108.296	100	N	Sc X	109.227	100		O VI	110.157	70	
V VII	108.3			O VI	109.27	40	ZZ	C VI	110.189		P
Al V	108.316	100		Na X	109.28		P	Fe VII	110.205	1	
Mg VI	108.338	100		Al VI	109.284	350		O VI	110.220	110	
Fe XIX	108.37	300		Sc X	109.285	300		Co XXIII	110.23	50	
Cr XVIII	108.37	10		Ni XXI	109.29	300		N VI	110.231	4	
Na VII	108.373	100		Ne X	109.297		P	C VI	110.243		P
Fe VII	108.381	10		K VIII	109.303	1		Ti IX	110.283	10	
Al V	108.388	150		Sc X	109.307	10		Sc X	110.306	100	
Co IX	108.390	90		Ne VI	109.31	30		Si XIV	110.343		P
Al V	108.406	150		Ca XI	109.333			Ne V	110.36	23	
Fe XII	108.440			Ne X	109.338		P	Cr X	110.37		
Mg VI	108.441	10		Mn XVII	109.359	250	P	Cr XIX	110.37	250	
Ti V	108.443	6	A, Z	Na X	109.36		P	V VIII	110.38		P

Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes
Si XIV	110.408		P	Mn XVIII	111.39	80		Fe IX	112.375	50	Q
Cr XVIII	110.41	375		Na VII	111.390	200		Si	112.4	50	N
Ne V	110.42	23		Sc	111.402	200	N	Mn IX	112.415	500	
Al XIII	110.470		P	Mg V	111.419	200		Sc	112.434	100	N
Ne VI	110.49	20	P	V VIII	111.44		P	Na VI	112.448	300	
Sc	110.498	300	N	V XVIII	111.442	2		Fe XXI	112.47	50	
F VII	110.5		N	Mg V	111.467	200		Fe VIII	112.472	15	
Ne VII	110.53	200		Co XXII	111.47	50		Fe VIII	112.486	20	
N VI	110.541	2		Mg V	111.496	200		Ti V	112.495	11	A, Z
V VIII	110.55		P	Mn IX	111.500	200		Se XIX	112.5	335	
Ne VII	110.56	350		Na V	111.512	100		Cu	112.532	120	N
Ti XVI	110.561	200		Co X	111.542	40		Sc X	112.544	300	
Fe XII	110.591			Na V	111.552	10		Ni XXIII	112.55	30	
Fe VII	110.593	1		Mg VI	111.552	500		K IX	112.586	250	
Br IX	110.6		P	Fe IX	111.557	25	Q	K IX	112.595	360	P
Ne VII	110.62	1000		Al IV	111.589	150		V XI	112.63		
Fe XX	110.63	200		Si	111.6	50	N	Sc	112.677	200	N
Na VII	110.647	200		F VII	111.6	100	N	Fe VIII	112.704	2	
K IX	110.650	1		O VI	111.6		N	V XI	112.76		
O VI	110.655	5		Fe XX	111.60	110		Sc	112.895	40	N
Ne VII	110.67	27		Fe VII	111.604	25		Ti V	112.896	0	A, Z
Co XXI	110.71	200		Fe VII	111.638	10		Ca VIII	112.908	40	
Co XXIII	110.71	200		Fe VII	111.663	1		Mg IV	112.914	10	N
Sc IX	110.718	100		Ti XI	111.664	40		Fe VIII	112.932	25	
O VI	110.721	20		Fe VII	111.691	1		F VII	112.935	400	
Fe XII	110.732			Fe XIX	111.70	80		Na VI	112.950	400	
Na VI	110.750	200		Sc	111.711	200	N	Ge XIV	112.96	335	
Na VII	110.778	300		Fe IX	111.713	10		F VII	112.976	300	
Al XIII	110.783		P	Na VI	111.725	100		Sc	113.014	300	N
Mg V	110.809	200		Fe VII	111.742	40		Mn XIX	113.04	110	
Na V	110.817	200		Mg VI	111.746	400		Mn IX	113.080	200	
Na VII	110.817	200		Sc	111.757	100	N	Fe VIII	113.081	1	
Si XIII	110.82		P	Fe VII	111.767	4		Si X	113.1	50	Q
Mg V	110.859	400		Ni XXIII	111.78	80		Na VI	113.125	400	
Na V	110.878	200		Al IV	111.781	50		Ni XXIV	113.14	50	
Al XIII	110.882		P	Fe IX	111.791	20		Al VIII	113.140	50	Q
Sc X	110.920	200		Na VI	111.793	100		Ti	113.151	3	N
Na V	110.921	10		Ne VII	111.807	430		Co XXIII	113.17	80	
Mg V	110.939	200		Fe VII	111.812	1		Mg VI	113.189	500	
F V	110.95	25	Q	Fe VII	111.849	10		Mg V	113.217	200	Z
Si XIII	110.957	100	Q	Ni XXIII	111.86	200		Co XXII	113.24	200	
Ca X	110.963	850		Mg VI	111.864	400		V VIII	113.27		
Mn XX	111.00	65		K XIX	111.865		P	Mg V	113.279	10	Q
Mn XX	111.01	35		Na V	111.879	10		Ti	113.289	3	N
Cr X	111.02			Cr XIX	111.88	80		Fe XXI	113.30	300	
Mg V	111.031	300		Mn VII	111.889	20		Mn XVIII	113.30	200	
Mn XX	111.04	10		Si XI	111.9	20	Q	Cr X	113.31		
Mg V	111.091	300		Sc	111.937	40	N	Al VI	113.314	50	
Ne VI	111.10	200		Ti	111.942	3	N	Fe VIII	113.315	10	
V VIII	111.11		P	Mg VII	111.984	10		Fe XX	113.34	300	
F IX	111.143		P	F VI	112.0	90	Q	Co XXII	113.37	250	
Ne VII	111.152	220		Ti	112.002	1	N	Ti X	113.374	1	Q
Ne VI	111.16	500		Na VI	112.009	300		V XII	113.39		
Cr X	111.16			Na V	112.009	300		V XVII	113.406	5	
Mg VI	111.160	300		Fe VII	112.012	4		Mg V	113.414	200	Z
Cr XIX	111.18	50		Fe IX	112.017	40		Al VI	113.437	150	
Se VIII	111.196	19		Fe VII	112.030	4		Fe XX	113.45	27	Q
Al IV	111.196	100		K XIX	112.050		P	Ca VIII	113.453	90	
Ca X	111.198	650		Mn VII	112.060	10		Fe VIII	113.463	5	
Mg VI	111.199	400		Na V	112.077	10		Mg V	113.518	100	Z
Mg V	111.199	400		Fe IX	112.096	40	Q	Na V	113.574	10	
Cu XXVI	111.2			Ti	112.116	1	N	V VIII	113.60		
Na VII	111.211	300		K IX	112.120	160		Cl XVII	113.601		P
F IX	111.226		P	Mg VII	112.135	10		Al VI	113.623	50	
Ni XXIII	111.23	80		Ti	112.153	1	N	Mn IX	113.627	300	
Mg V	111.247	200		Ti	112.178	3	N	Ti	113.643	1	N
F IX	111.255		P	Na V	112.186	10		Co XXI	113.70	250	
Ne VI	111.26	45		Fe XXII	112.21	10		Cr X	113.70		
Mg V	111.261	40		Sc X	112.210	300		Mg V	113.703	400	
Mn IX	111.262	400		Fe VIII	112.252	1		Mn XIX	113.75	50	
K XIX	111.266		P	Mg VII	112.269	1		Al VI	113.756	50	
Cu XIX	111.274	250		Cr XVIII	112.27	110		Co XXI	113.76	110	
V XVII	111.299	320		Sc	112.337	100	N	Fe VIII	113.763	7	
Ti IX	111.345	20		V XI	112.34			Sc	113.767	100	N
Cu XIX	111.353	350		Na V	112.347	10		V XII	113.78		

Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes
F IX	113.780		P	Na V	114.700	100		O V	116.161	20	
V XVII	113.785	30		Fe XX	114.72	4		Ca IX	116.176	250	
Fe IX	113.793	20		Mg VI	114.725	10		Fe VIII	116.196	35	
As XXXI	113.8		P	Al IV	114.737	50		Ti XVI	116.198	280	
Mg V	113.823	100	Z	Na V	114.738	100		Ca IX	116.203	90	
F VI	113.840	10		Ni XVIII	114.74	110		P XV	116.214		P
C VI	113.842		P	K X	114.76			Co XXII	116.22	4	
Cl XVII	113.848		P	Al XIII	114.778		P	Se VIII	116.235	43	
K VIII	113.858	1		Mg V	114.785	600		Ne VII	116.27	66	N
Ne V	113.86	30		Ca IX	114.816	1		Fe XXII	116.28	110	
Fe VIII	113.861	1		Ar XVIII	114.848		P	O VI	116.350	160	
Fe VII	113.861	10		Si X	114.9	20	Q	V XVIII	116.365	10	
F IX	113.867		P	Al XIII	114.937		P	Ti XI	116.387	0	
F IX	113.898		P	Kr IX	114.95	75		Fe IX	116.408	60	
C VI	113.899		P	Ca IX	114.977	10		O VI	116.421	220	
Li III	113.905	30	P	Al XIII	114.990		P	Sc XII	116.44		
V VIII	113.92			Fe XXI	115.01	10		Fe VIII	116.442	1	
Sc XIV	113.928	25		Mg V	115.013	600		Al IV	116.464	250	
Ge XIV	113.93	470		Ti XI	115.015	160		P XV	116.487		P
Co XXII	113.93	10		Ti XV	115.031	625		Ca IX	116.492	10	
V XV	113.930	320		Fe VII	115.033	40		Ti XII	116.497	60	
Cl XVII	113.932		P	Fe XXI	115.08	30		Ca XIV	116.517	15	
Mg V	113.934	300		V X	115.09			Ca IX	116.523	10	
Sc	113.937	200	N	Mg V	115.093	400		Cr XVII	116.53	250	
Ti XI	113.940	40		Ca IX	115.096	10		Sc XII	116.54		
Ne VI	113.95	10	P	Cr XI	115.13			P XV	116.576		P
Na V	113.952	10	Q	Fe XXI	115.15	50		Ne VI	116.58	100	N
Fe VIII	113.963	2		Fe VII	115.164	1		Ti XII	116.597	80	
Fe VII	113.964	25		Ar XVIII	115.165		P	Ca IX	116.638	1	
Cr XIX	113.97	300		Fe XXII	115.19	50		Cr VII	116.654	5	
Cr XVIII	113.99	300		Ca IX	115.246	40		Sc XIV	116.66		P
Mg V	113.990	300		Ar XVIII	115.274		P	O VI	116.666	5	F
Se XIX	114.0	420		Fe VII	115.281	4		Ne VII	116.693	770	
Mn IX	114.023	50		Cr X	115.29			Mn XX	116.70	10	
Fe IX	114.024	40		Ca IX	115.293	10		Fe VII	116.715	4	
Mg V	114.029	200		Ne VII	115.331	600		Cr X	116.75		
Ti	114.053	3	N	Cr XVI	115.348	250	P	Sc	116.770	200	N
Mg V	114.059	400		Fe IX	115.353	30		Fe IX	116.803	50	
Ne VI	114.07	60		Na VII	115.361	10		N VI	116.809	6	
Fe IX	114.111	20		Mn XVIII	115.38	375		Fe VII	116.809	25	
Ne VI	114.13	100		Ne VII	115.392	600		Fe VII	116.836	1	
K VIII	114.173	1		Mg V	115.399	400		V X	116.85		
Mg V	114.199	300		Sc XII	115.40			Fe VII	116.853	1	
F VII	114.2		N	Cr VII	115.407	285		Fe VII	116.882	4	
Mn VII	114.205	2		Ca IX	115.412	90		Ti XI	116.910	40	
O V	114.225	5	Z	Fe XIX	115.42	150		Al IV	116.921	150	
Mg V	114.226	300		V VIII	115.42			Fe VII	116.951	4	
Cr VII	114.235	285		Ca IX	115.445	10		Mg VI	116.968	500	
Ne VI	114.24	200		Fe	115.46	10	N	Co XXII	116.97	4	
O VI	114.25	50	ZZ	Fe VII	115.472	4		Fe VII	116.970	40	
Ti XI	114.272	90		Na VII	115.475	10		Fe VII	116.993	40	
Mg V	114.285	300		Ne VII	115.522	700		Fe VII	117.034	1	
O V	114.295	5		Mg V	115.537	400		O V	117.063	20	Z
Fe VIII	114.295	5		V VIII	115.58			Cr X	117.09		
Ne VI	114.30	45		V X	115.58			Sc XVI	117.090	15	
Fe XXI	114.30	4		Si	115.6	20	N	F V	117.1	140	Q, Z
Al IV	114.313	10		Mn XXI	115.69	10		Fe VII	117.104	60	
Mg V	114.324	300		Co XX	115.71		P	Cr XI	117.13		
Mg III	114.34		A, Z	Na VI	115.729	200		Fe VII	117.135	25	
Fe VII	114.356	4		Kr IX	115.74	100		Fe VII	117.144	10	
O V	114.358	5		V X	115.78			V XVIII	117.163	50	
Mn VII	114.380	2		Na VI	115.780	10		Fe XXII	117.17	150	
Co XX	114.40	200		Sc XII	115.82			Ti XI	117.171	0	
Fe XXII	114.41	200		O VI	115.822	360		Fe VII	117.174	10	
Mg VI	114.412	10		O VI	115.830	285		O V	117.181	20	Z
Ni XXII	114.45	110		Mn XIX	115.84	30		Sc XII	117.19		
Ni XVIII	114.46	110		Ne VII	115.955	330		Se VIII	117.195	5	
Mn IX	114.472	50		Fe IX	115.996	30		Fe VIII	117.197	60	
Fe VII	114.490	1		Ti XI	116.028	0		V VII	117.2	150	
Mg V	114.498	10	Q	Cr XX	116.05	80		Cr XVII	117.20	110	
Fe VIII	114.564	4		Ca IX	116.056	1		Mg VI	117.226	300	
Ca VIII	114.566	40	N	F VI	116.094	10		Ne V	117.23	27	
V VIII	114.59			K IX	116.109	1		Mn XVIII	117.25	150	
Mg VI	114.624	10		K IX	116.139	10		Ge XV	117.25	430	
Na VI	114.666	400		Sc	116.158	300	N	Fe VIII	117.254	1	



Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes
Ge I	1580.0	15	A, Z	Cu IV	1582.094	130	N	Si I	1584.089	6	P
Ge I	1580.006	10	A	Sc II	1582.112	1		Cr III	1584.09	10	N
Cu II	1580.0250	15		Na IV	1582.121	70		Fe IV	1584.117	200	
Cu IV	1580.068	120	N	Ni II	1582.135	2		Na IV	1584.141	650	
Se I	1580.07	200	P	Na IV	1582.182	550		Na II	1584.173	20	
Cr III	1580.116	90		Mn II	1582.23	40		Co II	1584.247	1	
Fe III	1580.215	150	P	Cr XXIII	1582.28		P	Ni IV	1584.299	20	
Zn	1580.220	20	N	Br I	1582.312	700		P I	1584.329	0	
Na IV	1580.233	360		V II	1582.32	80		Fe V	1584.337	125	P
Co V	1580.24		P	Na IV	1582.326	450		Si I	1584.3455	12	
Fe III	1580.259	150	P	Fe IV	1582.330	150		Fe V	1584.367	125	P
V II	1580.261	5		Mn II	1582.35	10		Mn II	1584.38	1	
Fe V	1580.3		F, P	Ni IV	1582.356	440		Fe II	1584.417	0	P
Si I	1580.3001	12		Cl II	1582.3581	125		O III	1584.45	400	
Cr III	1580.34	10		Fe II	1582.372	2	P	Al IV	1584.460	800	
Zn	1580.353	25	N	Ni II	1582.373	0		Ni II	1584.530	10	N
Co II	1580.361	5		As II	1582.406	5		Fe V	1584.530	150	
Zn II	1580.443	10	N	Fe III	1582.427	20	P	Kr II	1584.563	1	
Mn III	1580.462	45		Ni IV	1582.531	410		Ni II	1584.563	16	
Na IV	1580.500	450		V II	1582.57	150		Cr III	1584.60	400	
Ge I	1580.54	10	A, Z	Ni II	1582.571	2	N	Sc IV	1584.645	285	
Ni II	1580.588	8		Fe X	1582.60	1	F	Co III	1584.663	1	
Co III	1580.619	0	N	Na IV	1582.613	285		Al II	1584.708	4	
Cu II	1580.6257	8		Cr III	1582.62	250	N	Ni II	1584.761	1	
Fe II	1580.629	110	P	Fe III	1582.634	20	P	Cr III	1584.84	30	N
Ni II	1580.674	1	N	Ni II	1582.689	10	N	Si I	1584.855	30	A
Si I	1580.684	5	A	Si V	1582.737	200		Co II	1584.889	3	
Ni IV	1580.695	0	N	Ge I	1582.756	20	A, Z	Fe III	1584.922		P
Fe III	1580.698	150	P	V II	1582.80	80		V VI	1584.942	450	
Ni II	1580.698	2		Fe V	1582.802	30		Fe II	1584.952	110	P
Cr III	1580.73	200		Cu II	1582.8458	3		P I	1584.964	1	
Co III	1580.735	0		Cr III	1582.93	200	N	Fe IV	1584.969	375	
Ar II	1580.770	200		Ge I	1582.96	100	A, Z	Fe XX	1585.0		F
Fe IV	1580.904	200		Fe II	1582.981	2	P	Cr III	1585.01	30	
Al II	1580.919	1		Ni IV	1583.030	420		F II	1585.056	40	
Ar II	1580.960	100		Fe IV	1583.049	12		Ge I	1585.060	50	A
Ge I	1580.970	70	A, Z	Ni II	1583.051	17		Fe IV	1585.116	300	
Ge I	1580.996	70	A	Fe VI	1583.089	200		Ni II	1585.117	200	
Ge II	1581.0698	300		Zn III	1583.136	0	Q	Zn	1585.214	10	N
Fe III	1581.072	70	P	Ge I	1583.141	30	A	Fe II	1585.274	5	P
Ni II	1581.085	6		Cl II	1583.1677	50		Mn II	1585.30	1	
Na II	1581.108	25	N	Co V	1583.19		P	V II	1585.361	300	
Cr III	1581.15	100	N	Fe III	1583.196	200	P	Zn II	1585.368	100	
Fe IV	1581.174	250		Ge I	1583.369	20	A	Co II	1585.418	5	
Fe II	1581.270	3	P	Ni II	1583.398	1		Mn III	1585.480	20	
Fe II	1581.290	2	P	Sc IV	1583.407	360		Ni IV	1585.522	70	
Ni II	1581.334	25		Sc II	1583.424	1		F III	1585.593	3	
Ni IV	1581.343	50		Ni II	1583.436	10		Fe V	1585.655	60	
Mn II	1581.39	3		Sc II	1583.438	1		Fe II	1585.655	2	P
Cu II	1581.4066	0		Co II	1583.439	10		Ni II	1585.702	4	
Cu II	1581.4187	0		Cu IV	1583.469	850		Mn III	1585.714	150	
Fe II	1581.421	5	P	Ni II	1583.509	15		Fe IV	1585.841	375	
Ge I	1581.424	25	A	P I	1583.537	0	N	Cu I	1585.871	4	A, Z
Fe IV	1581.471	200		Ge I	1583.6	25	A, Z	Zn III	1585.876	5	
Ni IV	1581.483	270		Fe IV	1583.600	150		Si I	1585.9580	3	
Co III	1581.502	5	N	Zn III	1583.620	2	Q	V III	1585.97	25	
Zn III	1581.505	100		Cu II	1583.6823	80		Fe II	1585.999	30	P
Cr III	1581.57	20	N	S I	1583.683	1		Ar XIII	1586.		F, P
Mn III	1581.690	10		Cu III	1583.69		F, P	Cu IV	1586.048	260	N
Ni II	1581.704	10		Cr III	1583.70	20	N	Zn III	1586.076	6	
Co II	1581.714	3		P I	1583.727	25		P I	1586.078	3	
Sc II	1581.811	10		Fe IV	1583.741	200		Kr II	1586.093	1	
Ni II	1581.826	6		Cu I	1583.797	15	A, Z	Ca III	1586.125	650	
Na II	1581.835	20		Ar II	1583.833	100		Si I	1586.1372	15	
Cu III	1581.863	1		Na IV	1583.84	110	P	Kr II	1586.170	25	
V II	1581.99	80		As I	1583.90	2		Co III	1586.180	15	N
Cu II	1581.9953	15		Zn II	1583.933	15	Z	Mg III	1586.237	200	
Ge I	1582.0	25	A, Z	Fe V	1583.958	80		P I	1586.240	15	
Cu IV	1582.002	270		Si I	1583.958	25	A	Ar II	1586.261	200	
Co V	1582.02		P	Fe IV	1583.960	250		Fe II	1586.288	3	P
Zn III	1582.034	100		Cr III	1583.965	25		Fe II	1586.333	2	P
Al IV	1582.040	900		Fe III	1583.968	20	P	Cr III	1586.35	150	N
Co III	1582.044	3	N	Na IV	1583.977	550		V II	1586.58	400	
Ni IV	1582.063	50	N	Si I	1584.0207	8		Kr II	1586.621	10	
Cl II	1582.0909	100		V II	1584.06	150		Mn IV	1586.64	30	

Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes
Ni II	1586.677	4		Ni II	1588.798	20	N	Co II	1590.778	3	
P I	1586.717	1		Ge I	1588.8	15	A, Z	Cr III	1590.789	40	
Cr III	1586.779	60		Cr III	1588.87	200	N	Fe IV	1590.863	150	
Na IV	1586.78	40	P	Na IV	1588.87	40		P I	1590.934	3	
Si I	1586.7913	20		Fe V	1588.906	100		Ge I	1590.982	15	A
P I	1586.878	15		Si III	1588.950	40		Ni II	1591.041	50	
Si I	1586.8920	3		Na II	1588.983	7		Ge I	1591.053	35	A
Ni III	1586.909	1		Zn	1588.989	15	N	Fe IV	1591.062	375	
Co II	1586.910	2	N	Fe V	1589.013	80		Cr III	1591.09	50	N
V III	1586.92	250		Ni IV	1589.017	20	N	Ni II	1591.099	16	N
Na IV	1586.990	650		P IV	1589.042	90		Fe II	1591.122	2	P
Cu II	1587.0035	1		Ni II	1589.061	40		Si I	1591.1232	20	
Zn IV	1587.036	5		Ge I	1589.065	10	A	Co II	1591.142	1	
Na IV	1587.048	450		Ni II	1589.116	80		Si I	1591.24		
Cu II	1587.0596	1		Ge I	1589.143	20	A	Co II	1591.294	3	
Cr XI	1587.1		F, P	Si I	1589.1733	15		Na II	1591.321	15	
Mn II	1587.11	50		Ni II	1589.246	200		O III	1591.33	600	
Ni II	1587.138	3		Al IV	1589.275	400		Ni II	1591.350	10	N
Mn II	1587.15	7		Co V	1589.38		P	N II	1591.361		P
Co III	1587.186	10		Kr II	1589.384	1		Ni II	1591.415	80	
Fe V	1587.2		F, P	Fe V	1589.390	70		C III	1591.44	200	
Ni II	1587.207	8		Ar II	1589.465	500		Fe IV	1591.509	520	
B I	1587.340		A, Z	Fe V	1589.47		F, P	P I	1591.567	1	
Cr III	1587.35	10	N	Ni II	1589.474	5		Fe II	1591.622	2	P
Mn II	1587.38	1		Cu IV	1589.506	90		Fe II	1591.632	0	P
P I	1587.384	1		V III	1589.53	15		Ge I	1591.679	25	A
B I	1587.385		A, Z	Ni II	1589.547	1		Na II	1591.712	7	
V II	1587.40	500		Ni II	1589.563	3		Cr V	1591.721	750	
Ge I	1587.403	25	A, Z	Zn I	1589.567	30		Zn II	1591.724	2	Z
Co II	1587.422	5		Ge I	1589.615	10	A	Ni II	1591.732	2	
Ni II	1587.443	18		Ni III	1589.625	2		Fe III	1591.801	150	P
B I	1587.451		A, Z	Si I	1589.6399	7		Mn I	1591.802	100	N, A
Mn II	1587.46	15		Ni II	1589.644	20		Fe IV	1591.802	300	
Ge I	1587.463	10	A	Co II	1589.654	5		Ge I	1591.838	20	A
Se I	1587.49	150	P	Ge I	1589.695	25	A	Fe IV	1591.878	300	
B I	1587.500		A, Z	Mn II	1589.74	1		Ge I	1591.888	40	A
Ge I	1587.520	15	A	V II	1589.761	3		Ni IV	1591.933	490	
Cr III	1587.54	20		Ni II	1589.772	80		Ar II	1591.939	1	
Fe IV	1587.594	300		Zn II	1589.777	50		Mn III	1591.942	5	
B I	1587.596		A, Z	Al V	1589.87	350		Ge I	1591.981	40	A
Ge I	1587.65	90	A, Z	Ni II	1589.903	8		Si I	1592.0200	20	
B I	1587.653		A, Z	Cr III	1589.91	20	N	Fe IV	1592.048	520	
Cu II	1587.7151	0		Fe V	1589.941	10		Ni II	1592.080	200	
B I	1587.747		A, Z	Ni II	1589.948	7	N	N II	1592.124		P
Si I	1587.7620	15		Ni IV	1589.984	320		Zn III	1592.128	3	
Ge I	1587.788	12	A	Sc XV	1590.		F, P	Ni II	1592.144	15	
Ni II	1587.845	35		O III	1590.01	800		Mn III	1592.187	5	
Ge I	1587.854	15	A	Fe II	1590.124	2	P	Cu IV	1592.188	20	N
O III	1587.87	400		Ni IV	1590.126	10	Q	Sc IV	1592.233	285	
As I	1587.97	20		Zn II	1590.133	25	Z	Fe II	1592.243	5	P
Zn	1587.998	15	N	N II	1590.141		P	Ni II	1592.248	25	
Cr III	1588.00	20	N	Cu II	1590.1649	80		Ne V	1592.3		F, P
P I	1588.007	7		F III	1590.180	10		Fe IV	1592.333	200	
Ni IV	1588.025	120		Ar II	1590.233	200		Mg III	1592.360	60	
Cu IV	1588.070	20	N	Ge I	1590.249	12	A	Cr III	1592.39	100	N
Fe IV	1588.127	250		Co II	1590.263	3		Si I	1592.4234	60	
Ge I	1588.167	18	A	Br III	1590.3	25	Q	Zn III	1592.431	50	
Mn III	1588.182	12		Ge I	1590.327	30	A	Ni II	1592.479	50	
Fe V	1588.199	100		Ni II	1590.422	0		Co IV	1592.5		F, P
Ni II	1588.200	10		Si I	1590.4768	20		Co V	1592.50		P
Ge I	1588.232	15	A	Cr III	1590.49	20	N	Ni II	1592.502	15	
Co II	1588.267	0		V VI	1590.506	360		P I	1592.508	3	
Fe II	1588.290	110	P	Ni II	1590.529	10	N	Cu IV	1592.524	310	N
Ni II	1588.369	15		Co II	1590.542	20		Mn IV	1592.54	300	
Cr III	1588.42	150	N	Fe II	1590.559	1	P	Kr II	1592.565	1	
Ni II	1588.464	10		N II	1590.562		P	N I	1592.61	20	P, Z
Cu III	1588.554	75		Ni IV	1590.564	0	N	Al VI	1592.62	40	Q
V III	1588.59	150		Mn II	1590.569	20		Ni II	1592.662	1	
Ge I	1588.593	50	A	Si I	1590.5763	15		Fe III	1592.720	70	P
Co III	1588.642	10		O III	1590.61	400		Fe IV	1592.724	150	
Ge I	1588.659	10	A	Fe IV	1590.616	450		S I	1592.736	4	
Fe II	1588.688	5	P	Zn III	1590.678	2		Mn II	1592.76	0	
Ni II	1588.715	9		Ni II	1590.703	1		Ge I	1592.846	100	A
Si I	1588.731	25	A	Mn III	1590.753	7		Fe III	1592.898	70	P
Zn II	1588.754	3	Z	V III	1590.77	10		Fe II	1592.909	1	P

Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes
Cu IV	1592.924	290		Fe III	1594.850	20	P	Mn III	1596.948	300	
P I	1593.002	7		Kr II	1594.895	25		Al V	1596.95	60	
Ge I	1593.035	10	A	Fe IV	1594.921	200		Si V	1596.98	50	
Mn V	1593.059	350		Si I	1594.9493	70		Ni II	1597.031	1	
Co II	1593.074	1		Co III	1594.953	10		Ni III	1597.077	3	
Fe IV	1593.089	300		Zn II	1595.027	100	Z	Ni II	1597.101	25	N
Fe V	1593.1		F,P	Cr IV	1595.039	285		Mn I	1597.138	200	N,A
Br III	1593.1	150	Q	Ge I	1595.049	35	A	Mn II	1597.18	2	
Cu IV	1593.104	380	N	P I	1595.070	15		Zn	1597.183	25	N
Ni II	1593.132	1		Mn IV	1595.08	500		Cu IV	1597.264	390	N
P I	1593.147	1		Mn III	1595.081	100		Ni III	1597.30		F,P
Cr III	1593.16	40		Cu IV	1595.125	680		Co II	1597.360	1	
Si I	1593.177	1	N,A	Fe III	1595.166	20	P	Fe IV	1597.397	250	
Ni II	1593.200	15	N	Ca III	1595.193	450		Cu III	1597.425	50	
Mn II	1593.224	5		Ge I	1595.225	100	A	Cr III	1597.46	120	N
Se I	1593.24	150	P	Zn IV	1595.258	30		As I	1597.48	2	N
Fe IV	1593.276	12		Mn III	1595.3		F,P	Ni II	1597.484	9	
Co II	1593.294	3		Mn III	1595.3		F,P	Cl II	1597.5117	45	
Fe IV	1593.343	30		Zn	1595.308	10	N	Zn II	1597.556	15	Z
Cr III	1593.38	40	N	Ni II	1595.332	1	N	Fe III	1597.625	70	P
Co II	1593.442	3		Mn III	1595.35	80		Mn IV	1597.66	0	
Co III	1593.446	10	N	Cu IV	1595.412	280		Si I	1597.700	10	A
P IV	1593.466	4		Fe II	1595.416	1	P	Si I	1597.720	50	A
Ni II	1593.522	15	N	Si V	1595.44	30		Si I	1597.7357	20	
Cr III	1593.523	25		Al V	1595.46	20		Mg IV	1597.738	80	
Fe II	1593.532	5	P	Ni II	1595.519	8		Zn	1597.801	40	N
Al V	1593.54	20		Cr IV	1595.558	300	P	Zn II	1597.801	5	N
Cu II	1593.5556	500		Fe III	1595.586	400	P	Cr III	1597.86	10	N
Ar II	1593.587	200		Ge I	1595.6	20	A,Z	Ni II	1597.886	7	
N II	1593.596		P	Ni II	1595.608	70		Ni IV	1597.898	140	N
As I	1593.60	100		Cr IV	1595.622	60	P	Ni III	1597.899	3	
Mn II	1593.61	0		P I	1595.717	3		Fe IV	1597.907	30	
Ni II	1593.611	150	A,Z	Zn II	1595.732	20	Z	Cu IV	1597.931	100	Q
Fe II	1593.661	2	P	Ar II	1595.737	100		P I	1597.951	15	
Ge I	1593.675	40	A	Si I	1595.7552	30		Si I	1597.9620	60	
Ni II	1593.698	40		Ni II	1595.768	70		Ne II	1597.971	80	
Ge I	1593.706	20	A,Z	Co II	1595.778	20		Sc III	1598.002	80	
Fe V	1593.708	100		Fe IV	1595.800	300		Fe IV	1598.012	520	
Cr III	1593.71	10	N	Cr III	1595.86	20		Ge I	1598.039	35	A
Fe III	1593.743	70	P	Mn III	1595.896	12		Cr III	1598.05	50	N
Cu III	1593.748	500		Mn I	1595.914	1000	A,Z	Ni III	1598.073	15	
Ni IV	1593.836	110		Ni II	1595.919	15		Kr II	1598.082	40	
Fe III	1593.897	70	P	P I	1596.051	15		Co II	1598.095	5	
Kr II	1593.946	90		Al II	1596.059	112		Cu IV	1598.107	90	N
Ge I	1593.958	60	A	Cr III	1596.06	10	N	Na III	1598.177	500	
Mn III	1593.97	3		Fe IV	1596.065	375		Ni IV	1598.274	20	
Ge I	1593.977	60	A	Ni II	1596.074	60		Ni II	1598.282	40	
Si I	1593.978		P	Zn II	1596.076	10	N	Ni II	1598.315	4	N
Ge I	1594.00	95	A,Z	As I	1596.13	2		Sc IV	1598.347	20	
Ni II	1594.019	1		Ar II	1596.151	100		Fe IV	1598.350	150	
Cr III	1594.03	80	N	Mn III	1596.211	80		Cu IV	1598.361	220	N
Fe II	1594.113	10	P	Ge I	1596.230	40	A	Ni II	1598.371	30	
V II	1594.129	1		Mn III	1596.3		F,P	Cu II	1598.4023	200	
Si I	1594.147	15	A	Na IV	1596.304	40		P I	1598.428	3	
Co III	1594.182	0		Fe V	1596.365	40		Fe II	1598.455	1	P
Co II	1594.193	2		Na IV	1596.367	160		Co II	1598.463	2	
Cu IV	1594.194	310	N	O V	1596.375	80		Cr III	1598.48	30	N
Ni II	1594.287	6		Cu IV	1596.381	470	N	Zn III	1598.517	80	
Mn III	1594.312	5	N	Ne II	1596.397	30		Mn III	1598.529	10	
Co II	1594.337	5		Na IV	1596.401	360		Fe IV	1598.543	200	
Ni II	1594.346	35	N	Ge I	1596.446	45	A	Fe V	1598.556	100	
As I	1594.39	1		Mn III	1596.5		F,P	Ar II	1598.575	100	
Zn II	1594.448		Z	Co II	1596.514	5		P I	1598.609	3	
Cr III	1594.474	40		Cr III	1596.52	150		Mn I	1598.632	350	N,A
Co IV	1594.52	80	P	V III	1596.58	15		Mn III	1598.651	50	
Si I	1594.5655	70		Co II	1596.615	5		Si I	1598.674	1	A
Ni II	1594.575	1		Fe II	1596.641	10	P	Ti V	1598.697	4	
Mn IV	1594.66	500		Fe IV	1596.668	450		Ar II	1598.722	200	
Ni II	1594.703	12		Ge I	1596.697	40	A	Cr IV	1598.723	40	
Cr IV	1594.739	5		Cu II	1596.7458	1		P I	1598.750	15	
Fe IV	1594.744	30		Cr III	1596.76	10		Cl II	1598.78	50	
Mn I	1594.772	350	N,A	Fe II	1596.82	1	Q	Fe V	1598.824	100	
Ar II	1594.799	100		Mn V	1596.873	400		Ni II	1598.860	18	N
N II	1594.822		P	Ni II	1596.874	1		Ar II	1598.880	100	
Si I	1594.832	10	A	Co II	1596.928	10		Se II	1598.95	10	

Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes
Cr III	1599.01	30	N	Ni II	1601.045	16		Cr V	1603.191	650	
P I	1599.086	1		Zn I	1601.063		F,A	Mn III	1603.203	30	
Cu IV	1599.086	370	N	Fe III	1601.204	650	P	Fe X	1603.21	2	F
Cu IV	1599.130	400		Cl II	1601.2082	170		Mn I	1603.213	200	N,A
Ar II	1599.130	100		Cu II	1601.2097	1		Ni II	1603.224	1	
Zn III	1599.146	3		Co IV	1601.22	150	P	Cl II	1603.2362	125	
Zn III	1599.233	2	Q	Fe II	1601.220	5	P	Zn II	1603.315	100	Z
Cu IV	1599.237	340	Q	Ni II	1601.240	10		Ge I	1603.363	30	A
P I	1599.246	15		Ni II	1601.288	8		Ni II	1603.410	20	
Ni II	1599.251	40	N	Co II	1601.291	8		Ar II	1603.442	400	
Ni II	1599.282	12		Fe III	1601.298	400	P	Zn III	1603.470	0	
Co II	1599.300	20		Ni II	1601.400	3	N	Zn II	1603.508	3	Z
Cl II	1599.3909	125		Mn III	1601.42	5		Ni II	1603.555	25	N
Al II	1599.410	20		Si I	1601.459	5	A	Co III	1603.563	15	
Ni II	1599.439	1		Fe II	1601.460	1	P	Mn III	1603.598	2	
Kr II	1599.492	1		Cl II	1601.4864	170		Mn IV	1603.60	700	
Mn III	1599.50	5		Fe IV	1601.503	150		Ge I	1603.717	25	A
Ni II	1599.549	10		Ni II	1601.518	1		Kr II	1603.721	1	
Co V	1599.58		P	Mn IV	1601.55	80	N	Ni II	1603.728	16	
Ge I	1599.593	10	A	Cr III	1601.57	40	N	Fe IV	1603.730	520	
Ni II	1599.603	25		Ge I	1601.578	25	A	Cu IV	1603.740	320	
Ar II	1599.607	100		Fe II	1601.669	20	N	Mn III	1603.755	25	
Cr IV	1599.619	5		Fe IV	1601.670	520		Ge I	1603.869	10	A
Al III	1599.639			Zn	1601.695	15	N	Mn II	1603.87	5	
Cu IV	1599.651	30	N	Mn III	1601.727	40		Zn III	1603.873	5	
Cl II	1599.69	50		O I	1601.731		P	Ni II	1603.917	5	
Al III	1599.697			Ni II	1601.742	4		P I	1603.920	7	
Co II	1599.702	10		Cl II	1601.7970	125		Cr III	1603.93	10	N
Fe V	1599.842	10		Fe IV	1601.826	250		Ne II	1604.004	80	
F III	1599.926	10		Mn II	1601.84	5		Mn IV	1604.04	0	N
Cl II	1599.9306	125		Fe IV	1601.900	375		Co V	1604.08		P
Fe II	1600.013	55	P	Co III	1601.903	3	N	Ar II	1604.082	500	
Cr III	1600.02	70	N	V IV	1601.915	80		Ne II	1604.091	70	
Co II	1600.027	1		Ni II	1601.928	10		Cl II	1604.1806	170	
F III	1600.041	25		Fe III	1601.970	300		Mn II	1604.19	0	
Zn III	1600.074	2		Ne IV	1602.		F,P	Si V	1604.25	80	
Fe V	1600.08		F,P	Cl II	1602.0105	200		Cr III	1604.34	10	N
Ne II	1600.080	40		Al V	1602.03	20		Zn II	1604.347	20	Z
Mn V	1600.1		F,P	Fe IV	1602.078	450		Ni II	1604.394	2	
Ge III	1600.1	180	P	Mn II	1602.10	30		Mn III	1604.407	2	
V III	1600.11	10		Mn IV	1602.14	100		Si V	1604.47	60	
Ar II	1600.133	400		Mn III	1602.17	20		Ni II	1604.482	18	N
Cu III	1600.185	400		Cr III	1602.17	100	N	Zn	1604.500	12	N
Zn III	1600.206	1		Ni II	1602.209	12		Ni III	1604.537	300	
Cr III	1600.21	50	N	Fe II	1602.210	10	P	Ni II	1604.570	5	
Ni II	1600.268	10		Cu II	1602.2729	6		P I	1604.576	0	
Co II	1600.276	3		Ge I	1602.349	10	A	Fe II	1604.583	5	P
Fe IV	1600.294	250		Mn III	1602.38	20		Fe V	1604.6		F,P
Ni III	1600.294	10		Ge I	1602.382	20	A	O IV	1604.620	5	
Ti V	1600.353	1		Cu II	1602.3880	150		Fe IV	1604.669	375	
Mn I	1600.353	100	N,A	Ge II	1602.4863	500		Ni II	1604.696	3	
Mn III	1600.365	12		Ni III	1602.505	15		Se I	1604.77	40	P
B I	1600.373		A	Zn III	1602.511	1		Cr II	1604.82	20	
Cu IV	1600.385	780		Ar II	1602.554	200		Cu II	1604.8475	50	
B I	1600.455	70	A	Ge I	1602.574	25	A,Z	Fe IV	1604.885	520	
Fe IV	1600.503	450		Ge I	1602.591	35	A	O IV	1604.901	10	
Mn IV	1600.55	550		Fe II	1602.596	40	P	V III	1604.99	50	
Fe II	1600.552	5	P	Ni II	1602.679	1		Cl II	1604.9999	185	
Ni II	1600.565	18	N	Fe V	1602.766	60		Al VII	1605.		F,P
Fe IV	1600.580	520		Al V	1602.77	300		Co IV	1605.0		F,P
Al III	1600.642			Ge I	1602.781	28	A	Fe IV	1605.018	150	
Ar II	1600.694	600		Cr III	1602.79	100	N	Ni II	1605.027	9	
Fe II	1600.714	20	Q	Cl II	1602.8157	35		Ge I	1605.1	25	A,Z
Ti V	1600.726	80		Ar II	1602.891	200		Mn III	1605.107	4	
Ni II	1600.753	3		Ge I	1602.9	100	A,Z	Cr III	1605.18	20	N
B I	1600.761	120	A	Na III	1602.91	100	N	Zn II	1605.196	10	Z
Mn III	1600.770	10		C I	1602.9715	200		Mn IV	1605.20	40	
C I	1600.821	5		Ni II	1602.973	20		Ni II	1605.217	4	
Ge I	1600.826	40	A	K XIII	1603.		F,P	Mn III	1605.22	3	
B I	1600.846	1	P	Sc III	1603.0637	180		Cl II	1605.2479	125	
Zn III	1600.858	80		Ar II	1603.075	400		Cu II	1605.2813	200	
Ne IV	1601.		F,P	Zn IV	1603.088	6		Fe II	1605.324	70	P
Sc XIV	1601.		F,P	Cu III	1603.134	300		Mn II	1605.33	0	
Ni III	1601.025	2		Fe IV	1603.181	520		Ni IV	1605.345	10	
Mn III	1601.045	5		Cr III	1603.19	300		Fe II	1605.41	1	P

Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes
Mn II	1605.467	60		Cu I	1607.001	100	A	Ge I	1608.711	20	A
Mn III	1605.545	40		Mn III	1607.003	20		Co III	1608.777	5	N
Ni IV	1605.549	280		Cr V	1607.035	40		Co V	1608.81		P
Cu I	1605.623	1	A	V II	1607.046	4		Zn II	1608.819	70	N
Cu I	1605.658	1	A	Fe V	1607.1		F, P	Zn III	1608.829	40	Q
Mn III	1605.67	20		Mg IV	1607.108	320		Fe IV	1608.855	150	
Fe IV	1605.678	520		Cu I	1607.140	150	A	Co III	1608.864	5	
Cu I	1605.694	2	A	Ar II	1607.180	100		Cu I	1608.887	300	A
Cu I	1605.736	3	A	Mn III	1607.263	30		Kr II	1608.902	4	
Ni II	1605.744	35		Cu I	1607.290	200	A	Si I	1608.9157	25	
Al III	1605.766	700		V II	1607.294	5		Co III	1608.950	5	N
Cu I	1605.776	4	A	Al IV	1607.31	1		Ge I	1608.987	20	A
Ni II	1605.795	3	N	Cu IV	1607.317	700	N	Fe IV	1609.003	375	
Cu I	1605.820	5	A	Mn II	1607.37	2		Cr III	1609.01	30	N
Si I	1605.8370	20		Fe IV	1607.402	50		Mn III	1609.02	20	
Cu I	1605.864	6	A	Co III	1607.410	5		Zn	1609.043	20	N
Fe II	1605.865	1	P	Cu I	1607.454	215	A	Ti II	1609.043		P
Ni II	1605.910	60	N	Ni II	1607.477	1	N	Fe IV	1609.100	900	
Cu I	1605.915	7	A	Ni IV	1607.505	10	N	Si V	1609.11	80	
Cu III	1605.960	200		Mg IV	1607.514	200		Fe II	1609.168	2	P
Cu I	1605.969	8	A	Cu III	1607.524	100		Mn III	1609.172	500	
Fe IV	1605.970	700		Cu III	1607.559	100		Cu I	1609.232	310	A
Co II	1605.987	30		Cr III	1607.57	10		Si V	1609.28	80	
Ge I	1605.999	22	A	Cu I	1607.636	225	A	Ge I	1609.296	21	A
Ni XI	1606.		F, P	B I	1607.645		A, Z	Ni II	1609.343	1	
Al VII	1606.		F, P	Mn III	1607.658	0	N	Cr III	1609.35	200	N
Fe III	1606.006	200	P	Mn II	1607.67	5		Ni IV	1609.352	20	Q
Fe II	1606.010	1	P	Fe III	1607.727	600	P	Zn II	1609.390	10	Z
Cu I	1606.024	9	A	Si V	1607.73	40		Si V	1609.43	50	
Kr II	1606.026	4		B I	1607.733		A, Z	Ni II	1609.474	12	
Zn II	1606.082	60	N	B II	1607.76	10		Mn II	1609.50	30	
Zn	1606.083	25	N	Cr III	1607.78	20	N	Cu III	1609.597	100	
Cu I	1606.085	10	A	B I	1607.820		A, Z	Cu I	1609.619	320	A
Mn IV	1606.11	150		Fe V	1607.830	150		Ge I	1609.642	22	A
Cu I	1606.149	15	A	Cu I	1607.837	245	A	Zn	1609.725	15	N
V III	1606.17	25		Ni II	1607.849	20	N	Cu III	1609.748	200	
Cr III	1606.19	10		Ge I	1607.858	25	A	Cr III	1609.79	150	
Ar II	1606.197	300		Mn III	1607.884	30		F II	1609.798	10	
Cu I	1606.218	20	A	B I	1607.890		A, Z	Fe IV	1609.832	600	
Ge I	1606.226	35	A	Cr III	1607.92	30	N	Ni III	1609.876	100	
Zn	1606.255	20	N	Ni IV	1607.926	0		Cr III	1609.91	200	N
Ni II	1606.280	12	N	B I	1607.932		A, Z	Fe IV	1609.928	375	
Ge II	1606.29	2		Zn III	1607.950	10	Q	Fe V	1610.0		F, P
Cu I	1606.293	30	A	Fe II	1607.960	1	P	Ni III	1610.01		F, P
Fe IV	1606.333	200		Ni II	1607.987	3		Mn III	1610.010	20	
Cu I	1606.372	40	A	Fe II	1607.990	0	P	Ge I	1610.031	23	A
Ni IV	1606.415	20	Q	Ge I	1608.036	10	A	Fe IV	1610.041	375	
Cu I	1606.457	50	A	Cu I	1608.060	260	A	Mn III	1610.05	3	
Ni II	1606.469	30	N	As I	1608.07	3		Cu I	1610.059	330	A
Se I	1606.49	250	P	Ni II	1608.134	60		Cr III	1610.10	10	
Cr III	1606.490	60		Cu IV	1608.143	820		Ni II	1610.102	20	
Cu I	1606.549	60	A	Ni IV	1608.159	0	N	Sc III	1610.1945	150	
Cu III	1606.557	20		Ni II	1608.177	80		Mn III	1610.228	20	
Ni IV	1606.575	300		Mn III	1608.18	3		Si V	1610.29	40	
Al IV	1606.646	400		Cr III	1608.19	10	N	Cu II	1610.2964	5	
Cu I	1606.649	70	A	Ge I	1608.240	15	A	Ga I	1610.3		P, Z
Cr II	1606.67	20		Ni II	1608.244	4	N	Fe IV	1610.300	250	
Fe V	1606.675	50		Fe V	1608.26		F, P	Fe II	1610.314	2	P
V II	1606.685	6		Cu I	1608.306	275	A	Co II	1610.439	2	
Co V	1606.69		P	Ni II	1608.358	30		Ge I	1610.471	28	A
Ni II	1606.695	8		V III	1608.39	60		Fe IV	1610.472	520	
Cu III	1606.723	300		Co II	1608.402	15		V II	1610.487	2	
Ni II	1606.729	15	N	Zn III	1608.424	20		P V	1610.499	450	
Mn III	1606.755	1		C I	1608.438	70		Ni II	1610.532	18	
Cu I	1606.756	80	A	Ni II	1608.442	25		Ni III	1610.534	20	
Ge I	1606.776	39	A	Fe II	1608.451	160	P	Ge I	1610.553	25	A
Cu II	1606.8341	300		Ge I	1608.463	19	A	Cr III	1610.56	40	
Cu III	1606.850	40		Ge I	1608.512	30	A	Cu I	1610.561	340	A
Cu I	1606.873	90	A	Ne II	1608.512	30		Cu III	1610.570	150	
Ni II	1606.902	18	N	Zn II	1608.555	10	Z	Zn IV	1610.574	3	
Zn IV	1606.907	12		Cu I	1608.580	290	A	V II	1610.615	2	
Ar II	1606.926	400		Ni IV	1608.625	10		P I	1610.624	7	
C I	1606.960	50		Cu II	1608.6393	70		Ge II	1610.640	3	
Fe IV	1606.980	520		Zn	1608.680	30	N	Ni IV	1610.711	100	
Ni III	1607.000	5		Ni II	1608.708	1		Zn II	1610.743	30	Z

Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes
Se I	1610.75	100	P	Mn III	1612.78	2		Si I	1614.5665	30	
Ge I	1610.772	38	A	Fe IV	1612.798	375		Fe III	1614.611	70	
Mg IV	1610.799	140		Fe II	1612.806	135	P	Zn	1614.629	10	N
Si I	1610.829	5	A	Co II	1612.853	5		Si I	1614.6309	25	
Zn III	1610.832	30		Ge I	1612.866	10	A	Fe IV	1614.645	520	
Fe IV	1610.850	200		Zn	1612.937	15	N	P I	1614.658	25	
Ge I	1610.875	40	A	Ge I	1612.940	25	A	Ge I	1614.786	40	A
Cr III	1610.88	10		Ge I	1612.959	30	A	Ge I	1614.803	40	A
Fe II	1610.923	90	P	Ni III	1612.966	1		As I	1614.82	5	
Mn I	1610.940	10	A,Z	Ge I	1612.976	50	A	Ni II	1614.824	30	N
Zn III	1610.968	40		V II	1613.016	0		P I	1614.853	7	
Na III	1610.97	80	N	Cr III	1613.02	10	N	V II	1614.871	5	
Ge I	1610.972	30	A	Sc	1613.11	300	N	Zn III	1614.895	8	
Cl II	1611.0049	140		Ni II	1613.132	2		Ni II	1614.911	90	
Fe IV	1611.037	12		Mn I	1613.137	150	N,A	Mn III	1614.944	45	
Ni II	1611.061	8		Cr IV	1613.14	20		Fe IV	1615.005	520	
Ni II	1611.079	6		Fe II	1613.183	2		Mn II	1615.050	2	
Cr III	1611.08	100		F III	1613.186	60		P IV	1615.078	150	
Mn IV	1611.10	700		V II	1613.20	150		Fe IV	1615.103	110	
Cu II	1611.1181	2		Zn III	1613.201	15		Cl II	1615.1372	125	
Cu I	1611.136	360	A	Ge I	1613.204	10	A	P IV	1615.162	150	
Fe II	1611.201	40	P	Ni II	1613.216	60		Cu I	1615.2		F,P
Fe IV	1611.202	520		Ni IV	1613.273	10		Cr III	1615.21	10	
Mg IV	1611.215	300		Fe II	1613.29	1	P	Mn II	1615.22	1	
Ni II	1611.238	2	N	Ge III	1613.3	20	P	Ge I	1615.230	40	A
P I	1611.281	25		Fe IV	1613.326	110		Ge I	1615.260	10	A
Se I	1611.29	100	P	Fe II	1613.357	1	P	P I	1615.318	7	
P IV	1611.300	40		C I	1613.378	80		Ge II	1615.332	3	
Cr V	1611.330	40		V II	1613.40	5		Zn IV	1615.345	8	
Zn	1611.340	12	N	Ni IV	1613.476	0	N	P IV	1615.382	1	
Ni II	1611.390	25	N	Cu I	1613.479	420	A	Fe V	1615.41		F,P
Ge I	1611.458	10	A	Mn II	1613.50	1		Ni II	1615.459	120	
Zn II	1611.501	5	N	Ge I	1613.569	35	A	Ge I	1615.568	40	A
Mn III	1611.521	35		Mn II	1613.62	3		Ni III	1615.597	2	
Fe II	1611.540	2	P	Fe IV	1613.643	520		Fe IV	1615.609	450	
Ge I	1611.543	35	A	Mn III	1613.656	20		Ti II	1615.616		P
Sc IV	1611.550	5		Fe II	1613.722	2	P	Ge I	1615.633	35	A
Cr III	1611.57	10	N	Zn III	1613.728	20	Q	P IV	1615.681	4	
Ni IV	1611.570	20		Ge I	1613.745	12	A	Ni II	1615.704	9	N
Mn II	1611.61	5		Na III	1613.77	160	N	Ge I	1615.709	40	A
Co IV	1611.7		F,P	Ge I	1613.797	30	A	Mn II	1615.79	60	
Fe X	1611.70	0	F	C I	1613.804	80		P I	1615.803	60	
Fe III	1611.726	450	P	Ni II	1613.820	20		Ar II	1615.807	50	
Ge I	1611.735	32	A	Ge I	1613.831	35	A	Cu I	1615.834	460	A
Fe III	1611.772	450	P	Kr II	1613.853	4		Na IV	1615.922	550	
Cu I	1611.800	375	A	Kr II	1613.898	10		Ge I	1615.922	28	A
Al III	1611.814	100		Zn	1613.938	25	N	Ge I	1615.942	20	A
Zn II	1611.866	25	N	Zn II	1613.938	25	N	Si I	1615.9488	50	
Al III	1611.874	800		Fe II	1613.944	1	P	Zn II	1615.949	1	Z
V IV	1611.879	80		Mn I	1613.944	500	N,A	Si I	1615.990	5	A
As II	1611.927	225		Na IV	1613.948	450		Ge I	1616.009	22	A
Ni II	1611.927	2	N	Ni II	1613.949	1	N	Cr III	1616.040	90	
Fe IV	1611.988	150		Mn V	1613.984	600		Fe IV	1616.130	150	
Cr III	1612.07	30	N	Fe IV	1613.991	600	P	Cu III	1616.161	50	
Ni IV	1612.071	600		Cr III	1614.04	100	N	N V	1616.185	100	P
Fe II	1612.099	2	P	Fe IV	1614.049	100	P	P I	1616.202	80	
Ge I	1612.112	10	A	Ni IV	1614.119	10		Mn I	1616.308	250	A,Z
Co IV	1612.14	200	P	Ge I	1614.137	10	A	Fe II	1616.326	1	P
Mn II	1612.15	10		Mn III	1614.144	800		Zn II	1616.364	30	Z
Ni II	1612.163	1		Cu II	1614.1608	1		Ni II	1616.387	15	
Ni III	1612.165	30		Cr III	1614.17	80	N	Cu IV	1616.414	700	
Ge I	1612.199	45	A	Fe V	1614.186	100		Al II	1616.415	10	
Ni IV	1612.230	230		P I	1614.199	25		N V	1616.426	150	P
Co V	1612.35		P	Ni II	1614.218	2	N	As I	1616.44	6	
Ge I	1612.393	30	A	Zn	1614.235	25	N	Ni II	1616.456	2	N
Mn V	1612.4		F,P	Kr II	1614.274	60		Ge I	1616.518	40	A
Ni II	1612.450	20		Fe V	1614.28		F,P	Ni II	1616.536	25	
Ni III	1612.474	10		Zn II	1614.364	10	Z	Si I	1616.5794	70	
Fe IV	1612.550	375		Zn II	1614.432	8	N	Cu III	1616.605	200	
Cr III	1612.57	10	N	Zn	1614.468	30	N	Fe II	1616.652	20	P
As I	1612.57	4	N	S XI	1614.47	0	F	Cr III	1616.661	10	
Cu I	1612.573	390	A	Ni II	1614.495	10	N	Fe IV	1616.682	800	
Fe IV	1612.599	200		C I	1614.522	50		Cu I	1616.7		F,P
Zn III	1612.688	10		Cu I	1614.552	440	A	Zn II	1616.729	5	Q,Z
Ni III	1612.730	30		Mn II	1614.56	5		Co II	1616.734	2	

Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes
Ni IV	1616.747	10		Zn II	1618.968	40		As I	1620.94	5	N
Mn II	1616.79	5		Mn V	1618.970	100		Ni II	1620.946	1	
Mn I	1616.804	150	N,A	Cl II	1618.9917	185		V III	1621.01	40	
Si V	1616.81	40		Ge III	1619.0	5	F,P	Sc II	1621.014	4	
Ni II	1616.917	25		Fe IV	1619.025	600		Mn V	1621.026	1000	
Cu I	1616.924	20	A,Z	Si I	1619.0458	8		Ge II	1621.03	100	Z
Ar II	1616.972	100		Fe IV	1619.141	300		Ge III	1621.1	10	P
Ni II	1616.993	2		P I	1619.162	1		Cr III	1621.10	30	N
Ni XI	1617.		F,P	V II	1619.18	100		Fe IV	1621.155	520	
Fe V	1617.039	100		Ni II	1619.193	1		Se I	1621.24	150	P
Ge I	1617.043	35	A	B V	1619.205		P	Fe II	1621.252	10	P
Ni II	1617.088	50	N	Ge I	1619.208	40	A	Sc II	1621.267	1	
Ni IV	1617.113	30	N	Zn II	1619.269	80	N	Mn III	1621.284	1	
Ni II	1617.144	40	N	Cu I	1619.282	510	A	Ge I	1621.293	10	A
Mn III	1617.163	5		Ge I	1619.287	10	A	Cu I	1621.296	20	A,Z
Fe III	1617.171	70		Ni IV	1619.297	20		P I	1621.320	25	
Fe II	1617.187	1	P	Cl II	1619.3179	100		Al V	1621.36	10	
Ni IV	1617.225	20	Q	Fe II	1619.342	2	P	Fe IV	1621.362	300	
Ge I	1617.226	50	A	Cr III	1619.359	25		Ge I	1621.382	40	A
Cr III	1617.23	20	N	Mn V	1619.366	700		Cu II	1621.4256	300	
Ge I	1617.253	30	A	Cl II	1619.3922	50		Ni II	1621.460	40	
Fe IV	1617.269	150		Ni II	1619.395	6		Zn II	1621.552	40	
Ni II	1617.299	40		Ni III	1619.414	20		Zn III	1621.552	40	
Mn II	1617.34	4		Ge I	1619.525	12	A	Fe IV	1621.570	600	
V II	1617.35	100		Fe II	1619.526	0	P	Cr III	1621.60	10	N
Se I	1617.38	200	P	Si I	1619.5266	15		Cu I	1621.642	540	A
Cl IV	1617.38	100	P	Ni II	1619.607	7	N	Al IV	1621.68	350	
Cu I	1617.384	485	A	Zn III	1619.616	80		Fe II	1621.686	160	P
P I	1617.434	7		N V	1619.617	100	P	Ge I	1621.714	25	A
Cr III	1617.475	90		Mn III	1619.62	40		Cu III	1621.718	40	
Ge I	1617.489	18	A	Ni III	1619.642	30		Ni III	1621.830	50	
Fe V	1617.6		F,P	Fe II	1619.644	0	P	Si I	1621.838	1	A
Mg IV	1617.627	100		Ge II	1619.74	1		P I	1621.848	7	
Zn II	1617.675	40	Z	N V	1619.743	150	P	Fe IV	1621.854	375	
Ni IV	1617.678	30	N	B V	1619.785		P	Fe II	1621.867	5	P
Fe IV	1617.682	600		C V	1619.80		P	Cr III	1621.87	30	N
Cr III	1617.72	5		Ni II	1619.857	20	N	Ni II	1621.880	6	
Cu III	1617.73		F,P	Ge III	1619.9	10	N	Ni II	1621.926	18	
Mn III	1617.760	200		Sc II	1619.926	10		Na II	1621.940	12	Q
Ge I	1617.769	20	A	Cr III	1619.94	100		Ni III	1621.942	50	
Al IV	1617.81	400		V III	1619.95	5		Zn II	1621.951	15	Z
P IV	1617.833	4		Ni II	1619.964	6		N V	1621.966	35	P
Cr III	1617.90	10	N	B V	1619.970		P	Co II	1621.985	5	
Ge I	1617.911	15	A	Ni II	1619.989	5	N	P I	1622.058	15	
Cu II	1617.9154	8		Ge III	1620.0	10	F,P	Ni II	1622.106	80	N
Ni IV	1617.924	20	N	Mn I	1620.029	8	A,Z	Fe IV	1622.126	150	
Al IV	1617.93	200		Co III	1620.051	2		Fe II	1622.146	1	P
Si I	1618.0054	8		Fe II	1620.061	2	P	Ni II	1622.164	2	N
Fe V	1618.057	70		C III	1620.07	300		Na II	1622.347	12	
P I	1618.098	40		Cr III	1620.084	25		Cu II	1622.4278	100	
Ni III	1618.127	15		Fe V	1620.087	150		V II	1622.432	3	
Ge I	1618.174	30	A	Fe II	1620.149	1	P	V III	1622.45	10	
Fe IV	1618.225	150		Zn IV	1620.165	40		Fe II	1622.464	1	P
Mn II	1618.34	2		Co II	1620.201	3		Zn III	1622.509	100	
Fe V	1618.383	30		Co III	1620.254	3		P I	1622.514	7	
Al II	1618.399	50		C III	1620.33	200		Cr V	1622.607	40	
Cu I	1618.4		F,P	Ni II	1620.331	18		Co II	1622.661	0	N
Cu III	1618.406	50		Si I	1620.4049	60		Mn I	1622.697	200	N,A
Fe II	1618.468	160	P	Fe V	1620.42		F,P	P I	1622.719	7	
Co III	1618.491	5	N	Ni II	1620.428	1		Ge I	1622.746	25	A
P I	1618.497	0		Cr III	1620.44	10	N	Ge I	1622.758	20	A
Na IV	1618.570	650		Ni III	1620.443	100		Se I	1622.76	100	P
Fe IV	1618.571	300		Mn III	1620.472	15		Ni IV	1622.765	10	N
P III	1618.632	150		Cu I	1620.5		F,P	Ca I	1622.781		A,Z
Mn III	1618.689	1		C III	1620.59	10		Ni II	1622.796	20	
Ge I	1618.738	38	A	Ge III	1620.6	10	P	Zn	1622.829	15	N
Ti II	1618.782		P	Mn III	1620.602	1000		Cl IV	1622.86	200	
Mn V	1618.8		F,P	Ge I	1620.646	35	A	Si I	1622.8806	90	
Ni III	1618.801	20		P I	1620.652	3		Si III	1622.892		
Mn I	1618.906	120	N,A	C III	1620.68	100		Si III	1622.913		
P III	1618.907	200		Sc II	1620.738	4		Co III	1622.923	3	N
P I	1618.927	40		Cr III	1620.76	10	N	Ni II	1622.923	1	N
Ni II	1618.950	20		Cu III	1620.774	15		Ni II	1622.981	1	
Fe II	1618.955	0	P	Ni II	1620.842	3	N	Ni VI	1623.0		F,P
Fe II	1618.961	2	P	Fe IV	1620.912	450		Cr III	1623.01	10	

Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes
Si III	1623.055			P I	1625.378	80		Mn III	1627.467	10	
Ge I	1623.056	45	A	Fe IV	1625.395	80		Co II	1627.481	3	
Fe II	1623.092	110	P	Ge I	1625.480	35	A	Mg I	1627.514		A
Mn III	1623.122	10		Se I	1625.49	60	P	Al IV	1627.536	600	
Sc II	1623.137	10		Cu III	1625.496	30		Ge I	1627.604	50	A
Mn II	1623.14	40		Mg I	1625.50		A	Ni II	1627.656	4	
P IV	1623.155	1		Fe II	1625.522	135	P	V III	1627.67	150	
Cu II	1623.1732	20		Si I	1625.5320	35		Fe V	1627.7		F,P
Cu I	1623.2		F,P	Fe V	1625.54		F,P	P I	1627.738	15	
As I	1623.26	2		Ge I	1625.591	25	A	Fe V	1627.74		F,P
F III	1623.294	150		Al II	1625.627	125		Mn III	1627.743	20	
Si I	1623.3663	8		Si I	1625.7051	70		Si I	1627.7459	30	
Fe IV	1623.385	520		Fe II	1625.711	0	P	Ni III	1627.751	3	
F III	1623.402	250		P IV	1625.719	60		Mn I	1627.760	100	N,A
Ca I	1623.464		A,Z	Cr III	1625.78	10	N	Cr III	1627.80	20	N
Zn II	1623.479	40	Z	P I	1625.786	130		Mg I	1627.82		A
Sc II	1623.480	10		Fe IV	1625.788	80		P I	1627.847	25	
Si I	1623.4971	10		Mg I	1625.81		A	Ca I	1627.92		A,Z
Fe IV	1623.532	520		Mn II	1625.89	10		P IV	1628.065	1	
B II	1623.582	450		Fe II	1625.912	70	P	Cu III	1628.085	100	
S IV	1623.62	50		V III	1625.92	50	N	Mn III	1628.089	40	
Ni III	1623.622	35		Zn III	1626.009	1		Mg I	1628.104		A
O VII	1623.63	100		P I	1626.065	3		Ni II	1628.126	15	
Fe II	1623.707	10	P	Fe V	1626.077	100		Ti II	1628.148		P
Sc II	1623.723	10		Ge I	1626.079	40	A	Fe IV	1628.217	80	
V III	1623.73	15	N	Mg III	1626.093	4		Ge I	1628.218	20	A
Ge I	1623.754	15	A	Ni III	1626.096	100		Cu III	1628.290	300	
B II	1623.771	300		Cu III	1626.130	300		Fe III	1628.304	200	
Ni IV	1623.801	10	N	Mg I	1626.151		A	Cr III	1628.381	150	
P I	1623.819	60		Ni II	1626.161	12	N	Mg I	1628.46		A
Mn III	1623.911	300		Zn II	1626.200	3	Z	Cu I	1628.466	460	A
Se I	1623.94	50	P	Fe IV	1626.270	375		Zn	1628.470	20	N
Kr II	1623.948	25		Se I	1626.29	120	P	Cu I	1628.485	460	A
Fe IV	1623.964	50		Ni II	1626.309	20		Ni II	1628.497	10	
P I	1623.987	15		Ni II	1626.320	15		Ge I	1628.534	18	A
S IV	1624.00	200		Cr III	1626.33	100	N	Fe IV	1628.535	520	
Sc II	1624.008	30		Ge I	1626.338	30	A	Cr III	1628.58	10	N
Sc II	1624.011	30		Mg I	1626.36		A	Al IV	1628.58	50	
B II	1624.018	600		Ni II	1626.366	6		Ni VI	1628.7		F,P
Zn II	1624.020	30	Z	Na II	1626.372	20		Fe II	1628.722	1	P
Na III	1624.07	240	N	Cu III	1626.405	300		Ni II	1628.726	15	N
Ni II	1624.084	60		Ge I	1626.431	35	A	Ni IV	1628.757	30	
Ge I	1624.1300	2		Fe II	1626.443	1	P	Co II	1628.775	10	
Mg IV	1624.136	120		Fe IV	1626.470	700		Mg I	1628.786		A
B II	1624.16	400		Mn I	1626.529	100	A,Z	Ni II	1628.810	20	
Ni II	1624.172	20		Mg I	1626.549		A	Ar II	1628.825	100	
Fe III	1624.206	150		Co V	1626.57		P	Se I	1628.84	60	P
Ni III	1624.220	20		Co II	1626.699	5		Fe II	1628.881	1	P
Ge I	1624.227	32	A	Cu I	1626.7		F,P	Se I	1628.89	20	P
Fe V	1624.251	200		P I	1626.744	0		N II	1628.896	20	
Zn II	1624.262	2	Q,Z	Mg I	1626.79		A	Fe IV	1628.898	80	
B II	1624.340	450		Mn I	1626.818	300	A,Z	N II	1628.922	33	
Fe V	1624.40		F,P	Cr II	1626.85	50		P IV	1628.932	25	
P I	1624.420	7		Mn III	1626.885	0		Cr III	1628.98	100	N
Ni II	1624.435	0	N	Fe II	1626.894	1	P	Ni III	1629.000	25	
Ni IV	1624.524	150		Fe IV	1626.903	600		Fe IV	1629.045	250	
V III	1624.53	0		Ni II	1626.961	12		N II	1629.079	100	
Ge I	1624.548	28	A	Co V	1626.97		P	Se I	1629.10	60	P
Cu I	1624.625	560	A	Mn III	1626.99	6		Ge I	1629.100	35	A
P I	1624.654	15		Mg I	1627.000		A	Mn III	1629.117	400	
Ni II	1624.773	16		Fe II	1627.020	1	P	Ge I	1629.142	45	A
Ge I	1624.794	45	A	Si I	1627.0498	20		Zn III	1629.157	100	
Fe IV	1624.918	375		Ar II	1627.085	20		Co III	1629.157	1	N
Fe IV	1625.025	12		Fe II	1627.130	2	P	Fe II	1629.160	135	P
Fe IV	1625.098	50		Mn III	1627.200	3		P I	1629.165	100	
As I	1625.17	1		Fe IV	1627.237	200		S IV	1629.20	200	
Ni VI	1625.2		F,P	Cr III	1627.25	30	N	Mg I	1629.21		A
Mg I	1625.22		A	Mg I	1627.27		A	Co II	1629.273	2	
Se I	1625.23	70	P	Fe IV	1627.319	110		Ni II	1629.282	100	
Ni II	1625.233	25	N	N II	1627.349	33		Fe IV	1629.294	375	
Fe V	1625.264	250		N II	1627.376	100		Cu III	1629.313	20	
Mn II	1625.28	10		Fe II	1627.382	30	P	Fe II	1629.371	40	P
Ni II	1625.288	2		Ni II	1627.396	12		Si I	1629.404	15	A
Cr III	1625.32	30		P I	1627.435	15		Si I	1629.439	50	A
Mn II	1625.35	20		Fe IV	1627.451	300		Ni II	1629.445	11	N



Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes
Cr III	1629.56	100		Fe IV	1631.664	200		Ni IV	1634.246	50	
As II	1629.565	0		Cr III	1631.68	20		As II	1634.298	4	
Mg I	1629.579		A	Mg I	1631.7			Fe II	1634.350	70	P
Ge I	1629.585	55	A	As II	1631.725	0		Kr II	1634.396	40	
P I	1629.589	60		Ni III	1631.754	2		Zn II	1634.404	3	Q,Z
Ni II	1629.591	70		Cr III	1631.89	20	N	Mg I	1634.515		A
Mg I	1629.6		P	Ga I	1632.0		P,Z	Si IV	1634.607	70	
V III	1629.64	125		Zn I	1632.002	10		Cr III	1634.61	10	
Co III	1629.666	5		Kr II	1632.037	4		Mg I	1634.7		
Ni II	1629.718	1		Fe IV	1632.079	450		Ca I	1634.720		A,Z
Mn III	1629.775	20	P	Mn II	1632.10	2		Fe IV	1634.758	300	
V VI	1629.786	160		V II	1632.135	0		V II	1634.783	6	
N II	1629.832	10		Ni II	1632.152	15		Ge I	1634.873	12	A
Ar II	1629.834	100		Ni III	1632.166	100		V II	1634.98	0	
Mn II	1629.84	20		Ni II	1632.171	30		N II	1634.996		P
Kr II	1629.867	120		Zn III	1632.171	2		Mn III	1635.017	30	
Mn II	1629.94	10		Cu III	1632.176	3		Ni II	1635.070	30	
Si I	1629.9477	100		Fe IV	1632.209	50		Co VI	1635.1		F,P
Mn III	1629.997	150		Fe II	1632.307	5	P	Cr III	1635.10	100	
Mn II	1630.00	7		Cu I	1632.323	10	A,Z	P IV	1635.128	4	
Sc II	1630.005	30		Co II	1632.326	10		Zn II	1635.180	20	Z
Ca I	1630.105		A,Z	V II	1632.343	5		Ge I	1635.2590	2	
Fe IV	1630.110	375		Zn II	1632.390	15	Z	Zn II	1635.277	20	Z
Zn II	1630.119	25	Z	Fe IV	1632.404	600		Ni II	1635.340	100	
Ni III	1630.120	3		Ni II	1632.416	1	N	Fe IV	1635.396	375	
Ni II	1630.130	20	N	P I	1632.466	7		Fe II	1635.401	110	P
Ge I	1630.1733	2		Ni II	1632.488	6		Cr III	1635.48	100	
Fe IV	1630.183	520		Mn III	1632.538	20		Co III	1635.521	5	
Fe II	1630.189	2	P	Co II	1632.609	1		Mn III	1635.597	20	
Fe IV	1630.266	50		Ca I	1632.616		A,Z	Ni IV	1635.703	130	
Cu II	1630.2681	20		Cr III	1632.62	100		Ge I	1635.709	20	A
Ni III	1630.30		F,P	Zn III	1632.626	10		Ni III	1635.717	5	
Mn III	1630.300	0	P	Fe II	1632.667	55	P	P III	1635.766	60	
Ni II	1630.356	10		Co II	1632.727	2		P I	1635.777	40	
Cu III	1630.356	75		Ni III	1632.79		F,P	Fe IV	1635.797	250	
Fe IV	1630.363	300		Cr III	1632.85	20	N	Se I	1635.80	10	N
Co II	1630.457	3		Mg I	1632.924		A	Fe II	1635.810	2	Q
As I	1630.48	4		Ni II	1632.960	2		V II	1635.86	200	
Ni IV	1630.489	120		Ge I	1632.981	15	A	Sc II	1635.880	30	
Mg I	1630.509		A	V IX	1633.		F,P	Mg III	1635.946	4	
Zn III	1630.546	5		Fe IV	1633.065	300		Zn II	1635.974	2	Q,Z
Mg I	1630.6			Mg I	1633.1		P	Se IV	1636.0	20	
Ni III	1630.602	5		Cr III	1633.17	20	N	V II	1636.02	400	
Ti V	1630.613	80		Ni II	1633.189	4	N	Ni II	1636.068	1	N
Fe IV	1630.679	375		Ca I	1633.222		A,Z	Ge I	1636.083	45	A
V II	1630.717	5		Si I	1633.224	30	A	Mn III	1636.163	60	
V III	1630.72	10		Cu III	1633.239	8		P I	1636.199	40	
V II	1630.82	200		Ge I	1633.312	45	A	Ni II	1636.231	4	
Fe V	1630.841	1		Si I	1633.3277	40		Ge I	1636.313	60	A
Mn III	1630.868	0	P	Co II	1633.370	0	N	Fe II	1636.331	110	P
Cr III	1630.94	100	N	Br I	1633.404	950		Sc II	1636.346	4	
Cr V	1630.989	110		Ge I	1633.468	2		Cr III	1636.35	200	N
Ni VI	1631.0		F,P	Mn III	1633.51	20		V III	1636.45	50	
Ni II	1631.024	25	N	V II	1633.51	250		Mg I	1636.465		A
Fe IV	1631.077	900		Cu I	1633.537	460	A	Ni II	1636.488	3	
Fe II	1631.128	110	P	Ni IV	1633.555	0		Mn III	1636.559	3	
Ca I	1631.144		A,Z	Cu I	1633.583	460	A	Mg I	1636.6		
Si I	1631.170	35	A	Cr III	1633.60	20	N	Cu II	1636.6050	10	
Ni II	1631.182	12		Ni II	1633.625	10		Cr III	1636.69	10	N
Cu I	1631.2		F,P	Co II	1633.632	3		V III	1636.72	25	
Sc II	1631.330	4		Na III	1633.64	80	N	Mn II	1636.75	25	
Zn II	1631.364	20	Z	P I	1633.677	15		V III	1636.77	5	
Ni IV	1631.376	100		As I	1633.71	5		Al IV	1636.822	500	
Fe IV	1631.421	50		Sc II	1633.722	10		Mn II	1636.87	15	
Ni III	1631.479	2		Sc II	1633.749	10		Cu IV	1636.913	550	
Cr III	1631.49	20	N	Ti V	1633.780	110		Mn II	1636.96	6	
P IV	1631.499	4		Mn III	1633.800	500		Si III	1636.990	20	
Ge I	1631.533	25	A	Fe II	1633.909	90	P	Fe IV	1636.992	150	
Zn II	1631.539	12	Z	Ni III	1633.92		F,P	Si I	1637.0106	4	Z
Sc II	1631.557	4		Si I	1633.9851	90		As II	1637.033	0	
Fe IV	1631.558	250		Ni II	1633.988	35	N	V III	1637.05	10	
Mg I	1631.609		A	Fe IV	1634.006	520		Ni II	1637.072	20	N
Si I	1631.623	10	A	P I	1634.093	60		Si I	1637.128	5	A
Mn III	1631.638	0		Mn V	1634.1		F,P	Ni II	1637.140	2	
Zn III	1631.653	8		Cr III	1634.12	120		Fe V	1637.15		F,P

Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes
Cu I	1637.2		F, P	Fe IV	1640.039	800		Ni IV	1642.953	10	
Fe IV	1637.262	250		P I	1640.044	7		V III	1643.03	1000	
Ni II	1637.267	10	N	Ca I	1640.05		A, Z	V II	1643.03	300	
Co II	1637.302	10	N	Co II	1640.127	20		Cr III	1643.07	70	N
P III	1637.379	40		P I	1640.135	7		Mn II	1643.08	2	
Fe II	1637.399	110	P	V II	1640.15	350		Ge I	1643.1931	4	
Cu III	1637.41		F, P	Fe II	1640.152	110	P	Cr III	1643.20	100	N
Ni II	1637.439	100		Fe IV	1640.165	600		Ni II	1643.271	80	
V II	1637.439	10		Be IV	1640.224		P	Ni II	1643.334	20	
As II	1637.470	10		Si I	1640.267	1	Z	Cr III	1643.34	80	N
Ni II	1637.509	20		Be IV	1640.312		P	Cl IV	1643.40	100	
Ni IV	1637.511	20		Ar II	1640.343	100		Fe V	1643.427	2	
Zn	1637.529	25	N	He II	1640.345	333	P	V II	1643.43	300	
Cr III	1637.53	100	N	Ge I	1640.397	50	A	Se I	1643.43	150	P
V II	1637.55	50		Sc II	1640.416	50		Fe II	1643.578	90	P
Ni II	1637.589	300		Cu I	1640.436	480	A	O V	1643.617	250	P
Ni IV	1637.717	10	N	He II	1640.474	600	P	As II	1643.619	5	
V II	1637.77	500		He II	1640.490	70	P	O V	1643.718	200	P
Ge I	1637.791	30	A	As II	1640.491	1		Mn III	1643.729	30	P
Cr III	1637.90	100	N	Cu I	1640.518	480	A	Ca II	1643.770	200	
V II	1637.93	100		Fe V	1640.55		F, P	As I	1643.79	2	
Mn III	1637.974	2		P IV	1640.58	120	N	Cr III	1643.86	50	N
Kr II	1637.981	4		P I	1640.723	7		Ni II	1644.040	14	N
S	1638.	10	N	Ni II	1640.769	7		Cr V	1644.053	160	
Fe V	1638.0		F, P	Fe IV	1640.782	300		Ge I	1644.118	40	A
Fe IV	1638.070	450		Fe II	1640.856	20	P	Ni II	1644.137	6	
Cr III	1638.10	10	N	V II	1640.86	300		Al II	1644.235	100	
Ge I	1638.138	45	A	Mg IV	1640.892	180		As I	1644.33	5	
Zn II	1638.239	20	Z	Ni IV	1640.913	210		V II	1644.334	4	
Si I	1638.2823	2	Z	Cr III	1640.94	100		Ca II	1644.442	360	
Fe IV	1638.296	450		Al IV	1641.05	300		Ni III	1644.466	1	N
O VII	1638.30	60		S I	1641.085	7		Al IV	1644.47	200	
Ni IV	1638.482	0	N	Cr III	1641.09	50	N	Ge I	1644.526	40	A
Cr V	1638.495	285		Al IV	1641.20	200		Ca I	1644.540		A, Z
Mg IV	1638.522	80		Co II	1641.229	1		Cu III	1644.60		F, P
P I	1638.657	15		Zn III	1641.257	2		Ni IV	1644.629	20	
Cr III	1638.78	10		Fe IV	1641.292	30		Cr III	1644.652	150	
Kr II	1638.786	60	P	S I	1641.296	10		V II	1644.665	5	
Cu III	1638.788	8		Se IV	1641.3	35		Fe II	1644.756	2	P
Co II	1638.815	20	N	O I	1641.305			Se III	1644.8	10	
Kr III	1638.82	60		Ni II	1641.418	10		Al II	1644.809	100	
V II	1638.858	3H		Cu III	1641.419	1		Zn III	1644.820	100	
P I	1638.884	25		Al IV	1641.55	50		Cr III	1644.882	90	
Mg I	1638.890		A	Cr III	1641.56	100		Mn III	1644.935	10	P
Cu III	1638.945	300		Fe IV	1641.600	300		Fe IV	1644.944	375	
Cl IV	1638.95	10		V III	1641.64	50		Ni IV	1644.951	360	
Ge I	1638.961	55	A	Fe II	1641.762	90	P	Fe II	1645.016	30	P
Ni II	1638.963	4		Cr III	1641.83	10	N	Mn III	1645.03	15	
P I	1638.975	7		Fe IV	1641.866	700		C III	1645.03	100	
Al IV	1639.055	800		Mg I	1641.957		A	Ge I	1645.1146	1	
P I	1639.075	40		Ni IV	1641.961	10		Cr III	1645.16	50	N
Mg I	1639.1			Mn III	1642.054	10		Mn II	1645.32	10	
V II	1639.13	400		Cr III	1642.16	100	N	Zn II	1645.389	50	Z
Co II	1639.263	10		Mg I	1642.2			As II	1645.590	1	
Zn III	1639.318	100		Cu III	1642.206	1000		Cu I	1645.6		F, P
Fe II	1639.401	110	P	Mn IV	1642.25	40		Ni II	1645.654	0	
Cr V	1639.403	220		Ni II	1642.299	20	N	Fe II	1645.707	1	P
Fe IV	1639.404	600		Ni II	1642.324	40		Fe V	1645.742	50	
O IV	1639.430	15		Ni II	1642.351	15	N	Mn III	1645.815	40	
Cr III	1639.46	10	N	Co II	1642.396	3		Ge I	1645.839	28	A
Fe II	1639.609	2	P	Fe II	1642.427	10	P	P III	1645.886	25	
Ge I	1639.638	60	A	Co II	1642.468	5		Mg I	1645.921	0	A
Ge I	1639.7300	6		Fe II	1642.496	10	P	Co III	1645.986	30	
Cu IV	1639.754	910		Ti II	1642.633		P	Ni XI	1646.		F, P
Fe V	1639.794	10		Ni II	1642.670	5		Ge I	1646.108	15	A
Ni IV	1639.820	20		Ni II	1642.739	2		Cr III	1646.15	70	
Ge I	1639.828	40	A	Mn III	1642.762	30	P	Al IV	1646.15	200	
O IV	1639.842	10		Fe IV	1642.786	375		Fe II	1646.185	110	P
O VII	1639.87	20		Ni II	1642.792	2		Zn IV	1646.290	8	
Cr III	1639.90	20	N	Ca II	1642.802	40		Mg I	1646.3		
Cu III	1639.950	30		Mg III	1642.826	20		Fe II	1646.510	1	P
Be IV	1639.959		P	Ca I	1642.865		A, Z	Cr III	1646.56	20	N
As II	1639.979	5		Fe IV	1642.880	450		Mn III	1646.625	2	P
Ni II	1639.987	8	N	Mn II	1642.90	1		V III	1646.69	200	
Ni III	1639.996	25		Fe II	1642.927	2	Q	Na X	1646.90		P

Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes
K XII	1647.		F, P	Fe II	1650.065	0	P	Co V	1652.6		F, P
Cu I	1647.030	0	N	Fe IV	1650.091	150		Ni II	1652.726	10	N
Mn II	1647.07	1		Cu I	1650.133	510	A	Co III	1652.791	10	
Fe IV	1647.093	700		V III	1650.14	1000		Ni II	1652.839	15	N
Co III	1647.100	1		Cu IV	1650.156	190		Ni III	1652.866	300	
Ge I	1647.1222	2		F II	1650.200	1		Fe IV	1652.901	700	
Zn IV	1647.161	2		Zn II	1650.211	20	Z	Mn II	1652.91	10	
Fe II	1647.163	90	P	Ge I	1650.2945	4		Fe II	1652.911	0	P
Ca I	1647.188		A, Z	Cu I	1650.299	510	A	Na II	1652.921	20	
Fe IV	1647.241	375		As II	1650.319	1		Zn II	1652.931	5	Z
Ni IV	1647.251	20		P I	1650.393	3		P I	1652.980	25	
Co II	1647.266	1		V III	1650.40	75		Mn II	1653.00	2	
Kr III	1647.36	40		Ni II	1650.412	14		Cr I	1653.06	10	Z
Ni III	1647.484	1	N	Ar II	1650.535	100		Li II	1653.076	150	
Mn III	1647.497	250	P	Mn IV	1650.57	300		Ni III	1653.119	200	
P III	1647.513	90		Kr II	1650.630	25		Li II	1653.132	250	
As II	1647.527	10		Ni II	1650.636	4	N	Li II	1653.212	50	
Ge I	1647.5310	3		Na V	1650.654	20	Q	Fe V	1653.257	70	
Fe II	1647.546	30	P	Fe II	1650.704	70	P	Ar II	1653.322	100	
Zn II	1647.571	8	Z	Fe IV	1650.749	80		Ni II	1653.369	18	N
Ni II	1647.637	10	N	F III	1650.764	250		Si I	1653.3760	40	
Cr III	1647.71	5	N	Co V	1650.8		F, P	Cu III	1653.400	75	
Ca I	1647.711		A, Z	Ni II	1650.835	10		Fe II	1653.403	20	P
Zn II	1647.754	5	Z	As II	1650.842	0		Fe IV	1653.406	520	
Co II	1647.758	20	N	Fe V	1650.9		F, P	V III	1653.41	25	
Fe II	1647.758	5	P	Na III	1650.91	20	N	Mn III	1653.57	400	
Mn IV	1647.77	300		F III	1650.974	20		Fe IV	1653.643	80	
Al IV	1647.79	1		Ni IV	1651.012	0	N	P I	1653.663	25	
Mn III	1647.836	30	P	Mn II	1651.02	30		Ni II	1653.687	10	
Cl IV	1648.04	10		Si I	1651.0279	25		Zn III	1653.697	60	
V III	1648.10	75		Mg I	1651.163	10	A	Ni II	1653.779	10	N
Ge IV	1648.2	60	F, P	Mn III	1651.173	45		Mn III	1653.823	50	
Ni II	1648.353	3	N	Cl IV	1651.21	100		Mn IV	1653.83	750	
Cr III	1648.36	50	N	Cr III	1651.32	10	N	P IV	1653.891	40	
Mn III	1648.375	100		Mn III	1651.362	80	P	As I	1653.92	4	
Ni II	1648.381	1		Co V	1651.4		F, P	Fe II	1654.062	20	P
Fe II	1648.403	2	P	Ge I	1651.5288	3		Fe II	1654.114	10	P
Zn III	1648.406	2		Cr III	1651.56	100		V III	1654.14	25	
Cr III	1648.58	10	N	Fe IV	1651.578	700		P IV	1654.199	25	
F III	1648.608	6		Fe II	1651.615	10	P	Co II	1654.203	0	
P I	1648.689	3		Ni IV	1651.629	140		Cr III	1654.23	10	
Fe V	1648.743	10		Mn IV	1651.68	350		Fe II	1654.263	2	P
Mg III	1648.822	4		Ge I	1651.685	20	A	Fe IV	1654.291	200	
Fe IV	1648.902	150		Mg I	1651.7			Ge II	1654.46	75	Z
Ge I	1648.947	20	A	Cu I	1651.720	50	A, Z	Fe II	1654.478	30	P
V III	1648.99	100		Zn III	1651.739	100		Cu III	1654.559	300	
Fe IV	1648.993	250		Ni IV	1651.740	10	N	Ni II	1654.667	1	N
V VIII	1649.		F, P	Cu III	1651.754	50		Fe II	1654.670	2	P
Zn	1649.055	15	N	Co III	1651.783	0		Fe V	1654.744	150	
Fe II	1649.112	2	N	Mg IV	1651.837	40		Cr III	1654.79	10	N
Ni IV	1649.112	10		Cr III	1651.92	20	N	Ni IV	1654.843	0	N
Cr III	1649.13	50	N	Fe V	1651.927	15		Fe II	1654.91	0	Q
Co III	1649.153	5		Ge I	1651.9547	6		P IV	1654.918	25	
Fe IV	1649.189	250		Ca II	1651.991	320		Zn III	1654.950	5	
Ge II	1649.1942	500		Cu III	1652.003	500		Si I	1655.017	15	A
Ge I	1649.213	25	A	Co III	1652.024	5		Zn II	1655.020	30	Z
Co III	1649.265	200		Cr III	1652.08	50		Fe II	1655.028	10	P
Ca I	1649.289		A, Z	Co III	1652.182	5		Mn II	1655.04	1	
Co II	1649.303	100	N	Mg III	1652.218	12		Co II	1655.089	20	N
Fe II	1649.323	5	P	Zn II	1652.241	10	Z	P IV	1655.191	4	
Ni II	1649.396	13		Ti III	1652.256	1		Fe II	1655.253	1	P
Fe II	1649.426	55	P	Ni II	1652.270	13	N	Cu I	1655.318	100	A, Z
Cu II	1649.4575	25		F III	1652.288	3		Ni IV	1655.432	0	N
Mn III	1649.50	150		Ge I	1652.344	30	A	Na IV	1655.468	550	
Cr III	1649.51	150		Ni II	1652.355	3		Cr III	1655.48	70	N
Mn II	1649.52	1		Ni IV	1652.390	30	N	Fe II	1655.506	20	P
As I	1649.55	2	N	F III	1652.416	60		Cr V	1655.639	70	
Fe II	1649.576	90	P	Fe II	1652.44	0	Q	P I	1655.642	3	
P I	1649.704	7		Cr III	1652.46	150		Ni IV	1655.643	0	Q
Ti II	1649.706		P	Ni II	1652.477	3	N	Ni II	1655.749	1	N
Ni III	1649.771	100		Fe II	1652.489	0		N V	1655.876	40	P
Ca II	1649.858	600		Fe V	1652.531	15		Ni II	1655.903	0	
Ni II	1649.905	3		Zn III	1652.541	3		As II	1656.004	5	
Cr III	1649.93	40		Ge I	1652.551	18	A	Mn IV	1656.05	450	
Fe IV	1649.996	200		Cr V	1652.595	70		N V	1656.065	25	P

Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes
Fe IV	1656.106	520		P X	1659.		F,P	Co V	1662.3		F,P
Ni III	1656.126	250		Mg I	1659.0			Ni III	1662.311	1	
Fe II	1656.142	1	P	Fe IV	1659.012	375		Fe IV	1662.319	520	
Mn IV	1656.17	550		Co II	1659.062	30	N	Fe II	1662.358	2	P
Mn III	1656.245	150		Mg III	1659.244	12		V III	1662.41	15	
C I	1656.2665	350		Mn IV	1659.25	700	N	Ni II	1662.423	20	N
Cr XVII	1656.3		F	Cr III	1659.26	100	N	Fe II	1662.425	10	P
Cu II	1656.3219	20		V III	1659.27	50		Co II	1662.443	1	
P I	1656.333	15		Ge II	1659.29	3	P,Z	Ca I	1662.503		A,Z
Mn III	1656.334	150		Fe II	1659.327	0	P	Fe IV	1662.520	520	
Mn IV	1656.39	700		Co II	1659.378	0		Mn III	1662.533	3	
Ni IV	1656.392	60	N	Ni III	1659.438	10		B I	1662.608	50	A
Sc IV	1656.457	5		Fe II	1659.482	110	P	Zn II	1662.695	15	Z
Fe II	1656.461	5	P	Mn II	1659.50	0		Fe II	1662.722	1	P
Mn III	1656.510	3		Mn III	1659.602	100		Fe V	1662.742	10	
Fe IV	1656.649	700		Co III	1659.757	10		As I	1662.76	2	
Co II	1656.669	30	N	Kr III	1659.81	40		Mn III	1662.827	0	
As II	1656.704	50		Cr III	1659.82	30	N	Ge I	1662.890	30	A
Fe II	1656.743	2	P	Co II	1659.830	10		Ni II	1662.892	25	N
Fe II	1656.814	5	P	Fe V	1659.897	40		Mn III	1662.943	0	
Fe III	1656.831	150		V III	1659.94	25		Ge I	1662.9860	3	
Ni II	1656.840	3		Cu II	1660.0009	25		Cu II	1663.0020	60	
C I	1656.9282	300		Mn II	1660.06	10		B I	1663.031	100	A
Co II	1656.948	60	N	Fe IV	1660.101	600		Cr III	1663.051	25	
S	1657.	10	N	Cr III	1660.24	80	N	V III	1663.07	200	
C I	1657.0078	1000		Zn II	1660.247	4	Z	Fe II	1663.222	110	P
Co II	1657.028	80	N	V III	1660.25	50		Mg III	1663.287	4	
Fe II	1657.07	4	P	Mn III	1660.350	60		V II	1663.34	30	
Fe IV	1657.133	300		Fe II	1660.388	1	P	Zn III	1663.344	40	
Cr II	1657.18	10		Cr III	1660.44	10		Cu III	1663.431	3	
Mn III	1657.20	10		Si I	1660.4748	15		Co III	1663.500	3	
Fe II	1657.249	1	P	Mn II	1660.516	10		Ge I	1663.5393	10	
Ni II	1657.273	2	N	V II	1660.53	80		Fe IV	1663.542	520	
Ni II	1657.313	10		Fe V	1660.551	50		Ni II	1663.563	16	
Fe IV	1657.370	200		As II	1660.554	500		V II	1663.60	150	
C I	1657.3797	300		Cr III	1660.70	150	N	Mn II	1663.653	3	
Ni III	1657.39		F,P	Sc IV	1660.708	285		Fe II	1663.697	5	P
Co II	1657.400	20	N	Ge I	1660.7956	2		Cr III	1663.75	40	N
Cr III	1657.45	20	N	O III	1660.803	20		Fe II	1663.782	5	P
Fe II	1657.545	30	P	Fe II	1660.839	5	P	Fe II	1663.788	0	P
Fe IV	1657.667	150		Mn III	1660.846	20		V III	1663.82	150	
Cr IV	1657.71	40		Cu III	1660.885	100		Ni IV	1663.866	0	N
Zn IV	1657.790	5		Fe II	1660.886	15	P	Co IV	1663.9		F,P
Cu I	1657.8		F,P	Ti III	1660.935	25		Cr III	1663.926	90	
Fe IV	1657.824	450		Co V	1661.0		F,P	Fe II	1663.974	2	P
Co II	1657.835	10		Ni II	1661.018	20		K XIII	1664.		F,P
Mn III	1657.843	25		Cr II	1661.02	10		Cr III	1664.049	1	
Ni IV	1657.874	80		F III	1661.025	1		Co II	1664.058	10	
C I	1657.9070	300		Fe IV	1661.037	30		Mn III	1664.094	25	
Na II	1657.918	60		Fe V	1661.048	30		B I	1664.25	5	N
Co II	1657.933	30	N	Si II	1661.059	3	Z	Zn	1664.265	50	N
Cr IV	1658.083	450		Co II	1661.255	10		Cu I	1664.313	540	A
C I	1658.1222	350		V II	1661.27	600		Ni II	1664.316	10	
Co II	1658.190	8		Zn II	1661.306	2	Z	Zn II	1664.326	0	Z
Zn II	1658.245	60	Z	Mn IV	1661.32	350		Cr III	1664.35	150	
Fe IV	1658.247	375		Fe II	1661.324	30	P	Ni II	1664.384	2	
Ni IV	1658.292	0		Ge I	1661.3453	5		Ni II	1664.459	8	
Cr III	1658.30	20		Co V	1661.4		F,P	Fe IV	1664.471	200	
Mg I	1658.312	20	A	Co III	1661.422	10		Cr III	1664.491	4	
Kr II	1658.358	4		Be I	1661.478	1000		Si I	1664.5111	35	
Mn II	1658.37	3		Zn II	1661.495	4	N	Ni IV	1664.536	40	
Ge I	1658.3752	3		F III	1661.505			Cu I	1664.719	540	A
Co II	1658.377	20	N	Fe IV	1661.573	450		Mn IV	1664.73	750	
Ca I	1658.4		A,Z	Mn II	1661.576	0		B I	1664.76	5	N
Fe II	1658.401	10	P	Cr III	1661.58	20	N	Cu I	1664.819	1	F,A
V III	1658.42	200		V III	1661.62	15		Co II	1664.824	10	
Fe IV	1658.433	450		Si II	1661.633	1	Z	V II	1664.87	5	
Cu III	1658.457	300		V III	1661.73	15		Cr III	1664.90	10	
Cr III	1658.63	20	N	Ni III	1661.786	200		Fe IV	1664.928	200	
Mn III	1658.68	6		Cr III	1661.93	40	N	Ni IV	1665.040	170	N
Na III	1658.71	40	N	Fe V	1661.959	1		Zn	1665.072	20	N
Fe II	1658.772	90	P	Ni II	1662.063	3	N	Fe II	1665.133	1	P
Co II	1658.779	0	N	Ar II	1662.253	100		Cr III	1665.18	20	
Mg IV	1658.851	300		Zn III	1662.279	2		Co III	1665.269	50	
Cr IV	1658.93	120		V II	1662.28	5		Ge I	1665.2751	5	

Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes
Zn III	1665.352	6		Fe II	1668.535	0	P	P I	1671.070	200	
Ca I	1665.386		A, Z	Ni IV	1668.549	10		Si I	1671.1168	40	
V III	1665.40	200		Na II	1668.569	35		Mn III	1671.138	25	
Ni II	1665.477	4		Zn II	1668.585	1	Z	Se I	1671.15	250	
Cr III	1665.53	70	N	Na IV	1668.588	285		Co IV	1671.2		F, P
Cu III	1665.576	50		Co II	1668.655			Ni IV	1671.282	100	N
Cr III	1665.62	50		V III	1668.72	50		Zn II	1671.313	20	Z
Co V	1665.7		F, P	Mn III	1668.799	0		Cr III	1671.40	10	N
Mn III	1665.701	15		Ca XIX	1668.89		P	Mn III	1671.474	30	
V III	1665.71	250		Fe V	1668.926	200		Cu I	1671.483	12	A, Z
Ni III	1665.859	20	N	Cr III	1668.96	70		P I	1671.510	160	
Ni II	1665.860	1	N	Cl II	1668.9739	50		Ni II	1671.514	12	
Sc IV	1665.918	450		V III	1668.98	100		Co II	1671.557	1	
Fe II	1665.929	1	P	Fe II	1669.001	5	P	Co IV	1671.6		F, P
Cr II	1665.98	20		Fe II	1669.003	5	P	Ni IV	1671.659	20	
Ni II	1666.045	0		Mn III	1669.032	200		P I	1671.680	230	
Fe II	1666.06	0	Q	P III	1669.044	4		Zn III	1671.779	3	
Ni III	1666.102	20		Fe IV	1669.093	12		Cr III	1671.85	30	N
O III	1666.153	250		Ar III	1669.10	50		F III	1671.870	35	
Mn III	1666.277	115		V III	1669.20	15		Cu III	1671.873	250	
Co II	1666.316	40	N	Cu III	1669.267	40		As I	1671.88	2	N
Zn III	1666.342	5	Q	Cl II	1669.29			Na II	1671.886	35	
Si I	1666.3762	60		Zn III	1669.297	2		Mn III	1671.953	45	
Co II	1666.406	40		Ar III	1669.30	250		Fe IV	1671.990	150	
F III	1666.652	150		Ga II	1669.38	50		Mn IV	1672.00	600	
Cr IV	1666.66	100		Mn III	1669.404	200		Mn III	1672.009	10	
Fe II	1666.686	20	P	Zn II	1669.453	2	Z	Cr III	1672.03	10	N
S I	1666.6875	500		Mg I	1669.51			P I	1672.035	200	
V III	1666.76	10	N	Na III	1669.52	60	N	Zn III	1672.120	5	
Zn IV	1666.760	60		Co II	1669.541	10		Co III	1672.133	2	
Ni II	1666.828	4		Mg IV	1669.574	220		Ca I	1672.179		A, Z
Ni III	1666.828	20		Fe IV	1669.606	450		Fe IV	1672.211	300	
Cu III	1666.85		F, P	Cr III	1669.619	40		Ni III	1672.213	50	N
B I	1666.850	150	A	Fe II	1669.663	40	P	Na IV	1672.330	110	
Ge I	1666.866	20	A	Ni IV	1669.669	10	N	F III	1672.341	3	
Mn IV	1667.00	800		Ar III	1669.67	350		Fe II	1672.412	1	P
Fe IV	1667.000	110		Cl II	1669.67	220		Fe II	1672.427	0	P
V II	1667.084	1		Mn III	1669.691	2		Fe IV	1672.427	250	
Se II	1667.15	50		Zn III	1669.699	2		V II	1672.44	150	
Si II	1667.267	0	Z	Fe IV	1669.816	375		P I	1672.474	200	
B I	1667.272	200	A	Co II	1669.883	2		Sc II	1672.538	4	
Ni III	1667.28		F, P	Cr III	1669.97	150		Fe IV	1672.561	80	
Cr III	1667.337	40		V II	1670.01	100		Si I	1672.5961	80	
Cr III	1667.44	30	N	Ca I	1670.048		A, Z	Si IV	1672.612		
Co II	1667.534	10	N	Mn IV	1670.08	700		Ni IV	1672.632	0	N
Cr III	1667.621	250		As I	1670.12	2	N	Cr IV	1672.660	550	
Si I	1667.6288	70		Cu III	1670.130	200		Fe II	1672.675	0	P
Mn IV	1667.65	100		Cl II	1670.1742	170		Co II	1672.690	1	
V II	1667.66	100		Cr III	1670.27	50	N	Al IV	1672.722	20	
Mn III	1667.698	20		Mn III	1670.315	3		Cu II	1672.7757	10	
Fe IV	1667.752	150		F III	1670.388	500		P III	1672.850	25	
Ge I	1667.8015	6		Cr III	1670.45	150		Cu III	1672.850	5	
V II	1667.88	50		Zn III	1670.456	20		Fe IV	1672.858	450	
Zn II	1667.911	5	Z	Ca I	1670.502		A, Z	Ni IV	1672.946	0	N
Fe II	1667.913	55	P	Zn II	1670.563	4	Q, Z	Mn III	1672.974	200	
Cr III	1667.92	20		Ge I	1670.6085	9		Cr III	1673.00	20	
Ni II	1667.930	4		Zn II	1670.617	2	Z	Cr IV	1673.021	160	
Fe	1667.95	10	N	V III	1670.66	300		Zn III	1673.049	100	
Co VII	1668.		F, P	Fe IV	1670.711	150		Fe IV	1673.059	150	
V III	1668.03	300		Ne II	1670.737	20		Ar III	1673.14	50	
Co III	1668.032	5		Fe II	1670.746	150	P	Co II	1673.199	10	N
Mn III	1668.047	1		Fe IV	1670.782	50		V III	1673.23	10	
Ne II	1668.057	40		Al II	1670.787	400		Ar III	1673.24	150	
Mn III	1668.071	20		As I	1670.79	4	N	Si III	1673.315	140	
Fe IV	1668.089	520		Na IV	1670.79		N	Co III	1673.325	10	
Ni II	1668.122	1		Fe II	1670.790	70	P	Fe IV	1673.365	150	
Fe IV	1668.181	4		Cr III	1670.80	20	N	Ar III	1673.43	350	
Cl VII	1668.2		P	V II	1670.90	50		Cu I	1673.440	15	A, Z
Cr III	1668.24	100		Ni II	1670.935	7		Fe II	1673.464	110	P
Cr III	1668.33	80	N	Ge I	1670.9490	2		Cr III	1673.58	50	
Mn III	1668.387	20		Sc II	1670.971	1		Co IV	1673.6		F, P
Kr II	1668.416	1		Fe II	1670.991	30	P	P IV	1673.612	10	
Mg I	1668.419	50	A	Ge I	1671.0096	3		Na II	1673.649	15	
Fe IV	1668.426	200		Mn III	1671.015	200		Mn IV	1673.65	10	N
Si I	1668.5204	70		Fe IV	1671.041	600		Ni III	1673.659	10	

Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes
Co II	1673.662	0		Fe II	1676.361	10	P	Ni IV	1679.478	10	
Co III	1673.679	20		Si I	1676.408	1	A,Z	Co III	1679.481	5	
Fe IV	1673.683	520		Fe V	1676.441	150		Fe II	1679.494	30	P
Cr III	1673.784	150		Zn III	1676.443	20		Cr III	1679.537	200	
Co II	1673.793	3		Cu III	1676.452	100		Mn II	1679.55	60	
Mn III	1673.836	70		Co V	1676.5		F,P	Co III	1679.578	20	
Ge I	1673.850	1		Si I	1676.550	1	A,Z	V III	1679.64	5	
Ca II	1673.860	120		Ti II	1676.552		P	Mn III	1679.652	45	
Cr III	1673.867	90		Ni II	1676.671	2	N	Zn II	1679.667	5	Z
V III	1673.91	150		Zn III	1676.692	2		Co II	1679.674	0	
P I	1673.94	3	N	Fe IV	1676.784	450		Cr III	1679.691	1	
Co II	1673.956	20	N	Si I	1676.8207	15		P I	1679.695	410	
Co VII	1674.		F,P	Sc II	1676.828	1		Sc III	1679.824	5	
Ni II	1674.000	10		P I	1676.843	7		Cr III	1679.83	100	
V II	1674.09	80	N	Fe II	1676.856	70	P	Mg IV	1679.960	360	
Ni IV	1674.105	0	N	Mn III	1676.95	30		Ge I	1679.9868	2	
P III	1674.184	25		Cr III	1676.955	150		S	1680.	10	N
Fe II	1674.188	5	P	Si I	1677.054	1	A,Z	Ca II	1680.051	200	
Fe II	1674.256	55	P	Kr II	1677.058	40		Ca II	1680.129	20	
Ge I	1674.2703	9		P III	1677.083	60		Co II	1680.187	20	N
Ne II	1674.290	60		Fe IV	1677.124	450		V V	1680.204	1000	
Zn III	1674.291	12		V III	1677.18	25		Cu II	1680.3118	1	
Mn III	1674.408	3		Zn III	1677.216	5		Si I	1680.322	1	A,Z
Cr III	1674.439	1		Si I	1677.247	1	A,Z	Fe II	1680.36	1	P
Fe II	1674.440	1	P	Ni II	1677.297	1		Mn II	1680.401	40	
Kr II	1674.577	10		Cu III	1677.365	150		V III	1680.44	250	
Cu III	1674.588	200		F III	1677.397	600		Si I	1680.444	5	A,Z
As I	1674.59	3	N	Zn IV	1677.399	2		Ni III	1680.532	10	
P I	1674.591	410		Si I	1677.465	1	A,Z	Ni IV	1680.678	10	
Ge I	1674.675	12	A	Cr III	1677.54	10	N	Co III	1680.734	1	
Fe II	1674.716	70	P	P I	1677.553	15		Co II	1680.921	5	
Cr III	1674.73	150		Si I	1677.663	1	N,A	Si I	1680.935	1	A,Z
Li I	1674.76		ZZ	Co II	1677.674	10		Co VII	1681.		F,P
Ni IV	1674.823	0	N	Cr III	1677.68	10	N	Ne II	1681.035	50	
V III	1674.85	10		Si I	1677.705	1	A,Z	Fe	1681.05	100	N
Cr III	1674.896	4		Fe II	1677.842	40	P	V III	1681.05	5	
Co II	1674.953	30	N	V II	1677.88	30		Co III	1681.074	10	
Zn III	1675.059	3		Co III	1677.901	15		Si I	1681.074	5	A
Ti V	1675.150	250		Ge II	1677.99	5	Z	Sc III	1681.105	7	
Si I	1675.2053	200		Mn XX	1678.		F,P	Fe II	1681.111	40	P
Sc II	1675.245	4		Mn IV	1678.02	30		F III	1681.182	150	
Se I	1675.27	250		Mn III	1678.08	1		V II	1681.22	50	
Ge I	1675.283	15	A	P I	1678.087	40		Fe IV	1681.285	110	
Mn III	1675.329	3		P III	1678.12	10	N	Co V	1681.3		F,P
Ni IV	1675.379	0	N	Si I	1678.276	5	A,Z	Ti II	1681.339		P
Mn IV	1675.47	250		Fe II	1678.312	0	P	Ge I	1681.3426	7	
Mn III	1675.52	200		Cr III	1678.414	150		Fe IV	1681.356	520	
Fe IV	1675.535	50		Ni II	1678.447	5		Co II	1681.458	0	
Ge I	1675.5605	7		Ni II	1678.476	10		Cu III	1681.462	150	
Ar III	1675.58	350		Si I	1678.613	5	A,Z	As I	1681.47	1	N
Ar III	1675.64	200		Fe II	1678.629	1	P	F III	1681.478	10	
Fe IV	1675.661	600		Mn II	1678.63	2		Mn I	1681.511	100	A
Mg III	1675.710	2		Fe V	1678.726	2		V III	1681.56	5	
Cr III	1675.72	200	N	Zn III	1678.728	2		Fe IV	1681.573	30	
N II	1675.726	150		Na III	1678.74	20	N	Si I	1681.639	1	A,Z
V III	1675.75	100	N	Mn IV	1678.83	0		Li II	1681.667	400	
N II	1675.755	300		Sc II	1678.863	4		Cr IV	1681.673	110	
Mn IV	1675.78	300		Ni II	1678.941	1		Ne II	1681.683	120	
Zn III	1675.788	3		Si I	1678.991	5	A,Z	P I	1681.703	1	
Si I	1675.859	1	A,Z	Co II	1679.048	3		Co IV	1681.8		F,P
N II	1675.920	100		O III	1679.06	400		Si I	1681.802	5	A,Z
P III	1675.924	90		Ni II	1679.068	7		Al II	1681.809	80	
Si I	1675.943	1	A,Z	Cu III	1679.139	300		Zn III	1681.858	1	
Si I	1676.025	1	N,A	As I	1679.14	2	N	V III	1681.91	10	N
Ni III	1676.054	1		Zn III	1679.180	0		Fe IV	1681.948	450	
Si I	1676.060	1	A,Z	V III	1679.19	300		Ni III	1682.029	10	
V III	1676.08	5		Co II	1679.242	5		Cu III	1682.034	50	
Co V	1676.1		F,P	Cr III	1679.25	300	N	Fe IV	1682.082	30	
Mn III	1676.147	3		Zn III	1679.321	2		Co II	1682.124	20	N
Fe II	1676.156	0	P	Ge II	1679.335	2		V II	1682.17	5	
Si I	1676.160	1	A,Z	Cr III	1679.375	150		Zn II	1682.251	0	Q,Z
Cr III	1676.20	150	N	Fe II	1679.378	70	P	Co II	1682.355	100	N
Ge II	1676.26	0		Si I	1679.413	5	A,Z	Cr III	1682.383	150	
Si I	1676.280	1	A,Z	Co II	1679.423	40		Ni III	1682.443	1	
Ni II	1676.317	3		Mg III	1679.470	4		Si I	1682.448	1	A

Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes
Kr II	1682.622	25		Zn III	1685.196	4		V III	1687.40	25	
Zn III	1682.656	1		Co V	1685.2		F, P	Fe IV	1687.439	300	
Si I	1682.6734	70		Mn I	1685.218	12	A	Kr II	1687.456	10	
Cu III	1682.680	100		Ge I	1685.2221	3		Si I	1687.457	1	N, A
Zn II	1682.698	5	Z	Si I	1685.307	1	N, A	Si I	1687.521	1	A
Fe II	1682.822	1	P	Cr III	1685.38	10	N	Cl II	1687.53	100	
P III	1682.944	10		Ni II	1685.465	8		S I	1687.5305	450	
Fe II	1682.993	1	P	V III	1685.47	50		Fe IV	1687.534	150	
V II	1682.997	2		Co II	1685.486	1		Cr III	1687.56	70	N
Mg IV	1683.003	500		Si I	1685.505	1	A	Si I	1687.595	5	A
Si I	1683.1189	3		Ni III	1685.546	3		N IV	1687.60	50	
Mn IV	1683.12	450		P I	1685.592	15		Fe IV	1687.689	700	
Cu II	1683.1549	40		Si I	1685.628	1	N, A	Fe II	1687.739	1	P
Cu II	1683.1585	40		Cu I	1685.695	560	A	Cu I	1687.749	4	F, A
Cl III	1683.18	10		Fe IV	1685.829	30		Cu I	1687.784	2	F, A
Co III	1683.180	1	N	Cr III	1685.85	150	N	N IV	1687.82	100	
Cu II	1683.1884	40		Si I	1685.864	1	N, A	Co II	1687.845	2	
Fe II	1683.315	2	P	Co II	1685.882	20		V III	1687.87	200	
V II	1683.392	1		Si I	1685.910	1	A	Ni III	1687.897	400	
Mg I	1683.406	100	A	Zn II	1685.942	5	Z	Co III	1687.910	5	N
Zn III	1683.419	2	Q	Fe II	1685.954	70	P	Si I	1687.929	10	A
Si I	1683.423	1	A	Ni II	1685.965	9		P I	1687.965	3	
Ni III	1683.471	2		Mn IV	1685.97	300		S IV	1688.	50	
S III	1683.49	20		P I	1685.976	200		Si I	1688.016	5	A
Co II	1683.518	70	N	Ni III	1685.977	5		Cu I	1688.077	25	A, Z
Cr III	1683.540	90		N I	1685.992		P	N IV	1688.11	150	
V II	1683.548	2		Zn III	1686.039	6		Mn II	1688.13	2	
Mn I	1683.577	120	A	Cr IV	1686.072	360		Cr III	1688.134	40	
Si I	1683.590	1	A	Ar II	1686.076	50		Zn III	1688.240	15	
Si I	1683.643	10	A	Mn I	1686.129	130	A	Zn II	1688.240	15	
Ni III	1683.688	30		Zn II	1686.133	1	Q, Z	Fe II	1688.289	10	P
Co II	1683.698	8		V II	1686.19	10		Mn III	1688.290	30	N
Si I	1683.722	1	N, A	Cu III	1686.194	200		P III	1688.311	60	
Co II	1683.765	60	N	Ni III	1686.216	75		Co II	1688.338	20	N
Si I	1683.787	1	N, A	Si I	1686.233	0	P	Si I	1688.352	5	A
Si I	1683.851	1	N, A	Al II	1686.250	100		Ne II	1688.356	180	
Mn I	1683.948	2	A	P I	1686.301	100		Cr III	1688.39	40	N
F III	1683.991	6		Si I	1686.372	5	N, A	Fe II	1688.403	30	P
Fe II	1684.004	5	P	Cl VII	1686.4		P	Zn III	1688.589	100	
Cr III	1684.02	150		Cr III	1686.44	40	N	Cu III	1688.609	50	
Cr III	1684.14	100	N	Fe II	1686.455	70	P	P I	1688.626	15	
Si I	1684.235	1	A	Zn II	1686.502	25	Z	Ca III	1688.770	450	
Fe IV	1684.263	12		V II	1686.550	10		Se I	1688.79	30	N
Fe II	1684.276	0	P	Si I	1686.591	5	A	Cu I	1688.849	25	A, Z
Cr III	1684.277	4		Mn I	1686.622	20	A	Na III	1688.942	550	
Ni IV	1684.338	0	N	Al III	1686.676			Al III	1688.958		
Zn III	1684.381	6		Fe II	1686.692	40	P	Si I	1688.962	5	A
Ca III	1684.392	25		V III	1686.74	50		Co II	1689.024	3	
Si I	1684.408	1	N, A	V II	1686.748	15		Cu III	1689.032	100	
Ni III	1684.515	1	N	Fe IV	1686.770	80		Cr III	1689.038	1	
Si I	1684.546	5	A	Fe II	1686.788	5	P	V III	1689.04	150	
Mn II	1684.58	10		Zn III	1686.804	1	Q	Ni III	1689.121	5	N
Mn IV	1684.60	0		Si I	1686.8185	100		Cr III	1689.14	10	
Mn I	1684.617	10	A	Co II	1686.934	70	N	Co IV	1689.2		F, P
Cu III	1684.624	250		Ni II	1686.934	9	N	P I	1689.218	60	
As I	1684.63	2	N	V III	1686.95	150		Mn II	1689.25	2	
Ti III	1684.647	1		Si I	1686.993	1	A	Co III	1689.283	3	
Cu I	1684.674	20		Ar XII	1687.		F, P	Si I	1689.2902	60	
Si I	1684.674	5	A, Z	Co VII	1687.		F, P	Ca I	1689.3		A, Z
P III	1684.705	60		Ni XII	1687.		F, P	Si I	1689.326	5	A
Mn II	1684.71	10		Fe V	1687.0		F, P	P I	1689.334	15	
Zn II	1684.802	3	Z	Cr III	1687.03	150		Cr III	1689.457	200	
Mn IV	1684.81	0	N	Cu I	1687.053	560	A	Ar II	1689.470	50	
Si I	1684.815	10	A	Co II	1687.069	60		Mn II	1689.48	50	
Kr II	1684.845	1		Mg III	1687.091	250		Si I	1689.487	1	N, A
Ni II	1684.952	70		Si I	1687.0923	20		Cl III	1689.50	100	
Si I	1684.959	5	A	Cu III	1687.115	300		Ti III	1689.501	0	
Ca XIII	1685.		F, P	As I	1687.12	3	N	Si I	1689.536	5	A
P X	1685.		F, P	Sc IV	1687.163	160		Ni III	1689.596	1	N
V II	1685.014	5		Ti V	1687.165	200		Mn II	1689.611	15	
Cr IV	1685.02	40	N	Si I	1687.192	5	A	Fe IV	1689.612	150	
Cr III	1685.072	4		N I	1687.252		P	Cr III	1689.77	80	N
Ni III	1685.085	5		Si I	1687.299	1	N, A	Zn II	1689.818	25	Z
Si I	1685.092	5	N, A	Co IV	1687.4		F, P	Fe II	1689.832	55	P
Mg I	1685.13			V II	1687.40	25		Mn II	1689.84	4	

Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes
Co III	1689.858	100		Zn III	1692.554	8		Fe IV	1695.357	375	
Si I	1689.969	15	A	Si I	1692.609	20	A	Zn III	1695.407	100	
Cr III	1690.00	30	N	Mn III	1692.616	70		Si I	1695.5074	90	
Si I	1690.020	10	A	Cr III	1692.63	20	N	Ni II	1695.594	8	
Ge I	1690.0349	10		Si I	1692.640	5	A	Ni III	1695.599	30	
Si I	1690.069	1	A	Co II	1692.651	20		Si I	1695.66	1	A
Zn III	1690.111	3		Cu I	1692.654	5	N	Cr III	1695.77	70	
Mn IV	1690.12	500		Mg IV	1692.675	340		Fe IV	1695.770	300	
P I	1690.158	25		Cu III	1692.686	200		Si I	1695.771	1	A
Cr III	1690.28	300		V III	1692.82	10		Ga II	1695.85	120	
Fe IV	1690.304	375		Mn IV	1692.83	0		Ge I	1695.8597	8	
Mn II	1690.32	0		Si I	1692.875	20	A	Si I	1695.891	20	A
V III	1690.35	15		Cr III	1692.89	600		Ni II	1695.897	1	N
Ni III	1690.372	20		Ni III	1692.94		F,P	Ni III	1695.910	5	
Co III	1690.399	5	N	P III	1693.03	100	N	Si I	1695.982	1	A
Fe II	1690.456	0	P	Co III	1693.085	30	N	Mn III	1696.004	25	
Si I	1690.491	5	A	Ni IV	1693.087	10		Co III	1696.008	600	
Cr III	1690.52	20	N	V II	1693.09	100		Ti V	1696.031	30	
Fe IV	1690.628	300		Mn IV	1693.15	750		Si I	1696.065	15	A
Ni III	1690.634	5		Ni II	1693.177	10		Cu III	1696.183	75	
Se I	1690.70	250		Mn III	1693.289	20		Ni III	1696.195	5	
Cr III	1690.72	10	N	Si I	1693.2934	125		Co V	1696.2		F,P
Fe II	1690.758	20	P	Co II	1693.340	20		Si I	1696.2065	200	
Si I	1690.7889	60		Cr III	1693.43	30	N	Cr II	1696.27	70	
Ni II	1690.814	12		Si I	1693.4681	60		Fe II	1696.459	20	P
Cr IV	1690.881	450		Fe II	1693.476	30	P	Mn II	1696.51	60	
P I	1690.888	15		V II	1693.49	120		Ni II	1696.527	2	N
Ge I	1690.9030	4		Ni III	1693.559	3		N III	1696.560	10	P
Ni III	1690.974	15		P I	1693.579	3		Cr III	1696.64	600	
Fe II	1691.010	0	P	Fe II	1693.602	0	P	S IV	1696.69	150	
Cu I	1691.064	35	A,Z	Cr III	1693.72	20	N	Mn III	1696.700	70	
Si I	1691.065	1	A	V II	1693.756	15		Ge I	1696.7160	8	
Ge I	1691.0897	20		Fe II	1693.759	1	P	Fe II	1696.794	135	P
Cr III	1691.09	50	N	V III	1693.76	75		Cr III	1696.85	20	N
Ni II	1691.231	11		Co II	1693.786	20	N	N IV	1696.86	150	
Mn II	1691.248	40		Co II	1693.846	20	N	Co III	1696.875	5	N
Fe II	1691.273	40	P	Fe II	1693.936	40	P	Fe IV	1696.904	200	
Ni III	1691.275	1	N	Fe IV	1693.988	250		P III	1696.92	100	N
Co II	1691.324	15		V IX	1694.		F,P	Co II	1696.967	1	
Sc II	1691.344	10		Si I	1694.010	5	A	Co III	1696.980	5	
Si I	1691.352	5	A	P I	1694.028	160		Si I	1696.994	1	A
Co II	1691.413	5		Cr IX	1694.11	185	F	Fe II	1697.139	0	P
Mn II	1691.45	1		Si I	1694.137	1	A	N III	1697.156	4	P
Zn II	1691.470	1	Z	Mn II	1694.24	50		Kr II	1697.189	1	
Fe II	1691.564	1	P	P I	1694.296	0		Mn II	1697.19	80	
Zn II	1691.592	1	Z	Co IV	1694.3		F,P	Mn II	1697.19	80	
Si I	1691.612	1	A	Ni III	1694.307	5		Fe II	1697.225	0	P
Ge I	1691.6254	7		Ge I	1694.3424	4		Mg III	1697.282	250	
Cr III	1691.64	50	N	Ni II	1694.384	2		Co II	1697.356	3	
Sc II	1691.647	1		Co II	1694.452	2		Fe II	1697.428	0	P
Mn IV	1691.68	750		Ne II	1694.481	40		Cr III	1697.43	60	N
Na III	1691.70	20	N	Fe II	1694.484	10	P	Zn III	1697.433	1	
P I	1691.734	60		P I	1694.486	160		Fe IV	1697.501	375	
Cr III	1691.774	120		Cr III	1694.53	70	N	Mn III	1697.507	100	
Ca II	1691.779	80		Si I	1694.542	5	A	Sc II	1697.514	4	
Si I	1691.802	1	A	Ni III	1694.582	2		Mn II	1697.53	12	
Mn III	1691.803	35		Ne II	1694.600	80		P IV	1697.612	40	
P IV	1691.81	40	N	Ca I	1694.603		A,Z	Si I	1697.652	5	A
Ge I	1691.8656	7		Fe IV	1694.611	110		Si I	1697.818	1	A
As I	1691.87	7		Si I	1694.671	10	A	Cr III	1697.84	40	
Fe IV	1691.871	12		Fe II	1694.681	10	P	Co V	1697.9		F,P
V III	1691.90	75		Sc II	1694.770	1		V II	1697.90	20	
Si I	1691.949	10	A	V III	1694.78	1000		Si I	1697.9409	250	
Si I	1692.024	5	A	Ne II	1694.786	90		Co III	1697.988	575	
V II	1692.11	100		N III	1694.786	1	P	Ca XIV	1698.		F,P
Fe IV	1692.172	50		Ne II	1694.878	60		Cl XII	1698.		F,P
Fe II	1692.175	1	P	Cr III	1694.92	70	N	Cr III	1698.03	40	N
Si I	1692.189	1	A	Si I	1695.025	1	A	Mn II	1698.127	10	
Ni III	1692.219	3		Fe IV	1695.035	300		Fe II	1698.135	20	P
Cr III	1692.31	30	N	Fe III	1695.036	150		Ni III	1698.176	50	
Mn II	1692.34	2		Si I	1695.070	1	N,A	Ca II	1698.183	160	
P I	1692.452	25		Co III	1695.090	1	N	Si I	1698.209	1	A
Mn II	1692.46	10		Si I	1695.133	5	A	V III	1698.24	50	
Fe II	1692.499	40	P	Cr IV	1695.328	160		Mn IV	1698.30	800	
Ni III	1692.514	1000		P I	1695.338	60		Ni III	1698.381	5	



Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes
Ni II	1698.400	4		Cr III	1701.05	30	N	Ni III	1703.925	3	
Si I	1698.403	5	A	Ni III	1701.081	10		Si I	1704.055	5	A
Ge II	1698.43	0		Fe IV	1701.084	150		Cu III	1704.061	30	
Fe II	1698.438	20	P	Co V	1701.1		F, P	Ni III	1704.128	10	
Cr IV	1698.55	30		As I	1701.16	15		V III	1704.17	100	
Si I	1698.606	15	A	As I	1701.22	30	N	Zn III	1704.178	2	
V III	1698.68	10		Mg IV	1701.262	240		Fe IV	1704.186	375	
Mn IV	1698.70	750		Cu I	1701.291	1	A, Z	Si I	1704.195	1	N, A
Cr III	1698.75	200	N	Cr III	1701.297	60		Cr IV	1704.203	20	
Mg IV	1698.784	400		Ar II	1701.358	100		Cu IV	1704.368	710	
Fe IV	1698.878	700		Zn II	1701.398	4	Z	Mg III	1704.368	4	
Mn IV	1698.91	400		Cr III	1701.48	600	N	Mn III	1704.387	35	
Ge I	1698.938	10	A	Fe IV	1701.483	375		Co IV	1704.4		F, P
Ca III	1698.939	450		Ni II	1701.504	2		Si I	1704.4416	100	
N III	1698.999		P	Ni III	1701.599	60		Mn III	1704.456	30	
Ni III	1699.024	10		Fe II	1701.719	2	P	Zn III	1704.475	0	
N IV	1699.03	200		Zn II	1701.766	12	Z	Cr IV	1704.48	10	N
Zn III	1699.036	2		Co III	1701.770	1		Si I	1704.492	5	A
Mn IV	1699.06	700	N	Co IV	1701.8		F, P	Ni II	1704.54	100	N
Cu II	1699.0953	60		V III	1701.86	50		Si I	1704.560	30	A
Cu II	1699.1023	30		Fe II	1701.939	5	P	Zn II	1704.577	0	Z
Si I	1699.122	1	A	Na IV	1701.97	1000		Ni III	1704.641	60	
Si I	1699.155	5	A	Na III	1701.970	400		Fe II	1704.643	40	P
Fe II	1699.195	20	P	F II	1701.993	40		Mn III	1704.647	60	
Na III	1699.293	500		N IV	1702.006	250		V III	1704.68	50	
Kr II	1699.297	40		V III	1702.01	10	N	F II	1704.696	10	
N III	1699.336	90	P	Fe II	1702.044	110	P	Co II	1704.738	0	
Ni III	1699.349	8		Cu III	1702.104	400		Cr III	1704.79	10	N
Cr III	1699.35	10	N	F II	1702.130	200		Fe II	1704.815	2	N
Zn II	1699.471	3	Z	Ni II	1702.150	1		Co III	1704.817	5	
Cu III	1699.574	3		Cu III	1702.183	300		F II	1704.834	40	
Fe V	1699.636	70		Ar II	1702.188	100		Mn II	1704.87	15	
Mg IV	1699.654	300		Ge II	1702.20	0	Z	Fe V	1704.923	100	
Fe IV	1699.664	50		Zn III	1702.210	10		Fe IV	1704.932	450	
Cr IV	1699.677	110		Ni II	1702.265	7		Si II	1704.967	2	
Si I	1699.7162	10		N V	1702.267	50	P	Zn IV	1704.971	10	
V III	1699.75	5		Cu III	1702.334	35		S I	1704.986	5	
Ni II	1699.772	2		Mg IV	1702.367	200		S I	1705.115	3	
Zn III	1699.828	1	Q	Ge I	1702.3873	4		Zn III	1705.115	2	
Cr III	1699.84	20	N	Na IV	1702.409	450		V III	1705.19	40	
Co III	1699.880	1		Co III	1702.506	3		Co III	1705.306	0	N
Se I	1699.90	40	N	Zn III	1702.540	7		Cu III	1705.319	150	
Fe II	1699.908	2	P	Ni III	1702.591	10		Cr III	1705.36	10	
Si I	1699.931	1	A	Mn III	1702.631	15		Mn III	1705.497	3	
N III	1699.963	60	P	Si I	1702.6978	1	N	Ni II	1705.581	11	N
Co IV	1700.0		F, P	Fe II	1702.730	5	P	Cu III	1705.620	200	
N III	1700.027	25	P	Na IV	1702.735	160		Cr V	1705.629	70	
Zn III	1700.053	5		Co III	1702.790	500		Mn IV	1705.63	20	
Cr III	1700.12	20	N	Fe II	1702.805	20	P	Ni II	1705.739	8	N
Si I	1700.137	25	A	Si I	1702.811	10	A	As I	1705.74	4	
Si I	1700.15	1	A	Zn II	1702.836	2	Z	Si I	1705.755	35	A
F II	1700.185	10		Si I	1702.8694	70		Cr III	1705.76	10	N
Cr III	1700.269	250		Cr III	1702.89	80		Zn	1705.833	10	N
Mn II	1700.34	100		As I	1702.94	3		Si I	1705.866	5	A
Fe IV	1700.405	450		Cu III	1702.971	300		Fe II	1705.910	1	P
Si I	1700.4193	90		Na IV	1702.995	220		Mn IV	1705.93	10	
V II	1700.47	30		Fe IV	1703.09	3	F, P	Cr III	1705.961	250	
Co II	1700.515	1		Mg III	1703.108	7		Si I	1705.967	1	A
Si I	1700.573	20	A	V III	1703.12	5		Cr V	1705.968	20	
Mn II	1700.60	1		Fe II	1703.196	1	P	Ar II	1705.980	100	
Si I	1700.6360	80		N V	1703.218	60		Zn III	1705.997	15	
Ni II	1700.665	1		Mg IV	1703.357	320		Ni III	1706.041	10	
Mn II	1700.69	3		Mn II	1703.37	5		Co II	1706.053	8	
F II	1700.691	10		Ni II	1703.408	25		Fe IV	1706.066	50	N
Ca I	1700.712		A, Z	Ni III	1703.467	50		Fe II	1706.145	55	P
F II	1700.767	10		Si I	1703.480	5	A	Cr III	1706.15	50	N
Zn IV	1700.788	2		Na IV	1703.53	360		Ni II	1706.170	2	
Fe IV	1700.815	375		Fe IV	1703.56	1	F, P	V III	1706.22	100	
F II	1700.831	40		Fe IV	1703.592	375		Ni III	1706.246	15	
Si I	1700.863	1	A	V III	1703.70	50		S I	1706.360	10	
Fe II	1700.902	2	P	Zn III	1703.726	0	Q	P I	1706.376	160	
Zn III	1700.976	1		Cr III	1703.73	40	N	Se IV	1706.4	25	
B III	1701.		N	Mg III	1703.731	20		Fe IV	1706.542	200	
Cu III	1701.011	200		Fe II	1703.735	2	P	Mn II	1706.57	10	
Fe IV	1701.011	300		Cu I	1703.843	44	A	Fe IV	1706.641		P

Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes
Cr III	1706.65	30	N	Zn III	1709.401	4		Cr III	1713.43	50	
Zn III	1706.659	100		Si I	1709.502	25	A	Zn III	1713.455	0	Q
Fe II	1706.678	2	P	Fe II	1709.553	55	P	Kr II	1713.509	4	
Se I	1706.70	20	N	Ni II	1709.598	200		Si I	1713.616	1	A
Sc II	1706.780	1		Ca I	1709.638		A, Z	Mn III	1713.673	40	
Co II	1706.806	10		N II	1709.663		P	Ni IV	1713.687	130	
Co II	1706.937	20	N	Fe II	1709.685	55	P	Cr IV	1713.69	50	N
Fe IV	1706.965	80		Fe IV	1709.808	520		Fe V	1713.694	60	
Si I	1706.994	30	A	Fe V	1709.809	150		Co V	1713.7		F, P
Mg I	1707.056	150	A	Cr IV	1709.89	50	N	Fe II	1713.724	1	P
Si I	1707.1148	8		Fe III	1709.892	250		Co II	1713.734	5	
S I	1707.132	8		Ni III	1709.901	800		Si I	1713.810	10	N, A
Mn III	1707.157	2		Ni II	1710.032	3		Si I	1713.837	35	A
Zn II	1707.191	20		Zn II	1710.052	10	Z	Si I	1713.858	10	P
Zn III	1707.191	20		P V	1710.065	4		Ni III	1713.864	10	
Ni III	1707.242	10		Mg I	1710.07			V X	1714.		F, P
Cr III	1707.27	30	N	Cr III	1710.10	30	N	Cr III	1714.01	150	
Fe IV	1707.284	375		Mn III	1710.138	2		V III	1714.04	50	
Ni III	1707.346	200		V II	1710.147	2		As II	1714.069	0	
Co III	1707.348	600		As I	1710.16	7		Se XXIII	1714.1		F
Cu I	1707.391	5	F	Mn III	1710.318	25		Fe IV	1714.156	110	
Fe II	1707.399	90	P	Fe III	1710.374	200		Fe V	1714.157	50	
Ni III	1707.426	200		Si I	1710.579	15	A	Si I	1714.182	5	A
V III	1707.43	150		Cr III	1710.586	60		Cr III	1714.26	10	N
Mn IV	1707.43	750		Si I	1710.744	1	N	Zn II	1714.270	0	Z
Cr III	1707.43	800	N	Si II	1710.826	10		Mn II	1714.38	100	
Zn	1707.449	10	N	Ar II	1710.909	50		Zn IV	1714.457	15	
Cu III	1707.483	20		Fe II	1710.930	2	P	Cr III	1714.63	40	N
P I	1707.553	160		Ni VI	1711.0		F, P	Cu II	1714.6633	0	
Mn III	1707.559	30		Cr III	1711.02	200	N	Fe II	1714.676	15	P
Co II	1707.579	15		Co II	1711.088	3		Ni III	1714.698	100	
Si I	1707.589	5	A	Na III	1711.124	500		Fe II	1714.710	5	P
Fe IV	1707.606	375		Cu III	1711.245	75		Ge I	1714.7497	1	
Cr III	1707.608	40		Cr III	1711.25	5	N	Mg III	1714.783	12	
Fe II	1707.669	5	P	Si II	1711.296	20		Zn III	1714.800	0	
Zn III	1707.732	3	Q	Ti III	1711.331	1		Co VII	1715.		F, P
Si I	1707.750	5	A	Fe IV	1711.410	700		Ni XI	1715.		F, P
Cr III	1707.78	400	N	Ca I	1711.411		A, Z	Fe II	1715.026	30	P
Co II	1707.822	50	N	Cu III	1711.423	100		Cr IV	1715.04	30	N
Zn III	1707.865	2	Q	Co III	1711.531	5		Co II	1715.114	0	
V III	1707.89	150		Fe II	1711.536	2	P	Cr III	1715.17	30	
Co III	1707.951	500		Si I	1711.595	20	A	Mn II	1715.25	1	
Mn III	1707.995	2		V III	1711.61	100		Ni III	1715.303	650	
O V	1707.996	160		Cr III	1711.63	200		V III	1715.32	15	
P I	1707.998	7		Fe II	1711.684	5	P	Ti III	1715.352	3	
P VIII	1708.		F, P	Ni III	1711.779	10		Zn II	1715.388	1	Z
Se I	1708.04	30	N	Mn II	1711.83	100		Mn III	1715.397	15	
Co IV	1708.1		F, P	Zn III	1711.982	1		S IX	1715.45	2	F
Fe II	1708.240	10	P	Fe II	1712.064	5	N	Fe II	1715.515	40	P
Zn III	1708.259	3		Mn III	1712.134	1		V II	1715.57	20	
Mn II	1708.267	100		P V	1712.212	1		Cr III	1715.65	20	N
Ni II	1708.386	25		Cr III	1712.24	20	N	Mn II	1715.69	10	
Si I	1708.417	5	A	As I	1712.32	10		Zn II	1715.763	60	Z
P I	1708.434	25		Al IV	1712.43	200		Co III	1715.768	2	
Cr III	1708.498	25		Na III	1712.482	450		V III	1715.79	25	
Mn II	1708.55	4		Co III	1712.489	2	N	Mn III	1715.794	60	
Ni III	1708.552	50		Cr III	1712.52	10	N	Co IV	1715.8		F, P
Ni II	1708.570	1	N	Co IV	1712.6		F, P	Ge I	1715.8355	15	
Fe IV	1708.579	375		Co V	1712.7		F, P	Ni III	1715.931	100	
Fe II	1708.622	110	P	Fe IV	1712.757	600		Co II	1715.938	0	N
Mn II	1708.65	6		Mn IV	1712.78	200		Mn II	1715.98	12	
Mn III	1708.804	0		Cr II	1712.85	10		Zn III	1716.090	4	
P I	1708.878	7		Ni III	1712.893	5		Mn II	1716.14	12	
Zn III	1708.896	0		Fe II	1712.999	160	P	Ni II	1716.148	1	N
Cu III	1708.935	100	N	Ge I	1713.0806	10		Cr III	1716.21	40	N
Cr III	1708.98	60		Mn V	1713.202	20		Fe IV	1716.215	80	
Cu III	1709.026	300		Fe II	1713.213	10	P	Co III	1716.251	200	
As I	1709.03	2	N	Ar II	1713.218	200		Al IV	1716.28	5	
Zn III	1709.143	0	Q	Mn III	1713.223	30		Fe II	1716.321	0	P
Ca I	1709.230		A, Z	Zn II	1713.251	50	Z	Cr III	1716.33	40	N
Zn II	1709.243	0	Z	Ni II	1713.285	2		Cu III	1716.390	100	
As I	1709.26	2	N	Cu III	1713.336	30		Zn III	1716.467	1	
Co III	1709.395	3	N	Cu I	1713.365	56	A	V III	1716.47	50	
Cu I	1709.397		A, Z	V III	1713.40	50	N	Cr III	1716.50	40	N
Ge III	1709.4	5	P	Si I	1713.408	45	A	Mn III	1716.569	5	

Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes
Fe II	1716.577	55	P	Na III	1719.60	10	Q	As II	1722.680	2	
Kr II	1716.582	4		Kr II	1719.638	90		Fe II	1722.697	2	P
Zn III	1716.589	2		Cr III	1719.735	40		Kr II	1722.701	1	
Co IV	1716.6		F,P	V III	1719.77	100		Fe IV	1722.710	600	
Kr II	1716.657	10		As II	1719.802	50		Ni III	1722.790	20	
V V	1716.725	500		Ni III	1719.892	50		Fe III	1722.837	250	
Mn II	1716.78	80		Ni II	1719.906	5	N	P V	1722.856	50	
Ge I	1716.7844	40		Kr II	1719.908	25		Cr IV	1722.857	160	
Ni III	1716.886	75		Cr XVII	1720.		F,P	Co III	1722.911	1	
Zn II	1716.935	1	Z	Cr III	1720.00	80		Kr II	1722.936	60	
As II	1716.962	1		Cr III	1720.00	80		Mn IV	1722.94	650	
Mn I	1716.969	60	A	Fe II	1720.039	30	P	Mn III	1722.972	25	
F III	1716.990	250		Co III	1720.068	20		Fe II	1722.994	1	P
Mn I	1717.009	70	A	Ti II	1720.139		P	Fe IV	1723.010	30	
V III	1717.01	150		Co II	1720.182	0	N	Co II	1723.013	10	
Mn IV	1717.04	100	N	Si I	1720.189	15	A	Zn III	1723.111	6	
Mn III	1717.053	3		Kr II	1720.208	200		Cr III	1723.16	100	
Mn I	1717.068	90	A	Cr III	1720.249	200		Co III	1723.327	1	N
Fe II	1717.107	5	P	Fe II	1720.271	2	P	Ne II	1723.389	20	
Fe IV	1717.109	450		Fe V	1720.282		P	Cr III	1723.50	100	
Zn III	1717.212	1		Ca III	1720.334	300		Co III	1723.536	1	
Ti V	1717.396	375		Zn III	1720.339	2		Mn III	1723.565	40	
Fe III	1717.414	150		C II	1720.456	10		Fe IV	1723.568	150	
Cr III	1717.43	200		Fe IV	1720.492	150		Fe II	1723.616	1	P
Fe II	1717.448	5		Cr III	1720.512	40		Ni III	1723.793	150	
V III	1717.47	100		Mn IV	1720.52	750		Cr III	1723.83	10	N
Cr III	1717.65	40	N	Fe II	1720.613	110	P	As II	1723.852	0	
Ni II	1717.700	3		Ni III	1720.708	20		Ni II	1723.859	20	
Fe IV	1717.709	200		V V	1720.712	40		Zn II	1723.901	2	Z
Fe II	1717.716	5	P	Mn IV	1720.74	750		Ni II	1723.957	1	N
Cu II	1717.7214	15		Ge I	1720.7464	8		Co III	1723.970	500	
Fe V	1717.74		F,P	V XV	1721.		F,P	Fe IV	1724.057	600	
Fe II	1717.761	5	P	C II	1721.012	100		Si I	1724.243	40	A
Zn III	1717.880	1		Fe II	1721.080	2	Q	Fe IV	1724.265	450	
Fe IV	1717.899	600		Ni II	1721.092	15		Ni III	1724.291	75	
Cr III	1717.92	40	N	Co III	1721.151	10		Ge I	1724.3082	10	
Fe II	1718.101	55	P	Zn III	1721.151	2		Cr III	1724.32	120	
Fe IV	1718.155	600		Cr III	1721.18	150	N	Zn II	1724.364	2	Z
Cr III	1718.16	40		Si I	1721.199	1	A	Si I	1724.477	10	A
Zn II	1718.182	1	Z	Al II	1721.244	255		Ni III	1724.523	50	
Ni III	1718.184	20		Ni III	1721.256	200		Zn III	1724.558	2	
Co V	1718.2		F,P	Al II	1721.271	365		Fe II	1724.574	40	P
Ni III	1718.365	150		Si I	1721.326	10	A	V III	1724.63	300	
Mn III	1718.367	45		Mn IV	1721.41	750		Fe IV	1724.644	375	
Fe IV	1718.417	450		V II	1721.422	3		N II	1724.653		P
Kr II	1718.431	4		Cr III	1721.43	10	N	Ti IX	1724.7		F,P
Na III	1718.48	10	N	Mn III	1721.61	2		As I	1724.77	7	N
Ge I	1718.4933	6		Kr II	1721.632	25		Cu III	1724.795	75	
Si I	1718.514	20	A	Kr III	1721.64	20		Ni VI	1724.8		F,P
P I	1718.523	130		Fe IV	1721.660	375		Ti II	1724.805		P
Cr III	1718.530	120		Cr III	1721.67	200		Ni II	1724.818	1	N
Cr IV	1718.533	110		Co III	1721.678	3	N	Mn IV	1724.83	750	
As I	1718.55	1		C II	1721.682	200		Fe II	1724.853	50	P
N IV	1718.551	1000		Fe II	1721.738	1	P	Fe II	1724.855	20	P
Mn II	1718.56	2		Ni III	1721.799	0	N	Kr II	1724.864	60	
Mn IV	1718.67	650		Cr III	1721.84	70	N	Al II	1724.952	255	
Ar II	1718.680	100		Si I	1721.841	10	A	Fe II	1724.963	70	P
Ge I	1718.6883	10		Fe II	1721.934	1	P	Al II	1724.984	365	
Mn I	1718.738	5	A	V III	1721.98	400		V V	1724.994	150	
Mn II	1718.79	15		Ni III	1722.038	15		N II	1725.028		
Ni III	1718.873	20		Mg III	1722.041	100		Ni VI	1725.1		F,P
Co III	1718.887	2		Ni II	1722.113	1		Cr III	1725.12	100	
Br II	1718.9	20	Q	Cr III	1722.191	150		Ar II	1725.147	100	
P I	1718.972	100		C II	1722.238	10		Zn III	1725.230	0	
Fe II	1718.984	20	P	Ni III	1722.283	400		Co II	1725.232	20	
Ni III	1719.008	20		Cu III	1722.369	500		Cr IV	1725.257	285	
Zn II	1719.136	2	Z	As I	1722.37	4	N	Cr III	1725.29	150	N
P I	1719.271	80		Cr IV	1722.38	70		Mn II	1725.29	15	
Fe II	1719.330	5	P	Fe II	1722.432	30	P	N III	1725.315	4	Z
Ar II	1719.346	200		V III	1722.46	150		Ca I	1725.328		A,Z
Co III	1719.383	3	N	Si IV	1722.534	400		V III	1725.37	200	
Al II	1719.440	340		Si I	1722.562	45	A	Fe II	1725.390	5	Q
Ni III	1719.458	500		V II	1722.62	200		Mn II	1725.441	20	
Fe IV	1719.464	600		V III	1722.62	200		Zn II	1725.477	0	Q,Z
Cr IV	1719.560	450	P	Ni II	1722.646	2		Ar II	1725.549	50	

Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes
V II	1725.597	3		Ar II	1729.075	100		Co III	1732.358	0	
Cr III	1725.60	40	N	Ni III	1729.219	2		Mn III	1732.407	90	
Mn II	1725.61	10		Ar II	1729.259	100		N II	1732.428		
Fe IV	1725.629	800		Fe II	1729.325	10	N	As I	1732.44	30	
Cu I	1725.668	56	A	Ni III	1729.384	20		Mn I	1732.441	65	A
Fe II	1725.690	2	P	Ge II	1729.385	2		Si I	1732.453	10	A
V III	1725.78	15		Fe IV	1729.430	150		Mn I	1732.511	75	A
Si I	1725.791	5	A	Mn II	1729.57	5		Co III	1732.545	200	
As II	1725.846	1		Br II	1729.6	400	Q	Fe II	1732.575	5	N
Fe II	1725.979	1	P	F II	1729.669	1		Mn I	1732.601	100	A
Kr II	1725.982	25		Co III	1729.724	5		Ni II	1732.620	1	N
Cu XV	1726.		F,P	V III	1729.74	100		Cu I	1732.668	1	A,Z
Cr IV	1726.00	20		Zn IV	1729.760	10		Mn II	1732.702	300	
Fe II	1726.056	1	P	V II	1729.78	100		V III	1732.75	150	
Kr II	1726.078	120		Cr II	1729.79	40		Fe IV	1732.756	250	
V III	1726.11	10		As I	1729.80	30		Co II	1732.756	3	
Co III	1726.134	100		Mn III	1729.801	150		Cr III	1732.85	50	N
Fe II	1726.156	0	P	Fe IV	1729.809	250		As I	1732.86	30	
Co II	1726.230	0		Zn III	1729.918	3		Fe IV	1732.932	375	
Cu III	1726.265	30		Cr IV	1729.919	70		F III	1732.945	100	
Mn II	1726.29	10		Si I	1729.923	20	A	Zn II	1732.953	25	Z
Ni II	1726.324	4		N III	1729.945	250	Z	Fe VI	1732.958		P
Fe II	1726.392	90	P	N III	1730.04	400	N,Z	Ge I	1732.9586	2	
Mn II	1726.47	200		F II	1730.119	10		Cu III	1732.988	50	
Fe IV	1726.584	375		Ni III	1730.255	10		Cr III	1733.00	200	
Fe II	1726.584	5	P	Fe IV	1730.324	375		Fe II	1733.072	2	P
Cr III	1726.61	20	N	Cr III	1730.34	10	N	Fe IV	1733.095	110	
F III	1726.665	200		V III	1730.40	100		Ni III	1733.129	250	
Co III	1726.726	15		Ni III	1730.483	75		Cr III	1733.13	150	
N III	1726.776	4	Z	Si I	1730.492	10	A	F III	1733.200	6	
Mn II	1726.81	30		Mn IV	1730.55	600	N	Si I	1733.344	15	A
Fe II	1726.918	20	P	Cu I	1730.570	1	A,Z	Ar II	1733.372	100	
Cr IV	1727.067	360		Zn II	1730.619	2	Z	Fe II	1733.382	10	P
Cr II	1727.11	70		Ne II	1730.645	80		Fe VI	1733.472		P
Ni IV	1727.113	0	N	Co III	1730.669	250		Fe II	1733.513	1	P
Cu I	1727.260	8	F,A	Na III	1730.71	0		Mn II	1733.55	500	
Cu I	1727.321	4	F,A	Cu III	1730.724	5		Co III	1733.635	10	
Fe II	1727.325	10	N	Mg III	1730.733	40		Kr II	1733.649	1	
Si IV	1727.377	300		P III	1730.758	10		Kr II	1733.681	1	
As I	1727.38	4		Mg III	1730.778	7		Ni III	1733.762	50	
N III	1727.426	60	Z	Fe III	1730.842	250		Cr IV	1733.832	220	
Si I	1727.444	30	A	N III	1730.863	10	Z	Fe II	1733.860	5	N
Cr III	1727.51	10	N	Fe V	1730.864		P	Mn II	1733.87	30	
Ni III	1727.640	20		Cr III	1730.92	5		Fe II	1733.88	200	Q
Se XIX	1727.7		F	Cu XV	1731.		F,P	Cr IV	1733.979	450	
P I	1727.725	7		Fe II	1731.038	55	P	Co VII	1734.		F,P
Cr II	1727.78	10		F II	1731.047	40		Mn IV	1734.04	100	
P I	1727.808	40		Na III	1731.113	500		Mn III	1734.073	30	
Co II	1727.823	20	N	Fe II	1731.125	5	P	Fe II	1734.080	10	Q
Kr II	1727.854	1		Fe IV	1731.235	300		Co II	1734.130	5	
Cr III	1727.97	10	N	Cr IV	1731.280	220		Cr IV	1734.156	285	
Ni II	1728.022	1		Cu I	1731.32	2	N	Cu II	1734.2272	3	
Co III	1728.091	3		Fe II	1731.336	20	P	Al IV	1734.24	40	
Mn II	1728.12	1		Mn II	1731.36	40		Al III	1734.243		
Cu III	1728.125	150		Cr III	1731.53	20		Al III	1734.253		
Ni III	1728.127	1	N	V III	1731.54	15		Fe II	1734.448	10	N
Ni II	1728.133	2	N	N III	1731.561	10	Z	Mn II	1734.49	400	
P I	1728.218	7		As II	1731.671	0		F II	1734.494	10	
Cr III	1728.24	20	N	Mn IV	1731.68	200		Kr II	1734.507	10	
Fe IV	1728.265	250		Mn II	1731.73	0		V III	1734.52	50	
Na III	1728.273	550		Ni III	1731.733	2	N	Fe	1734.54	20	N
Fe II	1728.288	2	P	Cr III	1731.76	90		Fe IV	1734.677	110	
N III	1728.318	4	Z	Fe	1731.77	100	N	Cr IV	1734.68	60	N
Cr III	1728.34	80	N	Mg III	1731.786	20		Co V	1734.7		F,P
Cr V	1728.497	110		Al III	1731.836			Si I	1734.718	50	A
Ni II	1728.625	6	N	Si V	1731.868	20		Mn II	1734.72	30	
Fe II	1728.639	1	P	Fe II	1731.879	30	P	Cr III	1734.83	70	N
V III	1728.66	15		Cl II	1731.9759	100		Mg II	1734.8523	400	
Ni III	1728.738	20		V II	1732.035	3		Mn III	1734.863	130	
Co IV	1728.8		F,P	Cr IV	1732.043	450		P III	1734.867	40	
P I	1728.803	0		N III	1732.089	10	Z	P II	1734.88	1	
Fe II	1728.852	20	P	Zn II	1732.160	0	Q,Z	Ni II	1734.904	8	
V III	1728.87	50		As II	1732.236	0		Mn III	1735.073	30	
Na III	1728.923	50		Fe II	1732.275	5	Q	As II	1735.081	0	
P I	1728.983	3		P V	1732.315	12		Ni II	1735.135	5	

Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes
Cr III	1735.20	70		V III	1738.33	25		Ni II	1741.547	1000	
Mn I	1735.368	5	A	Mn II	1738.347	100		Fe II	1741.560	40	N
Ar II	1735.378	50		Fe III	1738.468	200		Cu I	1741.576	56	A
Co III	1735.400	50		Ge I	1738.4791	30		Fe IV	1741.611	300	
Mn I	1735.408	3	A	Mn II	1738.51	10		Mn II	1741.65	50	
F III	1735.417	35		Ni II	1738.549	1		Fe II	1741.82		F,P
Fe II	1735.496	20	P	Fe IV	1738.637	80		Co II	1741.895	1	
Zn II	1735.607	80	Z	Cu III	1738.646	75		Cr IV	1741.93	30	N
Cr III	1735.61	10	N	Co III	1738.653	1		Zn II	1741.930	18	Z
Ni III	1735.628	2		Ne II	1738.736	80		Ni III	1741.963	300	
Co V	1735.7		F,P	Mn I	1738.765	15	A	Mn II	1742.00	200	
As I	1735.70	3		Ni III	1738.785	300		Kr II	1742.093	90	
Ni III	1735.713	5		Ni II	1738.793	4		Mn IV	1742.10	850	
Fe IV	1735.728	250		Kr II	1738.804	40		V III	1742.15	25	N
Cr III	1735.76	10	N	Mg III	1738.835	600		Mn III	1742.15	50	
Fe II	1735.811	1	P	Kr II	1738.861	4		Cr III	1742.19	150	N
Zn II	1735.847	15	Z	Co II	1738.870	60		Ge I	1742.1951	25	
Ni III	1736.011	50		Cr III	1738.90	10		Zn	1742.285	20	N
Ni III	1736.051	50		Zn II	1738.915	1	Z	Zn II	1742.285	20	N
Mg IV	1736.067	260		V III	1738.93	25		Fe IV	1742.289	150	
Zn III	1736.138	0		Fe IX	1739.		F,P	V II	1742.334	4	
V V	1736.182	100		S IV	1739.03	50		V III	1742.35	150	
Co II	1736.218	2		Ge I	1739.1024	25		Co III	1742.372	2	
Co III	1736.312	250		Cr IV	1739.193	450		Cr III	1742.52	20	N
Fe IV	1736.356	300		Fe III	1739.201	20		As I	1742.59	10	
Sc II	1736.404	30		V III	1739.25	150		Sc III	1742.69	2	
Cr III	1736.49	30		V II	1739.33	150		Fe II	1742.709	55	P
V II	1736.498	0		Mg III	1739.475	7		N I	1742.7189	50	
Mn IV	1736.52	300		As I	1739.49	60		V II	1742.72	150	
Si I	1736.539	25	A	Cu III	1739.505	300		N I	1742.7306	350	
Cu II	1736.5514	10		Mn I	1739.522	20	A	Se I	1742.75	40	N
Mn III	1736.560	25		Al II	1739.538	50		Ne II	1742.869	70	
Ni III	1736.569	2	N	Ni III	1739.747	5		Ge VII	1742.9		F,P
Mn III	1736.599	20		Co III	1739.833	30		Cr III	1742.96	70	N
Fe II	1736.602	10		Mn III	1739.884	60		Fe IV	1742.984	110	
Cr II	1736.63	200		Zn III	1739.954	0	Q	Ar XI	1743.		F,P
Zn II	1736.825	0	Z	Ni III	1739.979	1	N	Co II	1743.021	0	
Ar II	1736.834	100		Si I	1739.993	5	A	N II	1743.197	200	
Co III	1736.856	3		Mn IV	1740.02	250		Co III	1743.212	10	N
Zn II	1736.889	60	Z	Cr III	1740.06	10	N	N II	1743.228		
V III	1736.99	40		Ca XX	1740.129		P	Na II	1743.309	15	
V II	1737.02	5	N	Fe	1740.14	20	N	Co III	1743.311	30	
Fe II	1737.185	20	P	Fe IV	1740.153	200		Fe II	1743.338	20	N
Co IV	1737.2		F,P	Mn II	1740.156	200		Mn II	1743.347	100	
Ni IV	1737.206	0	N	V II	1740.224	10		Mn I	1743.353	15	A
Si I	1737.269	5	A	Ca I	1740.260		A,Z	Co II	1743.395	15	
Co II	1737.321	1		V II	1740.291	3		Cr IV	1743.421	220	
Ne II	1737.341	50		Si I	1740.2988	20		Ni IV	1743.427	10	
Ni IV	1737.420	110		Cr III	1740.31	20		Cr III	1743.44	100	
Mn II	1737.43	5		N II	1740.310	400		Cr III	1743.65	30	N
Cr III	1737.47	30	N	Fe II	1740.312	20	Q	Zn IV	1743.734	15	
Zn III	1737.473	10		Zn II	1740.536	1	Z	Cr III	1743.87	30	
V II	1737.479	10		Co II	1740.563	15		Si I	1743.8941	20	
Sc II	1737.514	10		Si I	1740.597	20	A	Ni III	1743.903	1	
Co III	1737.523	3		Ni II	1740.619	30		Mg III	1743.947	4	
V II	1737.577	10		Fe IV	1740.634	50		Mn III	1743.96	3	
Mg II	1737.6283	500		Ni III	1740.671	15		Ge I	1744.0537	15	
Fe I	1737.63	0	Q	Ni III	1740.718	10		Cr III	1744.07	20	
Na III	1737.711	400		V II	1740.741	4		Fe III	1744.233	200	
Fe	1737.83	20	N	Cr III	1740.78	60		Ge I	1744.2546	15	
Cu III	1737.888	100		Fe IV	1740.816	110		Ne II	1744.277	50	
Zn II	1737.895	50	Z	As I	1740.93	3	N	Mn III	1744.35	2	
Mn II	1737.929	300		Ni III	1740.944	30		Ne II	1744.416	80	
Mn III	1737.932	190		Cr IV	1740.988	160		Zn IV	1744.502	12	
Fe II	1737.940	10	P	Co III	1741.057	5		Cu II	1744.5158	20	
V III	1738.00	25		Zn II	1741.090	0	Q,Z	Fe II	1744.526	10	N
F III	1738.041	200		Cr IV	1741.100	160		Cu II	1744.5269	20	
Ni II	1738.059	3		Cu III	1741.131	75		Co III	1744.529	2	
Fe II	1738.105	10	P	Fe IV	1741.171	1		Mn II	1744.54	2	
Ge I	1738.1185	15		As I	1741.28	10		Mg IV	1744.674	280	
Cu III	1738.142	100		Na III	1741.33	20	N	Mn II	1744.69	20	
Cr III	1738.23	120		Fe II	1741.340	1	P	F II	1744.745	200	
Ni III	1738.252	500		P IV	1741.345	4		Cr III	1744.81	30	N
Cr III	1738.300	4		Cu III	1741.368	600		Mn II	1744.86	10	
Ni II	1738.311	12		Mn II	1741.50	40		Co II	1744.980	1	

Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes
Fe II	1744.99	0	Q	Mg I	1747.790	200	A	Mn III	1751.253	0	
Mg III	1745.009	2		Ni IV	1747.824	10	N	F III	1751.276	6	
Cr III	1745.04	40	N	V III	1747.84	400	N	Cr III	1751.34	100	N
N II	1745.046			N III	1747.848	450	P	Mn III	1751.422	20	
N II	1745.076			Zn III	1747.872	0		Zn IV	1751.463	8	
Fe IV	1745.209	80		F III	1747.881	10		Mn IV	1751.59	850	
Fe II	1745.242	5	P	Co II	1747.884	5		P I	1751.591	7	
Co II	1745.247	0		Mn II	1747.92	2		Mn II	1751.60	20	
N I	1745.2482	150		Mn II	1747.995	2		N III	1751.657	500	P
N II	1745.256			F III	1748.023	3		Ar II	1751.679	200	
N I	1745.2600	50		Mn II	1748.13	10		V III	1751.68	500	
V II	1745.264			Fe III	1748.177	150		Ne II	1751.698	80	
P I	1745.265	25		Fe V	1748.18		F,P	Ni IV	1751.706	40	N
Se I	1745.30	30	N	P I	1748.202	1		Fe IV	1751.755	300	
Si I	1745.3475	25		Fe IV	1748.233	30		P I	1751.799	25	
S IV	1745.42	100		Ni II	1748.285	500		Zn II	1751.806	5	N
Ni III	1745.436	1	N	Co II	1748.332	3		C I	1751.8277	800	
Cr III	1745.55	80	N	Mn III	1748.359	80		Co III	1751.854	200	N
F II	1745.550	300		V III	1748.39	150		Se I	1751.88	30	N
As I	1745.60	1	N	Si I	1748.616	5	A	Ni II	1751.911	300	
Mn III	1745.625	5		N III	1748.646	25	P	Zn III	1751.945	1	Q
Fe III	1745.638	250		Ti V	1748.671	30		Na III	1752.06	20	N
Si I	1745.646	5	A	Cr III	1748.74	80	N	Fe V	1752.12		F,P
Fe II	1745.661	2	P	Co II	1748.772	0	N	N III	1752.160		
Co III	1745.674	400		F III	1748.806	3		Na II	1752.185	12	
Cr III	1745.751	120		Ge I	1748.8572	20		V III	1752.19	50	
Ni IV	1745.764	0	N	Cr III	1748.87	40		P I	1752.349	0	
Co II	1745.800	2		Fe II	1748.880	0	P	Zn II	1752.358	3	Z
V XXII	1745.81		P	Mn III	1748.888	10		Mn II	1752.40	8	
Si I	1745.916	5	A	Fe II	1748.890	5	P	Ni III	1752.427	300	
Zn IV	1745.998	25		Mg III	1748.932	500		Cr III	1752.47	80	N
Co II	1746.025	1		V II	1748.99	50		V III	1752.62	10	
Ge I	1746.0651	30		Fe III	1749.052	70		Si I	1752.624	10	A
Co III	1746.131	0	N	Fe II	1749.123	30	P	Na III	1752.65	60	Q
Fe VI	1746.151		P	Mn III	1749.17	1		F III	1752.694	1	
Co II	1746.215	10	N	Cu I	1749.202	2	Z	Mn II	1752.92	0	
Sc IV	1746.233	285		Ni III	1749.203	1		Se I	1752.94	60	
Co II	1746.299	1		Fe II	1749.358	5	P	Ni III	1753.011	400	
V III	1746.36	25		V III	1749.39	5		Fe IV	1753.082	150	
Co III	1746.369	20		Mg IV	1749.480	240		Si I	1753.101	20	A
Na III	1746.39	10	N	Mn III	1749.537	20		Ni III	1753.150	3	
Cr III	1746.48	10	N	Fe II	1749.602	10	P	Cr III	1753.23	30	N
F III	1746.545	1		Zn III	1749.629	200		Fe II	1753.26	20	Q
Ni IV	1746.603	0	N	Cr III	1749.67	70	N	Cu II	1753.2811	15	
Cr III	1746.77	200		N III	1749.674	25		Fe IV	1753.351	4	
Fe II	1746.818	110	P	Kr II	1749.687	4		Ni III	1753.377	10	
N III	1746.822		P	As I	1749.72	1		Fe III	1753.455	20	
Fe V	1746.85		F,P	Co III	1749.728	25		Mg II	1753.4744	500	
Co III	1746.853	5	N	F III	1749.766	35		F III	1753.518	60	
Cr IV	1746.875	220		Fe II	1749.777	10	P	Fe II	1753.58		F,P
Ni VI	1746.9		F,P	Si I	1749.8076	3		Cr III	1753.60	30	
Co IV	1746.9		F,P	Cr III	1749.88	10	N	Fe IV	1753.619	200	
Ni II	1746.989	1		Mn II	1749.93	40		V II	1753.665	8	
Mn II	1746.99	10		Ge I	1750.0432	30		Zn III	1753.824	100	N
Na II	1746.996	0		V III	1750.17	50		Mg I	1753.84		
Co VII	1747.		F,P	Mn II	1750.18	8		V II	1753.852	8	
Ni III	1747.011	550		Cr III	1750.27	20	N	Fe IV	1753.857	200	
F III	1747.114	150		V III	1750.34	100		N III	1753.986	4	
Zn II	1747.118	75		As I	1750.37	2	N	V III	1754.11	50	
Cr IV	1747.132	285		Cu III	1750.386	400		Co II	1754.118	5	
Cr I	1747.14	300	Z	Fe IV	1750.602	300		Mn II	1754.12	1	
Ni VI	1747.2		F,P	Al II	1750.612	60		Al IV	1754.120	20	
Fe III	1747.260	70		F III	1750.640	10		Ca III	1754.153	100	
Cr III	1747.30	70		Mg II	1750.6637	400		As I	1754.21	10	
Co II	1747.305	1		Ar II	1750.694	50		Co II	1754.216	8	
V III	1747.31	10		Zn III	1750.770	10		Mn II	1754.34	5	
Ni III	1747.356	1		Ge II	1750.85	10	Z	Cr II	1754.36	20	
Mn III	1747.38	5		Se I	1750.89	60	N	P I	1754.369	100	
F II	1747.389	450		As II	1750.945	5		Zn III	1754.498	0	
Si I	1747.4141	40		Cr III	1750.98	10	N	Cr IV	1754.52	20	N
P I	1747.439	7		Ni XI	1751.		F,P	Fe IV	1754.602	110	
Mg III	1747.561	200		Co III	1751.037	100	N	Mn II	1754.65	0	
Ti V	1747.639	50		Fe II	1751.05		F,P	Cr IV	1754.685	110	P
V II	1747.640	2		Ne II	1751.216	60		Be III	1754.69	50	
Ni III	1747.680	50		N III	1751.218	300	P	Ge VII	1754.7		F,P

Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes
Cr III	1754.76	300		Cr III	1758.20	50		Co III	1761.367	10	
Co III	1754.761	0		Kr II	1758.265	10		Fe II	1761.372	110	P
Zn III	1754.777	0		Ge I	1758.2792	40		Cr III	1761.38	40	
Ni II	1754.808	50		Fe II	1758.312	5	P	Na III	1761.428	60	
Mn II	1754.81	8		Cr IV	1758.37	50	N	Co II	1761.435	3	
Kr II	1754.821	1		Co III	1758.454	0		F III	1761.444	6	
Cr III	1754.94	20	N	Ni III	1758.468	10		Mn III	1761.543	20	
Na III	1754.97	10	N	Cr IV	1758.486	250	P	Mn III	1761.615	20	
Cu III	1755.006	100		V III	1758.50	150		V III	1761.63	50	
Mn II	1755.04	0		Cr IV	1758.542	400	P	P I	1761.639	60	
Co II	1755.205	0		Co II	1758.548	0		Co II	1761.67	0	N
Cr III	1755.24	150		Ne II	1758.555	80		Cr III	1761.73	20	
V III	1755.30	100	N	Fe IV	1758.58	2	F,P	Mg III	1761.74		
Li II	1755.331	100		Ti II	1758.582		P	Sc II	1761.751	80	
Al IV	1755.431	100		Ne II	1758.590	20		V III	1761.84	50	
Cr III	1755.46	200		As I	1758.60	100		Fe II	1761.84		F,P
Na III	1755.475	200		Co II	1758.654	5		Mn I	1761.941	3	A
Co II	1755.475	2		Fe IV	1758.695	30		Al II	1761.975	190	
Co IV	1755.5		F,P	Co II	1758.814	3		N III	1762.09	25	Z
Cr IV	1755.643	550		Ni III	1758.940	3		Na III	1762.13	10	N
Ni III	1755.757	1		F III	1758.956	150		Zn II	1762.151	20	N
Zn	1755.761	10	N	V III	1758.96	50		Mn IV	1762.17	700	
Cr III	1755.78	100		Ti III	1758.994	15		Zn II	1762.191	10	Z
Ar II	1755.819	100		Fe IX	1759.		F,P	Zn II	1762.223	10	N
P I	1755.829	15		Fe IV	1759.08	22	F,P	Zn II	1762.243	10	N
Zn II	1755.847	10	Z	Co III	1759.144	5		Ca III	1762.259	500	
Fe II	1755.850	20	P	Cr III	1759.19	30	N	V III	1762.27	75	
Co III	1755.979	500		Se I	1759.24	80	N	Fe II	1762.32		F,P
V III	1756.02	25		Ge I	1759.2712	15		Ni III	1762.394	20	
Ni III	1756.151	1	N	Cr III	1759.34	20	N	Zn II	1762.395	25	Z
Cr III	1756.29	30	N	Ni IV	1759.389	10	N	Al IV	1762.424	200	
Mn II	1756.30	10		V III	1759.46	100		N III	1762.426	4	Z
Mn I	1756.414	75	A	Cr III	1759.50	50	N	Cr III	1762.52	30	N
Mn I	1756.508	100	A	Cu II	1759.5045	1		Cr IV	1762.52	30	N
As I	1756.51	2		Ti III	1759.561	3		Cu III	1762.555	100	
V III	1756.57	10	N	Na II	1759.572	30		N III	1762.592	4	Z
Cr III	1756.58	10	N	Si I	1759.5831	10		Fe VI	1762.630		P
P I	1756.610	15		Co II	1759.698	1		Co II	1762.665	1	
Mn I	1756.657	150	A	Ti V	1759.757	200		Kr II	1762.686	25	
Zn II	1756.665	2	Z	Fe II	1759.77		F,P	Mn II	1762.75	10	
P III	1756.798	40		Fe II	1759.773	10	P	V III	1762.78	10	
Mn II	1756.80	1		F III	1759.792	3		Cr IV	1762.804	285	
Ni III	1756.801	2		Mn IV	1759.82	750		Al I	1762.892	100	Z
Na II	1756.817	10	N	Co II	1759.841	20		Mn IV	1762.94	750	N
Co II	1756.819	0		P I	1759.880	40		Fe II	1762.977	10	P
Ni II	1756.829	2		V III	1760.07	1000		V III	1762.99	25	
Ne II	1756.835	80		Al II	1760.104	210		Si I	1762.999	1	A
Fe II	1756.84	2	Q	O III	1760.12	700		Zn III	1763.032	6	
Co III	1756.851	30		Zn III	1760.192	2		Ni III	1763.069	2	
Fe II	1756.960	5	N	Ni III	1760.260	20		Ni II	1763.097	1	
Cr III	1756.97	10	N	Cr III	1760.31	10		Cr III	1763.13	70	
Ni III	1757.034	25		Mn III	1760.343	50		N III	1763.16	10	Z
Co II	1757.136	8		Co III	1760.354	1000		Fe II	1763.17		F,P
Fe II	1757.14		F,P	P I	1760.361	15		V II	1763.20	5	
Mg III	1757.176	4		Fe II	1760.390	20	Q	F III	1763.206	150	
Fe V	1757.26		F,P	C II	1760.3954	450	ST	O III	1763.22	700	
Si I	1757.2827	3		V III	1760.41	10		Na II	1763.325	7	
Kr II	1757.384	4		O III	1760.42	500		Co III	1763.465	100	
Mn II	1757.44	2		C II	1760.4735	100	ST	N III	1763.51		Z
P I	1757.445	60		Co II	1760.509	0		Co III	1763.533	15	
Cr III	1757.45	10	N	Fe IV	1760.552	110		V III	1763.59	10	
As I	1757.47	4		Ni III	1760.560	150		Ni III	1763.607	20	
Ti III	1757.523	1		Cu III	1760.580	75		N II	1763.639	100	
Co III	1757.531	15		Sc II	1760.590	10		Si I	1763.6607	80	
P III	1757.626	60		Si I	1760.600	1	A	Ar II	1763.669	50	
V III	1757.73	500		Fe IV	1760.658	30		Co II	1763.683	5	
Fe II	1757.743	30	P	Mn II	1760.678	100		Ti II	1763.714		P
Co II	1757.770	0	N	C II	1760.8191	300	ST	Ne II	1763.727	20	
Mg III	1757.888	20		Mn II	1760.96	5		Cr III	1763.77	150	
P I	1757.913	60		Na III	1761.018	60		Mg III	1763.805	30	
Cr III	1757.95	10		V III	1761.04	50		N III	1763.84	60	Z
Fe IV	1757.972	80		Fe I	1761.08	0	Q	Na II	1763.841	30	
Fe II	1758.065	20	P	Co III	1761.082	1	N	Al II	1763.869	255	
Kr II	1758.077	25		Fe IV	1761.085	520		C I	1763.909	120	
Ne II	1758.105	70		Cu III	1761.155	75		Mn III	1763.933	150	

Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes
Mn II	1763.94	15		Ni IV	1767.122	20		Co III	1770.500	10	N
Cu III	1763.948	1		Cr III	1767.18	10		Fe III	1770.554	400	
Al II	1763.952	315		Cl II	1767.2027	200		Si I	1770.6295	125	
S	1764.	10	N	Na III	1767.21	10	N	Ti III	1770.644	7	
Fe II	1764.119	20	P	Co III	1767.308	50		Ar II	1770.658	100	
Cr III	1764.16	10	N	Fe IV	1767.355	450		Si I	1770.659	10	P
Ge I	1764.1852	30		Mn II	1767.67	60		Cr III	1770.66	20	N
N III	1764.218	4	Z	Zn III	1767.684	90		F III	1770.668	700	
V III	1764.23	250		Cl VI	1767.7			V II	1770.698	3	
Co II	1764.288	3		Al II	1767.731	225		Ni IV	1770.805	20	
Cr IV	1764.324	360		Fe II	1767.75	1	P	Si I	1770.9223	300	
O III	1764.48	700		O III	1767.78	1000		Cr III	1770.96	30	N
Co II	1764.512	0		V III	1767.79	10	N	F III	1770.963	10	
Cu I	1764.540	10	F	P III	1767.818	25		Sc IV	1771.103	220	
Ni III	1764.688	800		Ne II	1767.900	10		Mn IV	1771.24	450	
N III	1764.79	4	Z	Ni III	1767.938	500		Co III	1771.259	100	
Fe IV	1764.795	200		As I	1767.97	6	N	Fe II	1771.260	5	N
Mn III	1764.867	70		Co III	1768.003	5	N	V III	1771.35	75	
V II	1764.916	4		Fe II	1768.012	5	N	Na III	1771.35	40	
Fe IV	1764.920	450		F III	1768.038	200		Ti V	1771.452	150	
Ne II	1765.015	30		Ar II	1768.043	100		Mn III	1771.486	35	
Si I	1765.0296	90		Ne II	1768.085	10		Ni III	1771.492	100	
Cr III	1765.06	120	N	V III	1768.09	100		Fe II	1771.510	5	N
Co II	1765.108	5		V II	1768.175	2		Co II	1771.523	0	
N II	1765.140	50		Co III	1768.238	200		V III	1771.67	50	
Ca I	1765.2		A,Z	O III	1768.24	900		O III	1771.67	900	
Ni III	1765.229	1	N	Cr III	1768.32	40	N	Ar II	1771.829	200	
Fe VI	1765.253		P	V II	1768.334	3		As I	1771.84	2	
V III	1765.28	15		P I	1768.414	100		Co III	1771.854	200	
Ge I	1765.2843	30		Co III	1768.471	100		Ni II	1771.865	4	
Fe II	1765.325	20	P	Cr III	1768.50	40	N	Fe II	1771.960	10	P
C I	1765.366	50		Co II	1768.501	0		Fe III	1771.975	150	
Co III	1765.414	0		Cr IV	1768.549	110		Zn	1771.987	10	N
Mn II	1765.502	100		Mn II	1768.596	80		K XII	1772.		F,P
Cr III	1765.53	10	N	Na II	1768.603	7		S	1772.	10	N
Co III	1765.566	1	N	V III	1768.66	5		Ni IX	1772.		F,P
Si I	1765.6215	50		Fe IV	1768.681	250		Cl VI	1772.0		
Al I	1765.632	200	Z	Cr III	1768.78	50		Mn II	1772.00	2	
N II	1765.680		P	Mn III	1768.795	70		Cl II	1772.0258	200	
Cr III	1765.739	60		Cu III	1768.861	200		Mn IV	1772.11	650	
Fe VI	1765.786		P	Ca I	1768.890		A,Z	Ni II	1772.197	1	
Mn III	1765.801	60		P I	1768.902	100		Si I	1772.2254	12	
Al II	1765.815	190		As I	1768.97	5	N	Co III	1772.233	300	
Fe II	1765.83		F,P	As II	1768.985	225		Cu III	1772.299	2	
Ne II	1765.898	70		Ni IX	1769.		F,P	P II	1772.30	30	
V III	1765.92	15		Cr III	1769.03	100	N	O III	1772.31	400	
Cr III	1765.93	10	N	Mn II	1769.08	8		V III	1772.31	200	
Mn III	1765.940	35		V III	1769.13	15	N	Mn II	1772.35	30	
Si I	1765.945	10	A	Al I	1769.133	200	Z	Co III	1772.438	200	
Cl VIII	1766.0			Cr III	1769.17	300		Mn II	1772.45	5	
N III	1766.059	25	Z	V III	1769.22	10		Cr III	1772.46	40	
Si I	1766.0627	100		Fe II	1769.275	40	P	Cu III	1772.483	50	
Ge I	1766.0648	25		O III	1769.32	400		Ni III	1772.499	1	N
N II	1766.079	100		Ge II	1769.377	5		Fe II	1772.513	110	P
Cr III	1766.08	10		Si I	1769.461	5	A	As I	1772.54	8	
V III	1766.16	50		Co III	1769.495	10	N	Co III	1772.549	50	N
Cu III	1766.221	50		F III	1769.529	6		Cr III	1772.60	50	N
Co II	1766.249	0		Kr II	1769.546	1		V III	1772.63	100	
Mn IV	1766.27	850		V III	1769.60	25		Se I	1772.64	50	
O III	1766.34	400		Ni III	1769.634	1000	P	P IV	1772.661	1	
Mn IV	1766.34	400		Cr IV	1769.635	450		Co III	1772.671	100	
Si I	1766.3541	50		Ni III	1769.653	200	P	N II	1772.735		
Fe	1766.36	20	N	Fe II	1769.666	30	P	Al II	1772.802	10	
Al I	1766.381	200	Z	Si I	1769.7859	70		Mn III	1772.824	5	
Ni III	1766.387	10		Ni II	1769.940	2		Zn IV	1772.843	1	
Mn III	1766.416	130		Co III	1769.957	500		F III	1772.925	300	
Ge I	1766.4330	30		Fe II	1769.993	1	P	Mg III	1772.982	350	
Mn II	1766.50	50		V III	1770.06	25		V III	1772.99	50	
Cr III	1766.58	60	N	F III	1770.092	400		O III	1773.00	500	
Na III	1766.700	160		Cr III	1770.10	30	N	Co II	1773.042	10	
Fe II	1766.74		F,P	Ni III	1770.153	1		Mn IV	1773.06	300	N
Cr III	1766.92	300	N	Ga II	1770.2	50		Fe III	1773.098	70	
V II	1767.02	5		Cr III	1770.247	200		Cr IV	1773.131	360	
Co III	1767.084	30		Cr III	1770.35	20	N	Co III	1773.215	500	
Mn IV	1767.09	750		Mn II	1770.444	10		Fe II	1773.22	2	P



Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes
Ca III	1773.241	400		Ar II	1776.672	100		Mn II	1780.25	8	
Cr III	1773.32	20	N	Ni III	1776.802	30		Sc IV	1780.469	70	
Co II	1773.332	1		Si I	1776.8241	150		V III	1780.48	100	
F III	1773.363	600		Fe V	1776.849		P	V II	1780.52	100	
V III	1773.43	300		Al II	1776.975	100		As I	1780.52	50	
F III	1773.496	35		Cr IV	1776.992	20		N II	1780.551		
Mn IV	1773.51	750		Mn IV	1777.02	300		Co III	1780.686	0	N
Co III	1773.568	1000		Co III	1777.145	600		Fe IV	1780.708	300	
Cu III	1773.697	20		V III	1777.18	50		V II	1780.829	2	
Cr III	1773.70	10	N	Ni III	1777.227	10		Mn III	1780.891	60	
Mn II	1773.70	2		Mn II	1777.23	0		O III	1780.95	600	P
Ni III	1773.788	40		Cr III	1777.27	40	N	Fe II	1780.99	2	Q
O III	1773.85	500		Fe	1777.35	15	N	Cl II	1781.0431	60	
Ni II	1773.949	25		F III	1777.358	60		Ni III	1781.088	15	
Mg III	1773.959	2		Zn IV	1777.404	40		Fe IV	1781.090	110	
V II	1773.985	2		Fe II	1777.45	0	Q	Ni III	1781.279	50	
Al II	1774.002	25		Cr III	1777.49	10	N	Fe II	1781.343	30	P
V III	1774.02	10		Ca I	1777.6		A, Z	Cr III	1781.45	20	N
Zn II	1774.040	75	Z	Ti III	1777.672	15		As I	1781.48	50	
Co II	1774.059	2		Co II	1777.681	2		Fe II	1781.530	5	Q
Si I	1774.076	5	A	Fe III	1777.737	70		V III	1781.61	200	
F III	1774.104	150		Cr IV	1777.821	450		Fe II	1781.702	2	
Ge I	1774.1755	40		Al II	1777.825	3		Cr III	1781.73	10	N
V II	1774.209	3		F III	1777.846	35		Mn II	1781.82	1	
Mn II	1774.21	50		Co II	1777.863	3		Kr II	1781.888	60	
P III	1774.226	25		Fe II	1777.898	10	P	Mn II	1781.93	1	
V III	1774.25	25		Zn III	1777.911	3		Ge XVIII	1782.0		F, Q
Sc IV	1774.399	1		Mn II	1778.01	10		Ti III	1782.007	15	
Co III	1774.418	500		V III	1778.02	400		Fe II	1782.012	20	N
Cr III	1774.51	20	N	Cr IV	1778.053	110		V III	1782.04	5	
Co III	1774.577	10		Mn II	1778.09	6		Cr III	1782.07	100	N
Ni III	1774.640	10		Co III	1778.091	100		Co III	1782.195	5	N
Ge II	1774.703	10		Ti XVIII	1778.1		F	Mn IV	1782.21	750	N
Mn II	1774.75	15		Cl II	1778.1019	50		S I	1782.2626	50	
Al II	1774.770	10		Fe II	1778.22		F, P	Fe IV	1782.264	150	
Fe IV	1774.794	110		Na II	1778.243	40		V II	1782.454	3	
Cu I	1774.826	58	A	Ne II	1778.282	30		Kr II	1782.594	10	
Cu IV	1774.845	50	Q	Co II	1778.315	5		Ar II	1782.596	100	
Cr III	1774.89	10		Na III	1778.402	140		Mn III	1782.615	150	
P I	1774.951	410		Ni III	1778.583	10		Mn II	1782.626	8	
Ni III	1774.992	2	N	Mn II	1778.59	20		Ni III	1782.747	60	
Zn II	1775.024	3	Z	Ti III	1778.651	3		Fe IV	1782.80	11	F, P
Cr III	1775.06	30		Mn II	1778.692	100		P I	1782.838	360	
F III	1775.079	60		Si III	1778.715			Na III	1782.92	240	N
As I	1775.12	2	N	Ni III	1778.730	30		Fe IV	1782.944	12	
Mn II	1775.21	50		Cl II	1778.7350	2		Co III	1782.966	850	
Fe III	1775.267	70		Ne II	1778.747	30		Cr III	1782.99	250	N
Na III	1775.32	10	N	Ge XVIII	1778.8		F, Q	Cl II	1783.0131	50	
Ni VI	1775.5		F, P	Na II	1778.905	0		Na II	1783.043	60	
Mn II	1775.52	0		Cr III	1778.93	200		Mn II	1783.06	1	
Fe III	1775.566	20	P	O III	1779.08	700		Fe IV	1783.066	375	
Mn II	1775.69	6		C III	1779.09	10		Si III	1783.079		
V III	1775.72	75		Ni III	1779.127	20		Si III	1783.146		
Ni III	1775.750	150		Co II	1779.194	1		V III	1783.16	20	
Co II	1775.872	2		Mn II	1779.308	20		Mn II	1783.18	0	
Cr IV	1775.909	30	P	Fe II	1779.31		F, P	Si I	1783.2315	25	
Mg III	1775.942	4		Fe	1779.35	15	N	Mg III	1783.253	550	
Cr IV	1775.972	10	P	Ni III	1779.442	30		Cl VI	1783.3		
Fe III	1775.983	400		Co III	1779.536	20		Fe IV	1783.31	3	F, P
Co VII	1776.		F, P	Mn II	1779.59	1		Ni II	1783.317	1	
Cu XXIV	1776.0		F	Ni III	1779.607	1	N	Mn II	1783.38	2	
Mn II	1776.06	20		V III	1779.72	500		V III	1783.41	200	
Ni III	1776.068	400		Co II	1779.756	5		Na III	1783.460	180	
Be II	1776.100	500		F III	1779.778	6		Na II	1783.475	15	
V II	1776.104	3		Co III	1779.896	3		Mn II	1783.51	15	
Cu III	1776.129	75		Na II	1779.906	0		Mn II	1783.63	10	
Al II	1776.19	1		Cr III	1779.91	40	N	Ti III	1783.644	25	
Be II	1776.307	1000		Co II	1779.921	1		Mn II	1783.72	20	
Fe IV	1776.349	50		Mn IV	1779.98	450		Cl II	1783.7251	185	
Co II	1776.464	0		Cr III	1779.99	40	N	V II	1783.744	10	
V II	1776.48	0		As XVII	1780.0		F, P	V III	1783.77	50	
Na II	1776.571	90		Co III	1780.046	750		Ne II	1783.783	30	
Mn IV	1776.59	600		Cu III	1780.059	30		Cu III	1783.792	75	
Co III	1776.630	1		Cr III	1780.14	50		Ca III	1783.929	500	
Fe II	1776.649	30	P	Co II	1780.213	0		Mn II	1783.94	10	

Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes
Co II	1783.940	1		Co II	1786.970	0		Fe II	1789.90	2	P
Cu III	1783.941	30		S I	1787.	10	N	Ni III	1789.983	5	
Ni IV	1783.949	0	N	Mn IV	1787.04	750	N	Si I	1790.2548	25	
Cr III	1783.95	200		As I	1787.07	6		Co III	1790.258	500	
Kr II	1783.997	10		Co III	1787.082	600		Co III	1790.389	50	
Co III	1784.055	500		V III	1787.15	15		Ni III	1790.402	250	
Si I	1784.0884	8		Cl II	1787.1723	140		Mn IV	1790.44	750	
V II	1784.128	8		Cr III	1787.18	120		Se I	1790.48	30	N
Co II	1784.194	1		Na II	1787.189	80		Cr III	1790.48	40	N
Cr IV	1784.223	40	P	Mn II	1787.23	2		Co II	1790.520	1	
Mn II	1784.24	15		Mn II	1787.36	3		Na II	1790.562	2	
Mn III	1784.394	20		Mn IV	1787.38	750		Mn II	1790.60	80	
Cr III	1784.43	150	N	Zn II	1787.384	0	Z	Cu II	1790.6603	5	
V III	1784.44	400		Ti III	1787.418	40		Fe IV	1790.681	150	
Ti III	1784.450	25		Ca I	1787.42		A, Z	Cr III	1790.71	10	N
Mn II	1784.46	10		Ni III	1787.456	2		Zn II	1790.759	80	Z
Mn IV	1784.64	600		Mn II	1787.48	2		Mn II	1790.79	20	
Fe IV	1784.647	250		Co III	1787.502	50		Co III	1790.892	25	
Cl II	1784.6792	100		Si II	1787.538	8	Z	Fe IV	1790.911	1	
Cr III	1784.72	50	N	Co III	1787.575	30		Ni III	1790.934	200	
Co III	1784.790	30	N	Mn I	1787.653	150	A	Cr IV	1791.094	220	
O III	1784.85	600		P I	1787.656	315		Mn IV	1791.10	10	
Ni III	1784.882	75		Fe IV	1787.758	1		Co III	1791.153	300	
Mn IV	1784.89	200		As II	1787.885	0		Zn III	1791.185	1	
Co III	1784.944	3	N	Cu III	1787.902	10		Fe II	1791.21		F, P
Fe IV	1784.967	375		Mg III	1787.927	12		Ni II	1791.219	1	
Co II	1785.026	5		Co II	1787.972	3		Na II	1791.224	35	
Mn II	1785.032	20		Fe II	1787.996	40	P	V III	1791.23	50	
Cl II	1785.0445	170		Ar XII	1788.		F, P	Co III	1791.277	500	
Ge I	1785.0460	50		Zn IV	1788.015	0		Fe III	1791.345	20	
V II	1785.07	50		Fe II	1788.078	40	P	Mg III	1791.375	20	
Co III	1785.116	20		Ar II	1788.104	300		Mg III	1791.40		
Fe II	1785.272	160	P	F III	1788.110	1		F III	1791.445	3	
Mn II	1785.31	1		Mn I	1788.142	150	A	Cr III	1791.48	30	N
Mn I	1785.312	350	A	V III	1788.26	1000		Cr II	1791.51	40	
V III	1785.33	50		Ni III	1788.301	200		Mn II	1791.54	1	
Cl II	1785.3314	125		Fe IV	1788.361	1		Ar II	1791.561	100	
Fe IV	1785.394	4		Mn II	1788.43	40		Mn IV	1791.58	350	
Kr II	1785.419	4		Cr III	1788.464	1		Na IV	1791.629	285	
Mn I	1785.453	300	A	Ni II	1788.485	100		Ni III	1791.644	200	
Cr III	1785.53	10		Co II	1788.487	1		F III	1791.648	800	
Mn II	1785.618	20		Ni III	1788.502	150		Mn II	1791.67	2	
Co II	1785.626	2		Co III	1788.627	50	N	Ni V	1791.7		F, P
Fe V	1785.635		P	Mn IV	1788.64	750		Cr IV	1791.729	285	
Ar II	1785.672	100		Mn III	1788.669	150		Fe IV	1791.751	1	
Co III	1785.705	5		Fe IV	1788.685	200		As I	1791.77	40	
Mn II	1785.73	1		Mn II	1788.786	40		Na II	1791.862	30	
Mn I	1785.813	200	A	Ca I	1788.82		A, Z	Mn II	1791.88	25	
As I	1785.84	3		Ca III	1788.827	200		Co II	1792.096	10	
Fe II	1785.922	5	P	Na II	1788.846	45		Fe IV	1792.102	520	
Cu IV	1785.961	60		Ti III	1788.979	7		Cl II	1792.1067	185	
Co III	1785.965	50		Cl II	1789.0429	170		Co III	1792.144	100	
V III	1785.97	150		Co III	1789.070	600		Cl II	1792.2707	10	
Na II	1785.989	12		As I	1789.14	15		Fe II	1792.32		F, P
Mn IV	1786.02	750		Co II	1789.218	1		Mn III	1792.38	5	
Ge I	1786.0686	40		Mn IV	1789.23	300	N	Co III	1792.410	300	
Cr II	1786.11	40	P	Cr II	1789.24	30		V II	1792.49	50	
Cr III	1786.16	30	N	Co III	1789.373	100		Ni III	1792.513	25	
Ca I	1786.28		A, Z	N II	1789.402		P	Mn II	1792.52	0	
Mn II	1786.31	20		V III	1789.47	200	N	Zn III	1792.523	1	
Co III	1786.342	200		Zn II	1789.509	8	Z	Ti III	1792.589	3	
Si III	1786.371			Co III	1789.549	100		Ti III	1792.672	3	
Co II	1786.374	1		O III	1789.61	700	P	Cr III	1792.73	80	N
F III	1786.436	1		Ne II	1789.613	20		Cl II	1792.9286	125	
Si III	1786.438			Mn IV	1789.62	10		V V	1792.992	250	
Fe II	1786.448	1		V III	1789.62	100		Ni III	1792.994	100	
Si III	1786.515			V II	1789.62	75		Ge I	1793.0711	40	
Co III	1786.679	50		Mn II	1789.63	8		Fe IV	1793.127	375	
Fe II	1786.752	110	P	Ni II	1789.640	1		V II	1793.13	30	
Si II	1786.817	4	Z	As II	1789.643	5		Cl II	1793.1533	200	
Cl II	1786.8508	50		Zn III	1789.691	5	Q	Mg III	1793.207	4	
Mn II	1786.86	10		Cr III	1789.77	40	N	Mn III	1793.242	10	
V II	1786.91	5		Co II	1789.802	3		Se I	1793.29	250	
Ni III	1786.927	60		As I	1789.85	50		Fe II	1793.367	110	P
Mn II	1786.97	3		Ni III	1789.888	3		Ar II	1793.435	50	

Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes
Co II	1793.465	5		V III	1797.44	25		Fe II	1800.449	1	P
Fe IV	1793.477	300		Si IV	1797.496			Co II	1800.451	8	
Mn IV	1793.54	80		Ti VIII	1797.5		F, P	Co III	1800.469	50	
Mn III	1793.560	10		Kr II	1797.515	4		Fe V	1800.478		P
Cr III	1793.60	10	N	P II	1797.54	10		F III	1800.505	100	
Ne III	1793.7		F, P	V III	1797.63	100		Fe II	1800.55		F, P
Cr III	1793.75	50		P IV	1797.638	1		Mg III	1800.662	350	
Mn II	1793.753	30		Zn II	1797.643	100	Z	Co III	1800.7		F, P
Fe III	1793.785	70		V V	1797.646	60		Cr I	1800.7		N, A
V III	1793.82	500		Mn II	1797.76	20		Ne II	1800.733	70	
Fe IV	1793.876	250		Ti III	1797.765	7		N III	1800.789	10	Z
Mn II	1793.89	1		Fe III	1797.769	20		Cr III	1800.84	10	N
Co III	1793.924	200		Cl II	1797.9035	160		Cr I	1800.9		N, A
Cr III	1793.95	80	N	Mn III	1797.919	25		Cu II	1800.9526	2	
Ni III	1793.972	1	N	Cr III	1797.92	20		Mn II	1800.959	2	
Ti XVII	1794.		F, P	Cl III	1797.98	200		V II	1800.962	0	
V III	1794.00	250		Cu IV	1797.992	300		Co III	1800.974	25	
Mn III	1794.098	80		Fe II	1798.025	5		Cr IV	1800.991	220	
Ca III	1794.223	500		Co III	1798.064	500		Si I	1801.003	6	P
Cl II	1794.2533	140		Mn III	1798.130	80		Co III	1801.030	25	
Kr II	1794.421	4		V III	1798.15	500		Mn II	1801.04	1	
Cr II	1794.47	10		Fe II	1798.157	100	P	Fe II	1801.08	1	P
Se I	1794.55	50		Fe II	1798.196	10	P	Cr I	1801.1		N, A
Co II	1794.556	0		Cr I	1798.2		N, A	Mn II	1801.23	10	
As II	1794.567	0		Ca III	1798.246	450		Na II	1801.256	45	
Mg III	1794.582	300		Ne II	1798.281	80		Na III	1801.267	60	
V III	1794.60	1000		Cr III	1798.33	50	N	Mn II	1801.27	50	
Fe IV	1794.695	1		Ni III	1798.366	20		Ge I	1801.4323	50	
Fe II	1794.77	1	Q	P II	1798.37	5		Fe IV	1801.444	300	
Cr IV	1794.796	40		Na II	1798.410	80		Cr III	1801.46	10	N
Co III	1794.804	100		Fe IV	1798.457	200		Ni III	1801.506	50	
Ni III	1794.904	200		Mn III	1798.545	1		V II	1801.613	6	
Ar II	1795.10	30	Q	Fe IV	1798.563	250		Mn II	1801.63	8	
Fe II	1795.11	2	Q	Cr I	1798.6		N, A	N III	1801.639	4	Z
Zn II	1795.160	5	N	As I	1798.61	9	N	Cr I	1801.7		N, A
Ni III	1795.192	20		Co II	1798.634	2		Zn IV	1801.704	80	
Se I	1795.28	300		Fe V	1798.691		P	Fe III	1801.766	200	
V II	1795.38	5		N III	1798.733	4	Z	Co II	1801.909	0	
Co III	1795.426	2		Cu III	1798.757	30		As I	1801.92	3	
Cr III	1795.58	30		Co III	1798.876	5		Co III	1801.940	0	N
Mn IV	1795.65	800		Fe V	1798.927		P	Mn I	1802.013	75	A
Na II	1795.772	1		Cr III	1798.97	20	N	Mn I	1802.048	125	A
Mn IV	1795.79	800		Co III	1799.0		F, P	Mn IV	1802.09	150	N
Se I	1796.04	60	N	Ni III	1799.023	5		F III	1802.181	60	
Cr IV	1796.129	70		Ti V	1799.082	110		Cr IV	1802.340	20	
Si IV	1796.162			P II	1799.10	50		N III	1802.365	40	Z
Si IV	1796.166			Si I	1799.1193	30		Cr I	1802.4		N, A
Co III	1796.200	10		N III	1799.180	4	Z	Mn III	1802.450	1	
V II	1796.26	5		Co II	1799.306	10		Ni III	1802.546	2	
Cr III	1796.37	10	N	Mn III	1799.346	2		V III	1802.55	300	
Mn III	1796.457	45		Cr III	1799.40	10	N	Cr III	1802.60	120	
Ne II	1796.516	70		Ga II	1799.42	120		Ge I	1802.6246	40	
V II	1796.52	30		V II	1799.47	120		Mn IV	1802.63	10	
Co III	1796.664	5	N	As I	1799.51	2		Cr IV	1802.723	870	
Zn	1796.701	15	N	Fe IV	1799.514	50		Co III	1802.917	1	
Zn II	1796.701	15	N	Mn III	1799.56	2		Cr I	1803.0		N, A
V III	1796.77	300		Co II	1799.589	8		Mn II	1803.00	10	
Mn III	1796.864	100		N III	1799.660	4	Z	Si III	1803.023	60	
Cr III	1796.89	10	N	Cr I	1799.7		N, A	F III	1803.027	300	
Fe II	1796.915	20	N	Mn II	1799.81	40		As II	1803.028	0	
Fe IV	1796.932	520		Co II	1799.906	0		Ti III	1803.080	3	
Fe II	1796.98	40	P	P II	1799.91	20		Mg III	1803.087	4	
P X	1797.		F, P	V II	1799.97	30		Ne II	1803.114	30	
Kr II	1797.020	4		Ni III	1800.031	20		V III	1803.15	25	
Sc II	1797.021	1		Na II	1800.048	25		N III	1803.255	4	Z
Co III	1797.095	10		V III	1800.07	100		V II	1803.279	1	
Mn III	1797.100	150		N III	1800.131	25	Z	Fe III	1803.330	70	
Ti III	1797.159	3		Zn IV	1800.147	15		V II	1803.401	4	
Ne II	1797.198	30		Mg IV	1800.167	340		Mn II	1803.43	20	
Mg IV	1797.271	220		Ca III	1800.208	600		As I	1803.46	10	
N III	1797.277	1	Z	Fe II	1800.22		F, P	Cr III	1803.47	10	N
V III	1797.28	100		P II	1800.27	20		N III	1803.525	4	Z
Mn II	1797.35	2		Fe IV	1800.29	1	F, P	Fe II	1803.541	5	P
Si I	1797.3560	6		Ni III	1800.404	1		Ni III	1803.615	1	N
Ti II	1797.414		P	Si I	1800.406	1	A	Cr I	1803.7		N, A

Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes
Ne II	1803.732	70		Ni III	1807.056	50		Mn II	1810.12	2	
V III	1803.76	75	N	Na III	1807.070	300		Cr III	1810.14	30	
Na II	1803.833	15	N	Na II	1807.092	90	Q	Co II	1810.149	1	
Mn III	1804.065	400		V II	1807.15	10		Sc II	1810.224	4	
Kr II	1804.070	4		Ni III	1807.245	300		Cl III	1810.26	100	
F III	1804.073	200		S I	1807.3108	550		V III	1810.31	0	
V III	1804.13	500		Ca II	1807.337	200		Cu IV	1810.329	70	
Fe II	1804.166	0	P	Mn II	1807.34	30		Ge XIX	1810.4		F,Q
Fe IV	1804.39	1	F,P	V III	1807.35	50		Cr I	1810.4		N,A
Ni III	1804.394	30		Al II	1807.417	70		Mn III	1810.447	20	
Fe IV	1804.416	250		Cr III	1807.45	10	N	Co III	1810.464	15	
N III	1804.44		Z	Fe V	1807.530		P	Ni III	1810.489	150	
Mn II	1804.446			Mn III	1807.551	115		Cr IV	1810.499	360	
Ni II	1804.451	1	N	Zn III	1807.566	1		V IV	1810.566	30	
Ge I	1804.4523	50		Al II	1807.585	20		Fe II	1810.57	3	P
Ni II	1804.473	30		Fe IV	1807.597	375		V II	1810.60	60	
N III	1804.486	150		Al II	1807.651	1		V III	1810.71	250	
V III	1804.52	75		Cr I	1807.7		N,A	Mn III	1810.767	200	
Co II	1804.537	5		V III	1807.74	50	N	Na III	1810.767	200	
Fe IV	1804.570	110		Fe II	1807.740	20	P	Cr III	1810.77	30	N
Sc IV	1804.636	40		Mg IV	1807.746	120		Sc II	1810.821	1	
Fe II	1804.646	0	P	Cu II	1807.8410	15		Ge II	1810.83	1	Z
F III	1804.698	250		Ca III	1807.885	650		Cr III	1810.92	40	N
V III	1804.76	75		Mn III	1807.926	3		Zn II	1811.008	80	Z
Fe II	1804.827	1	P	Si II	1808.0117	150		Mn III	1811.025	300	
Cr III	1804.85	10		Co II	1808.019	20		Cu IV	1811.073	400	
Mn I	1804.859	3	A	Fe IV	1808.087	110		N V	1811.08	30	
Fe II	1804.95	1	P	V II	1808.097	3		Zn II	1811.105	15	Z
Co II	1804.954	60	N	Fe III	1808.203	20		Ti III	1811.185	40	
Zn II	1804.978	2	Q,Z	Mg IV	1808.286	320		Fe IV	1811.247	375	
V II	1804.979	2		Zn III	1808.300	3	Q	Mn IV	1811.28	0	
Ni IV	1805.012	20	N	Mn III	1808.316	25		Co III	1811.317	100	
Na III	1805.02	20		Ni II	1808.330	2		Co II	1811.324	3	
P II	1805.11	30		Na II	1808.375	60		V V	1811.425	300	
Ge I	1805.135	15		Co III	1808.384	300		Co III	1811.466	400	
Cr I	1805.2		N,A	Cr I	1808.4		N,A	V II	1811.51	0	
V III	1805.23	150		Cr IV	1808.410	110		Mn IV	1811.61	0	N
Fe IV	1805.319	450		Si I	1808.4301	20		N V	1811.62	35	
Fe III	1805.337	150		Ni IV	1808.488	10	N	Na III	1811.671	220	
Cu I	1805.341	10	F,A	Sc II	1808.492	1		Kr II	1811.674	4	
Cr I	1805.4		N,A	V III	1808.51	100		Ni III	1811.689	200	
Cu IV	1805.405	40		Cl III	1808.51	400		Co III	1811.694	3	
Cu I	1805.454	5	F,A	V II	1808.66	5		Sc II	1811.719	1	
Co III	1805.535	500		Cr II	1808.66	60		Mn II	1811.89	10	
Zn III	1805.599	3		Kr II	1808.713	4		Fe III	1811.924	200	
N III	1805.669	200		Mn II	1808.72	40		Mn II	1812.04	2	
Fe II	1805.718	1	P	Cr IV	1808.723	110		Mn I	1812.050	5	A
Na III	1805.764	140		Mn I	1808.724	20	A	Ni II	1812.065	30	
F III	1805.896	900		Fe II	1808.828	0	P	Ca III	1812.153	700	
V II	1805.932	20		Mn I	1808.842	15	A	Co II	1812.181	15	
Mg VI	1805.97		F	Co II	1808.915	15		V III	1812.19	1000	
Na II	1805.998	12		Zn II	1808.915	10	N	Ni III	1812.190	10	
Na II	1806.061	10		Zn III	1808.915	6	Q	V II	1812.195	100	
Co III	1806.096	10		Mn II	1808.96	40		Cr I	1812.2		N,A
P II	1806.12	150		Si I	1809.1047	100		Cr III	1812.24	40	N
As I	1806.15	200		Ni III	1809.200	5		Fe II	1812.266	0	P
Na V	1806.170	25	Q	Co III	1809.233	40	N	Fe IV	1812.267	4	
V IV	1806.184	80		Zn III	1809.253	1		Co III	1812.336	5	
Na III	1806.229	140		Fe II	1809.318	90	P	As II	1812.350	5	
Co III	1806.350	10	N	Ni III	1809.335	15		Cr IV	1812.413	750	
Ni III	1806.457	30		V III	1809.36	150		Ar II	1812.475	50	
Mn III	1806.473	300		Mn II	1809.43	30		Ni III	1812.539	3	
V II	1806.49	80		Kr II	1809.454	1		Fe IV	1812.544	200	
Co III	1806.492	5	N	Zn IV	1809.521	20		Co III	1812.550	50	
Cr I	1806.5		N,A	Cr III	1809.58	10	N	Na III	1812.555	160	
V III	1806.55	10		Cr I	1809.7		N,A	Co III	1812.6		F,P
Ni III	1806.550	30		Fe IV	1809.734	375		Ni III	1812.769	20	
Fe IV	1806.577	110		V II	1809.81	80		Cr II	1812.91	20	P
P II	1806.67	50		V IV	1809.854	60		Fe III	1812.974	150	
Ne II	1806.671	5		Co III	1809.904	5	N	Cr III	1812.98	10	N
Na III	1806.684	140		Mn II	1809.97	30		S II	1813.	10	N
V III	1806.71	25		Fe IV	1810.055	300		Ar II	1813.014	100	
Co III	1806.9		F,P	Na III	1810.071	40		Mn II	1813.03	10	
Ti II	1806.987		P	Cr II	1810.08	100		Co III	1813.044	50	
Mg VI	1807.		F,P	Ge I	1810.1006	4		V IV	1813.050	50	

Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes
Co II	1813.141	10		Mn II	1816.52	25		Co III	1820.064	100	
Zn II	1813.170	1	Z	Co III	1816.617	20		Al II	1820.124	2	
Co III	1813.186	300		Fe IV	1816.620	50		Mn I	1820.203	10	F,A
Si I	1813.27	1		As I	1816.72	10	N	Mn II	1820.22	50	
Mn II	1813.283	8		Na III	1816.812	200		S I	1820.3426	500	
Co II	1813.398	8		Mn II	1816.87	10		Fe IV	1820.417	450	
Cr II	1813.41	20	P	Mn II	1816.91	10		Co I	1820.42	12	
Sc II	1813.458	1		Si II	1816.9278	200		Mg III	1820.421	20	
Ca III	1813.585	550		Ni III	1816.990	1		Cr IV	1820.454	70	
Cr III	1813.60	20	N	V II	1817.09	0		Fe II	1820.479	2	P
Cu IV	1813.601	320		Ni II	1817.112	1	N	Fe III	1820.496	70	
Cr I	1813.7		N,A	Cr III	1817.16	100	N	Co III	1820.6		F,P
Sc II	1813.725	1		Cu I	1817.265	56	A	V III	1820.65	250	
Cl II	1813.75	10	N	Fe IV	1817.391	250		Mn II	1820.65	9	
Ar II	1813.766	100		Si II	1817.4511	10		Co III	1820.7		F,P
Mn II	1813.866	30		Fe II	1817.509	0	P	Cr II	1820.77	20	
V II	1813.87	80		Co III	1817.518	100		Cr II	1820.84	80	
Ge I	1813.9087	15		Mn II	1817.53	150		Mg III	1820.896	2	
Ga II	1813.98	350		Cu IV	1817.557	690		Co XIV	1820.9		F,P
Fe II	1814.01	1	P	Ni III	1817.598	15		Ni II	1820.916	1	
V III	1814.05	5	N	Kr II	1817.602	60		Co III	1821.004	1	
Fe	1814.06	15	N	Na III	1817.617	160		Co II	1821.064	0	
Si I	1814.0794	250		Co III	1817.626	100		Cr III	1821.08	20	N
Ni III	1814.082	1	N	V IV	1817.676	100		Fe V	1821.152		P
Co III	1814.084	10		Cl III	1817.68	400	P	Co III	1821.262	400	
Mn III	1814.093	35		Co III	1817.750	20	N	As I	1821.32	2	
Co I	1814.20	12		Cr III	1817.79	20	N	V III	1821.33	10	N
Co III	1814.219	100		B I	1817.843	150		Cu IV	1821.337	80	
Zn IV	1814.222	75		Si I	1817.9562	10		Cr II	1821.58	160	
Mn III	1814.271	20		Cr III	1818.28	40	N	Cr IV	1821.621	220	
Na III	1814.35	60	N	B I	1818.348	200		Zn III	1821.676	35	N
Cl II	1814.43	10	N	Al II	1818.352	50		Co III	1821.688	400	
Mn II	1814.47	25		Ni IV	1818.360	10	N	Na II	1821.695	50	
Na II	1814.474	25		Mn II	1818.38	100		Mn III	1821.697	45	
Ca II	1814.495	400		Al II	1818.392	3		Co III	1821.766	400	
Co III	1814.573	2	N	Cr I	1818.4		A,Z	Co II	1821.769	10	
Ne III	1814.6		F,P	Na II	1818.473	5		Fe III	1821.865	20	
Ca II	1814.647	40		Fe II	1818.521	70	P	Co III	1821.9		F,P
As II	1814.660	0		Mn III	1818.560	30		V III	1821.99	10	
Co III	1814.683	100		Al IV	1818.563	1000		Si IX	1822.		F,P
Sc II	1814.756	30		Co II	1818.566	15		Co III	1822.046	100	
Co III	1814.865	100		As I	1818.59	5		Co II	1822.090	2	
V II	1814.900	10		Na II	1818.628	7		Fe II	1822.123	40	P
V III	1814.95	250		Co III	1818.684	200		Se I	1822.15	80	N
Co III	1815.063	20		Fe II	1818.81		F,P	Fe II	1822.189	1	P
Cr IV	1815.100	360		Cr II	1818.89	20		V III	1822.21	15	
V III	1815.11	50		Cr IV	1818.90	10	N	Mn II	1822.213	30	
Ge II	1815.13	10	P,Z	Co III	1819.009	2		Co III	1822.215	1	
Cl II	1815.16	10	N	Na II	1819.024	20		V III	1822.31	25	
Mn II	1815.24	40		Co III	1819.070	1		Cr III	1822.333	60	
Ni III	1815.307	20		Cu IV	1819.226	670		Co II	1822.356	3	
Cr II	1815.32	60		Cr IV	1819.231	870		Si I	1822.4553	30	
V III	1815.35	100		Co III	1819.261	30		Cr IV	1822.49	20	N
Ni III	1815.398	15		Ni III	1819.275	300		Co IV	1822.5		F,P
Fe II	1815.410	30	P	Al II	1819.285	1		Cl III	1822.50	600	
Cr III	1815.49	80	N	Ni III	1819.325	3		Na II	1822.568	5	
Mn II	1815.57	5		Co III	1819.330	200		Ca III	1822.592	25	
Co III	1815.596	200		Mn III	1819.449	170		V II	1822.593	10	
Cl II	1815.61	10		Fe III	1819.480	150		V III	1822.61	50	
Ni III	1815.650	2	N	Mn II	1819.62	15		Mn II	1822.71	10	
Co III	1815.686	200		Fe II	1819.646	2	P	Zn III	1822.914	20	Q
Fe II	1815.766	20	P	Fe III	1819.718	70		Ni III	1822.918	25	
Fe II	1815.87	0	Q	Mn I	1819.730	7	F,A	Fe IX	1823.		F,P
Cr I	1815.9		N,A	Co III	1819.733	100	N	Mn II	1823.06	8	
Ar II	1815.98	15	Q	Mn II	1819.75	9		Ni III	1823.061	800	
Co III	1816.084	5		Cr II	1819.77	100	P	Cr II	1823.07	20	
Cr III	1816.09	10	N	Mn I	1819.809	5	F,A	Co III	1823.079	600	
Fe II	1816.09		F,P	Mn I	1819.849	3	F,A	Cu IV	1823.205	350	
Fe IV	1816.094	200		Cr III	1819.853	60		Ar II	1823.205	100	
Ar II	1816.14	50		Sc IV	1819.910	40		Mn II	1823.22	1	
Fe V	1816.187		P	Mn I	1819.950	10	F,A	Cr IV	1823.341	450	
Co III	1816.250	10		Mg III	1819.954	2		Fe IV	1823.348	80	
Mn II	1816.284	25		Fe IV	1819.994	300		Co III	1823.414	100	N
V III	1816.30	150		K XIII	1820.		F,P	Mn III	1823.477	40	
Zn II	1816.480	80	N	As II	1820.009	0		V III	1823.57	200	

Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes
Co III	1823.622	150		Fe IV	1827.982	520		Co VIII	1831.		F, P
Mn II	1823.69	30		Mn II	1828.251	10		Mn II	1831.05	10	
Fe II	1823.870	10	P	Ti III	1828.252	15		V III	1831.15	400	
Fe II	1823.931	5	P	Ni III	1828.279	15		Cr III	1831.15	100	N
Ni III	1823.936	1		Ti V	1828.292	110		Na II	1831.172	12	
Mn III	1823.994	10		Fe II	1828.346	5	P	Fe II	1831.261	40	P
Co II	1824.060	10	N	Co I	1828.35	12		As I	1831.30	50	
Na II	1824.098	0		Ti II	1828.382		P	V II	1831.349	2	
Fe II	1824.105	1	P	Cl III	1828.40	500		Zn II	1831.376	80	Z
Na IV	1824.113	110		Mn III	1828.485	60		Na II	1831.402	1	
Ge I	1824.3023	70		Cr II	1828.56	20		Ti III	1831.426	1	
V II	1824.328	6		Al II	1828.588	290		Co III	1831.439	750	
V III	1824.34	50		Cr II	1828.62	60		Ne II	1831.481	10	
Na III	1824.52	10	N	P II	1828.63	30		Ar II	1831.527	500	
Cl III	1824.59	300		Mn III	1828.647	40		P IV	1831.568	1	
Fe III	1824.659	70		Se I	1828.65	30	N	Ni III	1831.578	5	
Ar II	1824.842	50		Ni III	1828.672	15		N II	1831.586	10	
Co III	1824.874	100		Co II	1828.838	0		Cr III	1831.60	10	
V III	1824.88	75		V III	1828.84	500		Fe IV	1831.629	4	
Fe II	1824.979	2	P	V II	1828.84	500		V III	1831.64	400	
Cr IV	1824.995	450		Fe II	1828.854	20	P	Mn II	1831.66	40	
Ti VII	1825.0		F, P	Fe III	1828.857	70		As I	1831.74	30	
Zn III	1825.020	1		Zn	1828.925	75	N	V III	1831.74	15	
Si I	1825.021	10	A	Mg III	1828.974	2		Fe II	1831.753	30	P
Ni II	1825.068	1		Fe II	1829.126	0	P	Ni III	1831.850	1	N
Ni III	1825.084	20		Fe III	1829.172	150		Ti V	1831.875	12	
Co I	1825.17	1	N	Ni IV	1829.304	0	N	Co II	1831.880	5	
Fe V	1825.200		P	Cr III	1829.39	20	N	Co III	1831.916	565	
Mn II	1825.22	3		Co III	1829.392	5		P V	1831.935	1	
Cr III	1825.28	10	N	Co IV	1829.4		F, P	Fe II	1831.980	30	P
Fe II	1825.329	20	P	Co II	1829.404	10		Cl III	1832.08	400	
Cr II	1825.34	60		Ti III	1829.415	1		Ni II	1832.144	1	
Ne II	1825.343	80		Mn II	1829.43	60		Mn II	1832.19	50	
Cu I	1825.349	58	A	Ni IV	1829.498	20		Co III	1832.201	400	
Co III	1825.365	400		Ni III	1829.56		F, P	Ti III	1832.274	3	
Ti III	1825.406	1		Ti III	1829.605	1		V III	1832.29	25	
Na III	1825.44	200	N	Fe II	1829.65		F, P	Cr III	1832.34	10	N
Co III	1825.464	300		Co III	1829.674	200		F III	1832.361	6	
V II	1825.571	8		Se III	1829.7	10		Na III	1832.39	140	
V III	1825.60	25		Sc II	1829.713	2		Fe II	1832.40		F, P
Cr III	1825.66	10	N	Mn II	1829.75	20		P IV	1832.466	1	
Na II	1825.730	7		Cr III	1829.761	200		Co I	1832.47	15	
V IV	1825.836	200		Mn III	1829.818	190		Mn II	1832.47	1	
Mn III	1825.864	260		Si I	1829.8975	10		Fe II	1832.500	20	P
B I	1825.891	300		V VIII	1830.		F, P	Ti II	1832.502		P
Cu IV	1825.918	90		Ni III	1830.006	400		Ni II	1832.566	1	
Co III	1825.947	565		Cr IV	1830.010	220		Co V	1832.6		F, P
Co II	1826.113	20		Ca III	1830.059	600		Ge XX	1832.7		F
Fe III	1826.156	70		Ni III	1830.075	200		Co III	1832.784	1	
Co II	1826.189	2		Fe V	1830.081		P	Al II	1832.837	225	
Cr IV	1826.211	750		Co III	1830.093	750		Cr III	1832.87	40	N
S XI	1826.23	3	F	Na II	1830.124	20		Zn III	1832.940	1	Q
S I	1826.2451	450		Fe IV	1830.149	250		V III	1832.99	150	
Fe III	1826.267	20		Mn II	1830.15	10		Cr III	1833.00	10	N
Cu III	1826.339	100		Fe II	1830.262	30	P	Mn III	1833.019	20	
B I	1826.400	300		Ni V	1830.3		F, P	Fe II	1833.076	40	P
Mn II	1826.59	20		Cr IV	1830.350	450		Fe II	1833.233	2	P
Ne II	1826.667	5		Se I	1830.41	40	N	Cl III	1833.25	400	P
Se IV	1826.7	10		Fe II	1830.463	20	P	Co II	1833.287	3	
Co III	1826.716	1	N	K XVIII	1830.50		P	Mn II	1833.30	20	
Mg III	1826.750	2		N II	1830.527	1		F III	1833.322	3	
Fe II	1826.80		F, P	Cr III	1830.54	40	N	Ni II	1833.403	5	
Ne II	1826.829	90		F III	1830.567	3		V III	1833.42	25	
Cr IV	1826.863	650		Co III	1830.581	300		Mn II	1833.47	1	
Fe II	1826.962	50	P	Br III	1830.6	150	Q	Zn II	1833.481	40	
Fe II	1826.999	30	P	V III	1830.61	50		Ti III	1833.550	1	
Mn II	1827.076	100		Cr II	1830.61	100		Zn II	1833.573	50	Z
Co III	1827.094	300		Fe III	1830.623	200		V II	1833.58	100	
Cr III	1827.26	300	N	Fe II	1830.734	20	Q	Fe II	1833.631	55	P
Cr IV	1827.408	650		Ar II	1830.770	500		Cr IV	1833.66	10	N
Fe IV	1827.417	250		Co III	1830.780	20		Fe II	1833.662	55	P
Fe II	1827.729	30	P	Kr II	1830.842	4		Ni III	1833.669	20	
Ti V	1827.899	110		Ni III	1830.859	15		Co II	1833.676	1	
Mg I	1827.935	300	A	Co III	1830.870	150	N	Co IV	1833.7		F, P
V III	1827.96	200		Fe II	1830.887	20	P	F III	1833.791	3	

Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes
Cr IV	1833.812	450		Ni III	1836.843	30		Al II	1839.39	0	
Fe II	1833.813	1	P	Mn II	1836.92	20		Fe II	1839.460	5	N
Kr II	1833.847	4		Mn III	1836.947	225		Co III	1839.535	50	
Na II	1833.873	45		Al II	1836.964	60		V II	1839.54	200	
Co III	1833.876	50		Cr I	1837.0	1	A	N III	1839.541	25	
Mn II	1833.91	15		Cu IV	1837.037	560		Si III	1839.585		
Ne II	1833.910	80		Cr III	1837.099	250		Mn II	1839.59	15	
Cr III	1833.915	1		Mn II	1837.13	80		Ge II	1839.634	20	
P I	1833.950	100		Cu IV	1837.210	230	N	Co III	1839.636	20	
Ni V	1834.0		F,P	Mn II	1837.25	2		Fe	1839.65	0	N
N I	1834.011		P	Cr I	1837.4	1	A	Fe II	1839.674	5	P
Ar II	1834.038	200		Cr IV	1837.400	1000	P	Cr III	1839.72	10	
Fe III	1834.096	70		Fe III	1837.422	70		Fe II	1839.742	5	P
V II	1834.165	0		Ti V	1837.436	30		Fe II	1839.804	10	P
Co V	1834.2		F,P	Ge II	1837.460	0		Na II	1839.835	25	
Zn II	1834.268	40		Mn II	1837.48	60		Mg III	1839.878	7	
Co I	1834.34	10		Cr V	1837.502	1000	P	Cr I	1839.9	5	A
V II	1834.371	0		P II	1837.51	20		N II	1839.931		
Ni III	1834.381	15		Na II	1837.522	15		F III	1839.968	400	
Mn II	1834.47	15		Co II	1837.559	10		As II	1839.978	5	
Mn II	1834.57	30		Fe III	1837.588	250		Fe II	1839.998	20	P
P IV	1834.621	4		Co III	1837.630	600		Na II	1840.032	20	
Cr III	1834.68	10	N	Cr IV	1837.642	450		Si I	1840.0418	8	
P I	1834.801	200		Mn II	1837.65	10		Ca II	1840.061	600	
Al II	1834.808	170		Zn IV	1837.680	1		Cr IV	1840.139	1000	
Co III	1834.840	75		Co V	1837.7		F,P	F III	1840.140	300	
Ni III	1834.890	20		Ni II	1837.744	1		Co II	1840.229	20	
Fe II	1834.964	40	P	Cl II	1837.7447	85		Fe IV	1840.240	450	
Zn IV	1834.966	30		V II	1837.76	0		Mn II	1840.249	100	
Co I	1834.99	10	N	Cr I	1837.8	1	A	Fe II	1840.320	0	P
F III	1834.997	100		F III	1837.815	1		Ni III	1840.421	40	
Co III	1835.000	1000		Co I	1837.82	8		V II	1840.438	10	
V III	1835.01	200		Co III	1837.840	100		V III	1840.45	25	
Ca III	1835.072	200		Mn II	1837.86	1		Mn II	1840.45	2	
Zn IV	1835.124	50		F III	1837.880	100		Cr III	1840.48	10	
Cr I	1835.2	1	A	Na II	1837.890	45		As I	1840.48	10	
Na II	1835.217	80		Ni II	1837.985	2		Co I	1840.55	10	
Na III	1835.223	500		Cr IV	1837.991	220		Mn II	1840.56	3	
Co III	1835.255	100		Ar XII	1838.		F,P	Cr I	1840.69	10	
Cr I	1835.4	1	A	Ca II	1838.008	400		Co I	1840.79	10	N
Fe II	1835.411	40	P	Si I	1838.0120	40		Mn II	1840.91	5	
Cr I	1835.5	1	A	Mn II	1838.05	10		Cu III	1840.913	200	
V III	1835.56	25		V II	1838.10	10		F III	1840.930	10	
N III	1835.568	25		Na III	1838.122	400		N II	1840.983	100	
N I	1835.573		P	Cr I	1838.2	5	A	Mn II	1841.12	30	
Co III	1835.617	150		Mn II	1838.25	2		Sc II	1841.145	30	
Cu III	1835.643	2		Co I	1838.28	15		Si I	1841.1520	125	
Co III	1835.687	20		Fe III	1838.309	450		Co II	1841.315	0	
Cr III	1835.693	90		Mg III	1838.336	12		Ge I	1841.3275	70	
Cr I	1835.7	1	A	Cr III	1838.34	30		Mn II	1841.33	10	
F III	1835.712	200		Si III	1838.466			Fe III	1841.387	200	
Fe II	1835.874	110	P	F III	1838.568			Mn V	1841.390	40	
Cr I	1835.9	1	A	Mn II	1838.604	30		Si I	1841.4490	400	
Mn II	1835.91	100		V II	1838.606	0		Co I	1841.47	10	
Co II	1835.945	8		Fe III	1838.621	70		Ti V	1841.490	300	
Zn II	1836.007	70	Z	Co III	1838.659	2	N	Cr I	1841.5	10	A
V III	1836.17	10		Fe III	1838.698	70		Fe III	1841.536	300	
N II	1836.172	100		Cr I	1838.7	5	A	Fe II	1841.542	20	P
Fe II	1836.18		F,P	Mn III	1838.789	30		Fe IX	1841.55	1	F
Cr I	1836.2	1	A	V II	1838.86	250		Co III	1841.582	5	N
Co III	1836.200	300		Cr III	1838.933	25		Fe II	1841.604	10	P
Cr II	1836.23	240		Na III	1838.944	500		Mn II	1841.61	40	
Cl II	1836.2912	140		Fe IV	1839.009	250		Fe II	1841.690	30	P
Na II	1836.367	2		Mn III	1839.01	2		N III	1841.718	10	
Cl II	1836.3726	125		Fe II	1839.05		F,P	Mn II	1841.72	3	
Cr I	1836.4	1	A	Ni III	1839.092	1		Fe II	1841.725	10	P
P II	1836.47	10		Cr I	1839.1	0	N,A	V II	1841.781	100	
Mn II	1836.508	50		Cu IV	1839.260	490		V III	1841.80	250	
Si I	1836.5102	200		Na II	1839.270	20		Na II	1841.822	60	
Cl II	1836.6459	160		Co II	1839.274	15		Ni III	1841.866	15	N
Zn II	1836.654	75		Co V	1839.3		F,P	Co I	1841.88	3	
Cr I	1836.7	1	A	Cr I	1839.3	5	A	Co III	1841.924	15	
N I	1836.712	4		F III	1839.301	300		Mn II	1841.947	100	
N I	1836.724	50	P	Zn III	1839.334	150		Fe III	1841.96	20	Q
V III	1836.78	250		Co II	1839.371	15		Fe II	1842.050	1	P

Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes
V III	1842.06	150	N	O V	1844.419	7	P	Cr I	1846.8	10	A
Si III	1842.064			V III	1844.43	50		Mn II	1846.93	10	
Cr III	1842.09	10	N	Fe III	1844.547	400		Co I	1846.94	4	N
Kr II	1842.091	25		As I	1844.57	40		Fe III	1846.943	200	
Co III	1842.109	1		Fe II	1844.59	5		Ge I	1846.9578	20	
Fe II	1842.240	20	P	Cr I	1844.6	1	N,A	V II	1846.965	0	
N II	1842.284	10		Fe II	1844.671	0	P	Mn III	1847.064	60	
F III	1842.326	1		Co III	1844.684	30	N	S VI	1847.1	10	P
Mn II	1842.33	10		Co III	1844.726	50		P I	1847.165	200	
Co I	1842.34	25		Co II	1844.788	1		Cr I	1847.2	5	N,A
Ne II	1842.341	70		Mn II	1844.794	20	N	Ne II	1847.249	5	
Cr I	1842.4	00	N,A	Zn IV	1844.909	75		Mn III	1847.268	30	
Ge I	1842.4098	70		Fe II	1844.923	30	P	Ni III	1847.275	650	
Mn II	1842.49	1		Fe III	1844.942	200		Cr I	1847.3	00	A
Fe II	1842.52		F,P	Cr III	1844.99	100	N	Co III	1847.300	125	N
Si III	1842.547	180		Se III	1845.0	50	N	As I	1847.32	10	
Cr I	1842.6	10	A	Na II	1845.016	70		Fe III	1847.348	70	
V III	1842.66	25		Fe V	1845.06		F,P	F III	1847.462	150	
Cr IV	1842.686	220		V III	1845.07	300		Si I	1847.4737	300	
B II	1842.811	300		Co III	1845.074	100		Na III	1847.527	240	
Co II	1842.853	0		Cr I	1845.1	10	A	Mg III	1847.561	2	
Mn II	1842.863	50		Co II	1845.117	10		Zn II	1847.562	75	Z
Ni II	1842.889	1		Mn III	1845.131	170		Na III	1847.589	200	
Cr IV	1842.897	220		Ni III	1845.141	15		Fe III	1847.637	150	
Fe III	1842.927	300		Fe II	1845.146	2	P	Mn III	1847.640	340	
Fe	1842.97	40	N	Na III	1845.149	450		Mn II	1847.73	150	
Ni XI	1843.		F,P	P I	1845.158	80		Co III	1847.825	125	
Sc II	1843.062	4		V III	1845.29	250		Co I	1847.89	30	
Ca II	1843.088	200		Mn II	1845.29	30		Fe II	1847.902	10	P
Cr I	1843.1	00	N,A	Ga II	1845.30	650		N II	1848.002	10	
Zn	1843.100	10	N	Fe III	1845.304	300		Cu IV	1848.028	550	
Fe IV	1843.102	150		Ge II	1845.388	30		Co III	1848.030	25	N
Mn II	1843.117	20		Ti VIII	1845.4		F,P	Fe III	1848.130	150	
V III	1843.16	100		Mn II	1845.51	40		Si I	1848.1504	200	
Fe II	1843.193	20	P	Si I	1845.5203	200		Mn II	1848.16	10	
Fe II	1843.199	15	P	Fe III	1845.521	450		Fe III	1848.231	5	Q
Fe II	1843.261	10	P	O V	1845.590	3	P	Mn II	1848.26	40	
Mg I	1843.32			V III	1845.60	25		O III	1848.26	500	
Co III	1843.332	2		O V	1845.601	2	P	P IV	1848.318	10	
N II	1843.357	10		N II	1845.616	100		Fe III	1848.428	20	
Cr III	1843.40	100	N	Co III	1845.636	2	N	F III	1848.431	200	
Ni III	1843.406	50		N III	1845.689	80	P,Z	Co II	1848.466	10	N
Fe III	1843.409	250		O V	1845.696	1	P	Zn	1848.481	20	N
V II	1843.43	50		Cr IV	1845.705	70		Fe III	1848.492	70	
Na III	1843.43	40	N	Fe III	1845.749	70		Mn II	1848.52	2	
Co III	1843.443	200		N III	1845.754	120	F,Z	Cr III	1848.56	100	N
Cr IV	1843.448	220		Ca III	1845.775	450		P IV	1848.579	1	
Co I	1843.45	8		N III	1845.865	120	Z	Cr IV	1848.593	285	
Fe III	1843.502	150		Ge I	1845.8723	70		Cl III	1848.74	10	
Mn II	1843.505	100		Co II	1845.910	200	N	Si I	1848.7480	250	
Co III	1843.532	200		Ne II	1845.996	80		Fe II	1848.775	70	P
Ni III	1843.689	1		Mn III	1846.001	3		Cr I	1848.8	10	A
Cr I	1843.7	5	A	Co III	1846.050	20	N	V II	1848.80	5	
Si I	1843.7700	200		Si I	1846.1118	200		Ne II	1848.823	70	
Mn II	1843.78	1		Mg III	1846.121	7		Fe III	1848.883	70	
Ne II	1843.908	80		N III	1846.142	25	Z	Al II	1848.888	1	
Fe II	1843.92		F,P	Co III	1846.157	500		V III	1848.97	10	
Co II	1843.939	1		V II	1846.268	1		Cr III	1848.995	120	
Mn II	1843.94	20		Fe II	1846.273	20	Q	Mn III	1849.049	15	
Zn III	1843.953	25		Mn III	1846.278	3		P I	1849.05	3	N
Co III	1843.960	75	N	Cr I	1846.4	1	N,A	Al II	1849.15	2	
Fe III	1843.999	200		N III	1846.415	150	Z	Fe III	1849.172	70	
Mn II	1844.027	6		Cr III	1846.45	80	N	P IV	1849.176	4	
P II	1844.06	5		Mn III	1846.491	45		Mn III	1849.289	260	
F III	1844.077	100		V III	1846.51	75		Co III	1849.299	150	
Mn II	1844.086	50		Co III	1846.514	50		Ni III	1849.319	100	
Mg IV	1844.151	320		Fe II	1846.574	40	P	Ne II	1849.381	90	
N II	1844.259	10		Mn II	1846.66	10		Fe III	1849.407	450	
Fe III	1844.263	300		Mn III	1846.671	260		N II	1849.414	100	
P I	1844.296	100		N III	1846.694	60	Z	Co III	1849.464	300	
As I	1844.36	40		Mg III	1846.707	7		Ni III	1849.473	50	
Na III	1844.362	550		Cr III	1846.71	10	N	Cr I	1849.5	1	N,A
Mn I	1844.385	5	A	Fe II	1846.769	10	P	P I	1849.52	9	N
Cr IV	1844.407	40		P II	1846.78	20		Co II	1849.524	2	
Ge I	1844.4102	15		Mn II	1846.78	4		Cu III	1849.525	15	



Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes
Ni III	1849.540	75	N	Fe V	1852.311		P	Cr II	1855.14	400	
V III	1849.55	250		Fe III	1852.366	70		Se I	1855.20	300	
Se I	1849.55	40	N	Cr II	1852.37	60		N III	1855.232	4	Z
Cl III	1849.56	10	P	Fe II	1852.459	20	P	Co III	1855.331	25	
Na III	1849.564	750		Si I	1852.4717	250		Fe II	1855.34		F, P
Mg III	1849.591	2		Zn III	1852.500	1	Q	As I	1855.39	10	
Cu IV	1849.616	790		Co I	1852.52	15		Mn III	1855.436	225	
Cr IV	1849.632	160		Ni II	1852.522	2		P I	1855.466	7	
Ge I	1849.6354	20		F III	1852.539	3		Fe III	1855.510	200	
Fe III	1849.648	70		Co II	1852.564	0		Ni III	1855.525	1	
Cr III	1849.76	10	N	Mn III	1852.579	3		Mn II	1855.54	8	
Zn IV	1849.791	75		Kr II	1852.603	1		Mn III	1855.541	225	
P I	1849.820	160		Co III	1852.645	20		Fe I	1855.58	100	
Co III	1849.932	200		P II	1852.65	10		Fe II	1855.67		F, P
Mn II	1849.94	3		Fe III	1852.677	400		Zn	1855.670	10	N
Fe III	1849.960	300		F III	1852.683	3		Ni III	1855.755	1	
Ti III	1849.961	3		V III	1852.70	25		Ti V	1855.76	30	
Cr III	1849.99	30	N	Co I	1852.71	30		Al II	1855.805	90	
Mn II	1850.00	20		N II	1852.721			Na III	1855.92	500	
Mg III	1850.060	7		Mn II	1852.78	60		Al II	1855.929	190	
Kr II	1850.093	10		Fe III	1852.812	150		Mn II	1855.947	5	
Zn II	1850.140	10	Z	Ni II	1852.875	2		Co III	1855.954	50	
Na II	1850.150	45		Co III	1852.919	500		Ne IX	1855.98		P
Fe III	1850.200	300		Cl X	1853.		F, P	Mg III	1855.99		
As I	1850.24	40		Cr III	1853.021	25		Zn IV	1856.025	5	
Na III	1850.24	400	N	Mn II	1853.05	2		Si III	1856.062	20	
Ni III	1850.29		F, P	Mg IV	1853.086	340		Al II	1856.096	90	
Na III	1850.379	600		Ne II	1853.115	90		Co I	1856.13	15	
Mn II	1850.43	3		V III	1853.12	15		Cr III	1856.20	10	N
Cr III	1850.45	10	N	Ge I	1853.1336	80		Fe I	1856.21	0	Q
Co III	1850.503	300		Si I	1853.1521	35		As I	1856.24	2	
Se I	1850.51	30	N	Na II	1853.166	80		Al II	1856.274	30	
Fe IV	1850.578	300		As I	1853.21	20	N	Fe II	1856.315	20	P
Mn II	1850.60	1		Co III	1853.266	10		Mn III	1856.316	3	
P II	1850.61	20		Mn III	1853.270	390		P I	1856.334	3	
Fe III	1850.650	70		Mn II	1853.272	300		Mn III	1856.580	1	
Si I	1850.6719	400		Cr III	1853.36	10	N	O III	1856.62	500	
V III	1850.69	300		Ne II	1853.453	20		V III	1856.64	500	
Ca II	1850.691	400		Ni III	1853.480	30		Fe III	1856.690	450	
Kr II	1850.773	10		Fe II	1853.732	10	P	Mn II	1856.70	12	
Co III	1850.780	10		Co II	1853.732	10		Na III	1856.71	500	
Mn II	1850.88	100		Mn III	1853.77	1		Ge II	1856.81	10	N
F III	1850.889	3		Co III	1853.841	10		Fe II	1856.921	0	P
Zn	1850.894	60	N	As I	1853.95	3		Cu II	1856.9291	0	
Ca III	1851.090	150		F III	1854.028	35		Fe II	1856.930	5	P
Na II	1851.194	70		Ne II	1854.035	90		V III	1857.00	25	
P I	1851.194	200		V II	1854.064	2		Mn II	1857.01	30	
Fe III	1851.261	400		Fe IV	1854.084	80		P I	1857.014	60	
Cr I	1851.3	10	A	Mg III	1854.139	4		F III	1857.034	1	
V III	1851.32	150		Ni III	1854.149	800		Fe II	1857.10		F, P
Fe I	1851.39	0	Q	Co III	1854.194	125	N	Ni III	1857.158	0	
Mn II	1851.44	60		Fe II	1854.239	2	P	Na II	1857.265	25	
Mn III	1851.458	390		Mn II	1854.24	2		Zn II	1857.274	5	Z
Co I	1851.49	8		Co I	1854.28	8		Cu IV	1857.295	60	N
Co III	1851.509	50		Cr I	1854.3	10	A	Cl II	1857.4876	220	
Fe II	1851.529	30	P	Fe III	1854.384	200		Ne II	1857.565	30	
Mn II	1851.61	10		Co III	1854.393	400		Na II	1857.576	40	
Co II	1851.641	5		V III	1854.42	500		Cl II	1857.5769	185	
Si I	1851.7829	70		Cr II	1854.46	20		Ni II	1857.587	6	N
N II	1851.810			P II	1854.59	150		Cr III	1857.59	20	N
Mn III	1851.865	225		Cr III	1854.63	20	N	Mn III	1857.638	35	
Cr IV	1851.890	1000		Cr II	1854.68	60		Co III	1857.657	50	N
Co III	1851.937	200		V III	1854.71	5		Cl II	1857.6594	210	
V III	1852.01	400		Al III	1854.716	1000		Cl II	1857.684	140	
V II	1852.017	75		Co III	1854.763	400		N V	1857.69	45	
Se I	1852.02	30	N	Fe III	1854.826	600		N II	1857.870	300	
P I	1852.069	160		Mn II	1854.89	40		N V	1857.88	50	
Fe IV	1852.085	80		Fe III	1854.975	300		P I	1857.907	7	
Mn III	1852.11	10	Q	Ne II	1854.976	20		Mn II	1857.923	200	
Cl III	1852.11	200		Ar II	1854.986	50		Ne II	1857.952	70	
Cr II	1852.13	500		Ni XII	1855.		F, P	Fe II	1857.959	30	N
P V	1852.241	4		Cr IV	1855.012	285		Al II	1858.026	315	
P II	1852.27	20		Co I	1855.05	40		Cr III	1858.03	10	N
Cr IV	1852.277	220		V III	1855.06	300		Fe IV	1858.057	375	
Cr II	1852.31	30		Mn II	1855.14	8		Ti IX	1858.1		F, P

Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes
Mg III	1858.186	250		Co III	1860.866	2	N	V III	1864.51	300	
Cr I	1858.2	15	A	As I	1860.87	5		Co III	1864.519	50	N
Cu III	1858.251	5		Mn III	1860.879	20		Fe III	1864.534	70	
Co I	1858.26	3		Fe II	1861.031	1	P	Ni II	1864.558	6	
V III	1858.32	75		Ge I	1861.0945	9		Mn II	1864.615	40	
Ne II	1858.408	80		Ne II	1861.137	50		P I	1864.628	7	
Fe V	1858.446		P	Na III	1861.211	500		Fe II	1864.647	55	P
Cr IV	1858.449	20		Mn II	1861.44	1		Mn III	1864.682	260	
Mg III	1858.451	7		Co II	1861.445	15		V III	1864.74	100	
N III	1858.48	25	Z	Mn III	1861.519	150		Fe II	1864.749	90	P
Co III	1858.487	50		V IV	1861.558	300		Co I	1864.92	4	N
V II	1858.50	20		F III	1861.584	60		Si I	1865.028	1	A
Mn III	1858.502	225		Mn V	1861.607	100		Ge I	1865.0525	70	
Cr II	1858.54	400		Cu II	1861.6229	0		As I	1865.10	8	N
Fe III	1858.542	300		Fe III	1861.665	200		Fe II	1865.13		F,P
N II	1858.545	200		Mn II	1861.667	100		Na II	1865.139	35	
Cu III	1858.678	20		Si I	1861.693	1	N,A	Mn II	1865.16	5	
Cr II	1858.72	300		Co III	1861.775	600		Na III	1865.177	160	
Ni III	1858.750	300		Si I	1861.799	1	A	Fe III	1865.202	450	
Se I	1858.84	250		F III	1861.814	35		Cr IV	1865.255	360	
P I	1858.886	360		F III	1861.912	3		Fe I	1865.30	300	
Co VI	1859.0		F,P	Fe V	1862.038		P	Mn II	1865.30	2	
Ne II	1859.017	20		Ni III	1862.06		F,P	Mg III	1865.388	1	
Mn II	1859.11	10		Al II	1862.081	5		Fe II	1865.39		F,P
F III	1859.143	60		F III	1862.094	35		V III	1865.41	10	
Na III	1859.20	10	Q	Mn III	1862.106	70		Co III	1865.424	100	
Fe I	1859.26	40		Co II	1862.303	5		Fe III	1865.445	150	
N II	1859.260	500		Al II	1862.311	400		Co III	1865.456	100	
V III	1859.29	50		Fe I	1862.318	100		Fe II	1865.46		F,P
Cr I	1859.3	5	A	Co II	1862.366	3		Mn II	1865.52	10	
P V	1859.330	30		V II	1862.37	300		Fe III	1865.606	150	
Ne II	1859.361	80		Na III	1862.40	120	N	Mg III	1865.636	12	
P I	1859.393	315		Fe III	1862.446	150		Ni II	1865.637	5	
Mn II	1859.44	8		Mn II	1862.515	80		V II	1865.68	20	
Mn III	1859.46	25		N II	1862.588	200		F III	1865.701	1	
Ni III	1859.480	2		Mn III	1862.657	190		Cr II	1865.80	20	
V III	1859.49	50		Co III	1862.660	100		Mn II	1865.832	150	
Co III	1859.510	50		V II	1862.76	250		V II	1865.99	30	
Fe II	1859.557	5	P	P IV	1862.762	250		Ni III	1866.008	3	
Na III	1859.61	10	N	Al III	1862.790	600		Zn	1866.055	100	N
Co II	1859.621	2		Ni III	1862.80		F,P	Fe I	1866.07	80	
N II	1859.636			Mn II	1862.80	20		Zn II	1866.077	100	N
Mn III	1859.65	2		Fe II	1862.81	8	P	V II	1866.080	1	
Se I	1859.69	50	N	P IV	1862.893	120		Ar II	1866.089	100	
Fe V	1859.728		P	Cr IV	1863.108	870		Cr III	1866.12	10	
P I	1859.736	25		Fe II	1863.114	2	P	Ni III	1866.163	5	
Fe II	1859.746	40	P	Co III	1863.134	5		Zn III	1866.200	1	Q
Fe III	1859.813	300		V III	1863.14	100		Cr II	1866.22	300	
B V	1859.911		P	Cr I	1863.2	25	A	Mn II	1866.25	1	
Fe III	1859.955	200		Fe III	1863.317	250		Co I	1866.27	6	
Al II	1859.980	110		V II	1863.44	5		Fe III	1866.305	600	
Fe II	1860.053	160	P	Co III	1863.467	200		Zn II	1866.366	10	Z
Ge I	1860.0865	50		Mn II	1863.48	20	N	Co I	1866.45	3	
Cr II	1860.09	240	P	Fe I	1863.54	10		Na II	1866.452	45	
Cl II	1860.1192	50		P IV	1863.580	200		N II	1866.457		
Co II	1860.217	8		Co III	1863.615	20		Co III	1866.497	20	
V III	1860.22	75		Mn III	1863.721	50		Ni II	1866.499	5	
B V	1860.327		P	P I	1863.741	25		Fe III	1866.554	300	
As II	1860.342	350		F III	1863.758	6		Co III	1866.615	100	N
As I	1860.40	80		Co III	1863.826	750		Cr III	1866.63	20	N
Mn II	1860.42	3		Co II	1863.874	5		V II	1866.68	50	
Fe IV	1860.422	450		Na II	1863.898	15		Cr IV	1866.685	20	
Co III	1860.428	1	N	Mn III	1863.975	3		Ni XIV	1866.75	1	F
Ca III	1860.432	500		Zn III	1864.006	50		Fe I	1866.815	40	
As I	1860.46	80		Zn II	1864.117	100	N	Mn III	1866.828	5	
B V	1860.464		P	Co II	1864.162	0		Mn III	1866.857	150	
N V	1860.5	85		Zn	1864.164	100	N	Fe III	1866.900	150	
Mn II	1860.51	100		Co III	1864.187	400		Fe II	1866.923	2	P
Na III	1860.61	50		P II	1864.22	150		Ar XI	1867.		F,P
P I	1860.612	60		Mn III	1864.286	50		Co II	1867.021	8	
Fe IV	1860.645	375		Cr I	1864.3	1	A	Cu III	1867.023	2	
Mn III	1860.658	225		P I	1864.348	200		F III	1867.050	6	
Ni II	1860.689	1		N II	1864.364			Co IV	1867.20		P
N III	1860.733	4	Z	Mn II	1864.400	80		Cu IV	1867.239	330	
Ni II	1860.796	1		Ti V	1864.451	150		Fe II	1867.258	10	Q

Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes
F III	1867.310	100		Na II	1871.517	40		Co III	1875.094	200	
V II	1867.47	200	N	V III	1871.58	200		Fe	1875.14	0	N
Co III	1867.490	50		Kr II	1871.619	10		Cr III	1875.18	10	
Na III	1867.517	50		As I	1871.68	30		Fe II	1875.211	2	P
Cr III	1867.52	10		Co III	1871.870	500		Cr II	1875.22	60	
Co IV	1867.54		P	F III	1871.923	10		Kr II	1875.296	1	
F III	1867.598	1		Fe II	1871.94		F,P	Fe II	1875.43	0	Q
Fe II	1867.660	1	P	Co III	1871.952	300		Fe IV	1875.457	300	
Ni III	1867.706	3	N	Zn II	1872.125	100	N	Cr III	1875.52	10	
Cu III	1867.747	100		Fe II	1872.20		F,P	Na III	1875.522	200	
Mn II	1867.880	80		Fe III	1872.214	400		Fe II	1875.536	15	
Kr II	1867.889	4		Ne II	1872.291	50		Mn II	1875.59	30	
Co III	1867.930	30		Fe I	1872.359	160		Mn III	1875.593	225	
Fe II	1867.942	10	Q	P II	1872.36	1		F IV	1875.6		F,P
Zn II	1867.994	40	Z	Ca III	1872.367	700		Co III	1875.609	0	N
Co IV	1868.19		P	Na III	1872.45	20	Q	V III	1875.62	250	
Ni III	1868.201	20		Co II	1872.465	3		Mn I	1875.781	300	A
Mg III	1868.225	40		Mn III	1872.507	115		Fe VI	1875.80		F,P
N II	1868.240	10		Fe III	1872.515	250		Mn III	1875.800	90	
Mn II	1868.28	0		Co III	1872.532	200		Si I	1875.8129	30	
Mn III	1868.305	60		Co III	1872.575	300		V III	1875.88	250	
Co II	1868.331	0		Ar II	1872.589	100		Fe IV	1875.884	12	
Cr IV	1868.344	750		Fe II	1872.638	20	N	Kr II	1875.999	60	
Mn II	1868.58	20		Fe	1872.65	2	N	Ne II	1876.003	70	
Kr II	1868.647	25	P	V I	1872.66	25	N	Co I	1876.01	10	N
Ar II	1868.660	300		Fe V	1872.708		P	Ge I	1876.0104	10	
F III	1868.690	10		Ne II	1872.721	5		V II	1876.06	200	
Si II	1868.765	1		Fe II	1872.738	0	P	Cr IV	1876.083	750	
Mn II	1868.78	40		Fe IV	1872.761	300		Mn II	1876.11	1	
Co III	1868.796	30		O III	1872.86	800	P	Na III	1876.155	160	
S	1869.	10	N	O III	1872.87	800		Ni II	1876.180	1	
Mn II	1869.03	15		Mn III	1872.942	130		Fe II	1876.215	40	P
Fe V	1869.096		P	Mg III	1872.956	4		Fe II	1876.22		F,P
Co I	1869.16	5	N	Ge I	1872.9745	6		Fe IV	1876.259	150	
Mn III	1869.164	6		V III	1873.01	5		Ni III	1876.27		F,P
Co IV	1869.20	100	P	Co III	1873.014	1		P III	1876.302	1	
Si II	1869.317	20		As I	1873.02	40		F III	1876.348	1	
Co IV	1869.38		P	Fe I	1873.052	160		Ni II	1876.418	2	
F III	1869.380	3		Mn II	1873.07	40		Fe I	1876.419	40	
Na III	1869.43	20	N	Si I	1873.1036	25		V II	1876.47	100	
V II	1869.47	500		Ar II	1873.140	600		Mn I	1876.479	350	A
Fe II	1869.549	30	Q	Fe I	1873.259	100		Co I	1876.48	7	N
Mn II	1869.55	1	N	Co IV	1873.26		P	Kr II	1876.491	1	
Fe IV	1869.635	450		Mg III	1873.268	1		Mn III	1876.701	60	
Cr I	1869.7	25	N,A	Cu III	1873.343	0		P II	1876.79	100	
Fe II	1869.766	5	P	Na II	1873.369	45		Fe II	1876.837	160	P
Sc II	1869.774	10		V II	1873.39	100		Co I	1876.88	8	N
Cr I	1869.8	25	A	Ne II	1873.492	20		Ca III	1876.915	10	
Fe III	1869.828	650		Fe III	1873.534	150		As I	1876.98	2	
Fe III	1869.925	250		Ne II	1873.677	5		V II	1877.00	100	
As I	1869.94	15		Cr I	1873.7	50	N,A	Al II	1877.04	5	
Fe V	1869.998		P	Mn III	1873.740	35		Mn II	1877.16	30	
Co III	1870.012	30		Kr II	1873.761	10		Na II	1877.365	20	
Si II	1870.227	15		Ne II	1873.873	60		Ne II	1877.387	30	
Co IV	1870.25		P	Cr IV	1873.892	870		Co I	1877.40	15	N
Ca III	1870.263	700		Fe IV	1873.938	300		Co III	1877.464	50	
Fe I	1870.36	0	Q	Na II	1874.098	15		Fe II	1877.469	190	P
Co I	1870.45	5		Mn III	1874.122	40		Ar II	1877.523	400	
Ni II	1870.460	8		Na III	1874.22	10	N	Co III	1877.544	50	
Cr II	1870.51	20	P	Fe IV	1874.226	450		Mn I	1877.545	400	A
Co III	1870.634	75		Ge I	1874.2565	200		Fe V	1877.557		P
Kr II	1870.645	10		Co III	1874.355	100		Kr II	1877.613	4	
Fe II	1870.72	1	Q	Cr I	1874.4	1	N,A	Mn III	1877.616	400	
Si II	1870.782	3		V II	1874.45	120		Ne II	1877.679	40	
Fe IV	1870.964	300		Mg IV	1874.576	440		Ni II	1877.838	40	
Cu XVI	1871.		F,P	Fe II	1874.58	3	Q	V II	1877.85	0	
Cr III	1871.00	20	N	Co III	1874.822	300		Ti III	1877.911	3	
Fe II	1871.077	2	P	Si I	1874.8423	175		Cr III	1877.93	10	N
V II	1871.08	120		Na III	1874.85		P	Zn IV	1877.976	50	
Ne II	1871.097	70		O III	1874.94	800		Fe III	1877.989	800	
As I	1871.14	2	N	V II	1874.97	10		Cr I	1878.0	1	N,A
Fe III	1871.152	600		Fe II	1874.972	40	P	Mn III	1878.018	2	
Fe III	1871.319	150		Mn III	1875.017	12		Kr II	1878.041	90	
Mn II	1871.39	20		Ni II	1875.069	3		Fe	1878.06	1	N
Fe III	1871.435	20	P	Na II	1875.075	60		Ni II	1878.103	2	

Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes
V II	1878.19	5		Cr III	1881.33	20	N	Sc II	1884.520	10	
Fe	1878.20	0	N	Kr II	1881.418	1		Co III	1884.532	3	
Kr II	1878.256	4		Co III	1881.427	150		Co I	1884.56	10	N
Co I	1878.28	25	N	Fe III	1881.578	200		Fe III	1884.596	550	
Fe	1878.31	70	N	Ge I	1881.6470	8		V III	1884.61	200	
Fe II	1878.386	40	P	Ne II	1881.690	70		Ti III	1884.638	1	
Cr I	1878.4	50	N,A	Co III	1881.691	250	P	Na III	1884.69	60	
Ti V	1878.458	12		Co III	1881.722	350	P	Ni III	1884.723	1	
Al II	1878.504	8		Cr III	1881.73	20	N	Fe	1884.73	2	N
Mn II	1878.52	3		V III	1881.75	10		Sc II	1884.759	4	
Fe III	1878.550	150		Si I	1881.8538	30		Cu IV	1884.805	600	
F III	1878.580	1		Zn IV	1881.861	90		Cl II	1884.8108	3	
N II	1878.624	200		Co III	1881.867	300		Sc II	1884.814	4	
V III	1878.68	300		Cr I	1881.87	250	Z	Sc II	1885.032	4	
Cr III	1878.77	20		Ti V	1881.886	150		F II	1885.047	10	
Cr I	1878.8	1	A	Mn II	1881.90	30		Mn II	1885.05	1	
P III	1878.828	4		Na II	1881.912	160		N III	1885.058	350	
Kr II	1878.830	40		Ni III	1881.94		F,P	Na II	1885.091	50	
Fe I	1878.849	20		As I	1881.96	40		Fe III	1885.125	600	
Mn V	1878.854	300		Fe III	1882.047	650		Mn III	1885.207	300	
Ti III	1878.894	80		Cu II	1882.2085	1		N III	1885.215	400	
V II	1878.90	100		Cu III	1882.252	40		V III	1885.26	15	
F III	1878.910	1		Mg III	1882.308	7		Se IV	1885.3	30	N
Mn III	1878.963	60		Co III	1882.323	150		Cr I	1885.3	00	N,A
Cr III	1878.99	20	N	Fe III	1882.357	300		F II	1885.442	40	
Ni III	1879.063	5		N V	1882.36	30		Co III	1885.476	15	
Cr II	1879.08	200	P	Mn I	1882.388	200	A	Cr I	1885.50	50	Z
Mn II	1879.09	5	Q	Sc II	1882.442	4		V II	1885.520	3	
Cr I	1879.1	5	N,A	Ne II	1882.478	60		Ni II	1885.525	20	
Kr II	1879.141	4		Cr I	1882.6	1	A	F III	1885.587	3	
Na III	1879.16	80		Ni III	1882.686	25		Fe II	1885.67		F,P
Co III	1879.170	10		Mn III	1882.838	45		Mn II	1885.70	20	
Cr I	1879.2	5	N,A	Mn I	1882.915	150	A	Na II	1885.742	45	
Na II	1879.240	30		N V	1882.92	35		Ni III	1885.864	10	N
Co III	1879.244	300		Fe III	1882.979	250		V II	1885.90	100	
Co III	1879.385	100		Fe VI	1882.99		F,P	Fe III	1885.947	300	
Ar II	1879.420	100		Fe II	1883.06	0	Q	Ni II	1886.043	12	
Si I	1879.432	7	P	Cr I	1883.11	50	Z	Sc II	1886.118	10	
Mg III	1879.492	200		Mn I	1883.130	75	A	F II	1886.147	100	
P II	1879.62	250		Cl II	1883.1313	185		Fe V	1886.301		P
Mn II	1879.66	1		Cr IV	1883.156	650		Cr I	1886.34	500	Z
Co III	1879.753	50		Ni II	1883.170	4		Ar II	1886.386	400	
Ar II	1879.790	200		Fe III	1883.185	150		Zn III	1886.405	1	
Mn II	1879.85	40		Ca I	1883.2		A,Z	F III	1886.464	6	
Fe	1879.86	2	N	Co II	1883.246	0		Co III	1886.469	50	
Ne II	1879.884	50		Mn III	1883.256	150	N	Fe III	1886.607	300	
Fe II	1880.052	55	P	Co III	1883.286	200		Sc II	1886.641	30	
Cl III	1880.10	300		Ge III	1883.3	120	P	Co II	1886.658	1	
Fe I	1880.14	35		Cr III	1883.32	45	N	Mn II	1886.72	20	N
Ne II	1880.210	50	N	Cr II	1883.35	200		Co III	1886.742	200	N
Co III	1880.321	50	N	Fe III	1883.394	70		Fe III	1886.757	800	
Co I	1880.34	4	N	Na II	1883.460	20		Mg III	1886.764	2	
Cr I	1880.39	50	Z	V III	1883.57	250		Co IV	1886.80		P
V III	1880.41	400		Mn II	1883.78	10		Fe II	1886.86		F,P
Co III	1880.449	30		Ne II	1883.796	80		F III	1886.950	3	
Ni III	1880.498	5		Na II	1883.804	20		Na III	1886.96	400	
Co VI	1880.6		F,P	Co II	1883.812	0		Fe III	1887.085	70	
Sc II	1880.604	200		Fe III	1883.816	200		Mn IV	1887.15	350	
Fe III	1880.620	200		Sc II	1883.861	4		Fe III	1887.197	550	
Na III	1880.663	200		Fe V	1883.871		P	Mg III	1887.308	12	
Fe III	1880.704	250		Fe I	1883.91	40		Mn II	1887.31	2	
V II	1880.811	1		F III	1883.925	6		Na III	1887.32	80	
Cr IV	1880.811	1		Mn II	1883.98	10		Na III	1887.39	200	
Mn III	1880.818	3		V II	1883.98	200		N II	1887.404	350	
Co I	1880.82	15	N	Cr II	1884.18	20	P	Ar II	1887.42	30	Q
Co III	1880.912	50		Cr I	1884.2	1	A	Sc II	1887.438	4	
Si I	1880.9657	5		Fe III	1884.233	150	P	Fe III	1887.471	550	
Fe II	1880.972	110	P	Fe IV	1884.234	300		Na III	1887.472	400	
Cr III	1881.02	20		V II	1884.254	5		Cr I	1887.60	150	Z
Cr II	1881.06	120		Cr III	1884.30	5		Si I	1887.6928	45	
Co III	1881.080	150	N	Fe IV	1884.381	150		Se IV	1887.7	30	N
Ni II	1881.155	25		Mn III	1884.431	45		Fe III	1887.734	250	
Al IV	1881.159	700		Co I	1884.45	10		Fe I	1887.761	300	
Fe III	1881.178	300		Cr III	1884.49	5		V III	1887.79	100	
V III	1881.28	25		Br II	1884.5	20	Q	Cr I	1887.85	50	Z

Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes
Co IV	1887.87	50	P	As II	1891.278	50		As II	1894.661	1	
Mn II	1887.87	10		Fe III	1891.339	70		F III	1894.779	1	
Co I	1887.89	12	N	Ne II	1891.366	60		Si VII	1894.8		F, P
Fe VI	1887.89		F, P	Cr I	1891.4		P	Fe III	1894.983	250	
Cl II	1887.9334	100		Mn I	1891.432	170	A	V III	1895.01	300	
Cr II	1887.96	120		As I	1891.47	5		Mn III	1895.032	12	
Fe II	1888.010	1	P	V III	1891.47	50		Ne II	1895.072	10	
Fe	1888.03	150	N	Fe III	1891.516	300		Ni II	1895.082	6	
Ne II	1888.107	100		Mn II	1891.55	30		Fe VI	1895.17		F, P
Cr I	1888.17	150	Z	Co IV	1891.70		P	Ge I	1895.1968	100	
Fe III	1888.260	150		V III	1891.71	10		Co III	1895.368	500	
Fe I	1888.32	80		Ne II	1891.730	5		Kr II	1895.408	1	
Co III	1888.345	10		Fe I	1891.74	200		V III	1895.44	5	N
Na III	1888.375	160		Mn III	1891.772	50		Sc III	1895.441	40	
Mn III	1888.438	1		Mn III	1891.846	200		Fe III	1895.456	1000	
Mn IV	1888.45	40		Fe III	1891.909	200		Si I	1895.461	1	
Co III	1888.451	10		Cu III	1891.960	2		Ni III	1895.479	5	N
P IV	1888.523	650		Mg III	1891.970	7		Co II	1895.491	10	
F III	1888.530	10		Cr I	1892.01	50		Co III	1895.495	30	N
Mn III	1888.709	12		Na III	1892.01	50		Fe III	1895.635		
Fe II	1888.734	160	P	Co III	1892.011	150		Fe II	1895.688	55	P
Kr II	1888.756	40	P	Mn II	1892.02	50		Cr I	1895.78	50	Z
Ar II	1888.782	400		Si III	1892.030	60		Ne II	1895.840	5	
Cr III	1888.83	10	N	Na III	1892.05	80	P	Na III	1895.864	120	
Sc II	1888.839	50		Fe III	1892.073	300		Fe IV	1895.896	250	
Br II	1888.9	0	Q	Fe III	1892.140	300		Fe III	1895.912	70	
Zn III	1888.968	3	N	Cu I	1892.192		F, P	Mn III	1895.971	20	
Cl III	1888.97	10	P	Fe III	1892.247	300		Co III	1896.031	1	
Si IX	1889.		F, P	Fe III	1892.339	70		Zn II	1896.056	2	Z
Ar II	1889.029	600		Mn II	1892.40	10		Cr III	1896.09	30	N
Mn II	1889.05	20		Fe III	1892.488	70		Ni II	1896.147	2	
Fe IV	1889.050	80		Fe III	1892.598	70		Mn III	1896.293	3	
F III	1889.076	20		Cr I	1892.8	50	N, A	Mg III	1896.304	20	
Co III	1889.090	10		Zn	1892.866	75	N	Fe III	1896.333	250	
Cr I	1889.20	50	Z	Fe III	1892.890	300		Si I	1896.339	1	
Co IV	1889.21		P	Fe V	1892.939		P	Cr III	1896.406	90	
V III	1889.22	40		Cr IV	1892.960	40		Cr IV	1896.419	20	
Na II	1889.317	30		Co III	1893.095	20		Fe III	1896.734	250	
Co III	1889.321	20		Fe III	1893.113	200		Zn III	1896.775	3	Q
F IV	1889.4		F, P	Se III	1893.2	120		Fe III	1896.803	600	
Fe III	1889.451	300		Si I	1893.252	175		N VI	1896.82	300	
Co I	1889.60	6	N	F III	1893.273	3		V III	1896.84	10	
Kr II	1889.679	10		Mn II	1893.288	60		Cr I	1896.9	1	N, A
Ne II	1889.710	100		Cr III	1893.30	10	N	Fe III	1897.028	250	
F III	1889.711	1		Co I	1893.43	3	N	Mn II	1897.06	20	
Fe III	1889.735	250		Mn III	1893.485	70		Se III	1897.1	85	
Co I	1889.87	10	N	Mn II	1893.49	30		Mg III	1897.226	7	
Mn III	1889.878	150		Se I	1893.50	60		Ti III	1897.27	10	N
Mn II	1889.88	8		Cr I	1893.59	50	Z	Mn III	1897.28	1	
Cu III	1889.888	2		Ni II	1893.600	1		Na III	1897.350	140	
As I	1889.95	5		Fe II	1893.649	2	N	Ar II	1897.352	50	
Cr I	1890.0	1	N, A	Mn II	1893.70	50		Fe III	1897.379	200	
Co II	1890.086	2		Co II	1893.865	0		Al II	1897.401	10	
Ni III	1890.155	15		Ne II	1893.876	70		Kr II	1897.457	40	
Mn II	1890.17	5		Mg IV	1893.888	500		Al II	1897.460	3	
Fe II	1890.256	2	P	Co III	1893.911	5		Co I	1897.48	10	N
Cu III	1890.340	20		Fe III	1893.981	700		Mn II	1897.48	100	
Mg III	1890.380	40		Fe II	1894.021	70	P	Fe II	1897.480	2	P
Cr I	1890.4	50	N, A	Fe V	1894.022		P	V I	1897.49	25	N
Mn III	1890.42	2		Cr III	1894.05	20	N	Co II	1897.496	5	
As I	1890.42	1000		Co I	1894.07	3	N	Al II	1897.500	1	
V II	1890.50	20		F III	1894.082	60		Co III	1897.560	5	
Cr II	1890.55	600		Ca III	1894.124	500		V II	1897.70	10	
Na III	1890.59	60		Mn II	1894.19	0		Co I	1897.73	8	N
Co III	1890.642	2		Cr I	1894.2	5	N, A	Cl III	1897.80	300	P
Fe III	1890.669	900		Co IV	1894.20		P	Ne II	1897.810	40	
Na III	1890.754	300		Fe III	1894.252	300		V I	1897.90	10	N
Cr I	1890.78	300	Z	Zn II	1894.259	75	Z	Kr II	1898.048	60	
V I	1890.82	15	N	C III	1894.29	200		Mn II	1898.12	30	
Fe III	1890.893	150		Se III	1894.4	85		Mn III	1898.133	260	
Mn I	1890.939	75	A	V I	1894.47	40	N	Br II	1898.2	20	Q
Fe III	1891.070	250		Al IV	1894.48	50		Be IV	1898.258		P
Mn II	1891.18	8		Cl II	1894.5004	2		Mn III	1898.301	200	
Fe III	1891.186	200		Fe III	1894.509	200		Ar II	1898.36	15	Q
Co IV	1891.24		P	Ca III	1894.582	250		Sc II	1898.393	4	

Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes
V III	1898.42	10	N	Fe III	1901.540	200		Fe II	1905.270	1	P
Be IV	1898.452		P	Mg III	1901.572	20		Co III	1905.354	300	
Be IV	1898.519		P	Cl III	1901.61	500		Co I	1905.41	6	N
Fe II	1898.536	90	P	V III	1901.63	50		P I	1905.481	230	
Se I	1898.56	400		Co VI	1901.7		F, P	Sc IV	1905.521	160	
F III	1898.631	100		Fe	1901.71	150	N	Na III	1905.674	60	
Kr II	1898.631	4		Co I	1901.75	20	N	Co III	1905.674	20	
Mn II	1898.64	30		Mn III	1901.754	1		Fe II	1905.70		F, P
Fe IV	1898.772	110		Fe II	1901.773	30	P	Fe II	1905.77		F, P
V II	1898.78	25		Fe II	1902.027	20	P	Ti II	1905.797		P
Co IV	1898.85		P	Mn II	1902.04	10		Co III	1905.810	5	
Fe III	1898.870	400		Mn III	1902.069	100		Fe III	1905.818	150	
Co II	1898.885	0		Fe III	1902.076	300		Co I	1905.87	20	N
Cr II	1898.92	700		Co I	1902.15	10	N	Si II	1905.878	3	Z
Co II	1899.020	0		Cr III	1902.19	20	N	Cu XIV	1906.		F, P
Mn III	1899.097	150		V III	1902.23	500		Na II	1906.112	15	
Ni III	1899.098	1	N	As I	1902.31	6	N	Cr III	1906.12	40	N
Cr III	1899.15	10	N	Ge I	1902.3955	2		Ti II	1906.251	300	P
Co III	1899.183	5		Fe III	1902.402	400		Co III	1906.265	30	
Al II	1899.194	25		Cr I	1902.43	150	Z	Mn II	1906.37	20	
Fe I	1899.21	20		Si II	1902.459	100	Z	P I	1906.403	200	
Ar II	1899.287	100	Q	V III	1902.48	150		Al II	1906.408	25	
Fe III	1899.318	300		Mn III	1902.559	115		V II	1906.451	1	
F III	1899.373	1		Cr III	1902.59	20	N	Fe III	1906.457	400	
Mn IV	1899.48	350		Ni III	1902.607	50		Ne II	1906.502	60	
Kr II	1899.501	4		P IV	1902.649	90		Kr II	1906.543	1	
Mn II	1899.51	10		Kr II	1902.778	4		V J	1906.55		P
Na II	1899.523	30		Fe III	1902.902	300		Al II	1906.596	4	
Cr III	1899.56	20	N	Mn II	1902.948	500		V II	1906.618	1	
Co IV	1899.61		P	Cl X	1903.			Cr I	1906.67	100	Z
Kr II	1899.629	40		Fe II	1903.023	1	P	Al II	1906.674	8	
Na III	1899.718	180		Fe III	1903.159	70		Co I	1906.72	5	N
Zn III	1899.793	12		Co II	1903.191	3		Mg IV	1906.723	360	
Co III	1899.795	50		Kr II	1903.193	1		Fe III	1906.814	400	
Ne II	1899.802	40		Co III	1903.199	5	N	N III	1906.847	40	Z
V III	1899.81	400		Fe III	1903.257	200		Fe II	1906.93		F, P
V I	1899.82		P	Ni III	1903.262	15		Fe VI	1907.01		F, P
Co IV	1899.84		P	Fe II	1903.284	5	P	Na III	1907.01	400	
Ar II	1899.847	100		Cr III	1903.29	5		Mn IV	1907.03	600	
Mn IV	1899.88	0	N	Cr I	1903.30	50	Z	Na III	1907.12	450	
Fe III	1899.931	300		Fe II	1903.387	5	P	Be I	1907.16	100	
V I	1900.00	30	N	Fe I	1903.39	20	P	Zn IV	1907.168	90	
Cr III	1900.02	20	N	Ti II	1903.416		P	Na III	1907.18	200	P
Ni II	1900.025	4		Ge I	1903.5620	10		N III	1907.209	90	Z
Mg VI	1900.04	100	N	Cr I	1903.57	50	Z	Cr I	1907.28	100	Z
Mn III	1900.041	12		V III	1903.68	50		N VI	1907.34	200	
Mg III	1900.043	20		Fe III	1903.706	70		Kr II	1907.356	40	
Na III	1900.164	300		Mn III	1903.807	100		V II	1907.361	1	
Ne II	1900.189	40		V III	1903.83	15		Ca III	1907.385	450	
Fe II	1900.190	1	P	Na II	1903.831	15		Cr II	1907.40	60	P
P IV	1900.244	40		Cr III	1903.979	10		Co III	1907.458	30	N
V I	1900.25		P	Fe III	1903.983	70		Cr VI	1907.462	50	
S I	1900.2863	550		V III	1904.01	75		Mn II	1907.49	20	
Fe III	1900.575	70		Cu III	1904.024	2		Ne II	1907.493	200	
Ar II	1900.638	400		Co IV	1904.04		P	Fe III	1907.577	650	
Cr II	1900.66	30		F III	1904.247	60		Ni II	1907.612	1	
Fe II	1900.67	10	N	Fe III	1904.257	150		P I	1907.665	270	
Ne II	1900.695	5		Cr IV	1904.323	400	P	Fe III	1907.741	250	
F III	1900.760	150		Si II	1904.326	5		Kr II	1907.760	25	
Co III	1900.763	50		Al II	1904.326	8		V II	1907.80	300	
Ni II	1900.865	15		Fe III	1904.402	250		V III	1907.80	300	
Ni II	1900.921	2		Cr IV	1904.410	350	P	Mn III	1907.83	200	
Ge I	1901.0607	8		Ne II	1904.510	70		Mn II	1907.840	200	
Fe III	1901.096	600		V II	1904.54	0		N VI	1907.87	200	
Si I	1901.3377	400		Si I	1904.6647	40		N III	1907.916	100	P, Z
Co III	1901.357	300		Ne II	1904.691	5		Co II	1907.951	0	N
Mg III	1901.360	4		Ge I	1904.7015	400		Ar II	1907.988	400	
Fe III	1901.379	300		Co I	1904.75	5	N	S IV	1908.	10	
Sc VIII	1901.4		F, P	P IV	1904.777	150		N III	1908.080	150	P, Z
Ti III	1901.417	80		Fe II	1904.791	110	P	Sc II	1908.094	10	
Kr II	1901.490	120		F III	1904.834	35		As I	1908.13	1	
Li I	1901.50		ZZ	Cr III	1904.84	30	N	Na III	1908.15	60	
Co IV	1901.51		P	Mn I	1904.863	7	A	Ti II	1908.193	300	P
Zn II	1901.523	60	Z	Mn I	1905.125	4	A	V II	1908.32	400	
As I	1901.54	5		Fe III	1905.214	70		Ni II	1908.326	1	

Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes
Fe II	1908.36		F,P	Fe III	1911.685	100	P	Mn II	1915.21	20	
Ge I	1908.4342	50		Ca III	1911.692	450		Fe II	1915.328	2	P
Zn III	1908.436	1		Fe III	1911.742	50	P	Ni III	1915.409	5	N
Cr I	1908.46	200	Z	Mn II	1911.76	2		Na III	1915.436	160	
Mn II	1908.47	20		Kr II	1911.797	10		Ni III	1915.497	5	
Mg III	1908.500	100		Al III	1911.817			Ar III	1915.56	350	
Co II	1908.523	8		Fe V	1911.827		P	V II	1915.71	0	
Mn II	1908.54	20		Cu IV	1911.829	210		Fe III	1915.750	150	
V I	1908.58		P	V II	1911.88	400		Fe II	1915.792	1	P
Mn III	1908.670	0		Ti II	1911.958	50	P	Ni III	1915.834	2	
C III	1908.734			Fe IX	1912.		F,P	Co II	1915.856	0	
Mn II	1908.91	100		Ni II	1912.146	2		Mn III	1915.907	150	
N III	1908.936	25	Z	Mn II	1912.15	1		Na III	1916.000	60	
Fe IV	1908.980	30		V III	1912.17	50		Ne II	1916.083	500	
Be II	1909.		ZZ	Ge II	1912.376	20		V III	1916.09	25	
Ni III	1909.091	5		V II	1912.39	400		Co III	1916.112	50	
Cu IV	1909.164	80		Ge I	1912.4087	100		Mn III	1916.223	115	
Ti II	1909.215	200	P	Co III	1912.465	10	N	Cr I	1916.23	100	Z
V II	1909.36	400		Cr III	1912.50	40	N	Fe II	1916.239	0	P
F III	1909.375	1		Be I	1912.53	100		Mn II	1916.34	0	
Zn III	1909.424	6		F III	1912.543	10		Mn III	1916.385	20	
Ar II	1909.5689	50	ST	Fe II	1912.564	10	P	V II	1916.404	0	
Co III	1909.666	150		Sc III	1912.620	60		N III	1916.41	4	P,Z
Ti II	1909.671	200	P	Cr I	1912.79	200	Z	Fe III	1916.507	300	
Cr I	1909.72	100	Z	Cl III	1912.90	400		Cl III	1916.53	400	
Fe III	1909.782	150		Fe III	1912.920	250		Mn II	1916.71	30	
Kr II	1909.788	1		As II	1912.938	500		N III	1916.849	4	Z
Na III	1909.806	160		Co III	1912.952	30		Fe III	1917.087	150	
Fe II	1909.808	1	P	Mn II	1912.96	30		Sc II	1917.182	30	
Mn II	1909.830	60		P III	1912.974	10		As I	1917.21	20	
Kr II	1909.840	4		Cl XI	1913.		F,P	Fe IX	1917.21	3	F
Fe III	1909.846	150		Mn IV	1913.08	20	N	Fe III	1917.250	250	
Fe II	1909.87		F,P	V II	1913.10	200		Fe II	1917.320	40	P
Cr IV	1909.88	50	P	Al III	1913.166			Co III	1917.321	20	
Fe II	1910.04	1	P	Na III	1913.190	450		Na III	1917.344	450	
V V	1910.062	40		Fe III	1913.386	70		Fe III	1917.351	550	
Ca III	1910.097	550		Zn IV	1913.521	1		Mn II	1917.38	3	
Cr IV	1910.107	70		V III	1913.62	350		Kr II	1917.387	10	
Fe II	1910.150	1		Fe III	1913.622	250		Fe III	1917.453	600	
Co III	1910.151	1		Cu III	1913.644	2		Cr III	1917.52	10	
Fe III	1910.172	70		V II	1913.70	350		Mn III	1917.530	225	
P IV	1910.183	200		Mn II	1913.73	20		N III	1917.572	1	Z
Mn IV	1910.25	750		Co II	1913.758	8		Ge I	1917.5924	200	
Cr I	1910.3		P	Mn I	1913.759	250	A	Ge III	1917.6	5	P
Cr III	1910.33	50	N	Se I	1913.79	350		Mn II	1917.61	100	
Co VI	1910.4		F,P	Mn IV	1913.82	0		Co II	1917.625	10	
Fe III	1910.401	400		Cr III	1913.85	20	N	Fe III	1917.665	150	
Kr II	1910.421	1		Ni III	1913.890	30	N	V V	1917.686	10	
Fe II	1910.445	1	P	Sc II	1913.891	1		F III	1917.766	1	
Fe I	1910.53	0	Q	P VIII	1914.		F,P	Ar II	1917.79	30	Q
Kr II	1910.539	60		Ti II	1914.022	25	P	V II	1917.79	150	
Si II	1910.621	50		Kr III	1914.05	60	P	Cl III	1917.87	400	
Mn III	1910.649	40		Fe III	1914.056	1000		Fe III	1917.960	400	
Na III	1910.660	120		Ni III	1914.076	3	N	Ar III	1918.06	50	
Fe II	1910.675	40	P	Cl III	1914.09	300		Fe II	1918.100	30	P
V III	1910.68	200		V II	1914.295	1		Mn III	1918.198	0	
Cl II	1910.7442	160		Ti II	1914.321		P	Fe X	1918.25	5	F
P III	1910.780	4		Fe II	1914.330	5	N	Fe III	1918.284	450	
Al II	1910.825	80		Ar III	1914.40	450		Cr II	1918.30	80	
Co III	1910.840	300		Mn V	1914.515	250		Mn I	1918.333	250	A
Cl II	1910.8830	100		Kr II	1914.648	4	P	Fe V	1918.373		P
Al II	1911.013	15		Ar III	1914.65	150		As I	1918.39	3	N
Ar II	1911.053	50		V III	1914.68	15		Na III	1918.453	500	
V II	1911.108	4		Mn II	1914.68	200		Fe III	1918.459	450	P
Co III	1911.174	20		S I	1914.6982	350		Be III	1918.46	30	P
Sc II	1911.200	10		Ne II	1914.729	30		Na III	1918.46	240	P
Cu IV	1911.208	80		Ni III	1914.75	1		Cr III	1918.489	1	
Cr II	1911.26	140	P	Zn II	1914.806	60	Z	N III	1918.53	10	Z
Cr III	1911.263	10		Cr III	1914.87	30	N	Cr IV	1918.542	5	
Si II	1911.265	0		V II	1914.91	150		Kr II	1918.567	4	
Cr I	1911.30	350	Z	Na III	1914.91	0		Mn IV	1918.61	30	
Fe III	1911.338	450		Ni III	1914.919	1		Cr III	1918.61	40	N
Mn II	1911.41	300		Ni XXIII	1915.0		F	Mn II	1918.643	200	
Sc II	1911.581	30		Fe III	1915.083	750		Ar III	1918.67	200	
Cr III	1911.66	80	N	Mn II	1915.10	1000		Cu IV	1918.708	300	

Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes
Mg III	1918.777	20		Mg III	1922.540	2		Na III	1926.21	400	P
N III	1918.87	40	Z	Na III	1922.58	60		V III	1926.23	25	
Mn II	1918.909	30		Fe II	1922.692	5	P	Fe II	1926.240	30	P
Zn II	1918.962	50		Br II	1922.7	20	Q	Na III	1926.259	700	
Fe III	1918.966	200		Cr III	1922.72	20		Co II	1926.263	0	
Zn IV	1919.019	100		Mg III	1922.788	1		Fe III	1926.304	1000	
Cr III	1919.05	30	N	Fe III	1922.789	1000		Co III	1926.365	1	N
Zn III	1919.068	20		Cr III	1922.790	4		Ca I	1926.5		A,Z
Co II	1919.103	3		Fe II	1922.797	20		Mn II	1926.585	500	
Co III	1919.120	500		Ni III	1922.91	1	N	Sc II	1926.623	50	
Mn III	1919.162	20	N	Co II	1922.924	5		Cr III	1926.64	40	N
Se I	1919.19	300		C III	1922.96	300		B II	1926.65	10	
Kr II	1919.199	40		V III	1922.98	25		Co III	1926.659	2	N
Ar II	1919.199	300		Fe III	1923.003	450		Na III	1926.711	100	
N III	1919.288	90	Z	Cr II	1923.02	160		Mn III	1926.728	150	
V II	1919.35	200	N	Mg III	1923.042	20		V III	1926.75	200	
Fe VI	1919.50		F,P	Mn II	1923.07	200		Fe III	1926.898	200	
Ar III	1919.52	200		Ti XXI	1923.08		P	Co I	1926.90	10	
Kr II	1919.522	4		Cl II	1923.1553	160		O III	1926.94	500	
N III	1919.547	150	Z	C III	1923.16	200		Mn II	1926.948	50	
Fe III	1919.572	250		Ne II	1923.226	5		Al II	1926.948	20	
Mn II	1919.639	300		Mn II	1923.34	200		Zn III	1927.005	2	
As I	1919.72	1	N	C III	1923.34	200		C II	1927.02	5	Q
N III	1919.768	150	Z	Cr III	1923.41	10	N	Al II	1927.070	10	
Be I	1919.80	200		Ni III	1923.463	5		Cr I	1927.1	15	N,A
Na III	1919.93	80		Ge I	1923.4674	100		Al II	1927.13	0	
Sc II	1919.967	4		O III	1923.49	700		Ar II	1927.19	10	Q
Co III	1919.980	5		Co IV	1923.54		P	Co III	1927.198	5	
Ar II	1920.007	200		Co II	1923.679	0		Na III	1927.237	550	
Mn II	1920.03	100		Kr III	1923.80	10	P	Mn II	1927.33	10	
O III	1920.04	600		Co III	1923.801	2	N	Mn III	1927.337	0	
Mn III	1920.075	290		O III	1923.82	500		Fe III	1927.436	300	
Na III	1920.12	120	N	Fe III	1923.877	450		B II	1927.45	1	
Ti V	1920.163	150		Mg III	1923.896	200		Fe II	1927.485	5	P
Ne II	1920.181	80		Na III	1923.963	220		Ne II	1927.549	5	
Fe III	1920.186	250		Cr VI	1924.089	80		Fe II	1927.553	25	P
Fe III	1920.260	150		Fe III	1924.119	250		Na III	1927.59	60	
Zn II	1920.271	70	Z	Ne II	1924.166	70		Fe III	1927.679	150	N
Se IV	1920.3	150	N	Mn III	1924.422	20		Ni II	1927.707	2	
Cl III	1920.32	400		Co I	1924.46	15	N	Co III	1927.740	200	
V III	1920.38	75		Mg III	1924.479	30		Mn IV	1927.78	20	
Mn III	1920.390	70		Co III	1924.529	50	N	B II	1927.78	1	
Kr II	1920.467	4		Fe III	1924.532	400		Mn III	1927.889	80	
Ni V	1920.5		F,P	Co III	1924.722	10	N	Fe II	1927.919	2	P
Ni II	1920.582	1		Al II	1924.754	50		Mn III	1927.968	90	
Cr IV	1920.620	160		Cr I	1924.8	10	N,A	Ni XXII	1928.		F,P
Fe II	1920.63		F,P	Al II	1924.825	30		V III	1928.05	15	
N III	1920.654	300	Z	V II	1924.87	300		Zn III	1928.098	0	
Cu II	1920.6718	5		Al II	1924.879	10		Mn II	1928.15	40	
Fe II	1920.70		F,P	Mn II	1924.96	5		Fe III	1928.178	250	
Co II	1920.707	5		S	1925.	10	N	Mg III	1928.198	2	
O III	1920.75	500		Co I	1925.05	12		Fe III	1928.247	100	P
Fe III	1920.752	150		Mn II	1925.17	5		C II	1928.30	10	Q
N III	1920.838	150	Z	Na III	1925.189	160		As I	1928.30	1	N
Mn II	1920.95	2		Cr III	1925.26	10	N	P II	1928.30	5	
Zn	1920.951	10	N	Co III	1925.260	20		Fe III	1928.306	200	P
Fe II	1920.985	0	P	Fe III	1925.271	250		Mg III	1928.424	30	
Zn III	1921.012	20		Br II	1925.4	500	Q	Cu II	1928.45	1	N
Fe III	1921.132	150		Mn IV	1925.41	40	N	Mn III	1928.479	1	
V III	1921.24	100		Co II	1925.457	0		Co III	1928.490	100	
Mn II	1921.250	800		Sc II	1925.512	10		Fe II	1928.52		F,P
N III	1921.299	200	Z	Co III	1925.513	5	N	Li III	1928.552		P
Mg III	1921.374	2		Mn II	1925.52	300		Co III	1928.570	500	
O III	1921.52	500		Co III	1925.563	15		Cr II	1928.61	10	
Fe II	1921.87		F,P	Mn II	1925.728	1	Q	Fe III	1928.642	250	
V V	1921.915	10		Mg IV	1925.742	240		Li III	1928.677		P
Fe III	1921.990	70		Ti III	1925.823	3		Cr I	1928.7	10	N,A
Co III	1922.000	1		Mn III	1925.851	20		Cu III	1928.714	75	
Mn II	1922.031	100		Fe III	1925.855	200		Li III	1928.721		P
Fe III	1922.132	70		Co III	1925.910	1	N	Fe II	1928.785	2	P
Cu II	1922.1425	5		Fe II	1925.987	135	P	Ne II	1928.786	60	
Al II	1922.16	1		Al II	1926.029	60		Co III	1928.802	200	
Fe II	1922.269	0	P	Fe III	1926.036	250	P	Mg III	1928.811	4	
Mn I	1922.523	200	A	Fe III	1926.041	250	P	Cr III	1928.814	250	
Co II	1922.531	5		Mn II	1926.167	40		Fe III	1928.837	250	



Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes
Fe II	1928.88		F,P	S IV	1932.			Na III	1935.54	10	Q
Mn III	1928.925	2		Cl VIII	1932.0			Cr III	1935.550	200	
Fe III	1928.991	70		Co II	1932.107	0		Ni V	1935.6		F,P
Fe V	1928.997		P	Ar II	1932.230	200		Cr II	1935.63	500	P
Sc II	1929.010	50		Fe II	1932.25		F,P	Ca III	1935.72	600	
Ni II	1929.063	1		Al I	1932.255		P,Z	Mn III	1935.770	2	
Mg III	1929.080	1		Mn II	1932.27	10		Al III	1935.840	300	
V V	1929.138	90		Sc II	1932.272	50		Al III	1935.863	15	
As I	1929.14	3		Al II	1932.377	150		Cr III	1935.918	4	
Fe II	1929.196	10	P	Mn III	1932.44	2		Ni III	1935.947	5	
Mn IV	1929.34	20	P	Co III	1932.442	5	N	Al III	1935.949	200	
Co I	1929.34	15		Fe II	1932.485	70	P	Co II	1935.962	1	
Sc II	1929.357	1		V II	1932.55	5		Mn II	1936.089	1	
Fe III	1929.413	250		V III	1932.59	10		Ni III	1936.10	2	
Cr IV	1929.422	220		Mn II	1932.600	20		P I	1936.347	15	
Ti III	1929.448	7		Cr II	1932.64	100		Co III	1936.392	20	
Cr I	1929.60	10	Z	Na III	1932.737	600		Ne II	1936.417	30	
Cu II	1929.6081	25		Ne II	1932.754	70		Al I	1936.448		P,Z
V II	1929.61	600		Co III	1932.766	1		Mn III	1936.559	200	
Na III	1929.624	60		Cr VI	1932.783	12		Co I	1936.58	30	
Fe III	1929.632	70		Fe III	1932.818	300		S II	1936.71	300	
Ne II	1929.643	60		V III	1932.82	25		Mn II	1936.74	10	
Zn II	1929.670	3		Mn IV	1932.85	30		Co III	1936.784	5	
Fe II	1929.709	2	P	Mn III	1932.92	1		Fe II	1936.793	15	P
Be I	1929.71	300		V II	1932.99	30		Fe II	1936.805	55	P
Cu II	1929.7510	25		Co I	1933.03	3	N	Fe III	1936.806	250	
Mn III	1929.752	3		Co III	1933.250	50		Na III	1936.815	120	
Co III	1929.756	300		V II	1933.28	100		Al II	1936.907	125	
Zn III	1929.774	80		Mn II	1933.32	15		Mg IV	1936.931	200	
F II	1929.791	10	Z	Fe II	1933.417	5	P	Co III	1936.933	300	
Ge I	1929.8262	400		Fe II	1933.45	10		Na III	1937.03	60	
Co VI	1929.9		F,P	Ni III	1933.47		P	Ar II	1937.041	100	
Fe III	1929.941	150		Mn III	1933.483	100		Co II	1937.076	5	
Cr IV	1929.953	285		Ne II	1933.529	90		Fe III	1937.077	200	
Cr II	1929.96	240		As II	1933.530	0		Mn III	1937.121	4	
Al II	1929.978	150		Mg III	1933.563	40		Ge I	1937.1456	8	
Ne II	1930.028	300		Co II	1933.618	0		V III	1937.17	25	
Mn II	1930.06	3		Ne II	1933.642	10		B II	1937.2		
Fe III	1930.184	150		Ar II	1933.694	200		Fe I	1937.274	500	
Ge I	1930.2707	8		Mn III	1933.729	90		Mn II	1937.28	2	
Na III	1930.293	120		Co III	1933.742	1	N	Fe III	1937.345	950	
Ne II	1930.335	60		Kr II	1933.784	25		V II	1937.44	600	
Mg III	1930.374	7		Ge III	1933.8	10	P	Mn II	1937.46	15	
Fe III	1930.387	1000		Kr II	1933.852	10		Cu III	1937.462	50	
Cr III	1930.39	20		Ca I	1933.88		A,Z	Ge I	1937.4825	300	
Fe II	1930.42		F,P	Na III	1933.885	650		Mg III	1937.539	1	
Ni III	1930.431	200		Mn III	1933.926	290		Cr II	1937.56	400	
Mn II	1930.45	30		Mn II	1933.93	80		Cl II	1937.5678	125	
Co III	1930.479	50		Cr VI	1933.955	30		As I	1937.59	900	
Ni II	1930.493	1	N	V III	1934.00	300		Cr IV	1937.630	750	
Zn III	1930.525	15	N	Ge I	1934.0482	100		Ni II	1937.661	1	
Mg III	1930.672	250		Co II	1934.091	0		Co III	1937.661	100	
S VI	1930.8	10	P	Cr IV	1934.13	20	N	V II	1937.68	70	
Co I	1930.90	6		Co III	1934.274	50	N	Mg III	1937.78		
C I	1930.9054	1000		Na III	1934.335	60		Cr III	1937.84	30	N
Fe II	1930.915	40	P	Co I	1934.34	12		Mg III	1937.843	150	
Fe III	1930.917	150		Cu IV	1934.434	20		As II	1937.869	0	
Co I	1931.00	10	N	Fe II	1934.47	1		Mn III	1937.929	25	
Fe II	1931.00		F,P	Al II	1934.503	225		Fe III	1937.996	250	
Al II	1931.048	125		Co II	1934.513	0		Ge II	1938.0077	100	
Mn III	1931.06	2		Fe I	1934.528	500		Mn II	1938.20	20	
Fe II	1931.07		F,P	Cr III	1934.581	10		Mg III	1938.249	7	
Zn II	1931.073	40	Z	Al II	1934.713	125		Mn II	1938.27	10	
V III	1931.09	250		Co III	1934.734	50		Ge I	1938.3003	300	
Kr II	1931.277	4		Mn II	1934.78	20		P IV	1938.403	4	
Fe III	1931.309	70		Co VII	1935.		F,P	Na III	1938.41	80	
Mn III	1931.394	300		Co III	1935.023	100		Cr II	1938.42	60	
Mn II	1931.404	300		Mn II	1935.068	100		Kr II	1938.427	1	
Ar II	1931.419	100		Fe II	1935.296	110	P	Cl II	1938.4724	80	
Fe III	1931.507	950		Ti III	1935.306	80		V II	1938.50	100	
Kr II	1931.565	90		Zn III	1935.354	5		Co II	1938.550	5	
Sc II	1931.829	4		Mn II	1935.384	20		Ca III	1938.572	150	
Mn III	1931.883	30		Fe II	1935.45	0	Q	Ni II	1938.579	2	
Co I	1931.89	8	N	Co I	1935.46	0		Na III	1938.637	120	
Mn III	1931.92	2		V II	1935.531	1		V II	1938.70	80	

Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes
Fe III	1938.775	250		As II	1941.876	1		Fe III	1945.342	800	
Zn	1938.775	12	N	Mn II	1941.89	20		V II	1945.35	300	
Co VI	1938.8		F, P	Kr II	1941.944	4		Ne II	1945.458	100	
Ne II	1938.826	200		Fe II	1941.995	2	P	Cr III	1945.47	10	N
Ge II	1938.8906	100		Mg III	1942.036	4		Si II	1945.504	3	Z
Fe II	1938.899	8		Mn II	1942.08	20		P II	1945.54	50	
Fe III	1938.901	650		Ar II	1942.13	30	Q	Zn II	1945.583	60	Z
Mn II	1938.92	1		Na III	1942.19	120	N	V II	1945.64	300	
Mg III	1938.936	7		Co II	1942.283	2		Mn III	1945.671	30	
Co I	1938.94	10	N	Cr III	1942.30	50	N	Fe III	1945.724	150	
Co VII	1939.		F, P	V II	1942.35	400		Mn II	1945.83	5	
Al IV	1939.022	300		Mn II	1942.35	5		Co I	1945.86	0	
Cl II	1939.0336	60		Co III	1942.369	200		Fe V	1945.885		P
Kr II	1939.037	4		Zn III	1942.392	1		Cr II	1945.98	200	
Mn III	1939.053	40		Co III	1942.497	100		Co II	1946.029	1	
V IV	1939.065	500		Mn IV	1942.60	0	N	Mg IV	1946.117	360	
Sc IV	1939.088	220		Ni III	1942.64	0		As II	1946.137	1	
Fe III	1939.107	70		Mn II	1942.66	40		Fe I	1946.219	40	
Cr II	1939.15	120		Cr III	1942.73	10	N	Fe III	1946.321	20	
Ca III	1939.244	400		Co III	1942.796	100		Ti III	1946.322	15	
Al II	1939.261	150		Cl II	1942.8687	65		Mn II	1946.34	30	
V II	1939.32	80		Mn III	1942.886	250		Na III	1946.426	600	
F III	1939.4		F, P	Ni III	1942.886	10		Ti V	1946.434	50	
Ni III	1939.40	3		S	1943.	10	N	Fe II	1946.437	5	P
Cr III	1939.44	20	N	Ca III	1943.012	550		Na III	1946.48	300	P
F III	1939.5		F, P	Na III	1943.047	80		Cu II	1946.4929	10	
Na III	1939.559	60		Ni II	1943.060	2		Cr IV	1946.549	360	
Ni III	1939.588	100		Mn III	1943.209	800		Zn III	1946.637	0	
Ca III	1939.683	500		Cl II	1943.2155	35		Kr II	1946.677	1	
Cr IV	1939.723	110		As I	1943.30	2		Fe III	1946.769	200	
Co I	1939.75	3	N	As II	1943.305	0		V IV	1946.772	5	
Mn II	1939.77	1		As II	1943.317	40		Co I	1946.79	25	
Ne II	1939.875	70		Na III	1943.347	180		Co III	1946.792	300	
Cr II	1939.90	100		Fe III	1943.481	950		Ar II	1946.795	200	
Ni II	1939.901	10	N	Na III	1943.516	200		Ni III	1946.81	3	N
Mn II	1939.96	20		Mn II	1943.541	100		Na III	1946.82	10	N
Ti III	1940.009	3		Co I	1943.64	12		Fe II	1946.85	2	Q
Fe III	1940.018	550		Co II	1943.656	2		Mn II	1946.94	20	
Mn III	1940.056	100		Cr III	1943.715	150	Q	Sc II	1946.980	4	
Kr II	1940.112	1		Be I	1943.72	500		Fe I	1946.983	600	
Co III	1940.147	500		Ni II	1943.744	2		N III	1947.049	40	
Co I	1940.16	15		Kr II	1943.765	4		Se IV	1947.1	45	
Mn II	1940.19	8		Mn I	1943.803	70	A	Se III	1947.1	120	
Mn III	1940.224	6		Fe II	1943.81		F, P	Mn III	1947.172	80	
Co II	1940.395	0		Ti III	1943.978	7		Mn III	1947.320	150	
Zn II	1940.413	40	Z	V II	1943.99	0		Na III	1947.324	20	
Cr I	1940.45	50	A	Fe II	1944.10		F, P	V II	1947.37	220	
Mn III	1940.458	15		Ge I	1944.1163	150		V III	1947.37	20	
Cr I	1940.56	50	A	Fe II	1944.134	0	P	Mn III	1947.516	200	
Fe III	1940.604	150	P	Mn II	1944.16	100		Ti III	1947.540	1	
Cr I	1940.64		A	Zn III	1944.160	60		Ge II	1947.55	2	
Fe I	1940.649	500		Fe II	1944.18		F, P	As II	1947.572	0	
Mn III	1940.74	2		Co II	1944.181	20		Co I	1947.58	5	N
Fe III	1940.769	250		Ti III	1944.271	7		Co III	1947.626	5	
V II	1940.86	400		Fe VI	1944.30		F, P	Si II	1947.769	1	Z
Ti III	1940.909	3		Mn II	1944.36	20		Mn II	1947.932	200	
Fe II	1940.939	0	P	Ni III	1944.36	2		Co I	1948.09	10	N
Ar II	1941.0724	300	ST	Si II	1944.586	15	Z	Sc I	1948.196		P
V II	1941.27	300		Cu II	1944.5970	40		Ca III	1948.257	600	
Mn III	1941.282	500		Mn III	1944.640	150		Cr IV	1948.28	20	N
Co II	1941.286	30		Mn IV	1944.73	20	P	Mn II	1948.28	10	
As I	1941.36	5	N	Ge I	1944.7313	300		Fe III	1948.280	200	
V II	1941.40	300		Mn II	1944.77	40		Mn III	1948.282	200	
Ni III	1941.41	0		Ne II	1944.883	60		Fe II	1948.383	70	P
Co III	1941.460	50		Cr III	1944.94	5		Zn II	1948.458	30	
Mg III	1941.500	12		Na III	1944.99	60	N	Cr II	1948.47	200	P
Ti III	1941.510	80		Co VIII	1945.		F, P	Ti III	1948.508	40	
Ni III	1941.58	0		Mn III	1945.010	190		Cr I	1948.51	40	Z
Mn III	1941.59	1		Co I	1945.09	12		Co III	1948.655	100	
Na III	1941.61	10	N	Fe I	1945.090	200	P	Mn II	1948.72	80	
Fe III	1941.633	200		Cl II	1945.1017	15		F III	1948.731	10	
Si II	1941.667	50	Z	Mn II	1945.15	200		Mn IV	1948.75	20	
Co III	1941.730	100		Cr IV	1945.160	220		Kr II	1948.752	90	
Co IV	1941.74		P	Co III	1945.234	200		Fe II	1948.883	1	P
Na III	1941.77	10	N	Fe I	1945.274	400	P	Ti III	1948.909	100	

Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes
Mn III	1948.935	40		Fe II	1952.15		F, P	Be III	1954.97	500	
Co I	1949.00	15		Co III	1952.158	200		Fe III	1954.975	550	
Cr II	1949.00	800		Fe I	1952.262	500		S	1955.	10	N
Mn I	1949.116	100	A	Ge II	1952.29	3		Mn II	1955.06	1	
Sc II	1949.167	4		Fe III	1952.329	100	P	Ge I	1955.1150	200	
Mn III	1949.173	100		N III	1952.330	10		Co I	1955.17	30	
Cr III	1949.198	150		Mn III	1952.361	500		P I	1955.170	25	
Cr II	1949.22	700		Fe III	1952.385	50	P	Na III	1955.326	160	
N III	1949.285	90		Sc II	1952.503	4		Mn III	1955.456	50	
Si II	1949.331	10	Z	Fe III	1952.514	200		Co II	1955.471	0	
Mn III	1949.354	200		Mn III	1952.525	1000		Co III	1955.505	30	
Sc II	1949.390	4		Ni III	1952.540	200		Co IV	1955.58		P
Ne II	1949.450	5		As II	1952.541	0		Fe II	1955.641	5	P
Fe III	1949.462	150		Co II	1952.567	1		Mn IV	1955.66	300	N
Co VI	1949.5		F, P	Cu II	1952.5758	5		Fe I	1955.690	400	
Fe VI	1949.500		P	Fe I	1952.579	500		Ni III	1955.74	0	
Mn III	1949.53	30		Fe III	1952.648	700		Co III	1955.793	200	
Co III	1949.533	30		Fe II	1952.650	1	P	P I	1955.800	25	
Mn II	1949.56	10		Ca III	1952.823	200		Cr II	1955.93	300	
Si II	1949.564	100	Z	Mn II	1952.86	2		Fe III	1955.943	20	
Fe III	1949.666	200		Sc II	1952.959	50		Zn III	1955.955	8	Q
Ne II	1949.696	70		Zn II	1952.999	80	Z	Co VII	1956.		F, P
Mn III	1949.744	150		Fe I	1953.001	500		Ti III	1956.009	3	
Co II	1949.747	0		Fe IV	1953.038	50		Co III	1956.011	200	
Co III	1949.805	200		Ca III	1953.064	450		Fe I	1956.052	500	P
N III	1949.909	40		Co II	1953.069	3		Ti III	1956.108	3	
Ni IX	1950.		F, P	Fe III	1953.202	250		Fe II	1956.12	10	P
Se III	1950.0	120		Mn II	1953.23	300		Co I	1956.22	15	
Co IV	1950.01		P	Cr III	1953.26	50	N	Na III	1956.314	300	
Sc II	1950.085	30		Ca III	1953.295	150		Cr III	1956.36	40	
Co II	1950.093	30		Fe III	1953.322	900		Fe IV	1956.400	110	
Cr II	1950.12	1000	P	Mn II	1953.35	3		Ni III	1956.402	3	
Mn II	1950.143	200		Ni II	1953.407	40		Kr II	1956.412	4	
Fe I	1950.223	500		Fe III	1953.488	650		Sc II	1956.535	80	
Ne II	1950.276	40		Mn II	1953.51	10		Mg IV	1956.548	340	
Mn II	1950.31	30		Ca III	1953.546	500		Mn III	1956.614	300	
Fe III	1950.334	650		Co I	1953.71	8		Be I	1956.67	100	
Cl II	1950.3642	70		N III	1953.784	25		Co IV	1956.71		P
As I	1950.38	2	N	Ge I	1953.8018	100		Co III	1956.770	0	N
Co IV	1950.39		P	Fe III	1953.821	70		As II	1956.835	0	
S II	1950.45	300		Mn II	1953.90	10		Cr III	1956.899	120	
Co II	1950.566	2		Co III	1953.942	500		Ni III	1956.964	20	
Ti III	1950.612			N III	1953.957			Co VII	1957.		F, P
Ti III	1950.640	40		Si III	1953.968			Fe III	1957.137	200	
Co III	1950.668	2	N	Fe III	1953.968	250		Ti III	1957.172	3	
Mn II	1950.69	2		Mn II	1953.98	5		Fe VI	1957.28		F, P
Zn	1950.769	10	N	P I	1954.026	15		Cl II	1957.3047	65	
V II	1950.77	5		Ne II	1954.048	70		Mn III	1957.358	60	
Cl II	1950.8992	45		Sc II	1954.054	1		Fe III	1957.375	150	
Ni III	1950.90	0	N	V II	1954.061	2		Co II	1957.429	20	
Na III	1950.906	600		Mn II	1954.10	5		Mn III	1957.472	10	
Co III	1950.911	400		Zn III	1954.183	1		O II	1957.49	10	
Mn II	1950.922	40		P I	1954.208	15		Cu II	1957.5176	20	
Co III	1950.961	50		Co I	1954.22	30		Kr II	1957.542	1	
Cr III	1950.997	60		Fe III	1954.223	650		Mn III	1957.651	35	
Fe III	1951.007	800		Sc II	1954.317	4		Co I	1957.69	12	
Co IV	1951.09		P	Mn II	1954.32	30		Ar III	1957.83	50	
Na III	1951.237	700		Fe II	1954.43		F, P	Fe I	1957.838	600	
Mn III	1951.24	1		Mn IV	1954.47	50	N	Cr III	1957.839	4	
Fe III	1951.318	200		Sc I	1954.606		P	V I	1957.90	250	
As II	1951.393	0		Fe IV	1954.615	110		Fe III	1957.938	400	
V IV	1951.432	400		Fe II	1954.618	1	P	Si I	1957.965	1	
Co I	1951.44	12		Cu III	1954.630	20		Mn II	1957.98	40	
Mn III	1951.504	200		Ni II	1954.709	1		Ar XII	1958.		F, P
N III	1951.521	25		Fe II	1954.72		F, P	Cr III	1958.038	1	
Fe I	1951.571	500	P	Fe III	1954.769	250		Fe II	1958.09	5	
Ne II	1951.727	80		Co III	1954.791	300		Co I	1958.10	8	
Sc II	1951.875	4		Mn II	1954.81	200		Fe II	1958.121	5	
Ca III	1951.888	150		P I	1954.829	40		Ca III	1958.149	300	
Co I	1951.90	25		Mg III	1954.831	7		V I	1958.18	60	
Zn II	1951.911	60	Z	Mn III	1954.833	315		Al II	1958.247	8	
Sc I	1951.924		P	Zn II	1954.872	75	Z	Cu III	1958.282	10	
V III	1952.00	150		Cr III	1954.874	250		Mn III	1958.310	8	
Ca III	1952.133	450		Co III	1954.876	100		Sc I	1958.359		P
Co II	1952.149	0		Si I	1954.8681	50		Fe V	1958.392		P

Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes
Kr II	1958.427	4		Sc II	1961.596	80		Fe II	1964.342	12	P
V II	1958.446	1		V I	1961.69	300		O II	1964.35	10	
S II	1958.45	300		Fe III	1961.724	70		Mn IV	1964.44	250	
Co I	1958.55	25	N	Co IV	1961.76		P	Mn II	1964.45	80	
Mn II	1958.58	5		Ne II	1961.772	60		Zn II	1964.538	80	Z
Fe III	1958.583	700		Kr II	1961.863	4		Fe II	1964.572	1	P
Co III	1958.590	30	N	Cr I	1961.93	10	N	Ca III	1964.614	650	
Fe I	1958.598	600		Fe IX	1962.		F,P	Be I	1964.63	900	
V I	1958.60	0		Ge I	1962.0133	500		Ni III	1964.689	100	
Fe I	1958.724	300	P	Fe I	1962.031	500		Mn II	1964.70	20	
Fe III	1958.732	300		Mn III	1962.042	250		Co IV	1964.72		P
Al II	1958.77	1		Fe II	1962.07	1		Co III	1964.765	3	
As I	1958.82	20		Fe I	1962.107	600		Fe III	1964.776	550	
Fe	1958.84	0	N	Mg III	1962.145	7		Mn III	1964.858	260	
As I	1958.91	40	N	V V	1962.154	10		Mn III	1964.961	150	
Mn II	1958.932	80		Cr III	1962.16	5	N	Al II	1964.990	40	
Co I	1958.94	15		Ar II	1962.161	300		Cr III	1965.031	90	
Ca III	1958.971	500		O II	1962.27	300		As II	1965.036	3	
Al II	1959.00	0		Cr III	1962.334	10		V I	1965.07	300	
Fe III	1959.026	200		Al II	1962.590	70		Na IV	1965.078	550	
Sc II	1959.032	1		Al II	1962.645	8		Mn III	1965.096	40	
Cr IV	1959.060	550		Al II	1962.691	60		V I	1965.26	300	
V I	1959.12	150		Fe III	1962.717	300		Ti III	1965.298	1	
Cl II	1959.1619	140		Al II	1962.735	70		Fe III	1965.309	550	
Cr III	1959.224	10		Ar III	1962.74	100		Al II	1965.316	10	
Mn II	1959.246	300		Fe I	1962.746	10		Ni II	1965.357	8	
Fe III	1959.324	550		Al II	1962.763	50		Ge I	1965.3830	200	
V I	1959.36	150		Mn II	1962.80	30		Cr III	1965.541	200	
Cu III	1959.386	30		Cl II	1962.853	40		Mn II	1965.68	60	
Co III	1959.414	500		Fe II	1962.86		F,P	Sc II	1965.723	1	
Sc II	1959.419	1		Fe I	1962.871	400		F III	1965.726	35	
Mn II	1959.69	5		Mn III	1962.896	290		Mn III	1965.918	25	
F II	1959.758	1		Fe III	1962.958	250		Fe II	1965.921	2	P
Ge II	1959.781	30		Ti III	1962.969	7		Co III	1966.029	2	N
V I	1959.97	200		Zn III	1962.974	1		Mn II	1966.04	20	
Mn III	1959.98	2		Cr II	1963.00	300		Mn I	1966.046	5	A
Ne II	1959.994	60		V IV	1963.103	300		Fe III	1966.074	200	
Kr III	1960.02		P	Fe I	1963.110	500		Fe II	1966.200	20	P
V II	1960.137	3		Fe II	1963.110	25		Fe III	1966.201	150	
Fe I	1960.139	600		Zn IV	1963.112	60		Mn II	1966.24	2	
Cr III	1960.18	10	N	Cr III	1963.119	120		V IV	1966.244	20	
Mn I	1960.210	20	A	Sc II	1963.190	1		Mn III	1966.250	150	
F II	1960.255	10		Fe III	1963.209	70		Cu IV	1966.306	360	
Mn II	1960.27	10		Cl II	1963.211	30		Ge II	1966.3173	40	
Fe III	1960.318	900		Co III	1963.243	3	N	V I	1966.52	300	
Al II	1960.322	3		Mn III	1963.27	1		Cr III	1966.57	10	N
O II	1960.34	100		Kr II	1963.361	90		Co I	1966.68	9	
Mn II	1960.37	10		Ge I	1963.3728	100		Co III	1966.680	3	
V II	1960.445	0		Co I	1963.38	12		Co IV	1966.72		P
Na III	1960.64	240	P	Mn I	1963.430	20	A	Fe III	1966.740	550	
Al II	1960.646	3		F III	1963.439	20		V II	1966.752	3	
Mn II	1960.67	0		Fe III	1963.461	70		V I	1966.76	300	
Cr III	1960.69	10	N	V I	1963.47	350		Ar II	1966.953	100	Q
Mn II	1960.757	10	N	Mn III	1963.514	100		Mn III	1967.080	10	
Na IV	1960.760	650		Co I	1963.55	20		V III	1967.11	150	
Al II	1960.846	10		Fe I	1963.629	200		Cr IV	1967.181	870	
Fe IV	1960.860	80		Mn III	1963.719	200		V II	1967.185	4	
As I	1960.89	2		Ni III	1963.73	2		Se IV	1967.3	85	
Fe V	1960.896		P	Co III	1963.743	100		Fe III	1967.352	250	
Se I	1960.90	500		Ni I	1963.85	50		Mn II	1967.59	30	
Mn II	1960.90	5		O II	1963.86	200		Na IV	1967.601	450	
Cr IV	1960.950	650		Co I	1963.92	8		Fe II	1967.635	1	P
V II	1960.98	20		Mn III	1963.950	225		Co IV	1967.64		P
F II	1960.984	40		Fe III	1963.991	200		Co I	1967.78	10	
Co I	1961.00	15		Ni XIV	1964.		F,P	Ca III	1967.936	650	
Fe III	1961.010	300		S	1964.	10	N	V I	1967.98	400	
Fe III	1961.230	400		Co I	1964.03	20		Cu II	1968.0118	2	
Fe I	1961.236	500		Fe I	1964.043	400		Cu III	1968.026	3	N
Co I	1961.26	8		Fe III	1964.054	100	P	Fe II	1968.042	20	P
Ni III	1961.324	5		V II	1964.091	1		Ni III	1968.053	3	N
Ar II	1961.3610	400	ST	Fe III	1964.169	550		Fe II	1968.216	2	P
Mn II	1961.39	20		Mn II	1964.19	10		Na III	1968.23	80	
Co III	1961.450	50		Fe III	1964.260	450		Cl II	1968.251	35	
Fe III	1961.456	70		V I	1964.27	300		Cr IV	1968.364	360	
Co I	1961.59	25	N	Cu III	1964.336	20		V III	1968.37	5	

Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes
Ni XIII	1968.4		F,P	Cr III	1972.45	100	N	Mn II	1976.002	10	N
Na IV	1968.441	360		Mn III	1972.471	3		Cr III	1976.07	30	N
Fe III	1968.625	150		V I	1972.48	75		Fe III	1976.126	550	
As II	1968.660	20		Co I	1972.52	30		Mn II	1976.18	2	
Fe II	1968.684	10	P	As I	1972.62	800		Kr II	1976.252	4	
Co I	1968.69	25	N	V II	1972.62	200		Mn II	1976.27	2	
Mn III	1968.776	4		Fe III	1972.638	150		Fe IV	1976.44	1	F,P
Co IV	1968.78		P	Na III	1972.780	140		Mn III	1976.490	30	
As II	1968.855	20		Co I	1972.82	0		Br II	1976.6	0	Q
Fe II	1968.896	5	P	Ca III	1972.823	600		V II	1976.62	600	
Ni I	1968.90	50		Mn III	1972.861	100		Sc II	1976.629	1	
Co II	1968.918	30		Cr III	1973.20	70	N	Na III	1976.700	160	
Co I	1968.93	25		Zn III	1973.305	1	Q	Ar II	1976.765	300	
Mn II	1969.24	200		Fe II	1973.31		F,P	Ni I	1976.87	150	
Kr II	1969.278	4		Mn IV	1973.41	80		Mn II	1976.87	40	
Ni VI	1969.3		F,P	Ar II	1973.4837	200	ST	Fe IV	1976.89	2	F,P
Co III	1969.312	20		V II	1973.55	25		Co I	1976.97	30	
Ni VI	1969.4		F,P	Fe III	1973.578	20		Ca III	1977.013	500	
Zn II	1969.404	100		Co I	1973.62	5	N	Cu II	1977.0270	15	
V I	1969.57	75		As I	1973.65	3		Co III	1977.031	200	
Mn III	1969.576	50		Co III	1973.667	5		Mn III	1977.044	4	
Ni III	1969.62	0	N	Co III	1973.767	10		Zn II	1977.159	25	Z
Sc II	1969.623	4		Ar III	1973.78	200		Na III	1977.161	500	
Co I	1969.68	3	N	Mn III	1973.811	60		Fe IV	1977.20	7	F,P
Mn II	1969.87	50		Co I	1973.85	25		Ar II	1977.200	20	Q
Mn II	1969.95	100		Na III	1973.86	10		Zn III	1977.250	1	Q
Co VII	1970.		F,P	Fe I	1973.911	20		Zn II	1977.494	5	N
Ti III	1970.017	25		Co VII	1974.		F,P	Mg III	1977.554	60	
Co III	1970.054	300		Co III	1974.003	2	N	Fe II	1977.595	1	P
Kr II	1970.125	10		Kr II	1974.015	1		Si I	1977.5978	400	
Mn II	1970.16	5		Cr III	1974.03	50		V II	1977.60	5	
Na III	1970.221	40		Fe I	1974.059	20		Ne II	1977.657	70	
Fe II	1970.357	2	P	Co VI	1974.1		F,P	Mn II	1977.72	40	
Mn III	1970.432	60		Mn III	1974.10	20		Sc II	1977.790	4	
Cu II	1970.4946	15		Mn II	1974.14	100	P	Ni III	1977.84	1	
Ni III	1970.54	0	N	Na III	1974.150	400		Cu I	1978.13	2	A
Mn III	1970.639	2		Ge III	1974.2	20	P	Cu III	1978.211	3	
Fe II	1970.662	10	P	Cu V	1974.2		F,P	Mn III	1978.253	60	
Mn III	1970.678	260		Zn IV	1974.254	15		Co I	1978.36	10	
Co I	1970.71	50		V II	1974.278	1		Ge III	1978.4	40	P
Co I	1970.77			Fe IV	1974.36	1	F,P	Fe III	1978.417	250	
Fe I	1970.771	10		Co I	1974.39	15		Co I	1978.53	12	N
S II	1970.86	400		Cr III	1974.43	60	N	Ca III	1978.551	500	
V II	1970.877	0		Fe V	1974.435		P	Fe III	1978.626	150	
Ge I	1970.8796	500		Ar II	1974.462	300		Mn II	1978.75	20	
Mn II	1970.947	5		Zn II	1974.467	12	Z	Kr II	1978.904	10	
As II	1970.953	0		Cu II	1974.4681	0		Cr III	1978.91	40	N
Na III	1970.986	50		Fe II	1974.49	1		Fe II	1978.919	2	P
Na IV	1970.986	70		Ni III	1974.493	15		Co III	1978.948	50	
Fe II	1971.03	1	P	Cr III	1974.70	10		Mn III	1978.953	500	
Cr III	1971.11	20	N	Mg III	1974.737	12		V II	1978.96	200	
Co I	1971.16	30		Ni III	1974.780	15		Ti III	1978.981	1	
Mn II	1971.22	100		Mn II	1974.82	80		Fe III	1979.002	70	
Mn III	1971.28	100		Zn III	1974.863	0		Mn III	1979.058	290	
Zn III	1971.416	2		Co III	1974.883	200		V II	1979.087	5	
V IV	1971.471	40		Co II	1975.013	3		Fe II	1979.156	0	P
Mg III	1971.514	4		V II	1975.021	1		C III	1979.16	100	Z
As II	1971.580	0		Na IV	1975.148	220		Si I	1979.2056	400	
Cr IV	1971.583	70		Mn II	1975.24	30		Si III	1979.233		
Ne II	1971.621	20		Kr II	1975.251	120		Ge II	1979.2736	30	
Mn II	1971.71	20		As II	1975.270	1		Mg III	1979.327	80	
Co I	1971.75	15		Co I	1975.36	6		Mg III	1979.43		
Co III	1971.889	100		Sc II	1975.419	1		Cl III	1979.46	300	
Cu III	1971.948	100		V I	1975.42	100		Sc II	1979.466	10	
Fe II	1971.96		F,P	Na III	1975.43	10	N	V II	1979.618	1	
Mn III	1971.976	8		Mn III	1975.439	100		C III	1979.62	50	Z
Ca III	1971.992	250		V II	1975.489	1		Fe II	1979.719	20	P
Cl X	1972.		F,P	Fe II	1975.548	40	P	As II	1979.755	10	
Cr IV	1972.075	650		Cr III	1975.56	100	N	Mn III	1979.790	1	
Mn III	1972.218	5		Na III	1975.617	60		Cu II	1979.9565	200	
Na IV	1972.233	360		Fe IV	1975.647	110		Mn III	1979.969	25	
Fe III	1972.245	150		Co I	1975.67	20	N	Ni VI	1980.0		F,P
Ar II	1972.274	200	Q	Mn III	1975.690	200		Br II	1980.0	0	Q
V II	1972.278	1		Cr III	1975.902	4		Ni II	1980.010	15	
Cu III	1972.370	3		Co I	1975.94	6		V II	1980.04	400	

Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes
Cr III	1980.083	120		Kr II	1983.634	4		Na IV	1987.140	220	
Co III	1980.113	200		Al II	1983.650	10		Co I	1987.15	12	
Cr III	1980.225	90		Fe III	1983.676	150		Cr II	1987.19	10	
Ni III	1980.248	2		Na IV	1983.746	110		Co III	1987.197	30	
Fe III	1980.392	150		As II	1983.787	3		Co I	1987.24	10	N
V II	1980.59	250		Ar II	1983.829	100		V I	1987.25	50	N
Li I	1980.59			Fe II	1983.941	1	P	Mn III	1987.254	50	
Co I	1980.59	15	Z	Co II	1983.948	5		V II	1987.314	10	
Si I	1980.6185	300		V I	1983.96		P	C II	1987.33	40	
Ni II	1980.699	3		Fe III	1984.027	450		Cr II	1987.43	100	
Sc II	1980.712	1		V II	1984.05	100		Fe III	1987.503	1000	
Mn II	1980.84	2		V I	1984.05		P	V II	1987.547	4	
Co I	1980.89	40	N	Mn III	1984.052	2		Cr III	1987.620	200	
Na III	1980.95	10	N	Si I	1984.0719	3		Co I	1987.65	20	
As II	1980.992	2		Mn III	1984.083	225		Mn III	1987.70	1	
Co III	1981.000	1		Fe II	1984.091	5	P	C II	1987.76	120	
Mn II	1981.01	10		Fe III	1984.288	600		Fe III	1987.810	200	
Mn II	1981.16	20		Co III	1984.324	30		V II	1987.82	3	
Ca III	1981.192	550		Fe VI	1984.42		F,P	Co IV	1987.82		P
V II	1981.245	0		V I	1984.43	30		Ni III	1987.83	1	
Kr II	1981.264	4		Mn II	1984.43	20		Sc II	1987.832	10	
Co III	1981.345	100		Si I	1984.4400	20		Ge I	1987.8492	300	
As II	1981.466	10		Cu II	1984.7643	1		Zn IV	1987.874	35	
Cu III	1981.478	20		Co II	1984.826	1		Co III	1987.952	10	N
V II	1981.53	80		V I	1984.91	250		Fe II	1987.954	1	P
Cr III	1981.558	1		Fe II	1984.956	20	P	Sc VII	1988.0		F,P
Ni I	1981.61	100		Si IX	1985.	7	F,P	As II	1988.018	20	
S II	1981.64	200		Cl VI	1985.0			V II	1988.031	8	
Cu I	1981.65	3	A	Na IV	1985.03	70		Mn II	1988.06	30	
Kr II	1981.653	4		S II	1985.07	200		C II	1988.09	80	
Mn II	1981.67	20		Co VI	1985.1		F,P	Cu IV	1988.211	90	
Ni VI	1981.7		F,P	Fe III	1985.105	200		Ge I	1988.2668	600	
Co IV	1981.70		P	Be I	1985.17	300		C II	1988.51	40	
Co II	1981.736	1		Mg III	1985.173	12		Ar II	1988.620	300	
Ar II	1981.74	100	Q	Co I	1985.25	10		V II	1988.674	0	
Cr III	1981.82	20	N	Mn II	1985.25	2		Al II	1988.699	3	
Sc II	1981.848	1		Co I	1985.36	10		Ti V	1988.750	150	
V I	1981.85	5		Mn III	1985.398	20		Co III	1988.806	5	
Co I	1981.97	20		Cr II	1985.42	440	P	As II	1988.955	100	
Ne VII	1981.974	600		Cr IV	1985.552	450		V I	1988.97	40	N
Cu XXII	1982.		F,P	Na III	1985.567	650		Si I	1988.9937	1000	
Co III	1982.049	1	N	Zn II	1985.608	70	Z	P X	1989.		F,P
V I	1982.06	200		Cr II	1985.67	240		Fe III	1989.0		F,P
Fe III	1982.076	400		P IV	1985.682	120		Ne II	1989.036	80	
Sc II	1982.109	10		Mn III	1985.717	300	Q	Mn III	1989.038	8	
Zn II	1982.111	100	Z	Cr III	1985.72	50	N	Cr I	1989.05	200	P,Z
V II	1982.21	5		Mn I	1985.740	10	A	Fe II	1989.09		F,P
Co IV	1982.24		P	Mn III	1985.797	750		Ge I	1989.1174	100	
Mn III	1982.240	260		Ni VI	1985.8		F,P	Co II	1989.165	0	
Co III	1982.361	1	N	P IV	1985.851	150		V I	1989.17	1	
V II	1982.41	80		Co I	1985.88	4	N	Zn IV	1989.190	10	
V IV	1982.422	15		Co II	1985.898	1		Co I	1989.28	10	N
Zn II	1982.429	10	Z	Zn III	1986.020	4		V I	1989.39		P
V I	1982.45	200		Cu III	1986.104	3		Mn II	1989.41	50	
Co I	1982.52	20		Cu I	1986.112	4	A	Ca III	1989.512	450	
Ni III	1982.538	50		P IV	1986.114	200		Mn III	1989.587	400	
Ne II	1982.576	40		Co I	1986.31	6		Co III	1989.598	400	
Mn II	1982.60	10		Si I	1986.3640	500		Ti VII	1989.6		F,P
Sc IV	1982.704	5		Zn III	1986.365	1	Q	Co II	1989.617	5	
Mn III	1982.76	400		Mn II	1986.40	20		Cr III	1989.64	10	N
Fe III	1982.805	550		Fe II	1986.419	40	P	Co III	1989.645	100	
Co I	1982.81	8		Cr III	1986.54	50	N	Co I	1989.80	25	
Kr II	1982.866	25		Ge II	1986.6	3	N	Sc IV	1989.809	110	
Fe II	1983.033	5	P	Mn III	1986.646	130		V I	1989.82	60	
Fe III	1983.144	20	P	Co III	1986.704	3	N	Co II	1989.845	30	
Co II	1983.162	100	N	Ni VI	1986.8		F,P	Cu II	1989.8554	90	
Mn II	1983.17	60		Cr III	1986.82	10		Cr I	1989.92	750	Z
Si I	1983.2330	300		Mn III	1986.839	100		Mn III	1989.958	45	
Ar II	1983.299	100		Zn II	1986.988	100		Fe III	1989.975	450	
V I	1983.37	250		S IX	1987.		F,P	Cl XI	1990.		F,P
As II	1983.581	100		Cr III	1987.00	10	N	Co VII	1990.		F,P
Fe III	1983.6		F,P	Fe III	1987.006	70		Cu II	1990.1804	1	
Cl III	1983.61	500		P IV	1987.022	150		Mn III	1990.219	3	
Sc IV	1983.623	160		Co II	1987.029	5		Na III	1990.240	160	
Co IV	1983.63		P	Co I	1987.03	15	N	Cr IV	1990.247	650	

Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes
Ni I	1990.25	200		Co III	1993.625	100		Ge I	1997.8064	150	
Cr I	1990.27	400	Z	Cr II	1993.63	500		Cr I	1997.90	600	Z
V III	1990.33	0		Fe II	1993.72		F, P	Mn II	1997.94	20	
Co I	1990.34	30		Mg III	1993.759	7		Be I	1997.95	100	
Kr II	1990.341	1		Kr II	1993.763	25		Cl II	1997.9784		
As I	1990.35	200		Cu II	1993.81	1	N	Be I	1997.98	300	
Fe VI	1990.390		P	Sc III	1993.886	90		Be I	1998.07	600	
Ni VI	1990.4		F, P	Ni II	1993.906	1		Mn III	1998.127	100	
Fe II	1990.46		F, P	Fe II	1993.912	2	P	Cr II	1998.14	40	
Al II	1990.531	315		Mn II	1993.99	100		Zn III	1998.150	10	
Mn III	1990.615	290		Fe III	1994.073	900		Zn II	1998.238	20	N
Zn III	1990.637	25		Mg III	1994.089	4		Fe V	1998.281		P
Cr IV	1990.664	450	P	Ne II	1994.095	90		As II	1998.340	10	
V IV	1990.712	40		Cr I	1994.10	400	Z	Co I	1998.49	25	
Cr II	1990.79	200		Mn III	1994.130	260		Na III	1998.584	100	
Fe II	1990.805	1		Co IV	1994.22		P	Na IV	1998.584	70	
Co III	1990.841	10	N	Mn II	1994.23	300		Cl II	1998.5853		
Na III	1990.989	400		Ni I	1994.29	100		Zn III	1998.653	10	
Al II	1991.05	1		V II	1994.34	100		Ne II	1998.667	20	
As I	1991.13	100		Fe III	1994.366	70		Cl II	1998.6950		
Cr III	1991.17	40	N	Zn III	1994.454	1		Mn III	1998.773	260	
Cr I	1991.22	750		Cr I	1994.55	750	Z	S II	1998.80	200	
Fe II	1991.252	10	P	V III	1994.57	25		Mn III	1998.883	20	
Mn III	1991.290	50		Ni VI	1994.6		F, P	Ge I	1998.8869	1000	
N II	1991.301	10		Fe II	1994.857	20	P	Co IV	1998.91		P
V I	1991.31	0		As I	1994.89	20		Zn II	1998.977	25	Z
V I	1991.40		P	Co I	1994.98	15	N	Cl II	1999.0230		
Fe II	1991.52		F, P	V II	1995.02	5		Fe III	1999.100	70	
Co II	1991.563	3		Mn III	1995.02	3		Cr III	1999.12	20	N
Fe III	1991.613	950		Cr III	1995.066	10		Fe II	1999.206	1	P
Na III	1991.633	100		Se I	1995.11	150		V IV	1999.320	200	
V I	1991.75	10		Fe II	1995.119	1	P	Cl II	1999.3406		
Co I	1991.80	3		Fe III	1995.266	450		Fe II	1999.413	70	P
Fe II	1991.802	2	P	Mn II	1995.275	1		Fe II	1999.462	10	P
Si I	1991.8537	50		Ne II	1995.280	50		Cr III	1999.484	90	
Cu I	1991.876	6	A	Sc II	1995.288	80		Cu I	1999.50	10	A
Co III	1991.929	1	N	Mn III	1995.356	225		Mn I	1999.500	450	A
S I	1991.9369	8		Co III	1995.397	50		Ni I	1999.53	0	
Co VIII	1992.		F, P	Fe II	1995.422	2	P	Fe III	1999.588	600	
Fe III	1992.017	600		As I	1995.43	100		Fe II	1999.730	30	P
Ne VII	1992.060	300		V I	1995.43	1		Fe III	1999.893	200	
Cr I	1992.12	300	Z	Zn III	1995.539	1	Q	Co III	1999.913	3	N
Co III	1992.158	10		Fe III	1995.563	800		Mn III	1999.916	315	
Fe III	1992.196	600		Sc IV	1995.567	1		Mn II	1999.92	80	
Mn II	1992.30	20		Mn III	1995.586	60					
Fe III	1992.427	70		Na III	1995.675	500					
V I	1992.46	1		Cr I	1995.69	250	Z				
Kr II	1992.464	4		Ni II	1995.723	15					
Mn III	1992.492	2		Mn III	1995.838	700					
S VI	1992.5	50	P	Cr III	1996.03	10	N				
Cr III	1992.556	90		Mn I	1996.047	400	A				
Cr I	1992.65	250	Z	Fe III	1996.420	800					
As II	1992.682	5		P IV	1996.443	1					
Cr III	1992.716	250		Fe II	1996.539	2	P				
Co I	1992.79	20	N	Cr II	1996.62	60					
V III	1992.83	100		Cr III	1996.70	20	N				
Fe III	1992.858	400		Cl II	1996.7136	160					
Mn III	1992.889	10		V I	1996.78		P				
Se III	1992.9	30		Mn III	1996.905	15					
Mn III	1992.927	290		Zn II	1996.922	50	Z				
Zn III	1992.936	1	Q	Fe II	1996.933	0	P				
Mn III	1993.013	190		Fe IV	1997.02	3	F, P				
Mn III	1993.222	80		Fe II	1997.03	4					
Co I	1993.25	10	N	Cr I	1997.09	250	Z				
Fe III	1993.262	450		Cu V	1997.1		F, P				
Fe II	1993.298	10	P	Mn III	1997.109	20					
Ni III	1993.362	10	N	Co II	1997.122	3					
Zn II	1993.367	50	N	Cl II	1997.2619	85					
Zn	1993.367	50	N	Cr I	1997.30	500					
Cr II	1993.37	300		Fe IV	1997.34	3	F, P				
Mn III	1993.550	20		Ne VII	1997.345	100					
Ar II	1993.555	20	Q	Cr IV	1997.35	20	N				
Ni II	1993.570	2		Cl II	1997.3705	210					
Mn II	1993.60	10		Mn IV	1997.54	650					
C I	1993.620	50		V IV	1997.722	500					

Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes
Ne V	117.27	27		Sc	118.552	400	N	Na VI	119.684	300	
V XVII	117.276	150		S XVI	118.579		P	Fe VII	119.686	60	
Fe VII	117.281	10		Na VI	118.585	10		Fe VII	119.692	4	
Fe VII	117.310	10		F V	118.6	25	Q	Se XX	119.7	265	
O VI	117.327	20		Mg V	118.603	100	N	Si XII	119.71		P
Fe VII	117.335	10		Sc X	118.616	300		Fe VII	119.715	25	
Ca	117.359	1	N	Fe VIII	118.648	3		Mn XIX	119.76	10	
Al IV	117.370	10	P	Fe XX	118.66	200		As VII	119.779	15	
Sc	117.373	100	N	Cr XIX	118.67	150		Fe VII	119.785	25	
F VI	117.4	115	Q	Co XXIII	118.68	4		Si XI	119.8	20	Q
O VI	117.401	5		Fe XXI	118.69	50		Fe VII	119.813	4	
Mn XIX	117.41	110		Fe XXI	118.71	150		Ti X	119.822	1	
Fe VII	117.432	1		Mg IV	118.737	80		Fe VII	119.846	25	
Cr IX	117.435	200		Ne V	118.74	12		Ti X	119.891	6	
Fe VII	117.459	1		V VI	118.779	20		Fe VII	119.896	1	
Ne VI	117.48	27		Mg IV	118.792	80		Ne VI	119.92	100	Q
Na VI	117.491	400		Ne V	118.8	50		Co XXII	119.92	80	
Fe XXI	117.51	110		Mg V	118.810	500		Fe VII	119.978	1	
Fe VII	117.512	4		Mg IV	118.810	160		Mg V	119.978	10	Q
Fe XXII	117.52	110		Cr XIX	118.83	110		F V	119.986	10	
Mg VI	117.527	100		Na VII	118.840	10		Fe XIX	120.00	200	
Na VI	117.609	300		Ne V	118.89	37		Fe XXII	120.03	200	
Fe VII	117.610	1		Na VII	118.902	10		Fe VII	120.030	4	
Ca XIII	117.611	70		Fe VIII	118.907	25		F V	120.032	15	
Fe VIII	117.661	8		Mg V	118.914	10	Q	Na V	120.040	100	Q
F IX	117.685		P	Ti	118.915	6	N	Mg IV	120.086	10	N
Na VI	117.699	300		Si V	118.961	1000		Ar VIII	120.09	100	
Na V	117.703	10		Ca	118.971	10	N	F VI	120.116	100	
Kr IX	117.71	20		Sc XV	118.980	225		Fe VII	120.131	4	
Mn XIX	117.74	200		Al V	118.983	200		Ca IX	120.146	360	
V VI	117.770	20		Ne V	119.01	66		Ar VIII	120.16	50	
F IX	117.777		P	Na VII	119.014	100		Fe VII	120.181	4	
Mn VII	117.793	10		V XVIII	119.015	2		Ne VII	120.192	500	
F IX	117.809		P	Sc	119.049	400	N	Fe VII	120.214	10	
Si V	117.853	1000		Ti	119.050	6	N	Ti	120.226	1	N
Na V	117.876	10		Ca	119.071	1	N	Sc IX	120.236	500	
Mg IX	117.880	10	Q	Na VII	119.100	10		Ne VII	120.274	44	P
Fe	117.89	6	N	O V	119.102	70		Mg VI	120.283	100	N
Sc XII	117.90			Co XXIII	119.12	80		Si	120.3	20	N
Na VIII	117.909	10		Mn XX	119.12	50		V XVII	120.304	30	
Ni XXII	117.91	300		Fe VII	119.144	25		Fe VIII	120.31	150	Q
Ni XXV	117.91	300		F	119.2	65	N	Sc	120.324	50	N
Cr IX	117.942	600		Na VI	119.204	10		Ni XXI	120.33	80	
Cr XX	117.95	30		Na VII	119.204	10		Mg XII	120.330		P
Mn VII	117.978	15		Cr XVIII	119.21	110		O VII	120.331	220	
Na V	117.990	400		Fe VII	119.240	25		Ne VII	120.337	700	
O V	118.000	40		Ti	119.268	10	N	Ne VII	120.348	44	P
Sc	118.048	200	N	Cr IX	119.269	400		Na VI	120.355	10	Q
V XIII	118.08	35		Fe VII	119.273	10		Ga XIII	120.37	70	
Mg V	118.083	500		V XI	119.28			Fe VII	120.401	25	
Ca X	118.123	250		Ti XVII	119.284	30		Ti	120.406	1	N
Ti	118.131	6	N	V VI	119.3	6		Mg VI	120.415	10	N
Mg IV	118.164	80		Cr IX	119.320	200		Ne VII	120.419	44	P
Cr IX	118.165	200		Sc	119.332	100	N	Ca	120.458	90	N
Ca X	118.176	360		V XI	119.36			Mn XIX	120.46	300	
Sc	118.179	100	N	Fe VIII	119.380	15		Mg XII	120.460		P
V X	118.18			Si	119.4	20	N	C VI	120.464		P
Si	118.2	20	N	Mg V	119.401	400		Ne VII	120.487	500	
Ni XXII	118.21	30		Na VI	119.415	5	Q	Mn XXI	120.50	300	
Ti XVI	118.215	315		Fe VII	119.422	10		Mg XII	120.504		P
Mn XVIII	118.22	110		Ca	119.430	10	N	C VI	120.528		P
Sc X	118.297	300		Fe VII	119.435	10		Ni XXV	120.53	30	
S XVI	118.298		P	Sc IX	119.444	400		Ti	120.559	20	N
Fe VIII	118.300	8		Mg V	119.447	400	Q	Cu	120.594	150	N
Co XXII	118.31	50		Fe VII	119.482	1		V XVIII	120.607	100	
Cr XIX	118.31	110		Ga XIII	119.49	60		Fe VII	120.636	120	
Mg IV	118.424	100		Fe VII	119.524	4		Si	120.7	20	N
Mg IV	118.476	80		Mn XX	119.54	250		Fe VII	120.789	1	
Mg IV	118.487	60		Fe VII	119.541	4		Mn XX	120.82	4	
Al V	118.497	250		Co XXII	119.55	50		Ti V	120.824	12	A,Z
V XIII	118.50	20		Fe VII	119.561	1		Cr XVII	120.84	200	
Na VI	118.500	10		Cr IX	119.569	100		Fe VII	120.872	4	
S XVI	118.507		P	Fe VII	119.587	1		V XVII	120.873	20	
Mn IX	118.510			Cr XVIII	119.62	200		Sc	120.881	100	N
Ni XXIV	118.52	80		Fe VII	119.623	4		Fe XX	120.89	29	Q



Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes
Ge XVI	120.9	445		K VIII	122.054	90		Mg IV	123.266	160	
Co XXI	120.91	10		O V	122.088	5		Se XX	123.3	235	
Fe VII	120.915	1		Ca VIII	122.095	1	Q	Mn XX	123.30	110	
Na VI	120.931	300		F VI	122.122	100		Co VIII	123.307	120	
Na VI	120.973	200		O V	122.133	40		Fe XXI	123.33	10	
Na VI	121.004	100		Ti	122.136	1	N	Ti X	123.331	3	
Ca IX	121.014	1	N	Mn VIII	122.168	150		Mg IV	123.367	120	
Sc	121.022	200	N	F VI	122.169	10		Mg IV	123.377	80	
Mg VI	121.025	500		Na VI	122.199	5	Q	Mg IV	123.401	60	
Ne VI	121.05	80		F VI	122.200	200		Mg IV	123.417	140	
Fe VII	121.090	25		F VI	122.251	15		Fe XI	123.470		P
K IX	121.091	40		Na VII	122.252	100		Ca	123.474	90	N
Si	121.1	20	N	Co VIII	122.273	120		Co VIII	123.489	10	
Ne VI	121.10	100		Mn XVIII	122.29	150		Fe VII	123.496	10	
Mn IX	121.12			Cr XX	122.29	10	N	Si	123.5	50	N
Ti V	121.138	2	A, Z	Co VIII	122.320	150		Fe XI	123.504		P
Ni XXIV	121.15	4		Fe VII	122.335	4		Mg IV	123.508	100	
Ne VI	121.15	100		Fe VII	122.370	4		Mg IV	123.567	100	
Mn XXI	121.16	250		Ti	122.376	6	N	Fe XI	123.572		
Fe VII	121.183	4		O V	122.383	70		Mg VI	123.590	100	
Ne VI	121.19			Fe VII	122.392	4		Mg IV	123.590	140	
Fe XXI	121.21	200		K VIII	122.413	160		Al XII	123.610		P
Na V	121.263	10		As VI	122.433	17		Mg IV	123.613	10	
Mg VI	121.290	300		N VI	122.445	5		Ti XVII	123.654	150	
Cr IX	121.293	600		Co VIII	122.472	200		Ti X	123.657	6	
Fe VII	121.304	25		Co VIII	122.488	50		F V	123.665	10	
Fe VII	121.331	1		Ne VI	122.49	200		Fe VII	123.667	1	
Ca IX	121.333	1	Q	Si	122.5	50	N	K	123.675	1	N
Mn IX	121.351			Ne V	122.52	200		Ti X	123.703	3	
Fe XXI	121.36	4		Fe VII	122.520	10		Mg IV	123.708	40	
Ti XVI	121.382	175		Cr XVIII	122.56	80		Fe VII	123.709	4	
Fe VII	121.408	4		Co VIII	122.577	50		Ne V	123.71	30	
Fe XI	121.419			Ge XXX	122.6		P	Mg IV	123.722	80	
Mn IX	121.442			V VII	122.60	250		Ca X	123.731	850	
Ti	121.464	6	N	Ar VIII	122.62	10		Na VI	123.744	400	
Ca	121.475	40	N	Sc XIV	122.671	500		Co VIII	123.753	10	
Mn XX	121.49	80		Sc	122.676	400	N	Ca X	123.756	250	
Fe VII	121.490	4		Ne VI	122.69	100		Fe	123.76		N
Ca	121.536	40	N	Ni XXIV	122.72	80		Mg IV	123.761	40	
Ti XVI	121.538	15		Cr IX	122.720	200		F V	123.774	100	
Mg IV	121.542	100		Sc	122.741	100	N	V XVI	123.780	100	
Mn XX	121.55	50		Se XXVII	122.8		F, P	Mn VII	123.790	30	
Fe VII	121.555	1		K	122.811	1	N	Ga XIV	123.80	60	
As VI	121.578	19		Ge XIV	122.82	360		Fe XI	123.822		
Ti XII	121.622	3	Q	Ti	122.847	6	N	Fe VII	123.822	1	
Mn IX	121.633			Ti XI	122.894	10		Fe XXI	123.83	4	
Mg V	121.644	600		Cr XVII	122.91	375		Mn IX	123.85		
K IX	121.645	90		As VI	122.936	2		Na VI	123.868	300	
Ne VI	121.65	40	N	Co VIII	122.956	30		Cr XVIII	123.87	250	
Ca XIII	121.737	1		Cr IX	122.964	200		F IX	123.885		P
Fe XI	121.747			Mn XXI	122.97	50		Mg IV	123.910		
Na VI	121.773	400		Ca X	122.989	650		Na VI	123.929	500	
Ne VII	121.774	260		Co VIII	123.022	85		Ti XI	123.946	40	
Cr IX	121.781	400		Fe VII	123.029	10		Mg IV	123.958	20	
Ti	121.783	1	N	V VII	123.03	200		Ni XVIII	123.965	200	P
Ge XVI	121.8	420		Ar VIII	123.03	50		Na VI	123.970	200	
N VI	121.820	1		Ti X	123.036	6		F IX	123.987		P
Fe XX	121.83	150		Co VIII	123.045	50		Mn VII	123.993	50	P
Mg IV	121.873	20		F VI	123.051	10		F IX	124.021		
K VIII	121.885	10		Ti XI	123.063	6		Fe VII	124.030	40	
V VII	121.89	300		V VII	123.07			Al IV	124.030	400	
Si XI	121.9	50	Q	F VI	123.090	10		Ni XVIII	124.050	200	P
Na VI	121.913	320		Si	123.1	50	N	Mn VIII	124.055	100	
Ti	121.922	3	N	Ca	123.128	1	N	Fe VII	124.058	1	
Mg V	121.922	500		Fe VII	123.130	10		Na VI	124.059	400	
Ca	121.929	10	N	Na VI	123.134	400		Ar XVIII	124.078		P
V VII	121.95			Mg IV	123.169	40		Mn XXI	124.08	150	
Fe VII	121.952	1		Co VIII	123.173	85		Ti	124.104	3	N
Ti XIV	121.986	625		F VI	123.175	100		Fe VII	124.120	4	
Fe XX	122.00	30		Ti	123.196	3	N	Sc XV	124.140	450	
V XV	122.005	320		Sc	123.223	200	N	Ti X	124.143	3	
Na VII	122.018	300		Cr IX	123.226	50		Na VI	124.153	400	
Na VI	122.018	300		Mn XXI	123.23	110		Cr VIII	124.184	200	
Mg V	122.034	400		Co VIII	123.239	1		V VII	124.24		
F V	122.042	10		Ti	123.253	6	N	Fe VII	124.250	4	

Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes
Ni XXII	124.31	50		Mn XX	125.42	110		Mg III	126.49		A, Z
Ne V	124.33	23		V IX	125.420	600		Si XII	126.50		P
Fe VII	124.384	10		Na V	125.428	300		Ne VI	126.53	80	Q
F VI	124.387	300		Fe VII	125.431	25		Ni XXIII	126.54	110	
Ti X	124.391	6		Fe VII	125.447	25		Ca X	126.543	10	
V X	124.40			Ti VI	125.456	10		Mg V	126.544	200	
Fe VII	124.415	10		Ti X	125.456	10		Na V	126.557	200	
Mg IV	124.417	120		Mg VI	125.459	300		Fe VII	126.559	60	
Fe VII	124.425	4		Na V	125.461	300		Ti XI	126.566	1	Q
F VI	124.440	10		Mg IV	125.462	100		Mg IV	126.602	20	
Sc	124.464	100	N	Ca XV	125.493	20		Na V	126.608	100	
F VI	124.474	10		Li II	125.5		Z	Ca X	126.625	1	
Ni XXII	124.48	30		Fe VII	125.508	10		K XII	126.650	3	
Mg IV	124.527	60		Cr XVIII	125.51	300		Ti X	126.651	20	
Na VII	124.532	10		Fe VII	125.524	60		K VII	126.654	1	
Mg IV	124.541	140		Al V	125.529	900		Ti XVII	126.676	25	
Fe VII	124.547	10		Fe VII	125.565	4		Mg V	126.677	10	
Al IV	124.550	300		Co VIII	125.566	10		Fe VII	126.705	4	
Ti XVII	124.553	245		Fe VII	125.596	4		Ni XXV	126.73	30	
Ti XII	124.555	1	Q	Mg V	125.600	400		Ne VI	126.73	35	Q
Mn XX	124.56	110		Mg VI	125.600	400		V IX	126.732	250	
Fe VII	124.586	4		Sc	125.610	100	N	Fe VII	126.743	1	
V XIX	124.60	30		Fe VII	125.640	1		V IX	126.765	250	
O V	124.618	160		Ti VI	125.689	6		Fe VII	126.768	4	
Ti	124.632	1	N	K IX	125.697	40		V XIX	126.77	10	
Mg IV	124.640	100		Fe XXII	125.71	110		Si XII	126.77	50	P
Fe VII	124.648	4		Cr VIII	125.728	100		Na V	126.779	10	
Co VIII	124.649	50		K IX	125.735	90		Na VII	126.779	10	
Mg IV	124.652	160		Ti	125.744	3	N	Zn XII	126.786	40	
Co XXI	124.67	30		Fe VII	125.798	4		Mg IV	126.799	80	
Ar XVIII	124.677		P	Mg IV	125.813	80		V IX	126.810	20	
Ca XIII	124.68		P	Sc XV	125.817	775		Na VII	126.814	100	
Fe XI	124.725			Ne V	125.82	37		Na V	126.814	100	
Mg IV	124.763	100		Co VIII	125.821	150		Co XXIII	126.82	80	
Ne VI	124.77	23		Fe VII	125.846	1		V XVII	126.832	100	
Fe VII	124.779	10		Na V	125.899	200		Fe VII	126.855	40	
Co VIII	124.795	1		Ne V	125.9	20		Fe VII	126.875	1	
Ti XVI	124.805	265		As VII	125.910	10		Fe VII	126.898	1	
Co VIII	124.830	10		Fe VII	125.922	10		Ne	126.91	35	N
Na VI	124.850	10		Cr XIX	125.93	50		Fe VII	126.913	10	
Ar XVIII	124.862		P	Ti XI	125.940	40		Na V	126.920	10	
Co VIII	124.871	50		Mg XII	125.950		P	F VI	126.923	500	
Mg IV	124.872	120		Ti XI	125.979	160		Al XII	126.93		P
Co VIII	124.878	50		Si X	126.0	20	Q	Mg IV	126.960	40	
Ti	124.940	6	N	V VII	126.00	400		Na V	126.985	10	
Fe VII	124.979	10		Ti XVII	126.004	15		Mg IV	127.013	60	
Mg IV	124.987	120		Fe VII	126.032	40		Fe VII	127.026	60	
Mg IV	124.999	100		Ti XI	126.042	250		Na V	127.036	10	
K XIII	125.		P	Al V	126.068	800		Fe XXI	127.04	30	
Ge XVII	125.0	375		O V	126.082	5		V IX	127.068	500	
Cr XVII	125.00	150		Fe VII	126.088	1		Fe VII	127.069	4	
As VII	125.014	40		Mn XVIII	126.09	200		V XVIII	127.079	3	
Co VIII	125.071	10		Na V	126.090	10		V VII	127.08	200	
Ne VI	125.12	66		Mg XII	126.091		P	Cu	127.105	200	N
Co XXI	125.15	250		O V	126.135	20		Fe VII	127.118	150	
Co XXIV	125.15	250		Mg XII	126.139		P	K VII	127.156	10	
Co VIII	125.155	85		Ca	126.148	1	N	Sc XI	127.156	500	
V XVI	125.173	250		V IX	126.152	400		Mg IV	127.161	20	
Na V	125.178	400		Fe VII	126.166	10		Fe VII	127.169	4	
Ti	125.195	1	N	Na V	126.210	100		Ca	127.203	1	N
Mg VI	125.206	300		Co XX	126.22	30		Ni XXIII	127.21	10	
Na V	125.216	400		Ti XII	126.276	1	Q	Fe VII	127.230	10	
Fe VII	125.266	60		Mg V	126.280	400		Fe VII	127.258	200	
Co VIII	125.268	30		Cr XIX	126.30	175		Ti XI	127.268		
V XVII	125.278	10		Ni XXII	126.32	110		V XVIII	127.27	30	Q
Na V	125.286	500		Cr XIX	126.33	200		Fe VII	127.278	10	
Fe XXI	125.29	30		Ti VI	126.330	3		Mn XIX	127.28	150	
Co VIII	125.340	120		Na V	126.368	10		Cr IX	127.31		
Mn XXI	125.35	80		Ge XVII	126.4	400		Fe VII	127.324	90	
Cr XVII	125.35	200		V XVIII	126.411	2		Zn XII	127.346	40	
Co VIII	125.350	120		Mg VI	126.450	100		K X	127.35		
Cr XVIII	125.38	200		Fe VII	126.453	40		Mn XXI	127.36	150	
Na VI	125.383	10		Na V	126.458	10		Mg IV	127.375	20	
Si	125.4	20	N	Mn XX	126.46	30		Fe VII	127.388	120	
F V	125.4	70	Q	Mg VI	126.488	100		Cr IX	127.42		

Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes
Fe VII	127.429	90		O VII	128.412	150		V IX	129.66		
Na V	127.444	400		Fe VII	128.417	1		Cu	129.697	200	N
Ni XXIII	127.46	4		Cr XX	128.42	375		Mg IV	129.711	100	
Na V	127.473	400		Cr XIX	128.43	375		Ti VII	129.722	3	
Ga XV	127.48	30		N V	128.430	1		Mg XII	129.729		P
Cr IX	127.53			O V	128.445	5	Z	Al IV	129.730	700	
Fe VII	127.559	150		Fe VII	128.449	4		Fe VII	129.730	60	
K X	127.56			Ti VI	128.450	1		Sc XV	129.751	225	
Ca	127.570	90	N	O VII	128.500	200		Cr IX	129.77		
Si XI	127.6	20	Q	K XIX	128.506		P	Fe VII	129.777	10	
Fe VII	127.604	10		Zn XII	128.518	20		Cr XVII	129.78	200	
Zn XII	127.631	40		Fe VII	128.538	1		O VI	129.785	450	
Fe VII	127.636	200		S XVI	128.546			Fe VII	129.789	1	
Fe VII	127.645	90		Ti	128.591	3	N	N V	129.811	30	
F VII	127.653	400		Cr XIX	128.63	30		Fe VII	129.822	1	
Ne VII	127.663	710		S XVI	128.631			Mg IV	129.857	320	
Fe VII	127.694	90		Fe VII	128.638	40		O VI	129.871	550	
Fe VII	127.763	4		Fe VII	128.659	40		Fe VII	129.872	120	
Ni XXIV	127.78	10		N V	128.662	10		Si XII	129.89	50	
Ti XVII	127.782	175		K XIX	128.674		P	V XVII	129.927	5	
F VII	127.796	500		Fe VII	128.682	120		Ca IX	129.935	360	
Al XIII	127.798		P	Fe XXI	128.73	80		Na V	129.942	100	
Sc XVI	127.813	175		Ti	128.731	3	N	Mg IV	129.966	220	
Na VI	127.837	400		Fe VII	128.753	90		Ca IX	129.973	90	
Ne VI	127.84	50		Sc	128.780	40	N	Mg IV	129.975	180	
Sc	127.844	200	N	Ne V	128.79	10		Fe VII	129.980	150	
Fe VII	127.852	4		Ni X	128.796	120		Cr IX	129.99		
Fe XX	127.86	4		O V	128.817	1	Z	Fe VII	129.996	10	
Fe VII	127.867	90		Cl XVII	128.823		P	Cr VIII	129.998	700	
Cr IX	127.88			Ni XXV	128.85	200		Fe VII	130.017	40	
Ca	127.904	10	N	Fe VII	128.852	10		Si XII	130.02	20	
Co VIII	127.916	10		Ni XXIII	128.87	200		Co XXI	130.02	80	
Ne X	127.918		P	Ti XI	128.871	3	Q	Mg XII	130.041		P
Cr IX	127.95			K X	128.93			Fe VII	130.050	40	
Cr XIX	127.95	4		N V	128.954	10		Co XXIII	130.06	10	
Co XVII	127.96	30		Ca	129.022	1	N	Al XII	130.06		P
Sc IX	127.985	50		Ne V	129.03	50		Mg IV	130.086	200	
Al XIII	127.991		P	Na VI	129.040	200		Fe VII	130.112	25	
Si XI	128.0	20	Q	Ti XI	129.055			Ti VI	130.113	3	
K XIX	128.014		P	Ti XVI	129.075	30		Mg IV	130.118	180	
Na V	128.025	400		Cl XVII	129.140		P	Mg XII	130.141		P
Sc IX	128.035	50		Ti VI	129.148	3		Ga XIII	130.18	50	
Na X	128.05		P	Fe XXII	129.17	4		Ca IX	130.191	90	Q
Na V	128.051	400		V XVI	129.195	250		Al XII	130.21		P
Al XIII	128.055		P	Ca IX	129.198	90		Sc	130.213	200	N
Ne VI	128.07	45		Cl XVII	129.248		P	Fe VII	130.221	60	
Ne X	128.076		P	Ti VI	129.249	6		Fe VII	130.226	60	
Sc	128.088	100	N	Ni X	129.258	70		Mg IV	130.246	140	
Cr XVIII	128.10	375		Cr XX	129.26	50		Fe VII	130.248	250	
Ti	128.111	6	N	Fe VII	129.278	4		O	130.25	140	N
Cu	128.123	250	N	Si XI	129.28			Fe VII	130.257	60	
Ne X	128.129		P	Sc	129.283	100	N	Ne VI	130.26	110	
Fe VII	128.147	150		Ti	129.288	0	N	Fe VII	130.277	40	
Na X	128.16		P	Mn XX	129.31	10		Mg VI	130.294	200	
O VII	128.18		P	Ca XI	129.322	10	Q	Mg IV	130.295	180	
Ne VI	128.18			Fe VII	129.330	90		Sc X	130.304	200	
Co XVII	128.20	50		N V	129.337	20		V IX	130.32		
N V	128.229	1		Ne VI	129.36	50	Q	Ca	130.329	1	N
Co XXIV	128.24	50		Ti	129.384		N	Fe VII	130.336	10	
Fe VII	128.240	10		Cu	129.398	100	N	N VI	130.340	25	
Ca XIV	128.241	245		Si X	129.4	50	Q	Mg IV	130.344	180	
O V	128.246	20		Ti	129.418	1	N	Mg IV	130.354	180	
Sc XI	128.247	500		Ca IX	129.423	250		Fe VII	130.374	90	
Cu	128.255	300	N	Ti XIV	129.440	600		Mn XX	130.38	10	
Ti VII	128.269	1		Ca IX	129.448	90		Al IV	130.39		
Ni X	128.273	10		Sc	129.454	200	N	Ne VI	130.40	100	
Ni XXIII	128.30	110		Na IV	129.464	10		Sc XV	130.409	50	
S XVI	128.300			Se XXI	129.5	290		Al V	130.411	800	
O V	128.302	40		F VI	129.5	150	Q	Fe VII	130.419	10	
Ga XV	128.31	20		Mn XX	129.55	200		N V	130.431	40	
Fe VII	128.368	25		Cu	129.567	400	N	Fe VII	130.467	25	
Co XXIII	128.37	110		Fe VII	129.579	90		Fe VII	130.481	10	
Ti XVI	128.373	50		V VI	129.580	70		Ca	130.497	160	N
V VI	128.379	40		Ti VII	129.603	1		Mg IV	130.537	60	
Co VIII	128.397	120		Se VIII	129.654	310		Sc X	130.558	100	

Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes
Mn XIX	130.59	200		Fe XX	131.70	10		O V	132.845	70	
Fe VII	130.608	1		Fe VII	131.713	10		Fe XX	132.85	300	
Ne V	130.61	18		O V	131.738	20		Fe XXIII	132.85	300	
Fe VII	130.623	1		O V	131.758	40		O VII	132.874	8	P
Mg IV	130.624	80		Fe VII	131.782	1		O V	132.875	20	
Mg VI	130.630	100		O V	131.812	70		Mn XXI	132.90	110	
Sc	130.642	300	N	Mn XX	131.88	10		Ca XIV	132.914	225	
Ne V	130.68	16		K IX	131.880	500		Ti	132.924	1	N
Na V	130.680	200		Ti VII	131.937	6	Q	Ti VII	132.982	1	
Sc	130.683	100	N	Ne V	131.99	45		Al V	133.010	200	
Mg IV	130.700	20		Ti XVI	132.022	100		Ca	133.023	40	N
Mg VI	130.701	10		Si X	132.03			Cu X	133.034	200	
Na V	130.723	100		Ne V	132.04	50		Ti	133.053	3	N
Ne V	130.74	30		Si XI	132.08			Fe VII	133.055	25	
Cr XX	130.76	250		Ti VII	132.093	1		Co XXI	133.06	110	
Ne V	130.77	16		K VIII	132.105	1		F V	133.082	10	
Fe VII	130.779	300		Ne V	132.11	18		K VII	133.084	10	
Fe VII	130.838	4		Cr XIX	132.11	10		Cl VII	133.11		
Al V	130.847	1000		Fe VII	132.120	40		Sc XV	133.118	450	
Se VIII	130.849	1000		Mg IV	132.123	100		Fe VII	133.123	25	
O	130.85	60	N	Se VIII	132.132	210		Na V	133.162	500	
Ca XI	130.883	1	Q	Ti VII	132.149	3		Fe VII	133.165	25	
Sc	130.886	200	N	Mg V	132.171	600		Ti	133.170	1	N
Ca	130.933	90	N	Ga XVI	132.19	20		Ca IX	133.180	10	
V XVII	130.941	100		Ga XXIX	132.2		P	Mg IV	133.197	180	
Fe VIII	130.941	150		F V	132.207	10		F V	133.208	100	
Sc XIII	130.952	610		Na IV	132.211	10		Ti VII	133.218	6	
Mn XIX	130.97	50		O VI	132.219	110		Al V	133.233	50	
Cr XIX	130.99	250		Cu X	132.240	50		Ca	133.264	1	N
Ni XXV	130.99	10		K VIII	132.301			Fe VII	133.274	25	
Al V	131.002	900		F V	132.310	100		Si XI	133.29		
Ca	131.006	1	N	O VI	132.312	160		O VII	133.31	110	N
Sc	131.068	270	N	Sc X	132.318	400		O V	133.316	5	
Cr IX	131.08			Cr VIII	132.321	200		O V	133.335	20	
Zn XIII	131.082	40		Ti VII	132.322	1		V XVI	133.338	100	
Co XXI	131.09	30		Ca IX	132.331	10	Q	Ca XI	133.366	10	Q
Ti	131.102	3	N	Ti VII	132.351	1		Ti VII	133.385	1	
V IX	131.13			Fe VII	132.355	25		Na V	133.388	400	
Ti XV	131.146	200		Ca	132.381	1	N	O V	133.389	40	
Fe VII	131.193	250		N V	132.383	60		Cr VIII	133.395	600	
Ca XIII	131.217	500		F V	132.389	10	Q	Mn VII	133.417	2	
V IX	131.22			Fe VII	132.407	150		Fe VII	133.424	1	
Fe VIII	131.240	200		Al V	132.407	1		Si XIV	133.473		
N V	131.254	50		F V	132.453	200		Ti	133.482	6	N
Fe VIII	131.255	80		Na IV	132.465	10		Ne VI	133.51	55	
V XVI	131.263	400		Cu X	132.478	120		Ca IX	133.510	160	
Ti VII	131.284	1	Q	F V	132.484	300		O V	133.522	110	
Ge XVIII	131.3	310		Mg V	132.485	500		V XVI	133.525	225	
Cr XX	131.31	150		Mg IV	132.509	60		Ni XXIII	133.54	30	
Fe VII	131.318	120		F V	132.511	300		O V	133.549	5	
Na V	131.345	300		K VIII	132.519	1		Ti	133.568	1	N
Sc	131.354	100	N	Ti VII	132.522	6		O V	133.574	5	
Ne VI	131.36	54		Fe VII	132.593	25		F V	133.599	110	
Na V	131.413	200		Mg V	132.623	300		Ca	133.630	1	N
Ca VIII	131.419	1		Al V	132.626	500		Ti VII	133.633	3	
Al V	131.438	900		Fe XIX	132.63	50		Mn VII	133.636	35	
Si XII	131.46			Co XXII	132.63	10		Ne VII	133.64	150	
Ca VIII	131.470	1		Fe VII	132.667	10		Mn VII	133.655	60	
Ti	131.474	1	N	Fe XX	132.67	325	Q	F V	133.662	100	
Cr XX	131.50	250		Sc XVI	132.688	445		Fe VII	133.670	25	
F V	131.516	10		Ga XVI	132.69	10		Fe VII	133.691	40	
Fe VII	131.531	25		F V	132.699	100		Ti	133.721	1	N
Cu	131.533	150	N	Sc	132.714	400	N	N VII	133.740		P
Cu	131.590	350	N	K VIII	132.715	40		Si XIV	133.746		
Ni XXIII	131.60	10		Ti VII	132.733	10		K XII	133.76		P
Se XXII	131.61	285		Na IV	132.740	10		Ca IX	133.767	40	
Ti	131.623	3	N	Co VIII	132.756	50		V XVIII	133.778	50	
K IX	131.633	650		Cr XVII	132.76	250		Ca IX	133.785	90	
Na V	131.635	300		O VII	132.777	5	P	Cr XX	133.82	150	
Cr VIII	131.638	600		Mn XX	132.79	50		Ca IX	133.820	90	
F V	131.638	10		Fe VII	132.792	25		Na VI	133.825	200	
Si XII	131.64	50		O V	132.797	40		Si XIV	133.835		
Al IV	131.647	150		Mg IV	132.814	400		Fe VII	133.842	90	
Sc XVI	131.684	315		F V	132.819	200		Ti XVIII	133.852	5	
V XVII	131.687	5		Ti VII	132.837	3		Ti	133.866	0	N

Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes
Fe VII	133.874	25		C VI	134.990		P	Fe	136.34	30	N
N VII	133.874		P	Li III	134.996	65	P	Cu XI	136.386	250	
Mn VII	133.875	5		Li III	135.001	35	P	Ti XVII	136.393	6	
Sc	133.882	300	N	Sc XVI	135.004	60		N V	136.429	80	
Fe VII	133.899	90		Ne IX	135.02		P	Na IV	136.4295	40	
Cu	133.916	400	N	Mn XX	135.06	30		Ne VI	136.45	150	
Ca XI	133.960	90	Q	Mn VIII	135.06	30		Ne VI	136.48	150	
Co VIII	133.985	1		Sc X	135.128	400		As VI	136.485	24	
Cr XIX	133.99	250		Mn VII	135.148	75		Co XXII	136.49	200	
V IX	133.99			Mn VIII	135.15	80		Li II	136.5		Z
Ti	133.990	0	N	O V	135.175	5		V XVII	136.511	200	
N V	133.994	70		Ti XI	135.179	90		Cr XVIII	136.52	150	
Na VI	134.021	100		Cr VIII	135.185	100		Fe XXIII	136.53	50	
Ca	134.035	90	N	Ti XVII	135.202	6		Na IV	136.5513	70	
V XVII	134.056	150		Al X	135.231	10	Q	Co XXII	136.56	110	
Fe VII	134.063	60		Co XXIV	135.24	50		Cu	136.572	15	N
Cr VIII	134.076	300		Cr XX	135.26	110		Ti IX	136.595	6	
Ne VII	134.12	44	N	Cu XI	135.286	100		N VI	136.604	2	
Fe VII	134.128	40		Ti	135.326	1	N	Na IV	136.6359	40	
Co XXII	134.13	80		Mn XIX	135.33	10		Sc XV	136.638	150	
Na VI	134.135	10		Mn VII	135.362	100		Al V	136.668	100	
Na V	134.183	10		Mn VII	135.394	3		Fe VII	136.671	10	
Mn VII	134.190	25		F VI	135.397	300		Ge XVIII	136.7	215	
O V	134.205	5	Z	Ti	135.458	1	N	Ti VI	136.714	6	
Na V	134.272	200		Ni XXIV	135.47	10		Cu	136.724	450	N
Ca XIV	134.276	450		Mn VII	135.475	120		Co XXII	136.75	80	
Ti	134.287	1	N	Mn VIII	135.48	20		Na IV	136.7540	40	
O VI	134.3	30	ZZ	Fe VII	135.488	1		Ti VII	136.815	3	
Ne	134.31	30	N	O V	135.523	220		Na IV	136.8547	70	
F V	134.407	400		Mn VII	135.532	8		Si X	136.86		
Si XI	134.47			Ca XI	135.582	90	Q	V VIII	136.867	120	
O V	134.473	20		Mn VII	135.609	10		F V	136.902	300	
Ne V	134.48	27	Q	Al X	135.620	50	Q	Cu	136.936	400	N
Sc XVI	134.503	15		F V	135.621	1		F V	136.955	10	
Ni XXIV	134.53	10		Sc XVI	135.631	550		K VIII	136.979	1	
Na VI	134.532	300		Mg V	135.638	200		Ni XXIV	137.01	10	
F V	134.539	500		Zn XIV	135.64	20		Fe X	137.027		
V IX	134.54			Cu XI	135.655	90		Cu X	137.036	150	
Cu	134.550	600	N	Ne V	135.66	14		Na IV	137.0573	70	
Co XXII	134.57	4		F V	135.692	10		K VIII	137.118	10	
Ti XV	134.609	320		Ne V	135.73	22		Na IV	137.1429	40	
Mn VII	134.628	30		Cu XI	135.734	500		Ti IX	137.153	3	
Fe XXII	134.65	110		V VIII	135.751	200		V VIII	137.194	50	
P XV	134.668		P	Fe XXII	135.78	110		Ca XV	137.194	175	
Mn VIII	134.69	20		Na V	135.791	300		Mg V	137.234	600	
Ti XI	134.701	3		Ti VII	135.801	20		K VIII	137.248	40	
F VII	134.703	100		O VII	135.820	48		V VIII	137.316	100	
Ti XVI	134.724	175		Cu	135.846	30	N	Ca XI	137.320	1	
Ni XXIV	134.73	50		Na V	135.854	300		Sc X	137.352	100	Q
Si XI	134.74			Ne V	135.86	24		Ti IX	137.377	20	
Fe	134.743	60	N	K VIII	135.889	10		Fe VII	137.384	90	
Mg XII	134.749		P	Cr VIII	135.892	50		Mg V	137.414	800	
Sc X	134.767	300		Mn VII	135.900	15		Sc X	137.418	70	
Mn VIII	134.79	40		Sc X	135.921	500		K VIII	137.424	90	
Sc	134.794	300	N	Ni XXV	135.95	10		O VI	137.43	80	ZZ
Zn XIV	134.80	30		Mg V	135.953	100		K VIII	137.458	10	
F IX	134.830		P	V XVIII	135.98	10	P	V VIII	137.491	120	
Ne V	134.84	27		Fe XXII	136.01	30		Mn VIII	137.50	100	
P XV	134.868		P	Cu XI	136.034	350		O VII	137.51	80	
F VII	134.882	200		Fe XX	136.06	30		Ni XXIII	137.55	10	
Cr XIX	134.89	80		V VIII	136.078	100		K VIII	137.563	160	
Ti	134.894	3	N	Ne VI	136.09	40	Q	Na VI	137.589	10	
Mg XII	134.908		P	Co XXIII	136.12	30		As XXVI	137.6		F, P
Ne IX	134.91		P	Mg V	136.128	10		K VIII	137.601	40	
C VI	134.912		P	Ti XVII	136.160	20		As VI	137.605	22	
Cu XI	134.914	400		Mn VII	136.177	35		Fe VII	137.640	40	
P XV	134.935		P	Ne VI	136.21	150		Ti VII	137.661	20	
Fe VII	134.940	10		Ne V	136.21	20		Na IV	137.7117	110	
Cr VIII	134.942	400		Al V	136.249	50		Co XXIV	137.73	30	
F IX	134.949		P	V XIX	136.25	550		Ti IX	137.743	1	
Mg XII	134.962		P	Ca	136.256	1	N	Mg V	137.748	700	
Sc	134.971	200	N	Ti VII	136.267	6		K	137.753	10	N
Mn VII	134.972	15		Ne VI	136.28	110		Sc XIII	137.799	500	
F IX	134.989		P	Ti XVIII	136.280	6		Fe VII	137.802	4	
Cu XI	134.989	120		Ne VI	136.34	350		Ti VI	137.813	3	

Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes
Mg VI	137.814	10		Na VI	138.970	25	Q	N V	140.356	160	
Mn VIII	137.82	70		O V	139.028	220		N V	140.358		P
V IX	137.83			Si XI	139.03			Ti XII	140.361	1	
Fe VII	137.833	10		Ca XI	139.04			Ti XV	140.395	600	
Sc X	137.870	200		Co XVII	139.04	80		F V	140.414	100	
Mg V	137.880	600		Ca XIV	139.050	175		Mg IV	140.425	200	
Cr XIX	137.89	10		K VIII	139.101	10		Fe XX	140.44	50	
K VIII	137.906	1		Mg IV	139.117	20		Ti VI	140.443	20	
Fe VII	137.907	4		Ca	139.169	1	N	Ti IX	140.443	35	
Mn VIII	137.92	60		V VIII	139.188	50		V VIII	140.451	600	
Ar VIII	137.93	150		Cu XII	139.210	100		Mg IV	140.474	220	
Na IV	137.9415	110		Cl XVII	139.219		P	Li II	140.5		Z
K	137.961	10	N	Ne VI	139.31	27	Q	Cr XIX	140.51	30	
Mg IV	137.966	120		Sc X	139.319	100		Ni	140.52	20	N
Ti IX	137.991	3		Mn XIX	139.36	10		Mg IV	140.523	220	
Ti XVI	138.020	5		Si	139.4	50	N	Ni IX	140.542	10	
O V	138.025	70		Ca	139.443	90	N	Mn XXI	140.55	10	
O V	138.051	110		Sc XIV	139.469	245		Mg IV	140.558	220	
Ca XI	138.09			Fe XX	139.47	43	Q	Ca XV	140.582	200	
O V	138.110	160		K VII	139.480	40		Ca XI	140.654	40	Q
Cr XIX	138.15	50		C V	139.5		P	V VIII	140.665	200	
V XVIII	138.168	150		V VI	139.518	360		Fe X	140.678		
V XVI	138.168	200		Ni	139.55	20	N	Si	140.7	50	N
F V	138.181	100		V XIX	139.59	250		Ne V	140.72	50	
Fe VII	138.191	60		Mn VII	139.595	85		Mn VIII	140.73	50	
As VI	138.194	6		Sc XV	139.615	225		Cr XX	140.75	250	
C V	138.2		P	Fe XXII	139.64	4		Ne V	140.76	150	
V VI	138.235	285		Mn XVIII	139.65	30		F IV	140.781	1	Z
F V	138.256	10		V VIII	139.730	200		Ne V	140.79	150	
Mg IV	138.261	200		F VI	139.758	500		F IV	140.816	1	Z
Sc XI	138.283	500		Cu X	139.771	200		Cr XVIII	140.82	110	
Ca XI	138.30			Br VIII	139.8	750		Ni	140.83	30	N
Mn XX	138.30	30		Co XXIV	139.80	30		Na VI	140.833	200	
Ti XV	138.357	250		F VI	139.800	600		Se XXIII	140.85	10	
Sc X	138.380	500		Cl XVII	139.817		P	K XII	140.862	600	
Sc XI	138.380	500		Fe	139.82	5	N	Mg IV	140.867	220	
Ne VI	138.39	30		Mn VII	139.862	1		Kr XXVI	140.878		P
Mg IV	138.392	160		Na VII	139.867	200		Se VIII	140.910	300	
Ar VIII	138.44	250		Na IV	139.867	200		Mg IV	140.915	160	
Mn VII	138.441	70		Fe X	139.868			Ni IX	140.917	85	
Zn XII	138.448	40		Cu X	139.868	150		Cr XIX	140.92	110	
Cr XIX	138.45	300		Cr XVIII	139.87	375		V VIII	140.934	50	
Cu XIII	138.481	0		Zn XV	139.87	20		Ne VI	140.96	50	
Fe XX	138.49	10		Ti XII	139.884	3		Mg IV	140.964	220	
K XIII	138.500	150		F VI	139.900	700		Ni IX	141.002	50	
Ga XVII	138.54	30		Ti VI	139.911	3		Mn XIX	141.03	300	
Ti IX	138.548	10		Ca XI	139.919	40		Ca XII	141.038	400	
Ti VII	138.548	10		Mn VIII	139.93	50		Na VI	141.040	10	
Ne VI	138.55	27		Na IV	139.9613	70		Mn VII	141.044	20	
Fe XXI	138.57		P	V IX	139.98			Ni	141.06	50	N
Fe XXI	138.61	4		Sc	139.980	100	N	Ti VI	141.061	3	
Ne VI	138.63	30		Mg IV	139.989	140		Mn XXII	141.09	300	
K VIII	138.632	250		Cl XVII	140.002		P	Se VIII	141.092	950	
Sc X	138.662	200		O V	140.030	1		Ti VI	141.113	10	
Mg IV	138.689	160		O V	140.052	5		Ca VIII	141.115	10	
Na VI	138.693	200		Cu X	140.071	200		Mn VI	141.119	2	
Mn VII	138.697	3		K VII	140.084	90		F VI	141.154	200	
Sc XV	138.715	125		O V	140.115	20		Ca VIII	141.155	10	
Si XI	138.72	50		Mg IV	140.119	200		Mn VI	141.193	1	
Ti XVI	138.760	10		Ne IV	140.13	15		Ti	141.208	1	N
As XXI	138.77	20		Zn XV	140.13	10		V VI	141.238	1	
V XIX	138.78			Na V	140.171	10		C V	141.27		P
Ni XXIV	138.80	50		Mg IV	140.173	340		Mn VI	141.277	10	
Ti XVI	138.800	125		Na IV	140.1811	40		Mn VIII	141.29	70	
Na V	138.812	200		Ca XIV	140.211	40		Ne VII	141.29	30	N
Ti VII	138.814	1		Ti	140.240	3	N	Ni	141.35	60	N
Ca XI	138.83			V XIX	140.25			Ni IX	141.356	120	
V XIX	138.84	350		Na V	140.258	10		Ca IX	141.358	90	
Fe VII	138.841	1		F V	140.266	10		Se VIII	141.376	770	
K VIII	138.842	10		Na IV	140.274	5		Ca	141.432	10	N
Cr XIX	138.86	4		V XVI	140.277	225		Ne V	141.45	27	
Br VIII	138.9	750		Zn XII	140.283	40		Mn XXI	141.49	110	
Na V	138.917	300		Fe X	140.296			Si XI	141.5	50	Q
Mg IV	138.935	20		V IX	140.31			Ca	141.521	40	N
Co XVII	138.97	80		Mn VII	140.323	15		Mn XXI	141.53	30	

Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes
Ca	141.656	250	N	Se VIII	143.088	50		Ne IV	144.28	5	
Se VIII	141.676	770		Se VIII	143.101	500		K	144.305	10	N
Ca XV	141.693	385		Sc	143.120	200	N	Ca XV	144.311	445	
Cu	141.694	300	N	V XIX	143.13	10		Ni X	144.323	100	
Ni	141.70	30	N	Cr VIII	143.17			Fe X	144.328		
Mn VII	141.757	25		Ca XI	143.173	100	Q	Na V	144.330	200	
Mn VIII	141.76	100		Ti VI	143.176	1		Ca IX	144.345	250	
V XVIII	141.77	10	P	As VI	143.197	20		Fe XXIII	144.36	50	
Se VIII	141.824	970		Ca VIII	143.218	250		N V	144.392	30	
Ca	141.829	1	N	Ar XVIII	143.219		P	Ti XVII	144.405	10	
V VIII	141.864	200		Ne V	143.22	50		Ti	144.461	1	N
Ni	141.87	60	N	N V	143.241	10		Se VIII	144.543	120	
V VIII	141.924	100		Na XI	143.243		P	Na V	144.546	200	
Ti XVII	141.948	175		Ne V	143.27	100		Ti V	144.551	12	
Ti VI	141.988	3		Co XXIII	143.30	30		F V	144.637	100	
Ca	142.000	250	N	Ni XXIV	143.30	10		K VIII	144.645	10	N
Se VIII	142.002	470		Fe XXII	143.30		Q	V VIII	144.653	600	
Mn VII	142.028	50		Sc IX	143.324	230		Na V	144.661	100	
K	142.041	10	N	Cu XIII	143.334	2		F V	144.673	90	
Fe XXI	142.05	80		Ne V	143.34	150		Ne VI	144.71	27	
Co XXIII	142.05	80		Se XXIII	143.36	30		Cu	144.728	250	N
O V	142.122	5		Na XI	143.372		P	O V	144.734	5	
Ti XV	142.130	200		V XVIII	143.377	2		Ti XVIII	144.759	40	
K	142.146	10	N	Ar XVIII	143.387		P	Si XI	144.76	50	
Cu	142.158	200	N	Sc IX	143.393	200		Cr VI	144.76	1	P
Fe XXI	142.16	110		Ne V	143.41	36		Fe XXI	144.79	110	
As VI	142.184	25		Na XI	143.417		P	O V	144.809	40	
K	142.209	40	N	Se VIII	143.431	720		Co XXIV	144.83	10	
Ni	142.22	40	N	Ti XVI	143.459	200		O V	144.837	70	
Na IV	142.2315	110		Sc XV	143.465	225		Fe XXII	144.85	110	
Na V	142.232	200		Sc	143.487	100	N	Ne VI	144.88	45	
V VIII	142.247	100		Ne VI	143.52	30		Ni X	144.880	80	
Se VIII	142.269	800		N V	143.520	10		Se VIII	144.892	120	
Fe XXI	142.27	4		Cr XVIII	143.53	50		Sc XVI	144.913	125	
Se VIII	142.320	130		Se XXII	143.57	345		Cr VI	144.961	1	
Na IV	142.3593	160		Cr XIX	143.57	110		N V	144.978	40	
Ca XIV	142.398	385		Cu	143.634	150	N	Na IV	144.9794	70	
Zn XXVIII	142.4		P	K XIII	143.741	450		Ni X	144.988	500	
Na V	142.415	10		Ni	143.80	50	N	Sc XIV	145.047	400	
Ni	142.42	50	N	K VIII	143.805	360		Ni X	145.061	100	
F V	142.422	100	Q	V XIX	143.82			Mn VI	145.117	8	
Ne V	142.44	37		Mn VII	143.87	20		Mn XX	145.16	10	
Ne VI	142.44			Co XXII	143.87	30		Mn VI	145.169	4	
Ne V	142.48	27		Se VIII	143.885	710		F V	145.177	100	
Br VIII	142.5		P	Ca IX	143.887	40	N	O	145.203	1	N
Ne VI	142.52			Sc XVII	143.888	160		Na IV	145.2046	5	
Ti	142.543	1	N	Co XXIII	143.89	30		Se VIII	145.218	20	
Ne V	142.58	18		F V	143.897	100		Mn VI	145.257	2	
Se VIII	142.585	120		Si XI	143.90			Mn XXII	145.27	30	
Ti XVII	142.589	30		Ca XV	143.903	15		Mn VI	145.280	16	
Ti X	142.595	3		N V	143.914	20		Na IV	145.300	5	
Mn VII	142.615	30		Se VIII	143.939	230		Mn VI	145.304	2	
Sc XVII	142.617	1		C V	143.94			Ti V	145.354	6	
Ne V	142.66	10		F V	143.965	15		F V	145.392	200	
Mn XIX	142.68	50		Ne V	144.01	45		Se VIII	145.410	750	
K XIII	142.681	150		Ne IV	144.02	10		Mn VI	145.414	2	
Na IV	142.6851	110		Se VIII	144.027	220		K	145.425	10	N
Ti X	142.687	10		Ca IX	144.038	150	Q	Mn XXI	145.45	80	
K	142.690	10	N	O VIII	144.039		P	Mn VI	145.452	2	
Ne V	142.72	50		Fe XVI	144.06	10		Ca	145.457	40	N
Ar XVIII	142.729		P	Ca VIII	144.070	360		F VI	145.462	100	
Se VIII	142.743	640		Ti	144.092	1	N	Mg V	145.485	500	
Ti XV	142.750	200		V XVIII	144.111	1		F VI	145.489	100	
K VIII	142.751	1		Ca VIII	144.111	90		S XVI	145.499		
Se VIII	142.768	270		O VIII	144.126		P	V VIII	145.507	400	
N V	142.797	1		Ne IV	144.15	10		K	145.542	10	N
Sc	142.836	200	N	Ca XV	144.150	20		F V	145.547	300	
Cu	142.892	600	N	O VIII	144.156		P	Se VIII	145.582	330	
Ne IV	142.93	15		Cu XIII	144.186	2		F VI	145.585	100	
Cu XIII	142.930	5		K	144.211	90	N	Ca	145.589	40	N
Mg V	142.933	600		Ni X	144.216	400		F VI	145.630	100	
N V	142.981	1		Ga XVII	144.23	20		Fe XXI	145.65	50	
Si X	143.03		Q	Se VIII	144.243	120		Cu	145.651	350	N
Cu	143.033	500	N	Fe XVI	144.25	10		K IX	145.659	160	
Ge XIX	143.04	380		Ca	144.265	1	N	Ti XVI	145.665	450	

Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes
Cu	145.671	100	N	Sc X	146.961	400		Mg IV	148.117	200	
O	145.677	5	N	Sc XV	146.966	125		Si XII	148.15		
F VI	145.691	300		Cr VI	146.980	4		Ne V	148.15	18	
K IX	145.712	250		Ni	147.00	70	N	N V	148.168	70	
Ni X	145.733	400		Mg IV	147.006	220		Ca XIV	148.168	265	
N V	145.742	50		Ni IX	147.013	85		K VIII	148.174	160	N
O VI	145.78	130	ZZ	Mg IV	147.052	220		Sc VI	148.18	150	
Se VIII	145.782	100		Co XXIII	147.09	50		O V	148.218	5	Q
Ti V	145.79	0		Se VIII	147.091	310		Sc	148.249	100	N
Ca XIV	145.802	70		Si XI	147.1	50	Q	Mn VI	148.273	1	
S XVI	145.816			C V	147.1		P	Sc	148.287	200	N
Sc XVII	145.836	1		K IX	147.120	500		Cu XIV	148.30	20	
Na IV	145.8426	40		V VIII	147.126	100		Ti VI	148.303	20	
S XVI	145.924			Ne V	147.13	150		Cu XIV	148.32	10	P
O VI	145.95		Q,ZZ	Ca	147.147	90	N	N V	148.328	10	
Sc XVI	146.052	225		Ti IX	147.157	1		C V	148.35		
Na IV	146.0644	285		Cr VIII	147.20			N V	148.387	40	
Ti XVII	146.067	30		Se VIII	147.218	270		Ni XI	148.402	100	
P XV	146.069		P	Fe XXIII	147.24	30		Br XXV	148.406	600	
Ni X	146.081	250		Mg IV	147.254	220		Sc	148.434	40	N
Mg V	146.083	600		O V	147.263	110		Ti XVIII	148.438	20	
K	146.089	90	N	Ti	147.268	1	N	Se VIII	148.451	800	
Mn VI	146.118	2		Ca XII	147.278	360		Mn VI	148.476	1	
Si XI	146.2	100	Q	Se VIII	147.294	420		Mn XIX	148.48	80	
Se VIII	146.221	400		V XVIII	147.30			Sc XIV	148.498	275	
Zn XVI	146.24	30		Cr VIII	147.30			Ti VIII	148.498	1	N
Ne IV	146.26	10		Sc IX	147.310	300		Se VIII	148.499	800	
Sc XVI	146.286	150		Ti	147.316	1	N	C V	148.5		P
P XV	146.301		P	Mg IV	147.321	200		Sc VI	148.536	100	Q
Na IV	146.3015	220		Ne VI	147.33	18		Sc	148.580	100	N
O V	146.347	40		Sc X	147.346	200		Ti XV	148.588	320	
K VIII	146.352	40		Cr XVII	147.40	10		Si XI	148.6	50	Q
Cr VIII	146.37			Mg IV	147.406	360		Ni	148.62	50	N
P XV	146.378		P	N V	147.424	240		Cr XIX	148.64	110	
K VIII	146.382	40		Ti XV	147.436	80		Na V	148.642	400	
Na VI	146.398	10		Ne VI	147.47	27		F VI	148.653	400	
Na IV	146.3991	160		Cr VIII	147.49			Ne IV	148.66	5	
Co XXII	146.40	4		Mg IV	147.497	80		Cr VII	148.714	450	
Se VIII	146.422	780		Mg IV	147.535	340		Ar VIII	148.73	100	
K	146.459	10	N	Cu	147.544	200	N	Se VIII	148.731	50	
Mg V	146.464	500		K XIV	147.556	15		Sc	148.743	100	N
Cr VII	146.497	650		Sc XV	147.558	150		Ne V	148.78	15	
Mg IV	146.526	220		Ca	147.565	40	N	Ne IV	148.79	15	
Ti XVI	146.55	30	P	Se VIII	147.568	730		Se VIII	148.803	780	
K	146.552	10	N	Ne VI	147.58	80		Sc	148.805	200	N
Mn XIX	146.57	30		Si XI	147.60	100		Ti VIII	148.820	1	N
Sc XVII	146.574	100		Ti XVIII	147.607	15		Ni	148.83	40	N
F VI	146.576	200		Cr XX	147.62	4		Ti XVIII	148.83		
Mg XI	146.58		P	Mg IV	147.629	160		Mn VI	148.846	2	
Ge XX	146.61	355		Ca	147.669	10	N	Cu	148.846	800	N
V VIII	146.613	180		Sc VI	147.740	100	Q	Na V	148.856	300	
F VI	146.613	300		Cu XI	147.742	350		Ca XIII	148.879	275	
Mg V	146.621	400		Mg IV	147.749	220		V VII	148.903	300	
Sc IX	146.628	300		Ne VI	147.78	50		Mg IV	148.904	20	
Cr VIII	146.63			Se VIII	147.784	590		Mn VI	148.909	2	
Cu	146.669	1000	N	Cr XVIII	147.79	30		Ne IV	148.94	20	
F VI	146.676	400		Si VI	147.8	50	Q	Mg IV	148.959	60	
N V	146.716	30		Sc IX	147.834	200		O VIII	148.982		P
F VI	146.718	200		Ni XII	147.847	1		Cr XX	148.99	250	
V XVII	146.719	50		Mg IV	147.884	180		Mn VI	148.998	4	
Sc XV	146.754	80		Na V	147.897	200		Na V	149.001	200	
N V	146.767	60		Sc VI	147.90	100		Ti VI	149.010	20	
Cr VI	146.776	1		K IX	147.912	650		Mg IV	149.025	40	
V VIII	146.789	200		K IX	147.941	160		O V	149.038	5	
Sc X	146.816	300		F V	147.946	400		O VIII	149.075		P
Mg IV	146.837	200		Se VIII	147.948	240		O V	149.076	70	
Ti XVII	146.856	10		Mg IV	147.981	20		O VIII	149.107		P
Ne V	146.86	18		F V	148.002	500		Ni	149.21	30	N
Co XXIII	146.86	80		Ti VIII	148.014	1	Q	Fe XXIII	149.22	30	
Ti V	146.897	4		Mn XX	148.10	4		Ar VIII	149.33	150	
Se VIII	146.914	150		Sc IX	148.103	200		Se VIII	149.341	360	
O V	146.920	1		Ti VI	148.104	3		Sc X	149.357	100	
N V	146.921	30		F V	148.108	100		Cl VII	149.37		
Mg IV	146.954	400		V XVIII	148.113	10		Ca XIV	149.388	225	
Sc IX	146.954	400		N V	148.116	40		Ti VI	149.392	10	



Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes
Si X	149.4	50	Q	Ni IX	150.574	10		Ar VII	151.88	100	
Mg IV	149.400	40		Si	150.6	50	N	Ti VI	151.897	1	
V XIX	149.42	65		V VII	150.625	200		Mn VI	151.899	45	
Cl VII	149.43			Na IV	150.642	220		Ni XXV	151.90	30	
Na VI	149.442	10		Na IV	150.6867	285		Sc XIV	151.910	320	
K XIII	149.447	30		Al XI	150.69		P	Sc XVI	151.910	315	
K	149.454	1	N	Co VIII	150.701	10		Ti VIII	151.915	1	
Cu XI	149.455	320		Na IV	150.7097	110		Mn VI	151.920	10	
Mg IV	149.456	20		Mn XX	150.71	10		Co VIII	151.944	150	
Ni	149.47	50	N	Mn XX	150.80	80		Mn VI	151.949	20	
Mg V	149.49		P	Fe VII	150.807	90		Fe VII	151.971	4	
Ti VI	149.560	10		Mg XI	150.83		P	Mg V	152.019	10	
Ti IX	149.560			Ni IX	150.836	85		F V	152.035	50	
Ne IV	149.59	10		Fe VII	150.852	90		Mn VI	152.046	8	
Ne V	149.60	18		Ga XVIII	150.86	30		Fe VII	152.072	40	
Na VI	149.621	10		Ti VIII	150.867	35		Mn VI	152.093	5	
Ti VIII	149.653	3		Sc X	150.900	300		Mg V	152.149	300	
Se VIII	149.685	20		Ne IV	150.93	5		Fe XXI	152.15	176	Q
Cu	149.703	800	N	Sc X	150.939	400		Ni XII	152.152	1	
Cr VI	149.706	4		Na IV	150.9424	110		Ni XII	152.153	15	
Co VIII	149.718	10		Co VIII	150.958	10		Ti VIII	152.164	20	
Se VIII	149.780	80		Na IV	150.9667	160		F V	152.174	50	
Cr XVIII	149.80	300		Na V	150.968	200		Ti XVII	152.174	1	
K	149.842	10	N	Sc XVI	150.973	550		Mn VI	152.182	10	
Ti	149.842	3	N	F IV	150.977	100		Co VIII	152.200	30	
V XVIII	149.87	10	P	Sc X	150.995	500		Ne IV	152.23	75	
Cr XXI	149.87	300		F IV	151.005	100		Ar VII	152.26	150	
Fe XXII	149.87	80		Ni IX	151.022	85		O IV	152.266	5	Z
Co XXIII	149.88	10		Fe VII	151.023	150		Ti VI	152.338	10	
Mg V	149.89		P	Fe VII	151.046	10		F V	152.339	200	
Cr VI	149.918	12		Na IV	151.0503	160		O IV	152.346	20	Z
Ar XII	149.93			K XIII	151.073	6		Se VIII	152.348	80	
Na XI	149.935		P	F IV	151.079	1		Mg V	152.384	100	
Cr XVIII	149.94	200		Si	151.1	50	N	F V	152.391	300	
Ni	149.97	40	N	Na V	151.127	400		Si	152.4	50	N
Mn XXI	149.97	30		Fe VII	151.145	40		Cr XIX	152.42	30	
Ti VIII	149.981	1		Na V	151.188	100		Zn XVI	152.42	20	
Mg XII	150.039		P	Ne V	151.23	66		K XI	152.462	560	
Ti VIII	150.039	60		Fe VII	151.268	50	N	F V	152.511	400	
Na XI	150.075		P	Ni IX	151.281	50		Mg V	152.527	100	
O VI	150.089	750		Na IV	151.2994	220		Co VIII	152.534	200	
Sc IX	150.092	500		Na V	151.303	100		F V	152.563	200	
V XVII	150.103	100		Sc IX	151.401	400		V XVII	152.566	5	
N V	150.116	70		Ne V	151.42	120		Mg V	152.591	10	
Na XI	150.123		P	Fe VII	151.432	40		Co VIII	152.597	10	
O VI	150.124	650		O V	151.4470	160	P	Sc VI	152.60	250	
Ti XVIII	150.15			Ne IV	151.46			Co	152.66	200	N
N V	150.171	140		O V	151.4772	200	P	Sc	152.681	200	N
Fe VII	150.186	4		O V	151.4782	100	P	Sc X	152.702		
Ti VI	150.213	3		Ti VIII	151.484	10		Co IX	152.733	130	
As XXI	150.22	50		Fe VII	151.488	25		K XIII	152.793	100	
Mg XII	150.232		P	Fe XXI	151.50			Cr XX	152.86	30	
Fe VII	150.282	10		Fe VII	151.512	60		Sc XIV	152.880	400	
Mg XII	150.296		P	Fe XXII	151.54	30		K VII	152.889	40	
Na IV	150.2981	360		O V	151.5465	250	P	Co VIII	152.896	50	
Se VIII	150.301	380		O V	151.5476	100		Fe VII	152.906	50	N
K	150.305	1	N	Mn VI	151.617	1		V XVIII	152.933	2	
Al XI	150.31			V XVII	151.656	3		Ti VI	152.960	10	
Ti VI	150.315	3		Fe VII	151.675	90		F IV	152.997	1	
Ni IX	150.32	10		Si	151.7	50	N	Co VIII	153.005	250	
Mn VI	150.324	8		Ar VII	151.70	50		Ca X	153.022	650	
F IV	150.335	10		Ni	151.70	30	N	O IV	153.086	1	Q, Z
Cu XI	150.369	30		Ni IX	151.700	10		Si	153.1	50	N
Fe VII	150.403	4		K XIV	151.713	160		F IV	153.102	10	
F IV	150.422	10		Mn VI	151.736	35		N V	153.136	180	
N V	150.429	20		Fe VII	151.754	4		F IV	153.141	10	
Na IV	150.459	5		Mn VI	151.769	20		Ti XVIII	153.15		
N V	150.488	50		Fe VII	151.782	120		O IV	153.151	20	Z
Sc XIV	150.490	500		Ne IV	151.82	75		Sc	153.172	300	N
K XIV	150.495	60		B V	151.823		P	Ni XII	153.174	5	
Fe VII	150.521	25		Ca X	151.843	500		N V	153.192	280	
Fe VII	150.530	25		Ni	151.85	30	N	Sc XV	153.197	6	
Na IV	150.5427	220		Ar XI	151.86			Ca XIV	153.228	175	
C V	150.55		P	Ti VIII	151.864	10		Ti XVIII	153.23	10	
Ni	150.56	40	N	B V	151.872		P	Ti VI	153.255	3	

Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes
Co IX	153.308	300		O IV	154.681	5	Z	Mn VI	155.747	10	
B V	153.321		P	Fe VII	154.705	90		Sc XV	155.765	630	
K	153.350	90	N	Ti VI	154.768	6		Na IV	155.7762	220	
B V	153.372		P	Mg XI	154.77			Cl VII	155.78		
Ti VI	153.384	3		Cu	154.785	400	N	Fe	155.78		N
C V	153.53			Na XI	154.787		P	Mn VI	155.789	20	
Ti VI	153.550	35		Si XIV	154.844		P	Fe	155.81		N
Ti XVII	153.554	25		Fe VII	154.848	25		Mn VI	155.813	5	
Sc XVI	153.564	150		Sc XVI	154.849	225		Na IV	155.8276	110	
Cu XXVII	153.6			Al XIII	154.866		P	Ca XIV	155.847	125	
N V	153.624	30		Ca XVI	154.878	150		O IV	155.911	5	Z
K VII	153.624	90		Na XI	154.886		P	Mn VI	155.914	25	
Ar XII	153.63			Fe VII	154.888	4		Fe XXII	155.92	50	
Fe VII	153.663	1		Sc X	154.897	200		K VIII	155.951	250	
F VI	153.678	200		Si XIV	154.911		P	K VIII	155.976	90	
N V	153.683	60		Cr XIX	154.92	30		Fe VII	155.994	120	
Cu X	153.711	85		Fe VII	154.921	60		Cr XX	156.00	200	
F VI	153.741	300		Fe VII	154.941	40		V XVI	156.060	5	
Fe VII	153.747	1		Co IX	154.942	350		K XIII	156.067	5	
Cu X	153.767	150		Fe VII	154.949	90		O V	156.119	20	
Co IX	153.803	180		Mg XI	154.95		P	Ne V	156.14	18	
Sc XV	153.843	550		Mn VI	154.994	2		O V	156.152	40	
Na IV	153.8432	40		Ga XIX	155.01	20		Ne V	156.20	18	
F VI	153.880	400		Fe XXI	155.06	10		Fe XXI	156.21	4	
Co	153.89	800	N	Co IX	155.076	90		O V	156.227	70	
Co VIII	153.926	200		Na IV	155.0826	220		C V	156.233	4	
O V	153.952	110		Sc VI	155.10	150		F VI	156.247	600	
Fe XXII	153.96	4		Mn VI	155.119	12		Ni	156.30	30	N
K XIV	153.970	175		Ni XIII	155.12			Sc XV	156.436	6	
Mn XX	153.98	80		Fe VII	155.124	1		Ti VIII	156.444	10	
Ca	153.985	1	N	Al XIII	155.139		P	Se XXIV	156.468	800	
Sc	154.006	230	N	Fe VII	155.150	1		Ne IV	156.48	25	
Sc XVII	154.018	550		Mn XX	155.21	50		K VIII	156.495	360	
Se XXIII	154.04	50		Al XIII	155.228		P	Na IV	156.5084	160	
Fe VII	154.042	25		Na IV	155.2398	220		K VIII	156.533	90	
Ti XVII	154.133	3		Fe VII	155.247	10		Na IV	156.5374	285	
Ti VI	154.161	1		Si	155.26		N	K VIII	156.551	1	
Ni XII	154.175	15		Co	155.27	400	N	Cu	156.557	200	N
Cr VI	154.197	30		Mn VI	155.317	2		Ti XVII	156.57		
Fe VII	154.216	1		Cl VII	155.32			Co	156.59	400	N
Ca	154.217	10	N	Na IV	155.3486	110		Si	156.6		N
Sc VI	154.25	50		K VIII	155.358	10	N	V VII	156.608	700	
K XIV	154.265	1		Sc VI	155.36	50		Ne V	156.61	20	
Fe XXIII	154.27	10		Na IV	155.368	5		Ni	156.68	40	N
Fe VII	154.271	4		V VIII	155.38			Ca IX	156.683		
Mn XXII	154.28	50		Fe VII	155.414	1		Ca XIII	156.686	300	
Sc VI	154.29	250		Na IV	155.4477	220		Na IV	156.7635	110	
Fe VII	154.307	10		V VIII	155.45			Na IV	156.7798	160	
Fe VII	154.335	120		Ti	155.456	1	N	Fe XVI	156.80	10	
Cu X	154.363	50		Cr XVIII	155.46	80		Fe VII	156.808	4	
Fe VII	154.363	25		Na IV	155.4600	40		O VIII	156.834		P
Ca	154.398	40	N	B V	155.466		P	Fe	156.84	130	N
Cr VI	154.418	50		Ti	155.494	1	N	Cu	156.847	200	N
V VIII	154.42			Li II	155.5		N	Ne IV	156.87	15	
Ar XII	154.43			Fe	155.50		N	Fe XVI	156.88	50	
Mn XXI	154.43	30		Na IV	155.5104	285		Na II	156.88		A
Fe VII	154.447	1		B V	155.517		P	Na IV	156.8800	220	
K	154.453	10	N	Co IX	155.530	100		O VIII	156.935		P
Na XI	154.475		P	Ti	155.545	1	N	Ca XIV	156.948	225	
Ne IV	154.49	25		Fe VII	155.549	1		Ca XV	156.948	225	
Ge XXV	154.5		F,P	Fe VII	155.619	1		Co VIII	156.958	10	
Ne V	154.50	45		Na IV	155.6197	160		K IX	156.963	10	
F VI	154.506	300		Ni	155.62	30	N	O VIII	156.970		P
Sc	154.507	100	N	F IV	155.624	10	Z	Fe XXII	157.03	50	
V VIII	154.55			Fe VII	155.632	1		Na V	157.036	200	
Fe VII	154.565	25		Ca	155.632	10	N	K	157.037	90	N
O IV	154.590	1	Z	Co IX	155.669	500		V XVII	157.070	5	
Cu X	154.591	85		Ca XV	155.671	80		K IX	157.071	1	
Cr XXI	154.61	50		F IV	155.673	10	Z	Na IV	157.0841	285	
Sc	154.643	300	N	Ti VIII	155.675	20		Sc XVII	157.095	300	
Si XIV	154.644		P	Na IV	155.6872	160		Ti VIII	157.112	3	
Fe VII	154.650	90		Ca	155.692	10	N	Fe VII	157.112	10	
Al XI	154.66			K VIII	155.701	160		Ca XV	157.161	125	
Cu XV	154.67	30		Na IV	155.7129	110		V XIX	157.17	175	
V VIII	154.68			Cu	155.718	150	N	C V	157.2		P

Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes
Na V	157.209	300		F IV	158.398	10		F V	159.658	10	
Ni	157.24	40	N	K VIII	158.437	40	N	Ni XXIV	159.69	4	
Co VIII	157.266	30		V VII	158.467	600		Mg III	159.741	40	
S XVI	157.285			Ti XVII	158.469	160		Sc XVII	159.768	20	
Mn VI	157.301	60		Si XI	158.47	20	P	Ne VI	159.82	30	
Cu	157.359	400	N	C V	158.47			N IV	159.833	1	Z
Fe XXII	157.37	50		Fe VII	158.481	120		Ca XIII	159.835	250	
Ti	157.378	6	N	Mn XXI	158.51	80		V VII	159.855	300	
Ca XIV	157.390	225		Na VI	158.517	5		Kr XXVI	159.889		P
Cr XVIII	157.40	200		Mg III	158.522	20		Ca	159.916	1	N
Co VIII	157.416	10		F IV	158.537	400		Ti XVII	159.955	1	
K VI	157.433	50	N	F V	158.537	400		Ni XIII	159.97		
Ti VIII	157.472	3		Ni	158.54	50	N	Co IX	159.972	250	
K	157.478	16	N	O IV	158.567	5	Z	Ni XII	159.975	1	
Na V	157.511	200		Ne V	158.59	30		Ni X	159.977	600	
F V	157.515	100		F IV	158.601	100		V XVIII	159.991	2	
Ti VIII	157.528	3		O IV	158.606	20	Z	Cr XIX	160.01	10	
V VIII	157.53			K	158.616	40	N	O V	160.023	1	
Ge XX	157.55	350		Ne IV	158.65	75		Ne VI	160.03	18	
Ni XIII	157.55	50		As VII	158.666	28		O V	160.059	5	
Na II	157.55		A	Na II	158.67		A, Z	Al IV	160.074	800	
Mn XXII	157.58	50		Sc XVI	158.671	60		As VII	160.115	4	
Na IV	157.5948	110		B V	158.703		P	Cl XVII	160.116		P
Ne IV	157.63	25		Ca IX	158.718	160	Q	Ca	160.127	10	N
Co VIII	157.687	30		Ne V	158.72	25		O V	160.132	5	
Fe VII	157.689	150		B V	158.757		P	Mg IV	160.228	280	
Si	157.7		N	Ni XIII	158.77	50		Cr XIX	160.30	150	
Mg III	157.701	10		Co VIII	158.784	250		Sc	160.337	230	N
Ni XIII	157.730	35		O V	158.792	20		Ni	160.38	30	N
Co VIII	157.773	120		Ca	158.818	1	N	Sc	160.387	200	N
Na IV	157.7792	285		O V	158.818	40		Na XI	160.412		P
Ne IV	157.78	15		Ne IV	158.82	75		Mn XXI	160.42	30	
Ca XVI	157.791	60		Ne V	158.82	23		V XVIII	160.44		P
Ni XII	157.798	2		Ni XXV	158.84	4		N IV	160.451	1	Z
Ti XVI	157.812	175		O V	158.858	5		Ne IV	160.47	50	
Sc XIV	157.820	250		Se XXIII	158.86	50		K	160.509	10	N
K	157.820	90	N	N V	158.862	40		C V	160.53		P
Ca	157.838	10	N	Co X	158.87	900		Ni XII	160.554	2	
Ne IV	157.86	10		O V	158.899	20		Na XI	160.571		P
S XVI	157.882			Ar VIII	158.92	400		Ca VIII	160.592	10	
K XIII	157.902	40		F IV	158.925	100		Si XI	160.6	50	Q
Sc XIV	157.904	360		O V	158.926	70		Cl XVII	160.606		P
Mn VI	157.908	2		N V	158.928	70		Na XI	160.624		P
Ca	157.929	40	N	Ti	158.952	3	N	Sc VI	160.637	300	Q
F IX	157.979		P	Co IX	158.953	100		Ca VIII	160.638	40	
Mg III	157.981	10		Kr XXV	159.0			Na II	160.66		A, Z
Co VIII	157.984	10		Co XXIV	159.00	50		Sc	160.725	330	N
Ni	158.00	40	N	Ti XVIII	159.00	65		Cu	160.763	500	N
N V	158.024	240		Cu	159.072	100	N	K	160.773	10	N
V VIII	158.04			Ar XIII	159.08			Cl XVII	160.774		P
Ti XI	158.042	3	Q	K	159.105	40	N	Sc XVII	160.777	80	
Ne IV	158.06	25		Ge XXI	159.14	30		Ni X	160.794	40	
Co VIII	158.066	85		Ar VIII	159.18	250		Mg IV	160.802	220	
S XVI	158.067			O IV	159.197	1	Z	Ti VIII	160.914	1	
Ne IX	158.07		P	Mg III	159.198	20		Sc	160.949	230	N
N V	158.088	360		Si X	159.3	50	Q	Co XXIII	160.97	10	
Si	158.1	50	N	O V	159.327	70		K	161.005	40	N
Ne IV	158.11	10		Mn XXII	159.33	50		Ca XV	161.014	445	
K XI	158.135	450		O V	159.343	110		Ca X	161.048	250	Q
Ca	158.136	1	N	V XVII	159.347	200		Mg III	161.108	50	
F IX	158.136		P	V XX	159.363		P	V VII	161.122	600	
Sc XVII	158.136	315		N IV	159.366	1	Z	K	161.145	40	N
Mn VI	158.139	6		O V	159.380	160		Sc	161.162	200	N
V XVII	158.143	10		O V	159.411	40		Ti XVI	161.168	280	
Fe VII	158.168	150		Ca X	159.445	1	Q	F VI	161.174	120	
F IX	158.189		P	K	159.460	10	N	As XXII	161.21	50	
Ne IX	158.22		P	Cu	159.462	100	N	N VI	161.223	14	
Na VI	158.225	5		Zn XVII	159.48	30		N IV	161.256	2	Z
Co XI	158.28	1		K	159.522	1	N	F VI	161.257	100	
Ca	158.283	90	N	Ca IX	159.538	160		Ca	161.261	10	N
Ca	158.337	10	N	F V	159.558	1		N IV	161.286	2	Z
C V	158.374		P	Co IX	159.575	300		Ti VIII	161.290	6	
Ni X	158.377	600		Si X	159.6	50	Q	Si XI	161.3	20	Q
K	158.380	10	N	K XII	159.603	70		K XIII	161.302	20	
Ti	158.391	3	N	Ti XVII	159.62			F VI	161.308	300	

Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes
Cr XX	161.33	10		Ca XIII	162.923	290		Fe VII	164.203	25	
Cu XV	161.34	20		Cu	162.926	20	N	Mn VI	164.224	180	
F VI	161.341	90		Ar XIII	162.96			Mn VI	164.249	20	
Sc VIII	161.353	300	N	Ca	162.960	90	N	Cu	164.259	200	N
K	161.386	10	N	Ti V	162.984	50		Ne V	164.29	80	
F VI	161.414	100		Co XI	163.00	1		Sc XVII	164.293	100	
K	161.427	10	N	Cr VI	163.014	50		Mn VI	164.300	30	
F VI	161.477	120		Sc X	163.022	300		Cr VI	164.301	1	
Co VIII	161.479	30		Ti XVII	163.049	2		V VII	164.302	100	
Cu	161.551	300	N	V VII	163.135	200		Mn VI	164.365	25	
Ni XIII	161.56	50		F VI	163.138	200		Mn VI	164.378	10	
Ar XIII	161.61			V VII	163.182	400		Mg III	164.394	80	
K	161.618	90	N	Fe VII	163.183	120		Si X	164.42		N
As VII	161.619	25		Na IV	163.1895	450		Mn VI	164.421	55	
Mg III	161.655	50		Ar XII	163.23			Ne V	164.43	18	
Cr VI	161.659	80		Ca IX	163.230	360		Sc	164.444	100	N
K	161.662	40	N	Cu	163.271	300	N	Ti V	164.446	80	
Cr VI	161.687	80		Na IV	163.274	5		Ti VII	164.478	3	
Al IV	161.688	700		Sc XVII	163.288	80		K	164.478	40	N
Co VIII	161.733	30		N IV	163.311	1		Mn XXII	164.48	30	
Fe XXII	161.74	4		Co XI	163.32	150		Ne V	164.48	18	
Ca XIII	161.747	450		Na IV	163.343	5		Cl X	164.5		
Cu	161.748	250	N	Si VII	163.4	50	Q	Ar XII	164.51		
Ni XIII	161.78			Si X	163.40		N	V VII	164.523	50	
K	161.808	40	N	Mn XV	163.41	4		Cr VI	164.564	12	
V VII	161.836	400		Sc X	163.416	400		Mn VI	164.566	60	
Cr VI	161.836	80		F V	163.456	300		O V	164.573	160	
Ca	161.839	160	N	F V	163.501	400		O V	164.588	110	
Sc	161.908	200	N	Cr VI	163.514	12		V XX	164.590		P
Cr VI	161.908	12		Fe	163.52		N	F IV	164.612	200	
Co VIII	161.917	200		Sc XVI	163.541	20		O V	164.625	70	
Cr VI	161.930	1		Mn VI	163.557	1		Mn VI	164.629	85	
Ni	161.94	30	N	F V	163.558	500		Cr XX	164.63	50	
Ca IX	161.979	160		Ne IV	163.56	60		Mn VI	164.639	60	
Si X	162.0	20	Q	Mg III	163.562	20		Ca XV	164.655	225	
F V	162.013	200		F V	163.596	200		O V	164.656	220	
Ti VIII	162.016	1		Cu	163.598	250	N	Sc XVI	164.665	175	
F V	162.053	300		Ne IV	163.60	10		Si X	164.69		N
Cu	162.078	200	N	Ti XVI	163.610	2		O V	164.708	160	
F V	162.082	300		Na V	163.616	300		Co VIII	164.721	50	
Co VIII	162.095	200		Mn XV	163.63	30		K X	164.77		
F V	162.121	200		Na V	163.662	5	Q	Sc VIII	164.772	300	
Ne V	162.15	15		Mn VI	163.663	1		N IV	164.794	30	
Ca XV	162.152	200		Si X	163.67		N	Ni XIV	164.80		
Ni	162.16	40	N	Ca XV	163.702	125		Mn VI	164.815	1	
F V	162.172	300		Mn VI	163.740	5		Ar XIII	164.82		P
Sc	162.172	200	N	Cr VI	163.801	12		Mn XXI	164.83	30	
K	162.206	160	N	Na IV	163.8396	360		Cr VI	164.833	12	
F V	162.215	300		Co	163.85	500	N	Na IV	164.8412	360	
Sc VIII	162.236	200		O V	163.85	125	Q	Mn XXI	164.87	10	
F V	162.270	400		Na V	163.930	200		Mn VI	164.892	20	
Mn VII	162.336	250		Mn VI	163.939	5		Si X	164.9		Q
Co VIII	162.337	150		Cr XIX	163.94	250		Co XI	164.91	120	
N IV	162.374	2	Z	N IV	163.949	10		Ge VII	164.914	3	
Ca IX	162.375	250		Ca XV	163.96	30		Na II	164.92		A, Z
Si	162.4	20	N	B V	163.965		P	Ne VI	164.93	18	
Ti VIII	162.401	1		N IV	163.972	2	Z	Mg III	164.949	80	
N IV	162.423	10	Z	Fe VII	163.974	4		Fe VII	164.955	25	
Na IV	162.4479	650		F VI	164.015	100		O V	164.986	70	
O V	162.492	160		Ne V	164.02	100		Cr XXI	165.03	80	
Ti XVI	162.503	20		B V	164.022		P	As XXIII	165.064	900	
V XVIII	162.51		P	N IV	164.048	50	Z	Fe VII	165.087	90	
Ne	162.52	27	N	Mn VI	164.051	180		Sc XVI	165.113	150	
Co VIII	162.55	10	P	Zn XVIII	164.06	20		Si XI	165.12		
N V	162.556	480		Ca XIII	164.107	245		Cu	165.127	300	N
Co XI	162.56	500		Mg III	164.133	10		K VIII	165.169	10	N
Cr VI	162.565	110		Ni XIII	164.146	35		Co VIII	165.191	10	
Cu	162.651	100	N	Ni XIV	164.146			Mg III	165.192	10	
Mn VII	162.656	300		Ne V	164.15	100		O V	165.218	1	
Mn VII	162.689	100		Cr VI	164.159	4		Ge VII	165.241	5	
Co VIII	162.708	10		Ca XVI	164.172	285		V XVII	165.322	5	
Cr VI	162.764	12		Ti VII	164.173	10		Mn XXI	165.34	50	
N IV	162.816	1		O V	164.174	70		Ca XIV	165.343	385	
Cl XI	162.83			Mn VI	164.188	2		O V	165.349	5	
Ni	162.90	50	N	K XIII	164.193	40		Ga XIX	165.35	50	

Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes
F IV	165.350	10		Cr VII	166.488	20		Mn VI	167.765	20	
Ni XXV	165.36	10		N IV	166.496	20	Z	Ge VII	167.767	2	
Ga XX	165.36	10	P	F IV	166.499	200		Ne V	167.83	25	
Sc VIII	165.395	300		As XXII	166.52	50		F V	167.858	100	
Ti VII	165.403	6		N IV	166.540	75	Z	K VIII	167.896	90	
Ni XXVI	165.42			Cr VII	166.560	70		Ne IV	167.92	25	
Ca IX	165.423	10		Ti	166.566	1	N	Ne V	167.92	25	
Ni	165.43	70	N	Ge VII	166.609	20		Ti	167.930	1	N
Ni IX	165.436	150		Fe VII	166.629	50	N	K VIII	167.934	90	
Fe VII	165.444	1		Cl XI	166.63			Mn VI	167.957	70	
Cr XIX	165.46	150		Cu	166.645	100	N	Cr XX	167.97	200	
Fe	165.47	500	N	Co	166.71	400	N	Ni VIII	167.97	40	
F IV	165.479	1		Fe XXIII	166.74	50		Ga XX	167.97	30	
Fe VII	165.490	150		O IV	166.741	1		Si XIV	167.970		P
Ar X	165.53	400		Br XXV	166.772	450		O V	167.988	285	
K X	165.54			Ca IX	166.776	10		Si X	168.0	50	Q
Se XXII	165.62	280		Ni XII	166.856		P	Fe VIII	168.002	150	
Fe VII	165.630	60		N V	166.875	440		O V	168.007	110	
Ti	165.653	1	N	K X	166.90			Fe VIII	168.024	100	
Sc VIII	165.654	400		Sc VIII	166.916	300		O V	168.046	70	
Fe VII	165.658	40		K XV	166.925	15		Si XIV	168.048		P
P XV	165.680		P	Cr VII	166.936	40		O V	168.076	70	
Ni	165.69	30	N	N V	166.946	520		Ni VIII	168.08	20	
Ti XV	165.690	2		Ca X	166.949	650		Co VIII	168.084	85	
Si	165.7	50	N	Ca XIV	166.956	450		Cr VI	168.088	11	
Ti VII	165.716	1		Sc VI	166.957	200	Q	Na IV	168.093	750	
Fe VII	165.724	1		Kr XXXIII	167.		P	Ne IV	168.10	10	
Co XXIV	165.75	4		Co VIII	167.016	30		Cu	168.111	150	N
Fe VII	165.764	60		Cr VII	167.020	220		Ni XIV	168.12		
Ge VII	165.791	2		Fe VII	167.047	40		O V	168.132	5	
Ni	165.81	40	N	Ca X	167.049	850		Mn VI	168.147	70	
Ti VII	165.836	3		Ca X	167.064		P	Ti VIII	168.162	10	Q
Co XII	165.86			Ni VIII	167.07	80		K XIII	168.165	5	
C V	165.91		P	N IV	167.074		P	Sc	168.165	100	N
Fe VII	165.919	150		O IV	167.115	1	Z	Ca	168.166	1	N
Ca IX	165.920	10		Mn XX	167.12	10		Fe VIII	168.172	500	
N IV	165.945	50		O IV	167.145	5	Z	Ti VIII	168.192	10	Q
P XV	165.970		P	Co VIII	167.152	10		Mn VI	168.282	15	
F V	165.983	900		Sc VI	167.17	200		O IV	168.306	5	
Fe VII	165.996	60		Mn XX	167.19	10		Mn VI	168.321	10	
Fe VII	166.010	40		Si	167.2	50	N	Co XI	168.327	90	
Sc VIII	166.022	200		C V	167.218		P	Ni VIII	168.33	10	
Ne V	166.05	30		Ti XVI	167.242	70		Co XII	168.34		
P XV	166.065		P	Li II	167.27			Mn VI	168.353	15	
Cl XI	166.07			V XVII	167.279	40		Cr VI	168.355	4	
Ni IX	166.079	85		Ti XVI	167.297	10		Ni XIV	168.37		
Ni	166.08	50	N	Ge VII	167.318	6		Sc XI	168.396	400	
Ti VII	166.087	10		V XIX	167.34	65		Ca XIII	168.399	320	
Co	166.09	200	N	Ni VIII	167.35	20		Na IV	168.4110	650	
O V	166.112	70		Ca	167.353	10	N	F IV	168.450	200	
Mn VI	166.115	10		Sc XVI	167.369	15		K XIII	168.471	40	
O V	166.150	110		Cu	167.392	10	N	Si	168.5	20	N
F V	166.177	1000		C V	167.402	4		N V	168.514	50	
V XIX	166.19			Ge VII	167.425	4		Mn VI	168.515	15	
Si	166.2	50	N	Ca XVI	167.433	285		Cr VII	168.523	40	
K XIII	166.214	20		Ca IX	167.457	10		Fe VIII	168.545	450	
Ti XVIII	166.225	5		Ne V	167.47	150		Na IV	168.5456	450	
O V	166.234	160		Fe VIII	167.486	400		Mn VI	168.549	70	
Co VIII	166.275	10	P	Cr VII	167.496	110		Ni VIII	168.58	150	
Ni	166.29	50	N	Na V	167.510	100		N V	168.587	120	
Ni IX	166.306	85		Ne V	167.61	30		Ne V	168.60	14	
Cu	166.308	120	N	Ge VII	167.610	4		Cr XXI	168.62	50	
Sc VIII	166.317	300		K X	167.62			Ni VIII	168.62	10	
N IV	166.337	10	Z	Ar XII	167.62			Ti VII	168.652	10	
Sc VI	166.35	350		Ti	167.625	1	N	Mn VI	168.664	40	
Fe	166.35	600	N	Fe VIII	167.656	200		Co XII	168.68		
Fe VII	166.365	200		Ni VIII	167.66	10		Mn VI	168.691	160	
Na VI	166.367	40	Q	Ne V	167.67	250		Ca	168.707	10	N
N IV	166.377	20	Z	Co	167.68	100	N	Mn XXI	168.72	50	
Li II	166.39			Ti	167.701	1	N	Ne VI	168.73	40	
Ca IX	166.414	90		N IV	167.709	150		Ne V	168.73	40	
Ca IX	166.442	1		Ne V	167.72	23		Li II	168.74		
F IV	166.444	200		Co VIII	167.738	30		Mn VI	168.740	5	
Ni	166.46	50	N	Si XIV	167.740		P	O V	168.759	20	
K X	166.48			K X	167.76			K X	168.79		

Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes
Cu XVI	168.80	30		Sc	170.105	100	N	F V	171.302	200	
Ne VI	168.85	27		Si VII	170.13		Q	S VI	171.33	20	
Ca XVI	168.866	245		Cr VII	170.139	20		Mn VI	171.348	70	
Ni VIII	168.87	40		Cr XXI	170.16	50		Ni XIV	171.37	40	
Mn VI	168.888	20		Co VIII	170.169	10		Ge VII	171.382	540	
Ge XXI	168.90	50		Ni VIII	170.17	80		Ti VIII	171.392	3	Q
Co VIII	168.921	10		F IV	170.187	200		Mg III	171.3946	150	
Fe VIII	168.929	250		N IV	170.208	50	Z	Cr VI	171.400	30	
Sc XI	168.942	200		Mg X	170.21			Fe VII	171.432	60	
Ni VIII	168.95	20		O V	170.218	220		Co VIII	171.460	30	
K XIV	168.961	8		N IV	170.249	100	Z	Co XXIII	171.50	4	
Na VIII	168.964	35	Q	Sc VI	170.25	250		Co VIII	171.522	10	
Ge VII	168.999	1		Ni VIII	170.27	20		Fe VII	171.529	40	
Si XI	169.0	50	Q	Ge VII	170.292	40		Sc	171.530	200	N
Ar XII	169.00			Mn VI	170.303	220		Fe	171.533	30	N
Ti	169.036	1	N	Co XII	170.33			Ge VII	171.536	50	
Co XII	169.04			Co XI	170.34	2		Ge VII	171.566	80	
Co VIII	169.051	85		Ti VII	170.358	125		Li II	171.582	100	
Fe XXII	169.08	4		Cr VII	170.393	450		Ca XV	171.593	125	
Cr VII	169.084	5		Sc XVI	170.400	30		Ca XVI	171.63		
Sc	169.105	100	N	Fe VII	170.417	25		Mn VI	171.633	120	
Mg III	169.1406	70		Sc XVII	170.45		P	Mg IV	171.655	500	
Ni VIII	169.16	400		N IV	170.463	50	Z	Fe XVI	171.66	300	Q
K XIV	169.165	4		Si	170.5	50	N	Co XI	171.67	2	
F IV	169.166	200	Z	Ni XIV	170.50			Fe VII	171.680	40	
Ge VII	169.174	8		N IV	170.505	100	Z	Ti VIII	171.723	3	Q
Co VIII	169.196	30		Ni VIII	170.52	250		Fe VII	171.779	90	
Sc VI	169.26	350		Sc VI	170.54	150		Co XXII	171.79	10	
Ni VIII	169.27	40		Ti VII	170.559	20		Ge VII	171.816	50	
Ti VII	169.301	20		Fe VII	170.565	4		Sc	171.823	100	N
Ti XVII	169.34			Cr VI	170.569	12		Cu XI	171.875	50	
Cr VI	169.435	150		Fe X	170.58			Ti VII	171.888	20	
Sc	169.451	200	N	Co VIII	170.589	85		Mg III	171.8984	40	
Sc XVII	169.451	90		Ar X	170.63	200		Ge VII	171.929	30	
O IV	169.474	1		Na V	170.631	100		Ti VII	171.952	6	
F IV	169.481	100		Fe VII	170.664	25		K	171.969	10	N
Ca XIII	169.485	245		V XVIII	170.678	10		Se VII	171.974	730	
Cu	169.488	150	N	O VIII	170.692		P	K VIII	172.028	40	
F IV	169.502	100		Co IX	170.695	800		Cu	172.036	400	N
Co VIII	169.537	30		K	170.738	10	N	Cl XII	172.06		
Mn VI	169.551	1		F VIII	170.76		P	Fe VII	172.069	90	
O IV	169.582	5		Mg III	170.8050	150		Ge VII	172.098	330	
Ti XIX	169.590	300	P	O VIII	170.810		P	Ni VIII	172.10	40	
F IV	169.610	100		K	170.814	10	N	Ni XIV	172.16		
Fe	169.616	20	N	F VIII	170.84		P	O V	172.169	750	
K	169.618	10	N	Ni VIII	170.84	10		N IV	172.171		P
F IV	169.661	200		O IV	170.847	1	Z	Ge VII	172.190	50	
Sc XVI	169.664	200		Cr VII	170.850	285		Co IX	172.190	600	
Ni XIV	169.69	30		O VIII	170.851		P	Cr VI	172.204	4	
Si	169.7	50	N	Sc XVI	170.867	40		Ge VII	172.212	120	
As XXVI	169.7		F,P	Mn VI	170.910	1		K XIV	172.252	225	
Co VIII	169.711	30		Na V	170.923	100		K VII	172.294	90	
K XII	169.726	225		O IV	170.935	5	Z	Mg IV	172.311	400	
Cr XIX	169.73	4		Ti VII	170.938	3		Ni VIII	172.32	20	
Ti XVI	169.740	550		Cr VII	170.982	160		K	172.325	40	N
Mg III	169.7411	60		O IV	170.988	20	Z	Co XII	172.33		
F IV	169.748	200		Mn VI	170.990	1		Ti VII	172.353	6	
Sc VIII	169.759	400		F IV	171.066	300		Ca XVI	172.362	100	
Cu	169.765	150	N	Ca	171.073	10	N	Ti XVII	172.380	20	
F IV	169.790	300		O IV	171.074	40		Si VII	172.39	50	Q
Co VIII	169.819	30		Fe IX	171.075	90		Ge VII	172.395	10	
K	169.836	40	N	Na V	171.076	100		Co VIII	172.402	50	
F IV	169.839	300		Ti XVII	171.09		Q	Co XII	172.41		
Cr VII	169.842	5		Co VIII	171.107	50		Co XXIV	172.42	300	
Cr XX	169.87	80		Ne VI	171.12	50	Q	Cr VI	172.487	80	
Fe	169.88	600	N	O IV	171.123	70		Ne IV	172.49	200	
Co XII	169.91			As VII	171.131	18		Ne IV	172.53	250	
Fe	169.915	30	N	Ge VII	171.135	20		Ge VII	172.539	50	
Sc XV	169.964	175		Fe VII	171.166	40		Ge VII	172.549	30	
K XV	169.989	3		O IV	171.188	5		K XII	172.584	225	
Cu	170.007	150	N	Ge VII	171.199	5		K	172.605	160	N
Ge VII	170.016	8		F V	171.214	10		Ne IV	172.62	400	
N IV	170.074	200		F V	171.241	100		F IV	172.653	10	
Cr VII	170.086	5		Ne VI	171.25	20	Q	Ni VIII	172.67	40	
Co XXII	170.09	10		Fe VII	171.279	25		Co VIII	172.767	10	

Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes
Co VIII	172.776	30		Cr VII	174.286	160		Ca	175.655	10	N
Fe VII	172.831	4		Ne IV	174.30	15		Ni VIII	175.67	400	
Cr VI	172.841	50		Ni VIII	174.36	400		C V	175.67		
Ge VII	172.867	15		Ge XXII	174.396	600		Cl XII	175.71		
Co IX	172.917	100		K XII	174.412	275		K XIV	175.723	200	
Se VII	172.928	980		Ca XVI	174.436	70		Cr VI	175.756	150	
Ni VIII	172.93	20		Ni VIII	174.46	250		Co XIII	175.77		
O VI	172.935	750		F V	174.490	300		Na IV	175.7965	40	Z
Fe VII	172.948	1		Ni VIII	174.50	10		Si	175.8	50	N
F V	173.020	100		K	174.502	10	N	Ni VIII	175.80	1000	
O VI	173.082	900		F V	174.513	300		Ti VII	175.812	90	
Si XI	173.10	50	Q	Fe X	174.534	90		Cr VII	175.812	70	
F VI	173.145	100		O V	174.560	40		Ni VIII	175.82	1000	
Cu	173.193	100	N	F V	174.568	300		As VII	175.836	44	
Fe VII	173.203	25		Sc IV	174.57	200	N	Se IV	175.89	200	N
Fe XXII	173.21	4		Cl VII	174.60	200		V XIX	175.90		P
Ge VII	173.218	50		N IV	174.602	200		Ni VIII	175.91	40	
Sc XV	173.245	245		As VII	174.606	35		Se XXIII	175.92	735	
Ge VII	173.260	1		As XXI	174.67	20		Co	175.93	300	N
N VI	173.28		P	Co	174.67	300	N	Na IV	175.930	5	Z
C V	173.281	10		F V	174.698	400		Ni VIII	175.94	750	
Fe XXIII	173.31	10		As VII	174.699	56		Ca	175.998	40	N
Sc	173.346	100	N	Si	174.7	50	N	Ne IV	176.01	250	
Ne X	173.369		P	Co	174.71	300	N	Ca XV	176.018	70	
Co VIII	173.373	30		Ni VIII	174.75	40		Ni VIII	176.03	400	
Ge VII	173.401	6		Ge VII	174.758	6		Cr VI	176.037	200	
Ni VIII	173.41	750		Ge XXI	174.78	50		Cr VII	176.053	110	
Cr XX	173.42	50		Ni VIII	174.79	150		Ca VIII	176.087	1	Q
Fe VII	173.441	200		Co XIII	174.82			Ni XV	176.10		
Ge VII	173.460	2		V XVIII	174.852	10		Ti	176.105	1	N
Sc XV	173.481	50		Ni VIII	174.88	80		K VII	176.120	250	
Ne X	173.498		P	Ne IV	174.88	50		Ni VIII	176.13	250	
B V	173.504		P	K	174.907	1	N	K VII	176.181	40	
Ne X	173.542		P	Ca VIII	174.916	10		Sc XVII	176.181	200	
Co VIII	173.561	10		Ni VIII	174.92	750		Ni VIII	176.21	10	
B V	173.568		P	Ne IV	174.92	40		Cu	176.232	150	N
K XIV	173.570	15		Ni VIII	174.95	40		Ni VIII	176.25	80	
Ga XXIV	173.6		F,P	Ca VIII	174.980	40		Ti XVI	176.267	8	
F V	173.656	10		Ni XV	174.99			Ni VIII	176.29	250	
Kr XXXIV	173.7		P	Si	175.0	100	N	Cr VII	176.295	5	
F V	173.714	10		As VII	175.014	34		Fe	176.32	400	N
Ni XV	173.73			Zn XIX	175.02	100		As VII	176.320	52	
Co VIII	173.742	30		K XIV	175.024	8		Sc	176.325	300	N
Ge VII	173.769	3		F IV	175.033	10		Fe VII	176.345	90	
Sc IX	173.771	300		Ni VIII	175.13	400		Ni VIII	176.35	20	
O IV	173.799	5		F IV	175.132	1		As VII	176.364	22	
As VII	173.817	13		K	175.147	10	N	F IV	176.367	400	
O IV	173.852	20		Mn XXII	175.18	80		Si X	176.4	50	Q
Sc IX	173.858	400		As VII	175.205	15		Ca XVI	176.407	70	
N VI	173.871	20	P	K VII	175.205	160		Ni VIII	176.42	40	
O IV	173.916	40		Ni VIII	175.26	40		Cr XX	176.42	4	
Ne V	173.93	500		Fe X	175.266	50		V XVIII	176.440	5	
Ni VIII	173.95	40		Ge VII	175.273	10		Sc XIV	176.455	30	
N VI	173.958	30	P	Ni VIII	175.28	40		F V	176.472	10	
O IV	173.969	5		Cr VII	175.315	220		Ni VIII	176.50	150	
Cr VI	173.973	4		Ti XIX	175.316		P	Ti	176.538	1	N
Br XXXII	174.		P	Ni VIII	175.32	400		Ar VII	176.57	500	
Na IV	174.0047	160		K XII	175.373	200		Na X	176.59		P
Zn XVIII	174.01	50		K XV	175.406	150		Fe VII	176.599	60	
Fe VIII	174.02	100	N	Cr XX	175.42	150		Ge VII	176.603	1	
Ge VII	174.024	2		Co XII	175.44			Cr VII	176.613	285	
Cl VII	174.04	150		Cr XXI	175.45	150		Ar XII	176.62		
Fe VII	174.069	4		Ge VII	175.454	9		Fe XI	176.620		
Cr VII	174.070	5		As VII	175.462	50		Ni VIII	176.69	80	
O IV	174.105	20		Fe X	175.474	30		K XII	176.691	200	
Sc XVI	174.111	50		Ne V	175.48	18		Ni XV	176.70		
Se XXIV	174.118	650		Cu	175.484	300	N	V XX	176.710		P
Cu XVII	174.12	50		Ni VIII	175.49	20		Fe	176.74	700	N
Ne IV	174.12			Na IV	175.4964	160	Z	Ni VIII	176.74	250	
Ge VII	174.130	0		Ni VIII	175.54	40		Fe VII	176.744	250	
Cr VI	174.175	12		As VII	175.559	56		Se VII	176.791	270	
Cl XII	174.21			Ni VIII	175.56	750		Cu	176.824	100	N
Ni VIII	174.22	10		Ni VIII	175.62	20		Sc XV	176.834	50	
O IV	174.221	40		Cu	175.633	250	N	Cr IX	176.86		
Ni VIII	174.24	750		Ni VIII	175.64	400		Ni VIII	176.87	750	

Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes
Si	176.9	50	N	Cl XI	177.96			Ca VIII	179.219	40	
Fe VII	176.904	40		Ni VIII	177.97	20		Cu	179.223	150	N
Cr VII	176.916	40		F IV	177.971	200		Fe XII	179.265		
Ca XV	176.921	125		Mn XXI	177.99	30		S IX	179.27	450	P
Fe VII	176.928	250		Li II	178.015	100		Ni XV	179.28	20	
As VII	176.932	39		As VII	178.018	55		V VI	179.330	750	
Fe VIII	176.94	700	N	Ni VIII	178.06	20		Sc XVI	179.343	20	
Ni VIII	176.95	250		Fe XI	178.060	40		Ge VII	179.351	290	
As VII	176.974	25		Na VI	178.061	20		Ar VIII	179.40	500	
Ni VIII	176.98	40		K	178.100	90	N	Al XIII	179.405		P
Fe	176.982	40	N	F IV	178.126	100		As VII	179.408	28	
O IV	177.0	10	Q, Z	Fe	178.15	600	N	Sc V	179.42	150	
Cl XI	177.00			Ar XII	178.15			Ca XV	179.463	10	
K	177.046	40	N	Co XXV	178.199		P	Ca VIII	179.511	90	
N V	177.1		P, Z	K XIII	178.205	150		K XIII	179.514	225	
Ni VIII	177.10	10		Ge VII	178.215	0		N IV	179.554	2	Z
Cl XII	177.11			Ti XVI	178.240	30		Mn VI	179.572	10	
N IV	177.119	100	Z	Na VI	178.244	15		Co XIII	179.59		
N IV	177.142	80	Z	Ca VIII	178.250	90		Al XIII	179.604		P
Ne IV	177.16	400		V XIX	178.32			Cu	179.630	15	N
N IV	177.163	200	Z	Ca	178.413	10	N	Fe VII	179.656	4	
Fe VII	177.172	200		F V	178.434	500		Al XIII	179.671		P
N IV	177.182	100	Z	Ge VII	178.472	30		P XV	179.680		P
Ni VIII	177.19	400		Cu	178.489	150	N	Cr VII	179.682	5	
Br XXVIII	177.2		F, P	Si	178.5	50	N	Br XXXIII	179.7		P
V VII	177.20			Mn VI	178.515	110		Fe VII	179.720	4	
Ga XX	177.21	50		Ni VIII	178.52	80		Ge VII	179.721	10	
Fe VII	177.235	10		F IV	178.540	100		Co VIII	179.731	120	
As VII	177.236	40		N IV	178.547	1	Z	Fe XI	179.762	40	
Ti VII	177.238	60		Ti VII	178.572	10		Ni VIII	179.77	40	
Na II	177.24		A, Z	Ca IX	178.577	160		Cr VII	179.776	40	
Fe X	177.243	80		F V	178.590	400		F IV	179.827	100	
Ca XV	177.252	100		Mn XV	178.61	30		Ti	179.842	1	N
Ni XIV	177.28			Ge VII	178.610	100		As VII	179.843	16	
Ni VIII	177.29	80		F V	178.612	300		Ge VII	179.845	5	
Co	177.30	300	N	Na XI	178.618		P	K XIII	179.855	3	
Ni VIII	177.32	40		Sc XV	178.631	20		P XV	179.865		P
Fe VII	177.329	120		As VII	178.634	51		Ti XVIII	179.902	4	
Ge VII	177.374	60		Se XXIV	178.643	250		F IV	179.907	1	
Ni VIII	177.43	80		Ca VIII	178.645	160		Ti	179.91	250	N
Sc XV	177.436	150		F IV	178.670	300		Ge VII	179.928	30	
Cu	177.466	200	N	Ti VII	178.673	20		F IV	179.943	200	
Fe VII	177.503	60		Ca VIII	178.687	10		Co VIII	179.949	120	
S X	177.55	250		Mn XV	178.69	30		Ni VIII	179.97	550	
Fe VII	177.555	60		As VII	178.700	30		Ne V	180.0		N
Ni XIV	177.56			O V	178.715	70		Cu XI	180.001	100	
O IV	177.562	5	Z	F IV	178.724	100		F IV	180.029	10	
Co XI	177.59	1		Fe XII	178.725	20	Q	Fe VII	180.059	60	
As VII	177.591	24		Ni XV	178.75			Ni XV	180.06		
O IV	177.594	5	Z	Ca VIII	178.751	1		Mg IV	180.069	240	
Fe	177.597	30	N	Ni VIII	178.77	400		Ar VI	180.07	80	
N IV	177.602	100	Z	As VII	178.779	15		V XIX	180.07		
N IV	177.621	100	Z	Si XII	178.8	50	Q	Fe XXIII	180.10	4	
Ni VIII	177.63	10		F IV	178.805	100		Ni VIII	180.12	250	
Na VI	177.637	30		K XV	178.807	20		Sc V	180.14	350	
N IV	177.646	250	Z	Na XI	178.810		P	Se VII	180.2	80	N
O IV	177.662	5	Z	Sc VIII	178.821	200		Si	180.2	50	N
Zn XIX	177.67	300		Cr VII	178.851	1		Ge VII	180.240	160	
Sc	177.686	200	N	Ni XV	178.87			Ar VIII	180.25	750	
O IV	177.693	20	Z	Na XI	178.875		P	Sc VII	180.260	200	Q
Cr VII	177.694	70		Ni VIII	178.91	250		As VII	180.264	8	
Ti	177.729	1	N	Ca IX	178.944	160		Ge VII	180.280	790	
Ni VIII	177.73	40		Kr XXVI	178.965		P	Ar XIV	180.29		
O IV	177.762	20	Z	Ge VII	178.966	1		Ge VII	180.319	110	
Al X	177.80			Co XIII	178.98			O IV	180.354	20	
O IV	177.801	40	Z	Ca	178.984	40	N	S X	180.36	150	
K	177.812	40	N	Fe	179.00	500	N	Ge VII	180.366	470	
Ni VIII	177.83	10		Al V	179.003	5		Cr XIX	180.37	30	
Ni VIII	177.87	10		Co VIII	179.068	250		K XII	180.370	200	
Ge VII	177.873	20		P XV	179.084		P	Ge VII	180.389	180	
Ca VIII	177.892	160		Ti VII	179.107	10		Ni VIII	180.39	250	
Cr VII	177.895	70		Co VIII	179.147	150		Ne IV	180.40	75	
Ge VII	177.907	2		Cr XIX	179.18	50		Fe XI	180.407	90	
K	177.918	40	N	Ge VII	179.180	160		Co VIII	180.422	10	
Co	177.93	300	N	Cr XX	179.21	50		Co XII	180.45		



Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes
Fe X	180.45			Mn XXII	181.69	10		V XIX	182.60		P
Ge VII	180.458	220		Si	181.7	50	N	Sc	182.618	100	N
Mn VI	180.474	40		Mn VI	181.708	80		K VIII	182.643	40	
Fe VII	180.477	25		N IV	181.746	400		Ca X	182.644	40	Q
O IV	180.480	40		Na IV	181.7565	285		As VII	182.682	31	
Ge VII	180.500	180		Na IV	181.7640	160		Co VIII	182.686	50	
Ti XVIII	180.52			Co VIII	181.786	10		Mn VII	182.692	200	
As VII	180.541	50		V XX	181.801		P	Ge VII	182.703	110	
Cr IX	180.57			Ca XIII	181.81		P	O IV	182.706	70	
V XX	180.577		P	Mg XII	181.828		P	Ca VIII	182.710	160	
Ca	180.582	90	N	Cl XI	181.84			Ge VII	182.732	400	
Fe XI	180.600	30		Mn VI	181.849	130		Fe VII	182.740	40	
Mg IV	180.615	500		Mg X	181.86			Sc VII	182.743	100	
Mn VI	180.626	60		Ge VII	181.862	2		K XII	182.752	30	
Ge VII	180.665	30		O IV	181.866	20		Ni VIII	182.76	20	
Sc XVI	180.687	285		O IV	181.887	40		Ge VII	182.776	380	
Sc XVIII	180.703		P	N IV	181.895		P	N IV	182.779		P
Cl IX	180.71			Mn VI	181.897	120		Ni VIII	182.79	20	
Ge VII	180.715	60		Ge VII	181.907	300		Ca	182.794	1	N
Ar VI	180.72	120		Ca XV	181.908	175		K	182.818	20	N
S X	180.72	350		Ge VII	181.929	380		O IV	182.827	110	
Ge VII	180.721	70		N IV	181.943	10		N IV	182.827	30	
Ni VIII	180.74	40		K	181.974	20	N	Ne IV	182.83		
Fe VII	180.760	10		Mn VI	181.980	70		Ca XV	182.859	30	
K	180.780	10	N	K	181.991	90	N	Ni VIII	182.87	80	
Mg IV	180.794	400		O IV	181.994	70		Ge VII	182.888	110	
As VII	180.797	38		Se XXXI	182.		P	N IV	182.894	10	Z
Mn VI	180.817	15		Si	182.0	50	N	Ge VII	182.939	540	
Sc V	180.82	200		As XXIII	182.009	950		Ni VIII	182.94	40	
Cr XX	180.85	80		Ge VII	182.011	120		Mn VII	182.945	100	
Cl XI	180.85			O IV	182.015	20		Ni VIII	182.96	80	
S XVI	180.864		P	Mn VI	182.048	90		Mg III	182.9717	120	
Co XIII	180.87			V VI	182.050	450		F V	182.979	400	
K XV	180.878	20		Fe VII	182.071	60		As VII	182.984	40	
Ge VII	180.892	15		Ti XVII	182.072	150		Ni VIII	182.99	40	
Si	180.9	50	N	Co XIII	182.09			Sc VII	182.993	400	
K	180.917	10	N	C VI	182.097		P	V VII	183.00		
N IV	180.928	5	Z	Mg XII	182.100		P	F V	183.016	300	
Sc V	180.96	200		Na IV	182.1230	160		Ni VIII	183.02	40	
Cu	180.986	200	N	Ge VII	182.124	280		Ge VII	183.033	30	
Na III	181.023	30		Na IV	182.1322	220		Ge VII	183.093	720	
Ca XVI	181.041	70		Ti VI	182.151	90		V VII	183.12		
As VII	181.093	18		Na X	182.16		P	As VII	183.135	21	
Ni VIII	181.10	40		Ge VII	182.162	500		Mn VII	183.141	500	
Fe VII	181.104	25		Fe XI	182.173	60		N IV	183.146	5	
Fe XI	181.140	40		Mg XII	182.189		P	Ge VII	183.146	170	
O IV	181.150	110		O V	182.205	40		Ni VIII	183.16	10	
Sc XV	181.165	345		Fe VII	182.221	10		Co VIII	183.167	10	
Ge VII	181.182	400		Ge VII	182.227	60		Ne IV	183.17	75	
Ge VII	181.219	810		C VI	182.230		P	Ge VII	183.181	60	
O V	181.26	10	P	Mg III	182.2415	150		Ca	183.184	1	N
K VI	181.265	50	N	Ni VIII	182.27	20		F V	183.208	10	
O IV	181.277	160		V VII	182.27			Ni VIII	183.23	10	
Ge VII	181.327	310		N IV	182.275		P	Ne IV	183.25	60	
Mg IV	181.344	280		Ge VII	182.283	310		Ge VII	183.258	110	
S XVI	181.353		P	Mn VI	182.286	250		Co VIII	183.266	30	
Mn VI	181.357	160		Na IV	182.2885	160		Si	183.3	50	N
Mn	181.37	300	N	Fe X	182.310	30		O IV	183.338	5	
Ne X	181.470		P	Ge VII	182.312	910		Ge VII	183.366	140	
Na III	181.476	30		N IV	182.323	20		O IV	183.382	20	
F IV	181.521	400		Co VIII	182.355	50		Ni VIII	183.39	20	
S XVI	181.521		P	Sc V	182.392	200	Q	N IV	183.402	35	
Sc V	181.55	50		Ge VII	182.409	950		Ar XIV	183.41		
Fe XXI	181.57	4		Ca XV	182.41	15		Mg IV	183.439	220	
F IV	181.571	400		V VII	182.43			Ni VIII	183.44	40	
As VII	181.574	39		Ni VIII	182.44	400		O IV	183.444	20	
Mg X	181.60		P	Mn XXI	182.48	10		N IV	183.450	50	
Mn VI	181.602	80		Mn VII	182.499	300		Ca XIV	183.457	150	
Ne IV	181.61	100		Si	182.5	20	N	V VII	183.46		
Ne X	181.610		P	Na III	182.511	10		Ge VII	183.462	70	
Mn VI	181.617	50		As VII	182.515	53		Cu XVII	183.47	50	
Fe VII	181.646	25		Co XIII	182.52			Ne VIII	183.5		
Ne IV	181.65	100		Ge VII	182.540	1000		Ni VIII	183.51	150	
F IV	181.655	200		Ni VIII	182.55	40		Na III	183.515	10	
Ne X	181.658		P	Ge VII	182.559	300		Fe VII	183.539	90	

Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes
Na III	183.556	30		Co XIV	184.41			Sc VII	185.526	300	
Na III	183.571	40		Fe XI	184.41			O IV	185.535	20	
Ge VII	183.578	370		Ca V	184.415			Ca V	185.540	100	
Sc X	183.593	370		Ga XXI	184.428	800		Fe VII	185.547	200	
Ge VII	183.600	80		Ca IX	184.432	360		N IV	185.568	3	
Sc VIII	183.626	130		As VII	184.435	33		Sc VII	185.575	40	
Ni VIII	183.63	10		N IV	184.437	1		Cu XVIII	185.58	10	
Ca	183.648	1	N	Ni VIII	184.44	550		Mg II	185.59		A, Z
Co XIII	183.65			Ge VII	184.463	20		Ge VII	185.598	60	
Ga XX	183.65	50		Cr XXI	184.48	110		Si X	185.6	50	Q
Sc	183.673	100	N	Sc IV	184.484	5		N IV	185.623	5	
As VII	183.681	33		N IV	184.485	2		Ni VIII	185.65	80	
Co VIII	183.686	10		Si	184.5	50	N	As VII	185.659	49	
Mn VII	183.708	100		Ar XI	184.51			Ge VII	185.683	330	
Ne V	183.72	18		Mn VII	184.538	200		O V	185.745	450	
Mn	183.72	600	N	Fe X	184.542	60		Ca XIV	185.763	100	
Na III	183.729	30		Ge VII	184.578	30		Fe VII	185.773	4	
Ca	183.733	10	N	K XV	184.58			Ge VII	185.798	210	
Na III	183.747	40		Ni VIII	184.58	10		Sc VII	185.808	330	
Ni VIII	183.80	40		K IX	184.590	250		Ge VII	185.809	270	
Na V	183.806	30	Q	Sc VII	184.607	200		Ni VIII	185.82	10	
N VII	183.811		P	Ni VIII	184.62	10		Co VIII	185.835	10	
Fe VII	183.825	200		Ge VII	184.633	40		N IV	185.853	75	Z
Ni VIII	183.83	900		Ge VII	184.661	70		As XXII	185.87	50	
Fe VII	183.884	40		Ni VIII	184.68	40		K IX	185.881	360	
N VII	183.894		P	Mg II	184.68		A	K XIV	185.883	125	
Ni VIII	183.91	80		Fe XI	184.70		P	Sc IV	185.927	5	
Mg IV	183.915	140		Ne V	184.73	100		Ge VII	185.936	580	
N VII	183.923		P	Fe VII	184.752	60		Sc XVI	185.972	150	
O VI	183.937	360		Mn IX	184.80			Mg II	185.98		A, Z
Co VIII	183.939	50		Fe XI	184.800	30		Ge VII	186.006	2	
Na III	183.946	50		Mg II	184.81		A, Z	Ca	186.052	10	N
Sc VII	183.96	200		Co VIII	184.850	10		Cl X	186.06		
Ge VII	183.960	430		Co VIII	184.861	10		N V	186.063	520	
Ni VIII	183.97	20		Fe VII	184.886	40		Ge VII	186.070	70	
Mn VI	184.001	350		Ni XV	184.89			Se XXXII	186.1		P
Na III	184.018	40		Ar XIII	184.90			Ge VII	186.122	280	
As VII	184.067	52		Ge VII	184.921	0		As XXIII	186.142	180	
Ge VII	184.073	1		Ni X	184.937	150		N V	186.149	620	
Mg II	184.09		A, Z	Cu	184.938	7	N	Ge VII	186.159	50	
V XVII	184.1		P	Ni VIII	184.95	40		Ni VIII	186.16	10	
Ti VI	184.106	35		Ge VII	184.966	200		Ni VIII	186.18	80	
Fe VII	184.114	25		Ge VII	184.980	670		N IV	186.218	50	Z
O VI	184.117	450		Co VIII	185.041	10		As VII	186.269	40	
Ni VIII	184.12	900		As VII	185.068	47		Cu	186.296	150	N
Sc VIII	184.12			Ca V	185.102	100		Ni VIII	186.31	10	
Ge VII	184.144	560		Ge VII	185.117	830		V XIX	186.32	175	
Mn VII	184.161	300		K XV	185.123	15		C V	186.329		P
Ca VIII	184.162	250		Ge VII	185.131	330		Mn	186.35	500	N
Mn	184.19	700	N	Fe VII	185.176	25		Zn XIX	186.38	500	
Mg IV	184.190	80		Ni VIII	185.18	20		Ar XIII	186.38		
Na III	184.193	40		N VI	185.192	9		Ca XV	186.391	60	
Ni VIII	184.20	10		As VII	185.206	55		Ti	186.417	1	N
N IV	184.200	50		Fe VIII	185.213	700		O V	186.442	1	
Co VIII	184.203	120		Sc	185.219	100	N	Mg II	186.47		A, Z
Na III	184.206	40		Ni VIII	185.23	10		Ni VIII	186.49	250	
Ge VII	184.218	50		Ni XVI	185.23			Mg III	186.5149	200	
N IV	184.247	75		N IV	185.237	50		Ge VII	186.517	100	
Co VIII	184.265	150		Mn	185.24	500	N	Ge VII	186.528	110	
Ar VIII	184.27	150		N IV	185.257	150		Mn VI	186.545	40	
Ca V	184.280	150		Cl IX	185.26			F IV	186.558	100	
Ge VII	184.280	680		Mg II	185.26		A	Ne IV	186.58	750	
Ge VII	184.305	8		Ca V	185.288	50		Si	186.6	50	N
Mg II	184.31		A, Z	N IV	185.306	200		Fe VIII	186.601	600	
As VII	184.310	53		Ge VII	185.308	120		Ca XIV	186.613	225	
Ar VIII	184.32	250		As VII	185.381	13		Fe VII	186.657	150	
Cu XI	184.320	40		Co XIII	185.39			N IV	186.690	150	
Ca IX	184.333	160		O IV	185.402	5		C V	186.697	30	
Co VIII	184.356	10		Ge VII	185.406	100		Ge VII	186.706	500	
Ca IX	184.372	250		Mn VIII	185.46	900		N IV	186.709	250	
Ge VII	184.377	130		Co VIII	185.461	10		F V	186.715	400	
Ge XX	184.38	300		Fe VII	185.465	4		C V	186.745	30	
Ge VII	184.386	100		Ne IV	185.48	100		N IV	186.759	300	
Ni VIII	184.40	10		F IV	185.484	300		Ni VIII	186.76	10	
Na III	184.409	40		Ge VII	185.489	1		F V	186.788	400	

Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes
Ne IV	186.79	25		F IV	187.916	100		Mn VI	188.862	60	
Co XIV	186.79			Ge VII	187.949	90		Na III	188.873	40	
K XV	186.799	3		Ar XIV	187.95			Co XIII	188.89		
Mn VI	186.805	5		Mn VI	187.955	80		Mg II	188.91		A, Z
Ge VII	186.837	90		Mn	187.96	500	N	Ge VII	188.978	80	
Mg II	186.84		A, Z	Fe VII	187.990	40		Ca XIV	188.991	150	
F V	186.842	500		F IV	188.004	10		Mg II	189.01		A, Z
S XI	186.85	200		Co VIII	188.054	10		Fe XI	189.017	30	
Fe XII	186.856			Ni VIII	188.06	20		Co VIII	189.040	10	
Ni VIII	186.86	10		Ge VII	188.088	20		Ge VII	189.047	30	
Ti XVII	186.863	40		Mn	188.09	500	N	Mn	189.06	800	N
Fe VII	186.868	90		Mn VI	188.097	250		Mn VI	189.078	500	
O IV	186.870	20		Fe VII	188.125	40		Fe XI	189.129	30	
F V	186.879	300		Ni XXV	188.13	10		Mn VI	189.129	400	
Fe XII	186.880	17		Mn VI	188.137	50		Mn IX	189.16	800	
Ge VII	186.894	5		O IV	188.151	40		Ni XV	189.21		
Sc XVIII	186.918		P	Mn VI	188.160	450		Mg II	189.23		A, Z
Ne IV	186.92	75		Co VIII	188.165	10		Ge VII	189.274	250	
Ni VIII	186.93	40		Fe XII	188.170			Na III	189.348	50	
O IV	186.935	40		Ge VII	188.173	2		N IV	189.365	1	
Mn VI	186.942	10		N VII	188.174		P	Mg II	189.37		A, Z
F V	186.968	400		Na IV	188.178	5		N IV	189.386	5	
O IV	186.978	5		O IV	188.185	1		N IV	189.437	10	
Fe	186.983	20	N	Mn	188.19	600	N	Fe VII	189.450	90	
F V	187.008	400		Cu XVIII	188.20	30		Mn VI	189.460	70	
Ne X	187.012		P	O IV	188.210	1		Ti XIX	189.468	100	P
Cr XIV	187.02	10		Fe XI	188.219	70		Co VIII	189.472	10	
Ni VIII	187.08	10		Mn VI	188.233	15		Na VI	189.473	10	
Ar XI	187.08			Co VIII	188.241	10		Mn	189.49	500	N
F IV	187.105	200		N VII	188.261		P	Ca IX	189.491	90	
N IV	187.123	10		Ge VII	188.282	160		Fe	189.50	300	N
N IV	187.142	10		N VII	188.291		P	Fe XII	189.561		N
Ge VII	187.145	240		Si	188.3	50	N	Mn VI	189.569	100	
Mg X	187.17			Ge VII	188.302	190		Ar XI	189.57		
V XX	187.185		P	Ti XVII	188.312	100		Fe VII	189.573	1	
Mg II	187.19		A, Z	Ca	188.331	10	N	Br XXV	189.620	400	
N IV	187.194	20		Co VIII	188.345	30		Ti XVIII	189.663	5	
Mg III	187.1977	200		Fe VII	188.396	150		Ge VII	189.724	120	
Ni VIII	187.20	20		O IV	188.405	5	Z	Fe XI	189.735	30	
Ni VIII	187.23	10		Ge VII	188.418	100		Ca	189.737	10	N
Fe VII	187.235	150		Ne V	188.42	30	Q	Fe VII	189.756	25	
Fe VIII	187.237	300		Co XIII	188.42			K XV	189.766	1	
F IV	187.240	300		Mn VI	188.438	10		Mn	189.82	400	N
Ca XVI	187.246	150		Mn XXII	188.45	50		Mn VI	189.837	30	
Na X	187.25		P	Fe XII	188.45			K XIV	189.85		
Fe	187.27	600	N	Ge VII	188.457	20		Ge VII	189.881	870	
Mn VI	187.278	90		Sc XV	188.476	60		Fe XI	189.940	30	
Cr XIV	187.30	10		Mn IX	188.48	900		F V	189.943	200	
Ne X	187.323		P	O IV	188.494	1	Z	Al V	189.977	2	
As VII	187.369	40		Fe	188.498	40	N	Mn IX	189.98		
Co VIII	187.375	10		Mg III	188.5296	100		S X	189.99	150	
Mg II	187.38		A, Z	Mg II	188.54		A, Z	Ge VII	189.990	10	
Mn VI	187.398	40		Ge VII	188.552	30		As XXX	190.		N, P
Ne X	187.423		P	Fe VII	188.576	150		Ge VII	190.026	120	
Fe XI	187.446			Ni VIII	188.58	150		Cl XI	190.03		
Mn	187.45	500	N	N IV	188.583	100		Fe X	190.044	50	
Na X	187.49		P	Co XIV	188.60			Fe XII	190.06		
Mn VI	187.495	30		N IV	188.606	200		Ge VII	190.062	40	
Ca	187.515	40	N	Ge VII	188.620	10		Na IV	190.1300	285	
Ca	187.534	90	N	N IV	188.656	250		N V	190.155	200	
Ti XVIII	187.55			F IV	188.656	200		Ti XI	190.181	1	Q
Mn	187.63	400	N	Ca XIII	188.658	15		Mn XX	190.23	4	
Ti	187.671	1	N	Mn	188.67	600	N	N V	190.249	320	
Fe VII	187.692	90		Co VIII	188.674	10		Si XIV	190.266		P
Mn VI	187.695	10		S XI	188.68	225		Ge VII	190.285	20	
Ti	187.752	1	N	Ge VII	188.699	300		Co VIII	190.342	85	
Mn VI	187.756	130		N IV	188.743	100		Ca V	190.363	200	
Mn	187.76	500	N	Mn VI	188.748	90		Mn VI	190.365	20	
Cr XX	187.79	30		F IV	188.758	100		S XI	190.37	250	
Ti	187.819	1	N	N IV	188.762	200		K	190.379	1	N
Ge VII	187.828	5		N IV	188.818	300		Ge VII	190.406	730	
Ge VII	187.858	740		Ar XI	188.82			Na IV	190.423	20	
Ni VIII	187.87	10		F IV	188.834	10		Na IV	190.4337	360	
Co XIV	187.89			Na III	188.858	30		Na IV	190.4453	450	
Co VIII	187.909	10		Fe	188.86	500	N	Ca V	190.457	250	

Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes
Fe XII	190.459			Ge VII	191.466	10		Mn VI	192.441	80	
K	190.475	1	N	S VI	191.48	20		Ti VII	192.474	6	Q
Sc XV	190.479	150		Ca V	191.480	100		N IV	192.533	10	Z
Mn VI	190.480	10		Ge VII	191.505	230		Mg II	192.55		A, Z
Ge VII	190.512	2		Na III	191.511	30		Na IV	192.551	5	
K XIV	190.551	7		O V	191.550	20		Ge VII	192.570	850	
Si XIV	190.555		P	S VI	191.56	50		Cu	192.585	7	N
Ca V	190.558	150		Mg II	191.56		A	Ni X	192.599	250	
Mn VI	190.565	15		Ge VII	191.570	30		Sc VII	192.607	150	
Al V	190.569	10		Ge VII	191.578	30		Co VIII	192.619	10	
Ne IV	190.57	125		O IV	191.583	20		Ar VII	192.64	350	
F V	190.571	600		Ne VI	191.59	20	Q	Fe XI	192.641	20	
Ca XV	190.571	20		Mn IX	191.60	700		Ar XII	192.66		
Co VIII	190.574	10		Sc VII	191.602	300		Mn VI	192.675	10	
Cl VII	190.59	100		O IV	191.607	40		Ge VII	192.685	130	
Ge VII	190.606	2		Ca XIV	191.614	50		Ti VI	192.710	20	
Ge XXII	190.614	500		Ca XV	191.614	50		Ge VII	192.722	10	
Mn VI	190.625	150		O IV	191.631	20		O V	192.751	650	
N IV	190.625	200		Co VIII	191.645	10		Ti VI	192.754	250	
Co XIV	190.65			Mg II	191.65		A, Z	Ge VII	192.781	5	
Ne IV	190.65	75		N IV	191.651	250		O V	192.799	750	
Si XIV	190.650		P	N IV	191.676	100		S X	192.80	50	P
Ge VII	190.652	90		O IV	191.680	20		Fe XI	192.819	50	
Sc VII	190.654	400		O IV	191.699	40		Cr XX	192.82	4	
Ge VII	190.673	270		N IV	191.702	400		N IV	192.823		P
Mn VI	190.700	350		N IV	191.727	150		Mg II	192.84		A, Z
Ge VII	190.724	100		N IV	191.748	120		K XIV	192.85		
Mn	190.73	600	N	O IV	191.748	70		Ca XVII	192.858	250	P
Co XIV	190.75			Co VIII	191.757	10		N IV	192.859	400	
Mn VI	190.753	250		Co XIV	191.76			Ge VII	192.860	60	
Ti	190.762	1	N	Ar VII	191.76	150		N IV	192.888	100	
Ge VII	190.767	20		Ne VI	191.77	20	Q	As XXXI	192.9		P
K XIV	190.779	5		Ca V	191.801	100		O V	192.906	900	
Co XIV	190.82			Na III	191.808	20		N IV	192.908	100	
Ge VII	190.821	50		Ge VII	191.847	30		N IV	192.941	10	P
Na IV	190.8273	360		N IV	191.868	150		Ge VII	192.943	130	
Na IV	190.8359	360		Ge VII	191.887	60		O V	193.003	160	
F V	190.839	700		F V	191.892	300		Sc VII	193.004	300	
Ge VII	190.851	20		N IV	191.898	350		Mg II	193.09		A, Z
K	190.852	10	N	N IV	191.951	350		Ge VII	193.122	30	
Mn VI	190.890	30		F V	191.973	400		Sc X	193.128	100	
K XV	190.90		P	Ge VII	191.994	100		N IV	193.139	200	
Ge VII	190.906	3		Ne V	192.0		N	N IV	193.160	300	
Cl XI	190.94			Fe VIII	192.004	200		N IV	193.214	350	
Ar XI	190.96			Fe VII	192.006	150		Mg II	193.31		A, Z
Cr XXI	190.98	50		Fe XXIV	192.017	300	P	K	193.313	1	N
Na IV	190.9992	285		Fe XI	192.020			Sc	193.332	200	N
Na III	191.000	50		Ca	192.032	1	N	Ti XVIII	193.39		P
Fe XII	191.045	20		Ar VII	192.04	250		N V	193.4		ZZ
Mn VI	191.059	120		Mn VI	192.050	350		Mg II	193.40		A, Z
Ge VII	191.081	70		Cl XI	192.06			Zn XIX	193.42	500	
Mn VI	191.091	200		Mn X	192.08	600		Fe VII	193.421	4	
Mn VI	191.130	70		Ge VII	192.081	730		Mn X	193.43	600	
Ge VII	191.163	580		Mn VI	192.101	500		Ge VII	193.473	70	
Fe	191.20	200	N	Ti VII	192.102	3	Q	S X	193.49	150	
Ge VII	191.204	20		O IV	192.138	70		Ti VII	193.501	1	Q
Na VI	191.205	10	Q	K	192.161	90	N	Fe XII	193.509	60	
Mn VI	191.227	200		O IV	192.163	110		Ge VII	193.513	10	
N IV	191.228	100	Z	Mn XX	192.20	4		Ti XIX	193.530	0	P
Ti XVIII	191.23			O IV	192.200	160		Ti VII	193.534	3	Q
Mn XII	191.23	400	Q	Mn XV	192.22	600	Q	Sc XVII	193.558	200	
Ge VII	191.230	10		Ge VII	192.223	380		Ti VII	193.585	6	Q
S XI	191.26	250		Mn VI	192.225	450		Ge VII	193.589	120	
Co VIII	191.262	50		O IV	192.231	40		Mn	193.59	500	N
Ca XIV	191.273	30		S VI	192.27	20		Mg II	193.64		A, Z
Cl VII	191.28	200		Ti VII	192.272	3	Q	Ge VII	193.655	1	
Mg II	191.30		A, Z	Ge VII	192.310	180		Ti VII	193.668	10	Q
Ge VII	191.306	40		Mn VI	192.327	50		Si	193.67		N
Na III	191.307	40		Co VIII	192.332	10		Ar XII	193.68	30	
Ge VII	191.339	10		Ge VII	192.343	5		Mn VI	193.706	60	
Ar XIV	191.35			Fe XII	192.394	25		Ge VII	193.732	230	
O V	191.400	1		Mg II	192.40		A	Ti	193.737	1	N
Ge VII	191.439	10		Fe XXI	192.40		P	Ge VII	193.754	20	
Ca V	191.439	150		Mn	192.42	500	N	Ti	193.791	1	N
O V	191.460	5		Ge VII	192.423	0		Na III	193.804	50	

Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes
Ge VII	193.864	1		Fe XII	195.119	90		Ge VII	196.798	0	
Ca XIV	193.874	265		Fe XII	195.19			N IV	196.802	100	Z
Sc IV	193.897	40		N IV	195.202	20	Z	Mn VI	196.809	150	
Ge VII	193.900	110		Cl XIII	195.22			S X	196.83	200	
V XIX	193.93			Cl VI	195.23	150		N IV	196.866	500	Z
K XV	193.930	3		N IV	195.258	100	Z	F V	196.870	100	
Fe VIII	193.967	100		Mn	195.28	500	N	Fe VII	196.917	60	
Na III	194.037	50		Ne VIII	195.3			N IV	196.921	200	
Ti XI	194.039	1	Q	Ne V	195.37	50		Fe XII	196.923		
Ni XVI	194.04			Zn XX	195.375	600		Fe VII	196.944	25	
Mn XI	194.07	400	Q	Ge VII	195.383	10		N IV	196.944	400	
N IV	194.083	75	Z	Fe VII	195.391	350		C IV	196.96	2	
Ge VII	194.084	20		Fe X	195.399			F IV	196.968	100	
Ar XI	194.09			Ge VII	195.411	170		Ca V	196.970	250	
F V	194.108	300		K XIV	195.422	40		K	196.975	40	N
Na III	194.121	40		Sc IV	195.455	40		N IV	197.000	400	
Ge VII	194.146	20		Fe	195.476	1000	N	Ca	197.002	90	N
Ne X	194.153		P	Ge VII	195.507	20		Co XIV	197.01		
Na III	194.168	50		Ni XV	195.52			C V	197.024	4	
K	194.217	1	N	Na III	195.532	60		Fe XVII	197.029	30	
Sc XVI	194.263	20		Ne V	195.55	30		P IX	197.04	200	
Ne IV	194.28	500		K	195.572	10	N	Mn VI	197.070	60	
Si XI	194.28		F, Q	N IV	195.610	1	Z	Si XI	197.1		Q
Na III	194.292	50		Ne V	195.62	20		F IV	197.108	200	
Mn X	194.30	600		Co XIV	195.66			Cu	197.128	300	N
Fe	194.31		N	Ge VII	195.676	10		Ti	197.178	3	N
Ne X	194.312		P	Cl XI	195.69			N IV	197.230	500	
B V	194.317		P	Ge VII	195.755	3		P IX	197.27	900	
Na III	194.322	40		K XIV	195.79			F IV	197.298	100	Q
Ti XIX	194.361		P	Mn VI	195.802	300		N IV	197.343	2	Z
Ne X	194.365		P	Mn X	195.85	500		Ge VII	197.344	130	
Mn X	194.37			O IV	195.863	285		Fe VIII	197.362	230	
Ar XIV	194.39			Fe VIII	195.972	400		Ni XVII	197.39		
B V	194.395		P	O IV	196.009	360		Ni X	197.405	170	
Ti	194.420	1	N	Sc XVII	196.010	20		Mn VI	197.423	10	
Ge XXII	194.435	150		Fe	196.046	750	N	Fe XIII	197.434	30	
Na III	194.461	50		Fe VII	196.046	150		Ti VI	197.460	200	
Ne IV	194.48	200		Na III	196.054	50		Ca V	197.531	100	
Ti	194.490	3	N	Ge VII	196.067	10		Co XV	197.54		
Na III	194.530	20		Mn VI	196.111	40		Cu	197.598	300	N
Na III	194.550	50		Cl VII	196.12	500		Ne IV	197.6		N
K	194.593	50	N	S X	196.14	100		Cr XXI	197.61	10	
O V	194.593	360		K XIV	196.151	8		F V	197.615	1	
Al XIII	194.601		P	Ge VII	196.155	10		Ti	197.629	6	N
Mn IX	194.61	600		C IV	196.27	2		Mn VI	197.635	150	
Fe XII	194.61			Ge VII	196.304	30		Mn	197.64	500	N
Ne IV	194.62	250		Cl XII	196.33			Ca V	197.648	100	
P IX	194.63	600		O IV	196.349	20	Z	Ca V	197.685	20	
N VII	194.633		P	F IV	196.351	400		Ca	197.695	90	N
Na III	194.639	50		Cu	196.363	100	N	Ti	197.697	6	N
K	194.657	10	N	Mn IX	196.38	500		K	197.743	40	N
Fe VIII	194.662	500		Cl VII	196.39	400		Mg II	197.76		A, Z
Na III	194.684	60		F IV	196.390	500		F V	197.780	10	
Sc XVI	194.685	245		Ge VII	196.391	20		Cl XII	197.82		
N VII	194.725		P	Cu XVIII	196.40	50		C IV	197.82	5	
V XX	194.747		P	O IV	196.422	5	Z	Ca	197.821	40	N
N VII	194.757		P	K	196.423	10	N	Ti XVIII	197.838	4	
V XVIII	194.76		P	Fe VII	196.423	120		Ti	197.843	3	N
Fe	194.762	250	N	Ge VII	196.439	30		Mn VI	197.856	10	
Cl VI	194.80	100		Ti	196.443	1	N	Sc VII	197.875	50	
Sc VII	194.813	40	Q	F IV	196.448	600		Ni X	197.909	150	
Ga XIX	194.83	20		Fe VII	196.453	40		Ge XXIX	198.		P
Al XIII	194.831		P	K VIII	196.461	40		O IV	198.031	70	Z
F VI	194.840	100		Co XIV	196.48			Mn XXI	198.04	10	
Mn VI	194.857	200		Fe XIII	196.525	50		K	198.074	90	N
Mn	194.88	600	N	Mn VI	196.531	300		Ti	198.079	1	N
Ti VI	194.900	200		Mn	196.54	500	N	Ca	198.100	160	N
Al XIII	194.908		P	Ge XXI	196.57	680		Ti	198.137	3	N
Fe XII	194.920			Ge VII	196.584	1		Ca	198.201	1	N
K	194.954	1	N	Cu	196.585	30	N	Ge VII	198.214	10	
Na III	194.979	50		Fe XII	196.640	6		Mn	198.23	400	N
Zn XXIII	195.02		F, P	Fe VIII	196.650	40		Sc VII	198.232	200	
Mn X	195.03	600		F V	196.713	200		Ti	198.311	3	N
Ge VII	195.044	10		P VIII	196.75	850		Cl XIII	198.40		
Na III	195.044	30		Ti	196.785	1	N	Ca	198.415	40	N

Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes
Mn X	198.42			Ni V	199.890	120		V V	201.235	40	
F V	198.476	100		Ca V	199.890	150		Ti VI	201.311	90	
V XIX	198.51		Q	K VIII	199.922	360		Cu	201.329	150	N
K XIII	198.524	20		F IV	199.934	500		Ge VII	201.382	20	
K VIII	198.538	90		Ga XXI	199.942	800		Cr VI	201.388	200	
Ti	198.540	3	N	V V	199.955	50		Fe XII	201.413		
Fe XI	198.549			Ti	199.960	3	N	Mn VI	201.457	5	
S VIII	198.550	50		Ni V	199.966	250		Ge VII	201.465	270	
Fe XII	198.58	200		Ne VIII	199.97			F IV	201.465	400	
Ca	198.663	10	N	Ti	199.993	1	N	Sc	201.476	40	N
N IV	198.740	150		F IV	200.001	500		V V	201.493	10	
Ge VII	198.761	2		O VIII	200.005			Cl X	201.50		
N IV	198.764	250		Fe XIII	200.021	60		K XIII	201.505	225	
F V	198.765	1		Ar VIII	200.03			Cr VIII	201.54		
Mn VI	198.792	70		Ne VIII	200.03			Fe XII	201.540		Q
N IV	198.821	300		F VIII	200.05			Fe X	201.556	30	
Ca	198.860	10	N	V V	200.050	50		Ca IX	201.572	1	Q
Mn VI	198.933	20		F IV	200.089	700		Fe XI	201.575		
Mn VI	198.947	20		K XIV	200.097	2		Cr VI	201.606	450	
Ti VI	198.977	400		Ge XXX	200.1		P	Cu	201.615	200	N
K VIII	198.978	250		Co IX	200.100	150		Fe	201.69	300	N
Ne VIII	198.98			Sc XVI	200.115	200		Ar XIII	201.69		
Ge VII	198.992	170		Ar VIII	200.13			Fe XI	201.737		
F IV	199.004	300		O VIII	200.162		P	V V	201.746	20	
Ca	199.030	1	N	V V	200.202	10		Cr XIX	201.82	10	
C IV	199.04	10		O VIII	200.215		P	Na III	201.845	20	
Mn X	199.08	800		Ge VII	200.227	60		Ca IX	201.846	160	
F IV	199.086	300		F VIII	200.24		P	Fe VII	201.855	60	
N IV	199.087	200	Z	Mg I	200.29		A, Z	Ti VI	201.865	125	
Ca	199.093	10	N	N IV	200.316		P, Z	Mn VI	201.949	20	
Ge VII	199.111	10		Li I	200.32		Z	N IV	201.988	100	Z
Ni V	199.154	410		K	200.339	90	N	Mg II	202.00		A, Z
N IV	199.159	450	Z	N IV	200.340	300	Z	Fe XIII	202.044	80	
Sc VII	199.166	100		K VI	200.341	50	N	Cr VI	202.057	110	
Ne VIII	199.17			Fe XII	200.356			Cu	202.065	200	N
Mn VI	199.213	130		Ge VII	200.450	100		Fe XII	202.090		
Li I	199.23		Z	Ca V	200.512	250		Cl XIII	202.10		
Li I	199.24		Z	Sc XVII	200.559	10		K XIII	202.140	225	
Mn VI	199.246	200		Ni XVII	200.59		P	Co VII	202.143	70	
Li I	199.25		Z	Cu VII	200.665	200		Na III	202.149	60	
Li I	199.26			Ge VII	200.668	20		O V	202.161	300	
Fe XII	199.26		Q	Mn XI	200.67	600		Sc XVII	202.172	125	
Li II	199.282	300		C IV	200.68	25		Na III	202.186	60	
Li I	199.29		Z	Ti	200.691	1	N	O V	202.191	300	
Mn VI	199.297	270		Co XIV	200.75			Ca XIV	202.218	25	
Mg II	199.31		A	Fe	200.80	100	N	Ge VII	202.220	60	
Li I	199.31			Sc VI	200.810	100		O V	202.224	300	
K	199.316	1	N	Ge VII	200.820	220		Mg II	202.27		A, Z
Mn IX	199.32	600		O IV	200.830	20	Z	O V	202.283	300	
Cl XII	199.37			Cu VII	200.851	150		Ti	202.303	1	N
Li I	199.40		Z	Ca V	200.860	150		Ca	202.315	40	N
Ni V	199.504	370		F V	200.861	100		O V	202.334	300	
Mn VI	199.509	10		O IV	200.915	2		Ca IX	202.35		
Sc VII	199.522	50		Cu VII	200.948	100		Fe VII	202.378	25	
Ca XVII	199.549		P	O IV	200.966	2		Mn XI	202.38		
Ca V	199.553	300		Ca XV	200.973	100		O V	202.393	380	
K XV	199.567	10		O IV	200.995	5		Fe XIII	202.424	40	
K XIII	199.567	10		Ne VIII	201.0			Cr VI	202.442	375	
F IV	199.607	100		Cr VI	201.007	375		N IV	202.485	300	Z
Li I	199.61		Z	F IV	201.011	600		Na III	202.494	80	
Mn VI	199.612	5		O IV	201.022	1		N V	202.5		ZZ
Cu	199.723	100	N	V XX	201.035		P	Mg II	202.51		A, Z
Ge VII	199.730	30		Ca	201.055	1	N	Cl XII	202.54		
Ni V	199.742	230		F IV	201.063	700		K XII	202.545	40	
Ti VI	199.759	200		Se XXIV	201.07	900		N IV	202.595	500	Z
F IV	199.761	500		O IV	201.073	2		Kr XXXII	202.6		F, P
Mn VI	199.768	300		Co IX	201.086	20		S VIII	202.605	50	
Na IV	199.7722	450		O IV	201.098	2		Sc VI	202.638	50	
V V	199.799	10		F IV	201.101	600		S IX	202.66	250	P
F IV	199.804	500		Fe XII	201.121			Mn VI	202.678	60	
N IV	199.806	20	Z	Fe XIII	201.121	70		Na III	202.709	50	
F IV	199.849	500		F IV	201.160	800		Na III	202.721	70	
N IV	199.857	50	Z	Sc XVI	201.205	265		Cr VI	202.739	300	
Ni XVII	199.87			F IV	201.222	600		Na III	202.764	80	
Ti XIX	199.888	50	P	Cr VI	201.224	250		Cr VII	202.828	870	

Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes
Ca	213.275	10	N	Cr IX	215.04			O IV	216.960	1	
K	213.276	10	N	O V	215.040	380		Zn XXVII	217.		P
V VI	213.313	220		Na III	215.047	80		Ni VII	217.029	96	
Zn XX	213.314	180		Na III	215.082	80		Ca XV	217.031	8	
Ni VII	213.346	70		O V	215.103	420		Ca VIII	217.041	160	
N III	213.364	50	Z	S XII	215.165	30		Na III	217.043	5	
Si VI	213.4	50	Q	Na III	215.218	30		Fe IX	217.108	40	
Ar XIV	213.42			Na III	215.228	150		Na III	217.114	30	
Ni VII	213.431	106		O V	215.245	500		Ca XVI	217.118	15	
K XVI	213.439		P	Co	215.26	80	N	Co VII	217.13	20	
N IV	213.443	300	P,Z	Sc IV	215.304	110		Ni VII	217.151	110	
N III	213.447	100	Z	Na III	215.324	20		Cr	217.19	300	N
Ni VII	213.506	142		Na III	215.340	100		Sc IV	217.192	110	
Ni VII	213.527	154		Ca XV	215.375	200		Na III	217.198	20	
Mg I	213.53		A,Z	Cr	215.38	300	N	Ar XII	217.21		
S XI	213.55	125		Ne IV	215.40	25		Mg I	217.21		A
Ca IX	213.568	1	Q	Na III	215.481	80		P V	217.214	12	
Co IX	213.574	300		Ar XII	215.49			N IV	217.218	500	
Co XVI	213.60		P	Sc VII	215.51			Fe XII	217.271	30	
V VI	213.604	40		Sc IV	215.522	100	N	Fe XXII	217.30	10	
Cu	213.617	8	N	Cu	215.611	500	N	Ne IV	217.34	75	
Sc XVIII	213.679		P	Na III	215.659	70		Mg I	217.37		A,Z
F V	213.684	10	Q	F V	215.676	10		Mn XII	217.39		
Sc VI	213.702	100		Na III	215.683	70		Cr	217.55	200	N
Ni VII	213.728	138		Ne IV	215.71	15		V VI	217.597	1	
Mn XI	213.75			K	215.727	10	N	Si VII	217.6	50	Q
Fe XIII	213.770	40		N IV	215.755	75		Cr	217.61	200	N
F IV	213.848	700		Ni VII	215.767	148		K XIV	217.615	3	
K	213.865	40	N	Ne IV	215.84	75		S XI	217.63	200	
Co VII	213.868	40		Mn XI	215.86			Ni VII	217.630	72	
V VI	213.871	285		Na III	215.860	120		Ne IV	217.64	75	
Fe VII	213.893	25		Sc VII	215.87			Ni VII	217.663	92	
Co VII	213.911	40		Ni XVII	215.89			Na III	217.686	20	
Ni VII	213.926	180		Ni XV	215.94			Fe VIII	217.691	300	
Ni VII	213.938	152		S XI	215.95	250		Cu	217.743	200	N
O IV	213.975	15		Na III	215.964	10		Na III	217.757	5	
P IX	214.00	50		Cr IX	215.97			Cl XIII	217.77		
O IV	214.028	25		Zn XXVIII	216.0		P	Ni VII	217.78	10	
Ni VII	214.053	144		Ca	216.009	90	N	Ne IV	217.78	75	
F IV	214.062	700		O V	216.018	500		Si VII	217.826	350	
F IX	214.086		P	Ca XVI	216.059	150		Ne IV	217.83	125	
Ni VII	214.126	128		Cu	216.063	50	N	N IV	217.836	200	P,Z
O IV	214.152	40		Ni VII	216.074	146		Co	217.88	20	N
Ni VII	214.180	98		Na III	216.118	120		Mn X	217.88		
Si	214.2	20	N	Mn XII	216.12			N IV	217.895	500	Z
O IV	214.205	15		Ne X	216.194		P	Fe XIV	217.9		P
F IX	214.215		P	Co	216.21	20	N	C IV	218.		ZZ
Na III	214.233	70		Mg I	216.22		A,Z	N IV	218.044	150	Z
O IV	214.249	2		Ca XIV	216.320	5		Cr	218.06	100	N
Ni VII	214.252	52		Ne X	216.386		P	N IV	218.067	250	Z
F IX	214.259		P	Si XI	216.4	50	Q	N IV	218.079	100	P,Z
S VI	214.28	20		Co VII	216.403	110		N IV	218.088	400	Z
O IV	214.290	2		Ni VII	216.417	120		V VI	218.091	450	
N IV	214.291	250		Ne X	216.450		P	Mn X	218.11		
K V	214.351	100	N	Cu	216.454	250	N	N IV	218.116	100	Z
N IV	214.414	50	Z	K	216.471	1	N	Co VII	218.122	40	
Fe XII	214.415	20	Q	Na XI	216.473		P	Ne IV	218.13	100	
Ni VII	214.456	72		Ni VII	216.562	86		Cr	218.15	100	N
P IX	214.47	350		Fe VII	216.591	150		Ge VI	218.164	70	
V VI	214.495	20		Mn XI	216.60			Ne IV	218.18	50	
Ni VII	214.507	68		Cr VIII	216.67	400		Mg I	218.19		A,Z
Na III	214.588	80		Mg I	216.68		A,Z	S XII	218.193	30	
Co VII	214.605	200		Co	216.70	250	N	Fe XIV	218.21		
Ne V	214.71		P	Cr X	216.72			N IV	218.250	400	
Si VIII	214.756	100		K	216.729	1	N	Ca XVI	218.27	5	P
F III	214.804	3		V XVIII	216.74		P	Co VII	218.279	30	
Ca XV	214.843	150		Na XI	216.744		P	Ar XII	218.29		
N IV	214.843	10		Si VIII	216.800	20		Si	218.3	50	N
S XI	214.85	125		Ne IX	216.81		P	Ne IV	218.34	75	
Na III	214.860	60		Na XI	216.833		P	N III	218.349	50	Z
F III	214.862	3		Fe XIII	216.88			N III	218.378	70	Z
Na III	214.874	80		Br XXVIII	216.9		F,P	Ni XVI	218.39		
Ca XVI	214.92	60	P	Si VIII	216.918	100		Co VII	218.405	60	
S XI	214.98	100		Fe XIV	216.95			N III	218.416	100	Z
Mn XII	215.03			Ca VIII	216.954	90		Mg I	218.42		A,Z

Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes
Co VII	218.449	40		Zn XIX	220.60	500		V VI	222.370	5	N
Ne IV	218.48	100		Co VII	220.608	550		Ca VII	222.373		
Co VII	218.509	50		Co VII	220.622	150		K VII	222.449	90	
Ti XIX	218.511	50	P	K VII	220.629	90		Co VII	222.521	30	
Ni VII	218.53	100		Co XVI	220.72		P	V V	222.533	100	
Mn XII	218.56			Co VII	220.733	80		Co VII	222.566	780	
Co	218.56	10	N	Ti	220.739	1	N	Ne IV	222.60	200	
Fe XII	218.562			Al XIII	220.741		P	Co VII	222.623	320	
Fe VIII	218.564	60		F IV	220.765	700		Co VII	222.659	450	
V VI	218.636	360		Co VII	220.77	40		Mg I	222.67		A, Z
Ne IV	218.64	125		Si X	220.8	50	Q	Co	222.72	10	N
Mn XII	218.70			Co	220.81	20	N	Cl XII	222.72		
Co VII	218.717	100		Fe	220.882	30	N	O IV	222.763	25	
Mg I	218.74		A, Z	Fe X	220.882	7	Q	O IV	222.777	15	
Sc XVIII	218.752		P	N IV	220.885	2	Z	C IV	222.791	350	
Cu XVII	218.76	20		Co VII	220.89	20		V V	222.818	130	
Ne IV	218.77	250		Ar VI	220.95	200		Co VII	222.824	160	
Ni VII	218.774	98		Co VII	220.967	200		V V	222.842	30	
Sc VI	218.837	400		Co VII	221.02	750		Sc VI	222.844	150	
Ca XVII	218.846	250	P	Al XIII	221.029		P	Sc VI	222.855	300	
Ni VII	218.85	20		K VII	221.035	90		K VI	222.858	20	N
Cr X	218.88			As VI	221.044	73		K	222.864	10	N
Co VII	218.932	70		Co	221.06	150	N	Ca XVII	222.866	300	P
Fe IX	218.935	5	F	Al XIII	221.125		P	N IV	222.893	30	Z
N III	218.949	100	Z	Ar XV	221.15	200		Co VII	222.900	80	
S XI	218.99	125		Co VII	221.154	30		V VI	222.931	110	N
K VII	218.990	10		Cr X	221.18			Co VII	222.948	20	
V VI	218.994	220		Sc VI	221.204	330		O VII	222.98		P
Mg I	219.04		A, Z	Co VII	221.227	140		N VII	223.000		P
K VII	219.071	40		S IX	221.27	100	P	Cr XXII	223.015	150	P
Co	219.09	10	N	K VIII	221.281	160		Ca XVII	223.029		P
Cu XXII	219.1		F, P	Co VII	221.288	170		V VI	223.062	285	N
S XI	219.13	200		Fe XXIII	221.33	80		N IV	223.066		P
Fe XIV	219.135	60		Co VII	221.37	10		Co VII	223.067	940	
Ni VII	219.137	50		Cu XIX	221.376	450		Ni XVI	223.09		
N III	219.168	250	Z	Cl XIII	221.38			V	223.11	200	N
F III	219.277	1		Cr VIII	221.41	200		Cl XII	223.11		
Mg I	219.28		A, Z	S XII	221.429	30		N VII	223.119		P
Cr	219.29	400	N	Co VII	221.431	450		V VI	223.136	285	N
Fe XII	219.438	11		Co VII	221.442	700		N VII	223.158		P
Ni VII	219.499	116		K VII	221.479	250		Co VII	223.168	400	
Cl XII	219.53			Co VII	221.505	600		O VII	223.18		P
Mn XII	219.54			O IV	221.515	1	Z	Ne IV	223.235	125	
F III	219.588	0		Al VI	221.535	50		Ni VII	223.25	20	
Co	219.64	40	N	K VII	221.564	10		S IX	223.28	100	P
Ni VII	219.78	20		K VII	221.595	10		Co VII	223.286	1000	
K XIII	219.793	15		Co VII	221.606	250		N V	223.3		ZZ
Ar VI	219.90	120		O IV	221.648	70	Z	V VI	223.300	360	N
Co VII	219.907	120		Co VII	221.677	100		Ge VI	223.321	600	
P VII	219.91	450		N IV	221.729	300	Z	Co VII	223.349	430	
Cu	219.927	6	N	Co VII	221.734	500		Ni VII	223.387	98	
Co XVI	219.94			N IV	221.774	250	P, Z	F IV	223.394	300	
Cr	219.94	200	N	N IV	221.789	450	Z	Sc IV	223.407	110	
Co VII	219.940	150		Co VII	221.805	120		Sc VI	223.408	100	
As VI	219.990	72		N IV	221.810	200	P, Z	K	223.410	10	N
Cr IX	220.02			Fe XIII	221.822	40		N IV	223.421	500	P, Z
Mg I	220.03		A, Z	N IV	221.854	250	Z	Sc XVII	223.424	50	
Kr XXVI	220.032		P	N IV	221.871	300	Z	Mg I	223.45		A, Z
Co VII	220.044	150		Co VII	221.896	150		F IV	223.456	200	
Ti	220.045	1	N	Ni XV	221.93			P VII	223.48	350	
Co VII	220.052	250		Co VII	221.947	560		F IV	223.497	100	
Fe XIV	220.095	60		V VII	221.95	200		Co VII	223.519	850	
Co	220.10	10	N	Ti	222.021	1	N	Ge VI	223.527	270	
N IV	220.124	50		Co VII	222.023	60		K	223.545	10	N
Co	220.23	10	N	Mg I	222.03		A, Z	V VI	223.549	5	N
Sc IV	220.280	285		K VII	222.121	90		Mn XII	223.56		
N IV	220.280	400		Ge VI	222.147	100		Ne IV	223.601	125	
Mg I	220.33		A, Z	Cr	222.16	200	N	Co VII	223.711	960	
Co VII	220.34	150		Co VII	222.170	130		Co VII	223.711	960	
O V	220.352	800		Fe	222.189	200	N	Kr XXVIII	223.72		F, P
Co	220.37	150	N	V	222.20	200	N	Si IX	223.72	80	
Co VII	220.40	150		O V	222.235	200		O IV	223.728	1	
Cr X	220.42			Co VII	222.277	140		Mg I	223.74		A, Z
Ni XVIII	220.428	85		Co VII	222.358	40		V VI	223.759	20	N
Co VII	220.499	150		P VIII	222.36	200		Ni VII	223.76	60	



Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes
Ni VII	223.791	26		F V	225.114	10	Q	Ti	226.680	1	N
Sc XVII	223.821	20		Co VII	225.12	80		K	226.691	20	N
Ni VII	223.826	52		N IV	225.142	500		Ge VI	226.695	150	
O IV	223.841	1		V V	225.146	130		C IV	226.72	6	
Cr X	223.86			V VII	225.16	800		Ti	226.722	1	N
Cr IX	223.87			Mg I	225.18		A, Z	Sc IV	226.764	5	
Fe	223.870	200	N	Ni VII	225.191	10		Ge VI	226.817	350	
Co VII	223.899	260		N IV	225.212	800		Co VII	226.83	20	
C IV	223.9	2		Co VII	225.218	160		N III	226.832	350	Z
Fe XIV	223.9		P	V V	225.225	130		As VI	226.836	44	
Ni VII	223.954	26		Ni VII	225.246	58		Cr	226.89	300	N
Co VII	223.959	300		S IX	225.25	50	P	Mn XIII	226.91		
Co VII	223.977	240		V VI	225.279	70	N	N III	226.910	400	Z
V VI	223.984	110	N	O IV	225.299	25		F IV	226.944	600	
F V	223.999	1		N III	225.302	70	Z	Co VII	226.964	200	
K	224.009	90	N	Co VII	225.343	360		Si IX	227.007	800	
Ni XV	224.04			Ti V	225.347	450		N IV	227.026	100	
V VI	224.052	1		Fe VII	225.411	150		V VI	227.041	160	N
Co VII	224.063	100		Co	225.43	40	N	V VI	227.077	70	N
F IX	224.091		P	V V	225.465	200		F IV	227.079	300	
Si VI	224.1	50	Q	Co VII	225.473	40		P IX	227.08	200	
Cl VII	224.14	300		Ni VII	225.487	40		F IV	227.101	500	
Co XIV	224.15		P	C IV	225.49	4		Co VII	227.122	240	
Ti	224.169	1	N	Cu	225.497	25	N	V VI	227.142	70	
Co VII	224.171	800		Ne V	225.5			Ni VI	227.162	60	
V VI	224.191	40	N	Fe VII	225.505	4		V VI	227.172	110	
F IX	224.231		P	Mg I	225.54		A, Z	C V	227.192	100	
Cu XIX	224.240	100		Co VII	225.679	140		S VI	227.20	200	
Ar XII	224.25			Co VII	225.698	100		Ni VII	227.200	102	
K	224.257	90	N	N IV	225.741	50	Z	Cr VI	227.202	375	
F IX	224.279		P	Ni VII	225.742	134		Fe XV	227.208	20	
Fe VIII	224.305	500		Ni VII	225.767	76		F IV	227.211	400	
Co VII	224.319	250		Ca XVI	225.78	30	P	V VI	227.240	70	N
Ne IX	224.34		P	Co VII	225.783	840		Ni VII	227.256	46	
Ni VII	224.363	82		V VII	225.79	500		Si IX	227.30		
Ge VI	224.380	200		Co VII	225.826	400		V VI	227.331	110	N
Ni VII	224.388	152		Ge VI	225.833	450		O V	227.372	300	
Fe XI	224.39		P	N III	225.837	300	Z	Ni VII	227.377	80	
C IV	224.4		ZZ	Fe	225.867	30	N	Cr X	227.42		
Ge VI	224.418	700		Co	225.87	10	N	V VI	227.428	40	N
K XIV	224.457	6		Ni VII	225.894	38		Co VII	227.445	100	
Co VII	224.488	60		V VI	225.895	220	N	N IV	227.446		P, Z
Ge VI	224.495	600		Co VII	226.018	1000		O V	227.469	300	
V VI	224.500	1000		N III	226.030	120	Z	Cl XII	227.47		
K	224.509	160	N	O III	226.038	50		K	227.471	50	N
Ca XVI	224.549	150		F III	226.055	6		N III	227.479	150	Z
Sc XVIII	224.574		P	Ni VII	226.069	110		S XII	227.482	30	
V VI	224.583	160	N	F III	226.094	10		O V	227.511	380	
C IV	224.6	2	P	N III	226.122	300	Z	N III	227.515	250	Z
As XXVI	224.6		F, P	F III	226.169	20		O V	227.549	300	
Co	224.60	10	N	V VI	226.169	20	N	V V	227.561	100	
Cl XIII	224.60			Ni VII	226.238	48		Ni V	227.565	820	
Mn XII	224.62			Cr X	226.24			Ni VII	227.581	90	
N IV	224.629	450		Cr VI	226.241	450		P IX	227.62	300	
V VI	224.691	1	N	Mg I	226.26		A, Z	K VII	227.625	250	
Ni VI	224.703	180		Co VII	226.262	400		O V	227.634	300	
Co VII	224.705	700		Ni VII	226.273	46		Ti	227.639	1	N
Ni VII	224.733	146		Ca VII	226.292	50	Q	Ni VII	227.642	126	
Cr X	224.74			Fe X	226.320	10	Q	Ca VI	227.642	20	
Fe XV	224.745	40	Q	F V	226.341	200		Cr VI	227.689	80	
S IX	224.77	450	P	Ni VII	226.352	102		O V	227.689	300	
Co VII	224.779	70		K IX	226.372	20		Fe XV	227.70		
Cu XXVII	224.8			Ni VII	226.40	20		Ni VII	227.738	50	
Ti	224.818	1	N	Ti	226.409	1	N	Cu XXVI	227.8		
V VI	224.851	110	N	Cr XI	226.45			Cl XII	227.83		
N III	224.873	50	Z	Ti	226.462	1	N	S VI	227.84	200	
V V	224.913	180		Ge XXII	226.505	500		K	227.851	1	N
Ni VII	224.928	136		N III	226.520	50	Z	Ge VI	227.851	200	
Co VII	224.93	10		Ti VI	226.561	10	Q	Co	227.88	20	N
Ge VI	224.952	400		S IX	226.60	100	P	V VII	227.88	400	
Ti	225.033	1	N	F V	226.608	90		V V	227.885	170	
Si IX	225.033	800		Ti	226.629	1	N	Ni VII	227.893	130	
Cl VII	225.08	500		V VI	226.656	160		Ca	227.895	100	N
K	225.087	90	N	Ni VII	226.668	44		Ni VII	227.907	116	
N IV	225.110	300		K	226.679	10	N	Fe VII	227.918	1	

Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes
Ca VI	227.922	100		Ca VI	229.734	350		Ge VI	231.084	50	
Ar XVIII	228.022		P	He II	229.736	6		Fe VIII	231.097	260	
Ni V	228.031	780		Ni VII	229.795	24		O IV	231.101	40	
Ni VII	228.043	102		P V	229.819	30		O IV	231.140	15	
Fe	228.057	30	N	Fe VII	229.828	90		Ne IX	231.16		P
K	228.098	10	N	V VI	229.856	5		O IV	231.200	40	
Co VII	228.109	150		Co VII	229.865	540		Cr X	231.21		
K	228.134	10	N	Na III	229.869	150		O IV	231.239	40	
Ti	228.135	1	N	O IV	229.896	1		F IX	231.297		P
Co VII	228.148	550		Fe X	229.99			K XIV	231.297	6	
V VIII	228.15			Si	230.0	20	N	O IV	231.299	60	
S X	228.167	40		V VIII	230.00			V VIII	231.33		
Co VII	228.177	370		N IV	230.035	100	Z	Co VII	231.353	40	
Fe XIII	228.18	10		O IV	230.040	1		F III	231.381	1	
Ne V	228.2			Co VII	230.054	20		F IX	231.396		P
P IX	228.24	100		Fe X	230.089			P XI	231.40	100	
Ni VII	228.262	68		F III	230.117	35		Co VII	231.430	160	
V VI	228.266	20	N	V VIII	230.12	500		He II	231.454	17	
C IV	228.27	25		Fe XXII	230.129	40	Q	N III	231.465	100	Z
Cl XII	228.29			He II	230.139	9		Ne IX	231.47		P
Ni VII	228.30	10		Ti	230.155	1	N	Co VII	231.480	50	
V V	228.301	140		Ge VI	230.244	300		N III	231.497	150	Z
Co VII	228.318	30		Co XIV	230.27		P	K XV	231.54		
Ni V	228.346	660		Cr XI	230.29			N III	231.540	200	Z
Ge VI	228.409	1000		Ti	230.304	1	N	Ti	231.553	1	N
Co VII	228.412	70		Ni VII	230.342	28		Ni VI	231.556	160	
Ni VII	228.489	72		Co VII	230.351	130		Co VII	231.562	50	
F IV	228.496	1		Sc XVII	230.357	1		Ni VI	231.574	100	
Mn XI	228.52			V VI	230.398	5		V VI	231.646	5	
Ni VII	228.54	100		Ti	230.425	1	N	Co VII	231.683	140	
Ni V	228.547	580		C IV	230.43	25		Fe VII	231.693	4	
F IV	228.552	10		Co VII	230.470	50		Fe VII	231.728	400	
Sc V	228.565	300		Ca VI	230.495	250		Mg III	231.7333	1000	
Fe VII	228.584	4		F III	230.553	1		Si	231.74		N
Mn XII	228.61			Ti	230.591	1	N	Ge VI	231.766	700	
Ni VII	228.613	34		N III	230.591	200	Z	V VI	231.818	360	N
Ca VI	228.628	350		Na III	230.593	120		O V	231.823	380	
Ni V	228.644	300		Ni VII	230.598	18		Co VII	231.823	200	
F IV	228.645	100		F III	230.603	1		Fe VIII	231.884	200	
V VIII	228.67	400		Sc XVIII	230.620		P	V VI	231.893	1	
S X	228.70	350		N III	230.626	300	Z	Co VII	231.924	90	
Cr X	228.71			K VIII	230.656	40		Ca III	231.967		A, Z
Ca XVII	228.742	200	P	N III	230.681	50	Z	V VII	231.99	300	
N III	228.762	150	Z	O IV	230.682	2		Fe VII	232.047	60	
V VI	228.783	160	N	He II	230.686	12		N IV	232.112	100	
N III	228.790	250	Z	Ne V	230.69		P	Mn XIII	232.12		
Ni VII	228.831	34		K VIII	230.694	90		Co VII	232.139	600	
N III	228.844	25	Z	K XV	230.71			N IV	232.145	150	
Ni VII	228.865	26		Ni VII	230.739	20		Ge VI	232.150	450	
Fe VII	228.866	20	Q	K VIII	230.750	160		Cr XI	232.18		
S IX	228.87	100	P	O IV	230.755	5		N IV	232.223	200	
Co VII	228.886	170		N III	230.765	100	Z	Co VII	232.236	130	
O III	228.893	10		N III	230.789	150	Z	Fe VII	232.256	200	
Ti V	228.909	300		Fe XII	230.79			Ni VI	232.275	160	
Ni VII	228.93	20		V VI	230.799	40		Ca VI	232.275	300	
O III	228.988	10		Ge VI	230.813	100		Co VII	232.337	50	
Co XVI	229.07			V VIII	230.82	200		K XV	232.34		
Br XXXI	229.1		F, P	V VI	230.841	70		Ti	232.361	1	N
Co VII	229.115	15		Sc V	230.848	100		Co VII	232.426	100	
Cl XIII	229.15			N III	230.861	250	Z	Fe VII	232.442	300	
Br XXV	229.22	50		Ni VII	230.866	16		Ti	232.466	1	N
K VII	229.258	360		N III	230.879	100	Z	Ni XVI	232.48	30	
Ge VI	229.263	600		Ar VIII	230.88	350		Co VII	232.507	200	
Ar XVIII	229.277		P	Ti XVII	230.89			Ca VI	232.531	250	
Ge VI	229.337	300		C IV	230.9	2		Ge VI	232.547	100	
Co VII	229.360	10		Co VII	230.984	25		Co VII	232.565	550	
V VII	229.38	600		F IX	230.987		P	P IX	232.57	200	
Ni VII	229.427	30		K XV	231.00			V VI	232.571	360	N
He II	229.431	5		F III	231.011	6		He II	232.584	24	
Ar VIII	229.44	250		O IV	231.031	10		Fe VII	232.613	10	
Co VII	229.601	590		Fe VII	231.044	120		Co VII	232.655	400	
V VI	229.606	5		K XIV	231.066	3		K V	232.673	50	N
Ti XII	229.619	3	Q	O IV	231.070	60		Ti	232.711	1	N
Co VII	229.704	150		O V	231.070	380		Co VII	232.797	130	
Ar XVIII	229.708		P	Ni VII	231.071	168		Ca XVII	232.809	30	P

Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes
Ti	232.847	1	N	Co VII	234.339	900		Cl V	236.44	100	
N III	232.854	300	Z	He II	234.347	40		Co VII	236.446	140	
Si VIII	232.864	10		Fe X	234.356		Q	Ni V	236.467	290	
Fe VIII	232.876	20		Ni VI	234.403	300		Co VII	236.509	200	
Co VII	232.922	190		Co XV	234.41			Ni V	236.606	200	
Fe VII	232.946	60		S XII	234.48	75		Si XIV	236.616		P
Cr X	232.96			Ne VII	234.6		N	Co VII	236.681	270	
V VI	233.010	5	N	Cl XII	234.64			P XI	236.71	500	
Fe VII	233.015	400		Ge VI	234.640	280		O III	236.710	50	
Co VII	233.06	20		Cl XI	234.67			Ni V	236.716	230	
Ge VI	233.120	500		Ti	234.680	1	N	Co VII	236.733	100	
F IV	233.159	200		Ne IV	234.704	125		Fe VII	236.778	60	
Si VIII	233.159	10		Fe XV	234.73		Q	Se XXVII	236.8		F, P
Cl XI	233.17			Fe VII	234.757	150		Ni V	236.802	120	
K XV	233.22			Co VII	234.785	640		Co VII	236.82	10	
F IV	233.222	600		Cl XI	234.84			Ni VI	236.871	130	
Fe XIII	233.234	30		P X	234.84	150		Fe VII	236.872	60	
Cr XI	233.26			Co VII	234.891	80		Ti	236.914	1	N
F IV	233.297	200		Ti	234.902	1	N	Ni V	236.932	100	
Fe VII	233.308	250		Co XVII	234.925	55	P	P X	236.95	100	
Co VII	233.314	70		P X	234.95	80		N IV	236.954	150	Z
N III	233.332	250	Z	O IV	234.988	10		Co VII	236.978	100	
N III	233.368	400	Z	Cr XI	235.03			Si XIV	237.044		P
N III	233.393	350		Ge VI	235.047	400		Co VII	237.050	50	
F IV	233.393	500		Ti VI	235.066			Ti	237.059	3	N
N III	233.424	50	Z	Mn XIII	235.08			Ni VI	237.124	150	
Co VII	233.425	80		Fe VII	235.081	25		Si XIV	237.181		P
V VI	233.440	360	N	Ti	235.096	10	N	Cl V	237.23	200	
O IV	233.457	60		Co VII	235.13	10		Cr XI	237.24		
N III	233.459	150	Z	Ni VI	235.170	330		Ti	237.250	1	N
V VII	233.47			Fe VII	235.221	90		Be IV	237.261		P
O IV	233.496	60		Si VIII	235.221	10		Co VII	237.302	110	
N III	233.498	50	Z	P X	235.26	800		Be IV	237.311		P
Ca XVI	233.50	10	P	Ni VI	235.293	280		He II	237.331	70	
P X	233.51	60		Cu	235.299	30	N	Ge VI	237.348	420	
O IV	233.521	40		Ti VI	235.316	3		Cl XI	237.42		
F IV	233.526	400		V VI	235.330	20	N	V VII	237.50	300	
C IV	233.53	100		Ti	235.353	6	N	Ti	237.519	1	N
O IV	233.561	90		Ni VI	235.386	130		N III	237.532	250	Z
O IV	233.596	40		Ti VI	235.408			N III	237.565	450	Z
N III	233.599	80	Z	Ni VI	235.414	140		Co VII	237.571	10	
Si X	233.6	20	Q	Ti	235.450	6	N	N III	237.624	50	Z
N III	233.620	150	Z	Cr XI	235.53			V IX	237.66		
N III	233.696	300	Z	Mn XI	235.55			Cl XIV	237.70		
N III	233.716	80	Z	Si VIII	235.563	20		Co VII	237.743	30	
Mn XIII	233.73			Ge VI	235.563	750		Mn XII	237.78		
Co VII	233.744	180		Fe VII	235.662	200		Ge VI	237.785	600	
Ni XVIII	233.756	150		Ti	235.683	20	N	Co VII	237.791	20	
N IV	233.762		P	V IX	235.72	400		Ti	237.826	1	N
Fe VII	233.762	90		Cr XI	235.74			Ni XVI	237.84	50	
Ti	233.787	1	N	Ni VI	235.769	90		Ni VI	237.857	150	
Cr X	233.80			Ni VI	235.790	50		N IV	237.873	200	
Fe XV	233.865	30		Ni XXIII	235.8		P	N IV	237.908	400	
Ni VI	233.890	180		Ni VI	235.825	70		Ni VI	237.909	190	
Co VII	233.906	180		Ti VI	235.836			F IV	237.913	300	
Ni VI	233.969	220		F V	235.840	100		F IV	237.955	400	
Co VII	234.004	60		K XVI	235.871		P	N IV	237.991	500	
Ni VI	234.010	130		Ti	235.887	10	N	N III	237.994	80	Z
Co VII	234.037	30		Co VII	235.937	170		F IV	238.012	300	
Ni VI	234.088	190		V VIII	236.01	300		Ge VI	238.025	950	
N IV	234.124	600		N IV	236.068	550		N III	238.034	200	Z
N IV	234.172	150	P	O IV	236.071	2		F IV	238.042	200	
Ti	234.184	3	N	Co VII	236.079	250		Fe VII	238.048	25	
C IV	234.19	4		Ni V	236.110	420		Ti	238.054	6	N
N IV	234.195	600		Co XIV	236.15		P	N III	238.093	350	Z
Ni XXVI	234.20	85		Fe VII	236.180	10		F IV	238.099	100	
N IV	234.203	180	P	Co VII	236.188	130		Co VII	238.102	30	
Cu XVIII	234.24	50		Ar XIII	236.27			Ge VI	238.119	400	
Mn XIII	234.24			Co VII	236.290	120		N III	238.134	100	Z
N IV	234.249	600		S IX	236.34			Co	238.17	20	N
P XI	234.25	200		Cu	236.343	5	N	C IV	238.200	100	
Mg III	234.2631	800		Ni XVIII	236.36	3		C IV	238.250	150	
Co VII	234.27	20		Ge VI	236.384	220		Co VII	238.261	70	
Ne IV	234.319	125		Fe VII	236.388	50		Ti	238.294	1	N
Fe VII	234.337	300		Ni VI	236.399	40		Ca XVII	238.321		P

Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes
O IV	238.360	400		O IV	239.935	1		Fe VII	241.853	125	
Co VII	238.37	900		Ni VI	239.941	140		Cr XI	241.87		
Fe VII	238.393	40		F IX	239.968		P	O III	241.875	50	Z
P X	238.45	300		Ge VI	239.972	500		Ne IV	241.9		N
Ni VI	238.476	10		K XVI	239.981		P	Ar XIII	241.90		
Ni VI	238.550	390		V VI	239.998	5	N	V VII	241.91	200	
Ni XXV	238.56		P	Ti	240.009	1	N	Ti	241.917	3	N
O IV	238.571	500		F IV	240.017	700		Ge VI	241.990	400	
Mn VII	238.617	300		Fe VII	240.053	90		O IV	242.045	5	
N IV	238.657	450		Ni VI	240.063	110		Ti	242.059	1	N
N IV	238.683	450		F IV	240.079	900		Fe XXI	242.07	85	Q
Ti	238.689	3	N	O IV	240.079	5		O IV	242.140	10	
N IV	238.694	400		K XV	240.083	3		Ni VI	242.148	440	
Ca XVI	238.70	15	P	Fe VII	240.083	90		O IV	242.183	1	
Fe X	238.72			F IV	240.146	700		Ar XIII	242.22		
N IV	238.731	500		Ca XVI	240.17	20	P	Ca VI	242.265	150	
Al XIII	238.734		P	V VIII	240.22	300		Fe VII	242.284	120	
N IV	238.769	500		Fe VII	240.223	300		F V	242.324	300	
V VI	238.776	28	N	F III	240.231	3		Ca IX	242.384	150	
N IV	238.802	600		Fe X	240.243			Ti	242.403	1	N
Co VII	238.874	15		S XII	240.26	175		Ni VI	242.412	100	
Ni VI	238.890	260		F III	240.264	1		F V	242.439	200	
Fe VII	238.929	25		F IV	240.275	700		V VI	242.455	160	N
Ni VI	238.941	390		V IX	240.30			Cr VII	242.461	5	
Co VII	238.954	80		Ti	240.321	3	N	Ti	242.475	3	N
Ge VI	238.964	500		N IV	240.363	200		S XI	242.57	125	
Co VII	238.986	30		Al VII	240.368	125		Ni VI	242.576	180	
Ni VI	239.029	210		F IV	240.371	700		Cr VII	242.579	70	
Al VII	239.030	100		Ni VI	240.410	140		Ca VI	242.592	150	
Ni VI	239.046	310		Co VII	240.421	40		Ti	242.604	1	N
Ni VI	239.071	80		V XXI	240.423		P	Ca VI	242.631	250	
Ni VI	239.118	360		C IV	240.5		ZZ	Ni VI	242.653	480	
N IV	239.146	200		Ni VI	240.536	120		Ni VI	242.741	60	
N IV	239.174	300		F III	240.546	3		Cl XI	242.76		
C IV	239.196	25		V V	240.572	10		S XI	242.82	175	
N IV	239.212	450		Fe VII	240.572	120		Ti	242.847	3	N
Se XXIV	239.23	480		Ni VI	240.582	60		Cl VI	242.89	250	
N IV	239.243	180		Ge VI	240.635	320		Ni VI	242.917	130	
K XVI	239.244		P	Ni VI	240.647	210		Cr VII	242.953	20	
Ge VI	239.266	600		Fe XIII	240.713	50		Be IV	242.954		P
Ca VI	239.296	20		V V	240.719	40		Be IV	243.006		P
Ni VI	239.320	180		F III	240.720	6		He II	243.027	130	
Al XIII	239.328		P	Ca VI	240.721	300		Ti	243.035	3	N
Co XIV	239.33			F III	240.735	1		S XII	243.06	200	
Ge VI	239.349	70		Co	240.74	10	N,Q	Ni VI	243.084	60	
Co	239.37	10	N	Cr XI	240.76			Cl VI	243.19	400	
Mn VII	239.381	25		Ga XXI	240.770	550		Cl VI	243.21	100	
Ti	239.404	3	N	Al VII	240.770	200		Ti	243.259	1	N
V V	239.407	160		Ni VI	240.771	130		Ca XV	243.26	10	P
Co XV	239.42			Cl VII	240.83	300		F III	243.357	3	
V V	239.485	190		Ni VI	240.830	90		Fe VII	243.379	400	
Al XIII	239.513		P	F III	240.857	1		Fe XVII	243.39		Q
Ni XVI	239.53			Cl VII	240.87	200		Ni VI	243.403	270	
Ca VI	239.535	350		Ni VI	240.885	300		F III	243.407	1	
O IV	239.592	10		Ti	240.926	10	N	Ni VI	243.432	90	
Be IV	239.603		P	V V	240.933	70		Mn XIV	243.45		
K	239.608	50	N	Ni VI	240.946	90		Ti	243.503	1	N
N IV	239.616	500		O III	240.979	100		Ni VI	243.512	200	
N IV	239.632	300		Ti	241.013	1	N	V IX	243.58		
Be IV	239.653		P	O III	241.037	100		Ni VI	243.683	60	
N IV	239.659	200		Mn XIV	241.07			V VIII	243.69	100	
N IV	239.679	100		Ni VI	241.104	180		Mn XXI	243.69	4	
N IV	239.708	100		F III	241.135	1		Fe VII	243.705	120	
P XI	239.71	200		V	241.14	200	N	F IV	243.736	200	
Fe VII	239.734	120		Ni VI	241.167	100		Ar XIV	243.74		
F IX	239.756		P	Ti V	241.240	1	Q,Z	Al VI	243.766	600	
N IV	239.763	10		Ni VI	241.268	160		Ni VI	243.781	270	
V V	239.765	70		Ti V	241.271	1	Q,Z	Fe XV	243.783	50	
Ni VI	239.808	70		Cr VII	241.393	20		F IV	243.796	300	
S XI	239.81	150		Fe VII	241.467	120		Sc V	243.823	40	
F IV	239.856	700		Ni VI	241.527	90		Cl VI	243.85	600	
Fe VII	239.860	120		Cu	241.583	150	N	Sc V	243.872	500	
Mn XXII	239.87	4		Fe IX	241.739	60	F	Cl VI	243.88	150	
F IX	239.914		P	Ti	241.750	1	N	Mn XIV	243.88		
Ti	239.933	1	N	O III	241.819	50	Z	F IV	243.922	400	

Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes
Ni VI	243.927	110		Ni VI	246.473	400		N III	248.371	150	Z
Ti	243.968	3	N	O IV	246.503	10	Z	N IV	248.383	500	
Ni VI	244.008	160		Co VII	246.521	130		Ni VI	248.400	270	
Co VII	244.024	60		O IV	246.563	15	Z	N III	248.428	350	Z
Fe VII	244.030	4		Ti	246.564	10	N	N IV	248.433	500	
Ca XVII	244.042	100	P	Cr VII	246.599	70		Al VIII	248.456	55	
O III	244.049	100		Ni VI	246.614	80		O V	248.459	330	
Ni VI	244.051	150		Ti	246.699	1	N	N IV	248.461	500	
Fe VII	244.098	90		Ni VI	246.738	490		Mg II	248.47		A, Z
N IV	244.100	300		Ti	246.743	1	N	N III	248.478	100	Z
Co VII	244.101	230		Ni VI	246.785	110		Ti	248.481	1	N
Ni VI	244.150	210		Fe VII	246.859	40		N IV	248.484	500	
Co XXV	244.190		P	Ni VI	246.861	60		O III	248.538	50	
Ni VI	244.270	50		S XI	246.90	200		K XVI	248.539		P
Ti	244.291	1	N	Ca XV	246.94	20		N IV	248.540	450	
Si	244.3	50	N	Fe VII	246.943	25		N IV	248.563	500	
Ni VI	244.350	60		Sc VI	247.03			Ni VI	248.568	300	
V IX	244.46	100		Ni VI	247.069	280		O III	248.574	60	
Ti	244.482	1	N	O III	247.080	50		Ti	248.592	1	N
Fe VII	244.541	120		Fe VII	247.098	25		O III	248.618	100	
P VIII	244.56	500		S XII	247.12	250		Ni VI	248.635	350	
Cr VII	244.565	5		S XI	247.12	250		N IV	248.654	450	
Ni VI	244.688	70		Ti	247.135	1	N	Cr XIII	248.66		P
Kr XXV	244.7		P	Mg II	247.14		A, Z	C V	248.661	200	
Cr XII	244.70			Ni VI	247.186	140		Co VII	248.678	130	
F III	244.701	6		Fe XXII	247.19	120		Ar XIII	248.68		
Mn VII	244.766	500		K	247.202	100	N	Ni VI	248.689	40	
F III	244.769	20		N IV	247.205	900		C V	248.738	200	
Ti	244.779	1	N	Ni VI	247.225	180		Fe VII	248.743	10	
V IX	244.89			Ti	247.278	1	N	Co VII	248.849	60	
C IV	244.907	500		Ne VIII	247.3		N	Ti VIII	248.908	20	Q
Fe IX	244.912	40		Sc VI	247.31			V IX	248.91		
Mn VII	244.935	100		C V	247.31			Co VII	248.962	40	
F III	245.005	10		C IV	247.357	25		Ti	248.980	6	N
N III	245.021	200	Z	Ti	247.385	1	N	S VI	248.99	400	
N III	245.115	400	Z	Ni VI	247.396	40		Ni VI	249.069	140	
Fe VII	245.153	350		Al VIII	247.401	10		Si VI	249.124	700	
Ti VII	245.258	1	Q	C IV	247.415	50		Co VII	249.132	75	
K XVI	245.309		P	Ne IV	247.42	50		Ni VI	249.170	20	
V X	245.35			Ti VI	247.450	250		Ni XVII	249.180		
Ni VI	245.407	20		Fe VII	247.458	120		O IV	249.223	10	
Cr VII	245.431	20		Ni VI	247.472	50		F IV	249.228	100	
Fe VII	245.488	120		Mn VII	247.473	250		Ti	249.229	1	N
Ti	245.535	1	N	Ge XXV	247.5		F, P	S VI	249.27	400	
O IV	245.62	2	P	Ni VI	247.508	370		Ti	249.278	1	N
Ti	245.637	1	N	Ti	247.536	1	N	N IV	249.316	300	Z
Cr XI	245.70			Co XVII	247.540	50	P	P VIII	249.33	400	
Mn VII	245.739	300		Ni VI	247.560	150		O IV	249.365	15	
C IV	245.775	200		N V	247.561	85		Ar VII	249.38	100	
C IV	245.830	250		K	247.561	100	N	Fe	249.389	40	N
F III	245.866	3		Sc VI	247.62			Ca IV	249.408	150	
V	245.89	200	N	Ni VI	247.639	40		Cu	249.415	150	N
Ti	245.894	1	N	P VIII	247.65	1000		Ar XIII	249.46		
Ni XXI	245.9		F, P	Cr X	247.67			Ti	249.471	1	N
Ti	245.937	1	N	V IX	247.70			Ti	249.529	1	N
S XI	245.94	75		N V	247.706	100		Ti V	249.589	3	Q, Z
Co VII	245.978	250		Ti	247.719	3	N	Sc VI	249.60		
Fe VII	246.000	60		Co XV	247.76			Ni VI	249.611	510	
Si VI	246.004	800		Ni VI	247.767	190		Ti	249.632	1	N
V VI	246.042	70	N	K IX	247.777	50		Ni VI	249.636	50	
Ne VII	246.1		Q	Ne IV	247.81	40		Mn XIV	249.64		
Si VII	246.12		P	S XI	247.83	75		Ti	249.688	1	N
Ti	246.198	6	N	Ni VI	247.878	340		F IV	249.744	10	
N III	246.206	400	Z	Ti	247.929	3	N	Ti	249.785	1	N
Fe XIII	246.208	50		P XI	247.95	100		As XXIII	249.82	350	
Ti V	246.235	1	Q, Z	Ne IV	248.00	40		Co XVII	249.84	10	
Ni VI	246.249	180		Be IV	248.015		P	Ar VII	249.886	250	
N III	246.249	650		Ti VII	248.037	3		Ni XXII	249.9		F, P
Co VII	246.252	90		P VIII	248.06	400		Co VII	249.903	60	
O III	246.265	150		Be IV	248.068		P	Cu	249.908	100	N
N III	246.311	100	Z	S XI	248.09	75		Ca VI	249.914	150	
P VIII	246.32	350		Ti VIII	248.150	1	Q	Ti	249.920	20	N
Ti	246.395	3	N	V VI	248.225	20	N	Mn VII	249.929	50	
Sc V	246.424	400		N III	248.320	100		Ti V	249.984	3	Q, Z
O IV	246.465	5	Z	O III	248.320	50		Ti	250.050	1	N

Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes
N IV	250.121	300		Ni VI	251.854	70		Ti VII	253.811	200	
K	250.123	20	N	V	251.87	100	N	Ni VI	253.877	690	
Al VIII	250.139	100		S VI	251.91	200		P XI	253.90	150	
Ca IV	250.153	150		V VI	251.920	360	N	Ti	253.906	3	N
Ne VII	250.2		Q	Cu	251.947	200	N	V VI	253.925	285	N
Ni VI	250.206	250		Fe XIII	251.953	50		Ni VI	253.981	520	
C VI	250.234		P	Ni XVII	251.97			S X	254.00		
Ca VI	250.265	200		Ni VI	252.047	420		Ti VII	254.022	800	
Cr VII	250.311	40		Ni VI	252.062	340		Ti VI	254.037	200	P
C VI	250.317		P	Ti	252.065	20	N	P XI	254.04	90	
Ti	250.339		N	Ni VI	252.088	130		Ni VI	254.067	280	
Ni VI	250.344	560		Ni VI	252.151	150		Ni VI	254.105	540	
C VI	250.346		P	Ti VII	252.162	200		Cr X	254.15		
P IX	250.38	550		V X	252.17	100		F III	254.165	20	
Ni VI	250.384	220		Fe XIV	252.190	40		Ni VI	254.168	520	
Cu	250.400	300	N	Cu	252.223	150	N	V IX	254.17		
Ti VI	250.482	1000		Cr XII	252.27		P	Cr VII	254.177	20	
Ni VI	250.504	50		Ti VII	252.275	800		Ti	254.188	3	N
Na III	250.516	500		Ni VI	252.291	190		F III	254.197	10	
V X	250.54			Ni VI	252.362	250		Ni VI	254.273	60	
N IV	250.566		P	Ni VI	252.386	140		Ti	254.288	20	N
Si VIII	250.60		P	Si	252.4	20	N	C IV	254.3		ZZ
Ni VI	250.686	330		Co XXII	252.4		P	Ni VI	254.308	250	
Na XI	250.709		P	V V	252.440	180		N IV	254.338	100	Z
P IX	250.73	750		Ni VI	252.523	200		Ni VI	254.353	170	
Ni VI	250.738	540		O IV	252.550	160	Z	Ni VI	254.393	470	
Mn VII	250.771	1000		Ti VII	252.571	60		Ni VI	254.458	420	
Co XXIV	250.79		P	K	252.581	20	N	Ni VI	254.472	270	
Ti	250.790	3	N	O IV	252.581	160	Z	Ti	254.485	6	N
Ni VI	250.792	40		Cr X	252.64		P	F IV	254.491	200	
Na XI	250.907		P	Cu	252.780	750	N	Cu	254.510	500	N
Ti VII	250.913	3		Si VIII	252.79			Mn VII	254.517	15	
Ar VII	250.940	350		Ni VI	252.792	100		P XI	254.54	70	
Si VIII	250.97		P	Cr VII	252.837	1		Ni VI	254.570	660	
Na XI	250.974		P	V V	252.838	80		Ti	254.574	1	N
Sc V	250.978	400		Sc V	252.846	500		F IV	254.595	100	
Ti	250.999	10	N	Ti	252.874	3	N	Ni VI	254.672	220	
F IV	251.026	1000		Ni VI	252.888	110		F IV	254.681	10	
Fe XVI	251.058	40		S XI	252.93	25		Ti VII	254.687	200	
Ti VI	251.071	700		O IV	252.948	40		Ni VI	254.733	690	
O IV	251.114	5	Z	Ti V	252.958	900		Cu	254.772	700	N
Ne III	251.12	200		P V	252.959	4		Ni VI	254.810	80	
Cr VII	251.124	20		Mn VII	252.985	750		Ti	254.859	1	N
Ni VI	251.128	470		V VI	253.000	285	N	Ni VI	254.897	470	
O IV	251.148	5	Z	O IV	253.082	60		Ni VI	254.974	230	
Ni VI	251.199	380		Ti XII	253.142	35		Se XXVII	255.0		F,P
P VIII	251.23	400		V X	253.20			Ni VI	255.043	300	
Ti	251.266	6	N	V IX	253.21			O III	255.044	10	
Cu	251.278	20	N	Ni VI	253.257	240		Ti VII	255.076	250	
Al VIII	251.347	10		Co XV	253.34			S X	255.08	20	
Ca IV	251.354	150		S XI	253.36	50		Ni VI	255.089	370	
Na III	251.372	300		Fe XXII	253.38		P	Fe XXIV	255.090	300	P
Ni VI	251.428	120		Ti	253.427	1	N	Ni VI	255.109	450	
Ni VI	251.452	60		Ni VI	253.435	110		N IV	255.148	380	
Ca VI	251.465	200		Ni VI	253.461	250		Ni VI	255.155	570	
Mn VII	251.479	400		Cu	253.465	150	N	O III	255.158	50	
Cr XII	251.52			Ni VI	253.485	560		Cr VII	255.210	70	
Ti V	251.533	6	Q,Z	Ti	253.518	1	N	V X	255.24		
Ne III	251.54	200		Ni VI	253.524	510		O IV	255.252	25	
Ni VI	251.544	310		O III	253.548	10		K	255.267	20	N
Ni VI	251.564	330		Ti	253.591	1	N	Ni VI	255.274	660	
Mg V	251.584	100		Br XXIV	253.6		P	Si V	255.3	50	Q
Ti	251.622	35	N	S XI	253.62	150		O III	255.302	10	
V V	251.655	200		Mn VII	253.654	400		Ti VI	255.375	300	
Cu	251.670	200	N	Ti V	253.674	1	Q,Z	Sc V	255.379	50	
Ni VI	251.678	180		K XVI	253.677		P	Ni VI	255.385	80	
Si	251.7	50	N	Ni XIV	253.69			Cu	255.417	350	N
Ti	251.715	1	N	Ni VI	253.717	160		Ni VI	255.426	120	
Ne III	251.72	200		Sc V	253.733	500		Ti	255.439	1	N
Ni VI	251.722	520		V VI	253.735	5	N	Cr VII	255.447	1	
Ni VI	251.761	60		Br XXVII	253.76		F,P	Fe VI	255.461	2	
Ti	251.800	6	N	Si X	253.772	70		Ni VI	255.474	590	
Ni VI	251.802	220		Cu	253.786	150	N	Ni VI	255.528	60	
Ca VI	251.816	50		Ni VI	253.808	110		K	255.530	50	N
V IX	251.82			V VI	253.809	285	N	V X	255.54		

Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes
Cr VII	255.545	40		Ti	257.003	10	N	Ni VI	258.791	510	
P V	255.587	80		K	257.131	20	N	Sc V	258.808	40	
Ti	255.628	3	N	Cl XVII	257.147		P	Ni VI	258.867	130	
Ni VI	255.630	330		Ti V	257.155	6	Q,Z	Ti	258.868	3	N
F III	255.632	3		Sc V	257.157	200		K VI	258.873	150	
Sc V	255.636	300		S X	257.16	100		Cu	258.927	800	N
F III	255.667	1		Ne I	257.19		A,Z	Ti	258.930	3	N
P V	255.674	50		Ni VI	257.198	200		Ni VI	258.941	440	
P V	255.681		P	Si IX	257.255	50		Mn XXI	258.95	10	
Ni VI	255.696	270		Fe X	257.262	45	Q	Ni VI	258.962	610	
F III	255.723	35		Cu	257.315	200	N	Ti	258.969	3	N
K	255.729	20	N	Ar XIV	257.37			Al VII	259.036	262	
Ti	255.754	1	N	Ti	257.382	1	N	K XVI	259.039		P
K XV	255.76			Fe XIV	257.385	50		Ni VI	259.047	90	
F III	255.770	60		Cr VII	257.422	70		Ni VI	259.103	520	
Ni VI	255.809	510		Cl XII	257.43			Cr VII	259.181	285	
Ti	255.813	10	N	Ti XII	257.430	6	Q	K	259.184	20	N
F III	255.863	100		Ni VI	257.486	120		N III	259.189	700	Z
Ti	255.875	6	N	N III	257.502	300	Z	Cu	259.199	200	N
Co XV	255.88			Cl XVII	257.578		P	Al VII	259.207	345	
Cl XVII	255.893		P	Ni VI	257.593	150		Ti VI	259.232	250	
Ni VI	255.907	110		Ni VI	257.615	220		Ni VI	259.283	290	
Ni VI	255.957	150		Cu	257.626	200	N	Ti XX	259.296	30	P
Ni VI	256.001	130		Ti	257.645	6	N	Ti VIII	259.311	6	Q
Ti	256.149	6	N	Ni VI	257.657	280		Fe XXI	259.33		P
C VI	256.175		P	K VI	257.657	100		Mn XII	259.33		
Ni VI	256.196	150		Cr VII	257.676	450		Ni VI	259.357	150	
K VIII	256.222	1		Ne I	257.68		A,Z	Cr VII	259.360	110	
Be IV	256.238		P	Ni VI	257.725	210		Ni VI	259.377	190	
C VI	256.261		P	Ni VI	257.760	70		Cr VII	259.432	40	
C VI	256.291		P	Ni VI	257.831	590		Ti	259.448	35	N
Be IV	256.295		P	Ti VI	257.855	250		C IV	259.471	300	
Ti	256.305	10	N	N III	257.953	500	Z	S X	259.52	150	
He II	256.317	320		Ca V	257.976	265		C IV	259.542	350	
Cr XI	256.32			Ar XIV	257.98			Ca V	259.576	150	
Ti XII	256.338	3	Q	Ne VII	258.0		N	K VI	259.609	100	
F III	256.358	35		Cu	258.004	150	N	Ni VI	259.615	280	
Cu	256.365	300	N	Ti	258.008	1	N	Cr VII	259.636	360	
Si X	256.37	300		Ni VI	258.014	200		Ti	259.649	20	N
Fe X	256.38		Q	K VI	258.018	200		Ni VI	259.650	620	
K	256.402	20	N	Ti	258.056	1	N	Cr XIII	259.68		
Zn XX	256.41	250		Si IX	258.073	20		Ni VI	259.682	210	
Fe XIII	256.42			Ni VI	258.093	210		Ni VI	259.699	190	
O III	256.425	100	Z	O IV	258.116	5		Si IX	259.75		
P IV	256.453	4		Ni VI	258.170	370		Ni VI	259.797	360	
Ti	256.454	10	N	Co VII	258.174	10		N IV	259.824	450	
O III	256.460	150	Z	Ti	258.178	1	N	Ni VI	259.830	230	
O III	256.506	150	Z	O IV	258.207	10		Ti	259.835	10	N
K	256.512	20	N	Ni VI	258.222	250		Ca V	259.856	150	
Ti	256.525	1	N	Sc V	258.238	150		Cu	259.871	250	N
F III	256.526	3		Ca V	258.251	150		Ni VI	259.891	360	
Si VIII	256.53			Cu	258.265	450	N	Ti	259.895	3	N
Co VII	256.556	40		Ti XI	258.267	1	Q	Ne I	259.96		A,Z
Si X	256.569	10	N	V X	258.28			Cr XXI	259.97	10	
Ni VI	256.571	190		Ni VI	258.306	360		Ca V	259.978	150	
Ti	256.586	20	N	N IV	258.320	150		Ni VI	259.978	210	
Ni VI	256.587	250		Si X	258.347	120		K IX	260.042	40	
S XIII	256.66	250		Si IX	258.36			Sc V	260.054	50	
Ni VI	256.675	320		Ni VI	258.371	140		Ni VI	260.057	720	
F III	256.675	3		Ni VI	258.397	130		N III	260.090	800	Z
Ti V	256.685	3	Q,Z	K VI	258.411	50		Se XXX	260.1		F,P
Ni VI	256.716	140		Ti	258.467	1	N	Ni VI	260.131	230	
F III	256.723	1		Ni VI	258.474	90		C V	260.136	4	
Ti	256.732	6	N	Ne I	258.48		A,Z	Ti	260.145	1	N
Ni VI	256.806	360		N III	258.499	650	Z	Ni VI	260.187	500	
Ti	256.815	1	N	Ni VI	258.505	140		Ni VI	260.218	290	
Ni VI	256.828	440		Ni VI	258.569	80		C V	260.229	4	
K VI	256.831	150		Cr XX	258.57	50		Ni VI	260.238	340	
Ti	256.869	1	N	Ti VIII	258.610	700		Cu	260.245	250	N
F III	256.894	6		K XV	258.62			Ar VIII	260.25	200	
Cu	256.898	400	N	Ni VI	258.637	480		Ti	260.251	60	N
Ni VI	256.910	420		V VI	258.643	70	N	Ni VI	260.270	290	
Fe	256.919	40	N	Ni VI	258.674	40		Co VI	260.284	80	
Cr XX	257.0			Ni VI	258.716	210		Fe VI	260.289	20	Q
V X	257.00			Ni VI	258.755	210		F III	260.307	20	

Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes
Ar VIII	260.33	300		Fe VI	261.846	250		Ni VI	263.434	400	
Ne VIII	260.34			Ti VII	261.851	60		Fe VI	263.449	100	
Ni VI	260.351	790		Ni VI	261.888	340		Ti VIII	263.564	120	
F III	260.372	10		Cr XIII	261.91			Co VI	263.589	100	
O IV	260.389	150		Ti	261.916	1	N	Ni VI	263.605	300	
Ti	260.408	1	N	P XI	261.92	70		Ni VI	263.653	500	
Mn XIV	260.41			Co VI	261.942	170		Ti	263.658	6	N
Ni VI	260.446	230		Fe VI	261.944	150		O III	263.692	150	
Ca V	260.446	165		Ni VI	261.958	440		Ni XVII	263.7		P
N IV	260.447	600		Fe VI	261.977	50		K	263.716	100	N
F III	260.496	10		Ni VI	261.982	160		O III	263.728	200	
N IV	260.519		P	Ne X	262.024		P	Fe XXIII	263.76	120	
Ti	260.522	6	N	Ni VI	262.028	270		O III	263.768	150	
Ni VI	260.522	530		V X	262.04			F III	263.808	150	
O IV	260.555	120		Ni VI	262.066	650		Na II	263.81		A
Ti	260.566	1	N	Ni VI	262.111	280		O III	263.818	250	
Co VI	260.572	430		O III	262.113	100		K	263.819	100	N
Ni VI	260.592	790		N III	262.184	450		Ti	263.822	1	N
P V	260.619	12		N III	262.233	800		O III	263.861	150	
Ni VI	260.661	630		Ni VI	262.235	650		Ni VI	263.868	180	
Co VI	260.692	300		Ni VI	262.255	460		O III	263.903	10	
Ti VII	260.704	250		Ni VI	262.287	180		Ni VI	263.913	690	
Ni VI	260.717	780		O III	262.289	10		Ti VII	263.944	35	
Ni VI	260.756	590		Ne X	262.294		P	Ni VI	263.984	190	
F III	260.782	3		B V	262.294		P	B IV	264.02	5	
Ni VI	260.808	490		Ti	262.300	3	N	Ni VI	264.022	520	
K IX	260.828			Ni VI	262.302	150		Cu	264.029	150	N
Ti VIII	260.829	1	Q	N III	262.304	100		Co VI	264.046	390	
Co VI	260.845	230		Cl XII	262.32			Ni VI	264.060	720	
Ti IX	260.916	6		Cr XIII	262.33			Cr VI	264.078	250	
V X	260.93			Ni VI	262.335	210		Ca XV	264.09	10	
Ni VI	260.976	190		Co VI	262.337	100		Ni VI	264.131	100	
Ti	260.986	3	N	Ni VI	262.372	230		Ni VI	264.182	700	
Ti	261.026	10	N	Ne X	262.384		P	Co VI	264.199	130	
O III	261.027	200		Ni VI	262.416	410		Ni VI	264.228	190	
Al VII	261.044	330		B V	262.427		P	S X	264.24	200	
Si X	261.045	50		Cu	262.442	200	N	O III	264.257	200	
P VIII	261.05	80		Ni VI	262.447	510		Mn XII	264.26		
Ni VI	261.058	280		Ni VI	262.485	180		Ti	264.272	20	N
Ni VI	261.109	510		Ti	262.499	1	N	O III	264.338	250	
K II	261.200	50	N	Ni VI	262.518	260		K	264.339	100	N
Al VII	261.219	495		Ni VI	262.541	430		P XI	264.34	150	
Ti	261.224	1	N	C IV	262.550	150		Na II	264.34		A
O VII	261.26		P	Ni VI	262.562	280		P V	264.358	30	
Ti V	261.280	1	Q, Z	Cl XII	262.60			Ni VI	264.358	300	
N III	261.282	800	Z	Ni VI	262.612	290		Ti	264.367	3	N
N VII	261.303		P	C IV	262.624	200		Ni VI	264.440	150	
Ni VI	261.310	680		Ti VIII	262.651	10	Q	Co VI	264.446	360	
Ti	261.365	1	N	Ni VI	262.662	290		K VIII	264.478	100	
Si IX	261.41			Ni VI	262.683	460		O III	264.480	300	
Ni VI	261.436	660		Ti VIII	262.718	10		Ni VI	264.512	710	
N VII	261.460		P	Ni VI	262.723	330		Co VI	264.574	120	
P IV	261.477	10		O III	262.729	10		Co VI	264.602	210	
Ti	261.493	10	N	Ni VI	262.850	570		Ni VI	264.614	190	
Ni VI	261.498	210		N III	262.867	400	Z	Ti	264.650	1	N
N VII	261.512		P	O III	262.882	50		Ni VI	264.669	770	
Ge XXII	261.52	100		Ti	262.894	1	N	Ni VI	264.718	350	
O VII	261.54		P	N III	262.914	500	Z	Cr VI	264.732	12	
Ni VI	261.547	660		Ni VI	262.931	390		Ti	264.739	1	N
Ti VIII	261.578	1	Q	Ni VI	262.963	490		Si	264.74		N
Cr VII	261.598	20		Ti	262.967	1	N	Co VI	264.745	180	
Cu	261.606	300	N	Fe XVI	262.967	40		Ni VI	264.746	120	
Ni VI	261.622	440		Si	262.98		N	Na II	264.76		A
Co VI	261.652	180		Ni VI	262.990	630		Fe XIV	264.779	60	
Ni VI	261.657	490		Ni VI	263.026	560		Cl XIII	264.78		
Ni VI	261.689	630		Na II	263.06		A	N III	264.822	100	
F III	261.713	100		Ni VI	263.077	330		Ti VII	264.823	250	
Ti VIII	261.725	60		Ne I	263.11		A, Z	Ni VI	264.825	120	
F III	261.749	60		P X	263.22	80		N III	264.846	200	
Fe VI	261.786	200		Ti VI	263.246	250		Co VI	264.866	250	
Ni VI	261.804	680		Br XXVIII	263.3		F, P	Ni VI	264.868	20	
Cu	261.806	200	N	Ni VI	263.352	490		P V	264.911	50	
S VI	261.81	50		Ti	263.384	6	N	N III	264.945	400	
V X	261.84			Na II	263.39		A	Ti	264.958	1	N
Ni VI	261.842	160		Co XIII	263.41			N III	264.966	100	



Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes
C VI	264.970		P	Ni VI	266.473	670		Ni VI	267.688	590	
Ni VI	264.979	600		Ni VI	266.493	690		Ne III	267.71	200	
Ti VII	264.997	35		Co VI	266.496	450		Cr XIII	267.73		
As XXVI	265.0		F, P	Ti VII	266.502	200		Co VI	267.749	230	
Ni VI	265.002	540		Ni VI	266.565	590		Ni VI	267.769	650	
Fe XVI	265.007	3		Cu	266.584	100	N	Ca V	267.772	400	
C III	265.029	10	Z	N III	266.613	200		Ni VI	267.784	700	
Co VI	265.035	320		Co VI	266.635	230		N III	267.787	300	
Ti VII	265.059	90		Ni VI	266.670	460		Ni VI	267.825	320	
Co VI	265.059	190		Ti	266.670	3	N	Ni VI	267.848	390	
C VI	265.061		P	O IV	266.690	1	Z	N III	267.848	300	
O IV	265.062	1	Z	Ne VIII	266.7		N	P XI	267.85	200	
Na II	265.08		A	Ni VI	266.721	180		Na III	267.874	500	
Ni VI	265.080	210		O IV	266.729	1	Z	Ne IX	267.9		N
C VI	265.093		P	N III	266.737	250		Ti IX	267.941	120	
Ni VI	265.103	250		Ni VI	266.781	410		N III	267.952	500	
Ti	265.145	3	N	Sc VII	266.800	200	Q	N III	267.966	50	
Ni VI	265.207	490		Ni VI	266.805	350		Ni VI	267.972	490	
N III	265.216	100		N III	266.805	200		Co VI	267.975	90	
N III	265.232	500	Z	N III	266.847	200		Ni VI	267.995	240	
Ni VI	265.243	310		Ca V	266.863	150		Si	268.00		N
Ti	265.255	1	N	Ni VI	266.882	140		Ni VI	268.019	170	
N III	265.271	500	Z	Na III	266.896	250		Ti VII	268.035	200	
C III	265.287	10	Z	Mn XXIII	266.896	50	P	Ni VI	268.048	430	
Na II	265.30		A	Co VI	266.909	520		Co VI	268.059	480	
V XI	265.31			N III	266.930	400		Ti VII	268.106	35	
Co VI	265.315	30		Ni VI	266.931	670		Ni VI	268.118	680	
N III	265.339	200		O IV	266.932	40		Ni VI	268.146	330	
K	265.353	50	N	Co VI	266.965	800		Ti VIII	268.178	120	
Ni VI	265.397	530		O IV	266.967	25		Ni VI	268.193	550	
Co VI	265.442	110		O III	266.967	250		N III	268.212	200	Z
Ni VI	265.455	620		N III	266.974	200		Ni VI	268.215	600	
Ni VI	265.511	600		Co VI	266.978	500		N III	268.255	300	Z
Ni VI	265.525	590		F IX	266.979		P	Ni VI	268.262	190	
O V	265.550	250		O III	266.985	350		Ti	268.269	6	N
Co VI	265.561	170		Ti	267.024	3	N	Ni VI	268.288	290	
Ni VI	265.565	420		Ni VI	267.026	630		Co VI	268.301	640	
Ti X	265.574	6	Q	O III	267.030	350		Cu	268.309	600	N
Co VI	265.584	130		K	267.036	100	N	N III	268.314	400	Z
Ni VI	265.611	550		O III	267.050	150		Co VI	268.316	650	
P X	265.62	70		Na II	267.06		A	N III	268.347	350	
Ni VI	265.658	680		Ne III	267.07	300		Ni VI	268.381	570	
Ti	265.666	1	N	N III	267.075	300		Ni VI	268.410	190	
Fe VII	265.697	150		Ni VI	267.076	590		O III	268.451	50	
Se XXIII	265.7	290		Ni VI	267.094	620		N III	268.473	600	
V X	265.70			Ni VI	267.110	510		Ni VI	268.479	200	
Ni VI	265.716	730		O III	267.121	200		Ti VII	268.493	1	
Co XVI	265.74	85		Co VI	267.128	480		Ni VI	268.539	250	
Ni VI	265.765	590		Ti VII	267.136	60		Ti	268.566	1	N
P X	265.79	150		Ni VI	267.153	630		Ni VI	268.571	550	
Ni VI	265.795	190		F IX	267.170		P	Ca V	268.583	100	
N III	265.852	100		Ti	267.187	1	N	Na III	268.626	500	
Ni VI	265.878	170		Ni VI	267.189	130		Ni VI	268.637	610	
Ni VI	265.926	530		N III	267.199	500		Co VI	268.659	60	
Ni VI	265.946	600		Ni VI	267.232	560		Ni VI	268.697	400	
Ti VII	265.951	60		F IX	267.234		P	Ti	268.699	1	N
Co VI	265.954	160		Ni VI	267.253	490		N III	268.703	500	Z
N III	265.978	200		C V	267.267	30		Ni VI	268.732	530	
Na II	266.06		A	Ni VI	267.285	90		Ti	268.748	1	N
Cu	266.061	200	N	Co VI	267.291	610		N III	268.756	400	Z
Ni VI	266.105	570		Ti VI	267.343	200		Cl XII	268.77		
Co VI	266.116	100		Ni VI	267.367	630		Cu	268.773	500	N
N III	266.132	300		Ti VIII	267.401	60		F IV	268.785	400	
Ni XVII	266.15			Co VI	267.403	370		Co VI	268.790	90	
Ni VI	266.154	450		Ni VI	267.408	560		F IV	268.817	100	
Cr VII	266.172	1		Ni VI	267.461	670		Ni VI	268.835	330	
Ni VI	266.180	280		Ni VI	267.498	610		Cr VII	268.852	70	
Ti	266.180	3	N	Ne III	267.53	300		Na II	268.88		A
N V	266.196	120		Cu	267.562	250	N	Ni VI	268.939	400	
Ni VI	266.227	650		Ni VI	267.571	710		Cu V	268.947	90	
N III	266.255	500		Na II	267.61		A	Ni VI	268.967	540	
Ni VI	266.299	500		Ni VI	267.640	510		Mg VI	268.986	650	
K VI	266.344	200		Na III	267.645	700		Ni VI	269.007	720	
Ni VI	266.354	270		Ni VI	267.654	590		Ti	269.010	1	N
N V	266.379	150		N III	267.661	250		Ni VI	269.026	720	

Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes
Cr VII	269.038	70		Fe XXI	270.52		Q	Na XI	271.953		P
Cu	269.044	400	N	Ti VIII	270.530	1		Ni VI	271.953	500	
N III	269.072	150		Ni VI	270.538	270		O IV	271.990	40	
Ni VI	269.072	670		N III	270.554	50	Z	Ni VI	271.990	680	
F IV	269.076	300		Ca V	270.570	100		Si X	271.995	40	
Mn XV	269.11			C III	270.583	100	Z	Co VI	272.025	510	
Ni VI	269.114	430		Ni VI	270.585	480		Ti VIII	272.037	90	
P IV	269.117	40		N III	270.613	150	Z	O IV	272.076	40	
Ni VI	269.140	550		Ni VI	270.614	500		Na III	272.076	200	
Ni VI	269.159	570		Ni VI	270.635	360		Mn XIII	272.09		
N III	269.199	300		Ni VI	270.658	280		O IV	272.127	60	
Cl XII	269.21			Ti	270.675	10	N	Ni VI	272.146	610	
F IV	269.225	200		F III	270.677	20		Co VI	272.149	5	Q
Ni VI	269.234	710		N III	270.685	50	Z	O IV	272.174	25	
Mg IV	269.282	40		Ni VI	270.736	290		Na XI	272.182		P
Mg VIII	269.295	10	Q	Cu	270.740	200	N	Ne VIII	272.2		N
Ni VI	269.298	700		Ti VII	270.748	10		Ne I	272.21		A, Z
Ti	269.314	1	N	Ni VI	270.771	210		N IV	272.219		P
Co VI	269.390	110		Ne VIII	270.8		Q	Na XI	272.259		P
Cr VII	269.397	20		Ni VI	270.803	510		Ca V	272.265	250	
Ni VI	269.399	530		Ni VI	270.811	520		O IV	272.273	40	
Ni VI	269.425	140		Co VI	270.843	200		O IV	272.310	40	
Ni XVII	269.44			Cr VII	270.897	160		Ni VI	272.311	680	
Ni VI	269.459	470		Ti	270.913	6	N	Ca V	272.336	150	
P X	269.47	300		Co VI	270.917	220		Ni VI	272.361	280	
Ti VIII	269.533	175		Co VI	270.937	160		Ti VIII	272.369	10	
Ni VI	269.547	140		Ni VI	270.941	320		Ni VI	272.384	310	
O IV	269.559	5	Z	Na II	270.947	7		Ti	272.417	3	N
P X	269.64	100		Ni VI	270.971	640		Cu	272.424	150	N
Cu	269.653	200	N	Co VI	270.972	210		Na III	272.449	200	
Ni VI	269.661	520		O V	270.982	10		Fe XXV	272.48		P
Ti	269.708	1	N	Co VI	270.990	330		Co VI	272.480	500	
Ni VI	269.740	680		N IV	270.994	650		Ga XXIV	272.5		F, P
Ti VII	269.759	90		O VIII	271.011		P	P V	272.513	12	
Cr VI	269.776	300		C III	271.014	100		N III	272.523	400	
Mn XII	269.82			Ni VI	271.014	460		Ni VI	272.548	550	
Ni VI	269.828	680		Ti	271.030	6	N	Ti	272.569	3	N
Ni VI	269.874	350		Cr VII	271.070	160		Ni VI	272.587	580	
Fe VI	269.879	2		N III	271.077	200		Co VI	272.620	100	
Ni VI	269.903	90		P X	271.11	30		Ni VI	272.629	280	
Ni VI	269.925	10		Ni VI	271.135	340		Si VII	272.641	200	
Ti	269.939	10	N	O VIII	271.139		P	Ni VI	272.648	120	
Na II	269.993	10		Ca V	271.141	200		N III	272.654	650	
N III	270.004	400		Be IV	271.148		P	Ni VI	272.678	120	
Ni VI	270.013	510		Co XIII	271.16			Ti	272.707	1	N
Ni VI	270.035	50		Ni VI	271.179	450		F III	272.712	20	
Cu V	270.059	140		O VIII	271.183		P	Ni VI	272.726	200	
Ti	270.067	3	N	N III	271.209	350		F III	272.756	10	
N III	270.073	400		Be IV	271.212		P	Cu	272.807	100	N
Ni VI	270.090	220		Ti	271.234	6	N	Ni VI	272.811	600	
Ni VI	270.118	150		Ni VI	271.262	430		Ti VIII	272.843	6	
N III	270.131			Cu V	271.334	490		Ca VII	272.866	150	N
Ni VI	270.134	310		Na II	271.373	5		Ni VI	272.887	490	
Ni VI	270.156	480		Co XVI	271.38			Ni VI	272.901	410	
Co VI	270.164	440		Ni VI	271.383	460		F III	272.919	10	
Ni VI	270.172	390		O III	271.403	50		Ni VI	272.942	190	
N III	270.201	650		Ni VI	271.410	330		Ca V	272.982	200	
F IV	270.225	600		Ca V	271.440	50		Ni VI	272.992	620	
Ni VI	270.226	660		Ni VI	271.463	90		Ni VI	273.013	720	
Ti	270.281	10	N	Ti	271.488	6	N	K IV	273.065	100	
Ni VI	270.287	600		O III	271.523	50		Ni VI	273.089	520	
Ca V	270.305	300		Ni VI	271.525	310		Na III	273.089	30	
Co VI	270.311	50		Ni VI	271.562	210		Ni XVII	273.10		P
Ni VI	270.312	290		Ti VIII	271.591	3		Na III	273.103	20	
C III	270.324	10		Co VI	271.597	400		P V	273.112	30	
Fe VII	270.363	1		O III	271.611	10		Ni VI	273.117	310	
V IX	270.38			Ni VI	271.689	140		N IV	273.140	300	
Mg VI	270.394	750		Co VI	271.709	50		Ti VIII	273.178	90	
Ni VI	270.401	260		Cr XX	271.72	10		F III	273.206	6	
Co XV	270.43			Ni VI	271.733	610		Cr VII	273.269	5	
Ti	270.443	1	N	V XI	271.75			Ni VI	273.281	390	
Ni VI	270.454	210		Ni VI	271.788	320		Ni VI	273.315	20	
Ca V	270.494	150		K IV	271.820	150		Co VI	273.319	340	
Fe XIV	270.512	50		Ni VI	271.849	40		Ni VI	273.358	460	
Ni VI	270.515	640		Ti	271.892	1	N	Cu XIX	273.361	150	

Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes
Ni VI	273.394	410		Co VI	274.819	610		Fe VI	276.352	50	
Cu	273.417	200	N	Ni VI	274.838	140		Ni VI	276.402	510	
Ni VI	273.436	680		Na II	274.931	20		Cr XIII	276.41		P
N III	273.462	200	Z	N IV	274.946		P	Co VI	276.426	30	
Ni VI	273.465	400		Al XIII	274.958		P	Fe VI	276.427	40	
Na III	273.467	30		Co VI	274.990	110		K	276.428	20	N
Ni VI	273.490	550		Na II	275.003	20		Ni VI	276.452	280	
Cu V	273.494	130		N IV	275.016		P	Cu V	276.533	20	
N III	273.503	100	Z	Co VI	275.020	160		Ni VI	276.542	250	
N III	273.524	450	Z	Co VI	275.085	30		Ti	276.565	35	N
K IV	273.546	50		Al XIII	275.095		P	Co VI	276.575	280	
Ni VI	273.560	610		Ni VI	275.108	170		Mg V	276.582	700	
Ti	273.562	6	N	Ti	275.128	3	N	Ni VI	276.587	490	
N III	273.562	200	Z	Cu V	275.158	20		Co VI	276.613	380	
Fe VI	273.60		Q	Ni VI	275.163	190		Ni VI	276.639	650	
Ni VI	273.616	540		Co VI	275.168	370		Ni VI	276.672	710	
Ni VI	273.636	210		Ni VI	275.210	600		Fe VI	276.690	150	
Ni VI	273.677	160		Na II	275.218	5		Ni VI	276.694	550	
Ca III	273.695	50		Ni VI	275.221	620		Ti VIII	276.701	10	
Co VI	273.717	300		Cu	275.244	100	N	Co VI	276.716	580	
F VIII	273.75		P	Ni VI	275.260	570		Ni VI	276.730	280	
Co VI	273.817	490		Cu V	275.272	190		N IV	276.741	10	
Ni VI	273.841	650		O III	275.281	100		Fe VI	276.742	50	
Ni VI	273.893	560		Co XX	275.30		F,P	F III	276.780	35	
Ni VI	273.904	580		Ni VI	275.311	520		Ti IX	276.785	20	
Ti	273.916	3	N	Ni VI	275.332	620		Ni VI	276.812	510	
Na II	273.940	12		Al VI	275.343	300		Si VII	276.839	200	
Cr VII	273.952	1		Si VII	275.352	250		Si VIII	276.839	200	
Ni VI	273.965	630		N IV	275.354	450		K	276.890	20	N
Co VI	273.968	280		O III	275.366	150		F III	276.897	20	
N III	273.977	200		Ni VI	275.400	580		Ti	276.909	1	N
Co VI	273.982	290		Co VI	275.403	260		Fe VI	276.945	250	
Na II	274.023	12		Ni VI	275.417	660		Mg VII	277.007	300	
Ti	274.028	6	N	O III	275.513	200		Ni VI	277.033	480	
Co VI	274.048	70		Ni VI	275.522	510		Ti	277.034	1	N
C III	274.051	200		K	275.525	20	N	Si VIII	277.054	200	
Ni VI	274.062	660		Co VI	275.548	500		Ni VI	277.058	330	
Ni VI	274.077	610		Cr VII	275.563	1		Ni VI	277.074	240	
Ni VI	274.103	170		Ni VI	275.597	160		Co VI	277.080	470	
N III	274.108	400		Cr VII	275.635	5		Ne VIII	277.1		N
Ni VI	274.156	520		Si VII	275.665	200		Ti	277.111	3	N
Ni VI	274.174	590		P X	275.74	20		Ti	277.168	1	N
Si VII	274.175	200		Cr VII	275.756	1		Cl XIII	277.17		
Ga XXI	274.18	20	P	Co VI	275.770	140		Co VI	277.214	430	
Fe XIV	274.203	60		Mn XII	275.78			Fe VI	277.232	50	
N III	274.213	50	Z	Cr VII	275.792	1		Ni VI	277.250	600	
Co VI	274.222	280		Ni VI	275.810	530		Si X	277.261	50	
Ni VI	274.236	50		Co VI	275.827	480		Ni VI	277.373	630	
N III	274.258	160	Z	N III	275.829	400	Z	O III	277.385	350	
Co VI	274.260	190		Ni VI	275.838	270		Mn XIII	277.42		
F III	274.260	60		N III	275.852	100	Z	Ni VI	277.421	430	
N III	274.276	100		Ti IX	275.867	60		Ni VI	277.457	600	
Ni VI	274.276	390		Co VI	275.869	530		Co VI	277.493	110	
Ni VI	274.295	160		N III	275.871	150	Z	O III	277.514	50	
N III	274.316	200	Z	Ni VI	275.879	340		Fe VI	277.570	800	
Co VI	274.320	640		N III	275.883	100	Z	Ni VI	277.579	590	
N III	274.337	200	Z	P X	275.91	40		Co VI	277.581	490	
N III	274.374	400	Z	Cr VII	275.926	5		Cl XIII	277.59		
Ti IX	274.411	10		N III	275.931	50	Z	Ni VI	277.623	80	
Co VI	274.442	220		Ni VI	275.941	280		Fe VI	277.626	300	
Ni VI	274.444	400		Co VI	275.943	440		Ni VI	277.715	410	
N IV	274.451	250		Ti	275.979	1	N	Ni VI	277.735	550	
Ca III	274.461	10		Ni VI	276.005	70		Ti	277.760	1	N
Fe VI	274.494	10		Ni VI	276.077	340		Cu	277.761	100	N
Co VI	274.498	190		V IX	276.08			Ni VI	277.765	630	
Ni VI	274.508	650		Ni VI	276.114	430		Mn XXII	277.80	30	
Ti VIII	274.514	3	N	Cl XIV	276.13			Sc	277.809	200	N
Al XIII	274.532		P	Mg VII	276.145	200		N III	277.813	150	
Co VI	274.538	250		Co VI	276.171	120		Ti VIII	277.813	35	
K IV	274.552	150	N	Fe VI	276.173	80		Co VI	277.853	420	
Cu	274.601	150	N	N III	276.193	400		Ni VI	277.862	140	
Ni VI	274.618	120		Ne IX	276.2		N	Ti	277.866	3	N
Ni VI	274.676	260		Co VI	276.285	580		N III	277.873	300	Z
Ni VI	274.726	150		N III	276.326	700		N III	277.901	50	Z
Co VI	274.757	70		Ni VI	276.342	660		Co VI	277.936	120	

Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes
Sc VI	277.943	300	N	Cr VI	279.154	80		O III	280.483	50	
Fe VI	277.947	300		P IX	279.18	150		C III	280.522	200	Z
Ni VI	277.958	210		Al VII	279.187	440		Ni VI	280.556	210	
N III	277.961	150	Z	Ti	279.195	3	N	Cr VII	280.571	1	
Ti	277.984	3	N	Ni VI	279.201	470		Cr XI	280.572	1	
Co VI	278.011	350		Co VI	279.203	480		Co VI	280.578	330	
Cu V	278.020	140		Ni VI	279.270	350		P V	280.593	80	
Ni VI	278.032	280		Co VI	279.289	450		Cu V	280.606	190	
Co VI	278.038	320		Cr XIII	279.32			Ni VI	280.627	110	
Ti	278.065	35	N	Co VI	279.327	370		Co VI	280.650	780	
Ni VI	278.075	410		Ni VI	279.385	450		Ni VI	280.672	500	
Co VI	278.076	550		Co VI	279.398	680		Fe XIV	280.69		
Si X	278.107			Ni VI	279.410	310		Ni VI	280.696	390	
Co VI	278.116	350		Fe VI	279.421	250		Co VI	280.709	500	
Ni VI	278.118	540		K VII	279.433	20		Mg VII	280.744	300	
Fe VI	278.150	800		Ni VI	279.445	320		Al VII	280.745	100	
Ni VI	278.168	480		O IV	279.456	20	Z	Co VI	280.767	580	
Co VI	278.178	950		Fe VI	279.466	20		Co VI	280.779	600	
Co VI	278.186	880		Co VI	279.497	920		Ni VI	280.786	410	
Ni VI	278.209	460		Ni VI	279.514	260		F III	280.802	1	
Ni VI	278.226	550		Ti VII	279.516	200		Cr VII	280.823	20	
Fe VI	278.244	300		K VII	279.521	20		Ni VI	280.829	60	
P XII	278.26	350		Co VI	279.523	780		Cr VI	280.879	12	
Cu V	278.275	100		Ni VI	279.545	490		F III	280.905	3	
Co VI	278.300	280		Ni VI	279.605	580		Co VI	280.918	480	
Ni VI	278.301	600		Cr XIII	279.62		P	Ni VI	280.931	420	
Ti	278.331	60	N	O IV	279.631	150		Co VI	280.934	550	
Ni VI	278.341	230		Ti	279.654	6	N	Ni VI	280.979	270	
Fe VI	278.343	500		F III	279.689	100		Ca V	280.992	400	
Co VI	278.363	270		Ni VI	279.728	240		Al VII	280.994	150	
Ni VI	278.401	530		Cr XXII	279.731	120	P	Sc V	280.997	400	
Mg VII	278.406	400		Ni VI	279.756	320		Cu V	280.999	230	
Co VI	278.419	790		Co VI	279.773	780		Ni VI	281.026	490	
P IX	278.42	40		Ni VI	279.786	420		Ni VI	281.077	340	
Ni VI	278.435	640		O III	279.787	150		V XII	281.11		
N III	278.436	200		Sc XIX	279.817		P	Ni VI	281.111	480	
Si VII	278.445	200		Ni VI	279.830	310		Co VI	281.117	370	
Ni VI	278.448	590		F IV	279.834	300		Ni VI	281.141	230	
Fe VI	278.474	300		Co VI	279.863	510		Al VII	281.153	12	
Co XXI	278.5		F, P	K IV	279.877		N	Ti	281.193	1	N
Ni VI	278.511	290		Ni VI	279.908	560		Ni VI	281.204	470	
Ni VI	278.526	320		O IV	279.933	200		F III	281.204	10	
Co VI	278.569	80		Ti VIII	279.940	20		Si VI	281.23		Q
N III	278.572	400		P V	279.965	50		Ni VI	281.257	350	
Si X	278.61	100		Ni VI	279.976	560		Si VI	281.3	50	Q
Ti	278.627	10	N	Fe VI	279.997	100		Sc VI	281.327	200	
Co VI	278.636	930		F III	280.007	60		F III	281.343	20	
Ni VI	278.636	560		Co VI	280.007	910		Ni VI	281.380	390	
Ni VI	278.660	430		Ni VI	280.014	370		C III	281.390	200	Z
Co VI	278.685	50	Q	Ti IX	280.027	20	Q	Al V	281.394	900	
Al V	278.694	1000		O III	280.030	100		Ni XV	281.4		P
Co VI	278.699	840		C III	280.043	300		S XI	281.40	175	
Ti IX	278.713	225		Co VI	280.058	730		Ar VI	281.43	120	
Ni VI	278.735	570		Si	280.1	50	N	Ni VI	281.442	630	
Co VI	278.739	900		Al IX	280.114	175		Ti IX	281.446	6	
Ni VI	278.764	500		O III	280.116	50		Cu VI	281.489	57	
Co VI	278.778	860		Ti IX	280.141	3		Ni XVII	281.50		
Fe VI	278.787	100		Ni VI	280.142	510		Ni VI	281.504	620	
Ti VIII	278.806	20		Cr VI	280.143	50		Ni VI	281.515	640	
Ni VI	278.829	180		N IV	280.180		P	Co VI	281.533	500	
Ni VI	278.915	420		Co VI	280.193	710		Cu V	281.543	120	
Ti	278.926	6	N	O III	280.234	50		Ni VI	281.548	530	
C VI	278.937		P	O III	280.265	150		Fe VI	281.572	2	
Ni VI	278.962	330		Ti	280.284	20	N	Co VI	281.582	390	
Fe VI	278.970	300		Co VI	280.311	520		V XX	281.589		P
Co VI	278.981	680		O III	280.328	50		Ni VI	281.620	630	
Al VII	278.982	510		Ni VI	280.330	490		Ni VI	281.644	530	
C VI	279.038		P	Mn XV	280.35			Na II	281.691	25	
Co VI	279.044	280		Co VI	280.353	280		Ni VI	281.722	370	
C VI	279.073		P	Fe VI	280.397	300		Cu VI	281.740	44	
Ti IX	279.074	20		O III	280.412	50		Co VI	281.753	360	
As XXII	279.1		P	Ni VI	280.449	620		Cu V	281.765	310	
Ni VI	279.106	520		Co VI	280.452	390		Co VI	281.786	350	
Ti	279.140	35	N	Co VI	280.471	400		Na II	281.788	25	
Cu	279.150	100	N	Ni VI	280.480	340		Ni VI	281.802	410	

Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes
Co VI	281.809	280		Ni XVII	283.		P	Al IX	284.015	345	
Ni VI	281.843	330		Ni VI	283.032	250		Cu V	284.028	130	
Ni VI	281.857	370		Cu V	283.055	180		Ni VI	284.033	410	
Co XVI	281.88			Cu VI	283.068	5		N III	284.040	400	Z
Cu V	281.885	30		Ni VI	283.071	160		Mn VII	284.059	100	
Ti VII	281.898	200		Co VI	283.076	860		Ni VI	284.059	460	
Ar VI	281.92	160		Co VI	283.091	88		Cu V	284.062	70	
Cu VI	281.942	16		Si	283.1	20	N	Cu V	284.067	390	
Ni VI	281.955	610		Ni VI	283.107	160		V V	284.075	20	
Co VI	281.958	320		Ni VI	283.131	400		Co VI	284.095	300	
Co VI	281.972	380		Ne III	283.15	300		Fe XV	284.147	80	
Ni VI	281.975	480		Ar VI	283.16	120		Ni VI	284.192	130	
Ni VI	282.015	560		Ne III	283.17	600		Cu V	284.197	20	
Ni VI	282.038	320		Cu V	283.179	270		Si	284.2		N
Ni VI	282.055	210		Ti	283.204	1	N	Ni XV	284.2		P
N III	282.070	400		F VIII	283.21		P	Ni VI	284.219	680	
Ni VI	282.075	150		Ni VI	283.213	390		Co VI	284.222	90	
Ti	282.086	6	N	Co VI	283.215	170		Ni VI	284.243	620	
Co VI	282.089	180		Na II	283.258	15		Sc VI	284.263	900	
Mn VII	282.095	30		P IX	283.26	200		Cu V	284.265	190	
Mn XV	282.10			V XII	283.28			N III	284.277	100	Z
Ni VI	282.118	120		Ti	283.316	1	N	Ni VI	284.292	480	
Co VI	282.130	340		Ni VI	283.327	520		Co VI	284.300	490	
N III	282.209	700		Cu V	283.341	40		N III	284.308	250	Z
Sc VI	282.209	700		Ni VI	283.391	190		Cl XIV	284.31		
O IV	282.213	2		Fe VI	283.396	150		N III	284.336	400	Z
Ti VI	282.215	1		Co VI	283.406	670		Ti	284.349	20	N
Ni VI	282.250	660		Cu V	283.410	90		N III	284.365	150	Z
Ne VIII	282.27			N IV	283.419	500		Co VI	284.366	410	
Cu V	282.275	70		Ni VI	283.463	570		Fe VI	284.385	50	
Ni VI	282.295	400		N IV	283.476	700		Ni VI	284.392	450	
P IV	282.301	90		S VI	283.50	300		Co XVI	284.42		
Ni VI	282.327	350		Ni VI	283.515	540		Sc V	284.450	800	
Cu VI	282.342	23		Co VI	283.518	170		Ni VI	284.458	220	
Co VI	282.343	290		Cu V	283.519	80		V V	284.494	80	
K V	282.355	150	N	Co VI	283.557	590		Ni VI	284.507	460	
Cu VI	282.355	30		N IV	283.583	900		Fe VI	284.513	250	
Ni VI	282.362	280		Ti VI	283.586	20		Ni VI	284.539	730	
Ni VI	282.385	530		N IV	283.599		P	Ni VI	284.580	650	
Al IX	282.407	240		Ni VI	283.599	520		V V	284.581	110	
Ni VI	282.410	330		Ne IX	283.6		N	Ni VI	284.671	630	
Co VI	282.414	200		Cu V	283.626	280		Cu V	284.676	220	
Ar VI	282.42	240		Fe XII	283.64			Co VI	284.679	150	
Cu VI	282.439	28		Ni VI	283.645	70		Ca V	284.794	100	
Ni VI	282.451	100		Ne III	283.66	500		Ti VII	284.829	1	Q
Ne III	282.49	10		Ni VI	283.670	120		Co VI	284.831	150	
Ni VI	282.492	220		O VIII	283.678		P	Ni VI	284.845	560	
Cu V	282.494	110		Co VI	283.700	610		K VI	284.860	20	
Sc VI	282.497	600		Ni VI	283.713	510		Ni VI	284.868	710	
Ni XXIII	282.5		F, P	Ni VI	283.732	390		Co VI	284.883	510	
Co VI	282.511	520		Fe VI	283.776	300		Sc VI	284.884	600	
Ti	282.520	1	N	K XIV	283.78		P	Cu V	284.888	20	
Ni VI	282.529	570		Cr XX	283.8		P	Co VI	284.919	250	
Cu VI	282.537	8		Ni VI	283.816	260		Fe VI	284.928	10	
Ar VI	282.56	40		O VIII	283.817		P	Na III	284.94		Z
Cu V	282.568	120		Co VI	283.847	420		Ni VI	284.946	660	
Sc VI	282.587	300		N III	283.850	30	P, Z	Ca V	284.978	300	
Ni VI	282.594	370		Ni VI	283.862	580		Cr XI	284.988	20	
Ne VIII	282.61			O VIII	283.864		P	Co VI	285.031	390	
Ti IX	282.613			Ne III	283.87	300		Ni VI	285.057	710	
Al VII	282.660	315		Ni VI	283.878	530		Fe VI	285.079	5	
Ni VI	282.676	640		Co VI	283.881	770		Ni VI	285.112	230	
Co VI	282.678	350		N III	283.882	180	Z	Co VI	285.116	840	
Na II	282.709	35		N III	283.898	180	Z	Cu V	285.125	40	
Cu VI	282.770	6		Mn XIII	283.91			Ti IX	285.128	20	
Na II	282.803	35		Sc V	283.911	900		Sc VI	285.191	800	
Ni VI	282.833	540		Co VI	283.929	580		Ni VI	285.195	510	
Ni VI	282.853	490		N III	283.937	50	Z	Ni VI	285.220	490	
Co VI	282.866	270		Cu V	283.966	490	N	Fe VI	285.231	5	
Ti VII	282.898	1		Ni VI	283.977	730		Cu V	285.299	80	
Ni VI	282.924	420		N III	283.977	200		Ni VI	285.304	540	
Co VI	282.937	470		Sc VI	283.99	40		Fe VI	285.349	150	
Ni VI	282.946	390		Co VI	283.992	280		P IX	285.37	450	
Cu V	282.958	70		N III	283.996	200	Z	Ni VI	285.375	290	
Ni VI	282.990	350		C IV	284.		ZZ	Ti	285.417	90	N

Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes
Ni VI	285.456	430		Sc IV	286.677	40	N	Ti	288.125	6	N
K	285.458	20	N	Co VI	286.681	120		Zn XX	288.22		
Al VIII	285.467	50		P IX	286.70	10		Ni VI	288.222	500	
Ni VI	285.471	440		Co VI	286.735	80		Co VI	288.227	440	
Ni VI	285.537	280		Ni VI	286.768	180		Ti	288.232	6	N
Ti	285.543	35	N	Ni VI	286.806	360		F IV	288.267	100	
N IV	285.561	600		V V	286.839	200		Sc V	288.286	600	
Ni VI	285.566	430		Ni VI	286.851	610		Ni VI	288.296	90	
S XI	285.58	250		Si	286.9	50	N	Ti VI	288.355	60	
Ni VI	285.587	370		Sc VII	286.927	1000		C III	288.423	10	
Ni VI	285.611	170		Co VI	286.928	290		Co VI	288.424	80	
Co VI	285.648	330		Ne IV	286.93	75		Cu V	288.427	20	
Ni XVII	285.66			Ca V	286.96	450		Ni VI	288.437	150	
Cu V	285.666	250		Ni VI	286.977	610		S XII	288.45	20	
Ti XI	285.672	6	Q	Fe VI	286.986	10		Fe XIV	288.45		
O IV	285.710	40		Ni VI	286.991	610		Ti X	288.462	1	
Ni VI	285.710	550		Ni VI	287.035	90		Co VI	288.507	310	
Co VI	285.713	180		Ti	287.041	10	N	Fe VI	288.557	500	
Ti	285.726	3	N	Co VI	287.064	440		Ni VI	288.613	110	
Fe VI	285.746	5		Co VI	287.077	490		Mg VI	288.652	10	
Cu V	285.751	120		Al VIII	287.083	165	Q	V XII	288.67		
Co VI	285.788	480		Ni VI	287.089	260		Ni VI	288.757	400	
Ni VI	285.789	280		Ni VI	287.134	430		Ne IX	288.8		N
Al VII	285.822	360		Co VI	287.134	410		Co VI	288.835	620	
S XI	285.83	200		Si X	287.16	50		Ni VI	288.854	400	
O IV	285.834	60		Ni VI	287.176	530		Ni VI	288.885	240	
N III	285.855	225		Fe VI	287.182	250		Co VI	288.937	190	
Ti	285.860	10	N	Ni VI	287.203	340		Ni VI	288.937	180	
Cu	285.873	100	N	Ne IV	287.21	50		Se XXVI	288.95		F, P
Si VI	285.92		Q	Fe XII	287.23		Q	Ni VI	288.971	300	
Ni VI	285.932	610		Co VI	287.258	230		Si XI	289.0	50	Q
Al VIII	285.959	105	N	Co VI	287.289	380		Ti	289.019	3	N
Sc	285.966	300	N	Ni VI	287.320	230		Ni VI	289.038	40	
V V	285.979	180		Cl V	287.33	300		Fe VI	289.066	400	
Ti IX	285.992	1		Fe VI	287.343	100		Al VIII	289.07		
Cu V	285.993	130		Co VI	287.349	170		Ni VI	289.077	70	
Si	286.0	20	N	Ti	287.355	6	N	S VI	289.09	200	
N III	286.000	450		Co VI	287.381	460		Fe VI	289.096	100	
O III	286.038	10		Ni VI	287.387	640		Fe VI	289.115	800	
Ni VI	286.040	170		Ti	287.400	6	N	Al VIII	289.12		
Sc	286.078	300	N	Co VI	287.411	520		C IV	289.143	450	
Ti IX	286.112	20		Fe VI	287.415	150		S XVI	289.151		P
Ni VI	286.127	360		Cu V	287.437	20		Fe XIV	289.160	10	
Co VI	286.128	250		V VI	287.440	550		Ti	289.178	1	N
Cl V	286.13	200		Fe VI	287.461	300		Si X	289.186	100	
Fe VI	286.150	250		Ni VI	287.470	220		Fe VI	289.187	300	
Ni VI	286.200	210		Sc VII	287.48	40	Q	V XII	289.21		
Ti	286.233	1	N	Ni VI	287.530	490		C IV	289.230	500	
Ni VI	286.257	150		Fe VI	287.545	40		O IV	289.292	10	
Cl XIV	286.26			Sc VIII	287.55	50		Fe VI	289.307	250	
As XXVI	286.3		F, P	Co VI	287.559	370		Ti	289.318	10	N
Co VI	286.310	280		N III	287.56	300	Z	Co VI	289.335	430	
Ni VI	286.310	370		Ni VI	287.577	520		Cu	289.358	0	N
Ti	286.333	1	N	Ni VI	287.599	480		Ti VIII	289.375	1	
Fe VI	286.347	100		Al VIII	287.610	60	N	Ti	289.456	1	N
Al IX	286.364	215		Co VI	287.615	110		Ni VI	289.467	260	
Co VI	286.371	330		Ca V	287.657	150		O IV	289.469	5	
Cu V	286.395	110		Ni VI	287.668	480		Fe VI	289.469	200	P
He I	286.4	20	Z	Co VI	287.669	510		Fe VI	289.478	200	P
Ni VI	286.421	310		Fe VI	287.694	200		N IV	289.479	300	
Ni VI	286.448	380		Ni VI	287.701	280		P IX	289.49	500	
O V	286.448	100		Ni VI	287.778	460		Fe VI	289.524	400	
Ne IV	286.45	75		Ni VI	287.848	370		Mn XX	289.57		P
V V	286.490	50		Sc	287.873	400	N	Ti X	289.579	90	
Ne VII	286.5		N	Co VI	287.880	270		Ti IX	289.579	90	
Ti	286.532	20	N	Ni VI	287.965	150		Ni VI	289.583	430	
Ni VI	286.547	420		Co XVI	287.97		P	Sc V	289.589	900	
Ni VI	286.569	630		F IV	287.994	1		O IV	289.590	2	
Ni VI	286.597	460		Ni VI	287.999	570		B IV	289.64	5	
Al VIII	286.61			Ni VI	288.028	240		Al VIII	289.645	58	N
Ni VI	286.624	160		Co VI	288.034	310		Fe VII	289.68		F, P
Co XII	286.64			Ni VI	288.059	240		Fe VI	289.682	200	
Co VI	286.662	180		F IV	288.078	10		Cr XX	289.7		
Ni VI	286.670	150		Co VI	288.079	320		Ti	289.731	1	N
Fe VI	286.674	70		Sc	288.104	300	N	Cr XIV	289.735	50	

Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes
Mn XIII	289.74			F III	290.945	35		Ni VI	292.256	240	
Ni XVII	289.77		P	Cu V	290.959	100		Ni VI	292.294	560	
Cu V	289.829	90		N III	290.965	100	Z	Fe VI	292.314	30	
Fe VII	289.83		F,P	Ti VIII	290.971	35		Co VI	292.321	290	
Sc IV	289.851	1000		Ge VI	290.98		F,P	Sc VI	292.344	600	
Fe VI	289.853	700		Fe VI	290.985	80		Sc VII	292.344	600	
Fe VI	289.871	100		Ni VI	290.988	480		Fe VI	292.346	60	P
O IV	289.898	20		Fe XII	291.010	8		Fe VI	292.352	20	P
O IV	289.933	5		Ge VI	291.02		F,P	Fe XV	292.36		
Cu V	289.937	80		Fe VI	291.020	700		Ni VI	292.367	440	
Fe VI	289.959	30		N III	291.023	160	Z	Cu V	292.373	60	
Ti	289.992	1	N	N III	291.031	200	Z	Ne VIII	292.38		
Ni VI	289.995	300		Ni VI	291.035	270		Ti	292.401	1	N
Ni VI	290.014	240		O IV	291.054	5	Z	Ni VI	292.402	280	
Fe VI	290.040	800		Co VI	291.075	240		Fe VI	292.409	200	
Fe VI	290.092	600		Co VI	291.095	250		Ni VI	292.427	510	
S VI	290.13	300		Ni VI	291.115	220		Fe VI	292.437	100	
Co VI	290.134	560		Ti	291.186	60	N	N III	292.447	450	
Fe VI	290.147	300	P	Fe VI	291.187	800		Ni VI	292.456	140	
F IV	290.147	400		Fe VII	291.20		F,P	Fe XXII	292.46	120	
Fe VI	290.149	400	P	Ni VI	291.201	170		O VIII	292.465		P
Ni VI	290.149	350		O IV	291.203	5	Z	Ne VIII	292.47		
Ni VI	290.181	160		Si VII	291.22			F VIII	292.52		P
Ti	290.215	10	N	Fe VI	291.229	800		Co VI	292.525	20	
Sc VII	290.232	800		Ni VI	291.264	560		N III	292.595	750	
Fe VI	290.273	900		Ni VI	291.297	60		Fe VI	292.599	300	
Ti X	290.294	1		C III	291.3261	500		Ni VI	292.616	360	
Fe VI	290.309	700		Mg VI	291.348	300		Fe VI	292.693	100	
Fe VII	290.31		F,P	Fe VI	291.365	100		Fe VI	292.733	800	
Cr XI	290.323	40		Ti	291.403	6	N	O VIII	292.774		P
Ni VI	290.326	80		Cu V	291.406	60		Ni VI	292.784	80	
Ti	290.344	3	N	Co VI	291.427	370		Si IX	292.83	80	
Ti	290.385	20	N	Ni VI	291.427	370		O VIII	292.874		P
Ni VI	290.388	150		Fe VI	291.444	100		Co VI	292.878	280	
Fe VI	290.390	200		Co VI	291.453	350		Ti XI	292.901	1	Q
S XVI	290.404		P	Mg VI	291.458	200		Co VI	292.912	360	
Ni VI	290.429	100		Ni VI	291.468	220		F VIII	292.95		P
Cu V	290.430	80		Fe VI	291.473	900		Mg VI	293.026	200	
F IV	290.440	300		Co VI	291.478	36		Ti	293.033	1	N
F IV	290.461	200		Co VI	291.543	440		Fe VI	293.043	300	
Sc IV	290.487	300	N	Fe VI	291.552	300		K V	293.050		
Cu V	290.488	40		Ti	291.585	3	N	Ni VI	293.059	40	
Fe VI	290.500	300		S XI	291.59	200		Ne IV	293.12	75	
Ni VI	290.504	310		Ni VI	291.609	150		Mg VI	293.124	400	
Ti	290.506	1	N	Fe VI	291.617	60		Cr XXI	293.15	50	
Cl XIV	290.51			Co VI	291.625	200		Fe VI	293.171	150	
Ga V	290.524	60		Fe VI	291.635	250		Fe VI	293.217	200	
Co VI	290.543	290		Ni VI	291.641	480		Ti	293.240	1	N
Fe VI	290.579	800		Co VI	291.666	640		Sc V	293.248	800	
Ti VIII	290.601	6	Q	Ni VI	291.703	460		Ni VI	293.248	70	
F IV	290.608	200		Cr VII	291.738	20		Cl VII	293.25	400	
Si IX	290.63	20		Co VI	291.783	540		Cu	293.257	100	N
Fe VI	290.661	125		Fe VII	291.80		F,P	Fe VI	293.293	300	
Ni VI	290.666	340		Fe VI	291.801	800		K V	293.332	150	
Ni VI	290.687	220		Ni VI	291.806	420		Co VI	293.357	270	
Sc VII	290.700	600		S XI	291.83	0		Fe VI	293.380	300	
Co VI	290.718	510		Fe VI	291.835	600		Fe VI	293.391	200	
Fe VII	290.72		F,P	Ni VI	291.891	250		Ge XXI	293.4	280	
Ti	290.726	3	N	Cu V	291.901	50		Co VI	293.410	190	
Ni VI	290.739	90		Fe VI	291.909	70		Cu V	293.411	220	
Fe VI	290.739	400		Ni VI	291.918	220		Ne IV	293.43	50	
Fe VII	290.76		F,P	Sc V	291.932	1000		K VI	293.438	100	N
Co VI	290.773	370		Ti	291.958	1	N	Ni VI	293.467	140	
Co VI	290.802	520		Ni XVIII	291.970	350		Co VI	293.472	90	
Ni VI	290.802	590		Ca VI	291.976	50	N	Ni VI	293.482	190	
Ti X	290.815	1		Ni VI	291.990	440		Fe VI	293.488	800	
Ni VI	290.830	170		Co VI	292.015	480		Ni VI	293.517	110	
S XVI	290.835		P	Ni XIV	292.03			Fe VI	293.549	200	
Co VI	290.840	250		Fe VI	292.039	200		Ti	293.549	1	N
F III	290.846	60		Ni VI	292.146	450		Co VI	293.552	490	
N III	290.865	200	Z	Ar VI	292.15	200		Co VI	293.574	600	
Fe VI	290.900	200		Fe VI	292.185	50		Ti	293.640	1	N
N III	290.916	160	Z	Ni VI	292.208	30		Ne IV	293.65	25	
Ni VI	290.925	520		Co VI	292.219	330		Ge VI	293.66		F,P
N III	290.930	400	Z	Si X	292.220	60		Ti X	293.684	10	

Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes
V XXI	293.742		P	Ni VI	295.362	270		Ni VI	296.831	60	
Fe VI	293.742	900		F III	295.369	6		Cu V	296.840	90	
Ti X	293.798	1		Ni VI	295.389	150		Ni VI	296.846	50	
Fe VI	293.806	100		P V	295.392	50		Fe VI	296.851	70	
Fe VI	293.820	700		Mg VIII	295.393	10	Q	C IV	296.857	300	
Ni VI	293.849	200		Mg IV	295.395	100		Ni VI	296.901	70	
Fe VI	293.881	300		Ca VII	295.396	150	N	Co VI	296.914	880	
Ni VI	293.883	570		F III	295.404	3		C IV	296.951	350	
Na VI	293.887	30		Co VI	295.423	420		Co VI	296.955	330	
Ni VI	293.944	60		Sc VI	295.478	900		Ca III	296.958	300	
Ti	293.944	20	N	Sc VIII	295.478	900		Fe VI	296.988	500	
Ne IV	293.95	5		Ni VI	295.480	590		Ni VI	297.001	150	
Fe VI	293.965	800		O III	295.511	150		Ge XXV	297.06		F, P
Fe VI	294.039	300		Fe VI	295.560	150		Cu V	297.060	250	
Ar VI	294.05	240		Ni VI	295.573	520		K V	297.064	200	
Ni VI	294.074	140		Cu V	295.583	70		Ti	297.106	3	N
He I	294.1	150	Z	Ti X	295.584	35		Ne VIII	297.12		P
Ne IV	294.10	15		Si	295.6	50	N	Co VI	297.131	70	
Ni VI	294.121	290		Fe VI	295.606	200		Fe VI	297.139	200	
Co VI	294.135	280		O III	295.619	250		Cu V	297.164	210	
Ni VI	294.224	110		Ni VI	295.622	590		Ti VIII	297.197	20	
Ti	294.239	1	N	S XI	295.63	200		Sc VII	297.269	700	
Fe VI	294.262	900		Fe VI	295.634	500		Cu V	297.272	130	N
Ni VI	294.264	480		Ge V	295.651	1000		Fe VI	297.275	250	
Ni VI	294.290	330		O III	295.657	300		V V	297.276	20	
Sc VI	294.292	700		Fe VI	295.702	80		Fe VI	297.307	800	
Ti X	294.302	3	Q	F III	295.703	35		Ti	297.312	1	N
Fe VI	294.337	800		O III	295.716	300		Cu V	297.336	50	
Ni VI	294.362	350		Fe VI	295.732	200		Co VI	297.370	820	
Ne IV	294.39	15		Cu V	295.822	60		Ni VI	297.400	250	
Cu V	294.490	90		O IV	295.874	5		Ti	297.418	1	N
Cu V	294.490	90		F III	295.889	60		Co VI	297.444	160	
Ni VI	294.507	190		Cu V	295.890	300		Fe VI	297.479	300	
K	294.515	50	N	O III	295.944	150		Na V	297.482	30	Q
Ge V	294.515	700		Fe VI	295.947	80		Co VI	297.483	200	
Fe VI	294.516	700		Co VI	295.983	140		Cu V	297.488	70	
Ni VI	294.613	640		Ni VI	296.009	530		Ni VI	297.490	360	
Fe VI	294.645	100		O III	296.012	200		Ni VI	297.526	170	
O IV	294.650	5		Co VI	296.053	340		Ti	297.527	6	N
Fe VI	294.668	200		Ti VII	296.056	35		Ni VI	297.544	180	
Ge VI	294.68		F, P	Fe VI	296.077	70		Fe VI	297.561	800	
Si	294.7	50	N	P V	296.085	80		Fe VI	297.579	500	
Cu V	294.732	60		Cu V	296.099	160		N IV	297.595	500	
Fe VI	294.751	500		Fe VI	296.106	900		Ni VI	297.612	420	
Ni VI	294.754	490		Ga V	296.129	20		Ar VII	297.62	150	
Cr XII	294.77			Ni VI	296.145	210		N IV	297.634	500	
Cu V	294.808	90		Sc V	296.166	400		Co VI	297.648	760	
Ni VI	294.819	130		K V	296.169	200		Ge VI	297.65		F, P
K V	294.836	300		Si IX	296.19	150		Cu V	297.655	50	
Ni VI	294.850	180		Co VI	296.212	190		N IV	297.657	400	
Fe VI	294.850	250		O III	296.22	50	Z	Ni VI	297.659	120	
O IV	294.853	5		Ni VI	296.238	100		Ar VII	297.66	200	
Ge VI	294.89		F, P	Ni VI	296.279	570		Ar VII	297.70	300	
Cu V	294.892	160		Ni VI	296.310	110		N IV	297.704	600	
Cl VII	294.90	500		Sc IV	296.311	1000		Cu V	297.752	130	
Mn XIII	294.95			Cu V	296.311	220		V XII	297.77		
Fe VI	294.960	300		Fe VI	296.317	200		N IV	297.770	600	
Ni VI	295.001	600		As XXIX	296.4		F, P	Co V	297.799	180	
Fe VI	295.015	700		N IV	296.418		P	Ni VI	297.806	220	
Fe VI	295.042	700		Ni VI	296.531	70		N IV	297.816	700	
Cl XIV	295.05			Sc VII	296.539	400		Fe VI	297.828	100	
O IV	295.051	2		Cu V	296.548	170		Ti	297.858	1	N
Ti	295.070	6	N	Ca IV	296.554	250		Si	297.9	50	N
O IV	295.140	2		Cu V	296.629	20		Fe VI	297.934	200	
Fe VI	295.147	150		Ni VI	296.630	270		Ni VI	297.973	370	
Ca VII	295.171	150	N	Ni VI	296.672	460		Ti	298.014	3	N
Co VI	295.176	50		Fe VI	296.676	80		Cu V	298.022	230	
Ni VI	295.194	570		Co XIV	296.68			Ni VI	298.049	170	
He I	295.2	100	Z	V V	296.724	50		Cr XI	298.059	40	
Ti	295.207	6	N	Fe VI	296.725	200		Cu V	298.161	110	
Fe VI	295.224	30		Co VI	296.737	400		Ni VI	298.170	520	
Co VI	295.262	120		Cu V	296.779	40		Fe VI	298.184	100	
Fe VI	295.262	500		Fe VI	296.807	400		Sc VI	298.194	800	
Ni VI	295.298	580		Ga V	296.815	120		Si IX	298.20		P
Fe VI	295.360	800		Co VI	296.827	680		Fe VI	298.224	150	



Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes
Mn XXIV	298.25		P	Na II	300.153	160		Fe VI	301.622	800	
Cu V	298.280	130		Na II	300.202	160		Co V	301.656	30	
Co VI	298.318	360		Co VI	300.228	620		Na I	301.67		A, Z
Na I	298.33		A, Z	Fe VI	300.240	30		Co VI	301.710	150	
Co XIV	298.38			K V	300.252	200		Ni VI	301.739	20	
Ti	298.380	1	N	Cr XIV	300.271			Ca III	301.741	200	
Ga V	298.428	1000		Ni VI	300.272	490		Fe VI	301.750	100	
Sc VI	298.428	800		N IV	300.318	650		Co VI	301.784	40	
Co XVI	298.46			Cu V	300.324	110		Fe VI	301.796	100	
Sc VII	298.557	600		Ni VI	300.334	270		Cr XIV	301.814		
Co VI	298.649	340		Ni VI	300.372	670		Sc VII	301.820	500	
Sc	298.66	200	N	Fe VI	300.390	200		Fe VI	301.844	100	
Ge VI	298.70		F, P	Ti	300.416	1	N	Fe VI	301.878	250	
Ne VIII	298.70			Fe VI	300.423	100	P	P IV	301.880	4	
Cu V	298.705	130		Cu V	300.425	120		Ti VI	301.913	20	
Cu V	298.750	60		Fe VI	300.426	50	P	Cu V	301.954	70	
Na I	298.83		A, Z	Ni VI	300.426	440		Co VI	301.954	580	
Ni VI	298.832	210		Fe VII	300.43		F, P	Fe VI	301.969	100	P
Cu V	298.917	230		Ni VI	300.447	580		Fe VI	301.975	50	P
Fe VI	298.960	10		O III	300.455	150	Z	Si	302.0	50	N
Co VI	298.990	780		Ni VI	300.499	200		Ti	302.007	1	N
Sc IV	299.037	1000		K V	300.503	200		Cu V	302.050	50	
Co VI	299.056	340		Co VI	300.533	630		Co VI	302.061	120	
Ne VIII	299.13			Co VI	300.538	630		Ni VI	302.065	90	
Co VI	299.161	290		Ni VI	300.545	250		Ni VI	302.108	140	
Cu V	299.222	560		Al IX	300.560	125		Co VI	302.125	610	
P IV	299.258	1		Ga V	300.564	760		Co VI	302.157	20	Q
O III	299.275	100	Z	He I	300.6	100	Z	Cu V	302.171	20	
Fe VI	299.295	400		Cu V	300.607	20		Ca XVIII	302.215	300	P
Ni VI	299.305	410		Fe VI	300.657	300		Ni VI	302.224	370	
Cu V	299.307	200		Sc VI	300.677	300		Cu V	302.237	40	
Ca IV	299.315	200		Ni VI	300.707	120		Cl XIII	302.24		
Cu V	299.330	440		Ga V	300.774	180		Co VI	302.254	130	
Ni VI	299.341	350		Fe VI	300.776	500		Ni XIV	302.27		
Ni VI	299.417	350	N	Sc	300.817	200	N	Ti VIII	302.272	60	
Co VI	299.458	670		Cu V	300.824	160		Ni VI	302.306	370	
Ga V	299.466	580		Ni VI	300.89		F, P	Cu V	302.319	140	
Zn XXIII	299.48		F, P	Na I	300.90		A, Z	Fe VI	302.327	250	
Ga V	299.486	200		Ni VI	300.955	360		He I	302.4	150	P, Z
Ni VI	299.495	580		Fe VI	301.002	200		Co VI	302.410	510	
O IV	299.499	10		Ni VI	301.031	470		Si IX	302.42		P
S XII	299.50	175		Fe VI	301.095	100		Sc VII	302.436	100	
Ti	299.563	3	N	Ni VI	301.107	450		Sc VI	302.438	100	
Cu V	299.582	70		Cu V	301.109	80		Na II	302.446	60	
Co VI	299.590	310		Ne III	301.12	400		Ni VI	302.448	230	
Fe VI	299.593	100		Ca V	301.139	20		Fe XV	302.45		
O IV	299.620	5		Ni VI	301.174	90		Co VI	302.471	470	
Cu V	299.639	530		Co VI	301.175	260		Cu V	302.474	120	
Cu V	299.650	490		Ga V	301.187	620		Ni VI	302.536	180	
N III	299.661	300		C III	301.206	200		Fe V	302.543	1	
Co VI	299.662	260		Co VI	301.208	430		Ti	302.558	1	N
P IV	299.672	1		Sc	301.233	200	N	Na VII	302.563	20	Q
O IV	299.710	5		C III	301.243	300		Fe VI	302.598	300	
Ni VI	299.742	700		Ti	301.244	1	N	K VI	302.657	100	N
Fe VI	299.803	100		P IV	301.249	1		Co XVI	302.69		
N III	299.818	550		Si VI	301.25		Q	Cu V	302.695	90	
Co VI	299.824	610		C III	301.279	100		Ga V	302.718	50	
O IV	299.853	15		V X	301.283	5		Cu V	302.737	410	
Cu V	299.863	300		Ni VI	301.286	400		Co VI	302.738	360	
Ti	299.889	1	N	Ti VIII	301.297	6		Ga V	302.871	360	
S XIII	299.89	75		Sc VII	301.301	300		Ti	302.906	1	N
N III	299.903	200	Z	Na II	301.318	90		Cu V	302.934	240	
Fe VI	299.963	300		Ni VI	301.355	520		Cu V	302.967	360	
Ni VI	299.967	630		Ni VI	301.396	580		Na I	302.97		A, Z
Ni VI	299.996	300		Co VI	301.400	90		Ni VI	303.001	180	
Sc V	300.004	700		Sc VI	301.426	400		N IV	303.006	150	
Ga V	300.006	830		Na II	301.436	100		Cu V	303.022	20	
Si	300.02		N	Cu V	301.438	230		Ni VI	303.03		F, P
Fe VI	300.043	100		Fe VI	301.445	800		N IV	303.048	300	
Ni VI	300.053	520		P IV	301.460	4		Co VI	303.073	200	
Cu V	300.078	230		V XII	301.50			N IV	303.078	100	
Cr XII	300.08		P	Cu V	301.516	130		N IV	303.124	500	
Fe VI	300.092	400		Ni VI	301.518	540		Sc VIII	303.157		
Cu V	300.109	150		V V	301.604	100		N IV	303.162	100	
Fe VI	300.136	10		Co VI	301.609	110		Fe VI	303.167	200	

Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes
N IV	303.191	10		Cu V	304.659	380		Fe VI	306.470	200	
Co VI	303.192	340		Cu V	304.659	380		Ni V	306.488	20	
Cu V	303.273	20		Ni V	304.702	210		Ni VI	306.489	290	
N IV	303.280	500		Cu V	304.716	160		Cu V	306.560	100	
Fe VI	303.299	150		N IV	304.733		P	Ni V	306.565	20	
Ni XIII	303.31			N III	304.786	100	Z	Co VI	306.568	200	
Si XI	303.318	60		N IV	304.793		P	K	306.620	100	N
Cu V	303.347	220		N IV	304.800		P	O IV	306.623	90	
S XIII	303.37	50		P IV	304.805	4		Ni V	306.669	120	
C IV	303.4		ZZ	N IV	304.811		P	Ni V	306.776	160	
Fe XV	303.40		N	N III	304.812	250	Z	Fe VI	306.829	300	
O III	303.411	350		N III	304.837	110	Z	Fe VI	306.862	70	
Co VI	303.416	300		Mn XIV	304.85			O IV	306.884	60	
Ne X	303.429		P	Ni V	304.854	20		K	306.888	50	N
C III	303.432	400		N III	304.860	500	P,Z	Al IX	306.91		
N VI	303.46			N III	304.887	100	P,Z	Fe VII	306.91		F,P
O III	303.460	350		Na I	304.89		A,Z	Fe VI	306.926	500	
C III	303.468	100		Ca III	304.910	150		Ga V	307.016	890	
O VIII	303.511		P	N IV	304.916		P	Fe VI	307.021	250	
O III	303.515	350		N III	304.921	100	Z	Sc VIII	307.083	600	
Fe VI	303.543	100		N IV	304.927		P	Co VI	307.088	310	
Co VI	303.565	10	Q	Ti XIX	304.929	150	P	Ni VI	307.097	570	
Cu XIX	303.57			V X	304.974	20		Co VI	307.104	260	
Fe VI	303.580	300		Co VI	304.977	100		Mn VI	307.109	100	
C VI	303.595		P	Ge V	304.984	200		Fe VI	307.134	300	
O III	303.621	350		Ni V	304.991	130		Na V	307.152	800	
Ne X	303.627		P	P IV	304.996	90		Co VI	307.157	50	
Co VI	303.629	320		Fe XV	305.00			Ga V	307.202	230	
O VIII	303.669		P	Co VI	305.036	250		P IV	307.203	1	
Be IV	303.678		P	Fe VI	305.043	100		Ni VI	307.207	710	
Co VI	303.687	360		Al IX	305.055	165		Ni V	307.225	180	
K	303.690	100	N	Cu V	305.082	120		Cu V	307.243	250	
O III	303.693	350		Cu V	305.101	150		Al VI	307.249	350	
Ne X	303.694		P	Ni V	305.129	100		Al IX	307.26		P
C VI	303.712		P	Fe VI	305.206	300		Co VI	307.263	390	
O VIII	303.722		P	Co VI	305.215	290		Co VI	307.287	620	
N VI	303.75			Ni VI	305.220	170		Cu V	307.307	20	
C VI	303.752		P	Sc VIII	305.260	100		Cu V	307.307	20	
Be IV	303.756		P	Ge VI	305.29		F,P	Sc VII	307.320	200	
He II	303.7804	665	P	Ni V	305.305	80		S XIII	307.36	50	
He II	303.7858	335	P	Fe V	305.313	5		Fe VI	307.380	300	
Ti	303.791	1	N	Co VI	305.329	170		Ni VI	307.383	90	
O III	303.799	450		He I	305.4	175	P,Z	Fe VI	307.398	250	
N III	303.825	50	Z	Cu V	305.470	310		Fe VI	307.415	200	
Fe VI	303.833	20		Si	305.5	50	N	Sc VIII	307.447	40	Q
Ga V	303.837	650		O III	305.596	400		Ni VI	307.449	260	
N III	303.856	180		Co VI	305.614	280		Ni VI	307.492	420	
Ga V	303.856	20		O III	305.656	450		Ni V	307.492	130	
Ge VI	303.87		F,P	Ni VI	305.658	750		Ti	307.493	1	N
N III	303.880	180	Z	O III	305.703	400		Fe XIX	307.56		F,P
Ti	303.891	35	N	Ti VII	305.730	1		Ca VII	307.563	100	N
N III	303.910	100	Z	N III	305.761	250		Ni VI	307.592	90	
Co VI	303.943	20	Q	O III	305.769	500		Ni VI	307.613	160	
N III	303.960	200	Z	He I	305.8	270	P,Z	P IV	307.648	4	
N III	303.985	200	Z	Cr XII	305.81			Si VIII	307.65	20	
Ni V	304.018	290		Cu V	305.832	650	N	Fe VI	307.653	70	
Na VII	304.030	20	Q	O III	305.836	400		Ni VI	307.670	250	
N III	304.035	450	Z	Fe VI	305.837	100		Fe VII	307.70		F,P
Ga V	304.052	100		Si IX	305.85			Fe VII	307.71		F,P
N III	304.103	300	Z	O III	305.879	200		Ni VI	307.773	370	
Co VI	304.126	230		Ni V	305.891	30		Fe XV	307.78		
N III	304.203	200	Z	N III	305.920	500		Fe VI	307.805	250	
Fe VI	304.227	800		Co VI	306.029	90		C IV	307.806	50	F
Ca III	304.330	150		Ni V	306.054	20		Ni VI	307.819	170	
Cu V	304.330	120		Ni VI	306.056	240		Mn VI	307.842	60	
P IV	304.364	4		Ti	306.083	1	N	Fe VI	307.875	40	
Co VI	304.374	5	Q	Co VI	306.130	170		Co XXII	307.9		F,P
Cu V	304.437	330		Ti XI	306.144	1		Mn VI	307.999	400	
Sc VIII	304.456	100		Co VI	306.225	190		Fe VI	307.999	100	
Ni VI	304.47		F,P	Ga V	306.230	160		Ni XXIII	308.0		F,P
Ti IX	304.498	1		Cu V	306.306	40		Ni VI	308.009	580	
He I	304.5	325	Z	Ni V	306.338	70		Fe VI	308.012	300	
Co VI	304.504	20		Co VI	306.360	80		Cu V	308.020	100	
Fe VI	304.558	800		Ni VI	306.388	110		Ni VI	308.046	440	
Co VI	304.615	130		Mn XI	306.458	1		O III	308.051	50	

Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes
Fe VII	308.07		F, P	Ni VI	309.581	220		Fe VI	311.706	900	
Cu V	308.084	40		Al VI	309.597	400		N III	311.721	50	
Cu V	308.118	20		Fe VI	309.604	50		O IV	311.726	10	
K	308.129	100	N	Ge VI	309.61		F, P	Ni XV	311.73		
Ge VI	308.14		F, P	Ga V	309.627	240		Mn VI	311.748	200	
Sc VII	308.180	600		Fe VI	309.635	200		Cu V	311.763	210	
Fe VI	308.191	300		Ni V	309.769	20		Cu V	311.763	210	
Fe VII	308.24		F, P	Ni V	309.811	210		Ga V	311.786	700	
Ti XI	308.250	90		Cu V	309.842	180		Fe VI	311.786	80	
Ga V	308.253	600		Al VI	309.851	300		Ni V	311.788	260	
Si VIII	308.26	50		Co VI	309.851	100		Ni V	311.800	250	
Na V	308.264	1000		V XX	309.937		P	Mg VIII	311.806	10	
Fe VI	308.296	900		Sc VIII	310.042	500		Fe VI	311.918	70	
Ni VI	308.299	300		Sc VII	310.043	100		Na VI	311.921	400	
O III	308.306	100		Mn VI	310.058	200		Cu V	311.937	220	
Ga V	308.343	240		Ni V	310.071	130		Sc VI	311.947	400	
Ni VI	308.385	280		C III	310.1697	700		Fe XIII	312.164	8	
Fe VI	308.385	300		Mn VI	310.182	180		Ni VI	312.173	100	
Ni V	308.387	20	N	Fe VI	310.276	700		Ni V	312.217	100	
Co VI	308.396	100		Cu V	310.286	80		Al VI	312.237	300	
P IV	308.402	4		Ni VI	310.316	110		Sc VIII	312.239	200	
Ti	308.408	3	N	Cu	310.380	20	N	Fe VI	312.268	800	
B IV	308.41	20		Cu V	310.383	430		Mg V	312.302	200	
Co V	308.449	290		Ni VI	310.383	120		Ni VI	312.302	170	
Na XI	308.500		P	Co VI	310.438	180		Cu V	312.324	20	
Na VI	308.500	25		Ni VI	310.441	120		Ni VI	312.335	120	
Co V	308.534	70		Ti	310.518	1	N	Ni V	312.388	220	
Fe XI	308.534		P	Ni V	310.538	70		Ni VI	312.390	510	
Fe VI	308.539	700		Mn XI	310.547	110		V V	312.394	170	
Ne III	308.56	100		P V	310.578	110		Ga V	312.412	360	
Mn VI	308.560	400		Cr XIX	310.6		P	Ni V	312.412	240	
Al VI	308.563	300		Fe VI	310.602	700		C IV	312.422	750	
Ti XI	308.568	250		Co XV	310.69			C IV	312.453	700	
Ti IX	308.568	35		P IX	310.70	60		Cu V	312.506	510	
P IV	308.615	10		Cu V	310.730	450		Ni V	312.520	160	
Ni VI	308.623	180		Fe VI	310.736	10		Co XVII	312.542	300	
Fe VI	308.644	700		N III	310.746	50	Z	Fe XV	312.55	5	
Co VI	308.648	210		Ni V	310.791	230		P IV	312.566	4	
Fe VI	308.666	100		Fe VI	310.796	100		Cu V	312.602	180	
Fe VI	308.704	800		N III	310.803	100	Z	Na VI	312.608	300	
Mn XIII	308.75			Ni V	310.846	160		Ni V	312.615	120	
Ni VI	308.755	370		Al VI	310.907	300		Ni VI	312.645	270	
Na XI	308.787		P	Mn VI	310.908	800		S XIII	312.68	25	
Mn VI	308.853	300		Ni VI	310.948	50		Ni V	312.680	130	
Na XI	308.882		P	N IV	310.962		P	Mn VI	312.692	160	
Sc	308.895	300	N	N III	311.007	350	Z	Cu V	312.744	90	
Se XXVII	308.9		F, P	Ni VI	311.023	170		Fe VI	312.769	10	
V X	308.903	110		Ni V	311.024	10		Co V	312.769	400	
S XIII	308.91	125		Cu V	311.037	60		P X	312.77	40	
Mn XIII	308.92			Cu V	311.107	220		K V	312.770	250	
Fe VI	308.969	200		N III	311.113	200	Z	Cu V	312.782	80	
Ni VI	308.993	520		Fe VII	311.13		F, P	Fe VI	312.801	300	
Ni V	308.994	80	N	Fe VI	311.137	100		Cu V	312.835	350	
Fe VI	308.995	200		Sc VIII	311.138	200		Ni V	312.839	90	
Fe VI	309.022	80		C III	311.157	10		Co VI	312.865	490	
Al VII	309.023	420		He I	311.2	30	P, Z	Fe VI	312.872	100	
P IV	309.060	25		Ni V	311.201	240		Co V	312.900	470	
Al VII	309.072	475		Ni VI	311.202	580		Ga V	312.921	70	
He I	309.1	190	Z	Fe VI	311.241	300		Ni V	312.962	170	
Ti XX	309.104		P	Ga V	311.242	20		P X	312.98	150	
Al VII	309.121	375		K V	311.243	200		Ni V	313.000	100	
Sc VII	309.161	500		Sc VIII	311.332	100	N	P IV	313.024	10	
P X	309.20			P V	311.342	150		Co V	313.039	300	
Ni VI	309.252	110		Co VI	311.391	210		Ne III	313.05	400	
Ni V	309.351	30		Fe VI	311.410	50		Cu V	313.057	170	
Ga XX	309.4		P	F III	311.413	20		Ni V	313.059	80	
Fe XX	309.4		F, P	O IV	311.499	25		Cu V	313.071	180	
Ni XVI	309.40			Ni VI	311.542	300		Fe VI	313.170	80	
Co V	309.410	150		Ni V	311.547	170		Co VI	313.200	340	
Fe VI	309.426	200		Cr XII	311.55			Fe VI	313.207	300	
Mn VI	309.440	240		N III	311.550	300		Ti XI	313.229	90	
Co VI	309.482	240		Fe XIII	311.552	2		Co VI	313.290	420	
Ni VI	309.495	110		N III	311.636	500		V XIII	313.314		P
Cu V	309.518	200		Ti	311.659	1	N	V V	313.376	140	
Mn VI	309.579	200		O IV	311.682	40		Fe VI	313.432	500	

Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes
Cu V	313.439	20		Ni V	315.573	240		Ni VI	317.631	150	
Co V	313.465	440		Ga V	315.615	40		Na VI	317.641	600	
Ca VII	313.478	100	N	P XI	315.65	80		Co V	317.677	80	
Fe VI	313.587	20		Ti	315.670	1	N	Fe VI	317.737	70	
Co VI	313.667	300		Ca VII	315.702	100	N	F III	317.791	3	
Ga V	313.669	330		Ni V	315.712	560		Ni V	317.865	160	
Ne III	313.68	300		Fe VI	315.742	250		Fe VI	317.883	150	
Cu V	313.699	70		F III	315.747	60		Ni V	317.901	20	
Ti XI	313.710	1		Cu V	315.767	20		Cu V	317.930	380	
Mg VIII	313.743	100		Ti	315.779	3	N	Ti VIII	317.992	1	
Na VI	313.748	500		Sc	315.786	300	N	Ca IV	318.094	200	
Mn XI	313.777	1		Ni V	315.829	380		F III	318.126	1	
Cu V	313.790	60		Ti	315.844	3	N	Fe XIII	318.21	3	
Ni VI	313.858	170		Cu V	315.875	220		Ni VI	318.260	420	
Co VI	313.868	110		Sc	315.890	200	N	Ni V	318.260	80	
Ne III	313.92	100		Ni V	315.905	210		V VI	318.265	20	
Cu V	313.925	170		Mn XIV	315.93		P	P X	318.28	250	
Co XIII	313.95			Ga V	315.943	200		Co VI	318.320	20	
V X	313.990	40		Ni VI	315.944	350		Fe VI	318.342	70	
Ni V	313.993	120		Ni V	315.969	300		Fe VI	318.384	300	
V V	313.993	100		Fe VI	316.071	200		Ca IV	318.385	50	
Fe VI	313.999	300		Fe VI	316.100	300		Sc VIII	318.408	500	
Fe VI	314.033	300		Ni V	316.113	420		Co V	318.514	90	
Sc VI	314.049	400		Ca V	316.115	150		Ni V	318.528	40	
Ni V	314.132	110		Ni V	316.189	210		Fe VI	318.530	80	
Cu V	314.157	220		Si VIII	316.202	100		Al IX	318.537	120	
Co VI	314.250	90		Fe VI	316.289	150		Ti	318.543	1	N
P IV	314.300	10		Cu V	316.302	50		Cu V	318.565	400	
Si VIII	314.31	50		Ca VI	316.389	20	N	Fe X	318.599	25	
Fe VI	314.310	500		Fe VI	316.404	50		Sc IX	318.615	400	
N IV	314.324	20		Ni V	316.428	310		Ni V	318.703	20	
Cu V	314.394	210		Fe VI	316.433	200		Cl IV	318.75	100	
Fe VI	314.408	150		Ni V	316.468	330		Cu V	318.764	320	
C III	314.41	100		Ga V	316.469	280		Ni V	318.766	390	
P IV	314.512	60		F III	316.484	20		Ni V	318.803	20	
Sc VIII	314.53	200		Cu V	316.486	100		Fe VI	318.811	250	
Cu V	314.545	380		Ni XIV	316.53			Co XI	318.85		
Mg VI	314.554	300		Sc	316.567	200	N	Cr XII	318.89		P
C IV	314.6			Ni V	316.569	60		Ni V	318.900	80	
He I	314.6	30	Z	Cr XIII	316.60		P	Co V	318.965	130	
Ca VII	314.609	100	N	Ni V	316.668	60		K V	318.969	50	N
Fe VI	314.675	20		Fe VI	316.669	20		Cu V	319.013	70	
Mg VI	314.676	400		Ni V	316.714	90		Ni V	319.015	110	
Si	314.7	50	N	Ni V	316.776	140		Mg VII	319.016	400	
Co V	314.714	580		Al IX	316.793	90		Ni XV	319.03	200	
N III	314.715	450		Ni V	316.810	210		Ni V	319.031	90	
Ni VI	314.743	310		Fe VI	316.813	300		V VI	319.149	5	
Fe VI	314.824	300		F III	316.822	10		Fe VI	319.159	100	
N III	314.850	800		S XIII	316.84	50		Ni V	319.163	200	
Co V	314.852	350		Ni V	316.853	240		Ge XXVI	319.2		F
N III	314.877	80		Ni V	316.866	270		Ni V	319.202	20	
Ti	314.940	3	N	Cu V	316.874	210		Ni V	319.241	20	
Mn VI	314.979	120		Ni VI	316.916	130		Fe VI	319.254	100	
Co V	314.983	190		Ca VI	316.947	165	N	Co V	319.257	90	
P IV	314.991	25		O III	316.967	150		C III	319.29	300	
Cu V	315.018	100		Cu V	316.971	590		Ni V	319.392	260	
Mg VIII	315.022	200		Ti X	316.987	1	Q	Ga V	319.398	700	
Co V	315.036	160		F III	316.995	6		Ni V	319.414	480	
Fe VI	315.038	500		V VI	317.006	1		Fe VI	319.445	80	
Cu V	315.050	30		Mg VIII	317.029	100		Ge VI	319.46		F, P
N IV	315.060	600		Ni V	317.037	190		Ti VIII	319.463	1	
Ni V	315.082	130		Fe X	317.043	1		Cl IV	319.51	100	
Sc VIII	315.163	350		Co V	317.107	90		Ni V	319.526	360	
K V	315.181	200		P XI	317.20	80		Cl IV	319.62	300	
Fe VI	315.182	700		Fe VI	317.205	200		Na IV	319.6436	450	
F III	315.219	150		O III	317.24	50	Z	Co V	319.686	630	
Ni V	315.235	550		Co VI	317.257	70		F IV	319.695	300	
Cu V	315.268	70		Ni V	317.291	410		Na I	319.71		A, Z
Sc VIII	315.420	300		Ni VI	317.291	660		F IV	319.740	10	
Fe VI	315.462	300		Fe VI	317.337	500		Co V	319.764	300	
Cu V	315.508	80		Ni V	317.402	290		Mg VI	319.80		
Fe VI	315.521	300		Sc VIII	317.437	400	N	Ni VI	319.828	100	
F III	315.536	100		Cu V	317.460	220		Si VIII	319.829	100	
K V	315.537	150		N IV	317.596	200		Cu V	319.844	230	
P IV	315.570	150		Fe XV	317.61	120		Fe VI	319.856	30	

Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes
Ti	319.887	1	N	O IV	321.457	5		Ni VI	323.298	180	
Ni VI	319.899	210		Fe XIII	321.47	120	Q	Cu V	323.302	250	N
Fe X	319.936	10		Ni V	321.535	60		Mg IV	323.3076	800	
Cl IV	319.99	10		Mn VI	321.541	180		Ne III	323.33		P
O III	319.996	150		Cu V	321.542	170		Cu V	323.356	630	
F IV	320.004	200		Fe VI	321.552	100		Cl VI	323.36	600	
Co VI	320.006	280		Na I	321.57		A, Z	Ti V	323.365	150	
Ni V	320.111	50		Ca IV	321.593	120		Ni V	323.394	160	
Ge VI	320.12		F, P	Ca V	321.609	120		Na I	323.40		A, Z
Cu V	320.132	690		Fe VI	321.635	50		Cu V	323.415	170	N
V VI	320.134	40		Cu V	321.674	170		N III	323.436	100	
Co V	320.145	600		Fe X	321.766	60		Cu V	323.449	370	
Cu V	320.170	330		Fe XV	321.78	200		Cu V	323.479	410	
Ni V	320.185	220		Fe VI	321.798	30		N III	323.493	200	
Co V	320.186	450		Ni V	321.809	100		P IV	323.502	10	
F IV	320.192	100		Si	321.81		N	Al VIII	323.52		
Cr XII	320.20			V VI	321.810	40		Cu V	323.542	700	
Ni V	320.208	110		Ni VI	321.897	190		Ni VI	323.57		F, P
Cl IV	320.25	100		Ge XXV	321.9		F, P	Co V	323.583	170	
Co V	320.284	470		Co V	321.969	60		Cu V	323.586	420	
He I	320.29	370	P, Z	Cu V	322.105	140		F IX	323.588		P
Na I	320.32		A, Z	K	322.146	50	N	Na I	323.59	6	A, Z
Ni V	320.351	20	N	Ca V	322.166	500		N III	323.620	500	
Cu V	320.370	200		Co V	322.222	70		Co V	323.649	50	
Cu V	320.392	230		Fe V	322.275	2		N III	323.675	100	
Fe VI	320.395	5		Ga V	322.302	590		Cu V	323.680	480	
Sc VII	320.406	100	N	Sc	322.35	150	N	P IV	323.734	25	
Cu V	320.440	200		Cu V	322.350	100		Cu V	323.771	270	
Ca VI	320.445	100	N	Ni VI	322.356	180		V X	323.811	5	
P IV	320.462	4		Mn XI	322.427	20		Cu V	323.814	310	
Fe VI	320.472	100		Ni VI	322.434	160		Fe V	323.835	1	
Mg VII	320.50			Mg VI	322.44			F IX	323.858		P
Ga V	320.522	160		N IV	322.506	700		Al VIII	323.863	80	N
Ni XVIII	320.537	300		P IV	322.544	1	Z	Na I	323.88	10	A, Z
Co VI	320.542	210		N IV	322.572	700		Cl VI	323.94	800	
Mn VI	320.598	180		C III	322.5741	800		F IX	323.947		P
V XI	320.626	20		Cu V	322.576	580		Cu V	323.988	610	
Cu V	320.633	490		Ni VI	322.60		F, P	Ti	324.047	1	N
Fe VI	320.658	100		Cu V	322.615			V VI	324.105	1	
Mn VI	320.681	180		F III	322.647	680		Ca V	324.110	150	
P IV	320.701	10		Ne III	322.66		P	Ni V	324.172	130	
Ni V	320.702	30		F III	322.675	10		Cu V	324.193	90	
O III	320.720	100	Z	Ti VIII	322.698	1		Sc IX	324.199	600	
Fe VI	320.791	250		Cu V	322.719	50		Ti VIII	324.207	1	
Fe XIII	320.800	7		N IV	322.722	700		P IV	324.221	40	
Ni V	320.815	20		Ti XI	322.75			Cu V	324.240	30	
Ni V	320.868	290		Ni VI	322.753	170		Ga V	324.243	750	
Mn VI	320.874	180		Ca V	322.757	250		Na I	324.28	14	A, Z
Cl IV	320.88	100		Cu V	322.788	310		Cu V	324.294	420	
V VI	320.915	70		Co V	322.813	170		Ni VI	324.33		F, P
Co V	320.928	150		Cu V	322.818	490		Cu V	324.350	260	
Co V	320.968	730		Cu V	322.893	100		Cu V	324.385	130	
O III	320.979	600		Si	322.90		N	Co V	324.418	30	
Mn VI	320.979	180		Ga V	322.917	520		Ni V	324.460	120	
Mg IV	320.9943	1000		Cu V	322.946	110		Ca V	324.477	250	
Al IX	321.027	160		Fe VI	322.969	100		Cu V	324.481	840	
Cu V	321.048	660		Ga V	322.980	960		Cu	324.485	70	N
Cu V	321.067	590		Co V	322.984	250		Cu V	324.509	480	
Mg VII	321.07		P	Cu V	323.089	60		Na I	324.51		A, Z
N III	321.079	220		Ga V	323.098	380		Sc IX	324.570	50	
Ni V	321.102	170		Ni V	323.113	50		Ne II	324.570	20	
N III	321.135	200		Mg VII	323.12		P	V VI	324.575	40	
N III	321.162	500		Co V	323.124	160		Cu V	324.606	820	
P IV	321.172	10		Ni V	323.168	40		Fe V	324.634	15	
Mn VI	321.176	220		N IV	323.178	600		Cu V	324.681	700	
N III	321.198	100		S XII	323.18			Fe X	324.71		Q
Co V	321.213	20		Cu V	323.184	50		Ti IX	324.712	1	
N III	321.261	200		V XIII	323.200		P	Cu V	324.805	460	
N III	321.278	220		Ni V	323.208	180		Ga V	324.820	50	
Cu V	321.303	240		V VI	323.209	360		Cu V	324.860	730	
Fe V	321.321	15		Ca V	323.223	300		Na I	324.90	22	A, Z
C III	321.372	10		Ca VI	323.223	300		Ni V	324.936	340	
Ni V	321.385	80		Co V	323.231	460		Ga V	324.945	520	
Fe VI	321.389	20		Na I	323.25		A, Z	Fe XV	324.97	120	Q
V VI	321.425	1		N III	323.263	600	Z	Cu V	325.018	510	

Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes
Ca V	325.020	150		Co V	326.935	380		O III	328.742	450	
Fe V	325.027	5		Fe V	327.029	3		P V	328.775	250	
Cu V	325.037	730		Fe XV	327.03			Cu V	328.788	470	
Ni V	325.082	20		K V	327.031	100		Cu V	328.828	810	
Sc VII	325.121	200	N	Mn VI	327.08	20		Ge VI	328.84		F, P
Cr XII	325.13			C III	327.112	400		K III	328.845	100	N
Mn VI	325.146	400		Si IV	327.137			Cu V	328.848	650	
Cl VI	325.16	1000		Na I	327.14		A, Z	Na I	328.89		A, Z
Na I	325.19	11	A, Z	C III	327.176	400		K III	328.933	150	N
Cu V	325.269	60	N	Cu V	327.177	60	N	K V	328.973	100	
K III	325.278	20		Si IV	327.181			Cu V	329.039	890	
Ca V	325.282	250		Ti XI	327.192	10		Mn VI	329.043	100	
P XI	325.31	30		P XII	327.25	50	P	Cu V	329.052	840	
Al VIII	325.31			Ne II	327.262	30		K III	329.053	100	
Mn XIV	325.34			Cr IX	327.267	1		Ca IV	329.116	250	
Fe VI	325.342	200		Co V	327.281	520		Cu V	329.118	20	
Cu V	325.377	70		Mn XI	327.288	40		Ne X	329.145		P
Ne II	325.393	10		Cu V	327.317	110	N	Ti IX	329.159	20	
Cu V	325.494	720		O IV	327.320	5		Mn VI	329.177	40	
P XI	325.51	150		V VI	327.322	110		Cu V	329.221	340	
Cu V	325.518	760		Ne II	327.355	20		N III	329.242	50	Z
Co V	325.541	90		Co V	327.371	270		Ni V	329.251	20	
Cu V	325.551	760		K V	327.376	250		Ge VI	329.27		F, P
C III	325.570	100	Z	Cu V	327.382	650		Co V	329.274	50	
Al VIII	325.596	155	Q	Co V	327.455	440		Na I	329.28		A
Co V	325.650	510		Na I	327.46		A, Z	Mn XII	329.28		
P IV	325.651	10		Ni V	327.510	20		Ca VI	329.298	150	
Cu V	325.685	760		O IV	327.519	1		K V	329.307	50	
V VI	325.697	1		Cu V	327.532	210	N	N III	329.307	100	
Co XIII	325.70			Cu V	327.558	450		Mn VI	329.320	100	
Fe VI	325.704	500		K III	327.605	50		Cu V	329.369	190	
Ti	325.767	1	N	Cu V	327.620	730		Ne X	329.374		P
N III	325.788	20	Z	Ne II	327.626	20		Ca IV	329.391	150	
Cu V	325.817	200		Na I	327.68		A, Z	Ne X	329.451		P
N III	325.841	50	Z	Cu V	327.707	410		Fe V	329.514	40	
Cu V	325.846	560		C III	327.784	100	Z	Cu V	329.532	690	
Na I	325.86	25	A, Z	Mn XIV	327.79		P	Al VIII	329.551	40	
Cu V	325.934	580		Ca VI	327.806	200		Na I	329.58		A, Z
V XI	325.945	70		Fe V	327.823	5		Cu V	329.625	110	
Sc XIX	326.028		P	Ni V	327.876	20		Sc VII	329.640	300	
Cu V	326.086	60		Co V	327.936	210		Cu V	329.646	380	
Ga V	326.126	410		Na I	327.97		A, Z	Na I	329.74		A, Z
Co V	326.132	400		Cu V	328.020	20		P XV	329.775		F
Co XII	326.17			Ne II	328.090	20		Cu	329.805	30	N
Co V	326.221	540		Co VI	328.125	160		Cu V	329.806	820	
Cu V	326.227	520		Na I	328.14		A, Z	V VI	329.810	5	
Ti	326.259	1	N	Cu V	328.168	100		Cu V	329.851	840	
Cr XXIII	326.26		P	Al VIII	328.200	10		Cu V	329.869	630	
Na I	326.32	17	A, Z	Cu V	328.205	140		Cu V	329.940	530	
Cu V	326.397	630		F IV	328.213	10		Co V	329.996	70	
P XI	326.45	10		Mn VI	328.232	200		Ca VII	330.010	200	
Cu V	326.483	230		Co V	328.238	70		V VI	330.027	1	
Co V	326.514	190		Cu V	328.240	580		Ni V	330.043	180	
Ge VI	326.53		F, P	Ti	328.248	1	N	Cu V	330.047	490	
Fe VI	326.538	500		Cr XIII	328.29	150		Cu V	330.111	20	
Ca XVI	326.54	7	P	Cu V	328.322	440		Ne II	330.146	5	
Ne II	326.542	40		Ti XIX	328.336		P	Ga V	330.15	0	N
Cu V	326.548	250		Cu V	328.354	430		Ni V	330.158	210	
Mn VI	326.571	40		Co V	328.362	200		Ne II	330.205	5	
Cu V	326.574	740		S XII	328.39			Na I	330.21		A, Z
Ni V	326.588	280		Cu XXII	328.4		F, P	Sc XVIII	330.213		P
Cr XX	326.6			Na I	328.40		A, Z	Co XV	330.25		
Cu V	326.611	50		Cu V	328.408	930		N III	330.26	300	Z
Ni V	326.614	10		Mn VI	328.431	400		P XII	330.31	40	
Fe V	326.658	5		O III	328.448	500		Fe VI	330.341	500	
Cu V	326.670	20		Ga V	328.457	40	N	Cu V	330.369	40	
Zn XIX	326.7		P	P V	328.470	300		As XXV	330.37		F, P
Cu V	326.707	470		S VI	328.51	600		Sc	330.39	100	N
Cu V	326.753	390		Cu V	328.535	860		Ca VII	330.403	100	N
Ga V	326.759	400		Mn VI	328.558	180		Fe V	330.434	40	
K XVII	326.777		P	Ca IV	328.577	50	N	Mn XIV	330.45		P
Ne II	326.787	50		Cu V	328.582	490		Cu V	330.488	220	
Sc	326.791	400	N	Ni V	328.613	40		Fe V	330.512	2	
Ni V	326.852	220		Ga V	328.644	280		Cu V	330.564	70	
Cu V	326.871	420		Al VI	328.67			Ga V	330.583	0	

Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes
Ni XXII	330.6		F,P	Cu V	332.088	310		Cu V	333.558	820	
Cu V	330.606	700		Si	332.1	50	N	Ca V	333.570	200	
C III	330.617	100		Fe V	332.135	10		Cu V	333.589	350	
Ne II	330.626	5		Ni V	332.140	40		Ni V	333.651	140	
Na I	330.66		A,Z	N III	332.140	350		Fe VI	333.678	70	
K III	330.684	250		Co V	332.164	250		Cu V	333.725	700	N
C III	330.687	100		Ca VII	332.184	60	N	Cu V	333.734	690	
Ti VI	330.703	60		K	332.207	20	N	P IV	333.758	25	
Fe VI	330.714	200		Cu V	332.254	520		Mn X	333.798	160	
Cu V	330.715	300		Fe V	332.280	150		Na XI	333.807		P
Na V	330.718	10		Ni V	332.293	230		P XII	333.83	20	
Cu V	330.745	710		Cu V	332.300	300		Co V	333.857	20	
Cu V	330.774	730		Cu V	332.313	390		Ca V	333.857	150	
P XV	330.781		P	Ni V	332.316	200		Cu V	333.872	590	
Ne II	330.790	20		N III	332.333	650		Co V	333.907	290	
Ca	330.809	50	N	Ni V	332.345	70		Na V	333.910	900	
Ni V	330.820	160		Cu V	332.359	70	N	Cu V	333.929	660	
V XI	330.913	40		Cu V	332.406	700		Cu V	333.964	100	
Ca V	330.937	300		Ni V	332.410	20		P IV	334.013	40	
Na I	330.95		A,Z	Na I	332.45		A,Z	Fe V	334.045	100	
Cu V	330.955	110		Ni V	332.471	220		Co V	334.083	40	
Al VIII	330.982	65	N	Fe V	332.476	50	P	Fe VI	334.108	40	
Al VIII	331.01			Fe V	332.488	100	P	Ni V	334.116	180	
Ni V	331.017	150		Ni V	332.504	150		Sc VII	334.138	500	
Cu V	331.026	80		K	332.515	20	N	Ca VI	334.14		
Ne II	331.069	1		Ni V	332.528	220		Fe XIV	334.178	50	
Ti	331.074	1	N	Ca IV	332.531	235		Cu V	334.200	800	
Fe VI	331.084	300		Cu V	332.535	480		Fe VI	334.219	200	
P XV	331.088		P	Na V	332.550	800		Co XIV	334.22		
Ni V	331.113	120		Ti	332.554	1	N	Cu V	334.285	420	N
Ni V	331.141	40		Co V	332.604	520		Cu V	334.312	720	
Cu V	331.149	360		Cu V	332.659	600		Ca VII	334.357	100	N
Na I	331.16		A,Z	Na I	332.67		A,Z	Na XI	334.398		P
K V	331.168	50	N	Ni V	332.689	60		Si	334.4	20	N
Cu V	331.191	600		Cu V	332.739	400		Ca XVI	334.40	35	P
Si VI	331.2	50	Q	Al X	332.783	20		Al VIII	334.40		
Cu V	331.217	570		Ni VI	332.787	590	N	N III	334.407	200	Z
Cu V	331.241	530		Ni V	332.788	290		Ni V	334.429	20	
Cu V	331.276	350		Si	332.8	20	N	Cu V	334.435	220	
Sc VI	331.309	200		Ca IV	332.808	150		Cu V	334.455	400	
Ni V	331.370	110		Cu V	332.814	640		Ti VI	334.457	20	
Ni XXIII	331.4		F,P	Cu V	332.835	430		N III	334.476	250	Z
K III	331.416	50		V VI	332.878	1		Co V	334.478	230	
Cu V	331.435	70	N	Cu V	332.889	880		Ni V	334.479	150	
Ca IV	331.442	200		Al X	332.891	10	N	Co V	334.520	120	
Ge VI	331.47		F,P	Co V	332.910	680		P IV	334.538	60	
Ni V	331.507	200		Cu V	332.917	590		Ga V	334.54	0	
Ne II	331.515	2		Co V	332.948	200		Ca V	334.545	300	
Cu V	331.538	300		Ga V	332.972	0		Cu V	334.552	410	
Ni VI	331.570	450	N	V VI	332.984	1		Co V	334.562	110	
Ni V	331.571	160		Cu V	333.002	420		Na XI	334.584		P
Cu V	331.574	700		Cr X	333.035	70		Fe VI	334.593	300	
Fe V	331.579	125		Cu V	333.057	290		Cu V	334.608	460	
Ca VII	331.650	160	N	Na I	333.07		A,Z	Fe VI	334.639	150	
Fe V	331.656	80		Cu V	333.105	460		Cu V	334.641	300	
Mn XIV	331.7		P	Ni V	333.109	330		Cu V	334.701	550	
Fe V	331.723	80		Cu V	333.146	720		Fe V	334.763	25	
Cu V	331.767	170		Ga V	333.178	0		Ti	334.859	1	N
Ti VI	331.767	6		Ga XXIV	333.21		F,P	Ca IV	334.904	40	
Cu V	331.804	240		Co V	333.232	170		Cu V	334.926	570	
Cu V	331.824	510		Cu V	333.277	60	N	Si VIII	334.94	50	N
Cl IV	331.84	200		Fe V	333.297	5		Cr	334.95		N
Cr XII	331.87		P	Ni V	333.302	110		Al VIII	334.951	215	
Fe V	331.874	30		Cu V	333.326	210		Fe VI	334.974	250	
Cu V	331.911	270		Ni V	333.360	150		Co VI	334.989		P
Cl XII	331.94			Ti IX	333.385	110		Fe V	334.997	70	
K	331.966	50	N	Sc VII	333.386	200		Cu V	335.011	760	
Fe V	331.986	100		Cu V	333.388	330		Fe VI	335.021	300	
Cu V	331.986	330	N	K	333.420	20	N	N IV	335.052	850	
Ca IV	331.991	250		Ca V	333.438	200		Fe XII	335.06		
Ni V	332.012	200		Ca VI	333.44			Co V	335.085	230	
P V	332.02	4		Cu V	333.460	370		P XII	335.09	150	P
Cr XII	332.06			Ni V	333.475	40		Co VI	335.103	260	N
Fe V	332.074	1		Cu V	333.480	570		Co V	335.115	260	
Ti VII	332.081	6		Sc	333.521	200	N	Cr VI	335.123	150	

Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes
Cu V	335.161	570		Cu V	337.183	130	N	N III	338.937	300	Z
K VI	335.175	150	N	Ni V	337.184	380		Co V	338.973	180	
Sc	335.18	100	N	Cr VI	337.185	450		V XVIII	339.		P
Fe V	335.185	25		Ga V	337.197	0		Mg VIII	339.007	100	
Cu V	335.209	350		Co VI	337.20		P	Ar V	339.01	150	
Mg VIII	335.230	10		Ni V	337.236	230		Cu V	339.031	660	
Cu V	335.256	610		Ar VIII	337.26	100		Cu	339.038	10	N
Ca VI	335.33			Ni V	337.276	250		Ni V	339.052	220	
Ca V	335.344	250		Mn XII	337.29			Ge XXVIII	339.1		F,P
F VII	335.38		P	Ni V	337.315	220		P IV	339.101	60	
Ni V	335.382	420		Ni V	337.340	100		V VI	339.187	160	
Ni V	335.395	420		Ca	337.396	100	N	Mn XIV	339.19		
Fe XVI	335.407	60		Fe VI	337.434	10		Ni V	339.213	40	
Ni VI	335.42		F,P	Ni V	337.441	230		Fe V	339.235	2	
Cu V	335.463	880		Ni V	337.461	340		Ni V	339.277	40	
Ni V	335.478	390		Cr X	337.490	5		O IV	339.330	2	
Fe VI	335.514	5		Ca V	337.541	200		Cu V	339.383	160	
Ni V	335.529	240		Ar V	337.56	150		Cu V	339.414	710	
Cu V	335.565	790		Cu V	337.602	20		O IV	339.436	1	
Co V	335.569	220		Ni VI	337.61		F,P	Cr XI	339.446	5	
Sc	335.58	50	N	Co V	337.618	110		Ca VI	339.463	150	
Ni V	335.593	240		Ni V	337.623	310		Co XVII	339.494	120	
Cu V	335.692	600		Ni V	337.696	360		Cu V	339.497	640	
Si XII	335.7	20	Q,ZZ	Ni V	337.726	240		Sc VIII	339.52	200	
Fe V	335.709	125		Ni V	337.743	330		Co V	339.543	390	
Ni V	335.718	570		Ni V	337.761	350		Co VI	339.58		P
Na I	335.73	16	A,Z	Cu V	337.783	350		P IV	339.633	90	
Cu V	335.732	670		Ni V	337.804	370		Cu V	339.643	160	
V VI	335.831	20		Ni V	337.830	160		Ni V	339.674	60	
Ni V	335.851	220		Fe VI	337.875	200		Ni V	339.716	20	
Fe V	335.853	25		Sc	337.911	200	N	Ca XVI	339.74	4	P
Cu V	335.876	200		Ni V	337.920	250		Ca IV	339.790	150	
Sc X	335.89	50	Q	Cu V	337.945	20	N	Ni V	339.810	60	
Fe XXI	335.9		F,P	Ni V	337.978	20		Cu V	339.828	660	
Ni V	335.911	90		O VIII	337.979		P	Co V	339.834	220	
Cu V	335.914	840		Ar V	338.00	300		Fe V	339.871	5	
Fe VI	335.945	150		Cu V	338.053	50		Cu V	339.880	810	
Na I	335.96	32	A,Z	Ca V	338.056	250		Ar V	339.89	150	
Ni V	335.971	510		He I	338.1	130	Z	Cu V	339.900	450	
Cu V	336.071	640		Co V	338.125	390		Ca VI	339.953	150	
P V	336.072	12		K VI	338.161	150	N	Ca VII	339.965	150	
Ni V	336.072	160		O VIII	338.169		P	F VIII	340.0		
Cr XI	336.121			Ni V	338.198	490		Cu V	340.034	730	
Ni V	336.154	280		Ar VIII	338.22	10		Ca VI	340.037	200	
Co V	336.169	240		O VIII	338.233		P	Co VI	340.04		P
Cu V	336.171	770		Fe XII	338.263	8		Cu V	340.059	800	
Cr VI	336.184	600		Cu V	338.307	750		Ni V	340.079	490	
Co VI	336.225	210		N III	338.349	500		Cu V	340.164	170	
Fe VI	336.258	250		Cu V	338.349	190		Cr X	340.181	220	
Cu V	336.275	820		Ni V	338.357	230		Ni V	340.189	160	
Ni VI	336.30		F,P	P XII	338.36	20		N III	340.20	500	Z
Ni V	336.301	460		Na I	338.38		A,Z	Cu V	340.202	290	
Cu V	336.323	410		Ni V	338.382	350		Cu V	340.229	110	
Cu V	336.400	300		V VI	338.392	5		Al VIII	340.23		
Ni V	336.446	90		Cu V	338.394	200		Cl VII	340.23	750	
Ni V	336.504	290		Si VIII	338.43			Co VI	340.25		F,P
Ca V	336.554	200		Ar V	338.43	100		Ca IV	340.286	200	
Ar V	336.56	150		Sc	338.447	200	N	Cl VII	340.30	900	
Cu V	336.573	610		Cu V	338.463	300		Cu V	340.313	20	
Ni V	336.575	360		Ni V	338.473	550		Cu V	340.355	520	
V XI	336.580	160		Ni V	338.569	300		Ca V	340.389	150	
Ga V	336.612	100	N	Cu V	338.618	330		Co V	340.452	410	
Fe VI	336.696	5		Na I	338.62		A,Z	K IV	340.462	300	
Ni V	336.792	630		Co V	338.697	370		Co VI	340.47		F,P
Ni V	336.818	570		Co VI	338.72		P	Co V	340.487	400	
Ti IX	336.895	160		Ni V	338.738	90		Ni V	340.487	290	
Ni V	336.930	320		Cu V	338.749	580		Co VI	340.51		P
Co V	336.956	20		N III	338.808	250	Z	Ca VI	340.516	150	
Mn XI	336.995	1		Ni V	338.819	410		Ni V	340.516	460	
Cu V	337.009	390		Co XIII	338.82			Co VI	340.55		F,P
Ca	337.020	50	N	Ca VII	338.824	100		Ni V	340.577	90	
Ni VI	337.04		F,P	Ca IV	338.828	200		V VI	340.622	220	
Cu V	337.076	370		P IV	338.841	25		Cu V	340.629	650	
Si	337.1	50	N	Ni V	338.886	440		Ni V	340.653	360	
Co VI	337.119	230		Co V	338.922	160		Ti XII	340.672	80	



Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes
Ca VII	340.700	50		Ni V	342.418	180		Ni V	343.883	450	
Ni V	340.742	140		Cu V	342.425	680		F III	343.893	35	
K IV	340.745	150	Q	Cu	342.432	20	N	Co XII	343.93		
Co VI	340.81		P	Ca IV	342.447	250		Ni V	343.930	680	
Ni V	340.897	30		Ni V	342.472	110		Ca IV	343.933	250	
Co VI	340.92		F,P	Cu V	342.496	300		F III	343.934	3	
Co V	340.935	180		Ni V	342.506	500		Co VI	344.00		P
V VI	340.953	70		Sc X	342.51	30	P	B IV	344.01	160	
Cu V	340.988	560		Ni V	342.545	360		Fe V	344.022	5	
Fe VI	340.994	50		Mn XIV	342.56			Ni V	344.038	320	
Co VI	341.01		F,P	Cu V	342.573	140		Ni V	344.053	370	
Co V	341.012	80		Ni V	342.592	500		Cu V	344.066	80	
Cu V	341.030	110		Ti VI	342.595	35		Fe V	344.106	5	
Ni V	341.039	60		N III	342.665	250	Z	Co VI	344.15		P
Cu V	341.063	260		Mn XII	342.67			Fe VI	344.161	60	
Ni V	341.068	90		Cr XIII	342.69			Cu V	344.172	650	
Cu V	341.098	210		Mn XIX	342.7		F,P	Ni V	344.200	360	
Co V	341.101	240		K IV	342.703	100		Ca V	344.219	100	
Ti VI	341.109	20		Cu V	342.707	830		Ni V	344.234	590	
Fe XI	341.113	40		Ni V	342.728	340		Cu V	344.262	340	
C III	341.143	500		N III	342.741	300	Z	Na I	344.27		A,Z
Co VI	341.17		F,P	Ni V	342.747	200		K III	344.270	200	N
Cu V	341.176	720		Ni V	342.790	400		Co V	344.332	760	
C III	341.179	600		K IV	342.805	100		F III	344.385	20	
Fe V	341.192	2		Ca VII	342.818	50		Ni V	344.438	250	
Co V	341.220	140		Cu V	342.837	570		Co V	344.443	420	
Ni V	341.242	30		Fe VI	342.871	60		Ni V	344.516	60	
C III	341.242	700		Ni V	342.910	420		Na I	344.56	55	A,Z
Co V	341.255	140		Cu V	342.914	320		Ni V	344.571	600	
Ca IV	341.284	200		Ni V	342.976	420		Co V	344.599	150	
Ni V	341.351	430		Ni V	342.996	350		K III	344.635	200	N
Fe VI	341.368	2		Ni V	343.044	440		Cu V	344.663	80	
Co V	341.378	110		Cu V	343.051	530		Ni V	344.676	60	
O V	341.391	10		Ni V	343.057	510		He I	344.7	30	Z
Ca IV	341.455	200		Co V	343.062	130		Ni V	344.767	530	
Cu V	341.476	710		Sc X	343.10	20	P	Ca XVIII	344.772	300	P
Co V	341.492	90		V XII	343.12			Ni V	344.810	330	
Co VI	341.54		F,P	Co V	343.151	100		Co V	344.841	210	
P V	341.549	30		Na I	343.16	18	A,Z	Cu V	344.859	610	
Co V	341.573	260		O V	343.168	3		Ni V	344.881	130	
Ni V	341.589	270		Ni V	343.182	90		Cu V	344.909	420	
Sc VI	341.62	200		Ca IV	343.194	100		N IV	344.916	250	
Co V	341.626	130		Ca V	343.194	100		Ni V	344.947	490	
Ni V	341.674	180		Ni V	343.215	140		Ca IV	344.958	200	
Ti IX	341.691	220		Co VI	343.25		P	Cu V	344.960	260	
Ni V	341.701	380		Ni V	343.256	180		Ni V	344.986	500	
Cu V	341.727	60		Al VII	343.290	125		Ni V	345.011	460	
Mg VIII	341.75			Fe V	343.295	30		N IV	345.025	200	
Ni V	341.768	360		Ni V	343.385	340		Co V	345.026	320	
Mg V	341.790	10	Q	Ni V	343.427	140		Co V	345.052	260	
Cu V	341.799	260		Ca IV	343.438	200		Fe VI	345.054	100	
Ni V	341.832	500		Fe V	343.446	1		Si IX	345.06	20	
Ni V	341.858	320		Mn XIV	343.45		P	N IV	345.062	600	
Cu V	341.911	190		Ni V	343.454	460		Si VIII	345.10		
F III	341.921	10		Ni V	343.464	430		N IV	345.111	150	
K III	341.924	300	N	K IV	343.468	150		Ni V	345.120	540	
Mn XI	341.929	1		Si VIII	343.49			Ca IV	345.130	215	
Co VI	341.94		F,P	Ni V	343.503	390		Ni V	345.160	280	
Si IX	341.95		P	Co V	343.552	280		N IV	345.207	200	
Co V	341.975	90		Cu V	343.580	100		Ni V	345.219	460	
P XII	342.02	50		Ca V	343.640	200		Fe V	345.236	100	
Mg VIII	342.07			Al VII	343.641	160		N IV	345.261	250	
Ni V	342.090	440		V VI	343.646	360		Ni V	345.287	330	
Ni V	342.135	350		Cu V	343.651	20		O III	345.309	500	
Co V	342.143	70		Ti	343.668	1	N	Ni V	345.345	500	
Si	342.2	50	N	Ni V	343.711	380		Co V	345.353	560	
Cu V	342.200	330		Cu V	343.735	410		Cu V	345.362	870	
Ni V	342.215	370		Ni V	343.739	310		Cu V	345.387	630	
Co XIV	342.25			Cu V	343.740	400		V VI	345.405	550	
Na I	342.35	20	A,Z	Fe VI	343.766	80		K III	345.405	100	
Ni V	342.355	100		Fe V	343.824	20		Ni V	345.406	550	
Ni V	342.379	220		Cu V	343.842	90		Ni V	345.442	360	
Ca VII	342.394	150		Co V	343.862	470		Co V	345.442	270	
Mn XVIII	342.4		F,P	Ni V	343.869	360		Ni V	345.469	380	
K IV	342.410	150		Na I	343.88	29	A,Z	Co VI	345.47		P

Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes
Ni V	345.500	380		N III	347.148	200	Z	Ca VI	348.650	50	
K III	345.545	100		Ni V	347.156	410		Ni V	348.674	500	
Cu V	345.561	170		Cu V	347.177	290		Cu V	348.677	80	
Ni V	345.576	590		Ni V	347.200	190		N III	348.683	800	Z
Cu XVIII	345.6	10		Co V	347.234	150		Cu V	348.705	380	
Co V	345.610	440		P V	347.234	150		Ni V	348.716	70	
Ni V	345.652	520		Ni V	347.236	240		Ni V	348.752	280	
Ni V	345.662	510		Cu V	347.240	370		Fe V	348.772	15	
Cu V	345.676	460		Cu V	347.256	530		Cu V	348.773	520	
Ni V	345.701	340		V VI	347.265	285		Ni V	348.786	320	
Fe X	345.723	220		Ni V	347.275	620		F II	348.795	1	Z
Co V	345.788	750		Cu V	347.289	320		Cu V	348.803	590	
Cu V	345.807	120		Cu V	347.333	520		N III	348.816	800	Z
Ni V	345.821	290		Ca VI	347.334	50	N	Ni V	348.836	410	
Ni V	345.843	280		Ni V	347.335	740		Cu V	348.852	270	
Co V	345.883	260		Ni V	347.397	410		Ni V	348.883	310	
Ni V	345.892	160		Mn XI	347.404	110		Fe VI	348.886	50	
Co V	345.917	330		Si X	347.417	40		Cu V	348.893	520	
Ni V	345.939	200		Ni V	347.422	490		Ni V	348.915	410	
Co V	345.962	410		Ni V	347.456	700		Ca VI	348.927	50	N
Ni V	345.987	90		Cu V	347.484	100		Cu V	348.970	520	
Cu V	346.000	810		Cu V	347.503	70		Ni V	348.987	320	
Fe VI	346.021	5		Ni V	347.505	630		Ca VII	348.999	20	
Co V	346.029	640		Ni V	347.515	610		Ni V	349.019	380	
Ni V	346.036	80		Cu V	347.539	150		Ni V	349.043	340	
Mn XII	346.04			Ni V	347.592	450		Fe XI	349.046	20	
V XI	346.123	20		Si X	347.644	200		Co V	349.058	340	
Ni V	346.165	320		Si X	347.646	15		Ni V	349.076	550	
Co V	346.185	470		Si X	347.693	15		Co V	349.078	310	
Co VI	346.22		P	Si X	347.695	100		Ni V	349.096	390	
Co V	346.232	210		Ni V	347.702	640		Cu V	349.106	270	
Ni V	346.239	160		Cu V	347.710	500		Co V	349.139	130	
Ni V	346.309	300		Ni V	347.716	670		Mg VI	349.155	700	
Ni V	346.327	250		C III	347.777	300		Ni V	349.184	160	
Ca VI	346.335	100		Ni V	347.788	460		Cu V	349.217	90	N
O IV	346.374	15		Ni V	347.811	630		Ni V	349.220	60	
Co V	346.412	680		Cu V	347.848	770		P V	349.242	50	
Ni V	346.417	340		C III	347.854	300		Ni V	349.293	180	
Na I	346.42		A, Z	Ni V	347.865	530		Ti	349.299	1	N
Co VI	346.43		P	Co V	347.878	150		Fe XXII	349.3	150	
Fe VI	346.430	10		V VI	347.911	450		Fe VI	349.303	60	
Co V	346.452	430		Cu V	347.944	520		Ni V	349.326	360	
Cu V	346.456	40		Ca VI	347.967	150		Ni V	349.339	330	
P IV	346.490	4		Ca VII	347.972	100		Cu V	349.353	90	
Ni V	346.553	240		Ni V	347.977	610		Ni V	349.403	120	
Cu V	346.566	230		K III	347.999	150		Ni V	349.485	210	
Ni V	346.577	130		V VI	348.024	70		Ni V	349.500	230	
Ni V	346.632	130		Ca VII	348.043	150	N	K V	349.504	200	
Cu V	346.661	200		Ni V	348.047	610		Ni V	349.522	240	
Na I	346.68	26	A, Z	Ni V	348.080	630		Cu V	349.556	30	
Cu V	346.691	630		Ni V	348.102	710		Ti VI	349.574	6	
O IV	346.692	10		Sc X	348.14			Ni V	349.576	40	
Mn XIV	346.7		P	Cu V	348.162	720		Fe VI	349.592	2	
Ti VI	346.728	1		Fe XIII	348.184	20		Mn XIV	349.64		
Ni V	346.730	630		Cu V	348.193	780		Cu V	349.742	90	
Co V	346.748	610		P V	348.196	200		Ni V	349.759	310	
Co V	346.787	380		Ni V	348.226	220		K V	349.793	150	
Co V	346.801	420		Ni V	348.245	230		Ni V	349.794	490	
Cu V	346.814	210		Cu V	348.270	500		Ni V	349.809	490	
Co V	346.847	330		Ni V	348.278	620		O III	349.825	150	
Fe XII	346.852	20		Ni V	348.303	530		Ni V	349.879	570	
Cu V	346.862	380		Co V	348.312	200		Si IX	349.90	50	
Ni V	346.925	110		Ni V	348.347	420		Ni V	349.900	270	
Co V	346.933	520		Ni V	348.375	310		Ti XI	349.91		
Ni V	346.970	270		Cu V	348.406	720		O III	349.918	100	
Ca VI	347.005	200		Ni V	348.409	410		Ti XII	349.929	130	
Fe VI	347.010	150		Cu	348.413	150	N	Ni V	349.950	190	
Ca VII	347.021	100		Ni V	348.422	370		Cu V	349.957	870	
Ni V	347.028	600		Ni V	348.498	450		O III	349.961	50	
K	347.063	20	N	Ni V	348.541	330		Cu V	349.983	400	
Ni V	347.064	400		Ni V	348.563	400		Ni V	350.019	240	
Cu V	347.067	70		Ni V	348.594	140		Cu V	350.046	760	
N III	347.072	100	Z	Sc XVIII	348.605		P	Ni V	350.065	310	
Cu V	347.131	60		Ni V	348.623	50		Co V	350.082	90	
Ni V	347.134	260		Cu V	348.628	260		Cu V	350.125	410	

Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes
C III	350.132	10	Z	Ni V	351.844	200		Sc X	353.55		
Ni V	350.133	80		N III	351.909		Z	Cu V	353.555	650	
Ni V	350.166	290		Ni V	351.926	270		Ni V	353.573	620	
Ni V	350.191	160		N IV	351.931	500		Ni V	353.588	690	
Ni V	350.249	260		Co V	351.967	270		P XI	353.60	20	
Cu V	350.276	70		Ni V	351.969	500		Ni V	353.619	280	
Cu V	350.298	240		N III	351.979	500	Z	Ni V	353.655	170	
Ni V	350.302	470		Co V	351.986	290		Ni V	353.689	230	
C III	350.35	200	Z	Ca VII	352.008	50		Ca VIII	353.699	20	
Ni V	350.352	350		Co V	352.020	210		Cu V	353.747	510	
Cu V	350.367	450		Cu V	352.086	150		Ni V	353.754	170	
Co V	350.374	100		Fe XII	352.107	30		Ti	353.757	1	N
Si VIII	350.38			N III	352.114	20	Z	P V	353.763	4	
Cu V	350.411	700		K	352.136	20	N	Al VII	353.769	140	
Cu	350.421	8	N	Al VII	352.145	75		Ni V	353.788	410	
Ni V	350.439	20		Mg V	352.200	360		Cu V	353.790	380	
Co V	350.464	270		Co V	352.206	180		Cr XIII	353.81		
Ni V	350.493	220		Ni V	352.241	130		Ni V	353.815	160	
S XI	350.50	0		Ne II	352.2466	30		Fe XIV	353.838	30	
Cu V	350.521	310		Cu V	352.247	370		Cu V	353.841	80	
Ni V	350.557	430		P XI	352.26	20		Sc VII	353.845	200	Q
Ni V	350.566	390		Na VII	352.275	600		Co V	353.849	200	
Cu V	350.570	560		Ni V	352.324	530		Mg VIII	353.86		
Ni V	350.600	210		Cu V	352.327	150		Ti VI	353.877	6	
Ti X	350.610	110		Ti	352.348	1	N	Co V	353.899	120	
Ni V	350.626	150		Cu V	352.348	350		Ni V	353.901	30	
Na VII	350.645	500		Ni V	352.386	380		Cu V	353.914	20	
V VI	350.659	40		O VII	352.39		P	Ar XVI	353.92	300	
Ni V	350.694	460		Cu V	352.438	150		Ne II	353.9349	30	
Ti	350.732	1	N	Ni V	352.451	60		Ti IX	353.942	70	
Ni V	350.773	690		Mg VIII	352.46			Co VI	353.98		P
V VI	350.781	5		K V	352.463	100		Ni V	354.013	20	
Cu V	350.813	630		Ni V	352.561	140		N VII	354.039		P
Ni V	350.841	310		Ti	352.574	1	N	Ni V	354.061	220	
Ar V	350.88	150		Cu V	352.590	360		Co V	354.089	360	
Ni V	350.900	320		Co V	352.594	310		Cu V	354.091	250	
Cu V	350.919	560		Ni V	352.618	210		Ni V	354.118	440	
Ni V	350.931	220		Co V	352.654	190		Cu V	354.129	450	
F VI	351.0		Q	Fe XI	352.661	160		K IV	354.139	100	
Ti XII	351.024	7		K V	352.750	100		Ni V	354.140	400	
Ni V	351.026	270		Ni V	352.769	570		Ca VIII	354.165	150	
Co V	351.068	180		Co V	352.794	460		N VII	354.167		P
Ni V	351.085	220		Cu V	352.814	530		Ni V	354.181	720	
Mg V	351.088	400		Ni V	352.834	210		Co V	354.206	160	
Cr X	351.092	1		Ni V	352.879	70		N VII	354.210		P
Ti	351.126	6	N	Ca V	352.915	450		Mg V	354.224	360	
Ni V	351.128	350		Ni V	352.919	400		Sc X	354.24	100	Q
Cr XIII	351.16		P	Ne II	352.9561	90		Co V	354.264	250	
Cu V	351.194	330		Ni V	352.960	120		Co V	354.285	220	
Ni V	351.286	320		Co V	352.967	340		Ni V	354.335	410	
Ni V	351.335	430		Ca VIII	352.998			Sc	354.350	100	N
Cu V	351.337	580		C III	353.000	300		Co V	354.374	110	
Fe V	351.349	1		Cu V	353.018	690		Cu V	354.389	70	
Ti	351.351	1	N	Co V	353.031	240		K	354.397	50	N
Ni V	351.365	400		Fe VII	353.04		F, P	Ca VII	354.418	150	
Ca VII	351.373	100		N IV	353.056	700		Ni V	354.418	760	
Ni V	351.455	450		Fe V	353.087	200		Ni V	354.467	360	
Ca VII	351.469	100		Mg V	353.091	600		Co V	354.486	280	
Ni V	351.503	60		Ni V	353.099	260		Ca VIII	354.488	50	
Co V	351.513	80		Ne II	353.2149	50		Ni V	354.493	680	
Cu V	351.525	530		P IV	353.236	10		Ni V	354.533	180	
Co VI	351.56		P	K	353.246	50	N	Co V	354.550	170	
Cu V	351.570	20	N	Co V	353.256	410		K	354.627	20	N
Ni V	351.581	60		Na VII	353.294	800		Fe V	354.679	150	
Ni V	351.613	300		Mg V	353.300	300		Cu V	354.679	100	
Co V	351.653	190		K	353.325	150	N	Ni V	354.721	370	
Ni V	351.677	330		Co V	353.362	450		Cu V	354.759	640	
Ni V	351.691	200		Ni V	353.368	160		Ni V	354.780	290	
Cu V	351.710	210		Ni V	353.407	410		Co V	354.799	270	
Ni V	351.730	40		F II	353.423	2	Z	Co XXII	354.8		F, P
Co V	351.737	180		K	353.455	150	N	Fe V	354.813	100	
Ni V	351.762	120		Cu V	353.474	60		Fe X	354.824	1	
Co V	351.791	440		Ni V	353.492	330		Ti	354.843	1	N
P IV	351.808	1		Cu V	353.507	80		Ni V	354.925	250	
Co V	351.823	320		Ni V	353.507	200		K IV	354.927	300	

Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes
Cu V	354.940	180		Ne II	356.1290	40		Ne II	357.5355	40	
Na VII	354.950	400		Ni V	356.134	20		Ni V	357.550	230	
Ne II	354.9622	60		Co V	356.153	900		Co V	357.572	570	
Ni V	354.964	350		Cu V	356.177	140		Co V	357.616	730	
Ca VIII	354.975	100		Co V	356.192	630		K IV	357.645	150	
Co V	354.985	170		Cu V	356.204	70		Co V	357.660	650	
Cu V	354.988	670	N	Ni V	356.208	130		K V	357.685	150	
Ni V	354.994	0		Ca V	356.246	250		K VI	357.685	150	N
Fe V	354.999	100		Ni V	356.253	40		P IV	357.708	60	
Cr VII	355.012	1		K IV	356.260	150		Co V	357.712	400	
F IV	355.045	200		Cu V	356.260	250		Ca XVII	357.736	100	P
Ni V	355.046	70		Co V	356.312	360		Ni V	357.743	20	
V XII	355.11			Ni V	356.328	220		Co V	357.786	710	
Cr X	355.112	40		Cu V	356.359	70		Cu V	357.802	740	
K	355.133	100	N	Ni V	356.359	20		Co V	357.818	530	
O III	355.137	300		P IV	356.364	10		Ni V	357.822	400	
Ni V	355.140	250		K V	356.372	50		Ne IV	357.831	250	
Sc	355.16	50	N	Ni V	356.410	250		P IV	357.837	60	
Fe V	355.196	250		Co V	356.412	210		Sc X	357.85		
Cu V	355.219	600		Cu V	356.435	620		Fe V	357.870	150	
Ni V	355.240	120		Ne II	356.4410	30		Cu V	357.882	890	
Cu V	355.278	660		Ni V	356.460	60		Cu	357.897	100	N
O III	355.293	150		Ni V	356.506	70		Ni V	357.897	110	
Ni V	355.309	220		Fe XI	356.519	5		Cu V	357.898	830	
Mg V	355.329	400		Ne II	356.5405	30		Ni V	357.921	130	
K	355.330	50	N	O III	356.558	10		Ni V	357.946	160	
O III	355.333	250		Co V	356.566	340		Cu V	357.949	390	
Fe V	355.370	200		Fe XIV	356.59	5		Ne V	357.95	400	
Cu V	355.411	860		K V	356.615	150		K	357.950	20	N
Fe V	355.411	10		K VI	356.615	150	N	Co V	357.958	320	
Cu V	355.423	190		Ni V	356.621	390		Fe V	357.970	5	
Ni V	355.439	90		O III	356.625	50		Ca VIII	357.977	100	
Ne II	355.4541	20		Cu V	356.626	770		Ca III	357.980	150	
Fe V	355.466	15		Co V	356.660	520		Ni V	358.014	360	
K	355.469	50	N	Cu V	356.688	260		Cu V	358.022	850	
O III	355.469	250		O III	356.725	100		Cu V	358.040	490	
Ni V	355.471	50		Cu V	356.727	810		Co V	358.050	350	
Co V	355.492	390		O III	356.768	10		Sc VIII	358.107	50	
As XXVI	355.5		F, P	Ni V	356.775	490		P IV	358.132	60	
Cu V	355.523	680		Cu V	356.786	270		Ni V	358.142	50	
Ni V	355.537	420		Ne II	356.7995	50		V XI	358.144	20	
Fe V	355.542	150		Co XXI	356.8		F, P	Ca VI	358.153	150	N
N VI	355.57			Cu V	356.822	30		Cu V	358.188	780	
Ni V	355.586	400		Ni V	356.831	70		Sc	358.22	250	N
Ni V	355.611	680		Ni V	356.860	170		Co V	358.234	130	
Co V	355.618	980		Ni V	356.876	330		Ni V	358.248	370	
Ne II	355.6559	40		Ne II	356.8769	20		N III	358.278	50	
Ca VIII	355.704	100		Co V	356.880	320		Si IX	358.29		
Co V	355.714	740		Al VII	356.880	20		Si XI	358.29		
C VI	355.750		P	Ca VIII	356.907	50		Si X	358.30		
Ni V	355.780	700		Cu V	356.947	100		Cu V	358.303	660	
K V	355.800	50		Ni V	356.957	30		N III	358.327	250	
Cu V	355.805	280	N	Co V	356.963	600		P IV	358.328	150	
Ti X	355.815	160		V XXII	356.98			N III	358.356	250	
Cu V	355.818	300		Cu V	357.020	310		Cu V	358.359	490	
Fe XI	355.837	1		Fe V	357.029	200		Ni V	358.368	100	
Ne II	355.839	1		Cu V	357.040	700		Ni V	358.396	140	
C VI	355.906		P	Cu V	357.122	20		N III	358.401	80	
Co V	355.925	480		Cu V	357.151	20		Fe X	358.414	40	
Ni V	355.935	580		N III	357.238	250	Z	Cu V	358.432	30	
Cu V	355.944	290		Cu V	357.284	370		Co V	358.449	650	
Ne II	355.9476	40		Cu V	357.320	630		N III	358.469	260	
C VI	355.958		P	N III	357.324	450		Ne V	358.48	500	
N VI	355.96			Cu V	357.331	630		Co VI	358.49		P
Cu V	355.963	640		Ca VIII	357.348	150		Ni V	358.503	70	
Co V	355.969	950		Cu V	357.368	210		N III	358.509	260	
Cu	355.977	5	N	Ni V	357.371	650		Si XI	358.54	100	P
Ni V	355.986	140		Co V	357.383	280		Ni V	358.570	690	
Mg VIII	356.000	10		Cu V	357.415	120		Cu V	358.572	250	
Cu V	356.006	110		Fe V	357.425	200		N III	358.578	600	
Ni V	356.047	580		Cu V	357.450	20		Ni V	358.583	680	
Si X	356.051	40		Si X	357.47	50		Cu V	358.595	690	
Cr XIII	356.07		P	Sc X	357.490	40		Co VI	358.61		P
Ni V	356.090	160		Ca VIII	357.492	50		Ni V	358.618	530	
Co V	356.091	380		Co V	357.520	230		Fe XI	358.621	20	

Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes
Co V	358.627	670		Ni V	360.242	60		Fe V	361.470	150	
Cu V	358.644	210		V VI	360.250	5		Fe V	361.486	200	
Cu V	358.666	320		Ca VIII	360.298	100		Ca I	361.492		A, Z
Co V	358.682	370		Si VI	360.3	50	Q	Fe V	361.512	50	
Cu V	358.716	460		Co V	360.305	180		P IV	361.514	120	
Ne IV	358.721	1000		Na V	360.319	800		Ni V	361.526	110	
P IV	358.736	90		P XI	360.36	20		Co V	361.532	870	
C III	358.740	400		Na V	360.367	800		Si IV	361.560		
Ni V	358.742	260		Cu V	360.377	590		Mn XIII	361.57		
Ni V	358.819	60		B V	360.394		P	Cu V	361.614	660	
Cu V	358.825	640		Cu V	360.411	90		Co V	361.619	570	
Cu V	358.856	940		Fe V	360.434	50		P IV	361.629	150	
Fe X	358.867	1		Ca I	360.452		A, Z	Ca VI	361.645	100	N
Fe V	358.892	5		Cu V	360.463	170		Si IV	361.659		
Co V	358.922	520		Ni V	360.474	410		Fe V	361.694	150	
Ni V	358.927	260		B V	360.477		P	Cu V	361.752	280	
P XI	358.94	20		B V	360.505		P	Cu V	361.783	480	
Ni V	358.944	120		Fe V	360.521	80		Cu V	361.783	480	
P IV	358.999	60		C III	360.557	600		Co V	361.799	760	
O III	359.016	400		K IV	360.568	100		P IV	361.802	40	
Ni V	359.020	240		P V	360.600	80		Fe V	361.823	150	
Ni V	359.047	380		Co V	360.604	440		Cu V	361.834	790	
Ni XXI	359.1		F, P	Cu V	360.612	850		Co V	361.849	990	
Ni V	359.101	190		C III	360.623	700		Ni V	361.851	170	
Co V	359.117	180		F IV	360.635	100		Fe V	361.863	100	
Cu V	359.179	690		Fe V	360.658	150		Co V	361.875	980	
Ni V	359.194	150		C III	360.675	500		Si	361.9	50	N
Cr XI	359.203			Co XXII	360.7		F, P	Fe V	361.935	50	
O III	359.223	400		Ni V	360.726	270		Co V	361.935	390	
Fe V	359.227	50		V VI	360.741	5		Cu V	361.957	260	
Co V	359.237	320		Cu V	360.753	260		Fe V	361.972	100	
Cu V	359.290	730		Na IV	360.760	450		Ca VIII	361.984	20	
P IV	359.293	120		Fe XVI	360.798	60		Cu V	362.004	350	
Ni V	359.316	150		Co V	360.798	720		Cu V	362.024	530	
Ca VIII	359.364	200		Cu V	360.806	140		Ni V	362.058	70	
O III	359.384	350		Co V	360.823	770		Fe V	362.064	150	
Ne V	359.39	500		Ni V	360.827	90		K IV	362.085	250	
Ca I	359.417		A, Z	Fe V	360.827	30		Cu V	362.094	300	
Ni V	359.420	70		Fe X	360.833	4		Cu V	362.101	270	
V VIII	359.454	1		Fe V	360.857	40		Co V	362.111	280	
Ni V	359.467	660		Cu IV	360.864	260		Ni V	362.120	130	
Co V	359.471	720		Ni V	360.886	550		P IV	362.133	60	
Co V	359.471	720		Si IX	360.9	50	Q	K IV	362.154	150	
Cu V	359.493	750		Cu V	360.949	750		Ga XXIV	362.2		F, P
Co V	359.494	180		Mn XV	360.97			Ni V	362.219	550	
Ni V	359.505	330		Cu V	360.980	500		Cu V	362.235	390	
Ni V	359.542	330		Cu V	361.021	80		Co V	362.238	350	
Co V	359.570	560		N III	361.061	100	Z	Fe V	362.256	150	
Co V	359.598	650		Co V	361.063	210		Co V	362.294	750	
Co V	359.598	650		Cu V	361.085	110		Sc VIII	362.300	20	
Fe XIII	359.638	10		Ni V	361.101	550		Ni V	362.309	590	
Ca VIII	359.647	50		Ca VI	361.114	200	N	Co V	362.332	980	
Co V	359.671	210		Co V	361.122	660		S XI	362.34	0	
Ni V	359.696	580		N III	361.143	50	Z	Cu V	362.361	240	
Ni V	359.720	260		Cu V	361.167	280		Fe V	362.376	200	
K IV	359.730	300		Co V	361.188	250		P IV	362.412	4	
Ni V	359.737	170		N III	361.205	50	Z	Cu V	362.444	180	
Co V	359.758	140		F IV	361.208	10		Na VI	362.444	400	
Cu V	359.780	590		Cu V	361.213	860		Ca I	362.452		A, Z
Ni V	359.781	350		Cu V	361.227	800	N	Ne II	362.4554	60	
Ca I	359.820		A, Z	Ca VI	361.241	20		Co V	362.476	390	
Fe XIII	359.837	4		Na VI	361.250	800		Ni V	362.506	560	
Cu V	359.867	910		Co V	361.264	230		Co V	362.512	760	
P IV	359.899	150		Ni V	361.266	580		Ti IV	362.520	1	
K IV	359.907	200		Fe V	361.281	300		Co V	362.531	930	
Fe V	359.937	30		N III	361.288	200	Z	Fe X	362.547	10	
Si	359.95		N	Co V	361.296	360		Cu V	362.558	570	
Cu V	359.963	500		Si XI	361.31	50	P	Co V	362.590	780	
Co V	359.967	310		Ni V	361.349	80		Fe V	362.601	200	
Ni V	359.967	140		Cu V	361.355	750		Ca VI	362.617	100	
Ni V	360.028	350		Fe X	361.409	10		Fe V	362.631	40	
Ni V	360.112	220		Ni V	361.416	70		Ni V	362.654	280	
Ti X	360.133	160		Cu V	361.428	760		Co V	362.663	220	
Co V	360.138	190		Ne II	361.4326	90		Ca I	362.679		A, Z
Cu V	360.150	20		Ni V	361.450	140		Co V	362.702	190	

Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes
V VI	362.717	20		Cu V	363.965	770		Fe V	365.434	300	
Co V	362.764	200		Ni V	363.975	60		Cu V	365.458	20	
Ni V	362.779	220		Ti IV	363.999		P	Co V	365.465	860	
Ca VI	362.788	50	N	Fe V	363.999	20		Co V	365.483	630	
Fe V	362.806	200		Ti XVII	364.		P	Ni V	365.485	190	
Fe V	362.821	50		Ni V	364.059	80		Ca I	365.499		A, Z
N III	362.831	150		Ni V	364.094	20		V X	365.518	5	
Cu V	362.867	80		Ca I	364.097		A, Z	Fe X	365.543	5	
N III	362.876	400		Se XXVII	364.1		F, P	Co V	365.552	310	
N III	362.902	200		Cu V	364.146	360		Cu V	365.590	60	
Ni V	362.928	530		Fe V	364.148	80		Co VI	365.60		F, P
Cu V	362.929	370		Fe V	364.170	50		Ne V	365.61	1000	
Fe V	362.930	200		Cu V	364.175	600		Ti X	365.628	110	
N III	362.949	700		Fe V	364.202	150		Fe V	365.632	250	
Ca I	362.972		A, Z	Ni V	364.229	360		K XVII	365.656		P
Co V	362.978	810		Co V	364.242	510		Co V	365.677	350	
N III	362.982	150		Ni V	364.262	160		Mn XX	365.7		F, P
Co V	362.983	890		Fe V	364.280	200		Cr X	365.718	20	
Cu V	363.001	690		V IX	364.296	160		Co V	365.721	770	
Ti IV	363.003	1		Co VI	364.30		F, P	Fe V	365.742	100	
N III	363.004	30		Ti IV	364.300		P	Co V	365.753	500	
K IV	363.021	150		Co V	364.324	550		C III	365.778	100	Z
Ti IV	363.023		P	Ni V	364.345	20		Co V	365.816	600	
Ni V	363.043	40		Ti IV	364.355		P	Co V	365.851	490	
Cu V	363.047	430		Fe XII	364.468	40		Fe V	365.855	300	
Co V	363.074	370		Na VI	364.477	300		Co VI	365.87		F, P
Cu V	363.084	270		Co V	364.480	640		F III	365.876	60	
Fe V	363.102	20		Ni V	364.485	50		Co VI	365.89		F, P
Ti V	363.145	1		Si XI	364.50	50		Sc	365.89	50	N
V VI	363.153	285		Co V	364.512	700		Fe V	365.997	250	
Ni V	363.182	20		Co V	364.541	600		Co VI	366.04		F, P
Co V	363.208	360		Co V	364.567	450		Mn XI	366.060	40	
Cu V	363.225	70		Fe X	364.589	1		Cr XI	366.085	40	
Co V	363.257	320		Co V	364.657	450		Ni V	366.085	180	
Cr IX	363.271	110		Co VI	364.66		F, P	Co VI	366.11		F, P
Ca I	363.278		A, Z	Fe VI	364.696	100		Na VI	366.110	400	
V VI	363.285	285		Co V	364.709	560		Ni V	366.113	620	
Ni V	363.309	50		K	364.725	20	N	Ca I	366.121		A, Z
Cu V	363.309	40	N	O III	364.739	150		Co VI	366.14		F, P
Sc	363.31	50	N	Co V	364.747	450		Co V	366.185	720	
Fe V	363.332	150		Ni V	364.773	240		C III	366.19	400	Z
Ca VIII	363.391	50		Fe V	364.795	250		Na VI	366.240	10	
Co V	363.432	390		Ni V	364.797	120		Co V	366.248	240	
Mn XI	363.441	110	P	Co VI	364.81		F, P	Co V	366.361	230	
Cu V	363.442	20		Cu IV	364.814	200		Ni V	366.386	80	
Fe V	363.444	70		Co V	364.865	680		F III	366.391	35	
P IV	363.467	10		Cu V	364.867	870		Co V	366.448	280	
Ca VI	363.525	100	N	O III	364.867	100		Cr XI	366.491	5	
Ni V	363.541	340		Ni V	364.867	110		Cu V	366.528	140	
Cu V	363.547	620		K	364.871	20	N	Ni V	366.541	140	
Kr	363.56	10	N	Ni V	364.899	340		Co V	366.550	620	
Ni V	363.568	60		Ca I	364.910		A, Z	Cu V	366.564	70	
Co V	363.594	310		O III	364.940	50		Co V	366.645	450	
Fe V	363.630	50		Fe V	364.974	200		Fe V	366.663	150	
K	363.647	50	N	Co V	365.000	520		Fe X	366.667	4	
Fe V	363.693	100	P	Co VI	365.01		F, P	Cu V	366.683	90	
Fe V	363.699	100	P	Ca I	365.019		A, Z	Ni XVII	366.7	12	
Co V	363.707	600		Co V	365.023	580		Cu V	366.740	260	
C III	363.7538	400		Fe X	365.144	1		Co V	366.757	620	
Fe V	363.760	50		Ni V	365.148	50		Fe V	366.764	200	
Co V	363.763	280		Fe VI	365.152	40		Cu V	366.796	180	
Mg VII	363.770	10		V VI	365.154	70		Fe VI	366.833	80	
Na VI	363.774	200		Ni V	365.189	100		Cu IV	366.849	220	
C III	363.7852	500		Mg VII	365.230	200		Cu V	366.865	320	
Co VI	363.79		F, P	Cu V	365.281	90		Fe V	366.890	100	
Ti IV	363.794		P	Co VI	365.32		F, P	Co V	366.894	440	
Sc	363.82	50	N	Cu V	365.322	390		Cu V	366.932	390	
Ni V	363.839	20		Co VI	365.33		F, P	Cr XI	366.942	5	
Co V	363.843	220		Fe V	365.338	250		Ni V	367.005	410	
Ti IV	363.848		P	Co V	365.361	470		Fe V	367.007	200	
C III	363.8598	600		Ni V	365.363	60		Ca VII	367.011	150	N
P IV	363.933	4		Cu V	365.380	130		Fe V	367.033	150	
Co V	363.947	510		Ni V	365.410	80		Sc VIII	367.085	40	
Cr XIII	363.96			Cu V	365.416	460		Co V	367.092	700	
Cu V	363.965	770		Si XI	365.42	100		Ni V	367.093	30	

Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes
Co V	367.136	680		Fe V	368.677	5		K V	370.523	150	N
Fe V	367.168	100		Fe VI	368.780	40		Co V	370.560	520	
V VI	367.173	1		Co V	368.787	760		Cu V	370.576	70	N
Ni V	367.182	150		Co V	368.806	780		K V	370.580	150	N
O IV	367.192	5		Ti	368.818	3	N	Fe V	370.589	130	N
Co V	367.208	620		Co V	368.878	320		N VII	370.590		P
Cu V	367.236	560		Ni V	368.898	510		Ni V	370.616	700	
Ni V	367.258	280		Co V	368.939	330		Cu V	370.626	650	
Fe V	367.338	250		B V	368.952		P	N III	370.640	300	Z
Co V	367.341	600		Ni V	368.958	90		Fe V	370.673	250	
K VI	367.378	100	N	Ca I	368.973		A, Z	Cu V	370.694	170	
Co V	367.379	870		Ni V	368.986	230		N VII	370.729		P
Co V	367.379	870		Cu V	369.025	180		Al VII	370.753	35	
Cu V	367.396	50	N	B V	369.037		P	Ca I	370.774		A, Z
V VI	367.404	1		Co V	369.058	330		N VII	370.776		P
Fe V	367.415	250		V IX	369.064	20		Ti	370.789	1	N
Co V	367.443	330		B V	369.067		P	N III	370.794	350	Z
Fe V	367.453	10		Cu V	369.093	260		Co V	370.815	50	
Cu V	367.484	120		Ni V	369.108	150		Fe V	370.847	125	
Cu V	367.501	140		Cr XIII	369.13			Cu V	370.896	360	
Co V	367.526	470		Co V	369.144	800		V VI	370.936	1	
F VII	367.53		P	Fe XI	369.154	20		Cr XI	370.959	40	
V VI	367.543	360		Ca I	369.154		A	Co V	370.966	790	
Na V	367.557	200		Cu V	369.160	290		Ni V	370.975	220	
Ni V	367.567	110		Fe VI	369.187	50		Ca XVII	371.037	120	P
Co V	367.577	760		Ni V	369.192	80		Mg VII	371.08		
P V	367.588	12		Co V	369.214	20		Fe V	371.083	5	
Ni V	367.648	130		Ni V	369.226	150		Cr X	371.086	1	
P IV	367.660	25		Ca I	369.380		A, Z	Ni V	371.091	290	
Ni V	367.664	120		K	369.392	20	N	Co V	371.102	400	
Mg VII	367.679	400		C III	369.415	500		Sc IV	371.160	450	
V VI	367.683	360		Sc	369.42	50	N	Cr XX	371.2		P
Co V	367.744	850		Cu V	369.438	190		Ca V	371.225	300	N
Fe VI	367.777	100		Co V	369.450	430		Co V	371.246	40	
Ni V	367.778	90		Fe V	369.470	200		Cu V	371.269	730	
Co V	367.794	990		C III	369.472	200		V IX	371.271	285	
Cu V	367.815	120		Ni V	369.475	210		Ni V	371.275	590	
Co V	367.820	990		Ca I	369.495		A, Z	Co V	371.286	130	
Ni V	367.826	50		Ni V	369.508	120		P IV	371.299	120	
Co V	367.844	600		Cu V	369.522	20		Ni V	371.306	670	
Fe V	367.852	150		Ni V	369.562	80		Ti	371.332	1	N
F VII	367.87			Fe V	369.565	2		Ti	371.410	6	N
Mn XI	367.877	1		V X	369.612	5		Co V	371.415	770	
Ni V	367.923	130		Ca	369.647	250	N	Cu V	371.427	140	
Co V	367.951	530		Fe VI	369.652	50		Fe V	371.454	15	
Fe V	367.992	100		Co V	369.703	620		Ni V	371.473	330	
Co V	368.003	220		Ni V	369.733	120		P IV	371.504	150	
Cu V	368.022	140		Na V	369.743	300		V VI	371.523	40	
K IV	368.030	100		Cu V	369.765	30		Ni V	371.543	100	
Ni V	368.037	50		Co V	369.784	880		Fe V	371.568	200	
Mg IX	368.071	100		Mg VII	369.85			Si XI	371.61	100	P
O VII	368.08		P	Co V	369.863	820		P IV	371.611	60	
Sc VIII	368.088	100	N	Co V	369.893	640		Ni V	371.643	120	
N IV	368.108	450		Ni V	369.906	70		Co V	371.650	800	
Ni V	368.115	20		Ni V	369.925	40		Fe V	371.683	100	
Cr XIII	368.12		P	Co V	369.988	910		C III	371.694	1000	
Fe XIII	368.12	50		Ni V	370.021	60		Fe V	371.732	250	
Co V	368.161	500		Ca VI	370.033	250		Co V	371.739	50	
Fe V	368.196	150		Sc	370.034	400	N	Fe V	371.742	200	
Co V	368.256	640		Cu IV	370.038	230		C III	371.747	1000	
Ni V	368.286	320		Co V	370.055	720		Ni V	371.763	680	
Ca	368.303	150	N	Co V	370.106	990		C III	371.784	800	
Si XI	368.38	50	P	K VI	370.115	100	N	Fe V	371.788	150	
Cu V	368.420	300		Sc VIII	370.169	110		Ni V	371.812	250	
Fe V	368.451	150		Co V	370.183	230		Co V	371.837	160	
K	368.465	50	N	Co V	370.220	470		Ca IX	371.893	10	
Ti IX	368.482	1		Co V	370.245	380		Mn X	371.905	110	
Ni V	368.496	420		V VI	370.314	20		Cu V	371.957	20	
Cu V	368.512	320		Co V	370.356	300		Co V	371.964	20	
Ni V	368.569	580		Cu V	370.370	20		P IV	372.001	200	
K	368.580	100	N	Fe V	370.381	7		Ni V	372.002	430	
Co V	368.634	600		Ti	370.408	1	N	Na II	372.075	300	
Ni V	368.641	40		Fe VIII	370.427		Q	Co V	372.083	740	
Co V	368.670	880		Co V	370.436	450		K V	372.148	500	
Ca I	368.671		A, Z	Cu V	370.437	250		P IV	372.150	60	

Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes
Ni V	372.159	390		Ni V	374.159	500		K	376.061	150	N
P IV	372.256	10		O III	374.165	400		Cr VII	376.073	70	
Co V	372.297	600		N III	374.204	500		Ni V	376.119	20	
Co V	372.324	440		Fe V	374.244	300		Fe V	376.209	1	
Co V	372.377	350		Co V	374.329	260		Ni V	376.211	70	
Sc IV	372.415	300	N	O III	374.331	400		Co V	376.276	260	
Co V	372.433	460		Ni V	374.340	620		Ca VI	376.279	135	N
Ni V	372.451	610		Fe V	374.356	20		Fe V	376.290	50	P
K V	372.462	200		Cu IV	374.399	240		Fe V	376.298	50	P
Cl V	372.59	200		O III	374.436	400		B III	376.372	100	
Co V	372.614	260		Co V	374.438	290		Na II	376.379	350	
Co V	372.680	390		N III	374.441	900		Fe V	376.382	200	
Co V	372.701	330		Fe V	374.444	150		Co V	376.402	440	
Fe VI	372.72	150	Q	Ni V	374.454	210		Fe V	376.404	150	
Ni V	372.724	620		Co V	374.526	50		Sc IV	376.449	300	N
Co V	372.736	160		Kr	374.54	20	N	K	376.477	20	N
Ni V	372.756	560		Ni V	374.581	240		Fe V	376.481	200	
K V	372.774	200		Ni V	374.604	480		Co V	376.501	550	
Fe XV	372.78			Co V	374.632	410		Ni V	376.509	20	
Fe V	372.890	70		Cl V	374.66	100		Co V	376.535	320	
Ca V	372.904	300	N	Sc VIII	374.660	160		Fe V	376.560	150	
Sc XI	372.940	300	P	Co V	374.677	110		Fe V	376.596	70	
Ca I	372.980		A, Z	F IX	374.684		P	Cu V	376.651	270	
Co V	372.987	620		V VI	374.705	1		Co V	376.662	800	
Ni V	372.987	300		Ni V	374.733	130		Mg V	376.665	100	
Ni V	373.018	410		Ca IV	374.744	250		F II	376.684	10	
K V	373.074	100		V VI	374.747	5		O II	376.693	10	
Ni V	373.083	230		Fe V	374.761	10		Fe V	376.708	40	
Co V	373.123	560		Ni V	374.770	590		Co V	376.713	380	
Co V	373.149	710		Co V	374.840	280		Fe V	376.741	1	
Cl V	373.17	200		V VI	374.851	110		O II	376.745	10	
Co V	373.171	640		Fe V	374.870	300		Co V	376.773	390	
Ca I	373.195		A, Z	Co V	374.872	670		Mn IX	376.778	450	
Ni V	373.213	170		F IX	374.881		P	Ni V	376.810	110	
K V	373.318	150	N	Co V	374.893	710		Fe V	376.837	200	
V XII	373.34		P	Cr XI	374.927	70		Co V	376.840	630	
Ni V	373.347	140		K VI	374.940	250		Co V	376.913	310	
Ne X	373.387		P	F IX	374.948		P	Fe V	376.952	150	
Si	373.4	50	N	Ni V	374.963	50		Co V	376.996	330	
Ni V	373.401	540		Ni V	374.992	40		F VII	377.0		N
Ca VI	373.417	100		Fe V	375.030	80		Fe V	377.006	50	P
Ni V	373.418	270		Cu V	375.032	380		Ni V	377.015	110	
Ni V	373.449	140		Sc V	375.048	400		Fe V	377.016	200	P
Co V	373.503	530		Co V	375.057	270		O II	377.045	10	
Ni V	373.521	220		Cl V	375.10	200		Fe V	377.054	250	
Ni V	373.536	230		Ni V	375.100	580		Co V	377.108	350	
Ni V	373.605	670		Cu V	375.135	570		Ni V	377.117	240	
Ca I	373.619		A, Z	Fe V	375.196	15		F II	377.133	1	
Ni V	373.644	400		F II	375.237	10		Mn XI	377.154	40	
Ne X	373.673		P	Co V	375.264	40		Ca V	377.181	250	
Co V	373.673	130		F II	375.303	100		Co V	377.202	20	
Ni V	373.690	180		Ca V	375.333	150	N, Z	Ni V	377.251	20	
Fe V	373.720	70		Na II	375.340	40	Q, Z	K VI	377.263	100	N
Ni V	373.760	390		Cr XI	375.362			Ni V	377.283	60	
Ne X	373.769		P	Cr VII	375.425	220		N III	377.286	100	Z
Cl V	373.78	300		F II	375.432	10		Co V	377.326	620	
Fe V	373.795	250		Ti	375.508	1	N	Cu V	377.356	690	
Ni V	373.804	400		Fe V	375.518	150		N III	377.380	100	Z
O III	373.805	400		Cr X	375.584	1		Fe V	377.386	40	
Ca IX	373.807	10		Cu V	375.624	90		Co V	377.402	150	
Fe V	373.835	100		Co V	375.657	150		Cu V	377.431	30	N
Ni V	373.903	370		F II	375.702	40		N III	377.444	100	Z
Cl V	373.91	10		Sc VIII	375.705	300	N	Cu IV	377.459	190	
Ca I	373.948		A, Z	Na II	375.730	45	Q, Z	Ni V	377.486	100	
Ni V	373.960	640		Ni V	375.733	20		Co V	377.506	140	
Zn XXIII	373.98		F, P	F II	375.784	10		N III	377.540	250	Z
Co V	373.980	190		Fe V	375.837	20		Co V	377.570	490	
Ca IX	373.988	40		Cu V	375.852	40		Cr XIII	377.60		
Mg VII	373.99			Co V	375.896	250		Ni V	377.646	290	
Ti XI	374.00			Ni V	375.898	160		Ni V	377.676	720	
Ca VI	374.000	200		F II	375.927	40		Cr VII	377.687	5	
O III	374.005	400		K IV	375.955	300		Co V	377.693	440	
Ni V	374.045	390		Fe V	375.979	300		Ni V	377.713	320	
Ni V	374.075	640		Co V	376.036	120		Cu V	377.718	240	
O III	374.075	500		Fe V	376.038	5		Co V	377.751	400	



Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes
Ni V	377.754	220		C III	379.254	10		B IV	380.94	5	
Cu V	377.758	740		K IV	379.279	100		Fe V	380.940	200	
K V	377.763	250		Co V	379.280	20		Ni V	380.948	60	
Sc	377.79	50	N	Fe V	379.300	250		Ni V	380.981	80	
Ni V	377.795	50		Ne III	379.31	700		V XII	381.04		P
Fe V	377.800	1		Cu V	379.346	710		Ni V	381.052	620	
Fe V	377.829	200		V IV	379.353	175		Co V	381.091	360	
Co V	377.845	90		Mn X	379.368	40		Fe V	381.104	100	
Fe V	377.909	125		V IV	379.372	65		Fe V	381.147	150	
Co V	377.961	50		V IV	379.395	65		Al VIII	381.15		
Fe V	377.970	200		Ge XXIV	379.41		F, P	Fe V	381.266	300	
Ni V	378.054	70		Fe V	379.414	5		Na VII	381.300	300	
Co V	378.054	580		Ni V	379.497	80		Co V	381.327	260	
V VI	378.081	20		O III	379.505	200		Ni V	381.346	210	
Ca IX	378.082	40		V IV	379.512	175		Fe V	381.366	250	
Cr XVIII	378.10		F, P	Ni V	379.550	70		Ni V	381.380	130	
Cu V	378.100	520		O III	379.575	150		Co V	381.391	180	
Ni V	378.133	520		Fe V	379.586	300		Ca VI	381.464	100	N
Ti X	378.135	110		V IV	379.613	350		Fe V	381.475	150	
Na III	378.136	1000		O III	379.631	100		Cu V	381.545	30	
Co V	378.175	120		Co VI	379.66		P	Ni V	381.577	20	
Fe V	378.191	200		V IV	379.682	110		Sc XI	381.580	700	P
K V	378.219	150		F II	379.719	1	Z	Cu V	381.584	30	
Na VII	378.22			Ti X	379.74			Co V	381.595	140	
Ca VII	378.258	150		Co V	379.751	270		Ca V	381.601	150	N
Co V	378.280	220		Sc	379.77	50	N	B V	381.619		P
Fe V	378.327	70		O IV	379.780	15		Co V	381.671	350	
Co V	378.376	40		Co V	379.804	740		Al VII	381.674	55	
Ni V	378.379	190		Si XIV	379.812			Ni V	381.678	400	
Ca IX	378.390	1		K IV	379.877	300		Fe V	381.680	200	
Br XXVIII	378.4		F, P	Co V	379.892	60		Ni V	381.702	130	
Fe V	378.419	150		Ni V	379.895	40		K IV	381.702	200	
Co V	378.439	480		O IV	379.923	10		B V	381.710		P
Ca I	378.454		A, Z	Co V	379.948	110		B V	381.742		P
Co V	378.461	580		Ca VI	380.003	50	N	Fe V	381.771	5	
Ni V	378.485	370		Co V	380.006	20		F VII	381.80		P
Co V	378.519	530		Fe V	380.009	30		Fe V	381.812	250	
Ca IX	378.540	1		Ni V	380.037	30		F II	381.824	1	Z
Cu V	378.549	350		Na III	380.100	700		Ca VI	381.849	100	N
P V	378.561	110		V IV	380.101	1		Co V	381.876	120	
F III	378.580	10		Si XIV	380.118			Fe V	381.887	250	
Ni V	378.591	150		Fe V	380.131	100		Co V	381.963	210	
Cu V	378.597	410		Ni V	380.141	20		Co V	381.978	190	
Fe V	378.622	5		P IV	380.152	60		O VII	382.02		P
Ti	378.630	1	N	Cr XVII	380.2		F, P	Ni V	382.032	500	
Ca VI	378.653	50	N	Cr VII	380.219	110		V VI	382.049	70	
Co V	378.661	780		Fe V	380.313	200		Mn V	382.056	20	
Co V	378.676	840		Fe V	380.316	100	P	N VII	382.136		P
Sc V	378.677	100		Fe V	380.340	250		Ni V	382.142	30	
V IV	378.678	65		Co V	380.343	20		Mn XI	382.142	70	
V VI	378.687	40		Ca V	380.396	250	N	Co V	382.155	230	
Co V	378.736	740		Ni V	380.417	270		V VI	382.185	5	
Ca VI	378.745	50	N	Mn XIII	380.42			O III	382.214	50	
Co V	378.766	530		Co V	380.430	350		Cu V	382.220	250	
Si XIV	378.808		P	Ni V	380.433	330		K III	382.229	300	
Ni V	378.820	40		Ni V	380.467	370		K IV	382.229	300	
Co V	378.833	290		K IV	380.477	250		Ni V	382.294	20	
V VI	378.834	1		K III	380.477	250		Co V	382.295	760	
Fe V	378.875	80		V IV	380.537	1		Ni V	382.370	170	
V IV	378.929	110		Ni V	380.626	220		Fe V	382.411	20	
V IV	378.993	110		Co V	380.634	260		N VII	382.446		P
Co V	379.012	90		Fe V	380.667	250		Co V	382.463	250	
Ni V	379.018	310		Cr	380.7		N	K IV	382.487	150	
Fe V	379.032	200		Co V	380.747	130		Ni V	382.493	310	
C III	379.065	100	Z	Fe V	380.752	150		Ni V	382.509	160	
V IV	379.093	110		Fe V	380.764	150		Fe V	382.536	200	
Ni V	379.104	160		Fe V	380.786	125		N VII	382.544		P
K V	379.118	300		Co V	380.819	720		O VII	382.60		
K III	379.118	300		Cu V	380.832	200		Ar III	382.61	125	
Ca VI	379.138	100	N	Co V	380.865	700		Fe V	382.624	250	
Cr VII	379.153	360		Fe V	380.883	250		K IV	382.646	200	
Fe V	379.223	150		Cu V	380.895	70		Sc	382.650	200	N
Ni V	379.225	190		F II	380.896	100	Z	Mg VII	382.72		
Cu V	379.228	840		Cr VII	380.897	1		Co V	382.752	140	
Ni V	379.252	560		Ni V	380.920	140		O V	382.757	1	

Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes
Mn XIII	382.76			Fe V	384.659	200		Fe V	386.162	100	P
Ni V	382.788	120		K	384.689	50	N	Fe V	386.163	250	P
Fe V	382.827	200		Fe V	384.707	150		Co V	386.188	360	
Ni V	382.827	240		Mn XV	384.74	250		K VI	386.193		
Fe XII	382.83	150		Co V	384.754	180		Ni V	386.196	90	
Ni V	382.849	480		Fe V	384.768	150		C III	386.2028	850	
Co V	382.864	150		Co V	384.780	230		Ca VI	386.254	50	N
O III	382.903	50		Fe V	384.825	150	P	Co V	386.257	580	
Mn V	382.905	100		Mn X	384.827	5		Fe V	386.261	250	
K IV	382.906	300		Fe V	384.833	100	P	Mn XII	386.27		
Cu V	382.906	280		Co V	384.843	290		Ni V	386.306	230	
Ni V	382.914	90		Cu V	384.904	130		Mn X	386.316	20	
Co V	382.930	360		Co V	384.945	20		Co V	386.318	460	
Mn V	382.987	20		Al IX	384.95			Co V	386.362	330	
Mn X	383.036	160		Fe V	384.958	300		Fe V	386.389	200	
Cu V	383.072	120		Fe V	384.972	300		Fe V	386.428	150	
Fe V	383.159	150		B IV	385.00	450		Cu V	386.453	150	
Co V	383.166	390		Cr VI	385.015	1		Fe V	386.476	200	
Ni V	383.167	80		K V	385.020	50		K VI	386.505	100	N
Ni V	383.255	30		Fe V	385.031	200	P	Fe V	386.528	250	
Co V	383.270	840		Fe V	385.033	100	P	Fe V	386.590	250	
Ni V	383.293	50		Co V	385.042	100		Cu V	386.594	290	
K V	383.318	100		C III	385.043			K IV	386.610	200	Q
Co V	383.322	870		Cu V	385.059	40		Ni V	386.645	480	
Co V	383.348	800		Na VII	385.061	10		Fe V	386.652	200	
Co V	383.371	560		Ca VI	385.091	100	N	Ni V	386.702	400	
Mn V	383.426	20		Co V	385.103	330		Co V	386.714	320	
Cu V	383.427	370		Fe V	385.108	300		Co V	386.733	370	
Fe V	383.491	200		Co V	385.157	620		Ni V	386.738	120	
Ni V	383.496	20		Fe V	385.196	100		Fe V	386.739	300	
Ni V	383.557	230		Ti	385.211	1	N	P IV	386.752	90	
Cr VI	383.575	1		Fe V	385.226	100		Co V	386.761	240	
Sc X	383.58			Ni V	385.245	20		Fe V	386.785	300	
Co V	383.594	670		Fe V	385.251	300		Cu V	386.812	230	
V XII	383.60		P	Na VII	385.254	10		Co V	386.832	360	
Mn V	383.688	80		Fe V	385.262	300		Fe V	386.847	300	
Al VIII	383.70			Ni V	385.283	70		Fe V	386.878	300	
Na XI	383.716		P	Fe V	385.300	300		Fe V	386.885	350	
Zn III	383.759	1		Co V	385.341	40		Ca IX	386.92		
Na VI	383.783	25	Q	Mn V	385.350	30		Fe V	386.924	100	
Al VIII	383.785	50		Si	385.4		N	Cu V	386.930	280	N
Co V	383.792	340		Fe V	385.420	200		Co V	386.940	790	
Fe V	383.817	40		Fe V	385.507	100		Ni V	386.945	90	
Ni V	383.826	70		K VI	385.547	200		Cu V	386.952	600	
Ti X	383.83			Co V	385.564	620		Co V	386.995	70	
Ni V	383.938	220		Cu XXIX	385.564		P	Fe XV	387.00		
Mn V	383.948	80		V XII	385.58		P	Co V	387.064	70	
Cl XV	383.96			F VII	385.6		N	Ni V	387.074	60	
C IV	384.032	800		Fe V	385.637	70		Ca V	387.080	200	
Fe V	384.033	150		Co V	385.669	350		Co V	387.124	170	
Fe V	384.058	200		K V	385.689	100		Ne IV	387.141	700	
K IV	384.095	250		Mn V	385.698	10		Ni V	387.154	580	
Na XI	384.141		P	Fe V	385.712	30		Ni V	387.176	530	
Co V	384.167	200		Fe V	385.746	100	P	Fe V	387.202	400	
Co V	384.177	320		Co V	385.751	40		Co V	387.222	470	
C IV	384.178	850		Fe V	385.752	200	P	Ni V	387.274	340	
Fe V	384.219	250		Co V	385.852	700		Mn V	387.307	50	
Na XI	384.278		P	Sc IX	385.869	160		N IV	387.353	500	
Si	384.32		N	Fe V	385.875	300		Ni V	387.360	310	
Ca I	384.330		A, Z	Ni V	385.910	20		Fe V	387.371	200	
V IX	384.382	1		Fe V	385.928	150		N III	387.375	300	Z
Co V	384.395	630		Ca VI	385.941	50	N	Si	387.39		N
K V	384.400	100	N	Co V	385.961	640		O III	387.398	100	
Fe V	384.416	250		Co V	385.974	650		Cu V	387.400	700	
Co V	384.442	540		Co V	385.974	650		Co V	387.428	40	
Cu V	384.464	520		Cu V	386.019	320		Ar III	387.45	100	
Fe V	384.479	200		Co V	386.042	290		O III	387.482	150	
Fe XX	384.5		F, P	Ni V	386.044	20		N III	387.483	500	Z
K VI	384.514	100		Co V	386.062	270		Fe V	387.493	100	P
Co V	384.555	410		Al VII	386.066	95		Fe V	387.504	300	P
Co V	384.578	450		Fe V	386.093	100		Co V	387.509	350	
Fe V	384.585	200		Cu V	386.102	410		Al VII	387.521	125	
Ni V	384.594	70		Ca VI	386.106	50	N	Co V	387.526	340	
Fe XXV	384.62		P	Ni V	386.106	20		Ni V	387.563	130	
Fe V	384.622	200		Ti XI	386.140	10		Co V	387.583	250	

Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes
Fe V	387.618	300		Fe V	389.035	250		Fe V	390.692	200	
O III	387.639	200		K IV	389.069	250		P V	390.699	300	
V IX	387.657	160		K V	389.069	250		Co V	390.719	300	
Fe V	387.689	100		Co V	389.071	330		Fe V	390.735	200	
Zn III	387.740	1		C III	389.0898	700		Ni V	390.744	50	
Fe V	387.763	200	P	Fe V	389.115	200		O V	390.755	15	
Fe V	387.769	200	P	Ar XVI	389.14	300		Co V	390.761	240	
Ni V	387.771	160		Co V	389.144	270		Co V	390.772	370	
Fe V	387.781	400		Fe V	389.146	200		Fe V	390.777	300	
Mg VI	387.787	200		Fe V	389.161	200		Cu IV	390.819	30	
Co V	387.791	330		Ca VII	389.195	50	N	Fe V	390.845	200	
K VI	387.809	300		Ti X	389.237	160		S VI	390.86	800	
K V	387.809	300		Ni V	389.239	100		Fe V	390.861	200	
Cu V	387.845	660		Ni V	389.259	80		Co V	390.872	320	
Co V	387.846	410		Fe V	389.339	7		Sc IX	390.888	285	
Ca I	387.858		A, Z	Ni V	389.350	230		Fe V	390.913	150	
Co V	387.890	270		Ni V	389.365	260		Ni V	390.943	30	
Fe V	387.895	20		Fe V	389.390	200		Fe V	390.985	40	
K XVI	387.896		P	Co V	389.410	420		Co V	391.005	440	
Sc IX	387.906	40		K V	389.428	100		N V	391.008		P
Al VIII	387.970	100		Ar VIII	389.43			Fe V	391.038	200	
Fe V	387.984	300		Co V	389.431	280		Kr	391.04	10	N
Ca I	387.993		A, Z	Ar III	389.49	25		Co XX	391.04		F, P
Mg VI	388.020	300		Ca VI	389.495	20	N	Co V	391.068	430	
Fe V	388.030	150		Co V	389.496	270		Co V	391.117	360	
Cu V	388.117	100		P V	389.496	250		N V	391.123		P
Fe V	388.129	100	P	Co V	389.515	260		Fe V	391.141	200	
Fe V	388.140	100	P	K VI	389.531	100	N	Ni V	391.177	300	
Fe V	388.199	100		Ni V	389.554	60		Co V	391.184	500	
Ne IV	388.218	500		Si X	389.57			Co V	391.221	340	
Ni V	388.224	20		Ni V	389.588	250		Fe V	391.239	150	
Zn III	388.224	0		Co V	389.627	110		Co V	391.273	150	
K VI	388.241	150		Fe V	389.642	70		Cu IV	391.274	10	
Co V	388.289	330		Co V	389.662	60		Co V	391.323	290	
P IV	388.318	500		Ca I	389.677		A, Z	Cu V	391.329	240	
Cu V	388.343	240		Fe V	389.689	80		V IV	391.362	1	
Ni V	388.360	130		P IV	389.698	90		Ni V	391.394	120	
Fe V	388.390	200		Ca XV	389.7		P	Co V	391.402	530	
Ni V	388.398	60		Ga XXVII	389.7		F, P	Fe V	391.424	150	
Cu V	388.399	250		K V	389.750	100		Co V	391.455	370	
Co V	388.416	70		Cr XIV	389.81	250		K IV	391.462	200	
Cu IV	388.482	170		Ni V	389.855	160		Co V	391.486	340	
K VI	388.485	100	N	Sc VIII	389.883	450		Ni V	391.487	130	
Co V	388.486	320		Co V	389.921	50		Fe V	391.489	250	
Co XVI	388.5		P	Ti X	389.99			Co V	391.511	260	
Ni V	388.503	120		Sc XVI	390.		P	Cu V	391.542	70	N
Fe V	388.504	250		Co V	390.047	270		Co V	391.559	150	
Co V	388.543	110		C III	390.055	300		Fe V	391.580	50	
Ni V	388.576	360		Ni V	390.082	130		Co V	391.603	50	
Mn XII	388.58			N V	390.102		P	Fe V	391.650	250	
Fe V	388.586	200		Fe V	390.107	150	P	Cu V	391.665	240	
Si X	388.59			Fe V	390.110	150	P	Co V	391.668	300	
Fe V	388.613	300		K V	390.114	250		Co V	391.720	310	
Fe V	388.661	150		N V	390.116		P	Co V	391.725	710	
Sc V	388.682	200		Ar VIII	390.12			Co V	391.742	320	
Ca VI	388.685	150	N	Co V	390.126	90		Cu IV	391.773	10	
Ni V	388.702	280		Cl V	390.15	400		Ni V	391.816	230	
Fe V	388.709	200		Ni V	390.158	90		Fe V	391.856	5	
Ca IX	388.72			Fe V	390.191	300		Co V	391.889	520	
Cu V	388.759	200		Ni V	390.197	90		Cu V	391.901	310	
Fe V	388.775	200		Cu IV	390.205	20		O II	391.912	50	
Fe V	388.817	300		Co V	390.216	90		K III	391.918	200	N
Cu V	388.833	80		Ni V	390.226	180		Fe V	391.938	300	
Ni V	388.841	210		Ni V	390.249	150		O II	391.943	100	
Co V	388.843	130		Co V	390.268	190		Co V	391.964	90	
Co V	388.899	460		Ni V	390.296	90		O II	392.002	150	
Co V	388.899	460		P V	390.371	50		Ni V	392.010	480	
K IV	388.920	250		Ni V	390.410	30		Fe V	392.010	30	
S VI	388.94	600		K IV	390.415	250		Al VII	392.048	45	
Fe V	388.947	200		Ti XXI	390.47		P	Fe V	392.058	300	
C III	388.9687	500		Co V	390.559	20		Ca I	392.122		A, Z
Mn X	388.988	70		K IV	390.574	300		Fe V	392.137	40	
F VII	389.00		P	Fe V	390.621	5		Ni V	392.159	250	
C III	389.0045	600		Co V	390.626	220		F VII	392.16		P
Ni V	389.026	240		Cu V	390.689	200	N	Co V	392.170	170	

Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes
Fe V	392.183	5		V IV	393.790	110		Al IX	395.51		P
Co V	392.203	130		Co V	393.819	370		Ni V	395.527	420	
K IV	392.274	100		Ni V	393.858	240		O III	395.558	600	
Fe V	392.290	250		Co V	393.884	330		Fe V	395.588	150	
O II	392.322	150		Fe V	393.913	300		Co V	395.602	110	
Co V	392.323	310		Ni V	393.914	700		Al X	395.62		P
Ni V	392.328	250		Fe V	393.970	300		Fe V	395.633	80	
Fe V	392.352	250		Co V	393.973	210		Co V	395.653	220	
Co V	392.359	660		Ni V	394.005	130		Fe V	395.687	50	
Fe V	392.381	300		Co V	394.032	140		Fe V	395.709	100	
Co V	392.384	520		Fe V	394.044	150	P	P III	395.723	4	Z
Al IX	392.425	80		Fe V	394.046	150	P	Si X	395.73		
V IV	392.428	65		K VIII	394.063	50		Fe V	395.788	300	
Cl V	392.43	500		Ni V	394.070	180		Co V	395.800	290	
Ni V	392.458	310		Ti	394.153	1	N	Fe V	395.833	250	
K IV	392.467	200		Fe V	394.170	200		Ni V	395.845	340	
Fe V	392.503	300		Co V	394.185	470		Co V	395.866	180	
Fe V	392.514	300		F II	394.207	10		Fe V	395.874	150	
Co V	392.525	470		N V	394.228		P	Fe V	395.903	400	
V XII	392.54		P	Fe V	394.232	200		Ar III	395.92	50	
Co V	392.577	790		Fe V	394.242	200		Co V	395.958	140	
V IV	392.602	30		Ni V	394.313	660		F III	395.972	3	
Ca I	392.603		A, Z	Mn V	394.320	40		Cr X	395.984	360	
Ni V	392.623	80		N V	394.348		P	Fe V	395.994	200	
Co V	392.645	170		Ni V	394.350	260		K XVI	396.004		P
Ni V	392.659	370		F II	394.438	1		Ca VI	396.044	100	
Ni IV	392.680	330		V IV	394.441	65		Ca VII	396.049	5	
Fe V	392.702	300		K VI	394.480	150		Al IX	396.05		Z
Co VI	392.72		F, P	Fe V	394.505	50		P III	396.059	25	
Co V	392.725	240		Co V	394.518	480		Cu V	396.065	510	
Fe V	392.770	100		Ni IV	394.526	120		Fe V	396.094	40	
Co V	392.832	230		Fe V	394.535	7		Ni IV	396.127	200	
Co VI	392.84		F, P	Ni V	394.537	270		Fe V	396.131	50	
P IV	392.901	60		Fe V	394.593	100		N III	396.186	450	
Cu V	392.904	20		Co VI	394.62		F, P	Co VI	396.21		F, P
Fe V	392.910	300		Ni V	394.641	520		Co V	396.218	580	
Co V	392.948	150		Fe V	394.643	300		Ni V	396.239	210	
Fe V	392.967	5		Sc IX	394.647	285		K VI	396.242	50	
V VI	392.990	1		Co V	394.659	470		F III	396.244	1	
Cr XII	393.00			Si X	394.71			Ni V	396.256	70	
Co V	393.020	450		Fe V	394.747	200		Fe V	396.258	150	
Co V	393.062	390		Co VI	394.75		F, P	Ti	396.288	1	N
Ca I	393.073		A, Z	Ca I	394.773		A, Z	Cr VII	396.288	450	
Cu V	393.105	190		Fe V	394.814	200		Co VI	396.33		F, P
Co VI	393.12		F, P	Ni V	394.819	90		Na VII	396.335	200	
Ni V	393.134	190		Co V	394.838	620		Co V	396.346	250	
Co V	393.139	140		Co V	394.863	560		Ar III	396.37	200	
K IV	393.142	500		Cu V	394.871	190		Sc	396.440	400	N
Fe V	393.142	150		K V	394.909	150		Co V	396.461	900	
Si	393.15		N	Co V	394.994	230		Fe V	396.480	100	
Ni V	393.155	250		F VII	395.0		N	N VII	396.504		P
Cu	393.172	3	N	Co V	395.015	260		Co V	396.521	340	
Ni V	393.211	100		Ca IX	395.025	40		V XII	396.53		P
Co V	393.211	370		Co VI	395.03		F, P	Ca I	396.535		A, Z
V IV	393.217	1		Cu V	395.059	90	N	Co V	396.572	390	
Ni IV	393.236	320		Fe V	395.064	20		Co V	396.598	300	
Fe V	393.271	300		Ni IV	395.087	20		P III	396.605	40	Z
Co V	393.295	150		Cu V	395.124	140	N	Co VI	396.62		F, P
Fe XXI	393.3		F, P	Fe V	395.153	300		N VII	396.660		P
Mn V	393.328	50		Co V	395.162	90		Cu V	396.675	100	
Ca I	393.362		A, Z	Cu V	395.183	130		F VII	396.7		
Cu V	393.392	150	N	Ni V	395.242	660		N VII	396.714		P
Co V	393.447	100		Co V	395.276	440		K III	396.763	20	
V X	393.469	20		Ni V	395.299	580		P X	396.77	10	
Co V	393.471	70		Co V	395.313	410		Fe V	396.773	250	
Cu V	393.504	150		Sc V	395.317	400		Co V	396.787	500	
Ni V	393.543	440		Fe V	395.318	250		K VI	396.858	20	N
Ni V	393.573	140		Co V	395.359	150		Ar IV	396.87	160	
Fe V	393.589	50		Al X	395.36			Mn V	396.886	20	
Cu V	393.667	170		Ni IV	395.369	130		Fe V	396.901	200	
F II	393.680	40		Cu V	395.401	190		Ca VI	396.918	100	
Fe V	393.717	300		K VI	395.407	150		P III	396.940	4	Z
Fe V	393.731	300		F III	395.443	6		Fe V	396.965	70	
Co V	393.734	490		Mn IX	395.473	285		V IV	396.991	1	
Mn XI	393.743	110		Co V	395.489	360		Fe V	396.996	10	

Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes
Ni V	397.015	30		N III	399.045	600	Z	Na V	400.722	1000	
Co V	397.046	270		N III	399.060	60	Z	Co V	400.756	340	
V IV	397.097	65		K VI	399.075	100		Fe V	400.761	150	
O III	397.120	100		Co V	399.082	80		Na I	400.80	80	A, Z
V IV	397.122	110		Fe V	399.164	100		Co VI	400.82		F, P
Co V	397.143	80		Co V	399.165	210		Si	400.82		N
Fe V	397.161	70		Na VII	399.182	400		Ca VI	400.827	200	
Ca I	397.192		A, Z	Fe V	399.233	150		Ni V	400.871	250	
Fe V	397.196	250		Co V	399.244	560		Fe V	400.920	250	
Fe V	397.226	150		Mg VI	399.289	600		Co V	400.923	410	
O III	397.231	50		K VI	399.419	100		Ni V	400.952	120	
Co V	397.237	970		Fe V	399.439	100		K VI	400.963	200	
Co V	397.258	940		Ni IV	399.444	110		Fe V	400.968	150	
O III	397.310	10		Co VI	399.47		F, P	Ni V	400.969	260	
Co V	397.455	400		Ni IV	399.487	80		Co V	401.031	260	
Mn XII	397.46			Fe V	399.491	150		Fe V	401.035	300	
Si	397.47		N	K VII	399.495	50		Al X	401.12		
Co V	397.488	270		Sc V	399.501	200		Ne VI	401.14	150	
Na VII	397.490	300		Fe V	399.526	120		Al X	401.183	10	N
Mn XII	397.55		N	Mn V	399.530	30		Co V	401.217	70	
Ni IV	397.557	40		Al VIII	399.57			Fe V	401.237	250	
Co V	397.623	310		C III	399.612	600	Z	Ni IV	401.299	230	N
Ar III	397.67	50		Fe V	399.628	250		Co V	401.354	170	
Fe V	397.674	100		Ar IV	399.63	120		Co V	401.421	310	
K VII	397.691	20		Fe V	399.647	250		Co VI	401.43		F, P
Co V	397.717	900		Cu IV	399.655	20		Co V	401.514	110	
Cu V	397.733	120		Cu IV	399.686	20		Fe V	401.548	200	
Co VI	397.75		N	C III	399.688	600	Z	K VII	401.553	150	
Al X	397.76		P	Cr X	399.707	40		Co V	401.615	230	
Co V	397.831	260		V IX	399.719	20		Ni V	401.644	20	
Cu V	397.910	190		Fe V	399.725	15		Fe V	401.644	300	
Co V	397.936	80		Co V	399.727	200		Cr VII	401.658	360	
Ni IV	397.967	140		V X	399.749	40	P	Fe V	401.700	10	
Co V	398.007	740		K V	399.754	200		Co VI	401.73		F, P
Fe V	398.082	250		Mn V	399.795	10		B V	401.738		P
K VI	398.104	150		Ne VI	399.82	50		Ti VIII	401.739	160	
Co V	398.130	240		Fe V	399.839	300		Fe V	401.759	150	
Cr X	398.150	450		Sc IX	399.888	160		Mn V	401.778	70	
Ar III	398.17	125		V XII	399.89		P	K VII	401.790	100	
V VIII	398.204	450		Mn V	399.896	50		B V	401.838		P
Co V	398.269	550		Ca VI	399.928	50		Fe V	401.859	300	
Mn X	398.322	70		Cl VI	399.94	250		B V	401.873		P
Ni V	398.336	230		Cl VI	399.96	350		Ne VI	401.93	250	
K VII	398.354	50		Co V	399.989	590		Ca I	401.936		A, Z
K V	398.363	200		Cl VI	400.00	400		Ni V	402.024	20	
Fe V	398.382	200		Ti IX	400.041	220		K III	402.104	200	
Cr XIX	398.4		F	V X	400.056	20		Ca I	402.109		A, Z
Fe XXV	398.41		P	Cu IV	400.080	140		Fe V	402.127	70	
C III	398.42	200	Z	Co VI	400.10		F, P	K VII	402.132	100	
Fe V	398.421	200		Fe V	400.112	300		Co V	402.186	520	
Ni IV	398.473	60		K VII	400.147	100		Fe V	402.202	200	
Fe V	398.483	40		Si V	400.15		Q	Mn V	402.286	70	
Ni V	398.514	310		Co V	400.155	160		K VII	402.291	20	
Ni IV	398.521	120		Mn V	400.159	30		Mn V	402.348	70	
Ar IV	398.55	160		Fe V	400.173	20		Co V	402.348	210	
Mn V	398.604	200		Co V	400.199	190		Fe V	402.364	10	
Ca VII	398.623	20		K IV	400.210	400		Co V	402.401	100	
K III	398.633	150		Co V	400.291	250		Co VI	402.46		F, P
Fe V	398.636	150		Fe V	400.318	250		Mn V	402.512	170	
Si	398.65		N	Fe V	400.350	20		Ni V	402.515	210	
Co V	398.667	290		V X	400.390	20		Co V	402.518	270	
Co V	398.759	270		Al X	400.43			Ca VII	402.551	40	
Co V	398.792	410		Co V	400.445	170		Fe V	402.651	150	
Co VI	398.86		F, P	Cr VII	400.452	40		Mn V	402.742	80	
Co V	398.871	90		Co V	400.500	290		Fe V	402.770	150	
K V	398.878	200		Fe V	400.510	300		Co V	402.778	20	
N III	398.885	500		Fe V	400.523	300		Fe V	402.869	300	
Ni IV	398.886	50	Z	Fe V	400.569	10		V IV	402.885	250	
Fe V	398.907	50		F II	400.582	10		Co V	402.905	190	
Ar III	398.91	50		Ni V	400.588	410		K IV	402.907	300	
K VII	398.943	200		Fe V	400.627	300		Na I	402.97	100	A, Z
Fe V	398.954	70		Fe XV	400.65			Fe V	402.978	250	
K VII	399.006			Fe V	400.662	200		Mn XIV	402.99		
Co V	399.037	160		Co V	400.667	320		Mn V	403.002	20	
Fe V	399.041	5		Mg VI	400.676	700		O II	403.035	10	

Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes
Fe V	403.057	300		K IV	405.773	100		Cr VII	407.918	220	
O II	403.087	10		Ne II	405.8538	150		Ni V	407.953	110	
Co V	403.148	130		Cu V	405.874	180		Ni IV	407.967	20	N
Ni V	403.172	60		Cu IV	405.898	220		Cr VII	408.019	160	
Co V	403.204	60		Fe V	405.927	150		Cu V	408.035	270	
Ni V	403.211	50		Fe V	405.962	250		K IV	408.076	250	
Fe V	403.249	20		Fe V	405.990	150		Fe V	408.079	250	
Ne VI	403.26	100		Cu V	406.018	360		Fe V	408.131	1	
O II	403.273	10		Mn V	406.020	380		Cu V	408.160	270	
Mn V	403.282	20		Fe V	406.033	200	P	K VII	408.210	50	
Na V	403.283	5	N	Fe V	406.038	50	P	Ti XI	408.25		P
Mg VI	403.315	800		Co V	406.074	170		Fe V	408.261	10	
O II	403.372	10		K VI	406.102	100	N	Fe V	408.288	10	
Cu V	403.468	120		F VI	406.12		N	V X	408.304	160	
Co V	403.526	20		Fe V	406.136	1		Mn V	408.311	250	
Mn V	403.538	80		Mn V	406.237	50		Co V	408.345	630	
Al X	403.55			Cl III	406.27	100		Mn V	408.380	70	
Mn V	403.671	50		Al X	406.31			Ni V	408.443	80	
Ca III	403.724	450		Cu IV	406.333	440		Fe V	408.453	250	
Fe V	403.739	40		Cr VII	406.369	70		Ti VIII	408.528	220	
Mn V	403.739	180		Mn V	406.402	300		Co V	408.539	320	
Fe V	403.766	5		F IX	406.443		P	Cu IV	408.571	180	
Ni V	403.781	60		Cu IV	406.447	750		Co V	408.579	600	
K VII	403.800	300		K III	406.484	300		Co V	408.595	580	
Fe V	403.803	5		Co V	406.522	210		Fe V	408.613	1	
Sc	403.84	100	N	Fe V	406.529	200		V X	408.630	70	
K IV	403.967	250		Si	406.54		N	Na IV	408.6836	650	
K VII	403.991	150		F IX	406.672		P	Co V	408.695	150	
Ne X	404.102		P	Co V	406.738	220		Cu IV	408.709	170	
V X	404.106	220		F IX	406.749		P	Mn V	408.728	120	
Co V	404.142	230		Ti VIII	406.756	40		F VIII	408.9		
Sc VIII	404.201	70		Fe V	406.759	200		Cu V	408.957	120	
Si	404.30		N	Co V	406.764	190		K III	408.959	400	
Mn V	404.311	150		Fe V	406.814	50		Co V	409.005	470	
Co V	404.314	150		Mn V	406.832	200		V IX	409.097	5	
Cu V	404.321	100		Fe V	406.834	250		Co V	409.097	140	
Mn V	404.355	300		B IV	406.84	5		Si	409.1		N
Fe V	404.402	1		K VII	406.850	20		Ar	409.12	20	N
K IV	404.412	150		Fe V	406.905	200		Ni V	409.127	20	
Co V	404.415	120		K	406.912	50	N	Cu IV	409.132	390	
Mn V	404.446	120		Cu V	406.943	250		Fe V	409.190	60	
Fe V	404.496	150		Ni IV	407.035	20	Q	Mn V	409.212	40	
Mn V	404.497	80		Fe V	407.035	50		Co V	409.241	130	
P IV	404.535	150		F II	407.041	200		Fe V	409.265	10	
Fe V	404.620	400		Fe V	407.059	80		Co V	409.301	210	
K VI	404.684	200	N	Co V	407.117	120		C III	409.325	600	
Ne X	404.692		P	Ne II	407.1376	120		Mn V	409.333	80	
Mn V	404.806	20		Cr VII	407.138	285		Fe V	409.400	150	
Fe V	404.867	100		Co V	407.164	280		Fe V	409.419	50	
Ne X	404.877		P	Mn XI	407.187		P	Ni V	409.451	80	
Ni V	404.954	20		Mn V	407.292	90		Co V	409.457	360	
Fe V	404.977	200		Co V	407.300	240		Mn V	409.489	40	
O VI	405.		ZZ	Mn V	407.333	40		Fe V	409.496	40	
Mn V	405.082	190		Fe V	407.335	40		Mn V	409.540	100	
Fe V	405.085	100		Fe V	407.415	800		Co V	409.596	390	
Fe V	405.140	150		Fe V	407.438	600		Na IV	409.6142	450	
K VI	405.178	100	N	Cl XIII	407.48			Cu V	409.620	320	
Cu V	405.226	270		Fe V	407.486	400		Fe V	409.638	50	
Cu IV	405.242	300		F II	407.503	100		O VIII	409.658		P
Ti IX	405.272	1		Cl III	407.51	10		F VIII	409.7		
K VII	405.345	100		Co V	407.521	130		Fe V	409.712	400	
Cu IV	405.377	310		Zn XXIII	407.54		F,P	K	409.737	400	N
Ar	405.42	20	N	Fe V	407.565	200		Co V	409.751	430	
V IX	405.461	1		Cu V	407.579	600		Mn V	409.797	140	
K VI	405.475	50	N	Cr IX	407.637	110		Co V	409.819	160	
Fe V	405.495	400		Fe V	407.648	10		P IV	409.827	40	
N IV	405.530		P	Fe V	407.699	10		Fe XXI	409.9		F,P
Si V	405.54		Q	Si VIII	407.7		N	O VIII	409.927		P
Fe V	405.590	80		Co V	407.723	130		Be IV	409.932		P
Mn V	405.619	180		Fe V	407.746	500		Ca III	409.954	350	
F II	405.638	100		Ca VII	407.764	40		O VIII	410.016		P
Mn V	405.646	260		Cu IV	407.819	90		P V	410.029	150	
Cu IV	405.674	550		Sc	407.85	150	N	Fe V	410.049	200	
K VI	405.675	100	N	Fe V	407.854	5		Be IV	410.064		P
Co V	405.714	320		Co V	407.912	180		Sc IV	410.080	70	

Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes
Ar	410.10	20	N	Co VI	412.74		F,P	Co V	415.528	480	
K III	410.102	400		Mn V	412.742	460		Ni IV	415.588	140	
Fe V	410.121	70		K VI	412.790	50	N	Mn V	415.620	600	
Fe V	410.204	400		Co V	412.808	500		Fe V	415.689	30	
Cu V	410.207	240	N	Cu IV	412.855	80		Fe V	415.763	10	
Co V	410.250	390		Co V	412.868	210		K V	415.793	200	
Fe V	410.278	250		Sc IV	412.868	1		K V	415.793	200	
Cu IV	410.292	270		Mn XIX	412.9		F,P	Co V	415.796	420	
Mn V	410.302	600		Cr XII	412.90		P	V XVII	415.8		F,P
Na IV	410.3715	1000		Si IV	412.939			P IV	415.805	250	
Mn V	410.377	100		Sc IV	412.968	110		Fe V	415.834	150	
Mn V	410.451	250		Cu V	413.003	130		Ar	415.86	20	N
Co V	410.455	150		Fe V	413.025	30		V VI	415.861	220	
Ca VII	410.481	110		Co VI	413.04		F,P	Co V	415.882	140	
Fe V	410.483	250		Co V	413.044	80		Fe V	415.906	5	
Ni V	410.495	180		Cu V	413.073	20	N	Co	415.94	10	N
Na IV	410.5411	285		Cr VIII	413.112	650		Sc IV	415.968	220	
Co V	410.594	200		Cu IV	413.144	80		Mn V	415.976	650	
Mn V	410.598	600		Fe V	413.162	50		Fe V	415.977	150	
Co VI	410.65		F,P	Mn V	413.235	50		Mn V	415.991	250	
Co V	410.666	470		Co V	413.272	320		K III	416.001	300	
Sc X	410.89			O V	413.296	25		Fe V	416.037	150	
Co V	410.900	340		Ni V	413.321	220		Sc IX	416.041	70	
Cr XII	410.91			Ge V	413.33		F,P	Co V	416.078	110	
Co VI	410.96		F,P	Ni IV	413.331	240		Ne V	416.20	800	
Mn V	410.980	480		Mn V	413.382	180		Fe V	416.205	50	P
N III	411.056	350		Cu IV	413.447	410		Co V	416.211	390	
Ge XXV	411.08		F,P	Co VI	413.46		F,P	Fe V	416.218	150	P
Co V	411.088	160		Co V	413.517	360		Fe V	416.253	50	
V XII	411.12			Ca I	413.542		A,Z	Co V	416.373	120	
Na VIII	411.145	100		N III	413.681	450		V VI	416.418	70	
Cl III	411.16	300		Mn V	413.751	460		Mn XIV	416.42		
N III	411.173	200	Z	K III	413.792	500		Sc IV	416.440	70	
N III	411.243	200	Z	N III	413.797	450		Fe V	416.444	200	
Mn V	411.319	400		Sc IV	413.948	5		Co V	416.447	120	
Na IV	411.3343	450		Cu XXIV	414.1		F	K VI	416.509	50	N
N III	411.361	400	Z	Co V	414.220	90		Fe V	416.568	60	
Cl III	411.37	400		V VI	414.273	160		Co V	416.620	110	
Cu IV	411.469	160		Mn V	414.326	10		K VIII	416.654	5	
Fe V	411.549	600		Ni V	414.344	20		Fe V	416.655	300	
Mn V	411.577	320		Na VI	414.370	200		Cr X	416.690	110	
Cu IV	411.599	340		K V	414.465	150		Fe V	416.717	125	
Kr	411.65	10	N	Co	414.52	50	N	C III	416.769	500	
Cr X	411.655	70		Cr VII	414.582	160		Mn V	416.810	70	
Fe V	411.665	10		Cr IX	414.602	110		Ne V	416.82	250	
Ca X	411.695	250		P IV	414.604	120		Fe V	416.839	100	P
C III	411.697	10	Z	O V	414.612	3		Fe V	416.846	200	P
Cu IV	411.700	130		Ca VII	414.648	70		Sc IV	416.863	20	
Fe V	411.739	100		Co V	414.745	520		Fe V	416.864	100	
Co V	411.755	110		Co VI	414.78		F,P	Fe V	416.925	250	
Mn V	411.788	100		Fe V	414.787	125		Fe V	416.944	100	
Cl III	411.81	400		K III	414.870	300		Fe V	417.064	200	
B III	411.810	300		Cu IV	414.933	110		Ar	417.12	10	N
Mn V	411.883	80		Mn V	414.934	140		Mn V	417.137	5	
Mn V	411.924	120		Co V	414.977	300		Fe V	417.194	5	
C III	411.9577	300		P IV	414.999	200		Sc IV	417.195	20	
Cr XIV	411.99	200		Fe V	415.013	300		Fe XV	417.24	14	
K V	412.080	300	N	Ti XI	415.02		P	Fe V	417.241	200	
Mn V	412.131	120		Co V	415.050	660		K IV	417.280	150	
Si IV	412.155			K V	415.052	250		Fe V	417.391	700	
Ca VII	412.175	100	N	Si V	415.15		Q	Co V	417.449	480	
Ni XXII	412.2		F,P	Mn V	415.194	80		Sc IX	417.46		
Na IV	412.2418	750		Cl III	415.20	100		Fe V	417.520	40	P
K III	412.289	250		Co VI	415.20		F,P	Fe V	417.534	40	P
Ni IV	412.460	60		Mn V	415.207	250		K III	417.535	300	
Sc IV	412.468	5		Co V	415.238	480		Ni IV	417.547	110	
P IV	412.521	90		Kr	415.28	10	N	Na VI	417.595	600	
Mn V	412.528	250		K	415.289	20	N	S XIV	417.61	300	P
Mn V	412.555	80		Cl III	415.33	100		Cu IV	417.613	20	
Fe V	412.577	20		Mn V	415.354	50		Mn V	417.827	30	
Co	412.59	100	N	K V	415.465	150		P IV	417.828	4	
Cr XI	412.629	5		Co V	415.476	140		F II	417.872	10	Z
Mn XI	412.667		P	Cl XV	415.50			Ti XI	417.88		P
Zn IV	412.671	3		Cu IV	415.503	120		Co V	417.928	390	
Fe V	412.693	50		Na VI	415.505	400		V VI	418.041	1	

Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes
Fe V	418.045	700		F IV	420.729	1000		Fe V	423.494	70	
Co V	418.050	160		N IV	420.769	500		Mn V	423.504	250	
Mn V	418.113	10		Sc IV	420.807	160		Zn IV	423.533	5	
K VI	418.160	100	N	K VI	420.807	200	N	K	423.558	50	N
Co V	418.164	160		Mn V	420.834	110		Cr VI	423.559	0	
Kr	418.22	20	N	Fe V	420.892	200		Mn V	423.644	10	
Ni V	418.237	70		Mn V	420.905	200		Ti VIII	423.649	40	
Cr IX	418.290	160		Ne V	420.94	150		Fe V	423.700	100	P
K VIII	418.456	20		V VI	420.940	1		Ni IV	423.713	80	
Co V	418.457	270		Ni XVII	420.96		P	Fe V	423.714	150	P
Fe V	418.472	500		Zn III	421.035	3		Ni IV	423.765	80	N
K VIII	418.582	5		Fe V	421.055	700		Ge V	423.79		F,P
O II	418.598	50		Cr IX	421.057	110		Mn V	423.795	80	
C III	418.609	200		Fe V	421.124	200		Ni IV	423.806	60	N
K III	418.623	300		Sc IX	421.18			Si III	423.817		
B IV	418.66	285		Fe V	421.188	250		Na VI	423.821	200	
Ni IV	418.703	90	Q	Fe V	421.240	70		K	423.821	50	N
Ni V	418.704	120		Mn V	421.268	10		Fe V	423.835	150	
N III	418.712	650		Sc IV	421.324	40		Co V	423.882	370	
Ni IV	418.785	230		Mn V	421.408	10		Ni IV	423.921	60	N
Cu IV	418.797	210		Al VI	421.46	5		Mn V	423.937	20	
Sc IV	418.811	110		Na VI	421.465	100		Ar XV	424.01	120	
O II	418.812	10		Co V	421.476	170		Mn XXIV	424.09		P
Na VI	418.828	30	N	Ni IV	421.543	120	N	Mn V	424.105	30	
Fe V	418.862	250		Ni V	421.547	120		Co V	424.105	380	
Ni IV	418.866	180		Ni IV	421.608	50		Ni IV	424.122	40	N
N III	418.919	500		Ne IV	421.609	750		Cr IX	424.146	70	
Cr IX	418.925	70		Fe V	421.622	30		Ni IV	424.158	100	
Co V	418.973	140		Fe V	421.697	200		Ti IV	424.160	6	
Co V	419.028	220		Cl III	421.77	300		Co V	424.167	330	
K V	419.045	100		Co V	421.770	240		Ti IV	424.172		P
Fe V	419.082	80		Fe V	421.777	500		P IV	424.235	200	F,P
Cr VII	419.104	110		Fe V	421.842	150		Fe XIX	424.26		F,P
Ni IV	419.198	60		Kr	421.85	10	N	Ni V	424.273	20	
Cr	419.2		N	Li III	421.854		P	Ca IX	424.34		
Fe V	419.291	150		Li III	421.903		P	Fe V	424.354	20	
K V	419.310	100		Co V	421.937	410		Ni IV	424.405	490	
V VI	419.458	285		Cl III	421.99	300		Co V	424.450	760	
Cl XIII	419.46			Mn V	422.006	100		Co V	424.561	210	
Ti XI	419.46		P	F II	422.013	40		O II	424.577	10	
Fe V	419.487	150		Sc IV	422.027	110		Ni IV	424.583	120	
Sc IV	419.524	160		Cr XI	422.083	20		Fe V	424.587	100	
C IV	419.525	650		Ga IV	422.102	600		N V	424.61	35	
K	419.539	20	N	K V	422.178	400		Co V	424.706	400	
Co V	419.641	290		Ne V	422.21	150		Fe V	424.741	200	
F IV	419.645	800		Mn V	422.233	50		N V	424.75	40	
C IV	419.714	700		Fe V	422.277	300		V V	424.782	10	
K V	419.731	50		Cr XI	422.282	5		Mn V	424.859	180	
Ca X	419.754	360		Fe V	422.306	500		N IV	424.864		F,P
Fe V	419.782	40		Ne V	422.34	50		Fe V	424.914	40	
Mn V	419.802	350		K VIII	422.414	70		P IV	424.983	10	
Zn III	419.807	1		Mn V	422.492	230		Ca V	425.000	750	
K	419.823	20	N	Sc IV	422.507	20		Fe V	425.000	70	
Mn XXIV	419.90		P	Ni V	422.510	50		Ni IV	425.148	100	
Fe V	419.924	200		F II	422.623	10		Co V	425.155	350	
Co V	419.98		F,P	Sc IV	422.626	40		K V	425.159	300	
Sc IV	419.999	110		K VIII	422.643	5		Ni IV	425.197	20	N
Ca XV	420.		P	Cl III	422.71	100		O II	425.273	10	
Cu XXII	420.0		F	Ni IV	422.747	250		Kr	425.28	10	N
Co V	420.013	290		V XIII	422.785		P	C II	425.326	10	N
F IV	420.045	900		Sc X	422.850	400		Co V	425.357	680	
Sc IV	420.121	70		F II	422.884	1		Co V	425.419	440	
Co V	420.152	410		Ni IV	422.924	60	Q	Fe V	425.491	150	
Ca VII	420.191	50	N	Co V	423.144	250		Na VII	425.493	100	Q
Co V	420.317	110		Ga IV	423.165	1000		Sc IV	425.520	70	
V VI	420.370	110		Fe V	423.168	90		K V	425.588	500	
Ne V	420.39	100		Fe V	423.229	300		Ni IV	425.593	40	
Ni V	420.456	50		Fe V	423.286	10		Fe V	425.595	125	
Ca X	420.473	90		Co V	423.348	120		Mn XIV	425.6		P
Fe V	420.475	100		K	423.371	50	N	Mn V	425.620	30	
Cr VI	420.499	0		Zn IV	423.424	0		Fe V	425.689	1	
Sc IV	420.504	110		Mn V	423.428	300		Mn V	425.695	20	
Fe V	420.559	300		C III	423.438			Ti XI	425.74		
V XVI	420.69		F,P	Ar IV	423.48	10	Q	Ni IV	425.782	380	
Co V	420.721	200		Ti IV	423.487	6		Zn III	425.799	15	



Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes
Co V	425.799	20		Ni IV	429.017	40	N	Ca VIII	432.869	285	
Fe V	425.840	50	Q	Mn V	429.047	500		Ni IV	432.880	410	
Zn IV	425.891	40		Fe V	429.077	40		Ni IV	432.912	200	
Co V	425.919	280		Mg VII	429.134	100		Fe V	432.935	150	
Li III	426.017		P	Fe V	429.223	5		Mn V	432.947	130	
Fe V	426.056	500		V XI	429.232	70		Fe V	432.988	5	
Li III	426.067		P	Mn XIV	429.24			V XVIII	433.		F,P
Fe V	426.108	500		Sc IV	429.281	20		Cu IV	433.040	170	
Fe V	426.229	100		Zn IV	429.299	25		Ti IV	433.042		P
Ni IV	426.230	110		Fe V	429.353	5		P V	433.056	80	
Sc IX	426.256	70		K VI	429.438	100	N	Cr V	433.119	20	
Ti VIII	426.258	160		P IV	429.475	10		P V	433.173	50	
Co V	426.262	350		F III	429.512	250		Ne VI	433.176	400	
K VI	426.338	100	N	Mn V	429.554	20		Ti V	433.202	0	
Fe V	426.364	70		O II	429.557	100		Ne IV	433.24	250	
Co V	426.389	250		Fe V	429.573	150		Mn V	433.256	120	
Mn V	426.410	20		Fe V	429.609	125		Mn V	433.298	80	
Co V	426.517	490		Ti XI	429.64		P	C III	433.3391	800	
O II	426.526	50		O II	429.647	250		Ni IV	433.345	260	
Mn V	426.594	200		O II	429.716	200		Mn V	433.543	400	
Mn XX	426.6		F,P	Ni IV	429.775	150		Ti IX	433.567	5	
Fe V	426.614	80		Ar	429.80	10	N	Ca VII	433.598	160	
Si III	426.644			O II	429.918	250		Mn V	433.599	120	
Fe V	426.663	5		Ne VI	429.95		P	Fe V	433.610	70	
Cu IV	426.665	260		Mn V	429.984	100		Fe V	433.629	30	
Sc IV	426.685	70		O II	430.041	300		Ti IV	433.635		P
Fe V	426.740	150		Fe V	430.042	50		Cl III	433.66	10	
Co V	426.811	400		Fe V	430.103	70		Co V	433.728	50	
Fe V	426.829	300		Mn V	430.105	10		Sc IV	433.749	1	
Sc IX	426.86			Kr VII	430.15	50		Ti IV	433.760		P
Ni IV	426.924	70		F III	430.152	300		Cl III	433.77	10	
Fe V	426.974	350		O II	430.177	300		P IV	433.838	4	
Si IX	427.06		P	Si IX	430.22		P	Fe V	433.872	150	
Fe V	427.115	10		F III	430.222	150		N III	433.911	300	
Fe V	427.135	80		Mg VIII	430.467	10		N IV	433.930		P
Fe V	427.201	250		Zn IV	430.586	15		V IX	433.930	285	
Ni IV	427.308	50		Fe V	430.640	150		N IV	434.000		P
Fe V	427.343	30		Cr VIII	430.713	450		N III	434.014	260	
Sc XX	427.35		P	N V	430.714		P	N III	434.066	650	
Ni IV	427.372	170		Sc IV	430.74	150		N IV	434.067		P
Fe V	427.453	200		F IV	430.759	900		N IV	434.097		P
Co V	427.492	270		Fe V	430.792	1		N III	434.129	150	
Fe V	427.498	1		N V	430.857		P	Cr V	434.180	5	
Ar I	427.5		A,Z	K	430.895	20	N	Mn V	434.210	260	
Cr X	427.551	220		F II	430.914	300		N IV	434.235		P
Ca	427.655	50	N	K	430.968	20	N	N III	434.246	260	
Mn V	427.668	40		Ni IV	430.994	60		O III	434.256	200	
B IV	427.70	5		Ar I	431.0		A,Z	Kr VII	434.28	100	
Fe V	427.772	710		Fe V	431.116	2		N III	434.280	300	
Fe V	427.804	30		Cr XI	431.154	20		N IV	434.302		P
Ne III	427.84	300		Mg VII	431.318	200		Cr V	434.306	220	
Ge XXVI	427.9		F	Ne IV	431.47	125		Sc IV	434.395	110	
Fe V	427.924	150		Zn IV	431.535	15		Zn IV	434.407	0	
Fe V	427.987	70		Fe V	431.538	150		Mn V	434.412	50	
Co V	428.065	160		F II	431.552	200		Fe V	434.418	300	
Ca VIII	428.094	285		Fe V	431.580	125		Ni IV	434.461	140	
Fe V	428.138	30		Zn IV	431.613	25		Fe V	434.499	70	
N III	428.180	600		K III	431.622	50	Q	Ca IV	434.570	600	
Fe V	428.218	1		Fe V	431.666	100		Mn V	434.580	150	
N III	428.244	400		Fe V	431.759	5		B III	434.627	100	
Mg VIII	428.27			Sc IV	431.780	110		O III	434.646	150	
Fe V	428.290	70		Sc	431.82	50	N	Fe V	434.658	200	
K VI	428.315	100	N	F II	431.832	100		Fe V	434.686	250	
Ni IV	428.420	230		Li III	431.977		P	Mg VII	434.710	10	
K VI	428.538	250		Mn V	431.978	60		K III	434.722	750	Q
Fe V	428.540	5		Li III	432.029		P	Cu XXIII	434.8		F
Zn IV	428.541	30		Al IX	432.03			P IV	434.817	10	
Mn V	428.594	600		Fe V	432.341	125		O III	434.840	100	
Kr	428.75	10	N	Fe V	432.363	100		Mn V	434.887	50	
Fe V	428.752	200		Cr IX	432.440	70		Mg VII	434.923	200	
Zn IV	428.788	10		Fe V	432.483	125		Ni IV	434.938	60	
Ar I	428.8		A,Z	Kr	432.51	40	N	O III	434.975	500	
Ca VII	428.819	50	N	Al IX	432.66			Ti XI	434.99		P
Fe V	428.898	150		F VII	432.81		P	Ar I	435.0		A,Z
Co V	429.014	50		Mn V	432.827	50		Kr VIII	435.01	60	

Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes
Zn IV	435.023	5		Ga XXIII	437.79		F, P	Fe V	440.400	10	
Mn V	435.073	140		Cl IV	437.83	400		Ne VI	440.404	100	
Cr V	435.143	110		Si IV	437.849			K III	440.429	750	N
Mn V	435.299	100		K V	438.023	250		Fe V	440.479	250	
Fe V	435.374	125		Al IX	438.09			O II	440.552	150	
Mn V	435.602	140		Co V	438.156	130		Al XIII	440.587		P
Fe V	435.623	1		Ni IV	438.185	80	N	P III	440.590	10	
F II	435.636	200		S V	438.19	100		O II	440.598	100	
Cr V	435.636	110		O V	438.197	1		Ne VI	440.60	10	
Ne VI	435.649	400		Co V	438.211	280		Ti VIII	440.687	20	
Mn V	435.669	600		Cu IV	438.270	310		Kr	440.88	40	N
K III	435.676	500	Q	Sc IV	438.477	40		Al XIII	440.894		P
V IX	435.699	360		Co V	438.494	380		K IV	440.905	100	N
Co V	435.719	160		Fe V	438.516	3		Ar	440.91	30	N
Zn IV	435.762	20		Cr V	438.593	100	P	Li III	440.976		P
Mg VI	436.06		P	Kr	438.61	10	N	F VII	441.0		
Mn V	436.104	250		Fe V	438.618	50		Mn V	441.025	80	
Ca VIII	436.141	450		Cr V	438.633	130	P	Li III	441.029		P
Sc IV	436.144	110		Cr V	438.637	220	P	Cr V	441.056	110	
Mn V	436.162	350		Ar	438.64	10	N	P VI	441.08	1	
Mn V	436.179	500		K V	438.647	100		Ca VIII	441.089	285	
Sc	436.20	50	N	Sc IV	438.660	20		Si IX	441.13		P
Zn IV	436.248	15		Mg IX	438.69			Zn IV	441.146	15	
Mn V	436.253	60		Si IV	438.734			Sc IV	441.185	220	
F II	436.281	100		Mn V	438.737	450		Sc VIII	441.194	110	
Co V	436.330	170		Sc IV	438.789	360		Mg IX	441.20		
Cr V	436.351	70		C II	438.824		Z	Mg VI	441.22		
Zn IV	436.381	8		Fe V	438.865	80		Mg VIII	441.30		
Mn V	436.472	10		C II	438.897	100	Z	K VIII	441.370	150	
Co V	436.508	260		P IV	438.906	1		K VIII	441.379	70	
O II	436.510	50		Ca IV	438.930	200		Cl III	441.40	300	
P VI	436.53	3		Cu IV	438.935	470		Sc IV	441.494	220	
F II	436.565	40		Sc IV	438.972	110		Kr	441.52	40	N
O II	436.649	10		Si IX	439.04		P	N VII	441.538		P
Ar V	436.67	120		K VI	439.047	150	N	Zn IV	441.543	8	
Mn V	436.670	110		Co V	439.047	260		Cr VII	441.584	70	
Fe V	436.697	20		Co V	439.085	330		Ge IV	441.6	20	P
Mg VIII	436.726	100		Mg IX	439.180	10		Cr VII	441.680	20	
Ar XII	436.8		P	Fe V	439.225	300		Zn IV	441.693	20	
Zn IV	436.812	10		Cl IV	439.26	300		Sc	441.72	200	N
Co V	436.834	510		Ni IV	439.261	150		Mn V	441.722	1000	
Ti V	436.839	0		Sc	439.28	150	N	N VII	441.729		P
N V	436.85	60		Ti IX	439.302	20		Mg VIII	441.76		
Fe V	436.851	30		V VI	439.344	450		N VII	441.792		P
Mn V	436.867	90		Mn V	439.354	350		Fe V	441.799	200	
C V	436.94		P	Fe V	439.469	5		K II	441.812	250	N
Na VI	436.946	10	Q	P III	439.509	4		Ar	441.83	30	N
V IX	437.005	5		Ti IX	439.513	40		O II	442.001	200	
Cr XIII	437.05			O V	439.517	15		O II	442.048	200	
C II	437.102	100	N	Co V	439.523	60		Cr V	442.243	20	
Sc IV	437.160	1		Fe V	439.574	70		Sc IV	442.261	160	
Co V	437.161	220		Al XIII	439.585		P	Cu IV	442.283	90	
Fe V	437.200	100		Cu IV	439.604	350		Sc	442.30	50	N
K III	437.216	150	N	S V	439.65	100		K IV	442.300	200	
Co V	437.247	100		Co V	439.658	270		Kr	442.33	50	N
Si III	437.255			Ca III	439.691	250		Cr XVIII	442.34		F, P
B V	437.256		P	Ti IX	439.745	40		Zn IV	442.381	40	
Ca IV	437.271	100		Ge IV	439.8	20	P	Mn V	442.493	850	
O II	437.332	150		Mg VI	439.82			K IV	442.518	100	
C V	437.37		P	Sc IV	439.856	5		Ni IV	442.552	100	
B V	437.372		P	Mn V	439.886	20		Ca	442.607	50	N
B V	437.413		P	Co V	439.899	340		O IV	442.705	2	
Co V	437.415	580		Ga IV	439.904	300		Cu IV	442.752	150	
Cr V	437.420	70		Ar	439.96	40	N	O IV	442.873	1	
Al IX	437.46			O VI	440.		ZZ	K III	442.913	150	N
S V	437.48	100	P	Ca	440.118	100	N	Si VI	442.94	60	N
Fe V	437.538	150		Cr VII	440.121	1		Cl III	442.95	200	
Co V	437.639	280		Fe V	440.213	20		O VI	443.		ZZ
Cr V	437.655	40		Cr VII	440.244	285		Cr X	443.062	1	
Cu IV	437.671	110		Cl IV	440.25	200		Ar I	443.1		A, Z
O II	437.683	150		Na VI	440.266	300	N	Cu IV	443.247	590	
Co V	437.690	110		Kr	440.27	80	N	Mg IX	443.40		
Cu IV	437.696	110		Sc XI	440.29	50	Q	Ar IV	443.40	80	
Mn V	437.746	50		Ti VII	440.361	200		V XIII	443.429		P
Ca IV	437.773	250		Mn V	440.368	20		Ti IX	443.512	450	

Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes
K IV	443.567	300		Fe V	446.295	80		Ti V	449.063	30	
V VI	443.601	1		Cu IV	446.369	670		Ar V	449.065	900	
O II	443.681	10		Mn V	446.396	60		P VI	449.08	20	
Cu IV	443.681	690		Cu IV	446.431	540		Kr VIII	449.12	120	
Fe V	443.690	5		F VI	446.49		P	V VI	449.129	1	
P IV	443.803	200		Ti V	446.493	4		Zn IV	449.131	1	
Si VI	443.81	20	N	Fe IV	446.569	4		Ni IV	449.238	20	
Ca IV	443.821	750		Zn IV	446.582	40		Sc X	449.27		P
Mn V	443.829	250		Ne II	446.5901	250		Ni IV	449.273	160	
Kr	443.88	60	N	Cr V	446.672	5		Mn V	449.278	220	
Cu IV	443.954	30		Ti XI	446.69			Mn V	449.333	70	
Mg IX	443.981	10		Kr VII	446.76	80		Fe V	449.347	100	
F VII	444.0			Fe V	446.762	40		Cr VII	449.386	110	
Mn V	444.109	150		Ni IV	446.778	610		P III	449.462	10	
S XII	444.16			K	446.830	250	N	Ar V	449.49	200	
Ni IV	444.178	190		K IV	446.830	250	Q	Ti V	449.541	2	
Ni IV	444.208	570		Fe V	446.846	150		N III	449.559	450	
Cu IV	444.214	450		K IV	446.926	100		Mn V	449.615	80	
P IV	444.245	1		Ar V	446.949	400		V VIII	449.629	285	
Ca	444.254	50	N	Ar XII	447.0		P	Ti VIII	449.633	5	
Sc IV	444.268	1		Cu IV	447.007	770		Cu IV	449.641	120	
Mn V	444.324	30		Ni IV	447.029	180		K V	449.708	200	
K III	444.344	750		K V	447.085	150	N	Cr XIII	449.76		
Zn IV	444.383	60		Fe V	447.119	80		V VI	449.795	285	
Co V	444.392	140		Cu IV	447.182	40		Mn V	449.908	30	
Zn IV	444.455	30		Sc IV	447.194	5		Zn IV	449.970	40	
F VI	444.47		Q	O V	447.226	15		Mn V	449.989	120	
Sc IV	444.624	70		P VI	447.351	50		Zn XXVI	450.0		F, P
V VI	444.634	360		O V	447.356	25		Ni IV	450.017	180	
Ti V	444.643	12		Cu IV	447.373	230		Cu IV	450.025	750	
Na VI	444.686	20	N	Mn XIV	447.4		P	N V	450.072	50	P
Mn V	444.692	200		Cu IV	447.467	40		Ar V	450.08	50	
Fe V	444.701	300		Ti IX	447.484	160		N V	450.105	30	P
Cu IV	444.746	400		Mn V	447.509	280		Ni IV	450.183	120	
Ni IV	444.747	540		Ni IV	447.523	460		Kr VI	450.20	200	
Ca IV	444.766	150	N	Cr X	447.529	20		Cr VII	450.314	20	
Cu IV	444.999	780		Ar V	447.53	200		Fe V	450.350	30	
Ca IV	445.018	50		Sc VII	447.560	160		Ti V	450.397	50	
Sc IV	445.021	5		Mn V	447.587	300		Ar XII	450.44	80	Q
Ne II	445.0397	200		Ca VII	447.678	5		P IV	450.448	10	
Na V	445.046	500		Ti IX	447.701	5		Co V	450.532	170	
Mg VI	445.06		P	O VI	447.712	10		Ca IV	450.565	500	
P IV	445.158	300		Kr	447.77	20	N	P III	450.596	25	
Na V	445.190	600		Fe V	447.781	5		P VI	450.67	2	
Kr VII	445.33	150		Cr VII	447.792	40		Mg VII	450.69		
Fe V	445.334	150		Ne II	447.8150	180		C III	450.7338	800	
Fe V	445.368	200		O VI	447.840	10		Fe V	450.795	60	
Cu IV	445.392	440		Zn IV	447.850	8		P VI	450.900	100	
Fe V	445.438	300		V XI	447.881	1		Cu IV	450.934	190	
Sc VI	445.493	20		Cr VII	447.882	40		Zn IV	450.985	50	
Fe V	445.588	5		Mn V	447.942	140		Ni IV	451.009	30	
O II	445.601	200		Fe V	447.959	250		Mn V	451.066	250	
K IV	445.607	200		Cu IV	448.039	410		K	451.078	50	N
Cu IV	445.610	290		Ni IV	448.079	180		Cr V	451.141	5	
O II	445.638	200		Fe V	448.212	5		Cu IV	451.160	820	
Mn V	445.697	50		Mn V	448.267	240		Ar IV	451.20	15	
Sc IV	445.745	40		N III	448.285	350	Z	K VI	451.320	100	N
Cr V	445.751	20		Fe V	448.286	20		Ni IV	451.363	20	
S XIV	445.77	300	P	Mg IX	448.29			Mn V	451.379	50	
P IV	445.810	4		Cr XIII	448.31		P	Ti V	451.429	0	
Mn V	445.824	150		N III	448.384	400	Z	Mn V	451.483	70	
K V	445.878	50	N	Cu IV	448.429	750		Ni IV	451.500	210	N
Ca V	445.933	50	N	P IV	448.466	1		Cr V	451.607	5	
Mg IX	445.97			N III	448.549	450	Z	Zn IV	451.624	10	
Ar V	445.997	250		K III	448.595	750		Ni IV	451.690	40	Q
K VI	446.009	200	N	Kr	448.61	120	N	Fe V	451.734	50	
Ca V	446.036	50	N	Cr VII	448.729	110		Fe V	451.810	200	
Fe V	446.042	300		Ni IV	448.779	70		Ne VI	451.843	200	
Ca I	446.101		A, Z	Ni IV	448.821	20		N III	451.869	450	
P IV	446.121	1		Ti V	448.822	30		Ar IV	451.87	45	
Mn V	446.147	150		P VI	448.850	80		V VI	451.890	220	
Ne II	446.2556	300		P VI	448.928	60		K XIV	452.		P
Cu IV	446.262	410		O VI	449.		ZZ	V IX	452.132	110	
V XI	446.265	110		K V	449.013	150		Co V	452.134	200	
Ni IV	446.281	120		K VI	449.021	1		Ni V	452.157	50	

Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes
Si VI	452.17	100	N	Al V	456.08	15		O II	458.422	10	
Cu IV	452.202	560		Cu IV	456.080	250		Mn V	458.425	30	
Ni IV	452.212	40		Ti XVI	456.1		F, P	Cu IV	458.425	480	
N III	452.226	900		V VIII	456.134	220		V VI	458.487	40	
K V	452.227	100		Cr V	456.272	110		K	458.535	20	N
Ni IV	452.464	200	N	Ne II	456.2749	10		Kr	458.61	60	N
Fe V	452.474	60		V VII	456.284	650		Cu IV	458.715	700	
Cu IV	452.502	570		K V	456.328	400		B III	458.72	100	
V X	452.522	5		K IV	456.328	400		Fe IV	458.746	30	
P VI	452.59	30		Ne II	456.3483	120		Ti V	458.861	12	
Cu IV	452.656	890		Cr V	456.357	70		Fe IV	458.935	30	
V VI	452.660	40		Ni IV	456.361	60		Fe IV	458.949	50	
K VI	452.667	1		Ar VI	456.38	120		Ar V	458.98	100	
Ni IV	452.714	30		Ni IV	456.419	190		K V	459.005	150	N
Sc VII	452.734	70		P VI	456.430	300		Cu IV	459.050	220	
Ne VI	452.745	300		Mn V	456.520	20		Fe V	459.135	20	
Mn V	452.760	150		S XII	456.55			Ni IV	459.164	260	
Se VI	452.8	30		Kr IV	456.56	30	Q	K IX	459.317	160	
Zn IV	452.803	50		Cl VII	456.56	50		Ar VI	459.32	400	
P VI	452.835	10		Cr V	456.637	70		Fe V	459.338	150	
Mn V	452.846	50		Mn V	456.637	30		P VI	459.347	100	
Fe V	452.864	10		Ca I	456.640		A, Z	Sc X	459.45		P
K V	452.900	200		Zn IV	456.671	35		C III	459.462	900	
Ar IV	452.91	80		Al V	456.73	8		Cu IV	459.514	690	
Ti V	453.006	80		Cu IV	456.734	390		C III	459.521	950	
Kr	453.06	80	N	Cr V	456.743	40		Ar VI	459.60	100	
Cu IV	453.127	710		Sc	456.83	50	N	C III	459.633	1000	
Cr VII	453.183	110		P III	456.844	40		V VIII	459.647	5	
Ni IV	453.227	80		Mn V	456.876	90		Cu IV	459.680	220	
N II	453.257	20		Ne II	456.8962	90		Ar V	459.73	50	
N II	453.340	100		Ni IV	456.913	50		Cu IV	459.757	40	
Cu IV	453.417	910		Ca IV	456.981	250		V VIII	459.799	450	
Cu IV	453.441	910		O II	456.997	50		Ca	459.811	50	N
N II	453.624		P	Br XXVIII	457.0		F, P	Cu IV	459.885	790	
P IV	453.707	40		Al V	457.00	10		Na V	459.897	600	
N II	453.793		P	Fe V	457.001	250		C III	460.0487	800	
K	453.882	20	N	Cu IV	457.005	240		Ar VI	460.06	40	
Mn V	454.013	110		Ar VI	457.01	200		Ar VI	460.20	40	
Ne VI	454.072	300		V IX	457.010	220		N IV	460.217		P
Si IV	454.112			Cr V	457.028	160		N IV	460.272		P
Sc VII	454.125	220		Kr V	457.13	50	Q	Mn V	460.332	20	
Mn V	454.132	30		Cl III	457.17	300		N IV	460.394		P
Co V	454.157	240		F II	457.179	600		K VI	460.440	70	
Kr VIII	454.3		P	Cl III	457.24	200		Cu IV	460.653	590	
Fe V	454.360	5		Ni IV	457.293	120		Si V	460.68	1	
Ni IV	454.432	70		Zn IV	457.315	50		Ne II	460.7284	1000	
Mn V	454.459	30		Ti V	457.321	4		Ti XII	460.741	230	
P VI	454.537	20		K VI	457.323	50	N	Fe IV	460.999	12	
Ca IV	454.553	50		Si VI	457.42	30	N	Ni IV	461.010	210	
Fe V	454.648	70		K VI	457.427	20	N	Na V	461.051	850	
Ne II	454.6535	150		Cl III	457.44	10		V X	461.059	40	
Cu IV	454.702	150		Ar VI	457.48	800		Ni IV	461.061	110	
Ar	454.76	20	N	P VI	457.498	60		Ni IV	461.082	120	Q
Cu IV	454.796	720		Cr V	457.504	70		F IX	461.084		P
Ge XXVII	454.8		F	Mn XVIII	457.7		F, P	Ca IV	461.085	250	
Cl XIV	454.84		P	Fe V	457.736	5		Cu IV	461.116	350	
Mn V	454.954	40		Cu IV	457.760	500		C II	461.120	100	Z
Cu IV	454.981	150		Si IV	457.818	250		Sc IV	461.184	5	
Si IV	455.065			Ni IV	457.850	350		Cu IV	461.229	70	
Kr	455.15	20	N	P III	458.016	60		Ar V	461.23	300	
Fe V	455.220	70		Ar VI	458.04	40		Ar VI	461.23	300	
Sc X	455.26		P	K VI	458.045	20		V X	461.245	1	
Cl VII	455.27	100		Ar IV	458.1			Si VI	461.30	200	N
Ne II	455.2738	200		Cu XXII	458.1		F, P	Cu IV	461.324	690	
Ca IX	455.34			Cu IV	458.101	550		F IX	461.370		P
Ti V	455.419	4		Ar V	458.12	150		Ti V	461.414	150	
P IV	455.466	4		Sc X	458.13	40	P	F IX	461.466		P
C III	455.5	0		Si IV	458.155	200		Fe IV	461.492	12	
Li III	455.598		P	Fe V	458.158	300		Cr XIII	461.60		
Li III	455.655		P	Fe IV	458.172	80		Ni V	461.69		F, P
P XIII	455.67	10		Fe V	458.251	20		Ca VIII	461.711	220	
K V	455.670	250		Cu IV	458.306	380		K VI	461.737	150	N
Cu IV	455.780	360		Fe IV	458.307	1		Ni IV	461.764	60	N
Ar VI	455.81	80		Ni IV	458.356	170		Sc IV	461.817	40	
N III	456.077	600		Cl XIV	458.39			Ni IV	461.832	80	

Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes
P IV	461.834	1		Ni IV	464.423	160		C II	466.547	10	Z
Ar VI	461.90	40		Ne X	464.445		P	N II	466.558		P
Ni IV	461.907	150		Ni V	464.47		F, P	Ni IV	466.572	220	
Kr	461.91	100	N	Ni IV	464.483	80		Cu IV	466.595	380	
Sc	461.91	50	N	Ti V	464.562	80		Na VI	466.640	20	Q
Si V	461.97	3		Cu IV	464.645	810		Co VI	466.72		F, P
Ar VI	462.007	1000		S VI	464.68	1000		N II	466.728		P
Ni IV	462.009	340		O II	464.785	150		N II	466.737		P
P IV	462.050	1		Se VI	464.8	30		Ti V	466.749	4	
Ni IV	462.058	120		Cu IV	464.828	840		K III	466.793	750	
Cr XIX	462.07		F, P	Cl IV	464.86	400		Cu IV	466.817	50	
V VIII	462.112	160		Ne X	464.869		P	Ar V	466.82	60	
Ar VI	462.15	160		Ni V	464.89		F, P	N II	466.834		P
P IV	462.185	10		Cu IV	464.985	110		K IX	466.835	250	
Cu IV	462.267	40		Ne X	465.006		P	P VI	466.864	120	
Si VI	462.29	20	Q	Sc X	465.01			Co VI	466.87		F, P
Kr	462.35	120	N	Ar	465.02	150	N	Zn IV	466.924	60	
Mn VII	462.363	150		K II	465.078	50		Ar VI	466.93	160	
Cu IV	462.372	150		Kr V	465.11	10		N II	466.934		P
Ne II	462.3908	500		F III	465.113	250		Sc IV	466.964	40	
Ar V	462.42	150		Cu IV	465.186	320		F V	466.994	400	
Cu IV	462.548	610		Ne VII	465.221	700		N II	467.013		P
Ni V	462.56		F, P	Ni V	465.24		F, P	Ni IV	467.061	560	
Ti V	462.565	30		Kr VI	465.27	400		P VI	467.098	150	
Sc IV	462.570	160		Ni IV	465.307	440		Cu IV	467.108	700	
Ca VIII	462.591	50		Fe V	465.309	50		V IX	467.143	450	
Sc	462.61	200	N	Fe V	465.319	70		Cl IV	467.19	300	
P IV	462.625	4		Cl IV	465.35	300		P III	467.255	60	
Cu IV	462.713	220		F V	465.374	500		Kr V	467.26	10	
Kr V	462.79	50		P VI	465.376	200		Cu IV	467.286	430	
Kr III	462.79	150	Q	Ni XXIII	465.4		F	Mn V	467.319	400	
Ar XIII	462.8		P	Na VI	465.460	5	N	Fe IV	467.343	1	
P IV	462.827	4		Cu IV	465.472	300		Kr III	467.35	300	Q
P VI	462.926	100		Sc IV	465.485	110		Ni IV	467.373	300	
Ti V	462.982	30		N II	465.486		P	Ar III	467.39	300	
Cl IV	463.01	300		V VIII	465.493	220		K IX	467.391	40	
P IV	463.060	10		Ni IV	465.504	180		Sc IV	467.398	40	
Sc IV	463.118	5		Ni V	465.52		F, P	N III	467.432	500	Z
Na V	463.263	1000		O II	465.529	50		P V	467.448	1	
V VI	463.418	160		Mn V	465.574	50		Ni IV	467.495	30	
Al V	463.51	10		Ar VI	465.59	80		Zn III	467.630	0	
Ni IV	463.527	80		N II	465.592		P	Si V	467.64	1	
Cu IV	463.533	590		Ni IV	465.673	220		N III	467.649	450	Z
Ni IV	463.588	70	N	Ni V	465.72		F, P	Mn VII	467.662	300	
Ni V	463.59		F, P	O II	465.760	100		Ca XIX	467.68		P
P VI	463.605	60		Ni V	465.77		F, P	Fe V	467.701	150	
Ni V	463.61		F, P	N II	465.770		P	N III	467.795	350	Z
Sc IV	463.666	70		Ar II	465.8365	15	st	Ni IV	467.856	280	
Ni IV	463.708	20		Ni IV	465.862	210		O II	467.926	10	
Cu IV	463.717	780		Mg VIII	465.972	10	Q	P III	468.039	60	
P VI	463.735	30		F V	465.976	600		Ni IV	468.149	130	
Sc	463.74	50	N	Ca VIII	465.993	100		Kr	468.20	80	N
N IV	463.740	650		Ni IV	466.009	310		Ti V	468.257	30	
P IV	463.843	40		P III	466.038	25		Ni IV	468.318	230	
Cu IV	463.858	170		Cu IV	466.042	100		Fe V	468.339	200	
Cu IV	463.928	520		Ni V	466.06		F, P	Si V	468.345	25	
Sc IV	463.934	5		Mn V	466.104	250		Ar	468.38	80	N
Ar V	463.938	350		Ni IV	466.124	110	Q	Ni IV	468.395	380	
Ni V	463.94		F, P	Si III	466.129	80		Br V	468.4	120	
P VI	463.981	10		Cl IV	466.13	300		Zn IV	468.426	40	
Ti XV	463.99		F, P	Ni V	466.13		F, P	Ni IV	468.437	560	
Cr V	464.015	450		Sc IV	466.192	110		K V	468.447	100	N
Si V	464.05	10		Ar I	466.2		A, Z	P VI	468.464	70	
Ti V	464.143	0		Ti V	466.224	50		Ar III	468.47	200	
Ni IV	464.160	110		Sc	466.24	300	N	Cu IV	468.502	360	
O II	464.194	100		Al V	466.24	8		P IV	468.502	25	
Ar VI	464.26	160		Ca IX	466.240	160		P III	468.516	25	
Ni V	464.27		F, P	Ni V	466.34		F, P	Ca	468.540	50	N
K VI	464.275	110		C II	466.352	10	Z	Fe V	468.577	70	
F III	464.288	200		C II	466.407	100	Z	Ni IV	468.586	630	
Cl IV	464.29	300		Kr V	466.41	200		Fe V	468.717	10	
Ni IV	464.309	210		Co VI	466.44		F, P	Sc X	468.73		P
O II	464.310	50		Ni V	466.47		F, P	O II	468.766	100	
Ni IV	464.334	250		C II	466.491	200	Z	Si VI	468.78	100	N
F V	464.367	400		Ar III	466.53	250		Fe V	468.839	40	

Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes
Cu IV	468.885	410		Ni IV	471.236	650		Ni V	474.01		F,P
Ni IV	468.931	200		O IV	471.273	2		Ni IV	474.017	580	
C III	468.94	10		Ni XXI	471.3		F	Kr	474.09	100	N
P IV	468.953	4		Al V	471.34	5		Sc IV	474.120	70	
Ar III	468.96	150		Ni IV	471.360	520		Ti V	474.124	12	
P VI	469.052	60		Co VI	471.37		F,P	Cu IV	474.131	460	
Fe IV	469.085	12		P III	471.467	25		P IV	474.159	10	
Co VI	469.12		F,P	Ni IV	471.476	490		Cu IV	474.170	470	
Ni IV	469.133	420		Ni V	471.49		F,P	Sc IV	474.250	40	
O V	469.150	3		Fe IV	471.524	4		O VIII	474.302		P
Kr V	469.18	30		Ni IV	471.565	510		Ni IV	474.399	350	
Ni IV	469.193	20		K III	471.569	750		Cu IV	474.400	200	
Al V	469.24	20		Ti X	471.574	110		P III	474.433	1	
Kr	469.26	100	N	O IV	471.603	1		Si V	474.45	10	
Cr V	469.311	110		Sc IV	471.632	20		Ni V	474.47		F,P
Co VI	469.41		F,P	Co VI	471.65		F,P	N VI	474.48		P
Fe V	469.464	30		Al V	471.74	5		Fe V	474.481	2	
F VI	469.48		N	Sc IV	471.790	110		N II	474.493	10	
Cr XXIII	469.48		P	Co XXI	471.8		F,P	O VIII	474.498		P
Ni IV	469.492	30		Fe IV	471.800	4		Sc IV	474.533	70	
K II	469.50			Co VI	471.81		F,P	N II	474.546	10	
Co VI	469.57		F,P	Ni IV	471.825	210		Zn IV	474.558	60	
Ar II	469.6301	30	st	Ni IV	471.894	410		O VIII	474.566		P
Cr V	469.634	220		F II	471.921	10		N II	474.602	10	
Ni IV	469.669	670		F II	471.952	200		Sc IV	474.679	110	
Sc IV	469.692	20		Ar IV	471.97	60		Ti V	474.690	200	
Ni IV	469.706	360		F II	471.999	450		Ar XII	474.7		P
Si V	469.71	10		O VI	472.		ZZ	N II	474.706	20	
Fe IV	469.749	30		Fe V	472.059	10		Al V	474.75	8	
Ne IV	469.773	700		Zn IV	472.086	75		Cu IV	474.757	250	
Ti V	469.808	110		Kr V	472.16	300		N II	474.787	20	
Ne IV	469.820	1000		C V	472.21		P	Mn V	474.820	300	
Ar III	469.83	200		N III	472.239	300		Ni V	474.87		F,P
Ne IV	469.866	900		Cu IV	472.305	400		N II	474.891	200	
Cr V	469.893	70		Fe V	472.309	5		K III	474.920	450	
Ne IV	469.921	700		Cu IV	472.342	740		Mn V	474.966	20	
Ar III	469.97	200		N III	472.399	550		O VI	475.		ZZ
O VI	470.		ZZ	Ni IV	472.538	140		Sc IV	475.176	20	
Ni IV	470.000	70		Fe V	472.608	100		Ni IV	475.351	440	
Cu IV	470.048	250		Ni IV	472.608	20		Mn V	475.376	80	
Ni IV	470.084	20		Zn IV	472.655	70		Sc IV	475.462	20	
K III	470.089	1000		Ni V	472.67		F,P	Cu IV	475.491	430	
Ni IV	470.124	140		F II	472.681	100		P V	475.598	375	
V X	470.183	40		F II	472.711	300		Si V	475.63	15	
Ni IV	470.194	440		Cu IV	472.770	400		Al V	475.63	8	
Zn III	470.211	1		Ar II	472.8114	30	st	N II	475.647	100	
Kr	470.23	40	N	Sc VII	472.814	285		Ni IV	475.649	580	
P III	470.232	60		V VII	472.828	650		Ar VII	475.656	400	
Sc IV	470.249	110		V VIII	472.839	650		Kr	475.68	100	N
Ni IV	470.301	20	N	P IV	472.96	80		N II	475.698	200	
Ni IV	470.407	340		V XVII	473.0		F,P	Ar VII	475.73	100	
O II	470.408	200		Sc IV	473.000	110		N II	475.757		
Si V	470.42			Zn IV	473.014	60		Zn IV	475.768	8	
Ni IV	470.473	230		F II	473.015	200		Sc IV	475.788	70	
Cr V	470.567	40		Ar III	473.03	300	N	N II	475.803	250	
Ar XII	470.57	80	Q	Ni IV	473.104	350		Ni IV	475.855	80	
Ti XVII	470.60		F,P	Ni V	473.12		F,P	N II	475.884	100	
Sc IV	470.625	110		N II	473.180		P	Mn V	475.896	200	
Fe V	470.678	50		K VI	473.207	100	N	Ar II	475.9054	180	st
Cr V	470.697	20		K IV	473.207	100		Ni IV	475.912	530	
Sc VII	470.780	110		Ni IV	473.225	410		K II	476.029	100	N
Cu IV	470.933	160		N II	473.289		P	Al IV	476.13	5	
Cr V	470.976	5		Ni IV	473.308	40		Cu IV	476.143	130	
Ni IV	471.016	530		C III	473.410		F,P	Ca	476.177	100	N
Ni IV	471.071	140		Ni V	473.47			Cu IV	476.197	630	
Ca VIII	471.085	285		N II	473.473		P	Sc IV	476.210	40	
Ar IV	471.09	60		Zn IV	473.501	75		Al IV	476.27	20	
Mn XX	471.1		F,P	Kr V	473.55	80		Ar III	476.43	350	
Fe IV	471.118	1		Cu IV	473.667	210		N II	476.469		P
Ni V	471.14		F,P	Ni IV	473.727	560		Ca V	476.606	100	N
P III	471.146	90		Ar III	473.92	300		Ni IV	476.640	480	
Fe V	471.178	20		Ar VII	473.938	200		N II	476.656		P
Ca VIII	471.183	100		Si V	473.95	5		Si V	476.88	15	
Kr V	471.21	85		Ni IV	473.963	320		N IV	476.909		P
Ni IV	471.211	630		O VI	474.		ZZ	V XII	476.94		P

Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes
Ni IV	476.970	530		Ni V	480.47		F, P	Ti V	482.447	0	
Cu IV	477.075	430		Ca	480.471	150	N	Ni V	482.45		F, P
Ar II	477.1048	120	st	Sc	480.51	200	N	Al IV	482.48	10	
Cu IV	477.108	430		Kr IV	480.61	10	N	Ni V	482.53		F, P
Ni IV	477.240	50		Ni V	480.66		F, P	Ar III	482.55	400	
Ca	477.300	50	N	P IV	480.756	60		Ca	482.663	50	N
Ni IV	477.395	60		Ar II	480.8108	30	st	Zn IV	482.668	2	
Ni IV	477.475	60		Kr	480.90	30	N	K V	482.706	200	
F VI	477.55			Ni IV	480.908	310		Sc IV	482.729	1	
Ni IV	477.550	620		O III	480.955	200		Ni IV	482.765	430	
Sc IV	477.564	5		Al IV	481.01	30		Ca	482.769	100	N
Ni IV	477.573	460		Cu IV	481.088	50		Mn V	482.829	110	
Si V	477.59	1		O V	481.136	60		Ni IV	482.877	320	
P III	477.596	1		Si	481.15		N	Cu IV	482.944	100	
Ni XXII	477.6		F	Ni IV	481.151	420		P III	482.971	25	
Al IV	477.60	5		P IV	481.177	40		Ne V	482.99	500	
Ar II	477.6068	30	st	Si X	481.273			V V	483.009	350	
Ni IV	477.623	100		Ne V	481.28	150		Ni IV	483.043	330	
C III	477.6246	300		Al IV	481.29	10		Al VIII	483.10		P
Al IV	477.73	10		Sc VIII	481.321	20		Kr	483.13	20	N
Sc IV	477.764	70		O III	481.354	150		Co V	483.18		F, P
Ni IV	477.897	170		Ni IV	481.359	460		P III	483.210	60	
Kr	477.93	80	N	Ne V	481.36	250		Na VII	483.216	200	
Ni IV	477.998	240		O III	481.381	100		Fe IV	483.238	50	
Ga XXIV	478.02		F, P	Ni IV	481.410	40		Ni IV	483.276	220	
Sc X	478.09		P	Ti VIII	481.428	40		Na VII	483.328	300	
Ni IV	478.162	20	Q	Kr	481.43	120	N	P VI	483.340	40	
Al IV	478.26	30		Sc IV	481.434	160		Ni IV	483.388	70	
Sc IV	478.299	220		Fe XV	481.46	150		Sc	483.40	200	N
Ca	478.305	200	N	Ni IV	481.485	390		K	483.405	20	N
Ti V	478.455	30		V V	481.556	80		Cu IV	483.418	430	
Ni IV	478.501	580		O III	481.587	200		Ni IV	483.515	190	
Sc IV	478.511	1		O II	481.587	200		Al IV	483.55	20	
P VI	478.518	150		Fe IV	481.592	12		C III	483.567	300	
Sc IV	478.609	40		O II	481.635	10		C III	483.618	400	
Ni IV	478.618	420		O II	481.704	50		Cu IV	483.673	260	
Zn IV	478.646	75		Kr V	481.71	120		Si VI	483.68	40	N
Ni IV	478.668	570		O II	481.755	150		Ni IV	483.699	30	
Sc IV	478.804	20		Ni IV	481.756	100		Cu IV	483.708	230	
Ge XXV	478.84		F, P	K	481.759	20	N	C III	483.733	500	
Zn IV	478.898	60		N III	481.778	200		K V	483.745	200	
Ti VIII	478.971	450		Ti V	481.818	80		O II	483.752	200	
Al V	479.02	10		Co V	481.82		F, P	Ni IV	483.774	50	
Ni IV	479.088	450		Ar III	481.85	300		Ni V	483.85		F, P
Ar II	479.1678	30	st	P VI	481.878	5		Ni V	483.88		F, P
Ni IV	479.175	580		Cu IV	481.889	220		Fe IV	483.967	1	
K III	479.185	400		Fe V	481.899	100		O II	483.976	250	
Ar II	479.2177	60	st	Fe IV	481.905	80		Ti V	483.992	200	
Al IV	479.30	5		Ni IV	481.907	360		Ni IV	484.020	40	
Ni IV	479.331	320		C VI	481.965		P	O II	484.025	100	
Kr	479.34	120	N	Cu IV	482.013	310		Ni IV	484.114	300	
Ar VII	479.379	600		N III	482.030	500		Ar III	484.12	250	
Ar VII	479.49	100		Ni IV	482.055	340		P III	484.139	25	
Ti V	479.497	0		Al IV	482.08	100		K III	484.200	50	
Ni IV	479.504	260		P VI	482.083	4		Ni IV	484.201	330	
P VI	479.648	5		Zn IV	482.089	50		K VII	484.254	40	
Zn III	479.743	1		C VI	482.093		P	Fe IV	484.261	4	
Al IV	479.76	20		Br V	482.1	350		P III	484.278	90	
K VII	479.770	5		K III	482.107	100		Co V	484.32		F, P
Ni IV	479.828	260		Li III	482.112		P	Cu IV	484.355	370	
F VI	479.85			Ni IV	482.123	160		Ca	484.368	150	N
Ti XII	479.881	160		C VI	482.137		P	Kr	484.39	100	N
P VI	479.910	100		Li III	482.174		P	Ar III	484.45	250	
Al VIII	479.95		P	Cr XIII	482.2			Ni IV	484.456	340	
Ni IV	480.003	630		Cu IV	482.219	210		V V	484.510	250	
Ni IV	480.026	610		Sc IV	482.220	400		P III	484.518	40	
Sc IV	480.106	5		Fe IV	482.241	1		Cu IV	484.531	800	
Ni IV	480.197	300		Mn V	482.278	200		S III	484.58	50	
Ca	480.345	100	N	Ni IV	482.279	300		F II	484.601	850	
Ti VIII	480.376	550		K	482.281	50	N	K	484.637	50	N
Ni V	480.39		F, P	Kr	482.32	30	N	Ni IV	484.637	470	
K VI	480.397	50	N	P VI	482.355	2		Sc	484.69	50	N
Ne V	480.41	250		K III	482.408	100		Ni V	484.75		F, P
P XIII	480.42			Mn V	482.432	70		P IV	484.757	1	
F VI	480.439	50		Ar II	482.4451	15	st	Ni IV	484.759	270	

Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes
Ni IV	484.778	260		Ti V	487.115	50		Cu IV	490.260	280	
Ni V	484.78		F, P	Ni IV	487.170	250		Ni IV	490.275	420	
Mn V	484.985	40		V VI	487.217	1		Ne III	490.31	700	
Fe IV	484.990	1		F III	487.223	6		Al VIII	490.35		P
P III	485.009	40		Ar II	487.2272	300	st	Mg VIII	490.36		P
Cu IV	485.027	50		Ni IV	487.234	270		K VI	490.423	100	N
Cu IV	485.055	200		Ni IV	487.270	90		Ni IV	490.429	160	
Mg VIII	485.06		P	Kr	487.35	60	N	Ni IV	490.494	380	
K	485.084	250	N	Fe IV	487.383	1		V V	490.496	40	
O II	485.086	300		Ni IV	487.396	380		Ca III	490.549	200	
Ni IV	485.091	330		P XI	487.43			F IV	490.568	700	
V IX	485.110	70		Ni IV	487.446	600		Ar II	490.6495	290	st
Cu IV	485.123	10		Ni IV	487.584	100		Kr	490.67	150	N
Ar III	485.15	300		F III	487.643	3		Ar II	490.7012	70	st
Ti V	485.175	30		Ti X	487.654	160		Al IV	490.73	20	
Ni V	485.22		F, P	Cu IV	487.750	130		Cu IV	490.796	200	
S III	485.22	50		Fe V	487.796	10		Kr V	490.82	85	
Cu IV	485.229	200		Ni IV	487.819	80		Al IV	490.88	40	
P VI	485.269	4		Ti V	487.845	50		Ni IV	490.906	430	
Al IV	485.28	40		Sc	487.89	250	N	Zn IV	490.956	3	
Ne II	485.3		P, Z	Ni IV	487.910	400		F IV	491.001	1000	
Ni IV	485.310	190		Ni IV	487.967	590		P IV	491.008	90	
Ni IV	485.350	50		Ar III	487.99	350	N	Mg VIII	491.045	10	Q
K IV	485.359	100		Fe V	487.996	2		Ne III	491.05	900	
Ni IV	485.425	650		Ne III	488.10	800		Ca VII	491.097	50	N
P IV	485.453	120		Fe V	488.100	250		Ar III	491.12	200	
P III	485.453	60		V VI	488.120	160		Sc VII	491.141	110	
O II	485.465	10		K VI	488.132	110		Sc VIII	491.180	450	
Ni IV	485.472	360		Ni IV	488.141	270		Na VI	491.240	300	
Zn IV	485.476			Ni IV	488.274	380		Ni IV	491.253	320	
Fe IV	485.509	1		Kr	488.29	30	N	Ni IV	491.328	300	
K	485.513	150	N	Mn V	488.301	100		Na VI	491.340	600	
O II	485.515	250		Al IV	488.36	100		Ti V	491.358	4	
Ar III	485.52	200		Kr IV	488.44	85		Ni IV	491.364	590	
Ni IV	485.536	310		Ar III	488.45	350		Ca VII	491.381	70	
O II	485.572	50		V VI	488.462	5		Ni IV	491.422	280	
Mg VIII	485.59			V XII	488.57		P	S XIII	491.44		
N II	485.602		P	Ti V	488.582	300		Cu IV	491.598	580	
Ni IV	485.604	20		Ni IV	488.653	290		O III	491.714	10	
K	485.626	100	N	Si V	488.73	1		K VII	491.718	20	
O II	485.631	200		V IX	488.735	160		V V	491.746	20	
Ni IV	485.670	100		Ni IV	488.754	570		Cu IV	491.783	400	
Mn V	485.670	140		Ar II	488.7926	270	st	Cu IV	491.828	870	
Ar	485.79	60	N	Ni IV	488.842	340		Fe IV	491.832	4	
Ni IV	485.814	30		Ne III	488.87	700		P V	491.872	12	
N II	485.849	10		Ni IV	488.892	410		Cu IV	491.877	520	
P IV	485.854	1		Ne V	488.94			P V	491.944	4	
Ni IV	485.892	290		Ar II	488.9615	120	st	Na VII	491.950	400	
Ni IV	486.117	20	N	Ti X	488.971	1		O III	491.980	50	
Fe V	486.168	300		Ni IV	489.036	470		Ti V	491.981	1	
Cl IV	486.17	800		Zn IV	489.183	1		Kr	492.03	40	N
Ni IV	486.204	100		Ar II	489.1953	240	st	Fe IV	492.152	30	
Si V	486.22	10		Cu IV	489.298	50		Ni IV	492.216	550	
Ni IV	486.254	80		V VI	489.360	1		Ar III	492.23	150	
F III	486.430	10		Fe IV	489.409	4		Cu IV	492.235	710	
Fe V	486.464	5		Ni IV	489.486	30		Ni IV	492.305	70	
Sc VIII	486.525	40		Fe V	489.498	150		Al IV	492.31	20	
Ar	486.60	300	N	Ne III	489.50	1000		Na VIII	492.329	10	
Cu IV	486.639	60		Ni IV	489.558	250		Ar II	492.4083	150	st
Sc VIII	486.645	40		Na VI	489.580	500		Sc VI	492.423	750	
Ni IV	486.725	530		Kr	489.59	80	N	Ni IV	492.441	160	
Na VII	486.740	400		Fe V	489.600	5		Kr	492.56	50	N
Ni IV	486.758	330		Ni IV	489.608	350		Ar IV	492.64	50	
Sc VIII	486.810	40		Ne III	489.64	400		Ar II	492.6454	30	st
Ni IV	486.812	330		Ni IV	489.658	590		C III	492.6500	700	
Ca VII	486.838	100	N	Ni IV	489.682	580		Fe IV	492.653	50	
Cu IV	486.848	70		P V	489.695	30	F	Ni IV	492.705	170	
Al III	486.8839	70		Ca VII	489.700	50	N	Kr IV	492.71	200	
Al III	486.9124	30		Si VI	489.81	80	N	Al IV	492.78	25	
Ni IV	487.014	480		Mg VIII	489.82		P	Na VIII	492.79		
Ar III	487.03	350	N	Ni IV	489.915	20		Fe V	492.913	10	
Ne V	487.07	30		Cu IV	490.035	250		Ni IV	492.917	360	
Ni IV	487.071	470		Ar XIII	490.2		P	Al VIII	493.29		P
Sc IV	487.087	20		Ni IV	490.213	30		C III	493.341	500	
K VII	487.097	110		Sc X	490.23			Sc VII	493.350		



Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes
C III	493.364	500		Sc	497.19	150	N	K IV	499.993	100	Q
Zn IV	493.365	2		Ni IV	497.233	410		K IV	500.047	100	
C III	493.396	500		Na VI	497.273	5		K I	500.05		A, Z
C III	493.464	500		Ni IV	497.315	290		Ti VIII	500.116	110	
Cu IV	493.488	240		Sc VII	497.369	20		K IV	500.125	150	N
C III	493.519	500		F IV	497.375	60		Ni IV	500.165	410	
Fe IV	493.529	1		Al IV	497.47	15		Al IV	500.29	30	
C III	493.587	700		N IV	497.696		P	Zn III	500.342	2	
Ni IV	493.756	40		Zn IV	497.701	3		O II	500.343	50	
Ti V	493.783	110		Ni XI	497.8		F, P	S II	500.36	210	N
Cr XVII	493.8		F	Fe IV	497.810	4		S XIII	500.42		
Cu IV	493.816	30		F IV	497.830	100		Al IV	500.42	10	
Kr IV	493.86	250		Cu IV	497.892	280		Cu V	500.508		F, P
Cu IV	494.121	590		Fe IV	497.896	1		Fe IV	500.558	4	
Kr IV	494.14	200		C III	497.910	100		V VI	500.644	40	
Na VI	494.160	300		N VI	497.98		P	Cu IV	500.738	190	
Ni IV	494.286	220		V XVIII	498.		F, P	Ni IV	500.799	350	
Sc VIII	494.295	110		Kr	498.01	150	N	Ar II	500.8016	30	st
Na VI	494.382	700		Ca IX	498.014	40		Kr V	500.83	10	
F VII	494.4			Ti V	498.050	1		Ni IV	500.856	70	
Sc VIII	494.430	20		K I	498.06		A, Z	F III	500.953	10	
Cu IV	494.463	100		O VI	498.090	10		O VI	501.		ZZ
Ni IV	494.565	20		N IV	498.106		P	Ni IV	501.065	120	
Fe V	494.566	100		P III	498.180	120		Ar VII	501.07	120	
Fe IV	494.567	110		Ti V	498.260	700		K I	501.13		A, Z
Ni IV	494.658	120		N IV	498.323		P	Ca VII	501.134	1	
Ar II	494.6676	15	st	K I	498.36		A, Z	Ar II	501.1897	60	st
Fe IV	494.669	30		Cu V	498.385		F, P	Zn III	501.264	5	
Cu IV	494.682	290		O VI	498.431	100		Ar II	501.3872	15	st
Fe V	494.705	2		Cu IV	498.453	430		Cu V	501.401		F, P
Ni IV	494.871	30	N	Al IV	498.61	5		F III	501.425	6	
V VI	494.909	20		Kr IV	498.69	250		Kr IV	501.50	10	
Cu IV	494.950	230		Ni IV	498.706	400		Mn V	501.508	40	
O VI	495.		ZZ	Cu IV	498.758	820		Al IV	501.62	5	
V VI	495.138	20		K I	498.77		A, Z	Ti V	501.631	12	
K II	495.144	300	N	Ni IV	498.783	80		K VI	501.657	1	
N V	495.180		P	F IV	498.796	150		Si V	501.68	1	
Cu IV	495.242	130		Cu IV	498.868	280		Cu IV	501.801	20	
N V	495.356		P	Ni IV	498.873	390		F III	501.804	6	
Fe IV	495.447	4		Sc XV	498.9		F, P	Fe IV	501.849	150	
Ar IV	495.55	80		F IV	498.907	35		Cu IV	502.005	580	
Ni IV	495.584	50		P IV	498.968	4		Ar II	502.0276	15	st
Ni IV	495.648	520		Kr IV	499.05	50		Ti V	502.077	600	
Kr IV	495.66	50		F IX	499.109		P	P III	502.123	40	
Na VIII	495.76		P	Ni IV	499.141	150		Fe IV	502.142	30	
V VI	495.940	40		Br VI	499.2	85		Ar II	502.1629	60	st
Fe IV	495.953	4		K I	499.33		A, Z	Ni IV	502.179	120	
Cu IV	496.097	430		Si XII	499.40	33		Ni IV	502.243	540	
Cu IV	496.118	430		C III	499.425	700		Fe IV	502.246	80	
Fe IV	496.171	50		Mn V	499.433	40		F III	502.280	3	
V VI	496.180	70		Cu IV	499.456	250		Cu V	502.284		F, P
Na VIII	496.249	100		C III	499.462	800		Ni IV	502.391	90	
Kr	496.25	250	N	Ti IX	499.479	20		Kr V	502.40	40	Q
Zn III	496.423	1		V XII	499.48		P	Ar	502.42	40	N
Kr IV	496.46	300		C III	499.530	900		Fe IV	502.421	300	
Ni IV	496.470	100		C III	499.583	700		Cu V	502.431		F, P
Sc	496.52	300	N	Sc VII	499.645	110		Ni IV	502.447	600	
Ar II	496.6436	15	st	Zn III	499.678	2		F III	502.511	6	
Ar II	496.6592	15	st	F IX	499.697		P	Zn III	502.632	5	
Al IV	496.66	10		Sc	499.70	100	N	Cu IV	502.651	340	
Ni IV	496.660	80		Kr V	499.74	50		Cu IV	502.687	340	
Zn IV	496.719	1		Na VIII	499.78			Br VII	502.7	85	
Fe IV	496.724	4		Ni IV	499.805	470		Ti V	502.711	150	
Fe IV	496.766	1		Ni IV	499.840	620		F III	502.713	6	
Kr IV	496.79	50		Cu IV	499.848	740		K I	502.74		A, Z
P III	496.795	90		Ti VII	499.853	200		K	502.798	50	N
Ni IV	496.806	170		O II	499.871	100		Cu IV	502.874	160	
Sc X	496.84	150	Q	Ni IV	499.873	550		Kr IV	502.88	10	
Ar	496.91	40	N	Fe IV	499.880	1		Ni IV	502.978	290	
V VI	496.985	5		F IX	499.882		P	Ti V	503.031	30	
Cu IV	496.995	890		Ni IV	499.915	600		Ni IV	503.089	130	
Zn III	497.003	2	Q	Zn III	499.915	2		Kr IV	503.21	150	
C V	497.09		P	Ar II	499.9192	0	st	Ca IX	503.282	10	
K III	497.104	750		P XI	499.98		P	Cu V	503.389		F, P
Fe IV	497.184	12		S III	499.98	300		Cu IV	503.474	420	

Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes
Ni IV	503.512	480		C V	506.31		P	Cu IV	509.379	720	
P III	503.538	60		V V	506.429	10		O V	509.415	15	
Ar II	503.6503	60	st	Ni IV	506.434	120		Ti VII	509.511	600	
Kr IV	503.69	150		Ti V	506.468	150		Ca VII	509.526	1	
K VIII	503.697	50	Q	Fe IV	506.482	4		N III	509.586	400	
Br VI	503.7	250		Ni IV	506.539	60		P VI	509.619	100	
Kr V	503.71	120		Cu IV	506.555	200		Fe IV	509.681	1	
Cu IV	503.846	300		He I	506.5702	15		V V	509.697	20	
Cu IV	503.928	510		Cu IV	506.574	560		Ni IV	509.796	40	
Ni IV	503.931	90		C III	506.63	10		N V	509.896		P
Ni IV	504.032	250		Zn III	506.646	3		N III	509.897	350	
Zn III	504.227	1		F III	506.674	3		P IV	509.964	25	
Cu V	504.232		F, P	Ni IV	506.675	60		Be III	509.99	25	
Fe IV	504.240	80		Fe IV	506.694	375		He I	509.9979	50	
Ni IV	504.477	610		Co V	506.71		F, P	Se V	510.0	50	
C VI	504.499		P	Cu IV	506.740	680		Ni IV	510.061	50	
Br VI	504.5	150		Cu IV	506.781	780		Si III	510.079		
K	504.503	20	N	Fe IV	506.976	80		N V	510.096		P
Cu IV	504.524	370		He I	507.0576	20		Na V	510.102	10	
Na VI	504.541	30		Co V	507.06		F, P	N II	510.152		P
Ca VII	504.591	150	N	Ca IX	507.106	1		Sc XIV	510.23		F, P
Cu IV	504.598	910		Ti IX	507.174	160		He I	510.2586		F
Cu IV	504.633	300		Zn III	507.202	5		K VI	510.311	20	N
C VI	504.638		P	Ni IV	507.207	120		Si III	510.414		
Ti V	504.665	450		Kr V	507.22	200		Ca VI	510.427	70	
C VI	504.685		P	Sc	507.32	350	N	Ni IV	510.449	70	
Ni IV	504.770	210		Ti IX	507.365	285		Ar II	510.5509	30	st
Ti VIII	504.801	285		O III	507.391	800		Ar II	510.5564	200	st
Ar II	504.8117		st	Co V	507.40		F, P	Ni IV	510.584	310	
K	504.817	20	N	Ni IV	507.400	480		Zn III	510.668	1	Q
Ni IV	504.847	360		Si IV	507.45	148	N	Si IV	510.70	43	N
Cu IV	504.864	370		Cu IV	507.583	740		N II	510.758	250	
Mn V	504.869	60		Cu IV	507.601	620		Sc XVI	510.77		F, P
Fe IV	504.919	12		Fe IV	507.631	30		B III	510.777	200	
Si VI	504.95		Q	O III	507.683	850		B III	510.865	300	
Ni IV	504.951	320		Ti V	507.683	110		Ni IV	511.025	30	
Fe IV	504.982	12		He I	507.7178	30		K VI	511.062	20	N
O VI	505.		ZZ	Zn XXII	507.73		F, P	Si III	511.096		
Ar II	505.0121	30	st	K I	508.06		A, Z	Al III	511.1384	250	
Sc XI	505.108	400	P	F V	508.075	400		Al III	511.1907	150	
K I	505.16		A, Z	Sc	508.16	100	N	Na V	511.193	100	
Ca VI	505.206	220		Ni IV	508.179	590		Cu IV	511.211	260	
Cu IV	505.236	370		O III	508.182	900		Co V	511.25		F, P
Cu V	505.334		F, P	Fe IV	508.240	50		F VI	511.33		
Cu V	505.345		F, P	Mn V	508.319	30		Ni IV	511.339	80	
Fe IV	505.354	375		Si XI	508.32		Q	K	511.371	50	N
P IV	505.387	60		K I	508.34		A, Z	Fe IV	511.424	12	
N II	505.411		P	F III	508.386	400		Ti VII	511.442	200	
Ca V	505.446	20		Cu IV	508.424	210		Ca VI	511.500	450	
Ar	505.45	60	N	Ar III	508.44	450		Ar III	511.51	300	
Ni IV	505.467	220		N II	508.484	10		C III	511.5225	1000	
Cu V	505.496		F, P	F III	508.506	6		Ar III	511.57	180	
He I	505.5001	4		Ni IV	508.510	330		Fe IV	511.570	1	
N II	505.536		P	Ti VI	508.575	1000		Co V	511.61		F, P
Fe IV	505.545	4		Ar III	508.61	300		N V	511.804	30	P
Si V	505.58	1		Cu IV	508.635	50		N V	511.865	40	P
He I	505.6840	6		He I	508.6431	40		Ar V	511.89	25	
Cu III	505.722	15	N	N II	508.668			K XVIII	511.89		P
Cu IV	505.723	880		Kr IV	508.68	10		Ni IV	511.925	580	
N II	505.746		P	Ar III	508.68	180		C V	511.94		P
Ni IV	505.750	190		N II	508.697	150		Co V	511.96		F, P
K IV	505.761	50	N	Fe IV	508.749	12		Si III	511.994		
Ti XVI	505.8		F, P	N II	508.794		P	Ca IX	512.063	10	
Ti VII	505.899	200		Cu IV	508.853	650		P VI	512.066	100	
Se V	505.9	30		N II	508.928	10		He I	512.0982	70	
He I	505.9122	8		N II	509.006	15		Si III	512.219		
Kr	505.93	40	N	Ar	509.02	200	N	B V	512.384		P
Cu IV	505.968	860		Ti VII	509.127	12		Ni IV	512.432	130	
N II	505.986	100	Z	Ni IV	509.170	200		He I	512.5183		F
N II	506.054	200	Z	K I	509.26		A	B V	512.539		P
Fe IV	506.117	200		F VI	509.26			C V	512.54		P
N II	506.153	300	Z	V VI	509.260	285		Si III	512.557		
F V	506.159	300		Ca V	509.293	100	N	Ni IV	512.568	70	
Ca IX	506.179	90		Ni IV	509.313	610		B V	512.591		P
He I	506.2000	10		K I	509.37		A, Z	K	512.593	20	N

Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes
Zn	512.656	20	N	Fe IV	516.253	1		Ni IV	519.767	230	
Cu IV	512.681	470		Cu IV	516.308	370		Ni IV	519.848	340	
Si III	512.681			Ni IV	516.324	490		N VI	519.88		
Ni IV	512.747	200		Si IV	516.348	200		P IV	519.930	1	
Ar III	512.77	180		He I	516.3592		F	Ni IV	519.959	330	
Si III	512.772			Cu IV	516.361	410		Fe IV	519.962	50	
Ni IV	512.786	60		Kr III	516.38	80		P IV	519.973	4	
Zn	512.812	15	N	Br VI	516.4	250		Zn III	519.998	8	
Ni IV	512.999	80		Ni IV	516.420	360		Ni IV	520.042	140	
Kr IV	513.16	50	Q	C II	516.652	10	Z	S IV	520.11	200	
Si III	513.245			Zn III	516.837	8		K I	520.15		A, Z
Kr	513.28	30	N	K VII	516.853	50	N	Ni IV	520.218	410	
Ni IV	513.371	230		C II	517.07	100		P IV	520.246	40	
Ti V	513.374	200		Co V	517.07		F, P	Ni IV	520.256	550	
Ni IV	513.458	90		Fe IV	517.099	4		C VI	520.298		P
Zn III	513.522	4	Q	Fe IV	517.234	4		Br VII	520.3	85	
Cu IV	513.571	540		Ar V	517.25	25		K	520.493	150	N
F II	513.644	300		Kr IV	517.29	50		Ni IV	520.587	430	
Kr IV	513.74	10		Br VI	517.3	10		C VI	520.605		P
N II	513.849			Ni IV	517.328	470		K III	520.611	500	
Ar V	513.91	50		Ni IV	517.347	430		Ni IV	520.638	80	
F V	513.969	150		S III	517.39	111	N	Si XII	520.67	17	
Ni XXI	514.0		F, P	Cu IV	517.431	230		C VI	520.704		P
Ni IV	514.023	150		Fe IV	517.447	1		N VI	520.72		
F V	514.082	100		K I	517.48		A, Z	P IV	520.751	1	
Ni IV	514.173	290		Si	517.5		N	Si III	520.79	10	
Si V	514.177	10		Se III	517.6	30		Ni IV	520.817	390	
Ti VIII	514.206	650		Fe IV	517.642	4		S IV	520.83	300	
Co V	514.28		F, P	Kr IV	517.70	85		K VII	520.857	100	
Ar II	514.3100	210	st	Ni IV	517.719	80		Si III	520.92	20	
Na V	514.350	10		K VII	517.794	50		N IV	520.934		P
Ca	514.498	50	N	Co V	517.81		F, P	S IV	521.03	100	
O VIII	514.512		P	K I	517.81		A	S X	521.1		P
Ni IV	514.525	510		Si V	517.82	60		Cu IV	521.106	830	
Cu III	514.566	10	N	Ni XI	517.9		F, P	Si III	521.149		
Cu IV	514.570	510		K VII	517.909	40		Kr IV	521.15	85	Q
Cu IV	514.628	430		O II	517.937	200		Ni IV	521.156	350	
Ni IV	514.628	90		K I	517.96		A, Z	P IV	521.246	4	
Co V	514.64		F, P	S XIII	518.05		P	Si III	521.510		
Ni IV	514.684	260		Ti IX	518.100	1		Ti VII	521.561	300	
K I	514.73		A, Z	Mn XIV	518.16			Fe IV	521.570	4	
O VIII	514.737		P	Kr IV	518.17	50		Cu IV	521.614	210	
O VIII	514.814		P	Ni IV	518.175	80		Fe IV	521.665	50	
Kr IV	514.82	50		Se III	518.2	1		Ne IV	521.741	125	
V XXII	514.83		P	O II	518.242	250		Fe IV	521.782	4	
K III	514.943	100	N	B III	518.244	460		Co V	521.80		F, P
F II	514.944	600		B III	518.271	230		K I	521.81		A, Z
Co V	515.00		F, P	Ni IV	518.449	190		Ne IV	521.820	125	
Ti VII	515.008	200		Zn	518.550	20	N	N IV	521.845		P
Si IV	515.118	150		N IV	518.600		P	Si III	521.861		
Ni IV	515.164	90		Ni IV	518.602	150		Zn III	521.872	4	
Br VI	515.2	250		Ni IV	518.670	510		Kr V	521.88	50	
Zn III	515.254	8	Q	Cu IV	518.810	340		Sc IX	521.894	285	
K I	515.28		A, Z	Fe IV	518.908	30		S IV	521.99	200	
K V	515.320	50	N	Ar II	518.9088	150	st	Se III	522.0	10	
Ni IV	515.358	120		Fe IV	519.035	150		Fe IV	522.000	4	
Kr V	515.36	60	Q	Ni IV	519.041	150		P IV	522.02	10	N
Cu IV	515.491	160		Fe IV	519.141	12		Ar V	522.09	150	
O II	515.498	250		P IV	519.171	40		Co XXI	522.1		F, P
Cu IV	515.551	340		Fe IV	519.221	80		He I	522.2128	160	
Ni IV	515.560	230		Fe IV	519.247	12		F III	522.285	10	
Ca IX	515.567	10		Ni IV	519.265	190		V XII	522.4		
K I	515.60		A, Z	S IV	519.30	200		S IV	522.54	200	
He I	515.6165	100		Ar II	519.3269	300	st	Co V	522.55		F, P
Ar	515.62	20	N	K VIII	519.382	500		Co V	522.56		F, P
O II	515.640	200		Ar VIII	519.43	150		K I	522.58		A, Z
Ni IV	515.701	550		Cu IV	519.509	420		F VII	522.6		P
N V	515.741		P	Ni IV	519.556	290		Ni IV	522.646	260	
N V	515.757		P	Ni IV	519.572	340		Ti XI	522.66		
Ni IV	515.823	280		Ti V	519.575	4		Sc XI	522.777	200	P
Na VI	516.00		Q	Se V	519.6	85		Mn IV	522.780	120	
Ni IV	516.057	550		Ni IV	519.605	200		Ar II	522.7924	450	st
Ni IV	516.070	570		O VI	519.610	200		Cu XXV	522.8		F
K I	516.13		A, Z	P IV	519.718	40		Fe IV	522.810	1	
Ti IX	516.215	1		O VI	519.723	200		Kr	522.98	30	N

Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes
K IV	523.001	250		Sc IV	526.388	160		N II	529.413	250	
Mn IV	523.036	80		Se III	526.4	85		N IV	529.430		F, P
Ti V	523.050	150		Fe IV	526.411	4		Fe IV	529.469	80	
Ni IV	523.051	60		K IV	526.448	200		N II	529.491	250	
Mn IV	523.234	70		K VII	526.452	70		Fe IV	529.493	4	
Co XXII	523.3		F, P	Ar VIII	526.46	250		Ni IV	529.493	20	
Cu IV	523.320	170		Ar II	526.4969	210	st	Ni IV	529.566	160	
Kr	523.45	30	N	Fe IV	526.517	4		Cu V	529.569		F, P
Sc	523.490	100	N	Fe IV	526.567	300		Fe IV	529.628	12	
Se III	523.5	1		Ti V	526.570	520		Ti V	529.635	2	
F III	523.662	60		Kr	526.58	30	N	N II	529.637	250	
Fe IV	523.694	12		K I	526.59		A, Z	Fe IV	529.665	80	
K I	523.72		A, Z	Ca	526.604	0	N	N II	529.722	250	
He I	523.7238		F	Fe IV	526.634	520		Cr V	529.742	160	
K III	523.792	250		Cu III	526.684	3		V XVI	529.75		F, P
Cr IV	523.808	1		Cu III	526.783	4		K III	529.796	400	
Ni IV	523.892	180		Al IV	526.81	5		Ge IV	529.8	20	P
Ni IV	523.983	40		Mn IV	526.858	0		Fe V	529.832	1	
Se III	524.0	30		Ar VIII	526.87	50		N II	529.867	400	
Se III	524.1	50		Sc	526.99	200	N	Ar III	529.90	450	
Ti VI	524.113	900		K IV	527.064	100		Fe IV	529.936	30	
Ni IV	524.164	410		Fe IV	527.096	12		Ni IV	529.992	450	
Ar V	524.19	250		Fe IV	527.193	12		As IV	530.0	100	
Ni XXII	524.3		F, P	S IV	527.20	68	N	N III	530.037	200	
Zn	524.323	15	N	N IV	527.259		P	Ni IV	530.107	80	
Fe IV	524.344	12		Fe IV	527.276	200		Ni IV	530.133	50	
Sc	524.43	100	N	Cu III	527.387	2		Ti V	530.167	4	
O III	524.47		N	Mn IV	527.402	0		Kr	530.17	20	N
S III	524.56	62	N	V X	527.439	1		N III	530.268	250	
Ti V	524.578	450		Cu V	527.463		F, P	C II	530.274	300	
F V	524.594	200		K	527.565	50	N	Ni IV	530.307	120	N
K VII	524.639	100	N	K IV	527.617	150		Ca VI	530.308	160	
Ar II	524.6803	450	st	Ar V	527.69	300		Kr III	530.308	50	
Cu IV	524.786	180		Sc IV	527.879	220		K I	530.32		A, Z
Ni IV	524.956	50		S II	527.88	98	N	N II	530.343		P
O VI	525.		ZZ	Fe IV	527.977	4		C II	530.359	400	
Zn III	525.109	5		Fe IV	528.056	50		Al IV	530.42	2	
K I	525.11		A, Z	Fe IV	528.109	80		C II	530.454		
Ni IV	525.185	340		Ni IV	528.248	490		Ar II	530.4954	450	st
Se III	525.2	1		B III	528.25	10		P IV	530.534	4	
F V	525.292	300		Al IV	528.26	5		Cu V	530.548		F, P
Kr	525.33	150	N	Ca	528.286	400	N	Fe IV	530.562	250	
Fe IV	525.339	30		Sc IV	528.287	160		Ni IV	530.656	440	
Ni IV	525.362	70		Co XX	528.46		F, P	Ni IV	530.749	110	
Ni IV	525.423	460		K	528.519	100	N	Kr IV	530.89	10	
Ca IX	525.43			Sc	528.58	350	N	Fe IV	530.907	300	
Sc	525.49	200	N	Ni IV	528.608	300		Cu III	530.915	1	
Ni IV	525.500	50		Ni IV	528.636	360		Se III	531.1	50	
Co V	525.51		F, P	Ar II	528.6511	30	st	Sc X	531.13	250	Q
K VII	525.612	150		P IV	528.672	60		Sc IV	531.170	220	
Ni IV	525.641	120		Fe IV	528.710	110		Kr III	531.255	5	
Fe IV	525.689	900		Na VI	528.730	10	N	Ni IV	531.293	390	
Kr III	525.69	80		Ca VI	528.747	110		Ni IV	531.386	120	
Ni IV	525.718	250		Ni IV	528.804	210		Fe IV	531.475	30	
Co V	525.72		F, P	Kr III	528.809	15		Ni IV	531.697	180	N
Co V	525.73		F, P	P IV	528.834	150		C II	531.721	5	Z
Sc	525.79	150	N	K IV	528.879	50		Ni IV	531.737	230	
Ni IV	525.793	510	N	Cu III	528.882	2		C II	531.742	5	Z
O III	525.795	900		Fe IV	528.951	30		P IV	531.758	4	
Fe IV	525.930	50		Fe IV	528.987	4		Fe IV	531.777	300	
P IV	525.932	90		Ni IV	528.994	350		Sc IV	531.833	160	
Al IV	525.95	20		Ni IV	529.022	270		Fe IV	531.854	150	
Fe IV	525.976	12		Fe IV	529.057	30		C II	531.917	100	Z
N II	525.983		P	Fe IV	529.117	30		Fe IV	531.927	4	
Fe IV	526.045	30		Ni IV	529.131	220		Cu V	531.997		F, P
Ti V	526.076	110		Sc	529.16	300	N	Br V	532.0	350	
N II	526.118		P	O V	529.167	30	P	Ni IV	532.008	110	
Ni IV	526.189	180		O V	529.242	20	P	Fe IV	532.043	200	
Ti V	526.266	110		O V	529.272	15	P	Fe IV	532.157	4	
Sc	526.28	200	N	Fe IV	529.287	50		Fe IV	532.209	4	
Mn IV	526.293	20		Ti V	529.315	200		Sc IV	532.245	20	
Fe IV	526.293	700		Fe IV	529.328	12		Zn	532.310	12	N
F V	526.297	400		Ni IV	529.341	200	N	P IV	532.312	1	
Ni IV	526.341	250		N II	529.355	250		Ar III	532.41	350	
N II	526.345		P	Kr IV	529.37	50		K I	532.46		A, Z

Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes
Al IV	532.49	1		K V	534.873	100	N	Ni IV	536.927	20	N
Cu V	532.540		F, P	Ni IV	534.874	640		Ne IV	536.97	5	
Sc VII	532.585	20		Mn IV	534.876	40		Sc IX	536.982	450	
Fe IV	532.649	12		Ni IV	534.905	400		Cl V	537.01	400	
C II	532.659	100	Z	P III	534.960	10	Z	Zn III	537.019	8	
Cl VII	532.7		Q	Al IV	534.98	15		He I	537.0296	400	
C II	532.705	200	Z	P V	534.986	80		Ni IV	537.048	560	
Ni IV	532.754	170		Fe IV	534.988	1		Ni IV	537.080	430	
Fe IV	532.828	1		Ni IV	535.003	540		Fe IV	537.103	700	
Ni IV	532.847	540		Fe IV	535.028	4		Fe IV	537.133	200	
Ni IV	532.887	450		Cl IV	535.04	400		Ar II	537.1396	150	st
Cu V	532.933		F, P	Cl II	535.047	7		Fe IV	537.261	520	
Ti V	532.935	1		Ar II	535.0711	15	st	Cu IV	537.310	160	
Ni IV	532.981	160		Cu V	535.125		F, P	He I	537.3309		F
Ar II	533.0794	30	st	Ni IV	535.131	200	N	Al IV	537.34	5	
Se III	533.1	10		Fe IV	535.142	12		Fe IV	537.396	12	
Ni IV	533.137	480		N VII	535.197		P	Se III	537.4	1	
Si III	533.226			F VI	535.207	60		As IV	537.4	150	
Ni IV	533.248	110		Cu V	535.253		F, P	Ar II	537.4193	30	st
P IV	533.297	90		C III	535.2885	850		Ni IV	537.441	330	
Sc VII	533.442	650		P III	535.349	90	Z	Cl V	537.46	300	
Ti V	533.457	4		Mn IV	535.352	150		Ar III	537.46	300	
Kr	533.51	20	N	Fe IV	535.359	50		Ni IV	537.522	370	
N II	533.511	350		Sc VII	535.377	20		Cl IV	537.61	900	
Zn III	533.517	10		Ti VIII	535.381	5		Sc IX	537.612	300	N
Si III	533.530			Ni IV	535.386	370		Ca VI	537.613	300	N
P V	533.541	12		Cu III	535.407	3		Fe IV	537.655	50	
Ti XI	533.57		P	Ni IV	535.441	140		Cu III	537.785	1	
N II	533.581	400		Cl V	535.46	200		Fe IV	537.792	600	
K	533.587	20	N	N VII	535.467		P	Ge IV	537.8	20	P
Si III	533.592			Ni IV	535.472	280		Ni IV	537.825	290	
Fe IV	533.598	12		Fe IV	535.551	300		O II	537.830	450	
Fe IV	533.628	12		N VII	535.553		P	Fe IV	537.941	520	
Zn III	533.646	4		P III	535.560	40	Z	Ni IV	537.955	670	
N II	533.650	350		Mn IV	535.562	20		Cl II	538.0062	100	
P V	533.672	4		Ar III	535.58	350		Fe IV	538.021	150	
K	533.726	50	N	Kr IV	535.60	85		Cl V	538.03	500	
N II	533.729	500		Cl IV	535.67	700		Ni IV	538.051	90	N
Fe IV	533.757	80		F VII	535.7			Fe IV	538.057	250	
Cu V	533.786		F, P	Kr	535.71	60	N	Sc IX	538.075	5	
N II	533.815	350		K I	535.75		A, Z	C III	538.0801	900	
K	533.858	50	N	Ti V	535.836	300		Cu III	538.105	5	
Ni IV	533.903	220		O IV	535.85		Q	Cl IV	538.12	600	
C II	533.935	100		Si V	535.86	5		C III	538.1487	950	
Fe IV	533.945	1		Ti V	535.868	300		Ar XII	538.2		P
K	534.059	100	N	Ni IV	535.903	160		Fe IV	538.222	12	
Ni IV	534.080	430		Cl V	535.92	200		Ti VIII	538.241	70	
Cu V	534.140		F, P	Cu V	535.986		F, P	O II	538.256	500	
Si III	534.189			Ni IV	535.986	80	N	Ni IV	538.257	370	N
K	534.225	20	N	Fe IV	536.006	250		Si III	538.28	315	N
Ar III	534.26	50		Ca VI	536.008	20	N	Br IV	538.3	30	
Si III	534.276			Si IV	536.07	120	N	Cl II	538.3083	140	
Ti V	534.297	1		N IV	536.082		P	Ni IV	538.312	90	N
Ni IV	534.339	120	N	Ni IV	536.084	70	N	C III	538.3120	1000	
Si III	534.339			Kr	536.14	80	N	O II	538.318	350	
Ni IV	534.388	460		Cl IV	536.15	600		Ni IV	538.404	50	Q
Mn IV	534.396	0		P III	536.169	25	Z	Ar	538.41	40	N
F VII	534.4			K V	536.216	160	N	Fe IV	538.441	300	
P III	534.416	40	Z	Ni IV	536.282	660		Fe IV	538.450	30	
Fe IV	534.421	1		Mn IV	536.324	70		Cu III	538.487	1	
Ni IV	534.491	270		Fe IV	536.339	1		Se III	538.5	30	
Mn IV	534.504	90		Al IV	536.36	3		Ni IV	538.503	340	
Kr	534.51	10	N	Ti V	536.406	50		Ti V	538.511	1	
Sc VII	534.513	650		Ti XVII	536.42		F, P	Kr III	538.54	160	
O II	534.59		N	P III	536.491	40	Z	Ni IV	538.590	70	
P V	534.627	110		Cl V	536.53	300		Cl IV	538.60	400	
N II	534.637		P	Ni IV	536.535	590		Cl V	538.68	400	
Ni IV	534.648	210		Fe IV	536.609	600		S X	538.7		P
Fe IV	534.652	12		Ni IV	536.659	20		Ar III	538.79	300	
S III	534.70	135	N	Al V	536.73	5		He I	538.8956		
Cl IV	534.73	800		Fe IV	536.735	300		Al V	538.90	3	
Ni IV	534.742	170		Ar V	536.75	400	Q	Fe IV	538.968	200	
Ni IV	534.759	170		Ni IV	536.754	20	N	Cl V	538.98	300	
Mn IV	534.780	60		Ca IV	536.790	85	N	O VI	539.		ZZ
N II	534.872		P	Ni IV	536.832	540		Ni IV	539.005	370	

Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes
Zn III	539.072	2		Cl V	541.28	300		Mn V	543.351	50	
Ni IV	539.072	200		Ar II	541.3019	60	st	Kr III	543.417	80	
O II	539.086	400		Sc	541.31	350	N	C II	543.444	300	
Fe IV	539.127	4		Ni IV	541.342	20	N	Ar II	543.508	20	
Mn V	539.138	80		Fe IV	541.342	4		Al V	543.572	20	
Ar	539.19	30	N	Cu III	541.345	0	N	P III	543.584	10	
Se III	539.3	1		Si V	541.36	5		Fe IV	543.635	4	
Ni IV	539.339	20		Ni IV	541.421	460		K IV	543.640	100	N
Cu III	539.382	1		Ti V	541.459	200		Ni IV	543.676	20	
Fe IV	539.388	80		Ni IV	541.521	80		Fe IV	543.691	12	
Ca VII	539.396	40		Fe IV	541.557	12		Ar II	543.7305	270	st
Cl V	539.44	10		Ni IV	541.600	140		Ni IV	543.789	70	
Si X	539.44			Mn IV	541.667	350		Cl V	543.82	100	
Ni IV	539.476	30	N	Ni IV	541.697	550		Fe IV	543.845	80	
O II	539.547	400		Ti V	541.711	250		Ti V	543.858	1	
Ni IV	539.558	490		Cr XIX	541.72		F,P	Ne IV	543.891	750	
Kr	539.59	120	N	Fe IV	541.751	4		P III	543.909	4	
Ni IV	539.590	640		Fe IV	541.789	12		Ni IV	543.928	110	
Fe IV	539.681	4		Mn IV	541.814	100		Fe IV	543.956	50	
Ni IV	539.727	370		Mn IV	541.858	400		K IV	543.973	50	N
Ne IV	539.73	15		Al IV	541.86	5		Se III	544.0	30	
K III	539.731	150		Ni IV	541.908	40		Ni IV	544.013	150	
C VI	539.781		P	Ar XII	542.0		P	Mn IV	544.016	300	
Ar	539.79	50	N	Fe IV	542.028	200		Kr VI	544.03	600	
Fe IV	539.829	4		Ne IV	542.073	500		Fe IV	544.056	1	
S III	539.83	167	N	Ni IV	542.088	490		Sc	544.06	300	N
Ni IV	539.849	50	N	Kr	542.09	20	N	Ca VII	544.107	70	
O II	539.853	350		Mn IV	542.101	300		Ca VII	544.164	70	
Mn V	539.856	60		Sc	542.11	150	N	Zn	544.195	15	N
F V	539.91		Q	Fe IV	542.163	150		Fe IV	544.196	300	
C VI	539.938		P	Cl V	542.23	800		Ni IV	544.232	210	
Fe IV	539.938	12		Fe IV	542.240	4		Fe IV	544.257	30	
Li III	539.957		P	Ca IX	542.26			Ca VII	544.272	70	
Ni IV	539.989	220		Cl V	542.30	600		Al V	544.29	50	
C VI	539.991		P	Ni IV	542.305	280		Mn V	544.315	130	
Cu XXIV	540.0		F	Cu III	542.312	1		Fe IV	544.336	30	
Ar XII	540.0		P	Cu III	542.378	20		Ni IV	544.351	470	
Cl II	540.0270	100		Cl V	542.40	300		Ni IV	544.375	400	
Li III	540.034		P	Ni IV	542.405	410		Fe IV	544.409	30	
Fe IV	540.058	110		N IV	542.412		P	Kr III	544.410	50	
K I	540.09		A,Z	Mn IV	542.454	400		P III	544.492	4	
Mn IV	540.103	50		K I	542.47		A,Z	Mn IV	544.533	350	
Ti V	540.145	200		Fe IV	542.483	50		K V	544.537	50	N
Fe IV	540.230	80		Ni IV	542.488	470		Fe IV	544.609	4	
Mn V	540.253	60		Cu III	542.493	40		K V	544.627	50	N
Cl II	540.3330	115		Ni IV	542.549	450		Fe IV	544.658	4	
Kr V	540.35	50		P V	542.572	520		Ni IV	544.695	320	
Ni IV	540.450	20	N	Mn IV	542.653	300		Si V	544.719	30	
Fe IV	540.462	12		Sc	542.68	300	N	Ar VI	544.73	160	
Cu III	540.513	0		Fe IV	542.720	110		Mn IV	544.752	350	
Cu IV	540.647	360		Fe IV	542.756	110		Fe IV	544.768	12	
Fe IV	540.675	80		Zn	542.762	10	N	K	544.855	50	N
Fe IV	540.703	12		Fe IV	542.770	80		K I	544.86		A,Z
Fe IV	540.743	50		O IV	542.859	2		Ni IV	544.867	500	
Kr III	540.79	100		Cl V	542.87	400		P III	544.887	4	
Ni IV	540.792	590		Ge III	542.9	40	P	Fe IV	544.911	50	
Ar II	540.8066	30	st	Cu III	542.902	75		P V	544.923	600	
Kr III	540.860	110		Ar II	542.9123	300	st	Ni IV	544.950	170	
Mn IV	540.882	300		P III	542.980	4		Se III	545.0	10	
Fe IV	540.896	50		Ni IV	543.024	20		Ni IV	545.066	230	
Fe XX	540.9		F,P	O IV	543.03		Q	Cl V	545.11	1000	
Cl II	540.9047	100		S III	543.03	200		K	545.232	100	N
Cu III	540.930	25		Fe IV	543.078	30		Fe IV	545.377	12	
He I	540.9354		F	Ti V	543.103	150		Ca XIV	545.4		F,P
Fe IV	540.939	50		Fe IV	543.116	30		Br IV	545.4	120	
Ni IV	540.947	200		O IV	543.118	5		P III	545.464	10	
Kr XXIII	541.		F,P	Ni IV	543.189	500		K I	545.49		A,Z
Sc XV	541.0		F,P	Ar II	543.2032	450	st	Ni IV	545.509	450	
Mn IV	541.117	100		K	543.225	50	N	Mn V	545.532	70	
Ne IV	541.127	400		Ti XI	543.24		P	Fe IV	545.602	12	
Al V	541.161	3		Fe IV	543.245	1		Ni IV	545.652	20	N
Ti V	541.181	30		C II	543.257	200		Fe IV	545.829	30	
Cu III	541.185	0	N	P III	543.300	1		Al IV	545.97	10	
Ni IV	541.193	20		Fe IV	543.315	50		Mg VII	545.98		
Fe IV	541.266	30		Ti V	543.339	150		S III	545.99	121	N

Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes
Fe IV	546.031	80		Fe IV	548.298	250		P III	550.944	40	
Ti V	546.062	80		F II	548.322	300		O VI	551.		ZZ
K III	546.123	150		P XII	548.38			Ni IV	551.089	70	
Fe IV	546.135	80		Al IV	548.43	2		Fe IV	551.094	150	
Fe IV	546.167	30		Sc	548.45	200	N	Cl IV	551.12	200	
Ar II	546.1768	240	st	Fe IV	548.474	150		Si V	551.131	120	
Fe IV	546.216	300		F II	548.516	200		S IV	551.17	200	
Cu IV	546.319	280		Ti V	548.533	50		Fe IV	551.188	1	
Cl V	546.33	600		Mg VII	548.54			Si X	551.20		
Fe IV	546.408	30		Ni IV	548.546	90		O III	551.23		N
Kr III	546.549	80		Fe IV	548.605	110		Ni IV	551.268	100	
Ni IV	546.565	40		Fe IV	548.627	30		Si X	551.32		
Al V	546.60	40		Cu IV	548.652	510		Kr II	551.328	3	
Fe IV	546.622	12		Kr III	548.654	30		Cl II	551.333	20	
Kr III	546.687	30		Fe IV	548.763	12		P III	551.337	10	
Fe IV	546.715	50		Ar II	548.7808	210	st	Ar VI	551.37	320	
Ni IV	546.717	150		Fe IV	548.801	300		Ti V	551.410	4	
Sc	546.75	150	N	Fe IV	548.878	80		Fe IV	551.421	200	
Mn V	546.779	70		Ar VI	548.91	200		Ca VII	551.448	110	
Zn III	546.802	0		K I	548.99		A, Z	Ca VII	551.506	40	
Ni IV	546.804	60		Fe IV	549.012	4		Kr V	551.51	85	
F II	546.852	600		Ni IV	549.013	70	N	Si V	551.597	20	
Fe IV	546.857	4		N II	549.027		P	P III	551.607	1	
Ni IV	546.866	20	N	Ca V	549.070	150	N	Ni IV	551.627	150	
Fe IV	546.897	50		Ni IV	549.073	290		Ga XXIV	551.63		F, P
Ni IV	546.974	20	N	Cu III	549.075	4		Cl IV	551.64	100	
Fe IV	546.995	80		Ti V	549.083	110		Kr III	551.685	50	
Zn III	547.083	0	Q	Ni IV	549.161	70	N	Fe IV	551.689	80	
O III	547.13		N	Cl IV	549.22	500		P III	551.741	1	
Fe IV	547.136	30		P IV	549.221	25		Ni IV	551.755	110	
C II	547.140		Z	Be III	549.31	10		Fe IV	551.766	300	
C II	547.153	10	Z	Ni IV	549.315	270		C II	551.874	10	
Ar II	547.1650	270	st	C II	549.3195	300	ST	Cl VI	551.99	500	
Fe IV	547.222	30		Ni IV	549.366	70	N	Fe IV	551.993	12	
Fe IV	547.254	30		C II	549.3785	400	ST	Cl IV	552.02	700	
Ni IV	547.256	20	N	Ni IV	549.457	270		P III	552.045	1	
C II	547.277	5	Z	Zn III	549.491	4		P IV	552.045	4	
S III	547.28	126	N	Ni IV	549.496	180	Q	Cl VI	552.05	100	
C II	547.291	5	Z	C II	549.5110	500	ST	Fe IV	552.050	4	
Cu IV	547.294	340		C II	549.5700	300	ST	F V	552.06		Q
Cu III	547.324	3	N	Fe IV	549.628	1		Ti V	552.079	0	
Ni IV	547.330	20	N	Cu III	549.669	1	N	Fe IV	552.106	50	
Kr	547.37	60	N	Br V	549.8	150		Fe IV	552.142	520	
Fe IV	547.373	12		Br IV	549.8	300		Fe IV	552.168	200	
Si IV	547.40	157	N	Fe IV	549.843	50		Ti V	552.185	0	
Ni IV	547.426	20	N	Cu III	549.987	4	N	Ni IV	552.401	260	
Cu IV	547.454	250		P III	549.995	25		Ca III	552.411	10	
Ar II	547.4605	360	st	As IV	550.0	50		Ni IV	552.437	270	
Mn V	547.515	80		Cl IV	550.02	400		Fe IV	552.543	50	
Cl V	547.63	1000		Al XI	550.03	2		P III	552.573	10	
Ti V	547.642	30		Fe IV	550.030	4		Al IV	552.67	15	
Ni IV	547.669	40	N	Fe IV	550.122	110		Ni IV	552.685	120	
Fe IV	547.673	12		Si V	550.123	90		Fe IV	552.705	4	
Fe IV	547.744	110		P III	550.157	25		Fe IV	552.739	375	
N II	547.818	10		Cl II	550.188	25		Ni IV	552.779	260	
Fe IV	547.818	12		Ca VII	550.202	160		Fe IV	552.827	80	
Cu III	547.833	1		Kr	550.29	40	N	Cl III	552.91	200	
F II	547.874	450		Ni IV	550.303	140		K I	552.94		A, Z
Fe IV	547.887	80		Fe IV	550.315	375		Cu III	553.012	50	
Ni IV	547.897	50	N	K III	550.323	50		Fe IV	553.063	4	
Ca VI	547.898	150	N	P III	550.343	40		P III	553.089	1	
Br V	547.9	350		Cl VI	550.36	250		K I	553.12		A, Z
Fe IV	547.901	30		Se III	550.4	1		Ti V	553.122	4	
Ni IV	547.984	240		Fe IV	550.464	4		Ar II	553.1263	60	st
Ar II	547.9960	120	st	Ar II	550.4810	120	st	Fe IV	553.201	30	
Fe IV	548.029	50		Fe IV	550.584	30		Cl IV	553.30	600	
Kr	548.04	60	N	P III	550.614	10		O IV	553.330	900	
Fe IV	548.066	250		Fe IV	550.617	12		Ar III	553.47	450	
Cl II	548.088	15		Zn III	550.662	0	Q	Fe IV	553.549	50	
Ni IV	548.101	90		Cl IV	550.71	300		Fe IV	553.590	12	
Ni IV	548.155	70	N	Fe IV	550.728	4		Ti V	553.857	0	
Cu III	548.159	2		P III	550.770	4		K I	553.86		A, Z
Fe IV	548.211	150		Ar II	550.9045	30	st	Fe IV	553.935	30	
Fe IV	548.265	4		K I	550.91		A, Z	K VI	554.072		
Ni IV	548.294	60	N	Cu IV	550.921	600		O IV	554.075	950	

Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes
Fe IV	554.114	12		Fe IV	557.281	30		C II	560.4386	40	ST
N IV	554.137		P	Fe IV	557.360	12		Zn III	560.513	8	
Fe IV	554.161	4		Ni IV	557.401	10	N	Ar XVII	560.54		P
Ne VI	554.2			Sc IV	557.505	285		Cu V	560.615		F,P
Cl IV	554.21	100		Cl II	557.5192	60		Cl III	560.64	100	
Fe IV	554.257	300		Ni IV	557.566	10		Kr II	560.792	3	
O III	554.275	10		Kr	557.69	30	N	P IV	560.799	10	
Fe IV	554.292	80		Fe IV	557.700	12		Si IV	560.980	5	
Fe IV	554.335	12		Ca X	557.763	500		Kr III	560.984	50	
Ni IV	554.379	160	N	Fe IV	557.853	12		Ar IV	561.06	20	Q
Cu V	554.487		F,P	Fe IV	557.895	80		Sc VI	561.160	650	
Br IV	554.5	250		Br IV	557.9	150		Fe IV	561.192	4	
Ar	554.50	120	N	Ni IV	557.949	10		Si V	561.204	10	
O IV	554.514	1000		Sc III	557.995	1		Se VII	561.249	1	N
Kr VI	554.52	500		Sc VII	558.044	450		Ca VI	561.281	20	
Cl IV	554.62	700		Cl II	558.14	100		V VI	561.297	1	
C III	554.63	200		Mg VII	558.22			Fe IV	561.373	1	
Se III	554.7	10		Fe IV	558.280	1		Ni IV	561.378	300	
Kr III	554.796	80		Se III	558.3	10		Ne VII	561.378	200	
Mg VII	554.89			Ar III	558.32	250		Al V	561.40	30	
Ni IV	554.893	250		Fe IV	558.383	50		Fe IV	561.447	50	
Ca VI	554.983	40		Cl III	558.39	100		Fe IV	561.494	80	
S XI	555.0		P	Fe IV	558.457	110		Cl III	561.53	700	
O II	555.056	250		Ni IV	558.469	10		Cl II	561.5930	140	
Ni IV	555.062	100	Q	Ar V	558.48	250		K VIII	561.595	20	
O II	555.121	250		Mn IV	558.495	300		Mn IV	561.598	90	
N IV	555.126		P	Ne VI	558.59	50		Fe IV	561.678	30	
Ca XV	555.15		F,P	Sc III	558.608	1		Cl III	561.68	700	
Ti V	555.164	80		Ne VII	558.61	400		Cl II	561.714	25	
Fe IV	555.254	50		Ca V	558.615	450		Ne VII	561.728	400	
O IV	555.261	900		Mn IV	558.624	0		Cl III	561.74	700	
Fe IV	555.306	1		Zn III	558.641	0		Sc IV	561.891	70	
Fe IV	555.345	250		Kr III	558.642	80		Kr II	561.932	3	
Zn III	555.350	0	Q	Fe IV	558.708	80		O V	561.958	7	
Cl IV	555.49	100		S X	558.9		P	Ca III	561.969	20	
Cl VI	555.49	1000		Fe IV	558.943	4		O VI	562.		ZZ
Cl VI	555.58	150		Fe IV	558.984	12		O V	562.080	15	
Zn III	555.627	0		Zn XXIII	559.12		F,P	Ar	562.18	30	N
Ar VI	555.64	160		Mn IV	559.231	350		Ca VI	562.250	150	N
Fe IV	555.658	300		Zn III	559.239	6		Cl II	562.2867	110	
Sc VIII	555.672	220		Kr	559.24	30	N	Mn IV	562.288	80	
Ar II	555.7659	90	st	Cu III	559.279	30		Fe IV	562.294	1	
Cu V	555.819		F,P	Cl II	559.3057	185		C II	562.338	150	Z
Cu IV	555.854	100		Kr II	559.315	15		Fe IV	562.348	1	
K I	555.91		A,Z	Ti V	559.323	0		C II	562.367	150	Z
Fe IV	555.938	4		Cl II	559.4065	160		Cl II	562.3684	170	
Si V	555.944	40		Fe IV	559.433	1		Ar VIII	562.46		
Cl II	555.955	5		Ar	559.48	40	N	C II	562.473	150	Z
Zn III	555.979	0		Cl II	559.5279	170		Fe IV	562.492	12	
Fe IV	556.065	150		Si IV	559.533	2		C II	562.497	150	Z
Cu V	556.107		F,P	Mn IV	559.544	0		Si V	562.498	50	
Fe IV	556.199	4		Cu V	559.556		F,P	Sc VII	562.504	650	
Cl III	556.23	600		Fe IV	559.558	4		Sc VIII	562.547	450	
Cu III	556.231	15	N	Zn III	559.628	2		C II	562.562	300	Z
Fe IV	556.260	12		Br IV	559.7	300		Cl II	562.5662	170	
Fe IV	556.374	1		Fe IV	559.742	50		Cr VI	562.572	1	
Fe IV	556.551	4		N II	559.762	10		Ca III	562.607	10	
Ti V	556.562	1		Cu III	559.836	3	N	Fe IV	562.607	150	
Fe IV	556.601	30		Cu V	559.865		F,P	Ar VIII	562.61		
Ni IV	556.604	20		Ca XIII	559.93		F,P	Sc IV	562.640	220	
Cl III	556.61	700		Ni IV	559.935	250		Cl II	562.6651	140	
Kr	556.66	30	N	Ne VII	559.947	300		Kr III	562.69	100	
Si V	556.670	55		Kr	560.00	30	N	Ne VI	562.71	10	
Zn III	556.763	6		Ti V	560.056	1	Q	Al V	562.730		
Fe IV	556.797	12		Cl II	560.091	8		Sc VIII	562.777	70	
Ar II	556.8169	360	st	Cr XIII	560.11		P	Kr II	562.792	3	
Cu V	556.848		F,P	Cu III	560.155	3	N	Ne VI	562.80	150	
Ar III	556.89	300		Mn IV	560.181	300		Mn IV	562.806	50	
K VIII	557.016	20		Ar II	560.2232	270	st	Co V	562.89		F,P
Ar	557.04	40	N	Si V	560.227	100		Ne VII	562.992	200	
Ar XII	557.1		P	C II	560.2394	400	ST	Ca VI	563.042	70	
Ti V	557.115	0		F V	560.24		Q	Be IV	563.193		P
Cl III	557.12	700		Al III	560.3173	500		Kr VI	563.2		
Cu V	557.172		F,P	Al III	560.4331	200		Be IV	563.275		P
Ni IV	557.243	30		C II	560.4367	500	ST	Be IV	563.304		P



Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes
Co V	563.33		F,P	Cl II	566.8002	160		Fe IV	570.010	200	
Sc VII	563.401	200	N	K	566.836	20	N	Kr II	570.013	60	
Fe IV	563.443	4		Al V	566.847	20		Cl VI	570.03	400	
Kr V	563.46	120		P V	566.904	1		Fe IV	570.075	200	
Fe IV	563.589	4		Fe IV	566.912	80		Mn IV	570.130	0	
Cl II	563.6169	160		Fe IV	566.994	12		Sc VI	570.300	1000	
Se VII	563.677	1	N	Fe IV	567.211	30		Al V	570.364	100	
Fe IV	563.679	30		Sc	567.23	350	N	Cl VI	570.53	200	
Zn III	563.759	1		Sc IV	567.251	160		Ar V	570.61	80	
Br IV	563.8	300		Co V	567.28		F,P	Sc VI	570.627	70	
Br IV	563.9	250		Mn IV	567.295	80		F IV	570.640	800	
S IV	564.00	119	N	Fe IV	567.323	50		Mn IV	570.675	50	
Fe IV	564.141	30		Cl II	567.3397	25		Cu III	570.683	3	N
Fe IV	564.285	12		Br IV	567.4	120		Kr III	570.735	5	
Cl III	564.29	400		Ti XV	567.42		F,P	Cl VI	570.88	10	
Zn	564.305	10	N	Fe IV	567.457	4		Ti V	571.095	12	Q
Si V	564.403	60		Cl VI	567.48	100		Si V	571.158	20	
K VIII	564.480	100		Fe IV	567.500	12		V VI	571.190	1	
Cl III	564.51	200		Kr	567.54	30	N	Fe IV	571.215	30	
Ne VII	564.529	200		F III	567.636	150		Sc VII	571.249	650	
C II	564.565	40	Z	F III	567.686	400		Ni IV	571.262	10	
Cl II	564.5782	160		Fe IV	567.718	80		F IV	571.304	800	
C II	564.582	40	Z	F III	567.752	300		Mn IV	571.352	250	
C II	564.608	100	Z	Fe IV	567.769	4		Cl VI	571.38	100	
C II	564.635	50	Z	F III	567.801	150		F IV	571.391	900	
C II	564.663	200	Z	P V	567.810	1		Cl VI	571.44	10	
C II	564.698	40	Z	Ni IV	567.811	100		Sc VIII	571.442	650	
Cl II	564.7775	140		Si III	567.878			K VI	571.564	1	
Cl II	564.9716	140		Ar XII	567.9		P	Al IV	571.61	20	
Se III	565.0	1		Fe IV	567.919	50		Mn IV	571.696	350	
Fe IV	565.062	200		Fe IV	567.987	12		Al V	571.76	15	
Co V	565.10		F,P	P IV	568.038	250		Mn IV	571.774	350	
Cl II	565.1082	80		P III	568.038	120		Sc VI	571.900	550	
Kr III	565.128	50		Si V	568.054	90		Cl II	571.9033	200	
K VIII	565.132	1		Ni IV	568.056	150		S IV	571.92	88	N
Fe IV	565.220	30		Fe IV	568.091	200		Mn IV	571.923	20	
Kr	565.26	30	N	Zn III	568.099	25		Zn III	571.927	15	
Cl III	565.27	300		Al XI	568.15	1		Cu IV	571.974		F,P
Fe IV	565.280	250		S IV	568.21	270	N	Kr III	571.98	300	
Si III	565.289	20		Cl II	568.2952	10		Se VII	572.0	10	N
Ar	565.31	20	N	Sc VII	568.329	100	N	Cl II	572.0083	170	
Fe IV	565.374	80		Se XXVII	568.4		F,P	Ar II	572.0136	270	st
Ca IV	565.463	150		Ne V	568.42	400		Mn IV	572.021	30	
Cl III	565.48	400		Ni IV	568.489	20		N II	572.069		
Cl VI	565.48	400		Al V	568.492	60		Ne V	572.11	250	
C III	565.5280	700		K	568.534	20	N	Si V	572.110	5	
Co V	565.54		F,P	Ni IV	568.621	10		Cl II	572.1215	40	
Fe IV	565.612	200		Al V	568.629	20		Zn III	572.151	10	
Ti V	565.627	30		Mn IV	568.774	30		K	572.180	20	N
Kr III	565.645	110		Co V	568.84		F,P	Fe IV	572.189	4	
Si III	565.698	40		Fe IV	568.951	110		Mn IV	572.203	40	
Cl II	565.7376	170		Fe XX	569.		F,P	Br IV	572.3	50	
S IV	565.81	55	N	Br IV	569.1	350		Se XX	572.3		F,P
Cl II	565.8366	160		Ca	569.122	50	N	Ne V	572.34	800	
Kr III	565.88	80		Kr VI	569.13	800		Mn IV	572.433	400	
Ar XII	565.9		P	Kr III	569.160	110		K	572.451	20	N
Co V	565.96		F,P	Ni IV	569.165	20		Mn IV	572.532	100	
Fe IV	566.034	50		Fe IV	569.246	110		Fe IV	572.613	80	
Se III	566.2	0		Ti XI	569.3			F IV	572.663	1000	
O V	566.232	7		Br IV	569.3	150		Sc IV	572.667	220	
Ti XXI	566.25		P	N IV	569.450		F,P	Mn IV	572.671	350	
Fe IV	566.274	30		K VIII	569.506	5		Cl III	572.69	400	
Fe IV	566.406	30		Ni IV	569.564	20		Zn III	572.788	20	
Kr	566.46	40	N	Mn IV	569.614	200		K VIII	572.820	20	
Ti V	566.461	0		Fe IV	569.634	50		Fe IV	572.878	300	
C III	566.48	400		Cu III	569.648	2	N	Sc VIII	572.987	20	
Si III	566.546			Fe IV	569.672	200		Mn IV	572.992	40	
Si III	566.613	160		K VI	569.696	20	N	Fe IV	573.050	4	
Cl VI	566.63	200		Ne V	569.76	250		Ni IV	573.063	60	
Fe IV	566.699	12		Mn IV	569.781	300		Zn III	573.187	12	
Ni IV	566.714	40		Ne V	569.83	500		Sc VIII	573.206	1	
Si V	566.72	50		Cl II	569.8349	140		Kr III	573.231	80	
Mn IV	566.757	30		P III	569.853	200		O III	573.24		N
Sc VI	566.770	650		K VI	569.915	20	N	Zn III	573.338	8	
Sc IV	566.773	110		Zn III	569.987	25		Mn IV	573.352	80	

Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes
Cr IV	573.356	5		Ni IV	576.180	70		Co V	578.94		F,P
Sc V	573.356	1000		Kr	576.23	30	N	Co V	578.95		F,P
Ar II	573.3619	360	st	Cr IV	576.241	110		Ni IV	579.009	400	
Se III	573.4	1		F IV	576.265	15		Kr II	579.101	1	
Ar III	573.47	200		F IV	576.359	10		Mn IV	579.155	450	
Si III	573.538			Ni IV	576.376	250		Ni IV	579.183	300	
F IX	573.554		P	Cl VI	576.42	200		Cl II	579.1982	40	
Br IV	573.6	250		Be IV	576.567		P	Ar III	579.21	150	
Kr V	573.65	300		Br IV	576.6	350		K I	579.30		A,Z
Mn IV	573.677	500		Fe IV	576.609	12		Ni IV	579.337	20	N
Zn III	573.695	8		Si V	576.614	5		Kr II	579.414	3	
Mn IV	573.706	200		Co V	576.62		F,P	Sc IV	579.427	70	
Cr IV	573.758	20		Cr IV	576.623	110		Ne I	579.4722		st
Fe IV	573.759	30		Co V	576.63		F,P	Ne I	579.4888		st
P IV	573.760	10		S IV	576.65	97	N	Ti V	579.518	1	
F III	573.886	20		Be IV	576.652		P	Al V	579.53	2	
F III	573.935	1		Kr II	576.653	3		Fe IV	579.543	250	
Si III	573.951			Ca	576.662	50	N	Fe IV	579.624	12	
Si III	573.961			Be IV	576.682		P	Al V	579.73	5	
Ni IV	573.970	10	N	Ar II	576.7364	300	st	Fe IV	579.758	300	
F IX	573.976		P	Fe IV	576.758	300		Ne I	579.7711		st
Ca X	574.010	360		Sc X	576.79			Ca VI	579.775	100	N
Zn III	574.037	12		Ne I	576.8650		st	Fe IV	579.783	50	
O III	574.065	1		C II	576.8748	100		Mn IV	579.787	600	
Sc	574.11	150	N	Si V	576.89	1		Cr IV	579.831	40	
F IX	574.114		P	Fe IV	576.903	80		Kr III	579.831	110	
Zn III	574.161	8		Kr II	576.998	1		Ni IV	579.835	300	
Fe IV	574.232	12		Zn III	577.031	25		Co V	579.84		F,P
C III	574.2809	1000		C II	577.0859	200		Ne I	579.8411		st
Cl II	574.2946	220		Ne I	577.1090		st	Ti IX	579.896	1	
F III	574.384	10		Ar III	577.15	150		P III	579.944	120	
Cl II	574.4088	280		Ne I	577.1692		st	Fe IV	579.956	4	
Cl III	574.41	300		Ni IV	577.201	100		Ca XIV	580.0		F,P
Fe IV	574.441	110		Fe IV	577.308	80		Mn IV	580.026	500	
Sc	574.48	150	N	Fe IV	577.336	4	N	Ca III	580.058	10	
Fe IV	574.480	200	P	Kr	577.35	30	N	Sc	580.10	350	N
Fe IV	574.497	50	P	Cl VI	577.44	100		S III	580.17	210	N
Al V	574.499	5		Ne I	577.4886		st	Fe IV	580.211	50	
Fe IV	574.533	12		S V	577.55	165	N	Ar II	580.2631	360	st
Fe IV	574.626	80		Zn III	577.590	15		Mn IV	580.298	30	
N II	574.650	500		Ne I	577.6047		st	K V	580.320	450	
Sc IV	574.669	160		Al IV	577.66	10		Kr II	580.345	1	
Co XX	574.68		F,P	Fe IV	577.687	30		Mn IV	580.383	350	
Al V	574.77	8		F IV	577.734	35		O II	580.400	300	
Fe IV	574.770	4		Ni IV	577.788	80		Al IV	580.41	40	
Si III	574.799			K I	577.89		A,Z	Ni IV	580.423	100	
Ni IV	574.799	30		Ne I	577.9749		st	Cl VI	580.44	200	
Si III	574.814			S XI	578.0		P	Co V	580.51		F,P
O III	574.82		Q	Cl II	578.007	25		Ne I	580.5119		st
Si III	574.824			Co V	578.02		F,P	Fe IV	580.531	12	
P III	574.869	1	Z	Ne I	578.0715		st	Fe IV	580.551	250	
Kr III	574.958	15		Kr III	578.09	10		Kr III	580.580	80	
Zn	574.967	20	N	Ar II	578.1071	270	st	Fe IV	580.595	4	
Cr IV	575.048	160		Ne I	578.1270		st	Kr VI	580.63	600	
Cr IV	575.175	20		Cu IV	578.130		F,P	Ne I	580.6893		st
Fe IV	575.185	1		Fe IV	578.199	12		Ne I	580.7137		st
P III	575.217	1	Z	Kr III	578.212	30		Co V	580.76		F,P
O II	575.28		N	Fe IV	578.243	110		Co V	580.77		F,P
Fe IV	575.281	80		Si V	578.255	20		Si XI	580.85	1	
Cl II	575.4019	160		Al IV	578.32	5		O II	580.967	350	
Al V	575.473	50		Ar III	578.39	200		Mn IV	581.099	30	
Fe IV	575.534	4		Kr	578.47	60	N	Fe IV	581.112	1	
Sc VI	575.556	650		Fe IV	578.511	4		Ne I	581.1219		st
Cl III	575.58	300		Ne I	578.5129		st	S II	581.13	50	N
F IV	575.643	10		Zn III	578.559	12		Fe IV	581.176	1	
Sc XVI	575.66		F,P	Fe IV	578.604	12		Al IV	581.18	10	
Co V	575.71		F,P	Ar II	578.6043	270	st	V VI	581.214	1	
Kr III	575.72	100		Ne I	578.6056		st	Kr II	581.219	3	
Ni IV	575.818	250		Ne I	578.6185		st	Sc VI	581.393	650	
Cr IV	575.850	20		Co V	578.68		F,P	Mn IV	581.442	600	
Al IV	575.89	20		K I	578.70		A,Z	Ca VI	581.466	150	N
Kr II	575.907	7		Ca VI	578.732	200	N	Si V	581.473	50	
Ar XII	576.0		P	Ne I	578.8224		st	Kr II	581.500	15	
Ne I	576.0052		st	Ti V	578.905	0		Fe IV	581.502	80	
Kr III	576.08	80		Fe IV	578.921	50		Fe IV	581.543	30	

Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes
Mn IV	581.650	600		Fe IV	584.542	30		Ne I	587.2128	35	st
Co V	581.69		F, P	Ni IV	584.559	10	N	Mn IV	587.232	350	
Cl II	581.797	9		Cl II	584.611	20		Cu IV	587.270		F, P
Fe IV	581.798	150		Fe IV	584.623	30		Cl III	587.30	400	
Ni IV	581.818	20		Fe IV	584.698	80		Ca III	587.354	50	
P III	581.831	200		Ni IV	584.741	10		Fe IV	587.364	4	
Al IV	581.91	100		Cl II	584.7718	170		Kr III	587.378	5	
Mn IV	581.914	40		Sc IV	584.826	285		S IV	587.48	106	N
Co V	581.95		F, P	Mn IV	584.835	500		Si IV	587.53	104	N
Fe IV	581.950	50		Cu IV	584.852	180		Kr III	587.536	5	
Co V	581.96		F, P	Cl II	584.8829	170		Fe IV	587.556	150	
Be III	582.078	90		Si V	584.903	20		Mn IV	587.574	200	
Mn IV	582.089	80		Cu XXIII	585.0		F	Zn III	587.589	3	Q
Sc III	582.1144	2		S III	585.03	101	N	Ca VI	587.604	100	N
Zn III	582.123	10		Fe IV	585.036	150		Fe IV	587.686	30	
Fe IV	582.142	1		Br IV	585.1	300		Fe IV	587.734	80	
N II	582.156	400		Zn III	585.100	2		Ca VI	587.872	50	N
Ni IV	582.167	10	N	Al IV	585.13	5		Fe XXI	587.9		F, P
Br IV	582.2	150		Kr III	585.141	110		Sc V	587.935	600	
Fe IV	582.306	4		Fe IX	585.2		F, P	Cu IV	587.999		F, P
Al V	582.395	10		Mn IV	585.208	600		Se VI	588.0	85	
Mn IV	582.400	30		Ne I	585.2472		st	Cl II	588.0413	140	
Kr	582.42	80	N	C III	585.261	600		Zn III	588.048	10	
Cl II	582.4268	50		Ne I	585.3042		st	F III	588.060	3	
Ne I	582.4691		st	Kr VII	585.37	1000		Kr VI	588.08	800	Q
Fe IV	582.480	1		Fe IV	585.416	80		Fe IV	588.088	30	
Ne I	582.5064		st	C III	585.417	800		Fe IV	588.208	4	
Ni IV	582.544	10	Q	Al IV	585.44	3		F III	588.208	6	
Fe IV	582.567	1		Cl II	585.484	10		Fe IV	588.280	30	
Ne I	582.5982		st	C III	585.496	500		Al V	588.371	4	
Cl VI	582.6			K V	585.506	160		Ni IV	588.426	20	N
Cu III	582.657	1		Mn IV	585.586	500		Fe IV	588.447	110	
Fe IV	582.742	12		C III	585.608	600		Fe IV	588.639	1	
Sc III	582.7846	3		Al V	585.61	20		Ni IV	588.654	20	
Mn IV	582.785	450		S IV	585.62	105	N	Fe IV	588.745	110	
Cr IV	582.824	40		C III	585.666	600		Cl II	588.7857	185	
Ca VIII	582.845	360		Kr II	585.688	7		F I	588.84		Z
Zn	582.852	20	N	O III	585.71		N	Cl II	588.8564	140	
Fe IV	582.972	50		Mn IV	585.736	450		Ar VI	588.92	200	
Mn IV	582.993	500		Ar VII	585.75	750		Ca III	589.013	25	
Ne I	583.1261		st	Fe IV	585.777	50		Zn III	589.146	6	
Fe IV	583.138	150		Kr III	585.955	110		P IV	589.161	200	
Fe IV	583.342	4		Fe IV	585.976	30		Ne I	589.1792	35	st
Ca III	583.350	10		As VI	585.981	7		Kr II	589.265	40	
Mn IV	583.390	450		Fe IV	586.018	1		Ni IV	589.299	30	
Ar II	583.4371	300	st	Zn III	586.087	8		Sc III	589.320	0	
Fe IV	583.458	110		Cu IV	586.095		F, P	Cu III	589.328	15	N
Mn IV	583.480	350		N IV	586.104		P	Al IV	589.39	20	
Al IV	583.59	70		Fe IV	586.184	1		Sc III	589.487	20	
N IV	583.601		P	Kr	586.23	80	N	S IV	589.60	25	N
Mn IV	583.618	40		Cl II	586.2442	220		Ar VI	589.78	80	
O VIII	583.689		P	Mn IV	586.245	350		Fe IV	589.795	30	
Ne I	583.6893		st	Kr II	586.269	3		Ni IV	589.803	10	
Fe IV	583.799	12		Sc	586.29	150	N	Sc	589.83	400	N
Mn IV	583.824	150		Ne I	586.3140		st	Fe IV	589.833	80	
Fe IV	583.869	50		K V	586.321	450		Cl II	589.9001	160	
Mn IV	583.945	100		Fe IV	586.337	12		Ne I	589.9113	35	st
O VIII	583.976		P	Cl II	586.3828	200		Sc III	590.006	30	
F VIII	584.0			Cl II	586.4528	100		Ne I	590.0108		st
Fe IV	584.002	80		Ca III	586.547	10		Al V	590.078	8	
Mn IV	584.063	150		Mn IV	586.590	30		Ni IV	590.125	10	
Cl II	584.067	6		Fe IV	586.604	30		F I	590.25		Z
O VIII	584.071		P	Br IV	586.7	350		Ca VI	590.396	150	N
Fe IV	584.083	110		Cl III	586.87	400		Fe IV	590.566	110	
Mn IV	584.124	20		Mn IV	586.873	450		Fe IV	590.733	30	
Ni IV	584.167	30		Sc X	586.96			Fe IV	590.828	110	
Fe IV	584.222	50		Fe IV	586.993	80		Cl II	590.8491	170	
As VI	584.296	5		Cl II	587.0041	125		As VI	590.930	63	
Mn IV	584.296	50		Ar VI	587.01	40		Ni IV	590.943	10	N
K IV	584.314	1		Cl III	587.08	300		Cl II	590.955	9	
Al V	584.334	10		Al IV	587.11	5		Al V	590.98	10	
He I	584.3340	1000		Fe IV	587.140	12		Ca III	590.987	25	
Fe IV	584.366	12		Mn IV	587.157	350		Fe IV	591.076	30	
Fe IV	584.428	110		Cl II	587.1616	140		Cl III	591.12	300	
Mn IV	584.443	70		Zn III	587.194	4		N IV	591.180		P

Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes
Fe IV	591.180	4		Ni IV	594.707	150		As VI	597.453	69	
As VI	591.186	41		Fe IV	594.795	50		Fe IV	597.456	200	
K IV	591.237	50	N	C II	594.8000	600	ST	Fe IV	597.535	80	
Se VII	591.243	1	N	Kr VI	594.84	300		Mn IV	597.577	500	
K IV	591.311	50	N	Mn III	594.872	0		Fe IV	597.589	200	
Sc	591.37	300	N	N IV	594.895		P	Mn IV	597.644	450	
He I	591.4117	40		Mn IV	594.959	500		Ar II	597.7000	360	st
Cl III	591.43	400		Fe IV	594.968	1		As VI	597.706	27	
Fe IV	591.465	50		Ca III	594.978	50		O III	597.818	750	
Fe IV	591.529	4		K XIII	595.		F,P	Mn IV	597.820	150	
Fe IV	591.574	4		Kr VII	595.0		P	Ca VIII	597.851		
Ca III	591.584	150		Ni IV	595.008	20	N	Fe IV	597.871	110	
Al IV	591.62	60		C II	595.0219	700	ST	Fe IV	598.062	12	
Cl III	591.65	400		C II	595.0245	70	ST	Ni IV	598.154	30	
As VI	591.671	27		Sc	595.06	50	N	Fe IV	598.156	80	
Mn IV	591.707	150		Cr IV	595.093	70		Fe IV	598.198	30	
Zn III	591.710	2		Fe IV	595.133	30		Cl VII	598.211	600	
P V	591.714	1		Ge V	595.185	3		Fe IV	598.267	50	
Sc	591.75	300	N	Mn IV	595.223	60		Cl II	598.3026	100	
P IV	591.816	10		Ni IV	595.249	80		Ni IV	598.319	30	
Ne I	591.8303	70	st	Fe IV	595.289	110		Cl II	598.4179	100	
Cl III	591.96	200		Ni IV	595.327	20		Mn IV	598.526	500	
Br IV	592.0	300		Mn IV	595.392	0		Fe IV	598.532	150	
Ni IV	592.224	30		Ni IV	595.447	30	N	Kr II	598.643	3	
Mn IV	592.230	0		Kr III	595.53	140		Zn III	598.665	2	
Fe XIX	592.24	150	F	Kr II	595.539	100		Fe IV	598.669	30	
Al V	592.24	4		Ni IV	595.621	20	N	Cu III	598.680	2	
Ni IV	592.280	20		Fe IV	595.644	4		Ne I	598.7056	75	st
Cu XXI	592.3		F	Cu III	595.662	1	N	Sc VII	598.707	160	
Fe IV	592.300	1		Mn IV	595.684	550		Kr II	598.805	40	
Fe IV	592.371	4		Si IV	595.84	123		Fe IV	598.825	110	
Al IV	592.42	2		Fe IV	595.906	4		Ge V	598.826	15	
Cu IV	592.560		F,P	Ne I	595.9200	100	st	Cu IV	598.836		F,P
Mn IV	592.599	120		Sc X	595.98			Ne I	598.8908	35	st
Zn III	592.677	0		Cl III	595.99	300		Ni IV	598.932	20	
Fe IV	592.699	1		Se V	596.0	120		Al IV	598.95	10	
P V	592.712	4		Ni IV	596.058	300		Kr II	598.978	25	
Fe IV	592.942	80		Mn IV	596.174	450		Fe IV	599.020	30	
Fe IV	593.053	80		Cl III	596.24	400		Fe IV	599.075	1	
Ni IV	593.148	60		As VI	596.317	16		Fe IV	599.180	12	
Fe IV	593.255	4		Ni IV	596.338	10	N	Ni IV	599.197	30	N
Mn IV	593.279	100		Fe IV	596.349	80		Ar XII	599.2		P
Cl II	593.2888	140		Be IV	596.365		P	Cl II	599.2056	220	
Fe IV	593.315	4		Zn III	596.407	2	Q	Fe IV	599.324	4	
Mn IV	593.329	80		Kr III	596.412	110		Fe IV	599.407	12	
Ca V	593.404	50	N	Fe IV	596.446	1		S IV	599.41	104	N
Fe IV	593.409	50		Be IV	596.455		P	Fe IV	599.441	1	
Ca V	593.472	50	N	Be IV	596.487		P	Sc	599.57	250	N
Fe IV	593.533	110		S III	596.53	198	N	O III	599.598	900	
Ca III	593.645	10		Sc VII	596.530	70		Br IV	599.6	250	
Kr III	593.703	110		O III	596.56		N	N II	599.644		P
Cu IV	593.761		F,P	Cr IV	596.569	40		Fe IV	599.692	50	
Fe IV	593.792	4		Kr III	596.584	50		As VI	599.705	35	
Ni IV	593.842	60		Ca III	596.675	50		Cl IV	599.73	200	
Fe IV	593.888	30		Ar VI	596.69	160		Ni IV	599.761	20	Q
As VI	594.002	7		Fe IV	596.764	50		N II	599.819		P
Kr III	594.098	110		Fe IV	596.815	12		Mn IV	599.848	40	
Ar VI	594.10	100		Cu IV	596.861		F,P	Se VI	599.901	30	N
Mn IV	594.106	120		Fe IV	596.893	30		Ni IV	599.930	20	
Fe IV	594.162	110		Ca VIII	596.935	450		Kr II	599.954	40	
Ca V	594.239	50	N	V VI	596.947	5		Fe IV	599.958	30	
Mn IV	594.260	120		Kr II	596.956	25		Ne I	600.0365	70	st
Kr II	594.286	3		Co XXI	597.0		F,P	N IV	600.061		P
Ni IV	594.294	60		Fe IV	597.010	12		Br IV	600.1	250	
Cl II	594.3484	80		Ni IV	597.083	10	Q	F III	600.104	10	
Al IV	594.38	40		Sc	597.10	50	N	Fe IV	600.105	12	
Cl II	594.4756	170		Mn IV	597.107	400		N II	600.115		P
Fe IV	594.502	50		Kr III	597.19	120		Kr III	600.172	200	
Mn IV	594.503	350		Fe IV	597.288	12		Ca VI	600.206	40	
Cu IV	594.506		F,P	Ca III	597.291	100		Ca III	600.221	10	
Fe IV	594.543	4		Mn IV	597.298	450		C II	600.251	100	Z
Al IV	594.55	30		Fe IV	597.321	110		Mn IV	600.257	350	
Fe IV	594.626	30		Ge V	597.383	2		Fe IV	600.290	12	
Cl III	594.64	400		Zn III	597.413	0	Q	C II	600.337	100	Z
Fe IV	594.664	12		Ni IV	597.436	30		Fe IV	600.348	80	

Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes
C II	600.353	300	Z	K XIV	603.58		F, P	Fe IV	606.534	12	
F III	600.390	6		Fe IV	603.582	50		Ni IV	606.597	10	N
C II	600.503	100	Z	Br IV	603.6	120		Mn IV	606.648	80	
C II	600.518	100	Z	Ca	603.622	150	N	Ca III	606.756	10	
Fe IV	600.557	50		Al IX	603.65		P	Sc XIV	606.76		F, P
O II	600.585	300		Kr III	603.667	110		Co IV	606.788	81	
Zn III	600.599	2		As VI	603.768			Kr	606.79	120	N
Fe IV	600.610	12		Ni IV	603.770	10	N	F II	606.804	1000	
Mn IV	600.614	100		Mn IV	603.788	10		Ni IV	606.811	10	N
As V	600.7	150		As III	603.79	100		Cu III	606.821	125	
P III	600.757	25		Al IV	603.83	2		Fe IV	606.824	110	
K II	600.765	300		Kr III	603.856	50		F II	606.922	600	
Fe IV	600.788	50		Mn IV	603.863	100		Br IV	607.0	150	
As VI	600.844	17		Fe IV	604.072	80		Fe IV	607.036	1	
Ca III	600.852	25		Zn III	604.082	1		Al IV	607.04	10	
Mn IV	600.917	40		Ni IV	604.106	20		As VI	607.054	34	
Ca VI	600.917	285		Ar III	604.15	500	N	Cl IV	607.09	300	
Fe IV	600.944	110		Mn IV	604.177	40		Fe IV	607.100	12	
Se V	601.0	85		As VI	604.206	59		Se VII	607.161	1	N
Mn III	601.035	5		Fe IV	604.255	12		Cr VI	607.239	30	
Ni IV	601.063	10	N	Kr III	604.365	30		Ni IV	607.260	20	
P III	601.094	10		O V	604.416	80		As VI	607.288	44	
C VI	601.098		P	Cu III	604.441	3		Zn III	607.364	10	
Fe IV	601.141	1		Cl IV	604.59	500		F IV	607.37		
Kr III	601.142	80		As VI	604.621	7		Fe IV	607.427	1	
Mn IV	601.153	300		Ni IV	604.738	10	N	F II	607.472	700	
Br IV	601.2	350		Fe IV	604.750	30		Mn IV	607.478	200	
P III	601.212	1		Cl VII	604.783	1000		Fe IV	607.533	600	
Fe IV	601.237	150		Fe IV	604.885	50		Co IV	607.594	74	
Cr IV	601.273	1		Kr	604.89	60	N	Fe IV	607.702	80	
C VI	601.287		P	Ar XII	605.0		P	Ni IV	607.781	10	N
C VI	601.352		P	Al V	605.03	8		Ni V	607.81		F, P
He I	601.4041		F	Fe IV	605.038	150		Ge V	607.912	7	
Cu III	601.433	3		Ni IV	605.045	150		K II	607.931	250	
N III	601.468	100		Cl VII	605.05	50		F II	608.063	850	
Fe IV	601.493	12		Fe IV	605.138	1		Kr II	608.134	60	
Mn IV	601.499	70		K IV	605.316	50	N	Cr IV	608.138	5	
Cl IV	601.50	500		Kr II	605.331	40		S II	608.17	75	N
O IV	601.57		Q, Z	Mn IV	605.377	50		Fe IV	608.213	12	
Fe IV	601.609	50		Fe IV	605.382	30		Co IV	608.243	55	
Fe IV	601.651	4		N II	605.437		P	Fe IV	608.264	80	
Ca VI	601.692	360		Cu III	605.516	3	N	O IV	608.398	800	
Se V	601.7	85		As VI	605.534	55		Se VI	608.4	50	
Fe IV	601.773	1		Kr II	605.547	40		Cu III	608.453	40	
Mn IV	601.788	10		As VI	605.590	65		Mn IV	608.577	50	
Cl II	601.8086	40		Ne IV	605.60	10		Br IV	608.6	250	
N III	601.878	10		Cu III	605.625	150		P IV	608.613	40	
Cr VI	602.011	1		Ge V	605.633	1		Ni IV	608.709	10	
Cl II	602.029	2		F II	605.670	850		Cr IV	608.713	20	
Mn IV	602.115	80		Fe IV	605.682	12		P IV	608.741	40	
Fe IV	602.155	150		Br IV	605.7	120		Fe IV	608.805	520	
K V	602.257	160		Kr II	605.782	15		Fe IV	608.851	80	
Fe IV	602.295	80		Ni IV	605.785	30		Cl IV	608.90	400	
Fe IV	602.319	50		Cu III	605.792	2		Cr IV	609.013	5	
Ni IV	602.323	20		Cl III	605.86	100		C III	609.04	400	
Ca VI	602.408	40		Kr III	605.863	300		Ni IV	609.058	50	
Fe IV	602.444	110		Si III	605.873			Co IV	609.159	66	
Fe IV	602.481	110		Fe IV	605.890	30		Ne IV	609.17	5	
Ni IV	602.482	100		Se VI	605.9	85		Mn IV	609.188	0	
Cu III	602.507	50		N II	605.902		P	Co IV	609.215	70	
Mn IV	602.535	300		K IV	605.908	50	N	V XII	609.24		
Ni IV	602.573	100		Fe IV	605.934	110		C III	609.275	600	
Ne I	602.7263	170	st	Kr	606.02	30	N	Co IV	609.278	64	
Fe IV	602.744	50		Fe IV	606.031	4		Ni IV	609.448	50	
Mn IV	602.798	40		N II	606.080		P	Cu III	609.468	10	
Ar II	602.8584	300	st	Cl III	606.10	200		Ni IV	609.593	10	N
P IV	602.945	1		Ni IV	606.130	20	N	Fe IV	609.648	300	
Ne IV	603.00	10		Cu III	606.131	100		Cu III	609.661	10	
Fe IV	603.033	80		Zn III	606.164	8		Cl III	609.67	400	
Mn IV	603.129	0		Ge V	606.220	2		O III	609.705	300	
Fe IV	603.199	80		F II	606.286	700		Co IV	609.782	43	
Fe IV	603.301	50		Fe IV	606.290	30		Mg X	609.79	23	
As VI	603.411	27		Cl III	606.35	500		O IV	609.829	850	
K V	603.429	220		Kr III	606.466	150		Ni XXIV	609.9		F
Cu III	603.549	50		Ne IV	606.53	25		Cl III	609.90	10	

Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes
Fe IV	609.963	50		K I	613.47		A, Z	Fe IV	616.366	30	
O III	610.043	350		Ni IV	613.474	10		Fe IV	616.404	50	
Ni IV	610.043	250	Q	N I	613.500	2	A, Z	Fe IV	616.438	30	
Fe IV	610.082	4		Fe IV	613.570	50		Cl II	616.4631	100	
Fe IV	610.181	250		Se VII	613.649	50	N	Fe IV	616.538	30	
Ca III	610.225	10		Cu III	613.728	5	N	Ca III	616.581	25	
Co IV	610.254	37		Cr IV	613.746	70		Fe IV	616.591	12	
Ni IV	610.255	10	N	Fe IV	613.765	4		O II	616.6	3	N
Ni IV	610.366	10		Fe IV	613.913	4		P V	616.668	12	
Fe IV	610.393	200		As VI	613.917	52		Kr III	616.725	150	
Fe IV	610.471	1		Ni IV	614.005	20		Fe IV	616.734	1	
Br IV	610.5	30		Ca VI	614.015	150	N	Cr IV	616.819	285	
Mn IV	610.509	10		Cr VI	614.028	50		O IV	616.952	350	
Fe IV	610.644	30		Cr IV	614.028	70		P V	616.952	12	
O III	610.746	400		S IV	614.06	164	N	Cu III	616.971	1	
Co IV	610.790	24		Fe IV	614.071	12		O IV	617.005	150	
O III	610.850	300		Cu III	614.129	20		O IV	617.036	275	
K	610.850	50	N	Mn IV	614.153	400		Zn III	617.042	3	Q
Si XI	610.87		P	Fe IV	614.169	80		Cr IV	617.047	40	
Fe IV	610.886	30		Cl XVI	614.25		P	V III	617.05	10	
Kr	610.89	80	N	Fe IV	614.284	50		O II	617.051	300	
Ge V	610.913	9		Se V	614.3	85		Kr II	617.065	100	
Mn IV	610.967	450		P V	614.352	1		Sc IV	617.081	360	
Fe IV	610.972	80		N I	614.364	2	A, Z	As VI	617.141	31	
S IV	611.07	322	N	As III	614.38	150		Fe IV	617.264	1	
Se VI	611.087	50	N	Fe IV	614.475	30		N I	617.265	3	A, Z
Ni V	611.11		F, P	Cr IV	614.480	5		Kr	617.27	600	N
Kr III	611.115	300		Fe IV	614.595	80		Ni XXIII	617.3		F, P
Ca	611.186	50	N	Na XI	614.606		P	Cl II	617.3161	150	
Kr III	611.19	160		V III	614.63	0		V III	617.34	0	
Ge V	611.429	3		Fe IV	614.665	30		Fe IV	617.341	4	
Fe IV	611.436	50		Ar	614.69	10	N	Cu III	617.349	125	
Mn IV	611.461	450		As III	614.70	50		Ca VI	617.517	200	N
Cu III	611.543	50	N	Ni XXIII	614.8		F	Cl II	617.6293	220	
Fe IV	611.599	110		Kr VII	614.86	200		Ni IV	617.635	20	
As VI	611.659	25		Cr IV	614.903	70		As VI	617.724	38	
S IV	611.72	370	N	V III	614.94	0		Kr II	617.758	60	
Fe IV	611.846	50		Al IX	615.01			O IV	617.786	10	
K VI	611.864	70		Se V	615.1	10		Fe IV	617.810	4	
As VI	611.899	67		Kr II	615.138	40		Cr IV	617.94	20	P
N I	611.998		A, Z	Ni III	615.164	0	N	V III	618.02	0	
Fe IV	612.024	150		Mn XIX	615.2		F, P	Kr II	618.048	60	
Zn III	612.033	1	Q	As VI	615.204	73		Cl II	618.0539	260	
Fe IV	612.060	80		Kr II	615.227	40		O IV	618.107	15	
Cl IV	612.07	400		Cu III	615.246	3	N	Ca XV	618.18		F, P
K	612.272	50	N	As VI	615.310	30		Br IV	618.2	120	
Cu III	612.282	3	N	Cl II	615.3233	120		Cr IV	618.230	70	
Mn IV	612.292	500		Cr IV	615.335	40		Cr IV	618.262	70	
Ni IV	612.351	20		Fe IV	615.417	30		As VI	618.290	70	
Ar II	612.3715	300	st	P V	615.421	4		Fe IV	618.337	4	
N I	612.378		A, Z	V III	615.48	0		V III	618.41	0	
Kr	612.38	300	N	Fe IV	615.536	12		Kr II	618.511	60	
Fe IV	612.477	110		Ni III	615.554	5		Ar	618.63	200	N
Kr III	612.488	30		Cr IV	615.598	40		Kr VII	618.67	400	
Fe IV	612.555	1		Na XI	615.604		P	Ne I	618.6716	170	st
As VI	612.561	43		N I	615.627		A, Z	Fe IV	618.712	80	
K II	612.621	300		Ne I	615.6283	170	st	Cr IV	618.766	160	
Cr IV	612.643	110		Cu III	615.670	200		Mn IV	618.780	250	
Cr IV	612.643	110		Sc IV	615.694	40		Kr II	618.882	60	
Cl II	612.738	3		K I	615.75		A, Z	V III	618.89	0	
Zn III	612.787	0		Fe IV	615.858	12		Cl II	618.920	25	
Fe IV	612.790	80		As V	615.9	200		Ca III	618.923	10	
V III	612.85	10		V III	615.90	0		As VI	618.941	24	
N I	612.883	1	A, Z	Na XI	615.910		P	Cl III	619.03	100	
Fe IV	612.937	150		Mn IV	615.947	40		Fe IV	619.032	50	
V III	612.99	10	N	Cu III	616.031	150		Ar	619.04	200	N
Se V	613.0	120		Fe IV	616.060	80		Ne I	619.1023	120	st
O II	613.11		N	V III	616.09	25		Cr IV	619.133	110	
Mn IV	613.162	0		Mn IV	616.111	300		Mn IV	619.173	10	
Si III	613.21	293	N	K VI	616.122	70		Cu III	619.174	100	
Fe IV	613.299	50		K VI	616.189	40		Fe IV	619.207	1	
Kr II	613.374	40		Mn IV	616.277	300		V III	619.29	5	
Ar	613.40	20	N	O II	616.291	350		Kr II	619.385	60	
Fe IV	613.409	30		Zn III	616.310	8		Kr II	619.548	40	
K XII	613.43		F, P	O II	616.363	200		Mn IV	619.580	90	

Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes
N VII	619.601		P	Cr IV	623.541	70		Fe IV	627.195	1	
N IV	619.663		P	S III	623.57	196	N	O V	627.225	7	
Cu III	619.674	5		As VI	623.587	25		O V	627.351	25	
Cr IV	619.758	110		V III	623.67	5		Fe IV	627.373	30	
Cu III	619.775	50		Fe IV	623.680	30		P IV	627.374	120	
N VII	619.798		P	Al V	623.749	20		Al V	627.400	25	
Br IV	619.8	200		Cl III	623.77	300		As VI	627.417	33	
N I	619.847	4	A, Z	Ar IV	623.77	250	Q	Mn IV	627.432	50	
N VII	619.863		P	Sc IV	623.951	160		Cr IV	627.471	1	
Cu III	619.936	75		N I	624.059	4	A, Z	K I	627.48		A, Z
Ga III	619.96		P	V III	624.08	0		Cl II	627.533	15	
Fe IV	619.979	4		Cl VI	624.11			Ni III	627.541	15	
Cl II	619.9798	250		P IV	624.129	1		K VI	627.560	100	N
Ar	620.05	20	N	Ni IV	624.130	10		V VI	627.627	20	
Cr IV	620.125	5		Ni IV	624.243	10		O V	627.636	40	
V III	620.17	5		Kr III	624.27	60		Cl II	627.662	10	
Cu III	620.230	30	N	Ca VII	624.385	110		Cr IV	627.719	40	
Mn IV	620.275	200		V III	624.42	0		Kr VII	627.75	300	
Cl II	620.2958	280		Kr	624.44	80	N	Be IV	627.808		P
Al V	620.460	15		Sc X	624.5	21		Sc III	627.8465	8	
Ca	620.566	50	N	O IV	624.617	750		S VI	627.9	10	
O IV	620.66		Q	Fe IV	624.724	4		V III	627.90	10	
Cr IV	620.665	360		Fe IV	624.768	4		Be IV	627.908		P
V III	620.69	0		Fe IV	624.791	4		Be IV	627.942		P
Fe IV	620.756	12		Ca III	624.821	50		S IV	628.03	226	N
Fe IV	620.804	1		Mg X	624.95	12		Sc	628.111	40	N
K VI	620.808	20	N	Fe IV	624.960	30		As VI	628.340	73	
Cu III	620.850	20		Si III	624.997			Mn IV	628.380	30	
Cl III	621.03	300		Mn XIX	625.0		F, P	Cr IV	628.482	110	
Ar	621.05	20	N	Kr III	625.016	300		Kr III	628.588	250	
Kr II	621.074	100		Cr IV	625.037	160		Ca III	628.663	150	
Br XXVIII	621.1		F, P	O IV	625.130	800		Zn III	628.682	4	
Br V	621.1	350		Ca III	625.269	10		N V	628.744	70	
Fe IV	621.110	1		Ni III	625.306	15		Fe IV	628.767	30	
Cl II	621.1369	210		Cr IV	625.323	20		Sc IV	628.834	110	
Mn IV	621.176	70		Si IV	625.34	111	N	V III	628.86	5	
Ni IV	621.238	10	N	K VI	625.410	285		N V	628.874	50	
Cl III	621.28	400		Br IV	625.5	85		Zn III	628.955	2	Q
Cr IV	621.358	285		He I	625.563		F, P	P IV	629.008	350	
As VI	621.446	40		Fe IV	625.662	50		Al V	629.062	25	
Kr III	621.451	200		Ni III	625.682	100		N II	629.167	300	
K IX	621.452	360		S IV	625.70	151	N	Cl II	629.228	6	
V XVIII	621.46		F, P	P IV	625.724	40		Cr IV	629.264	450	
Ge V	621.524	20		As VI	625.724	72		Mn IV	629.341	0	
Fe IV	621.553	12		Kr III	625.760	110		Cl V	629.35	300	
Fe IV	621.643	30		Si IV	625.77	120	N	Fe IV	629.350	12	
Ni IV	621.690	10		O IV	625.852	850		Cr IV	629.355	110	
Fe IV	621.691	12		Kr II	625.901	40		Cl II	629.387	8	
Kr II	621.911	80		Ni III	625.938	15		N II	629.447	200	
Mn IV	621.964	80		Mn IV	625.961	90		Ti III	629.572	3	
K XIII	622.		F, P	Cr IV	625.986	20		Ca VI	629.602	220	
O III	622.00		N	Kr	626.06	150	N	N II	629.670		
Al V	622.02	10		Fe IV	626.107	1		Mn IV	629.685	180	
Ga III	622.04		P	K	626.186	20	N	O V	629.730	1000	
Cr IV	622.089	220		Fe IV	626.211	4		Ne I	629.7388	200	st
Ge V	622.097	9		K I	626.26		A, Z	Cr IV	629.743	360	
C III	622.13	200		Fe IV	626.356	40	P	Zn III	629.792	4	Q
Ge V	622.459	5		Fe IV	626.379	50	P	P IV	629.914	400	
Se VII	622.523	50	N	Kr	626.49	300	N	Ca III	629.921	25	
Sc IV	622.598	110		O IV	626.49		Q	Ca III	629.922	25	
Sc XX	622.63		P	S	626.53	103	N	Ti III	629.957	3	
Kr III	622.795	250		Ni III	626.548	10		Ge V	629.960	12	
Cu III	622.806	4		Se VII	626.549	30	N	Si III	629.97	188	N
As VI	622.836	59		Cr IV	626.564	1		Kr III	630.040	300	
Kr	622.89	200	N	Si IV	626.58	152	N	Ti III	630.086	3	
V III	622.92	0		Ni IV	626.712	30		Fe IV	630.096	50	
Ni IV	622.940	20		Cl II	626.7339	260		Br IV	630.1	350	
K VI	623.012	360		Ne I	626.8232	200	st	Si V	630.129	50	
Cl II	623.0617	185		Ni III	626.923	30		F III	630.137	150	
V III	623.27	5		Cr IV	627.037	1		F III	630.198	200	
Cu III	623.337	5		Sc III	627.0693	7		Ti III	630.199	1	
Sc IV	623.377	70		As VI	627.082	69		Cr IV	630.301	285	
Al V	623.39	10		C IV	627.1	0		Ar VII	630.31	100	
Sc IV	623.507	160		Fe IV	627.134	4		F III	630.327	2	
Ge V	623.534	1		Cr IV	627.185	40		Mn IV	630.329	150	

Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes
F III	630.346	1		Fe IV	633.456	30		Fe IV	636.428	12	
Cl III	630.38	100		Ca III	633.468	10		Cr IV	636.44	1	P
Cr IV	630.522	40		Ca III	633.588	250		Ca III	636.482	10	
Ca VII	630.537	160		Mn IV	633.607	10		Fe IV	636.493	12	
Cu IV	630.577		F, P	Kr III	633.630	80		Al V	636.552	30	
Cl II	630.6835	110		Fe IV	633.768	50		Na V	636.579	10	Q
Ti III	630.685	3		Fe IV	633.832	30		Cl II	636.6244	320	
Ti III	630.692	3		Ca VI	633.844	360		Kr II	636.630	80	
Mn IV	630.695	100		Ni IV	633.910	10		Ca III	636.641	10	
Se IV	630.7	85	N	V III	633.94	50		S II	636.65	253	N
Ni III	630.711	500		Fe IV	634.059	4		Al V	636.708	90	
Cl III	630.75	100		Cr IV	634.133	220		As VI	636.777	71	
Ti III	630.769	1		V III	634.16	5		Ar III	636.82	150	
Ca VII	630.785	40		Ar VII	634.21	100		Cr IV	636.859	110	
Cr IV	630.812	220		Ge V	634.238	6		Ar XII	636.9		P
Ti III	630.891	3		Si III	634.255			Fe IV	636.928	80	
Cr IV	630.902	285		Cl II	634.2568	220		Ar VII	637.05	200	
K VI	630.940	50	N	Kr II	634.272	60		Ni III	637.057	15	
Ti III	630.982	7		Ni IV	634.276	80	Q	Cl II	637.0691	260	
Se IV	631.0	50	N	Ni IV	634.377	20		V III	637.08	0	
Cl III	631.01	100		Fe IV	634.452	50		Cr IV	637.096	1	
Ca III	631.015	25		Kr	634.51	30	N	Ca III	637.111	25	
Se IV	631.1	50	N	Se V	634.511	85	N	Ni IV	637.158	20	
Fe IV	631.130	12		Cr IV	634.582	285		K VI	637.195	50	N
Ti III	631.135	1		Co V	634.61		F, P	As VI	637.210	66	
Ni IV	631.158	10		Cl II	634.6222	200		Ar III	637.28	1000	
V VI	631.164	1		Cu IV	634.768		F, P	Cr IV	637.338	160	
Fe IV	631.175	4		Ni XXII	634.8		F	As VI	637.393	63	
Cr IV	631.289	40		Zn III	634.807	10		P IV	637.398	120	
As VI	631.362	7		V III	634.81	25		Co V	637.42		F, P
Ti III	631.421	0		S II	634.81	328	N	Ar VII	637.47	50	
Ni IV	631.421	30	N	P IV	634.928	60		V III	637.49	5	
Zn III	631.444	5		Zn III	634.979	1		Ni III	637.535	200	
Kr III	631.559	50		Fe IV	635.092	1		Cr IV	637.553	220	
Cr IV	631.567	70		Ar V	635.12	150		Fe IV	637.581	50	
N I	631.624	8	A, Z	Fe IV	635.184	12		Al V	637.675	30	
Cr IV	631.666	70		Co V	635.19		F, P	Ni III	637.703	2	
Ar	631.68	60	N	N II	635.197	400		V III	637.73	0	
Fe IV	631.733	150		V III	635.22	10		As VI	637.772	36	
Cr IV	631.748	70		Cr IV	635.265	5		Ca III	637.788	10	
P IV	631.779	500		Al IV	635.31	1		P IV	637.817	90	
Ti III	631.830	0		Cl V	635.32	400		Kr	637.87	120	N
Cl II	631.8314	200		As VI	635.330	47		K VI	637.890	20	N
O VIII	631.936		P	Fe IV	635.332	80		Ca V	637.917	285	
F VIII	632.0		N	Ni III	635.406	1		Al V	637.984	80	
Ca III	632.017	50		V III	635.41	40		Al X	637.99		P
Fe IV	632.051	80		Ca III	635.481	25		S III	637.99	177	N
V VI	632.084	40		Cr IV	635.485	220		Co V	638.00		F, P
Br V	632.3	300		Zn III	635.498	6		Cr IV	638.127	285	
Ni IV	632.415	30		P IV	635.501	90		V III	638.13	10	
Kr	632.48	20	N	Fe IV	635.560	150		Al V	638.147	30	
V VI	632.509	1		Al V	635.64	8		Na VI	638.21	10	
Ti III	632.509	0		Fe IV	635.766	30		Kr II	638.215	80	
O VIII	632.519		P	Se V	635.820	85	N	Cl II	638.2909	300	
Fe IV	632.539	4		Cl II	635.8802	280		Ni IV	638.329	20	
Fe IV	632.604	12		Fe IV	635.881	50		Zn III	638.357	2	Q
Ni IV	632.615	50		P IV	635.915	90		Si III	638.40	133	N
Cr IV	632.623	220		Fe IV	635.933	30		Fe IV	638.522	1	
Fe IV	632.646	80		Zn XXIII	635.94		F, P	Cr IV	638.535	285	
O VIII	632.703		P	V III	635.97	0		Kr	638.60	20	N
As VI	632.790	71		C II	635.9945	300	ST	K V	638.681	40	
F VIII	632.8			Se IV	636.0	250		K	638.805	20	N
B II	632.8			Al V	636.008	10		Kr II	638.960	60	
Ni IV	632.835	10	N	P IV	636.124	60		Zn III	639.060	20	
Fe IV	632.843	110		Kr II	636.152	80		Ni IV	639.080	20	
Na VI	632.90	10		V III	636.21	0		N II	639.082		P
Ni IV	632.923	10	N	C II	636.2511	400	ST	Kr	639.12	10	N
Cr IV	633.059	285		As VI	636.301	69		Ca III	639.124	50	
Kr III	633.090	150		Ca III	636.318	25		F IV	639.13		Q, Z
Fe IV	633.159	50		K IX	636.325	250		Ca VII	639.150	160	
Cl V	633.19	400		O V	636.34		N	Fe IV	639.223	150	
Fe IV	633.220	12		Ni IV	636.343	30		Cl V	639.23	300	
Ca III	633.325	25		Kr III	636.35	20		Kr II	639.263	80	
V III	633.37	0		Ca III	636.388	10		Co V	639.27		F, P
Kr II	633.380	80		As VI	636.412	9		Ni III	639.338	10	



Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes
N II	639.368		P	Ca	642.812	100	N	Cl II	646.7435	140	
Cl II	639.4578	200		Kr III	642.84	20		Fe IV	646.771	50	
Al V	639.518	50		Co V	642.94		F, P	Mn IV	646.794	500	
Fe IV	639.547	12		Se VIII	642.969	30	N	Zn III	646.802	2	
Zn III	639.597	2		Cr IV	642.970	40		Ni III	646.890	1	
Se XXI	639.6		F, Q	Zn III	643.026	12		Mn IV	647.102	40	
Al V	639.712	30		Ca V	643.104	220		Ca VII	647.292	100	N
Cl III	639.76	100		Sc III	643.133	2		F VI	647.307	10	
Fe IV	639.846	50		F V	643.14		P	Ni III	647.319	0	
Zn III	639.850	4		Sc VIII	643.183	5		Fe IV	647.340	1	
Ge V	639.865	4		Cl II	643.2069	140		Zn III	647.415	1	Q
P IV	639.869	200		Ar III	643.25	450	P	S II	647.50	152	N
Fe XIX	639.91		F, P	Zn III	643.259	0		N I	647.505	14	A, Z
Kr III	639.983	300		Kr II	643.399	40		F V	647.666	150	
K V	639.994	20		Ca III	643.426	10		As VI	647.701	33	
Mn IV	640.069	80		Ca III	643.482	10		F V	647.768	400	
N II	640.121		P	Ar XII	643.5		P	Fe IV	647.777	12	
V VI	640.135	5		Sc III	643.597	2		Cu IV	647.783		F, P
Co V	640.21		F, P	V V	643.603	10		Ca V	647.855	160	
Zn III	640.263	20		Ar XII	643.9		P	F V	647.868	500	
Ca III	640.280	100		Fe IV	643.931	4		Mn IV	647.921	450	
S II	640.41	50		F VI	643.969	10		Zn III	647.927	1	
Ca VII	640.412	20		Mn IV	643.983	50		Fe IV	647.939	80	
Se IV	640.5	50	N	O II	644.148	600		F V	647.967	150	
Ni IV	640.668	30		Mn IV	644.273	300		Cu XXVI	648.0		F
Ca VII	640.679	1		Al III	644.3339			Si V	648.052	80	
As VI	640.714	53		Ar VII	644.39	100		Cr IV	648.077	220	
Kr II	640.871	80		As VI	644.404	65		Ge V	648.188	1	
Se IV	640.9	85	N	Fe IV	644.435	150		Ni III	648.271	3	
Mn IV	640.909	30		Ca III	644.484	25		Si V	648.312	50	
Cl III	640.93	100		Ni III	644.488	0		Fe IV	648.408	12	
S II	640.93	50		Kr III	644.52	20		P IV	648.482	350	
Mn IV	641.021	20		N II	644.634	650		F VI	648.496	10	
Mn IV	641.132	100		Mn IV	644.679	80		Fe IV	648.581	4	
O II	641.20		N	Zn III	644.700	30		Ca III	648.618	25	
Co V	641.20		F, P	Cr IV	644.756	5		As VI	648.629	14	
As VI	641.264	43		Se IV	644.8	85	N	S VI	648.63	100	
Cl III	641.30	100		N II	644.837	750		Ca XIII	648.65		F, P
Ar VII	641.32	100		S III	644.92	217	N	Mn IV	648.692	450	
Ar III	641.36	250	P	Ni III	644.948	20		Ni III	648.745	2	
Ge V	641.380	9		K V	644.964	20		Zn III	648.755	12	
Co V	641.49		F, P	Fe IV	644.985	4		Fe IV	648.799	30	
B II	641.5			F VI	644.999	10		K	648.932	20	N
C II	641.593	250	Z	Fe IV	645.121	4		Ni III	649.006	2	
Zn III	641.597	0	Q	N II	645.178	850		Ar	649.03	50	N
C II	641.627	250	Z	Ge V	645.193	3		Cu IV	649.218		F, P
Ni III	641.689	5		Ni III	645.305	30		Si V	649.23	5	
C II	641.771	300	Z	Al III	645.3063			Ca V	649.317	20	
C II	641.800	300	Z	Fe IV	645.349	80		Zn III	649.318	6	
S II	641.81	100		Si V	645.39	90		Co III	649.342	1	N
Ar III	641.81	600		S X	645.4		P	Si V	649.404	60	
Zn III	641.821	1		Br V	645.5	350		As VI	649.561	8	
Kr	641.86	50	N	S III	645.59	244	N	Cl II	649.6718	185	
Ni III	641.866	100		Ni III	645.632	2		P IV	649.69	20	N
Na VI	641.87		Q	Si IV	645.759	150		Fe IV	649.766	12	
Ca IX	641.88			Kr VII	645.77	400		Br IV	649.8	150	
C II	641.888	650	Z	Mn IV	645.832	250		Cr IV	649.821	160	
Ca VI	641.904	450		Zn III	645.836	15		Fe IV	649.869	12	
V III	641.91	0		Mn IV	645.931	10		Ni IV	649.870	20	N
Ge V	642.059	5		Al V	646.009	25		Cr IV	649.874	20	
Mn IV	642.195	40		F VI	646.092	5		Ar XII	650.		F, P
Br IV	642.2	350		Br IV	646.1	10		Fe IV	650.129	110	
Zn III	642.216	6		Fe IV	646.120	110		Kr	650.20	30	N
Se V	642.3	30		Mn IV	646.133	80		Fe IV	650.409	4	
Fe IV	642.312	80		K IV	646.181	550		S VI	650.43	100	
Cu IV	642.358		F, P	Fe IV	646.185	30		Fe IV	650.439	30	
Mn IV	642.588	300		K V	646.308	40		As VI	650.455	5	
Fe IV	642.609	30		Ca III	646.343	150		Ni III	650.701	2	
Ni III	642.611	1		F VI	646.360	35		Fe IV	650.785	80	
Ge V	642.624	8		Zn III	646.377	4		Ca III	650.842	10	
Co V	642.64		F, P	As VI	646.382	4		Si V	650.866	10	
Se IV	642.7	120	N	Kr III	646.412	450		Cl II	650.8935	320	
Zn III	642.702	8		Ca V	646.534	450		Cl II	650.944	125	
Ge V	642.757	7		Fe IV	646.702	12		Cu IV	650.970		F, P
Sc III	642.766	10		As VI	646.707	18		Cu III	651.000	30	

Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes
Ar XII	651.04	10	Q	Si III	654.78	111	N	S V	658.26	300	
F VI	651.082	5		Si V	654.819	40		Ni IV	658.285	150	
Si V	651.104	100		P IV	654.839	150		Br IV	658.3	10	
Ge V	651.156	9		Mn IV	654.870	400		Ge V	658.314	3	
Kr III	651.201	300		Mn XX	654.9		F, P	F III	658.329	600	
Al V	651.204	100		Zn III	654.977	0		Cu III	658.342	3	
C II	651.211	150		O V	655.039	40		K VII	658.398	110	
C II	651.234	150		Cr IV	655.039	5		Al V	658.42	1	
Zn III	651.261	10		Se V	655.108	1	N	Fe IV	658.467	12	
C II	651.269	400		Ni III	655.120	0		Mn III	658.481	0	
C II	651.304	300		Mn IV	655.122	250		Al V	658.56	60	
Ca IX	651.31			Cl II	655.1427	260		O III	658.578	50	
Ni IV	651.32		F, P	Mn IV	655.156	200		Fe IV	658.582	4	
Co III	651.323	0	N	K	655.188	50	N	Cu III	658.609	0	
C II	651.345	800		Cr IV	655.237	160		Kr II	658.649	100	
C II	651.389	150		Al V	655.300	10		Ni III	658.810	0	
Ca V	651.531	220		Ca III	655.342	10		Cu III	659.022	0	
Kr VIII	651.57	400		Mn IV	655.424	80		Cu III	659.110	15	
Fe IV	651.589	4		S IV	655.55	400		K	659.135	20	N
F III	651.622	3		K	655.554	20	N	P IV	659.185	40	
Fe IV	651.644	30		Fe IV	655.555	1		Ar XII	659.2		P
Si III	651.668	80		Al V	655.564	65		Ca IX	659.48		
Cr IV	651.766	1		Cu III	655.638	2		Cu III	659.533	3	
Zn III	651.975	0		Kr II	655.681	80		O III	659.538	10	
Cu IV	651.986		F, P	P IV	655.778	120		Cu III	659.587	5	
B II	652.0			Mn III	655.804	0		Ca	659.694	50	N
Ni IV	652.15		F, P	Fe IV	655.860	1		Kr III	659.718	300	
As VI	652.169	31		S IV	655.89	200		Ni IV	659.73		F, P
Mn IV	652.195	250		As IV	655.9	20		Ni IV	659.783	30	
Si III	652.223	120		Ca IV	655.998	750		Cu III	659.810	2	
Cr IV	652.305	40		P IV	656.029	4		Cl II	659.8107	320	
As VI	652.450	22		Cr IV	656.065	1		S V	659.85	400	
S IV	652.52	300		F III	656.121	400		Si III	659.93	175	N
Ni III	652.652	30		Mn IV	656.148	400		Cu III	659.935	4	
Se IV	652.7	300		Cu IV	656.164		F, P	Cr IV	659.986	110	
Ge V	652.716	2		S IV	656.30	100		Cu IV	659.996		F, P
P IV	652.836	120		Ni IV	656.41		F, P	Si V	660.057	400	
Ni III	652.837	1		Ni III	656.431	1		Ni III	660.079	30	
Kr	652.90	400	N	Zn III	656.486	2		Si III	660.09	338	N
S IV	653.00	300		P IV	656.583	120		Ar XII	660.1		P
Cl III	653.01	200		Ni III	656.724	1		N II	660.286	750	
Mn IV	653.018	0		Ca V	656.745	220		P V	660.316	1	
Ar XII	653.2		P	Cl III	656.77	200		Mn IV	660.344	80	
K I	653.23		A, Z	F III	656.869	500		Al V	660.36	70	
Zn III	653.321	1		Cl II	656.8795	60		Ge III	660.5	20	P
Si III	653.332	160		Cu IV	656.886		F, P	Ni III	660.620	10	
Ni III	653.496	10	N	Kr	656.97	150		Fe IV	660.836	12	
P IV	653.528	90		Ar XIII	657.		F, P	Ni IV	660.91		F, P
Si V	653.550	60		Ni IV	657.043	100		S IV	660.94	300	
S IV	653.56	400		Cu III	657.074	10		Ni IV	660.95		F, P
Zn III	653.575	0		Mn IV	657.077	400		Al V	660.964	100	
As VI	653.604	6		Kr II	657.095	130		S X	661.0		P
Al V	653.66	5		Cr IV	657.152	110		C IV	661.0	5	
Cl IV	653.70	400		Cl III	657.17	200		Cu III	661.053	0	
Cr IV	653.762	160		F V	657.227	500		Ni IV	661.06		F, P
Mn IV	653.811	180		Ni IV	657.25		F, P	Ni III	661.061	5	
F III	653.833	6		Si V	657.267	50		Br VI	661.1	350	
Cl II	653.8556	220		Ni III	657.304	1		Cu III	661.169	8	
Cu III	653.871	1		F V	657.333	800		P IV	661.228	40	
S IV	653.98	300		S IV	657.34	500		Fe IV	661.250	12	
Mn IV	653.988	150		Fe IV	657.357	50		Cu III	661.312	5	
F V	654.029	700		Ni IV	657.36		F, P	Be III	661.322	40	
Kr VII	654.19	300		Zn III	657.372	6		Fe IV	661.337	50	
Se IV	654.2	250		Fe IV	657.538	12		Mn III	661.385	0	N
O V	654.207	7		Br V	657.6	150		K VI	661.402	150	N
Mn IV	654.222	90		Ni III	657.668	0		S IV	661.42	600	
As VI	654.247	60		Cu XXII	657.7		F	Cu III	661.445	5	
S IV	654.42	100	P	Fe IV	657.749	1		Zn III	661.475	1	Q
Ni III	654.445	10		As VI	657.872	18		Si V	661.509	50	
Fe IV	654.460	4		K VI	657.931	150	N	P V	661.566	4	
P IV	654.569	90		Cl II	657.9335	130		Cl II	661.6588	170	
Fe IV	654.629	200		Ni III	657.998	0		Cu III	661.681	0	
Cr IV	654.688	160		Zn III	658.115	6		Mn IV	661.726	300	
O V	654.712	15		P IV	658.125	25		Al V	661.803	50	
Ni III	654.768	5		S X	658.2		P	Cl II	661.8394	360	

Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes
Ar II	661.8689	540	st	Se V	665.449	10	N	Fe IV	668.938	50	
Cl II	662.1637	320		Br III	665.5	350		Zn III	669.064	5	Q
Cu III	662.180	20		Cl II	665.5316	140		S II	669.13	207	
As VI	662.192	17		Al V	665.675	90		Ni IV	669.223	40	
P IV	662.219	60		Ti IV	665.690		P	Ge III	669.3	10	P
K I	662.22	20	A, Z	F III	665.809	10		V III	669.33	5	
Mn IV	662.234	0		Cu III	665.868	1		O I	669.371	20	A, Z
As VI	662.250	25		Kr II	665.879	80		Fe IV	669.423	50	
Zn III	662.309	0		Al V	665.938	90		Ni III	669.458	5	
Ni III	662.366	200		Fe IV	665.945	12		Mn IV	669.486	30	
Cu III	662.424	10		Ar II	666.0108	450	st	O I	669.526	5	A, Z
Cl IV	662.45	300		Cl II	666.0246	220		Fe IV	669.585	1	
Fe IV	662.475	1		Mn IV	666.035	350		O V	669.628	40	
Fe IV	662.538	1		Cl II	666.0502	220		F III	669.648	10	
Cu III	662.556	0		S IV	666.11	400		Ca IV	669.696	500	
Fe IV	662.672	50		Cu III	666.116	3		Al V	669.720	25	
Fe IV	662.754	50		Cl II	666.1465	260		Ni III	669.755	5	
Zn III	662.776	20		Kr	666.15	20	N	S II	669.77	186	Q
K	662.832	20	N	Fe IV	666.236	1		P VI	669.792	200	
O V	662.928	3		Mn IV	666.255	80		Mn IV	669.792	150	
Ca III	662.991	10		F III	666.258	6		Si V	669.888	100	
Cl II	663.0723	440		Co III	666.271	5	N	Al V	669.92	10	
Mn IV	663.085	80		Mn IV	666.332	100		Ti III	669.926	3	
V III	663.15	0		Ni III	666.417	50		Fe IV	669.948	1	
As VI	663.152	59		Cr IV	666.546	220		Cl III	669.95	200	
S V	663.16	500		Ni III	666.585	30		Si III	669.95	152	N
Br IV	663.2	30		F IV	666.662	1		Fe IV	670.028	200	
Cu III	663.213	1		O I	666.663	2	A, Z	Al X	670.06		
Cr XVIII	663.24		F, P	Mn IV	666.694	400		Al III	670.0676	100	
Fe IV	663.264	30		Fe IV	666.722	250		O I	670.091	5	A, Z
Fe IV	663.334	1		O I	666.838	5	A, Z	Se IV	670.1	350	
Fe IX	663.4		F, P	Fe IV	666.894	4		O I	670.237	20	A, Z
Mn IV	663.429	10		Kr	666.98	10	N	V III	670.25	5	
Ni IV	663.45		F, P	Mn IV	667.004	120		N II	670.296	220	
Ti III	663.541	3		O I	667.006	10	A, Z	Kr III	670.301	30	
Ni III	663.568	150		Fe IV	667.054	200		Cl III	670.38	300	
Ni IV	663.60		F, P	Ar XII	667.1		P	Ar	670.39	20	N
K XIV	663.62		F, P	Ca	667.126	100	N	Kr	670.40	60	N
Cl II	663.6432	320		Al V	667.156	70		O I	670.425	5	A
S IV	663.70	300		F V	667.218	35		O I	670.425	5	A
Al V	663.72	5		Cr IV	667.297	160		Ni III	670.440	0	
Ti III	663.789	1		F V	667.315	15		N II	670.515	120	
Ge III	663.8	40		Ti XI	667.34		P	Al V	670.546	20	
Mn XVIII	663.8		F, P	Cl II	667.4825	170		Mn IV	670.607	10	
Br IV	663.8	350		O I	667.487	10	A, Z	Ni III	670.640	2	
Mn IV	663.884	450		N IV	667.653		P	Fe IV	670.768	110	
Ar	663.93	10	N	Fe IV	667.689	1		S III	670.80	271	N
K	663.957	20	N	Mn IV	667.706	0		Kr III	670.820	30	
Ni IV	664.086	30		Ni III	667.783	5		N II	670.884	100	
V III	664.12	0		Cu III	667.819	4		Ge III	670.9	60	P
Si III	664.24	346	N	Al V	667.944	50		Ar II	670.9455	600	st
Si V	664.259	250		Ni III	667.976	1		O I	670.952	10	A, Z
P IV	664.277	25		Ar XII	668.0		P	Al V	670.977	50	
Ti IV	664.295		P	F III	668.195	6		K	670.987	20	N
Ar II	664.5622	300	st	Ni III	668.195	10		Ar XII	671.		F, P
Ni IV	664.63		F, P	O I	668.211	10	A, Z	N II	671.016	500	
Cu III	664.651	5		O V	668.225	3		Kr III	671.06	140	
Cl II	664.7199	320		Al V	668.26	1		Ni III	671.065	0	
Al V	664.804	50		Cl VI	668.30			Ge III	671.1	5	P
S IV	664.82	300		Fe IV	668.301	250		Al III	671.1184	200	
Cr IV	664.828	1		O I	668.307	2	A, Z	Kr III	671.182	30	
Mn IV	664.838	400		Mn IV	668.433	40		Mn IV	671.353	80	
Ni III	664.851	100		Ca	668.462	50	N	Cl VI	671.37	400	
Kr III	664.855	110		Mn IV	668.498	120		N II	671.386	500	
Ar	664.93	50	N	O I	668.509	5	A, Z	P IV	671.400	90	
Fe IV	664.992	80		Ni III	668.697	1		O I	671.406	30	A, Z
V III	665.00	0		O I	668.720	20	A, Z	N II	671.411	650	
Cr IV	665.00	30	P	Mn IV	668.736	180		K VII	671.512	160	
Mn IV	665.015	40		Cl IV	668.77	200		Fe IV	671.549	12	
Cu IV	665.017		F, P	O I	668.832	2	A, Z	Kr	671.61	30	N
Cu III	665.114	2		Kr II	668.835	100		N II	671.630	500	
Cl II	665.1679	200		Ko VI	668.864	150	N	Si V	671.651	100	
As VI	665.196	25		Co III	668.867	3	N	O I	671.669	5	A, Z
Cl II	665.2295	220		Cr IV	668.867	20		Si III	671.718	40	
Cu IV	665.337		F, P	O I	668.928	2	A, Z	Si V	671.72		

Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes
Cu IV	671.761		F,P	Kr III	674.835	80		Zn III	677.971	60	
N II	671.773	500		Al V	674.88	10		Si III	678.055	40	
Ti III	671.788	1		As VI	674.923	11		S V	678.08	200	
Zn III	671.804	1	Q	Cr IV	675.110	5		Br VI	678.1	120	
Cl II	671.8436	260		Al V	675.20	15		Ni IV	678.122	20	Q
Ar II	671.8513	900	st	Ar	675.28	20	N	Al III	678.1548		
Mn IV	671.891	10		Cu III	675.312	0		Al III	678.1564		
S X	671.9		P	K	675.335	50	N	Si IX	678.2		P
Se IV	671.9	250		Al V	675.336	30		K	678.458	20	N
N II	672.001	500		Ca III	675.424	10		S III	678.46	200	
Zn III	672.017	0	Q	O I	675.463	30	A,Z	Fe XX	678.5		F,P
Ti III	672.042	3		V IV	675.469	30		Si V	678.566	40	
C V	672.06		P	S IV	675.5		N	Cu III	678.578	1	
Ca	672.083	50	N	Be III	675.593	150		O V	678.612	15	
O I	672.090	10	A,Z	Cu II	675.6020	2		V IV	678.740	60	
N VII	672.133		P	Mn IV	675.654	80		Cr IV	678.808	110	
Kr	672.17	20	N	Si V	675.657	200		Se V	678.865	50	N
S VI	672.2		N	Ti III	675.722	0		Cr IV	678.904	40	
Ti III	672.220	7		Cu III	675.753	3		F IV	678.991	700	
Ca III	672.249	50		Cu III	675.884	10		K	679.107	20	N
K VII	672.269	1		Al V	675.938	20		S III	679.11	200	
Fe IV	672.279	1		S III	675.95	268	N	Fe III	679.129	200	
Si III	672.293	80		Ti III	675.982	0		O V	679.136	25	
Ca VI	672.315	20	N	Ti III	675.989	0		Cr IV	679.141	5	
Kr III	672.335	200		Ti III	676.013	0		O I	679.202	20	A,Z
N VII	672.364		P	O I	676.033	5	A,Z	F IV	679.214	1000	
O I	672.404	5	A,Z	Cu IV	676.041		F,P	Ar II	679.2183	300	st
Cl IV	672.43	10		F IV	676.119	800		Cl V	679.26	300	
N VII	672.439		P	P III	676.132	1		Al V	679.373	100	
P III	672.496	1	Z	O I	676.183	10	A,Z	Mn IV	679.374	150	
Cu III	672.668	50		S V	676.21	100		Ar II	679.4005	450	st
Ca VI	672.676	20		Ar II	676.2424	360	st	Cu III	679.401	3	
S IV	672.70	171	N	P III	676.264	40		Cr IV	679.455	1	
Ge III	672.8	20	P	Si V	676.332	10		V IV	679.647	50	
Kr III	672.852	150		Al V	676.380	65		Al V	679.659	10	
Ar II	672.8562	240	st	Cr IV	676.457	1		Mg VIII	679.77		
K IV	672.941	250	N	O I	676.487	5	A,Z	Ca III	679.845	10	
O II	672.948	400		Si V	676.511	150		Co XXI	679.9		F,P
Ni IV	672.957	150	N	Ca VII	676.563	150	N	Al V	679.909	30	
O I	673.052	30	A,Z	Cu III	676.566	75		Mn IV	679.939	200	
Fe IV	673.056	30		Kr III	676.568	150		Cu III	679.940	3	
Al V	673.104	40		Al V	676.595	45		O I	679.948	20	A,Z
P III	673.104	1		Mn IV	676.647	80		Kr XXI	680.		F,P
Cl III	673.13	300		O I	676.763	2	A,Z	Cu III	680.022	5	
S X	673.2		P	Cl V	676.79	300		Ca III	680.049	50	
Mn IV	673.208	40		Se XXVII	676.8		F,P	Kr III	680.126	150	
Zn III	673.278	2	Q	Al V	676.838	40		O I	680.146	5	A,Z
Al V	673.325	70		Ni III	676.941	500		Al V	680.15	1	
Ca VI	673.367	50		B III	677.004	500		Cr IV	680.170	40	
O I	673.421	5	A,Z	Cr IV	677.070	20		Si V	680.181	1	
Mn IV	673.449	0		Al III	677.0819			O I	680.256	5	A,Z
Si III	673.477	100		Cu III	677.115	2		Mn IV	680.265	300	
Zn III	673.499	2		B III	677.147	600		Cu IV	680.268		F,P
Cr IV	673.596	40		F IV	677.149	700		Ge III	680.3	40	P
Cl III	673.60	100		Br IV	677.2	120		P IV	680.306	120	
O II	673.768	350		Br III	677.2	350		S V	680.33	300	
Mn IV	673.804	0		F IV	677.219	900		Mn IV	680.362	350	
S XV	673.85		P	Al V	677.248	55		Zn III	680.364	0	Q
Ca VII	673.885	50	N	S V	677.34	100		Al V	680.41	40	
P V	673.899	450		V IV	677.345	200		Al V	680.44	10	
Cr IV	673.964	20		Al V	677.377	20		Zn III	680.468	1	Q
Ar XI	674.		F,P	Cu III	677.502	3		Se V	680.478	1	N
Si V	674.007	250		Si V	677.531	40		Al V	680.586	50	
Si IV	674.02	246	N	Cr IV	677.552	160		Ar	680.60	20	N
Ca VI	674.046	50	N	Ca III	677.620	100		Cr IV	680.619	5	
Mn IV	674.236	60		Cu III	677.640	3		V IV	680.632	40	
Al V	674.269	20		Zn III	677.642	60		S III	680.69	200	
Ca VI	674.297	70		Ti III	677.667	1		F I	680.698	2	Z
Kr V	674.32	10		Ti III	677.681	1		Fe III	680.700	150	
S V	674.41	424	N	Br III	677.7	250		Cr IV	680.833	160	
Se III	674.5	120	N	S III	677.75	200		O I	680.866	5	A,Z
Na VI	674.510	15	Q	K	677.833	20	N	S V	680.94	500	
Se V	674.520	250	Q	Ti III	677.878	1		V III	680.95	3	
Al V	674.53	15		Ar II	677.9518	300	st	S III	680.95	200	
P IV	674.724	1	Z	O V	677.968	7		Al V	680.955	5	

Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes
Kr II	681.133	80		Ca VII	684.743	250	N	Fe IV	688.245	4	
V IV	681.145	40		Ar	684.81	100	N	Ar IV	688.39	300	
Ar	681.15	10	N	O II	684.84		N	Si IV	688.395		
Cr IV	681.166	20		Fe III	684.858	70		P III	688.420	10	
O V	681.192	70	P	Cl II	684.8623	320		Cr IV	688.463	220	
Al V	681.22	40		N III	684.996	700		Fe III	688.53	20	
O V	681.238	100	P	Cu III	685.024	1		Al V	688.531	25	
S X	681.3		P	Cu II	685.1406	8		Ca III	688.543	25	
Sc IV	681.323	5		S III	685.35	50		P III	688.549	40	
O V	681.332	150	P	Fe IV	685.350	4		Br III	688.8	50	
Ca VII	681.363	150	N	Cu II	685.3968	2		Sc IV	688.867	40	
S III	681.50	100		Ca III	685.408	250		S IV	688.89	186	N
Cr IV	681.568	110		Fe IV	685.415	30		O III	688.93		N
S V	681.68	300		Kr	685.51	30	N	Cl V	688.93	400	
Na IX	681.72	10		N III	685.513	750		Ni IV	688.947	100	N
Cr IV	681.841	20		O I	685.544	55	A, Z	Ar IV	689.01	500	
Co III	681.867	0	N	Al V	685.58	5		Sc IV	689.060	1	
Cl V	681.92	400		Sc IV	685.654	70		Ni III	689.210	100	
Cl II	682.0516	380		O III	685.74		N	Ca VI	689.539	150	N
Co III	682.084	5		N III	685.816	800		Mg VIII	689.55		
Fe III	682.10	150		Kr II	685.820	60		Fe IV	689.597	4	
Mn IV	682.120	80		Cu IV	685.943		F, P	Ca III	689.602	150	
Cu III	682.166	125		V III	685.96	5		Fe IV	689.678	1	
Cu III	682.357	20		Cu III	686.128	5		Ca III	689.708	10	
V IV	682.455	40		S V	686.15	100		Ni IV	689.741	10	N
Al V	682.496	15		Al V	686.169	10		Al V	689.76	1	
C IV	682.5	5		Ca	686.190	100	N	Zn III	689.790	1	
F I	682.577	2	Z	S II	686.20	130	N	S V	689.84	100	
B IV	682.60		P	Kr III	686.254	250		Ni XXII	689.9		F, P
Ca III	682.632	150		O I	686.284	30	A, Z	Al V	689.927	60	
Cr IV	682.760	40		Ni IV	686.33		F, P	Al II	689.936	5	
Kr II	682.800	100		N III	686.335	700		Se V	689.946	10	N
V IV	682.923	40		K V	686.373	40		Kr V	689.96	10	
Ni III	682.947	5		Sc IV	686.377	5		P III	689.986	4	
Fe IV	683.003	4		C II	686.416	120	Z	Kr	690.01	200	N
S III	683.07	50		Fe IV	686.430	4		Ar XII	690.1		P
Co III	683.140	3		Se V	686.458	10	N	P III	690.125	40	
Cl V	683.17	400		C II	686.488	80	Z	O III	690.13		N
Ni III	683.186	10		Ar II	686.4883	180	st	Ar III	690.17	400	
Zn III	683.268	10		Ti III	686.543	15		Fe IV	690.190	1	
Ar IV	683.28	400		O I	686.603	10	A, Z	Cu III	690.249	40	
Al V	683.31	25		Fe III	686.63	70		Ni IV	690.27		F, P
Be IV	683.318		P	Fe IV	686.764	1		Si VI	690.35	90	
Ni IV	683.321	10	N	Al V	686.827	60		Se V	690.354	30	N
B IV	683.39		P	Cu III	686.902	50		C III	690.526	700	
Be IV	683.434		P	S V	686.93	100		Ni IV	690.54		F, P
Ni III	683.455	10		K V	686.968	360		Kr II	690.572	40	
S III	683.47	100		C II	687.0526	800	ST	P III	690.650	25	
Be IV	683.474		P	Cr IV	687.125	285		Si III	690.689	40	
Al II	683.529	2		O I	687.202	20	A, Z	Ni IV	690.689	50	N
P IV	683.571	10		C II	687.3453	1000	ST	Zn III	690.770	0	Q
Ni III	683.590	10	N	C II	687.3521	110	ST	Fe IV	690.772	80	
Ni IV	683.639	30	Q	K V	687.492	360		P III	690.787	10	
Kr III	683.683	150		S III	687.59	167	N	Kr V	690.83	30	
Ca XIX	683.76		P	Se V	687.608	30	N	Cu IV	690.843		F, P
Zn III	683.906	0	Q	Cl II	687.6575	380		Ni IV	690.851	10	N
Ni III	683.918	10		Br III	687.7	300		Se III	690.9	1	
Ca III	684.018	100		Cu III	687.763	2		Fe IV	690.903	12	
Mn IV	684.163	50		S X	687.8		P	Ca III	690.963	100	
Se V	684.205	10	N	Al V	687.81	1		Cl II	690.9645	280	
Fe III	684.28	70		Cu III	687.896	5		Ar II	691.0373	150	st
Fe IV	684.293	1		Zn III	687.929	0	Q	Fe IV	691.051	50	
Zn III	684.331	0	Q	Cu III	687.981	150		Ca III	691.136	150	
Cr IV	684.338	20		Ca VII	687.985	100	N	N III	691.187	100	
V IV	684.368	500		Kr III	687.985	250		Ca IX	691.2		P
Ca VII	684.383	100	N	O I	687.997	5	A, Z	K	691.206	20	N
Al V	684.402	60		S V	688.04	50		Mn IV	691.252	50	
V IV	684.450	100		Fe IV	688.072	1		N III	691.388	50	
Cl IV	684.49	10		K V	688.091	40		Ca III	691.432	10	
Al V	684.58	1		Cl II	688.1424	260		Fe IV	691.437	4	
Se III	684.6	10		K	688.182	50	N	V IV	691.530	100	
Ni IV	684.631	40		Si IV	688.194	1		Cu III	691.549	50	
Ca III	684.659	25		Si IV	688.200			Sc IV	691.550	1	
Mn IV	684.707	50		Ca VII	688.223	50	N	S V	691.74	100	
Al V	684.74	5		O I	688.245	5	A	Kr V	691.78	50	

Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes
Al IV	691.82	30		Si V	695.208	10		V IV	699.497	30	
O III	691.88		N	Ca III	695.219	50		Zn III	699.680	1	
Kr III	691.930	250		Mn IV	695.248	20		Ca III	699.715	10	
Ni IV	691.98		F,P	Ca III	695.382	10	N	Ar III	699.72	50	
Sc IV	692.089	20		Sc IV	695.391	5		Mn III	699.727	15	
Ca III	692.148	20		Si V	695.532	60		Kr IV	699.74	30	Q
S IV	692.25	103	N	Ar III	695.54	300		Cu IV	699.842		F,P
Cl II	692.4020	50		Kr III	695.610	300		Ca III	699.891	250	
Sc IV	692.453	110		Sc IV	695.626	160		Zn III	699.904	0	
S VI	692.5			Sc	695.72	250	N	Cr IV	699.981	110	
Fe IV	692.602	1		Cu IV	695.796		F,P	Sc IV	700.051	220	
Zn III	692.619	0		K	695.820	150	N	S III	700.15	300	
N I	692.70	35	A,Z	Al III	695.8289	500		Mn III	700.153	35	
Cr IV	692.705	5		Fe IV	695.837	50		Ni III	700.168	200	
Cl II	692.7820	185		Cu IV	695.857		F,P	Cu III	700.186	40	
As IV	692.9	250		Kr VIII	695.91	800		Ar VIII	700.245	1000	
Ni IV	692.96		F,P	Ca III	696.031	50		Cu III	700.261	50	
Zn III	692.983	0		Cr IV	696.063	110		Ar IV	700.28	320	
V IV	693.128	50		Ni IV	696.09		F,P	S III	700.29	300	
Mn IV	693.163	40		Si V	696.113	50		Si V	700.46	1	
Sc IV	693.201	70		Cl II	696.1386	340		Al V	700.473	30	
Ar II	693.3018	180	st	Fe IV	696.188	30		Se III	700.5	0	
Fe IV	693.356	200		K	696.202	50	N	Fe III	700.575	70	
Si II	693.41	348	N	Al III	696.2170	400		Kr	700.58	80	N
Ca III	693.487	200		Ni IV	696.26		F,P	Al V	700.680	40	
Kr V	693.51	50		Si IX	696.4		P	Si V	700.733	40	
Cu III	693.510	40		Co XXII	696.5		F,P	Mn III	700.932	60	
S V	693.52	200		K	696.608	50	N	O I	701.014	5	A,Z
Zn III	693.571	1		S V	696.612	315		Cl II	701.0721	160	
Si V	693.581	50		Ni IV	696.71		F,P	Si V	701.095	30	
Cl II	693.5947	380		Fe IV	696.880	110		Ni IV	701.11		F,P
Fe IV	693.635	12		Br III	697.0	200		Ar	701.11	150	N
Fe IV	693.713	30		Ni IV	697.15		F,P	Sc IV	701.194	40	
Sc III	693.724	30		Ca VII	697.281	100	N	Mn III	701.280	20	
N II	693.774		P	Ar II	697.4890	150	st	Al V	701.315	5	
Ca	693.824	100	N	Al V	697.491	60		Ni III	701.361	1	
Al V	693.896	60		Fe IV	697.499	4		Ca III	701.390	300	
Ni IV	693.91		F,P	Cu IV	697.514		F,P	Zn III	701.437	0	Q
Cr IV	693.924	360		O I	697.532	40	A,Z	Br VI	701.5	250	
B II	693.947	200		Ca III	697.551	250		Cu III	701.688	20	
Sc III	693.969	10		Cr IV	697.554	110		Cu IV	701.735		F,P
As XXVI	694.0		F,P	Fe IV	697.598	80		Ni III	701.778	100	
Cu IV	694.119		F,P	Sc IV	697.630	1		Si VI	701.89	90	
B V	694.125		P	Se II	697.65	100		As II	701.915	0	
K XII	694.13		F,P	Ar III	697.74	100		V IV	702.035	1	
Ca III	694.154	10		Al V	697.751	40		Cu III	702.118	25	
N II	694.169		P	Ca VII	697.809	100	N	O III	702.332	800	
B V	694.252		P	Cu III	697.926	20		Cl II	702.5714	280	
Sc IV	694.255	1		Ar II	697.9418	180	st	Zn III	702.594	0	
Na IX	694.27		P	Ca VII	697.972	100	N	Cr IV	702.667	40	
B V	694.296		P	Kr III	698.052	110		S III	702.78		
Fe IV	694.343	4		Ar	698.08	20	N	S III	702.82		
Ni IV	694.35		F,P	Si V	698.096	20		O III	702.822	800	
Ca III	694.370	25		Ni IV	698.105	30	N	O III	702.899	850	
Ar XII	694.4		P	Zn III	698.157	0		Cr IV	703.060	40	
F V	694.40			Al V	698.218	50		N IV	703.191		F,P
K V	694.477	100	N	O I	698.297	20	A,Z	Cu IV	703.204		F,P
Ni XX	694.54		F,P	Ni IV	698.344	10	N	Fe III	703.506	70	
S II	694.71	50		Cl II	698.4482	160		Si V	703.586	30	
O III	694.73		N	As IV	698.5	350		Ge XVIII	703.6		F
Fe IV	694.786	30		Cu IV	698.543		F,P	Cu III	703.612	30	
Sc IV	694.798	1		Si V	698.617	20		O III	703.850	900	
F II	694.801	10		O I	698.631	10	A,Z	Ca III	703.958	250	
Se II	694.83	10		Ca III	698.690	10		Zn III	704.108	1	
Ar IV	694.85	100	Q	Sc IV	698.698	40		Ge V	704.227	2	
Ar	694.85	100	N	S III	698.73	200		Ar II	704.5237	270	st
Ca III	694.898	100		Ca	698.757	1	N	Ge V	704.548	3	
Sc IV	694.949	1		Ar II	698.7745	270	st	Ca III	704.772	50	
Zn III	694.970	0		Br VI	698.9	150		Mn XXV	704.821		P
Ti III	694.986	1		Si V	698.93	5		Kr III	704.843	80	
Ca III	694.994	100		Ca III	699.085	250		Fe III	704.923	70	
Se III	695.0	30		Na VI	699.093	20		Ni IV	705.06		F,P
K V	695.042	150	N	Se VII	699.274	130		Al V	705.127	70	
Fe IV	695.150	110		Ar IV	699.41	240		Se IV	705.264	85	N
Cr IV	695.208	285		Al II	699.489	10		Ar V	705.35	150	

Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes
Ca III	705.426	150		Cr IV	709.992	5		O IV	713.61		Q, Z
S III	705.54	193	N	Co III	709.996	15		Br II	713.7	50	
S II	705.62	50		Cl XI	710.		F, P	Ca VII	713.793	150	N
K IV	705.641	150	N	Ni IV	710.06		F, P	Ar VIII	713.812	500	
Sc IV	705.651	40		Cr IV	710.077	5		Ca III	713.856	25	
Mg IX	705.72	1	P	Ge V	710.200	9		N V	713.860	120	
O III	705.762	100		Se II	710.47	1		As II	713.888	0	
P V	705.833	12		Ge II	710.487	5	Z	Zn III	713.904	10	
Kr VI	705.84	1000		Cl II	710.5210	250		Be II	714.		A, ZZ
Sc IV	705.846	40		K VI	710.526	220		Kr III	714.003	300	
Cu IV	705.850		F, P	Fe IV	710.566	12		Cl II	714.0521	360	
Fe III	705.892	150		Co III	710.592	0	N	Se IV	714.093	10	
Cr IV	705.975	160		Br II	710.6	1		Ni IV	714.13		F, P
Zn III	705.979	1		Zn III	710.603	2		Ca VII	714.176	135	N
Ni III	705.991	0		K	710.645	20	N	Ge II	714.206	2	Z
Cr IV	706.042	20		Ca VII	710.671	100	N	Ni III	714.254	100	
O III	706.224	150		Kr V	710.73	30		Ni IV	714.38		F, P
O III	706.298	100		K VI	710.932	50	N	Ca III	714.628	25	
Ni IV	706.33		F, P	Zn III	710.977	0	Q	Al II	714.695	20	
Mn IV	706.383	60		S III	710.98	387	N	Kr III	714.77	40	
F V	706.43			Se III	711.0	150		Sc IV	714.805	220	
As II	706.44	0		Co III	711.002	0		Co III	714.836	0	
S VI	706.48	600		Ni IV	711.02		F, P	Sc	714.87	300	N
Cr IV	706.481	70		Se VII	711.050	720		C III	714.879	100	
Zn III	706.667	1		Ti XVII	711.09		F, P	Ni III	714.965	1	N
Cr IV	706.885	70		As IV	711.1	400		Zn I	715.071		A, Z
Br III	707.0	85		Mn III	711.196	50		Co III	715.125	0	N
Mn XVIII	707.1		F, P	Si II	711.34	0	Z	Zn III	715.337	0	Q
P V	707.241	30		Ca VII	711.390	100	N	Ni IV	715.36		F, P
O III	707.315	200		Se III	711.4	150		As V	715.5	350	
Si V	707.420	60		Mn III	711.404	70		Cu III	715.532	150	
Fe III	707.444	70		Kr IV	711.51	120	Q	Cl V	715.55		
Cl II	707.4581	370		Ni III	711.518	20		Ni III	715.563	100	
Si III	707.54	110	N	S III	711.55	197	N	Cl II	715.5874	360	
Zn III	707.671	1		K	711.571	20	N	Ar V	715.60	200	
Sc IV	707.673	110		C V	711.59		P	Ar V	715.65	150	
Sc	707.72	150	N	Fe IV	711.737	1		P III	715.677	4	Z
Ni III	707.754	0		Co III	711.741	5		Mn IV	715.715	0	
Cu IV	707.765		F, P	Zn III	711.768	0	Q	As II	715.789	0	
Ni IV	707.779	10	N	Ni III	711.772	100		O V	715.955	15	
S II	707.86	50		Br II	711.8	300		Cl XII	716.		F, P
Ni IV	708.11		F, P	Si II	711.83	1	Z	K VI	716.016	360	
Ni IV	708.185	10	N	Cu III	711.853	15		Zn III	716.052	0	
Al IV	708.34	10		V IV	711.911	20		Co III	716.055	2	
Kr III	708.365	300		Zn III	711.924	0		Cr IV	716.128	40	
Fe IV	708.373	12		Mn IV	711.978	30		Ca III	716.136	10	
Si VI	708.394	60		Kr II	712.042	130		O V	716.137	15	
Ca III	708.521	25		Cu III	712.043	20		Cl V	716.19		
Ni IV	708.567	10	N	Sc IV	712.122	20		Ge V	716.264	35	
Ge V	708.692	8		Co III	712.193	0	N	K VI	716.289	110	
Co III	708.767	15		Ni IV	712.31		F, P	Ar	716.42	10	N
S IV	708.78	182	N	Al IV	712.43	10		Cl II	716.5138	70	
Kr V	708.79	250		Sc IV	712.452	1		O V	716.553	40	
P III	708.812	4		Cu III	712.481	35		Ni III	716.608	20	
K III	708.838	200	N	Mn III	712.493	115		Ca III	716.654	10	
Ni III	708.853	5		F III	712.524	1		Se IV	716.662	10	
Ca VII	709.001	100	N	Cr IV	712.576	5		Ni IV	716.67		F, P
Ni III	709.027	100		F V	712.64			P III	716.739	60	
Se III	709.1	200		Cl II	712.6792	370		Zn III	716.758	1	
Cl II	709.1616	300		S VI	712.68	400		S V	716.83	277	N
Ar V	709.20	250		K VI	712.728	50	N	Ca III	716.876	10	
Mn IV	709.244	90		Mn III	712.786	10		Zn I	716.878		A, Z
Br VI	709.3	85		S VI	712.84	300		Sc IV	716.880	1	
Cu II	709.3129	10		Co III	712.890	2		P III	716.912	25	Z
Se III	709.4	200		Cr IV	712.901	220		P VI	716.98	400	
Ge V	709.514	1		Cl II	712.9584	100		Zn III	717.143	0	
Se II	709.57	500		Ni III	712.976	100		Cl II	717.1519	340	
Mn IV	709.586	10		Ar XIII	713.		F, P	Ca III	717.283	50	
Mn IV	709.627	40		V XVII	713.0		F, P	Ni III	717.318	2	N
Ge V	709.702	2		K V	713.041	50	N	Ni IV	717.35		F, P
Ca III	709.802	10		Cu III	713.264	30		Co III	717.490	1	
Cr IV	709.900	40		Ni III	713.332	300		Se VII	717.527	410	
Co III	709.912	10		Ni III	713.385	300		Cl II	717.5327	130	
Ca VII	709.932	100	N	K	713.489	50	N	C V	717.58		P
Fe IV	709.980	4		N V	713.518	85		Ca III	717.638	10	

Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes
Co XXIII	717.8		F, P	Sc IV	722.881	20		As II	726.661	0	
Ca III	717.836	50		V IV	722.912	40		Br II	726.7	100	
Mn IV	717.945	150		V IV	723.045	40		B V	726.719		P
Ar II	718.0898	450	st	Fe XX	723.1		F, P	B V	726.767		P
Br II	718.1	20		Fe IV	723.243	12		P IV	726.811	25	
Sc IV	718.128	40		Co XXII	723.3		F, P	Al III	726.9152	300	
Cu II	718.1787	10		Zn III	723.354	1	Q	Fe IV	726.935	4	
Ni III	718.287	10		Ar II	723.3605	900	st	F VIII	727.0		
Ni IV	718.33		F, P	V IV	723.537	40		Zn III	727.002	0	
Ni III	718.480	500		Fe IV	723.553	4		Ge V	727.067	17	
O II	718.484	850		V IV	723.652	40		Ni II	727.100	2	
Br IV	718.5	350		Cr VI	723.675	4		Ca VII	727.185	50	N
Ni IV	718.51		F, P	Zn I	723.95		P, Z	As II	727.272	1	
O II	718.562	800		Cu III	723.961	35		K	727.295	20	N
Ni III	718.674	100		V IV	724.068	40		As II	727.311	20	
Ge V	718.710	8		Cl VI	724.13	150		Ni III	727.313	15	
Mn III	718.786	80		Ni III	724.155	3		Zn III	727.332	0	
Ni XXIII	718.8		F, P	Cu III	724.197	50		Se III	727.5	10	
Mn IV	718.893	0		Se III	724.2	300		Cl VI	727.54	150	
Ge V	718.913	25		Ge V	724.214	50		Ar	727.58	10	N
Mn III	718.929	60		Cr IV	724.218	1		Cu IV	727.584		F, P
Ca III	719.124	10		K VI	724.278	450		Ca III	727.656	250	
Cl II	719.2703	340		Ge V	724.284	20		Fe III	727.681	200	
Ge V	719.282	15		S III	724.29	300		S II	727.71	128	Q
As II	719.303	10		K V	724.441	360		Zn I	727.850		A, Z
Cr IV	719.420	1		Ni III	724.471	20		Mn III	727.860	25	
Ge II	719.487	5	Z	Cu II	724.4887	15		Br II	728.0	100	
Cu III	719.489	75		Sc IV	724.561	40		Ca III	728.004	50	
Na VII	719.491	15	Q	Al IV	724.62	7		As II	728.042	25	
Cu III	719.520	75		P V	724.688	1		C V	728.1	0	
As II	719.574	1		Ca III	724.762	10		As XXVI	728.2		F, P
Ni IV	719.65		F, P	V IV	724.809	5		Zn III	728.252	0	
Zn I	719.676		A, Z	O I	724.830	40	A, Z	Mg III	728.337	20	
S X	719.7		P	O I	724.932	30	A, Z	Fe IV	728.337	4	
Zn III	719.765	1		Cl XI	725.		F, P	P VI	728.34	60	
Kr III	719.843	15		S IV	725.00	207	N	Fe III	728.52	70	
Mn III	719.850	45		Ti IV	725.026	1	P	C VI	728.623		P
Se III	719.9	150		Ca V	725.088	50	N	Zn III	728.646	0	
Mn III	719.997	50		Ar V	725.11	100		S III	728.69	300	
N IV	720.244		P	Ge V	725.134	13		Al IV	728.71	60	
N IV	720.327		P	Ni III	725.196	250		O V	728.733	100	
Ni III	720.337	15		Cl II	725.2717	440		Fe III	728.810	400	
Se III	720.4	150		K VI	725.328	70		Se IV	728.856	10	N
K V	720.440	285		Mg III	725.347	7		C VI	728.890		P
N IV	720.510		P	Zn I	725.39		A, Z	Li III	728.908		P
Si VI	720.547	40		Cu IV	725.472		F, P	Cu III	728.920	10	
As II	720.59	5		Zn III	725.533	0		Zn III	728.921	1	
Se III	720.6	200		Ar II	725.5485	540	st	Cl II	728.9513	500	
Zn I	720.619		A, Z	Be III	725.586	40		C VI	728.978		P
Fe IV	720.711	4		Cl II	725.6570	320		Li III	729.039		P
Cr VI	720.771	4		O I	725.665	30	A, Z	Fe IV	729.048	4	
S IV	720.85	119	N	Al III	725.6826	200		As II	729.05	0	
Ar	720.94	10	N	Zn III	725.694	0		Mn III	729.204	20	
Se IV	720.959	50	N	Be II	725.71	100		Cu IV	729.238		F, P
S X	721.0		P	Si V	725.737	20		Ni III	729.249	100	
Ni III	721.259	200		O I	725.748	20	A, Z	Kr III	729.25	40	
Mn III	721.296	12		S VI	725.8			Zn I	729.252		A, Z
Se VII	721.392	760		Ni III	725.806	2	N	Cu IV	729.314		F, P
As II	721.409	0		K IV	725.848	50	N	Cl II	729.3406	380	
Ni III	721.418	100		S III	725.86	3		Fe III	729.349	200	
Ca VII	721.514	50	N	Ca III	725.956	50		Ti IV	729.353	4	P
Mg III	721.592	4		O I	726.035	10	A, Z	Kr II	729.404	230	
S II	721.64	224	N	O VIII	726.095		P	Cl II	729.5235	340	
Mn III	721.647	35		O I	726.104	10	A, Z	S III	729.53	400	
P VI	721.76	100		Zn III	726.184	0	Q	P VI	729.568	500	
Se II	721.88	0		Br VI	726.2	150		Ni III	729.820	500	
F IV	722.028	500		Cu III	726.296	30		Zn III	729.959	1	Q
Kr III	722.04	1000		Zn III	726.394	0		Fe III	729.996	300	
Ni III	722.094	300		Se III	726.4	250		Br II	730.0	100	
Zn III	722.182	0		Se II	726.41	1		Ni III	730.014	50	
Cr XVIII	722.32		F, P	As II	726.51	25		Zn III	730.064	1	
Ca III	722.382	10		O VIII	726.512		P	Ni III	730.109	250	
Fe III	722.419	250		B V	726.582		P	Ge V	730.127	16	
Ca VII	722.456	100	N	Al IV	726.63	30		Se III	730.2	30	
Se IV	722.8	200		O VIII	726.649		P	Al IV	730.22	60	



Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes
Ca V	730.257	250	N	S III	734.05	100		O I	736.629	10	A, Z
Kr III	730.267	15		Mn III	734.066	10		Ca III	736.693	200	
Cl VI	730.31	200		Ni III	734.100	5		O I	736.734	30	A
Zn III	730.310	1		Zn III	734.185	0		O I	736.734	30	A
Cu III	730.375	125		O I	734.251	10	A	As II	736.759	1	
Ge V	730.463	13		O I	734.251	10	A	Cl VI	736.76	150	
Ca III	730.474	25		Fe III	734.296	250		Co IV	736.79		F, P
Sc III	730.5997	10		V IV	734.344	20		F VII	736.8		
S III	730.78	300		O I	734.368	5	A, Z	Ca III	736.823	25	
Mn IV	730.873	0		Ni IV	734.38		F, P	O I	736.824	10	A
Fe III	730.88			Mn III	734.407	0		O I	736.824	10	A
Ar II	730.9297	360	st	Mg III	734.441	60		O I	736.910	10	A, Z
Cl II	730.9424	380		Cu IV	734.463		F, P	F I	736.987	2	
Zn III	730.946	0		Se VII	734.484	750		O I	737.019	5	A, Z
Fe III	730.96	150		Mn III	734.519	0		O I	737.083	10	A, Z
Cr XIX	731.1		F	O I	734.544	10	A	K IV	737.146	450	
Fe III	731.130	70		O I	734.544	10	A	Kr	737.19	20	N
Zn I	731.158		A, Z	Se IV	734.6	250		As V	737.2	250	
Zn III	731.197	0		F I	734.642	1		Se III	737.2	200	
Ge V	731.200	30		P V	734.65	1		Al IV	737.27	200	
Ca III	731.215	100		O I	734.746	5	A, Z	Se II	737.30	1	
P VI	731.35	80		F III	734.767	3		Ni II	737.300	5	
B II	731.357	100		F I	734.795	1		Si V	737.301	50	
B II	731.442	100		As V	734.8	400		Br II	737.4	150	
Fe III	731.443	70		Zn III	734.828	1		Ge V	737.411	17	
Ni III	731.481	150		Br VI	734.9	150		Ni III	737.419	50	
Se III	731.5	50		Zn I	734.907		A, Z	Ar II	737.4537	60	st
Ge V	731.546	25		O I	734.913	20	A	O I	737.495	20	A, Z
Cu XXII	731.6		F, P	O I	734.913	20	A	O I	737.614	10	A
Fe III	731.612	150		Ge V	734.933	25		O I	737.614	10	A
Sc III	731.6549	15		As II	735.09	25		O I	737.683	10	A, Z
Ni III	731.696	400		O I	735.092	5	A	Fe III	737.708	300	
Zn I	731.724		A, Z	O I	735.092	5	A	K	737.761	50	N
Fe III	731.846	150		Kr	735.14	30	N	O I	737.779	30	A
K V	731.869	450		F I	735.154	1		O I	737.779	30	A
Fe III	731.90	70		As II	735.17	5		Co IV	737.82		F, P
Co IV	732.00		F, P	Cu III	735.229	100		V IV	737.854	400	
Fe III	732.004	200		O I	735.234	10	A, Z	O I	737.873	10	A, Z
Cu III	732.029	100		S III	735.25	400		Mn III	737.940	12	
Ni III	732.158	300		Fe III	735.338	70		O I	737.995	10	A, Z
Ca III	732.244	100		Ge V	735.353	35		Co III	738.066	2	N
Kr III	732.257	80		O I	735.367	20	A	K	738.075	50	N
Al IV	732.35	3		O I	735.367	20	A	Se III	738.2	50	
S III	732.38	500		Cu IV	735.373		F, P	Ni II	738.201	2	
Fe III	732.425	150		Co IV	735.44		F, P	Ni III	738.258	200	
Ni IV	732.48		F, P	F I	735.469	1		Zn III	738.261	0	Q
Zn II	732.605	1		Cu II	735.5203	20		Co IV	738.33		F, P
Mg III	732.625	20		O I	735.616	10	A, Z	Ni IV	738.47		F, P
Cu III	732.693	25		Br IV	735.7	350		S III	738.47	400	
Ni IV	732.79		F, P	Co III	735.720	0	N	Zn I	738.497		A, Z
Ca III	732.894	250		O I	735.760	5	A	Ni IV	738.53		F, P
F I	732.960	1		O I	735.760	5	A	O I	738.537	20	A, Z
S III	732.98	50		Sc X	735.792		P	Ni II	738.548	1	
Ca III	733.096	10		O I	735.840	5	A, Z	Zn III	738.623	0	Q
Fe III	733.13	70		Cr III	735.89	200	N	O I	738.644	10	A
Kr	733.17	50	N	Ne I	735.8962	1000	st	O I	738.644	10	A
Zn III	733.281	0	Q	Co IV	735.94		F, P	Cu IV	738.652		F, P
Mn III	733.298	20		O I	735.960	20	A	K	738.696	20	N
Co IV	733.34		F, P	O I	735.960	20	A	P VI	738.71	5	
S III	733.34	50		Mn III	735.993	12		Fe III	738.742	70	
Mn III	733.435	80		Cu II	736.0319	25		Ni IV	738.84		F, P
Zn I	733.478		A, Z	O I	736.092	10	A	Ca III	738.845	100	
Ge V	733.542	35		O I	736.092	10	A	Fe IV	738.857	4	
As II	733.721	0		Br VII	736.1	350		Kr	738.90	400	N
Na VI	733.743	15	N	Ni IV	736.11		F, P	O I	738.906	5	A, Z
Ni III	733.807	20	N	Al IV	736.11	5		Cl II	738.9117	140	
Zn I	733.81		A, Z	O I	736.225	10	A	Co IV	738.98		F, P
Zn I	733.84		P, Z	O I	736.225	10	A	O I	739.085	20	A, Z
Si V	733.855	50		Ca III	736.239	50		K VI	739.177	50	N
Sc IV	733.881	70		S III	736.25	200		Co IV	739.18		F, P
Cl VI	733.89	150		Br III	736.3	250		O I	739.188	30	A
Se VII	733.932	730		Se VII	736.359	820		O I	739.188	30	A
O I	733.987	5	A, Z	O I	736.460	5	A, Z	Fe III	739.264	300	
Ge V	734.002	7		Fe III	736.47	20		Mg III	739.276	40	
F III	734.047	6		Mg III	736.563	30		Se III	739.3	50	

Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes
Al IV	739.31	5		Ni III	742.391	3		F I	745.767	2	
Ti III	739.327	1		O I	742.471	5	A,Z	N II	745.841	500	
Co IV	739.35		F,P	Ca III	742.541	200		Ge V	745.845	7	
P VI	739.48	400		As II	742.556	1		As II	745.855	0	
O I	739.499	10	A,Z	O IV	742.64		Q	F VI	745.91	10	
Ni IV	739.53		F,P	Ca III	742.672	150		Co III	745.939	0	N
Fe III	739.594	150		F III	742.699	60		O I	745.945	5	A,Z
Se III	739.6	120		Zn II	742.720	3		Zn I	745.970		A,Z
Al III	739.6707			Kr II	742.825	80		Ar XI	746.		F,P
P III	739.673	60		Kr VI	742.83	1000		Se II	746.02	1	
Fe III	739.724	250		Al IV	742.947	20		Ca III	746.060	50	
O V	739.810	15	P	Zn III	742.964	1		Be III	746.228	30	
Ni IV	739.83		F,P	As II	743.037	25		Ni II	746.241	5	
F III	739.833	25		As II	743.101	1		Fe III	746.247	200	
Al IV	739.93			Kr II	743.125	80		Ca III	746.248	300	
Zn I	739.840		A,Z	As II	743.161	1		Cr IV	746.248	110	
O V	739.847	7	P	Cr IV	743.271	0		Ni III	746.319	50	
Co IV	739.85		F,P	Ni III	743.275	2		K IV	746.342	360	
F III	739.851	20		K V	743.292	100	N	Se IV	746.4	350	
Al IV	739.93	5		Cu III	743.298	100		F I	746.400	1	
O I	739.940	20	A,Z	Ge V	743.364	25		Al IV	746.43	5	
O II	739.949	100		O V	743.42		N	Ni II	746.525	0	
As II	739.990	25		Be II	743.58	300		Ge V	746.620	6	
Cl X	740.		F,P	Br II	743.7	0		F I	746.627	3	
Ar VIII	740.0		P	Ne I	743.7195	400	st	Ge V	746.687	17	
O I	740.053	10	A	Kr III	743.901	50		Kr III	746.700	110	
O I	740.053	10	A	O I	743.929	30	A,Z	Al IV	746.71	20	
Co IV	740.10		F,P	Ni III	743.955	100		Kr III	746.83	100	
Ca III	740.160	10		Cu III	743.986	35		Cl III	746.86	100	
P III	740.178	90		Ne X	744.013		P	Ge V	746.882	60	
Sc IV	740.228	40		O I	744.051	40	A,Z	N II	746.984	650	
Ni III	740.235	100		Ni IV	744.10		F,P	Ni III	747.015	30	
P XIV	740.25		P	O I	744.128	30	A,Z	Ge V	747.040	11	
Ar II	740.2691	450	st	Ni IV	744.16		F,P	Ni III	747.213	20	
Zn III	740.279	0	Q	Cr IV	744.190	70		Fe IV	747.331	1	
O I	740.313	1	A,Z	P VI	744.21	150		Al IV	747.35	40	
Ca III	740.330	100		Cl II	744.2627	40		Zn II	747.358	5	
Cu IV	740.435		F,P	Ge V	744.272	10		Co III	747.375	0	N
Al IV	740.44	100		Kr	744.28	150	N	Cl III	747.42	100	
Co IV	740.51		F,P	Ni IV	744.29		F,P	Cl II	747.5649	100	
Ca III	740.553	400		Ca III	744.293	50		Sc IV	747.596	5	
Co IV	740.60		F,P	Fe IV	744.305	4		As IV	747.6	450	
Ni III	740.620	30		Mg III	744.342	40		Cl III	747.60	100	P
Cr XVII	740.8		F	Ni III	744.400	5		N II	747.606		P
Br II	740.8	200		N IV	744.566		P	K	747.677	150	N
O II	740.838	10		Ni II	744.636	2		Ni III	747.697	3	
Ni IV	740.89		F,P	N IV	744.737		P	K VI	747.848	100	N
Al III	740.9514			Ni III	744.784	100		Ca III	747.978	250	
Al III	740.9550			O I	744.794	55	A,Z	Ni III	747.989	300	
S III	741.01	228	N	Zn I	744.80		P,Z	F I	747.999	2	
Ni IV	741.03		F,P	F III	744.818	20		Co XXII	748.0		F,P
Co III	741.032	1	N	Ni II	744.867	5		Co III	748.019	1	N
O I	741.055	30	A,Z	As II	744.869	2		Ge V	748.039	3	
O I	741.177	40	A	O I	744.899	10	A,Z	Cu IV	748.051		F,P
O I	741.177	40	A	S IV	744.907	160		F I	748.134	1	
Al II	741.182	25		Ar II	744.9247	450	st	N V	748.195	120	
O II	741.293	1		F V	744.95			Ar II	748.1982	210	st
Ge V	741.516	35		Ne X	745.008		P	N V	748.291	150	
Ni IV	741.58		F,P	O I	745.011	10	A,Z	As IV	748.3	400	
O I	741.625	20	A,Z	N IV	745.020		P	F I	748.338	2	
Cr VII	741.889	20		Ni III	745.058	40		Cr III	748.35	80	N
As IV	741.9	400		O I	745.159	10	A,Z	N II	748.369		
Se III	741.9	200		V IV	745.165	20		Zn I	748.37		A,Z
O I	741.914	20	A,Z	Ar XII	745.2		P	O I	748.380	40	A,Z
Mg III	741.932	20		Cl IV	745.21	400		K	748.393	100	N
K IV	741.941	450		K IV	745.258	650		S IV	748.400	220	
F III	741.955	35		O I	745.287	5	A,Z	Co III	748.419	0	N
Ar VIII	742.0		P	Ne X	745.314		P	C V	748.43		P
O I	742.062	10	A	Ar II	745.3222	360	st	Kr VI	748.58	150	
O I	742.062	10	A	Br III	745.4	85		F I	748.580	4	
S VI	742.16	140	N	O I	745.628	5	A,Z	Al IV	748.63	2	
S V	742.2		N	Cl II	745.6368	50		O I	748.632	30	A,Z
Zn III	742.215	0	Q	Ni II	745.640	1		O I	748.680	30	A,Z
Ge V	742.232	5		Co III	745.762	0	N	F I	748.709	2	
O I	742.280	10	A,Z	Kr III	745.765	30		K	748.783	50	N
Se VII	742.283	760									

Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes
Ge V	748.865	2		P IV	751.944	60		Co III	755.972	1	
Fe IV	748.873	30		O V	752.019	3		Co III	756.064	1	
O I	748.93	1	A, Z	Ni III	752.023	200		P III	756.171	60	
F I	748.946	3		V IV	752.038	30		O I	756.243	40	A, Z
Ge V	748.985	11		Mn III	752.040	10		Ge V	756.285	20	
Al IV	749.07	60		Kr II	752.045	160		Co III	756.338	5	
S IV	749.24	141	N	Kr II	752.078	40		Cl VI	756.34		P
O I	749.253	40	A, Z	Cu IV	752.135		F, P	O I	756.354	30	A, Z
Se VII	749.421	680		O IV	752.150	5		O I	756.410	40	A, Z
B V	749.432		P	Ni II	752.403	0	N	Co IV	756.49		F, P
Ca III	749.479	150		Co III	752.485	0	N	P IV	756.510	300	
O I	749.517	10	A, Z	V IV	752.568	20		Se IV	756.519	1	N
Mg IX	749.55			Ni III	752.603	100		Cl IV	756.56	100	
O I	749.586	10	A, Z	Ni II	752.626	4		O I	756.56	1	A
O I	749.628	10	A, Z	As II	752.680	50		Cr III	756.567	1	
V IV	749.641	40		Co III	752.759	3	N	Sc IV	756.616	1	
C V	749.66		P	O III	752.762	200		Cl II	756.632	12	
Ni III	749.677	200		Cu II	752.80	0	N	O I	756.676	20	A, Z
B V	749.737		P	Co IV	752.85		F, P	Ni III	756.687	100	
O I	749.742	10	A, Z	F I	752.884	4		O I	756.704	10	A, Z
O I	749.795	10	A, Z	K	752.952	20	N	Cr VI	756.786	12	
B V	749.837		P	Zn III	752.956	0	Q	Cu IV	756.791		F, P
O I	749.894	5	A, Z	Mg III	753.247	12		Mg III	756.808	7	
Si IV	749.941	300		Ni III	753.252	30		C V	756.87		P
Zn I	749.962		A, Z	F I	753.303	4		Cu XXIV	756.9		F
K IV	749.979	450		Ar II	753.3654	15	st	As II	756.92	50	
O I	749.99	1	A, Z	Ni III	753.378	10		F V	757.037	100	
Ni III	750.053	300		Co IV	753.41		F, P	O I	757.059	10	A, Z
V IV	750.110	150		Ge V	753.447	2		Co IV	757.06		F, P
O I	750.19	2	A, Z	Ni IV	753.46		F, P	K V	757.112	200	N
S IV	750.228	285		O I	753.52	2	A, Z	O I	757.149	10	A, Z
K V	750.230	150	N	Cu IV	753.549		F, P	O I	757.15	2	A, Z
Kr	750.25	80	N	P VI	753.564	30		F V	757.158	35	
Ge V	750.265	40		Cl II	753.6251	250		Fe III	757.167	150	N
P IV	750.284	120		P IV	753.646	1		K VI	757.199	200	N
Cu IV	750.296		F, P	S IV	753.764	160		Ni III	757.201	50	
K XVIII	750.36		P	K VI	753.877	150	N	O I	757.254	20	A, Z
K V	750.381	50	N	O I	753.94	1	A, Z	Fe III	757.279	150	N
F I	750.418	1		Ge XIX	754.1		F	Ni III	757.397	5	
Al IV	750.52	40		F I	754.148	2		Sc IV	757.505	160	
O I	750.573	5	A, Z	As II	754.176	0		Sc	757.56	300	N
F I	750.610	3		K IV	754.187	5		O I	757.627	10	A, Z
O I	750.637	10	A, Z	F VII	754.2		N	P III	757.629	90	
As II	750.64	25		Ar IV	754.21	160		Ni III	757.689	10	
Fe IV	750.670	1		As II	754.270	0		Ni III	757.795	300	
Sc IV	750.698	20		F V	754.359	35		Cl VI	757.82		P
Zn I	750.73		A, Z	Sc IV	754.419	160		P III	757.878	4	
Mg III	750.745	12		Fe III	754.478	150		Ni III	758.039	150	
As II	750.77	75		Sc	754.49	250	N	As II	758.047	50	
P IV	750.775	1		F V	754.490	60		N III	758.09		P
V IV	750.809	40		Cu IV	754.507		F, P	Co III	758.212	20	
F I	750.885	1		Cr V	754.521	110		Ne IV	758.32	15	Q
Co XXI	750.9		F, P	Cl II	754.5869	280		P III	758.333	10	
As II	750.937	15		Ge V	754.613	13		O I	758.347	20	A, Z
Ge V	750.939	2		Ni IV	754.64		F, P	S IV	758.35	233	N
O I	750.956	10	A, Z	K IV	754.658	450		O I	758.412	30	A, Z
Ni III	750.983	150		Fe IV	754.784	12		Ca VI	758.465	50	N
Kr III	750.99	80		Co III	754.795	2	N	B III	758.476	100	
Sc IV	751.027	20		Ar II	754.8239	210	st	K V	758.559	50	N
P IV	751.069	90		Ar VI	754.93	100		B III	758.673	200	
Mg III	751.121	40		Se VII	755.002	810		O V	758.678	700	
Mg III	751.207	40		Ar IV	755.21	120		Mn XIX	758.7		F, P
Ni III	751.333	150		Co III	755.253	5	N	Ni III	758.733	250	
Al IV	751.41	40		Ni IV	755.28		F, P	Ge V	758.757	12	
Fe III	751.427	150	N	Ca III	755.303	10		Ni III	758.773	250	
O I	751.47	2	A, Z	Si II	755.362	2	Z	Cu IV	758.816	20	
Ni III	751.573	150		Co III	755.512	0	N	Se IV	759.0	250	
Fe III	751.648	150		F I	755.603	2		Co IV	759.01		F, P
P IV	751.651	90		Cl VI	755.63		P	Ni IV	759.04		F, P
Al IV	751.68	2		Cr III	755.69	10	N	Ni III	759.098	100	
O I	751.75	1	A, Z	Co IV	755.78		F, P	As II	759.186	50	
Se III	751.8	150		O I	755.790	40	A, Z	O I	759.200	10	A
F I	751.861	4		Cu IV	755.828		F, P	P III	759.200	4	
V IV	751.908	30		Ge V	755.836	35		O I	759.262	20	A, Z
Se VII	751.914	830		Mn III	755.854	10		Mn III	759.306	10	

Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes
P III	759.318	1		Ni III	763.313	2		Ni III	767.901	2	
S IV	759.34	141	N	N III	763.340	700		Ge V	767.938	40	
As II	759.366	150		O III	763.81		Q	Cu IV	767.965	20	Q
O V	759.441	640		Ti IV	763.842		P	Mn III	767.967	25	
P III	759.473	4		Cr IV	763.947	110		Mn III	768.031	20	
Ge V	759.579	20		Kr II	763.977	230		As II	768.091	150	
Co III	759.592	3		Mn III	764.003	40		Kr III	768.132	5	
O I	759.593	10	A, Z	Ni III	764.014	100		Cr III	768.21	20	
Se III	759.6	30		Mn III	764.106	70		Cr V	768.251	1	
Co III	759.644	3	N	Cr V	764.151	1		Ti IV	768.418		P
Ge V	759.765	4		P V	764.157	1		Mn III	768.424	25	
Se VII	759.810	30	N	As II	764.209	25		Co III	768.458	20	
Br III	759.9	50		Co III	764.229	0	N	Cu II	768.48	0	N
S X	759.9		P	Ni III	764.354	50		Cr III	768.51	30	
Co IV	759.91		F, P	N III	764.357	750		Sc IV	768.515	110	
Co III	759.970	0		Co III	764.363	2		Sc	768.62	150	N
Ni III	760.024	15	N	Cu IV	764.364	20	N	Ti IV	768.646		P
Ge V	760.053	60		Co III	764.418	2	N	As II	768.697	25	
Mn III	760.142	10		Mn III	764.695	80		P VI	768.787	70	
C V	760.18		P	Ca III	764.699	100		Cu IV	768.864		F, P
Zn I	760.20		A, Z	Mn III	764.794	35		Sc III	769.019	1	
Co III	760.211	1		N V	764.833		P	Co III	769.128	10	
O V	760.228	580		Co III	764.866	10		Al IV	769.13	10	
Se VII	760.425	800		N V	764.896		P	Ar III	769.15	600	
Ar IV	760.44	120		Cr IV	764.923	1		S X	769.2		P
O V	760.445	775		Co III	764.959	20		Cr III	769.20	40	N
Ni III	760.452	10		Ni IV	764.99		F, P	O I	769.23	5	A, Z
S IV	760.62	255	N	Ti XVI	765.0		F, P	Co III	769.343	5	N
Ni III	760.684	5		Ar XII	765.1		P	O I	769.3528	20	A, Z
As II	760.766	125		Co III	765.104	3		Cu IV	769.395		F, P
As IV	760.8	500		N IV	765.148	750		K V	769.402	100	N
Co III	760.825	30		Mn III	765.148	130		O I	769.4083	30	A, Z
Mg III	760.981	7		Se VII	765.156	30	N	Co III	769.459	3	
S X	761.0		P	K III	765.314	200	N	Mn III	769.467	25	
Ni IV	761.06		F, P	Mn III	765.480	25		Sc III	769.524	1	
O V	761.128	640		Zn I	765.51		A, Z	Br III	769.6	120	
As II	761.148	30		Co III	765.561	3		As II	769.60	10	
Kr II	761.175	360		S II	765.62	244	N	Ca	769.602	50	N
P III	761.200	10		K III	765.644	300		Cr III	769.66	30	N
Co III	761.202	1		Mg III	765.655	20		Sc IV	769.696	285	
As II	761.239	170		Ni III	765.726	50		Se III	769.7	10	
Sc IV	761.428	285		Cr IV	765.833	70		Mn III	769.757	20	
Ar IV	761.47	200		P IV	765.958	10		O IV	769.78		Q
Sc	761.50	400		Al IV	765.97	6		S VII	769.8		N
Ar II	761.5791	60	st	Ni III	766.000	5		Sc	769.80	400	N
Al IV	761.761			Kr II	766.205	230		Mn III	769.862	25	
Sc IV	761.863	20		Mn III	766.222	40		K VI	770.022	50	N
Br III	761.9	20	Q	S X	766.3		P	Co III	770.192	1	
Ge V	761.905	30		Al IV	766.31	3		Ni III	770.216	400	
Se VII	761.984	1	N	Mn III	766.335	35		Kr	770.22	30	N
As IV	762.0	400		As II	766.41	0		Mn III	770.233	25	
O V	762.003	700		Mn III	766.438	80		O I	770.2600	10	A, Z
Co III	762.038	1	N	Ca VI	766.522	50	N	K V	770.289	70	
Cu IV	762.077		F, P	Se XX	766.6		F, Q	O I	770.2907	2	A, Z
Ar II	762.2000	180	st	Co III	766.667	10		Ca III	770.321	10	
O I	762.26	2	A, Z	Ni III	766.693	100		O I	770.3464	10	A, Z
Se VII	762.292	300		As II	766.97	1		C IV	770.379	25	
N VII	762.521		P	Mn III	766.994	10		Ne VIII	770.409	1000	
Co III	762.529	3		Cl XII	767.		F, P	Mn III	770.421	60	
Co III	762.694	0	N	O III	767.03		Q, Z	Mn III	770.643	20	
As IV	762.7	200		Zn II	767.050	5		N IV	770.678		P
Mg III	762.756	12		Ar VI	767.06	200		O I	770.6986	10	A, Z
P III	762.757	25		Ge V	767.168	5		O I	770.70		A, Z
Co III	762.775	50		Cr III	767.30	10	N	Co III	770.723	2	N
N VII	762.806		P	Ni III	767.400	5		As II	770.76	25	
P III	762.852	1		Mn III	767.577	25		O I	770.793	55	A, Z
N VII	762.901		P	Cr III	767.61	10	N	B II	770.8		Z
Ni III	762.951	5		Co III	767.703	20		Se III	770.9	150	
Co III	763.013	0		Ar VI	767.71	100		Ca VI	770.928	50	N
P III	763.031	40		Al IV	767.747	100		Co III	770.967	0	
C V	763.07		P	Be III	767.75	10		Mn III	770.997	0	
Cr III	763.107	1		Mn III	767.763	30		Ni IV	771.00		F, P
Ni IV	763.12		F, P	Co III	767.770	15	N	Cl II	771.0246	60	
Co III	763.131	25		Cr III	767.83	20	N	Kr II	771.027	360	
Cu II	763.29	0	N	Ni II	767.898	1		O I	771.056	90	A, Z

Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes
K VI	771.103	250	N	O III	775.03		N	Zn II	778.112	5	
Mn III	771.138	60		Na IV	775.065	10	Q,Z	Cr III	778.165	40	
Kr	771.19	400	N	Se II	775.09	1		Se IV	778.166	85	N
Ni IV	771.34		F,P	As II	775.198	50		N V	778.172	40	
Mn III	771.345	45		O I	775.252	40	A,Z	S X	778.2		P
K V	771.376	150	N	P V	775.254	1		Ar I	778.224	1	A,Z
K V	771.454	110		Se III	775.3	1		Ar I	778.237	1	A,Z
Ge V	771.532	2		Cr V	775.308	1		Ar I	778.247	1	A,Z
N III	771.544	500		O I	775.321	55	A,Z	Cr V	778.253	40	
As II	771.561	25		Be II	775.362	400		Ar I	778.260	2	A,Z
Sc IV	771.582	70		Ni III	775.364	5		Ar I	778.273	2	A,Z
Se IV	771.586	30	N	Co III	775.446	2		Ar I	778.286	3	A,Z
Ni II	771.626	1		Ca IV	775.526	150	N	Ar I	778.302	4	A,Z
Co III	771.638	10		Fe IX	775.6		F,P	Cr III	778.306	4	
Ge V	771.644	10		Si VI	775.71	20		Cu IV	778.315		F,P
Cu IV	771.694	20		As II	775.759	0		Ar I	778.319	4	A,Z
O I	771.729	30	A,Z	Br II	775.9	10		Ar I	778.335	5	A,Z
Cu IV	771.770		F,P	N II	775.965	1000		Ar I	778.354	6	A,Z
Co III	771.868	30		Co III	775.992	10		Ar I	778.379	8	A,Z
N III	771.901	550		S X	776.		F,P	Ar I	778.396	8	A,Z
Cu IV	771.918		F,P	Ni II	776.000	3		Ar I	778.420	9	A,Z
Ge V	771.937	40		Ni II	776.078	5		V IV	778.433	0	
O I	771.967	40	A,Z	Fe III	776.097	150	Q	Cr III	778.438	25	
Ni III	772.040	200		O I	776.159	30	A,Z	Ar I	778.447	11	A,Z
Kr II	772.112	60		O I	776.206	30	A,Z	Ar I	778.474	13	A,Z
O I	772.147	5	A,Z	Cu IV	776.345		F,P	Ar I	778.504	14	A,Z
Ar XII	772.2		P	P IV	776.353	300		K III	778.528	350	
Se IV	772.257	50	N	Ge V	776.454	9		Ar I	778.537	14	A,Z
O I	772.344	20	A,Z	Cu II	776.48	0	N	Ar I	778.572	14	A,Z
P IV	772.382	10		Se IV	776.5	250		Cu III	778.599	75	
N III	772.385	600		O I	776.569	20	A,Z	Ar I	778.612	17	A,Z
Ar	772.41	10	N	Co III	776.688	20		Ar I	778.655	18	A,Z
Ar IV	772.49	10	Q	Cr V	776.743	5		Ar I	778.703	18	A,Z
Ca III	772.498	100		Ti IV	776.762	250		Ca VI	778.718	50	N
Mn III	772.513	70		Kr IV	776.78	150		Ar I	778.756	19	A,Z
Mn III	772.621	60		Co III	776.794	5		S X	778.8		P
Ca	772.641	100	N	Ni III	776.884	5		Ni III	778.806	500	
F VII	772.7		N	As II	776.91	75		Ar I	778.814	21	A,Z
Mn III	772.778	40		Cl IV	776.91	10		Ge V	778.816	10	
Ge V	772.855	30		F I	776.926	4		Ar I	778.879	22	A,Z
N III	772.891	450		K VI	776.957	200	N	Kr	778.88	20	N
Mn III	772.911	150		F I	777.010	5		Ar I	778.952	23	A,Z
N III	772.955	400	P	As II	777.06	15		Cl II	778.9924	60	
Cu IV	773.043		F,P	Cu III	777.119	150		Se VII	779.007	840	
Co III	773.125	1		Ni IV	777.16		F,P	Ar I	779.034	25	A,Z
Cr VI	773.223	30		Ni III	777.181	100		Si IV	779.04	101	
Ni III	773.464	100		Ni IV	777.25		F,P	Ti IV	779.074	800	
K VIII	773.5		P	Se III	777.3	250		Ar I	779.126	25	A,Z
Mn XIX	773.6		F,P	Cr III	777.362	1		Se VII	779.149	680	
Kr II	773.688	230		B V	777.401		P	Cu IV	779.150		F,P
Cu IV	773.716		F,P	Cr III	777.425	25		Zn II	779.163	10	
Co IV	773.85		F,P	Cu IV	777.471	40		Si VI	779.19	20	
Cu IV	773.942		F,P	Ca VI	777.508	50	N	F I	779.192	2	
Co IV	774.02		F,P	Ni IV	777.51		F,P	Cr V	779.209	1	
Cl VI	774.04		P	F I	777.531	4		Ar I	779.230	27	A,Z
Cr V	774.079	1		B V	777.556		P	Cu II	779.2949	8	
Mn III	774.079	25		Cl II	777.5623	440		Ar I	779.350	29	A,Z
Ca V	774.088	250	N	As II	777.57	150		F I	779.365	6	
Cu IV	774.129	50		Ni IV	777.58		F,P	Sc IV	779.393	5	
K	774.192	50	N	B V	777.610		P	Cr III	779.43	10	N
Se IV	774.198	30	N	Co IV	777.67		F,P	Co III	779.436	3	
Br III	774.2	50		Co IV	777.70		F,P	Ar I	779.486	11	A,Z
Ge V	774.267	20		As II	777.71	15		Ar I	779.49		A,Z
Ca V	774.354	150	N	N V	777.712	35		Ni XXI	779.5		F
Co IV	774.39		F,P	Cu II	777.7435	0		Sc III	779.538	60	
S III	774.40	232	N	Na VII	777.83			Br VII	779.6	250	
Se II	774.43	50		Cr III	777.86	10	N	Ca III	779.608	250	
Cu IV	774.462	50		Co IV	777.87		F,P	Cr IV	779.627	40	
Cu IV	774.462	50		Cr V	777.873	160		Ar I	779.645	11	A,Z
Ge V	774.464	17		Kr	777.92	20	N	Ar I	779.65		A,Z
O V	774.518	520		Ge V	777.931	12		Co III	779.683	20	
Mn III	774.566	15		Cu IV	777.975		F,P	O IV	779.734	200	
K	774.738	150	N	Cr III	778.026	10		S X	779.8		P
Cl II	774.7916	250		Ni IV	778.04		F,P	Cu IV	779.819		F,P
Al VIII	774.8			F I	778.059	6		O IV	779.821	400	

Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes
Ar I	779.828	11	A, Z	F I	782.575	2		Ni III	786.145	20	
Ar I	779.84		A, Z	P II	782.59	5		Ca III	786.159	50	
Se VII	779.900	0	N	Se II	782.66	1		P II	786.18	5	
Ca III	779.902	10		Ar I	782.705	31	A, Z	Cr V	786.210	40	
F I	779.910	5		P II	782.72	1		P III	786.252	60	
O IV	779.912	500		Ar I	782.74		A, Z	Si VI	786.343	10	
F I	779.972	2		Se IV	782.8	120	N	Na VII	786.35		
O IV	779.997	200		Mn III	782.880	12		Br II	786.4	10	
Ge V	780.028	15		P III	782.886	25		Cl VI	786.44		
Cu IV	780.028		F, P	P II	782.90	1		K V	786.464	100	N
Ar	780.044	13	N, A	Co IV	782.91		F, P	S V	786.48	800	
Ar I	780.044	13	A, Z	P III	782.972	60		Se II	786.49	150	
Ar I	780.05		A, Z	F I	782.976	5		Ar I	786.506	63	A, Z
Ca	780.116	50	N	S XI	783.		F, P	P II	786.52	5	N
F I	780.134	1		Se III	783.0	30		Ar I	786.59		A, Z
Ne IV	780.25	15		Fe III	783.069	200		Ar I	786.923	0	A
Ge V	780.271	9		Ar	783.14	250	N	Mn III	786.925	15	
Co III	780.287	0	N	Co III	783.179	10		Ar I	786.929	0	A
Ar I	780.300	13	A, Z	Br II	783.2	1		Ar I	786.938	0	A
Ar I	780.31		A, Z	N III	783.24		P	Ar I	786.947	2	A
Ne VIII	780.324	500		Mn III	783.356	5		Ar I	786.955	3	A
Co IV	780.33		F, P	Ni III	783.419	30		Co III	786.958	8	
Co IV	780.36		F, P	Cu IV	783.443		F, P	Ar I	786.964	3	A
Cu IV	780.380		F, P	Ni IV	783.51		F, P	Ar I	786.973	4	A
F I	780.390	15		As II	783.542	15		Ar I	786.984	6	A
Cu IV	780.403		F, P	P III	783.575	10		Ar I	786.994	9	A
Cr IV	780.428	5		Ar I	783.627	43	A, Z	Ar I	787.006	10	A
As II	780.46	25		Ar I	783.67	120	A, Z	Ar I	787.017	12	A
F I	780.519	10		Se III	783.7	50		Ar I	787.030	14	A
Ni III	780.572	30		S X	783.7		P	Ar I	787.044	17	A
Sc III	780.5966	6		P II	783.71	5		Ar I	787.058	21	A
Ar I	780.606	15	A, Z	Kr II	783.724	230		Ar I	787.074	22	A
Ar I	780.62		A, Z	P III	783.746	150		Ar I	787.090	24	A
F I	780.713	5		Fe XXI	783.8		F, P	Ar I	787.108	25	A
Sc III	780.729	8		Se II	783.84	10		Ar I	787.128	25	A
Se VII	780.831	810		Ni IV	783.85		F, P	Ar I	787.148	25	A
Cr III	780.87	50	N	Ni IV	784.02		F, P	Cl II	787.15	100	N
N II	780.9		P	Ge V	784.086	5		Ar I	787.170	26	A
Ar I	780.975	21	A, Z	P III	784.119	10		Ar I	787.194	28	A
Ar I	780.99		A, Z	Cu IV	784.189	20		Ar I	787.220	29	A
Cu IV	780.996		F, P	P III	784.227	25		As II	787.224	50	
Co III	781.130	20		Cu IV	784.259		F, P	Ar I	787.249	29	A
Co III	781.250	3	N	As II	784.26	50		Ar I	787.280	30	A
S VII	781.3		N	O I	784.37	5	A, Z	Ar I	787.312	32	A
K	781.338	50	N	Ar	784.38	30	N	Ar I	787.322	10	A
Se VII	781.412	720		Ge V	784.391	7		Ar I	787.349	32	A
Cr III	781.42	40	N	C III	784.393	300		Ar I	787.361	10	A
Ar I	781.427	23	A, Z	P II	784.46	1		As II	787.37	15	A
Ni IV	781.43		F, P	K V	784.713	100	N	Ar I	787.389	33	A
Ar I	781.45		A, Z	O V	784.795	7		Ar I	787.403	12	A
Ni III	781.486	50		P II	784.81	5		Co III	787.406	5	
Kr IV	781.58	200		Ar I	784.845	57	A, Z	Ar I	787.434	34	A
Br II	781.6	50		Ni IV	784.86		F, P	Ar I	787.450	12	A
F I	781.654	3		Ar XII	784.9		P	Ar I	787.482	36	A
Ti IV	781.730	650		Ar I	784.90		A, Z	Cu IV	787.498		F, P
P III	781.742	90		Cu II	784.9125	0		Ar I	787.500	13	A
Cr III	781.88	30	N	P III	784.913	4		Ar I	787.535	36	A
Cr XVII	781.9		F, P	Ni III	785.020	200		Ar I	787.557	14	A
Co III	781.983	15		Co III	785.034	0	N	Co III	787.562	8	
Ar I	781.992	24	A, Z	Ca III	785.120	150		Cl II	787.5805	700	
Ar I	782.02		A, Z	Sc IV	785.122	450		Ar I	787.595	39	A
Si VI	782.03	10		Co III	785.207	10		Ar I	787.619	15	A
Fe III	782.035	200		Sc	785.21	450	N	Ar I	787.661	39	A
Co IV	782.04		F, P	P III	785.373	60		Ar I	787.688	14	A
Se II	782.09	0		Co III	785.426	1		O IV	787.711	850	
Kr II	782.096	360		Cu IV	785.449		F, P	Ar I	787.736	40	A
Cu IV	782.259		F, P	Si VI	785.57	5		Ar I	787.763	16	A
Cr III	782.26	20	N	P IV	785.590	1		Ar I	787.819	38	A
K	782.265	20	N	Co III	785.677	1	N	Ar I	787.850	17	A
Ge V	782.282	1		Fe III	785.76	70		Ar I	787.913	36	A
P III	782.358	4		As II	785.799	0		Ar I	787.948	19	A
F I	782.378	10		Se V	785.8	120		S X	788.		F, P
Cr III	782.45	10	N	Co III	785.883	15		Ar I	788.020	37	A
Ge XXV	782.49		F, P	Kr III	785.968	450		Cr III	788.032	10	
Fe IX	782.5		F, P	Ne IV	786.14	5		Ni III	788.039	300	

Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes
Co III	788.057	8		Ar I	790.208		F,A	O I	792.9671	40	A,Z
Ar I	788.059	20	A	Ar I	790.210		F,A	Mn III	792.982	15	
Cu III	788.071	250		Ar I	790.266	36	A	Ar I	793.025	35	A
Ar I	788.141	36	A	Co III	790.268	3	N	Cu III	793.055	100	
O I	788.18	2	A,Z	Ar I	790.270	45	A	Ar I	793.115	1	F,A
Ar I	788.185	24	A	S V	790.36	110	N	Ar I	793.151	4	F,A
Ar I	788.280	41	A	Ni III	790.450	20		F I	793.237	1	
Ni III	788.298	200		Ar I	790.451	22	A	Cr XVIII	793.3		F
Ar I	788.329	28	A	S X	790.5		P	Cl II	793.3424	700	
Cu IV	788.331	70	N	P IV	790.508	150		Kr V	793.40	85	
Mn III	788.342	50		Ar I	790.535	2	F,A	Cl II	793.4574	630	
P VI	788.359	100		Ar I	790.559	4	F,A	K	793.464	20	N
Ar I	788.440	59	A	Cu IV	790.616		F,P	Ar I	793.586	1	F,A
Cu III	788.460	250		Ge V	790.623	5		Ar I	793.598	2	F,A
Ar I	788.496	29	A	Cr III	790.65	10	N	Co III	793.600	2	
O V	788.577	3		Co III	790.688	25		Kr II	793.617	80	
P IV	788.580	10		Ar I	790.768		F,A	Ar I	793.750	42	A
Ar I	788.623	40	A	Ar I	790.771		F,A	Ar I	793.781	42	A
Ar I	788.629	34	A	Se III	790.8	200		Sc IV	793.851	160	
Ar I	788.686	30	A	Ar I	790.840	60	A	Sc	793.93	250	N
Co III	788.693	2	N	P IV	790.844	25		Mn III	793.981	80	
Br II	788.7	0		Se VII	791.024	790		Fe III	794.01	70	
Cl II	788.7408	700		N IV	791.045		P	Zn I	794.07		A,Z
P IV	788.797	4		Ge V	791.047	3		Kr	794.11	150	N
Se III	788.8	150		Ca III	791.051	25		Fe III	794.19	150	
Mn III	788.812	115		Ar I	791.059	29	A	Cr III	794.246	4	
Co III	788.815	0	N	N IV	791.095		P	Ar I	794.291	27	A
Ar I	788.827	41	A	S X	791.1		P	K	794.341	20	N
Ar I	788.841	36	A	Ar XII	791.1		P	F I	794.417	10	
Ar I	788.863	30	A	N IV	791.167		P	Zn III	794.474	0	
Cr III	788.90	30	N	Ar I	791.202	1	F,A	Al II	794.475	20	
Ar I	788.902	34	A	Ar I	791.222	2	F,A	Co III	794.493	1	
S III	788.98	400		Se III	791.3	1		Ar I	794.574	2	F,A
Cl II	788.9860	550		Ni IV	791.36		F,P	Mn III	794.576	7	
Sc IV	789.001	285		Cu III	791.365	250		Ar I	794.619	4	F,A
Ar I	789.031	39	A	Co III	791.440	3	N	Ar I	794.964	5	F,A
Ge V	789.058	1		Ar I	791.478		F,A	C II	794.964	10	
Ar I	789.077		F,A	Ar I	791.482		F,A	C II	795.134	100	Z
Cl II	789.0997	280		O I	791.5136	30	A,Z	Br II	795.2	0	
Fe IV	789.107	4		Ar I	791.551	42	A	Ar I	795.212	1	F,A
Ar I	789.113	30	A	Ar I	791.566	30	A	Ar I	795.236	3	F,A
Ar I	789.140	18	A	S IV	791.62	213	N	Cr IV	795.241	40	
Sc	789.21	450	N	Sc IV	791.706	285		Cu III	795.261	15	
Ar I	789.257	34	A	Ar I	791.811	30	A	Cl II	795.3537	630	
As II	789.288	15		P VI	791.860	250		Ge V	795.423	3	
Fe XXI	789.3		F,P	Ge V	791.871	8		Ar I	795.430	49	A
Ni IV	789.34		F,P	Cr V	791.872	160		Ar I	795.4474	30	st,A
Ar I	789.387		F,A	F I	791.875	12		Co III	795.475	5	
Ar I	789.425	33	A	O I	791.9732	55	A,Z	Ni II	795.506	10	
Ar I	789.440	29	A	Zn I	792.00		A,Z	Fe III	795.550	150	
Co III	789.447	30		Ar I	792.033	1	F,A	Ni IV	795.58		F,P
Ge V	789.475	9		Ar I	792.059	3	F,A	F I	795.774	2	
Cr V	789.492	110		Ar	792.08	10	N	P III	795.835	90	
Ar I	789.568	23	A	O I	792.2330	20	A,Z	P VI	795.846		
Cr III	789.59	10	N	Cl II	792.2628	550		As II	795.94	1	
Na VIII	789.6			Ar I	792.3207	43	st,A	P III	796.020	10	
Ar I	789.625	1	F,A	Ar I	792.367	47	A	Cr III	796.025	10	
Co III	789.662	2		Ge V	792.439	20		Ar I	796.0955	30	st,A
Cu IV	789.744	60	N	O I	792.5063	20	A,Z	F VII	796.1		P
Ar I	789.756		F,A	Ar I	792.513	28	A	P III	796.223	120	
Ge V	789.799	5		F I	792.536	10		P VI	796.52	40	
Ar I	789.803	36	A	Cu IV	792.548	120	N	As II	796.528	0	
Cr III	789.81	10	N	Fe III	792.559	200		Ar I	796.599	2	F,A
Ar I	789.813	34	A	Mn III	792.567	60		Ar	796.62	10	N
Cu III	789.837	100		Se III	792.6	120		P VI	796.66	40	
As II	789.841	50		Ar I	792.632	25	A	O II	796.661	500	
Ar I	789.962	9	A	Co III	792.661	5		Ar I	796.665	4	F,A
Ni III	790.000	20		Cl II	792.694	15		Kr II	796.668	60	
F I	790.006	7		As II	792.720	60		S III	796.69	400	
Mn III	790.044	12		Cu IV	792.731	20		Se IV	796.8	85	
Ar I	790.046	2	F,A	Ni IV	792.81		F,P	Ar I	796.918	3	F,A
Cr IV	790.058	20		Co III	792.833	5	N	F I	796.982	3	
O IV	790.109	750		Si VI	792.86	5		Fe III	797.055	150	
Co III	790.197	50		O I	792.9381	40	A,Z	Ni II	797.074	200	
O IV	790.199	900		Ti V	792.948	0		Ni II	797.088	150	

Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes
Ni III	797.092	30		Be IV	800.892		P	K	805.002	20	N
Fe III	797.16	150		Ar I	800.914	3	F,A	Ni III	805.007	200	
Co III	797.166	2		Si VI	800.926	30		P III	805.056	1	
S IV	797.17	217	N	Be IV	800.945		P	Cu IV	805.097	90	Q
P VI	797.203	500		Cr III	801.04	30	N	Si II	805.101	10	
Co III	797.312	2		Zn II	801.075	1	Q,Z	S VI	805.15	126	N
Cu II	797.4552	10		Ar IV	801.09	400		Ni II	805.168	150	
Cu III	797.559	75		Ni III	801.145	20		Si III	805.20	141	N
Ar I	797.595	53	A	Cu III	801.145	150		Ni III	805.263	20	
O IV	797.62		N	Mn VI	801.182	7		O I	805.295	55	A,Z
Mn IV	797.657	40		Mn IV	801.194	0		Co III	805.345	20	
Se II	797.69	100		Se VII	801.233	700		Zn III	805.351	0	
Ar I	797.7457	38	st,A	Cr VII	801.277	40		Co III	805.379	3	
Cl II	797.8455	320		Fe III	801.32	70		Kr II	805.507	60	
Ar I	797.8818	15	st,A	P II	801.35	1		Ar I	805.560	4	F,A
Ge V	798.011	8		Mn IV	801.355	30		As II	805.576	110	
Se IV	798.1	150	N	Ar I	801.3577	51	st	Mn III	805.578	2	
Mn IV	798.121	40		Ar I	801.3937	41	st	Kr IV	805.72	30	
Ar I	798.1721	26	st,A	Ar IV	801.41	400		O I	805.745	10	A,Z
S IV	798.28	300		Co III	801.493	30		P III	805.765	1	
Cu IV	798.292		F,P	Se II	801.59	100		O I	805.810	70	A,Z
Cr III	798.31	10	N	Ni III	801.591	100		As II	806.016	0	
Na VI	798.320	10	N	Br III	801.6	50	Q	Zn III	806.108	5	
Ni IV	798.42		F,P	Ar IV	801.91	200		Ar I	806.119	4	F,A
Se VII	798.434	830		Mn III	802.029	30		P VI	806.14	20	
Ni II	798.518	30		Sc IV	802.108	1		Ar I	806.186	5	F,A
Ni III	798.572	2		K V	802.122	100	N	Ni II	806.188	30	
Se II	798.79	0		Zn III	802.152	0	Q	O I	806.231	20	A,Z
Br III	798.8	85		Ge V	802.187	11		C II	806.384	500	
P IV	798.803	60		Ar I	802.190	7	F,A	Ar I	806.4711	100	st
S II	798.92	50		P II	802.20	1		C II	806.533	200	
Co III	799.034	0		O IV	802.200	200		Cu II	806.5472	3	
Kr II	799.087	130		O IV	802.255	150		Zn II	806.561	0	Q,Z
Ar I	799.1316	10	st	Ni II	802.292	100		C II	806.568	500	
S II	799.14	50		Co III	802.434	1		C II	806.676	250	
Ni II	799.145	2		As II	802.83	170		C II	806.686	150	
Co III	799.237	2		Cu III	802.840	100		C II	806.830	300	
P IV	799.326	25		Ge V	802.849	10		C II	806.860	300	
Co III	799.361	0		Ar I	802.8590	20	st	Ar I	806.8689	60	st
Kr	799.43	10	N	Al IV	802.875	10		Fe IX	806.9		F,P
Ar I	799.518	2	F,A	Cl II	802.8911	140		Co III	806.962	3	
Ca III	799.529	50		Br II	802.9	100		F I	806.970	150	
Ar I	799.616	5	F,A	Co III	802.943	3		Se III	807.0	120	
B IV	799.66	20		Se III	803.0	150		Ni III	807.055	100	
C II	799.660	500	Z	Ni II	803.064	15		P III	807.107	1	
Se III	799.7	85		Mg IV	803.072	40		Co III	807.156	1	
C IV	799.7	100		P III	803.093	25		Ni III	807.213	30	
Ti V	799.714	4		S VI	803.20	176	N	Ar I	807.2184	30	st
Si VI	799.723	30		Si II	803.234	3		N II	807.222		P
As II	799.74	25		Ca III	803.396	200		Se VII	807.326	790	
Se IV	799.9	0		Mn III	803.447	0		Ti V	807.347	0	
Ni IV	799.90		F,P	Ni III	803.490	20		Ni II	807.391	0	
Co III	799.919	10		Ca III	803.553	10		Ar	807.46	30	N
Sc IV	799.920	160		Ar	803.59	20	N	Fe III	807.547	600	
C II	799.928	25	Z	Ni III	803.612	3		As II	807.58	60	
C II	799.944	350	Z	Se IV	803.8	250		Kr III	807.583	15	
Sc	799.97	250	N	P III	803.813	10		N II	807.603		P
S II	800.04	50		K V	803.826	100	N	Ar I	807.6529	40	st
Si III	800.066	100		Co III	803.942	5		As II	807.68	5	
Se IV	800.1	120		As VI	803.957	13		Fe III	807.855	550	
Ca III	800.301	250		Ar I	803.981	3	F,A	Co III	807.910	15	
Ni III	800.332	100		P VI	803.989	150		Si VI	807.94	5	
Mg IV	800.409	80		S IV	803.99	400		Co III	808.033	3	
Zn III	800.422	3		Cl X	804.		F,P	Fe III	808.079	300	
Co III	800.445	2		Mn IV	804.052	10		P II	808.25	50	
S IV	800.47	400		Zn III	804.077	5		Cu III	808.579	40	
Ni IV	800.48		F,P	Ar I	804.138	7	F,A	Zn III	808.606	3	
Se II	800.54	10		Ge V	804.148	5		Co III	808.612	5	
Ca III	800.550	200		O I	804.267	90	A,Z	B II	808.7		
Ar IV	800.57	200		Se V	804.3	120		Se V	808.7	200	
B IV	800.6		P	Co III	804.495	1		Br II	808.7	1	
Cl VII	800.641	150		Ar	804.59	60	N	S II	808.70	327	N
Be IV	800.739		P	O I	804.775	40	A,Z	Ni III	808.711	10	
Ar I	800.864	2	F,A	O I	804.848	55	A,Z	Se XIX	808.8		F,Q
Ca III	800.886	10		Si III	804.95	141	N	Fe III	808.840	550	



Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes
Ni II	808.933	5		Ni III	813.426	10		Mn III	817.162	225	
Ge V	809.214	9		Zn III	813.485	3		Fe III	817.166	200	
Co III	809.221	15		Ni II	813.602	2	N	Ca III	817.223	50	
Br III	809.5	50		P II	813.768	5		Cr V	817.246	5	
Se VII	809.563	800		Fe III	813.862	300		Si V	817.257	50	
F I	809.607	125		Cu II	813.8834	20		Fe III	817.348	200	
Co III	809.609	10		Cu IV	813.891	170		As VI	817.448	27	
Ca III	809.642	100		Se III	814.0	150		Se IV	817.466	35	Q
S IV	809.668	160		Ni II	814.050	5		Al IV	817.473	50	
Fe III	809.675	200		Co III	814.066	1		Ca III	817.480	100	
C II	809.677	400	Z	Zn III	814.120	1		Ni III	817.544	5	
C II	809.693	30	Z	Cr V	814.148	40		Se III	817.6	85	
Co III	809.706	15		Fe III	814.148	70		P IV	817.684	60	
P VI	809.710	400		Mn III	814.212	80		O I	817.777	55	A, Z
As II	809.720	1		Fe III	814.242	400		P IV	817.786	60	
C II	809.747	30	Z	P IV	814.386	1		Br III	817.8	120	
C II	809.764	300	Z	Na VI	814.515	15	N	Ge V	817.833	5	
Ni II	809.772	0		Fe III	814.565	300		Ni III	817.833	20	
Co III	809.844	2	N	Mn VI	814.580	3		O I	817.835	55	A, Z
Zn I	809.91		A, Z	Ca III	814.609	10		Cr III	817.87	10	N
Ar I	809.9266	50	st	Co III	814.649	2	N	Ni II	817.884	1	
Ca III	809.930	250		Cr III	814.71	10	N	Co III	817.937	1	N
Mg IV	809.975	40		P V	814.732	12		C III	817.950		
P II	810.00	30		Se V	814.8	150		Na VI	818.096	10	
Ni IV	810.09		F, P	As II	814.83	10		Si IV	818.129	550	
Cu III	810.105	10		Se II	814.86	0		Kr II	818.149	230	
Na VI	810.183	25		Mg IV	814.873	60		Ni IV	818.17		F, P
K V	810.215	50	N	Cr III	814.90	10	N	C III	818.181		
Kr V	810.22	85		Ar I	814.942	4	F, A	O I	818.236	55	A, Z
P II	810.24	100		S IX	815.		F, P	Ca III	818.321	200	
Ni II	810.292	20		Si XIII	815.00		P	Kr	818.33	40	N
Sc XVI	810.32		F, P	Si IV	815.049	500		Fe III	818.383	200	
Ca III	810.434	150		Ar I	815.087	5	F, A	Ni III	818.389	1	
Co III	810.502	15		Ar	815.14	30	N	Mn IV	818.468	0	
P IV	810.595	25		Fe III	815.363	200		As II	818.571	100	
Cu II	810.635	1	N	Cr III	815.40	10	N	Si II	818.590	2	
O I	810.6650	10	A, Z	Ar I	815.429	9	F, A	Fe III	818.598	250	
Ca III	810.687	200		Cr VII	815.474	20		Co III	818.600	20	
Co III	810.716	10		Br II	815.5	250		Se V	818.609	30	N
K V	810.893	50	N	Fe III	815.52	70		Zn III	818.682	0	
Fe III	810.940	450		Co III	815.555	25		Mn III	818.740	70	
Cu III	810.959	20		P III	815.559	25		Cr V	818.803	1	
Cu II	810.9984	15		Ni II	815.570	5		Se VII	818.937	10	N
O I	811.0512	20	A, Z	Fe III	815.612	200		Fe III	818.981	70	
P II	811.10	20		F IV	815.629	10		Fe III	819.066	250	
Fe III	811.246	250		Ni IV	815.64		F, P	Ni II	819.090	5	
Mg IV	811.276	80		Ni III	815.718	5		Cr V	819.153	1	
Ar I	811.282	5	F, A	P III	815.736	10		Kr	819.17	10	N
Fe III	811.284	550		S IV	815.952	220		Ni III	819.237	10	
Cu II	811.29	1	N	Cr III	815.99	10	N	O I	819.27	10	A, Z
Al IV	811.341	1		Ni II	816.024	8		Si II	819.49	0	Z
Ni II	811.389	2	N	Ni II	816.150	30		Ni III	819.665	5	
O I	811.4968	10	A, Z	Ni II	816.156	150		Cr IV	819.732	1	
Ar I	811.552	10	F, A	Fe III	816.163	400		Fe III	819.742	70	
Ni III	811.568	500		Ar I	816.2320	120	st	Ni IV	819.83		F, P
O I	811.7064	10	A, Z	Fe III	816.273	400		Fe III	819.898	200	
Ni IV	811.73		F, P	Cu III	816.297	12		Sc XV	819.9		F, P
P II	811.85	30		Co III	816.407	0	N	Co XIX	820.01		F, P
Co III	811.951	10		Ar I	816.4640	70	st	Cu IV	820.012		F, P
O I	812.0936	5	A, Z	Cr III	816.57	10	N	Co III	820.066	3	
O I	812.1594	5	A, Z	As II	816.607	80		Fe IX	820.1		F, P
Ni II	812.388	100		Co III	816.617	10		Ar I	820.1236	80	st
K	812.493	50	N	Zn III	816.670	1		Ca III	820.131	150	
Mn IV	812.499	40		As II	816.755	100		Cr VII	820.239	5	
P V	812.843	4		O I	816.766	90	A, Z	Fe III	820.271	200	
Co III	812.869	10		Cu IV	816.802	80	Q	Fe III	820.409	200	
Se VII	812.930	690		Ca VI	816.805	100	N	Si II	820.516	20	
Fe III	812.931	300		Kr IV	816.82	120		P III	820.552	1	
Cl VII	812.960	100		O I	816.862	90	A, Z	Ar	820.56	20	N
P II	813.10	40		Co III	816.864	1	N	Cu III	820.591	0	
P V	813.241	1		Ni II	816.864	1	N	Si II	820.63	3	Z
Fe III	813.288	250		Cr IV	816.92	10	N	As II	820.651	10	
V XVIII	813.35		F, P	Se II	816.99	100		Zn III	820.661	0	
Fe III	813.382	650		Fe III	817.038	450		Se II	820.68	100	
Br V	813.4	150		Ca III	817.056	250		Cl VII	820.7		Q

Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes
Se V	820.7	200		P II	824.66	30		Ar	828.86	40	N
Zn III	820.735	0		Zn III	824.711	0		Ca III	828.920	150	
Mn III	820.833	115		P IV	824.730	700		As VI	828.987	52	
Ni III	820.851	50		As II	824.763	80		S XI	829.		F,P
V V	820.859	200		Fe III	824.800	200		Ni IV	829.06		F,P
As II	820.868	20		Ni III	824.850	3	N	Co III	829.072	10	
Cr IV	820.88	10		Ni II	824.856	2		Cu III	829.345	100	
Fe III	820.915	200		S III	824.88	400		As II	829.360	50	
Si II	820.9210	3		Al IV	824.911	150		Fe III	829.375	250	
Ar	820.98	50	N	Kr	824.97	10	N	Fe III	829.375	250	
Fe XX	821.0		F,P	Ni IV	825.11		F,P	Cu III	829.429	10	
Zn III	821.070	2		Ar I	825.141	12	F,A	Ca III	829.445	50	
Mn III	821.123	25		Cr III	825.141	1		V V	829.483	300	
Kr II	821.154	130		Ni III	825.300	10		Ga II	829.60	30	
Se VII	821.202	820		Zn III	825.330	10	Q	Ni IV	829.60		F,P
V V	821.202	10		Ar I	825.3460	120	st	Mn III	829.635	2	
Ca IX	821.269	10		As II	825.349	30		Cl II	829.8029	280	
Mn III	821.287	115		N IV	825.4		P	Al IV	829.828	50	
Mg III	821.369	4		Co III	825.403	15		Zn III	829.866	0	
Ni III	821.373	15		K V	825.559	50	N,Q	Ge II	829.91	3	N
Si II	821.450	2	Z	Cr III	825.593	10		O I	829.98	2	A,Z
Ca III	821.572	300		Cr V	825.600	220		Mn III	830.067	50	
Ni II	821.612	1		Mn III	825.641	15		Se V	830.3	150	
Ni II	821.634	20		N VII	825.668		P	Kr II	830.375	230	
Mn III	821.682	20		F VII	825.8			Cu III	830.394	3	
F IV	821.694	1		Ca III	825.880	200		Fe III	830.500	70	
Fe III	821.723	200		V V	825.891	20		O IV	830.506	10	
Cr III	821.74	20	N	Zn III	825.955	2		N IV	830.6		P
Co III	821.771	0	N	Mn III	826.073	25		Ni III	830.666	10	
Cr VII	821.788	5		As II	826.100	60		Ni II	830.677	2	N
Ni II	821.875	1	N	Ca III	826.108	200		Ca III	830.777	50	
Ar I	821.999	6	F,A	Ni III	826.138	500		K V	830.785	50	N
Si III	822.004			V XVI	826.18		F,P	Zn III	830.901	0	
Ar V	822.161	200		N VII	826.252		P	Ni IV	830.95		F,P
V V	822.176	60		Al IV	826.287	200		Ni IV	831.06		F,P
N IV	822.299		P	Ar I	826.3649	120	st	O IV	831.070	15	
Fe III	822.314	200		K V	826.395	50	N	Ca III	831.077	200	
Ca III	822.432	150		Si II	826.42	1	Z	Ni III	831.229	100	
Zn III	822.498	0		Kr II	826.434	160		Zn III	831.380	0	
Cu II	822.500	1	N	N VII	826.437		P	Cl IV	831.43	400	
Kr	822.53	100	N	V VI	826.458	1		Fe III	831.464	300	
V V	822.668	10		Ni III	826.501	200		Ni II	831.475	2	
Br II	822.7	10		F VII	826.54		N	Ni III	831.487	5	N
Ni IV	822.75		F,P	As II	826.733	80		Ar I	831.738	5	F,A
Si II	822.8613	5		Al V	826.826	30		Cr XXIV	831.794		P
V V	822.927	30		V XVII	826.9		F,P	O I	831.83	1	A,Z
Ge II	822.968	0		Zn III	826.909	0		Na V	831.868	5	Q
K V	823.047	150	N,Q	S III	826.97	240	N	Al IV	831.939	10	
Se VII	823.053	840		Cu IV	826.990		F,P	Ar I	832.025	7	F,A
P IV	823.179	650		Cu II	826.9961	30		F II	832.035	10	
Mn III	823.191	150		Ar V	827.052	250		Co III	832.050	5	N
Ar XVII	823.25		P	Ni IV	827.06		F,P	Ni III	832.284	5	
Fe III	823.257	400		Ar V	827.35	150		Cr V	832.309	1	
N IV	823.273	100		Fe III	827.777	400		Fe III	832.328	300	
Ni II	823.277	3		Ni III	827.792	2		O I	832.42	1	A
K V	823.358	150	N,Q	Cl II	827.85	100	N	O I	832.42	1	A
Si III	823.408	180		Mn XX	827.9		F,P	Zn III	832.426	0	
As II	823.417	30		Na VI	827.909	5	N	Ga V	832.50	5	
Kr	823.42	40	N	P IV	827.932	800		Ni IV	832.67		F,P
Mn III	823.515	80		Cu IV	828.001	30	N	Se II	832.74	800	
Cu II	823.768	2		F VII	828.1		P	O II	832.762	700	
Mg III	823.788	7		Ni III	828.109	100		Ni IV	832.78		F,P
Ni IV	823.83		F,P	Ni II	828.152	10		Cu IV	832.847		F,P
Cu II	823.8378	2		Ca	828.451	100	N	Zn III	832.868	0	
Se III	823.9	150		S V	828.46	164	N	O III	832.927	700	
Cr III	823.971	4		Se II	828.48	600		Se III	833.1	120	N
As II	823.998	80		Ni III	828.491	3		O I	833.10	1	A,Z
Mn III	824.033	15		Se III	828.5	150	N	Ca III	833.141	150	
As II	824.055	50		As II	828.594	125		O I	833.20	1	A,Z
As VI	824.132	38		Co III	828.608	1		S X	833.3		P
Ni III	824.292	20		Mn III	828.617	2		O II	833.332	750	
F VII	824.5			Ge II	828.67	1	N	P III	833.492	4	
Ar I	824.603	8	F,A	Ni IV	828.67		F,P	Mn III	833.519	70	
Mn III	824.628	30		Ni II	828.786	1		Fe III	833.532	150	
Cu II	824.635	2	N	V V	828.791	10		Zn II	833.600	1	

Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes
Cu III	833.654	5		Cu IV	836.939	100	N	Ar IV	840.03	600	
P III	833.668	1		Ni II	836.954	1		P II	840.04	1	N
O III	833.742	800		Mn III	836.994	20		Fe III	840.141	250	
Mn III	833.907	170		Cu IV	837.007	40	N	Ge VI	840.174	50	
Ar XII	834.0		P	Ni III	837.025	20		As II	840.233	80	
Ni III	834.058	20		Zn III	837.054	0		Se VII	840.249	1	N
Ni II	834.059	100		Cr V	837.157	1		Cu III	840.269	1	
Fe III	834.067	250		Zn III	837.225	0	Q	Ca III	840.317	25	
Zn II	834.11	6		Ni III	837.266	50		O I	840.33	1	A, Z
O I	834.12	1	A, Z	O I	837.27	2	A, Z	Mg IV	840.366	40	
Cr III	834.131	4		Co III	837.330	1	N	Fe III	840.381	300	
Ti V	834.199	4		Mn III	837.378	130		O I	840.49	1	A, Z
O I	834.25	1	A, Z	O I	837.40	2	A, Z	Fe III	840.518	250	
Cu III	834.262	3		Cu III	837.415	4		Ca III	840.558	300	
O I	834.34	1	A, Z	Fe III	837.439	450		Fe III	840.629	200	
Ar I	834.3918	150	st	Mn III	837.456	225		Se VII	840.687	790	
Cl II	834.4229	320		S IV	837.48	400		Si III	840.74	111	N
O II	834.462	750		Zn III	837.613	0		Fe III	840.741	150	
Cl II	834.6463	550		Ni II	837.624	50		S II	840.75	216	N
Cl IV	834.66	300		O I	837.63	1	A, Z	Cl IV	840.81	400	
Cl II	834.7223	440		Cu IV	837.657	110		Ni II	840.878	5	
Cu III	834.782	15		Kr III	837.662	300		Cl IV	840.93	600	
Cl IV	834.84	500		Ni XXI	837.69		F, P	Al IV	841.050	1	
Ar V	834.88	200		Ge II	837.70	0	F, P	Ni II	841.056	10	
Fe III	834.944	400		O I	837.76	1	A	Fe III	841.088	300	
Ge II	834.97	0	F, P	Sc	837.76	300	N, Z	Cu II	841.1346	2	
Ni IV	834.97		F, P	Fe III	837.803	200		Cu IV	841.138	120	
Cl IV	834.97	500		Mn III	837.854	0		Ni II	841.205	0	
Ar I	835.0021	100	st	Ca III	837.918	50		P II	841.21	20	
Ge II	835.083	2		Ge II	837.947	20		Se VII	841.223	500	
O III	835.096	700		Fe III	838.048	550		Ni III	841.256	20	
Ni IV	835.28		F, P	Mn III	838.049	0		Cu III	841.300	4	
O III	835.292	800		Ni IV	838.13		F, P	Cu IV	841.321	290	
As II	835.349	150		Co III	838.133	25		Ni IV	841.34		F, P
S X	835.4		P	Al V	838.156	80		Cu IV	841.369		F, P
O I	835.44	2	A, Z	Ni II	838.224	10		Cl II	841.4191	850	
O I	835.60	2	A, Z	Ca III	838.237	200		Mn IV	841.536	0	
Fe III	835.627	150		Zn III	838.313	0		Ga XXIV	841.56		F, P
Mn IV	835.657	0		Ti V	838.315	30		As II	841.625	10	
Sc	835.70	300	N	Mn III	838.358	40		Zn III	841.664	0	
Ni II	835.739	0		Al IV	838.398	30		Fe III	841.688	150	
Ar V	835.79	50		Se II	838.43	1		Ti V	841.691	0	
Ca III	835.861	50		Fe III	838.498	150		Mn III	841.744	150	
Cu IV	835.882		F, P	Ca III	838.501	20		Cr VII	841.747	20	
Fe III	835.917	150		Ni II	838.524	1		Ni III	841.825	2	
Mn III	835.971	40		Zn III	838.658	0		Fe III	842.020	400	
Ni II	835.983	75		Sc	838.70	300	N	Be II	842.025	500	
Ca III	836.024	100		Mn III	838.757	30		Be II	842.031	250	
Cu II	836.0278	0		Ni II	838.834	50		Kr IV	842.04	200	
Se III	836.1	120	N	Fe III	838.869	150		Mg IV	842.087	60	
Co III	836.128	1	N	Ge II	838.91	2	Q	Fe III	842.09	300	
Ar V	836.13	100		Fe III	838.936	300		Cu III	842.113	0	
Mn III	836.182	260		Fe III	838.997	250		Ni III	842.142	500	
N II	836.187	10		Mn III	839.006	130		Cu IV	842.179	200	
Cu IV	836.205		F, P	Fe III	839.092	150		Cr V	842.195	20	
Ni IV	836.26		F, P	As VI	839.114	9		S III	842.27	127	N
N II	836.279	1		Fe III	839.195	150		Fe IX	842.3		F, P
N II	836.289	0		Co III	839.284	30		As VI	842.467	42	
V XVII	836.3		F, P	Cl II	839.2972	770		Cu II	842.4964	3	
S III	836.31	400		Cu IV	839.300	100	N	Ni III	842.546	50	
Cu IV	836.313	320		Fe III	839.319	300		Cu IV	842.649	40	N
S IV	836.34	400		Se V	839.4	85		Fe III	842.686	300	
Ni IV	836.50		F, P	K V	839.439	50	N	P IV	842.689	10	
Fe III	836.521	450		Ge VI	839.458	50		Ar I	842.8051	100	st
N II	836.616	5		Cu II	839.47	1	N	Cu III	842.828	3	
N II	836.627	2		Ni III	839.478	5		P IV	842.867	90	
Fe III	836.628	200		Mn IV	839.514	0		Ca V	842.950	150	N
Cu III	836.632	0		Cl II	839.6001	900		Se III	843.0	300	
Cr VII	836.644	20		Br III	839.7	100	Q	As II	843.215	10	
Ti V	836.656	0		Ga IV	839.800	65		K	843.317	50	N
Ca III	836.769	200		O I	839.83	2	A, Z	As VI	843.346	45	
N II	836.837	2		Cu IV	839.920		F, P	Cr III	843.37	10	N
Br II	836.9	150		Ti V	839.926	12		Cu IV	843.399	180	
Ni IV	836.90		F, P	O I	839.96	2	A, Z	Cu III	843.414	1	
Cu III	836.922	1		Fe III	839.981	200		C VI	843.473		P

Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes
O I	843.59	2	A, Z	P IV	846.415	200		Mn III	849.854	170	
C VI	843.668		P	Mn III	846.475	0		Mn III	849.951	90	
Ge II	843.7165	5		P III	846.496	120		As III	849.99	450	
Si II	843.7192	20		Fe III	846.534	400		Co III	850.067	3	
C VI	843.734		P	Ca	846.611	150	N	Si II	850.1409	10	
O I	843.75	2	A, Z	Mn III	846.667	0		Kr I	850.154	10	A, Z
Ni IV	843.76		F, P	P IV	846.701	25		Ge II	850.29	2	F, P
Ar IV	843.77	800		Ni IV	846.77		F, P	Kr II	850.319	160	
Br II	843.8	10		Sc	846.90	600	N	P IV	850.392	200	
S II	843.82	200		Cr III	846.977	4		Co III	850.424	3	
Cu III	843.843	12		P IV	847.019	250		Al IV	850.447	80	
Se II	844.00	150		Cu III	847.022	0		V III	850.49	0	
P II	844.01	20		Br II	847.3	50		Ge II	850.495	15	
Kr II	844.064	230		Fe III	847.425	550		Ar IV	850.60	1000	
Mn III	844.089	45		Ni III	847.433	300		O I	850.68	5	A, Z
Co III	844.097	20		Zn III	847.525	0		F III	850.707	3	
Cu IV	844.098	440		Fe III	847.578	450		Cu II	850.7480	2	
Ar I	844.100	12	F, A	P IV	847.669			Cl II	850.7509	140	
Cu III	844.106	5		P III	847.669	300		Cu III	850.760	2	
P IV	844.148	10		Mn III	847.691	0		Br V	850.8	250	
Cu IV	844.150	270		Fe III	847.700	400		Mg VII	850.9		P
Cu III	844.160	1		Ca III	847.757	50		Co III	850.965	0	N
Se VI	844.2	120		Ge IV	847.8	60	P	Ca	850.966	150	N
Fe III	844.284	650		Cu III	847.801	4		Kr I	850.988	13	A, Z
Co III	844.310	8		As II	847.809	25		P IV	851.091	90	
O I	844.33	1	A, Z	Mn III	847.855	70		Fe III	851.150	450	
Si III	844.39	222	N	Cu III	847.874	2		Cu II	851.3027	25	
Si VI	844.39	20		Zn III	847.879	0		Fe III	851.332	450	
Co III	844.411	1		Fe III	847.924	400		V III	851.36	0	
P IV	844.420	120		F III	847.962	10		Ni III	851.521	15	
Br II	844.5	20		Fe III	847.984	300		Cu III	851.530	2	N
O I	844.53	1	A, Z	Al IV	847.995	10		Zn III	851.539	0	
Al IV	844.564	200		P III	848.016	200		Mn III	851.554	130	
Al V	844.582			Kr	848.07	10	N	Cl II	851.6917	700	
Cu II	844.6128	3		Fe III	848.07	70		F III	851.700	6	
Mn III	844.629	60		Si II	848.0700	5		Mn VI	851.705	16	
P IV	844.646			Co III	848.088	30		Na VI	851.740	5	
P III	844.646	200		P III	848.465	120		Cu II	851.7714	2	
Ni II	844.748	2		Mn III	848.466	170		Ni III	851.788	15	
Ni III	844.787	50		Cr VII	848.517	40		As IV	851.8	500	
Fe III	844.838	250		Cu IV	848.588		F, P	Fe III	851.842	400	
Ni III	844.859	100		Fe III	848.601	250		Fe III	851.992	400	
Co III	844.866	10		P III	848.639	150		Kr VII	852.00	100	Q
Cu II	844.9122	5		As II	848.692	80		Kr I	852.064	18	A, Z
Al IV	844.949	50		Fe III	848.729	250		Se III	852.1	50	
Fe III	844.954	150		Cu III	848.740	2		S V	852.18	500	
Cr VII	844.989	5		Cu II	848.8075	15		Mg IV	852.232	40	
Ni II	845.033	3	N	Mn III	848.810	190		Zn III	852.306	0	
P III	845.038	150		F III	848.915	3		Cu III	852.508	3	
Sc IV	845.07	700		Fe III	848.977	200		Cu III	852.548	20	
Zn III	845.238	0		Cu III	849.081	10		Mn III	852.609	25	
Ni III	845.242	400		Ni II	849.086	5	N	Fe III	852.644	150	
As VI	845.341	52		Cu IV	849.093		F, P	P III	852.686	250	
P V	845.370	12		Zn III	849.117	0		Mn III	852.691	0	
Fe III	845.408	600		V III	849.15	15	N	Zn III	852.707	0	
Ni IV	845.42		F, P	Mn III	849.173	115		S IV	852.76	300	
Cu IV	845.475	230	N	Co III	849.210	0		Ni III	852.867	10	
Fe XXII	845.6		F	S V	849.24	600		Cu II	852.9061	3	
P III	845.664	250		As II	849.294	60		Sc IV	852.980	70	
Ar	845.68	150	N	V III	849.32	0		Mn VI	852.996	20	
Fe III	845.686	70		Cu II	849.3594	3		Fe XXI	853.0		F, P
Si II	845.7684	40		Mn III	849.364	40		Fe III	853.045	70	
As II	845.789	80		Zn III	849.386	0		S IV	853.10	300	
Co III	845.793	1	N	Ni II	849.398	5	N	Si III	853.11	159	N
Se V	845.8	300		O I	849.45	1	A, Z	Zn III	853.220	0	
Cr III	845.90	10	N	O I	849.48	2	A, Z	P III	853.355	60	
Fe III	845.925	450		Co III	849.485	5		Ar I	853.361	12	F, A
P IV	845.969	150		Br II	849.5	100		Al IV	853.393	100	
Fe III	846.035	200		Fe III	849.524	300		Ni III	853.398	5	
Fe III	846.089	150		As VI	849.561	47		Fe III	853.456	70	
P III	846.108	200		Fe III	849.569	250		Kr I	853.486	20	A, Z
S III	846.12	125	N	Se II	849.60	150		Cu II	853.5644	1	
N IV	846.215		P	O I	849.61	5	A, Z	Cu IV	853.824	100	
P V	846.299	4		P IV	849.799	350		P IX	854.		F, P
Sc IV	846.411	5		Ni III	849.810	5		Kr XXIII	854.		F, P

Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes
Mn III	854.054	15		Fe III	857.392	300		Cu IV	860.220	50	
Fe III	854.073	300		Sc IV	857.434	160		Ni III	860.238	150	
Fe III	854.205	70		Ni III	857.550	50		Zn III	860.286	0	
P III	854.232	90		Fe III	857.690	300		As VI	860.295	44	
Se V	854.299	150	N	Ga IV	857.704	35		O II	860.30		N
Fe III	854.367	400		Se VII	857.761	40		Fe III	860.315	300	
Mg IV	854.407	80		Cu III	857.767	20		As VI	860.318	49	
K V	854.416	100	N	N I	857.77	2		Ga V	860.355	80	
Se II	854.46	1		Cu IV	857.780	250	N	S V	860.46	500	
Fe III	854.532	150		Cu IV	857.798	240		P IV	860.479	120	
Ni II	854.604	3	N	S V	857.87	500		Se VI	860.498	50	N
Cu IV	854.606	180		Mn III	857.900	15		V III	860.55	0	
Ar I	854.705	13	F,A	Cu III	858.036	3		Si IV	860.551	20	
As II	854.727	150		Ti V	858.073	4		Cu III	860.554	4	
Kr III	854.73	500		C II	858.0918	500	ST	Si IV	860.560		
K V	854.771	50	N	Cu IV	858.112	140		Fe III	860.565	150	
Na VI	854.790	20	Q	P III	858.135	90		Ni III	860.642	300	
S V	854.80	700		Zn III	858.152	0		Cu II	860.7217	1	
P III	854.845	90		Kr I	858.157	27	A,Z	Zn III	860.808	0	
Ca VI	854.923	150	N	Ni III	858.198	20		Ca VI	860.827	100	N
Mg IV	854.936	40		Cu IV	858.240	410		N I	860.85	4	
Al III	855.0340	400		Cu III	858.241	15		Fe III	860.889	150	
Mn VI	855.056	30		As II	858.280	125		Ni III	860.905	10	
Cu III	855.124	1		N II	858.376	100		Al IV	860.937	150	
Mn III	855.181	50		Cu II	858.4869	25		Ca	860.983	50	N
Ni II	855.282	5		Kr I	858.534		A,Z	P IX	861.		F,P
Fe III	855.336	70		K	858.555	50	N	Sc IV	861.007	70	
Ar XII	855.4		P	C II	858.5590	900	ST	Fe III	861.087	150	
Kr I	855.424	24	A,Z	Ni II	858.562	2	N	Si IV	861.118	5	
Fe III	855.441	200		Fe III	858.565	250		N I	861.15	1	
Cu II	855.4762	5		Cu II	858.5667	25		Sc IV	861.243	285	
P III	855.624	350		Fe III	858.602	400		Fe III	861.284	250	
Ca III	855.660	100		Co III	858.663	1		Sc IV	861.298	285	
Kr I	855.687		A,Z	N I	858.80	2		As II	861.467	2	
Cu II	855.7002	10		Mn III	858.830	15		Cu IV	861.514	20	Q
Ar	855.71	10	N	Ni III	858.861	20		P IV	861.531	90	
Ni III	855.719	2		Co III	858.975	15		O I	861.56	40	A,Z
P III	855.722	10		Cu III	858.995	2		P II	861.61	10	
Br V	855.8	10		Ni IV	859.00		F,P	Ni IV	861.62		F,P
Se II	855.81	10		Kr II	859.037	160		Zn III	861.667	0	
K IV	855.815	100	N	Fe III	859.086	200		Mn VI	861.681	16	
Ga IV	855.824	50		Cu II	859.1509	0		Ge II	861.76	10	F,P
Fe III	855.879	150		V III	859.24	15		Fe III	861.761	550	
Ni III	855.922	100		Ni IV	859.25		F,P	Ti XVI	861.8		F,P
Fe III	855.935	150		O I	859.31	20	A,Z	V III	861.81	40	
Ca III	855.978	25		O II	859.32		N	Fe III	861.832	650	
Fe III	856.039	150		N I	859.35	3		Cu IV	861.933	30	N
Br II	856.2	350		O I	859.35	10	A	Cu III	861.934	3	
Fe III	856.244	70		P III	859.362	25		Mg IV	861.991	20	
Fe III	856.325	300		Ni III	859.387	20		Cu II	861.9936	40	
Cu III	856.360	3		Mn VI	859.396	7		V III	862.02	15	
Al V	856.394	50		P III	859.406	200		Fe III	862.028	300	
Fe III	856.480	70		K	859.455	20	N	N I	862.14	5	
Ge II	856.4880	10		Mn III	859.470	35		Fe III	862.191	150	
Ni III	856.506	50		As II	859.472	60		Kr I	862.198	35	A,Z
Cu IV	856.622	90		V III	859.57	5		Ge II	862.2339	50	
Ca	856.635	200	N	O I	859.59	2	A,Z	Mn III	862.283	15	
Ni III	856.684	50		Fe III	859.626	400		Fe III	862.326	150	
P III	856.717	1		P III	859.652	500		Ni IV	862.37		F,P
Al III	856.7457	500		As II	859.682	125		Al IV	862.455	10	
Ca III	856.791	200		Fe III	859.721	550		Fe III	862.468	200	
Cu III	856.846	2		P III	859.729	250		Kr III	862.582	450	
P III	856.934	40		N I	859.76	2		O I	862.678		P,Z
Mn VI	856.935	5		Zn III	859.760	0		Mn III	862.718	50	
Cu IV	856.963	50	N	Cu IV	859.825	70		Fe III	862.735	300	
P III	856.985	120		Fe III	859.838	400		Kr I	862.77		A,Z
Kr	856.99	10	N	Ni III	859.854	50		Ti V	862.786	1	
As II	857.032	25		Zn III	859.895	0		Cu II	862.8226	2	
Mn III	857.047	7		Mn III	859.910	25		Ni III	862.882	300	
Ni III	857.087	200		N I	860.004		P	N I	862.91	5	
Ti V	857.136	1		V III	860.06	0		V III	862.92	25	
V XVI	857.15		F,P	Zn III	860.062	0		Mn III	862.973	60	
Cu IV	857.185	160		Kr	860.12	10	N	N I	862.99	3	P
Al IV	857.198	50		N I	860.15	4		P X	863.		F,P
Mg IV	857.289	80		N II	860.205			Fe III	863.004	70	

Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes
Cr VII	863.043	160		B V	865.972		P	Cr VII	869.615	20	
P V	863.095	4		Ge XXV	866.06		F,P	P V	869.683	12	
Cu III	863.105	5		Mn III	866.174	170		Ni III	869.702	200	
Cu IV	863.111	110	N	Cr III	866.19	10	N	Mn III	869.735	260	
Br II	863.2	1		S II	866.23	100		Ar I	869.7542	150	st
Ni III	863.217	300		As III	866.36	350		Cu IV	869.775		F,P
V III	863.22	10		Cu II	866.4427	5		N I	869.878	4	
Fe III	863.232	250		Mn III	866.473	150		N I	869.925		P
P IV	863.300	150		Sc IV	866.619	110		Ni III	869.926	10	
Fe III	863.302	250		Ge VI	866.637	340		K V	869.965	150	N
Mg IV	863.698	40		Mn VI	866.662	6		P V	869.974	4	
Fe III	863.730	70		Ti V	866.676	0		Co III	870.007	15	
Cu III	863.798	0		Mn III	866.731	190		N I	870.029	5	
Zn III	863.850	1		Mg IV	866.735	80		Mn III	870.037	225	
O I	863.857		P,Z	Ar I	866.8000	180	st	Fe III	870.041	200	
V III	863.99	25		P IV	866.807	150		P IV	870.148	25	
Cu III	864.008	1		Cu IV	866.866	170		Ca III	870.152	25	
Fe III	864.034	400		Mn III	866.872	115		Al IV	870.154	5	
Ca III	864.035	150		Fe III	866.905	70		Mn III	870.169	20	
Kr	864.06	20	N	Ge VI	866.985	35		Fe III	870.235	150	
B II	864.08	10		Sc	867.01	200	N	Fe III	870.274	150	
Cu II	864.1546	10		Se VII	867.017	720		Cu IV	870.280	30	Q
Mg VII	864.2		P	Ni III	867.023	50		N I	870.367	3	P
Cu II	864.2138	10		As VI	867.061	49		N I	870.37	3	P
V III	864.27	100		S II	867.15	100		Cu III	870.451	1	
O I	864.370		P,Z	Mn III	867.168	60		Cu II	870.5389	8	
Fe III	864.375	150		Ni III	867.194	100		Mn III	870.596	10	
Cu III	864.378	12		Mn VI	867.236	5		Fe III	870.621	300	
Fe III	864.425	250		Mn III	867.428	150		As II	870.747	150	
Fe III	864.450		P	S II	867.50	100		Kr III	870.842	200	
V III	864.47	40		Ni III	867.508	300		Ni III	870.845	200	
Ca III	864.470	50		Na VI	867.537	5	N	Zn III	870.890	3	
Se II	864.59	0		Ca III	867.545	200		Cu IV	870.952	20	N
Cl II	864.6198	320		Fe III	867.639	300		Cr VII	870.980	220	
Na VI	864.625	10	N	Ge VI	867.669	120		Se II	871.02	50	
V III	864.68	50		Cu II	867.7336	8		Cu II	871.0676	8	
Kr	864.70	20	N	Se II	867.83	100		As III	871.07	500	
Ni IV	864.75		F,P	K V	867.921	50	N	Ti V	871.085	4	
Ga IV	864.768	25		As II	868.027	10		Kr XXI	871.1		F,P
Cu III	864.768	1		P VI	868.135	150		Ar III	871.10	500	
Kr II	864.821	230		K V	868.140	50	N	Mn VI	871.118	7	
Mn IV	864.850	100		Ar	868.20	10	N	O I	871.16	1	A,Z
N I	864.868	5		O II	868.21		N	Cu IV	871.239	100	
Mn III	864.872	150		Ge IV	868.3	60	P	Cr VII	871.296	110	
P IV	865.026	90		Sc	868.32	600	N	P V	871.394	600	
Cu III	865.047	2		P IV	868.336	60		As II	871.410	10	
Mn VI	865.060	5		O I	868.41	1	A,Z	P V	871.446		
Br II	865.1	0		Fe III	868.428	200	P	Kr	871.54	20	N
Mn III	865.124	30		Fe III	868.473	50	P	Fe III	871.552	150	
Fe III	865.267	70		Kr I	868.543	44	A,Z	Cu III	871.611	10	
Mn III	865.276	0		K V	868.552	50	N	Mg III	871.720	40	
Be II	865.3			Cl II	868.5774	380		O III	871.77		N
Cl IV	865.3		Z	Se IV	868.6	5		As III	871.79	400	
Cu II	865.3902	40		Mg IV	868.635	20		Ge VI	871.806	300	
P II	865.44	100		Cu III	868.646	1		As II	871.823	125	
P V	865.446	450		Cu III	868.804	1		Se II	871.83	150	
As VI	865.486	44		Fe III	868.836	300		Mn III	871.851	0	
Kr	865.50	20	N	N I	868.860	8		N III	871.870	25	
Co III	865.567	0		Kr II	868.871	230		Fe III	871.968	250	
Ca III	865.629	100		Cu III	868.898	2		S IX	872.		F,P
Cu IV	865.641	150		Cu IV	868.902	20	N	Fe III	872.027	250	
N I	865.65	5	P,Z	Al IV	868.994	1		Cl II	872.1338	220	
B V	865.719		P	Cl II	869.0127	220		N III	872.143	10	
Mg IV	865.722	60		Cu II	869.0641	10		Mn VI	872.240	50	
Mn III	865.767	45		Sc X	869.13	200	Q	Si V	872.25	5	
Cr VII	865.800	70		Mn III	869.176	40		Mn III	872.261	20	
Ti III	865.802	0		Ar	869.24	10	N	Se II	872.27	1	
Ti V	865.806	4		Cr III	869.327	40		Ge II	872.3075	10	
S II	865.87	50		Cu II	869.3360	25		K III	872.313	200	N
Fe III	865.896	250		N I	869.413	4		Se IV	872.4	25	
Co III	865.898	0		Kr I	869.42		A,Z	Al IV	872.626	20	
Se II	865.90	1		N I	869.424	4	P	Zn III	872.633	0	
B V	865.907		P	Cu III	869.478	1		Kr	872.71	10	N
Mg III	865.935	4		N I	869.482		P	P II	872.84	5	
N I	865.95	3	P	N I	869.546	6		Cu IV	872.849	210	

Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes
Cl II	872.8505	320		Sc IV	876.674	5		Sc IV	879.675	220	
S V	873.0		N	Kr III	876.676	300		Mn III	879.693	180	
Fe III	873.080	200		Fe III	876.679	200		S IV	879.73	191	N
Fe III	873.130	150		Ti V	876.686	0		V III	879.76	0	
Zn III	873.207	0		Cu II	876.7227	20		Cu II	879.8912	2	
Cu II	873.2629	15		Cr III	876.785	10		Ar I	879.9466	180	st
Fe III	873.462	550		Al IV	876.803	80		As II	879.989	80	
Mg III	873.580	20		Ni II	876.829	0		Fe III	880.008	300	
Ti V	873.618	4		Zn II	876.84	4		P IV	880.022	1	
Si V	873.832	250		Mn III	876.869	80		Ni III	880.028	20	
K III	873.865	100	N	N I	876.987	5		V III	880.08	50	
Fe III	873.988	70		Cu II	877.0121	25		Mg III	880.107	7	
Ca III	874.009	25		Mn III	877.082	30		Mn XX	880.2		F, P
K III	874.045	150	N	Mn III	877.179	90		Sc IV	880.236	220	
Fe III	874.129	150		Cr III	877.255	200		Cu II	880.3230	5	
Sc	874.18	300	N	Mn III	877.337	40		Fe III	880.447	400	
Cu III	874.230	1		P IV	877.476	700		Mn III	880.648	0	
Cl II	874.2790	220		Mg IV	877.486	40		Kr I	880.82		A, Z
Co III	874.294	10		Cu II	877.5548	20		Ca XIV	880.9		F, P
Cu IV	874.335	70		Mn III	877.561	30		Mn III	880.937	20	
Ga IV	874.383	120		As III	877.67	350		Fe III	880.949	400	
Kr	874.41	20	N	Cu III	877.729	3		Co III	880.950	10	
Zn III	874.542	0		Mn III	877.777	0		Cr VII	881.012	70	
Fe III	874.560	70		O I	877.7983	70	Z	Zn II	881.060	15	
P V	874.568	1		Cr III	877.807	90		Fe III	881.088	450	
As VI	874.575	16		Cu II	877.8471	15		Co IV	881.22		F, P
Ge VI	874.85	50		Ni III	877.852			Cu III	881.260	2	
K V	874.883	50	N	O I	877.8787	55	Z	Cu IV	881.264	30	N
As II	874.893	150		Co III	877.881	0	N	Ti V	881.379	0	
N I	874.934	4		Mn III	877.916	80		K V	881.405	150	N
Sc IV	874.981	20		Si III	877.92	109	N	O I	881.47	1	A, Z
K V	874.985	50	N	Ni III	878.078	30		Fe III	881.477	200	
Si VI	874.99	5		Co III	878.080	0		Mn III	881.553	0	
Mn III	874.994	150		Mn III	878.082	25		As II	881.557	125	
Cr III	875.05	20		Ga V	878.17	20		Zn III	881.565	0	
N I	875.067		P	Ga IV	878.181	15		Cu IV	881.606	20	Q
P IV	875.087	200		O I	878.2007	20	Z	Ni II	881.608	2	
Cr XIX	875.09		F, P	Cr III	878.203	90		As II	881.805	20	
Ge II	875.09	10	F, P	O I	878.25	10	A, Z	P III	881.813	25	
Fe III	875.090	150		Mn VI	878.257	20		Co III	882.025	0	
N I	875.100	10		Fe III	878.264	50	P	P III	882.028	1	
P IV	875.143	120		Fe III	878.316	200	P	Se IV	882.1	120	
Cr III	875.147	4		Cr III	878.407	60		F III	882.136	3	
P IV	875.175	90		Co III	878.543	10		Fe III	882.147	250	
N I	875.277		P	Cu IV	878.583	50		K VI	882.184	100	N
Ca III	875.301	25		O I	878.62	1	A, Z	Mn III	882.227	0	
Fe III	875.423	300		Cu IV	878.626		F, P	Fe III	882.295	70	
Ti V	875.489	1		Cu II	878.6986	50		Ni II	882.337	1	N
Ge II	875.4927	100		Ar III	878.73	600		Se VII	882.521	740	
Ar III	875.53	450		Mg III	878.847	7		B II	882.543	300	
Ge II	875.5766	10		Cu IV	878.907	120		Se II	882.61	350	
Ga IV	875.579	60		Co III	878.963	5		P III	882.626	90	
Mn III	875.592	150		O I	878.9720	20	Z	Ni III	882.642	20	
N I	875.598	2		O I	879.0194	20	Z	Ge VI	882.680	70	
Mn III	875.627	0		Se III	879.1	200		B II	882.681	300	
Ni III	875.641	150		O I	879.1001	20	Z	Si V	882.735	200	
N I	875.656	6		Cu IV	879.102	50		P III	882.848	40	
N I	875.721	6		Si III	879.233	10		O I	882.8895	40	Z
N I	875.791	6		Mn III	879.256	80		Kr	883.00	60	N
Mn III	875.836	115		P III	879.264	150		Cr III	883.00	50	N
Fe III	876.021	300		Ti V	879.268	0		Fe III	883.090	200	
Ar I	876.0577	180	st	Co IV	879.28		F, P	F VII	883.110	10	
N I	876.066	7		Cu IV	879.377	30		Cl V	883.13	400	
Si III	876.16	164	N	Zn III	879.380	0		Al IV	883.138	50	
N I	876.172	6		Kr I	879.388	46	A, Z	Co III	883.154	5	
Cu IV	876.230	60		Cr XVIII	879.46		F, P	Ar III	883.18	450	
N I	876.238		P	Mn III	879.466	10		Cu IV	883.228	80	
Mg III	876.312	7		Ni III	879.471	50		Cu II	883.2800	5	
N I	876.331		P	Co III	879.480	0	N	Mn III	883.336	70	
Mn III	876.465	35		Fe III	879.505	250		Co III	883.345	1	
Fe III	876.483	200		O I	879.5507	30	Z	Si III	883.398	100	
Fe III	876.564	200		As II	879.563	125		Ni XII	883.4		F, P
Cu III	876.569	2		F III	879.59	6		P III	883.467	1	
Co III	876.594	5		Ar III	879.62	400		S V	883.59	200	
N I	876.645	6		Mn III	879.642	0		Fe III	883.688	400	

Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes
Co III	883.703	2		Kr I	886.737	12	A	Mn III	889.171	130	
Se II	883.77	1		Se VI	886.8	120		Ga IV	889.184	50	
Cu II	883.8390	5		Kr I	886.822	11	A	Br II	889.2	1000	
Ni III	883.849	50		N I	886.829	6		Si VI	889.227	50	
As II	883.921	125		N I	886.840		P	Mn III	889.326	150	
Co III	883.960	0		Cr III	886.879	4		Cr III	889.33	80	N
Mn III	884.025	60		Kr I	886.909	11	A	Ni IV	889.40		F,P
Cu IV	884.054	60		Kr I	886.917	12	A	Mn III	889.407	130	
Kr	884.06	50	N	Ni III	886.924	10		Kr I	889.508	12	A
Cu II	884.1332	10		As II	886.941	40		Kr I	889.550	16	A
Kr II	884.141	360		Cu II	886.9434	60		Mn III	889.608	20	
V IV	884.146	30		Kr I	887.014	10	A	Si II	889.7228	100	
Cr III	884.18	20	N	N I	887.016	4		Br II	889.8	1	
Co III	884.192	2		Kr I	887.024	12	A	Kr	889.80	20	N
Fe III	884.263	250		Mn III	887.030	80		Cl II	889.8173	220	
Mn III	884.301	0		Sc IV	887.121	40		Cu IV	889.882	20	
Mn III	884.349	150		Kr I	887.133	9	A	Mg III	889.888	20	
V III	884.42	0		Kr I	887.143	10	A	Mn III	889.958	60	
Cu II	884.4346	8		Cu IV	887.236	20	N	Fe III	890.008	150	
S V	884.46	200		Kr I	887.266	10	A	Si VI	890.041	100	
C III	884.516	800		Kr I	887.280	13	A	Kr I	890.089	14	A
Fe III	884.600	300		Fe III	887.372	200		Ni III	890.131	5	
Si VI	884.64	10		N I	887.375	4	P	Kr I	890.139	16	A
Mg II	884.6967			Se III	887.4	50	N	Ge XVIII	890.2		F,Q
Mn III	884.698	40		Ar III	887.40	500		Kr I	890.333	4	A
Mg II	884.7189			Kr I	887.421	10	A	Mg IV	890.354	40	
P IV	884.724	25		Kr I	887.435	12	A	Cu II	890.5669	60	
N III	884.76		P, Z	N I	887.457	11		Mn III	890.589	130	
Mn III	884.795	15		Se II	887.48	250		Se II	890.59	350	
Cu II	884.8262	5		Cr III	887.588	4		Se III	890.6	50	
Cu III	884.845	3		Kr I	887.596	10	A	Mg IV	890.604	40	
Cu IV	884.862	50	N	Kr I	887.612	14	A	S IV	890.68	292	N
Mn III	884.978	0		Mn III	887.681	0		Fe III	890.755	600	
Ti V	884.982	4		Ge VI	887.681	70		F VII	890.786	5	
Co III	885.011	0		S VII	887.7		N	Kr I	890.811	14	A
P III	885.073	1		Co III	887.777	0		Mn III	890.858	150	
Ni III	885.103	3		Kr I	887.800	10	A	Sc IV	890.866	285	
Br II	885.3	1		Kr I	887.819	15	A	Kr I	890.871	18	A
Mn III	885.327	50		As VI	887.849	4		Ca	890.892	100	N
N I	885.380	5	P	S IV	887.90	204	N	Mn III	890.999	150	
N I	885.387	5		Cu IV	887.929	200		Kr II	891.006	520	
Ni III	885.455	2		Co III	887.988	0		Mg IV	891.006	40	
P IV	885.468	40		N I	888.022	10		Cu IV	891.078	200	
Br II	885.5	100		Cl II	888.0256	440		Kr I	891.115	7	A
N I	885.527		P	Kr I	888.036	11	A	Fe III	891.172	650	
Ar VII	885.55		P, P	Si VI	888.050	10		Mn III	891.287	40	
Ni IV	885.63		F, P	Kr I	888.058	14	A	O II	891.29		N
N I	885.656	10	P	As VI	888.058	27		Fe III	891.442	550	
N I	885.668	5	P	Se II	888.06	50		As VI	891.470	29	
N I	885.704		P	Cr III	888.25	10	N	Si III	891.479		
S V	885.77	100		Kr I	888.314	10	A	Cu IV	891.527	80	
Cu II	885.8472	25		Kr I	888.339	15	A	As II	891.587	125	
Ge II	885.9663	20		Kr	888.35	20	N	Mn III	891.603	130	
N I	885.973	6		N I	888.372	8		Kr I	891.723	16	A
Cr III	886.007	25		Cu IV	888.525	20	N	Mn III	891.739	150	
Ni IV	886.08		F, P	Cr III	888.54	10		Kr I	891.797	18	A
P IV	886.101	60		As II	888.584	80		Cu IV	891.834	310	
Fe III	886.138	70		Zn II	888.620	6		Co III	891.902	5	
Mg III	886.158	7		Kr I	888.642	10	A	Si VI	891.97		
N I	886.226	9		Kr I	888.672	15	A	Si II	892.0007	200	
Si VI	886.243	60		Cu IV	888.707	20		Al III	892.0242	400	
Ge VI	886.283	70		Si VI	888.72	20		Ni III	892.041	3	
Kr II	886.300	640		Fe III	888.777	150		Ar	892.07	10	N
N I	886.332	8		Mn III	888.778	150		Cu IV	892.084		F, P
Kr I	886.377	10	A	Na VI	888.784	5		Cr III	892.09	10	N
Co III	886.378	5		Ni II	888.818	5		Kr I	892.108	6	A
Kr I	886.423	10	A	S V	888.93	89	N	O I	892.11	2	A, Z
N I	886.428	8		Ni IV	888.95		F, P	Mg IV	892.218	40	
N I	886.465		P	P IV	888.957	120		Cu IV	892.283	30	
Kr I	886.474	11	A	Si V	888.999	3		Mn III	892.393	20	
Cu II	886.5111	10		As III	889.03	400		Cu II	892.4144	50	
N I	886.517		P	Cu IV	889.033	170		Fe III	892.417	400	
Kr I	886.530	12	A	Kr I	889.034	13	A	P IV	892.460	40	
Kr I	886.592	11	A	Cu IV	889.051	170		Cu IV	892.565	450	
Kr I	886.660	13	A	Kr I	889.069	15	A	Ga IV	892.590	25	



Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes
K IV	892.621	100	N	As VI	896.249	47		Ni III	900.008	100	
Ca IV	892.671	150	N	Cr III	896.310	4		Mn III	900.012	60	
Ge VI	892.680	50		Fe III	896.380	70		Cu IV	900.053	750	
As IV	892.7	500		Fe II	896.504	1		Ga IV	900.171	25	
Ar	892.74	10	N	Kr I	896.568	21	A	Mn III	900.237	170	
P IV	892.804	90		Br II	896.6	500		Cu IV	900.266	630	
Kr I	892.901	17	A	Cu IV	896.603	40		K	900.266	20	N
Zn II	892.914	10		Mg III	896.640	4		Mn III	900.286	120	
Kr I	892.990	18	A	Kr I	896.698	21	A	Kr I	900.313	20	A
Si V	892.993	150		Cu IV	896.700	490		Co IV	900.33		F, P
Co III	893.045	15		Cu II	896.7588	60		Ar IV	900.36	200	
Co III	893.095	8		Mn III	896.781	40		Fe II	900.360	5	
P IV	893.235	40		Mn III	896.816	150		Fe III	900.432	150	
Si V	893.277	60		Cr III	896.82	50		Cu IV	900.436	400	
Kr I	893.397	6	A	Ni VI	896.886	170		Mn III	900.453	150	
S IV	893.41	91	N	Cu IV	896.924	230		Ni II	900.510	0	
P IV	893.451	120		Mn III	896.975	120		N IV	900.516		P
Ar	893.50	50	N	Cu II	896.9762	40		Mn III	900.594	80	
Ni III	893.533	50		V V	897.124	20		Ge II	900.618	10	Z
Cl II	893.5483	440		Ge VI	897.174	100		Se III	900.7	10	
As VI	893.570	59		Mn III	897.176	130		N II	900.724		P
Ni II	893.630	3	N	Si V	897.227	40		Si VI	900.834	60	
Cu II	893.6777	80		Cr III	897.229	4		Kr I	900.876	22	A
Co III	893.713	8		Mn III	897.245	90		S V	900.93	200	
Ge VI	893.783	50		Ge VI	897.292	550		As III	900.94	300	
Mn III	893.786	10		Kr I	897.435	13	A	Fe III	900.940	200	
Co IV	893.79		F, P	Mn III	897.508	190		Sc IV	900.948	40	
Mg IV	893.869	40		Cu IV	897.529	20		Ni II	901.007	10	
Al III	893.8874	50		Fe III	897.580	70		Fe III	901.034	300	
Al III	893.8969	450		Co III	897.686	1		Cu II	901.0731	60	
Ni II	894.004	2		Mn III	897.714	100		Ti XVII	901.14		F, P
Cu IV	894.005	500		Fe III	897.747	150		Si V	901.168	70	
Fe III	894.008	250		Cu IV	897.789	20		Co IV	901.17		F, P
V III	894.13	0		Cu II	897.7932	15		Ar IV	901.17	400	
Mn III	894.154	170		Kr III	897.806	700		Ni IV	901.21		F, P
Cu II	894.2274	40		S IV	897.81	286	N	Mn III	901.212	130	
Ar I	894.3102	150	st	Mn III	897.855	130		Ga IV	901.264	20	
Cl V	894.34	400		Si V	897.856	80		N II	901.398		P
Cu IV	894.342	120		Ca	897.972	50	N	S X	901.4		P
Kr I	894.455	21	A	Mn III	898.103	0		Cr III	901.454	4	
S III	894.46	248	N	Cu IV	898.140	470		P IV	901.521	1	
Si VI	894.490	70		Mg III	898.207	12		Cu IV	901.547	490	
Cu IV	894.522	20		Si VI	898.281	40		Kr	901.61	10	N
Co IV	894.53		F, P	Kr	898.39	200	N	N II	901.626		P
Kr I	894.565	20	A	Ni II	898.716	2		Si VI	901.637	200	
Mn III	894.586	350		As II	898.768	125		Mn III	901.691	100	
V III	894.59	0		Fe II	898.776	0		Ti V	901.692	4	
Mn III	894.644	8		Fe III	898.805	70		Si II	901.7359	20	
Si VI	894.737	40		Ni II	898.821	5		Ni II	901.737	2	
Mn III	894.741	150		Cu IV	898.850	530		Ar IV	901.80	80	
Mg III	894.744	7		Cu IV	898.913	120		Co IV	901.91		F, P
Ni IV	894.75		F, P	O III	898.957	400		Ni II	901.999	50	
Cr III	894.86	10	N	Co III	899.025	1	N	Ni VI	902.047	370	
Cu III	894.888	2		Fe III	899.052	70		Mn III	902.101	70	
Cl V	894.91	100		Co IV	899.16		F, P	K	902.135	20	N
Ar	894.97	10	N	Ti V	899.171	0		Si VI	902.209	100	
Se II	894.99	1		V III	899.18	5		F III	902.239	3	
Cu IV	895.066	20		Sc XV	899.3		F, P	Cu IV	902.243	20	
Ni II	895.093	1		Ni IV	899.31		F, P	Mn III	902.316	80	
Kr I	895.108	11	A	Si II	899.4063	10		F III	902.425	3	
Ne VII	895.18			Fe III	899.417	550		Mn III	902.502	150	
Cr III	895.19	10	N	Si VI	899.427	40		Co IV	902.66		F, P
Si IV	895.228			Ge VI	899.463	240		Mn III	902.686	150	
Cu IV	895.311	20		Kr I	899.515	24	A	Ni II	902.687	1	N
Mg III	895.324	12		Cu IV	899.570	200		P IV	902.722		
Cu IV	895.406	160		Co IV	899.58		F, P	S V	902.80	100	
Ni II	895.458	15		Ge II	899.649	5	Z	Mg IV	902.812	60	
Cu IV	895.459	20		Kr I	899.651	24	A	P III	902.822	120	
Si IV	895.558			P III	899.767	1		Mn III	902.832	60	
Cu IV	895.727	90		Cu II	899.7888	50		Fe III	902.869	200	
V III	895.88	5		Cu II	899.7922	50		Mg III	902.923	7	
Cl II	895.9539	420		Si IV	899.86	582	N	Ni II	902.996	75	
Fe III	896.072	70		Cu IV	899.863	50	N	P VIII	903.		F, P
Ni II	896.168	5		Al XII	899.93		P	S X	903.0		P
Br II	896.2			P III	899.963	60		Mn III	903.018	150	

Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes
P III	903.022	40		Ge II	905.9771	200		Fe III	908.800	70	
Kr I	903.071	28	A	Br II	906.0	500		Mn III	908.835	70	
Sc IV	903.165	70		Kr	906.02	10	N	F IV	908.837	100	
Cl XVI	903.18		P	Cu II	906.1134	40		Cu IV	908.872	20	
P IV	903.191	1		Ni II	906.123	15		Fe III	908.885	150	
Zn	903.194	15	N	Si II	906.126	0	Z	F IV	908.958	150	
Mn III	903.234	35		Si VI	906.18	5		Ni IV	909.04		F,P
As II	903.521	150		N I	906.206	11		Cu IV	909.043	310	
Cu II	903.5290	1		Ni II	906.237	2		Ge II	909.050	5	N
P III	903.575	90		Cr III	906.290	4		S II	909.15	121	N
C II	903.6235	600	ST	Ni IV	906.32		F,P	Fe III	909.178	250	
F IV	903.64	35		Cr III	906.358	4		Si II	909.209	3	Z
Sc IV	903.687	110		Ni VI	906.380	50		Ga IV	909.258	30	
Co III	903.730	5		N I	906.433	13		Fe III	909.279	150	
Co IV	903.81		F,P	F III	906.577	3		Mn III	909.336	130	
Mn III	903.901	80		Si II	906.586	1	Z	Ge II	909.432	3	Z
F III	903.96	3		Cr III	906.596	10		Co IV	909.54		F,P
C II	903.9616	800	ST	Mn III	906.613	90		Ga IV	909.546	60	
N II	903.962		P	Cl II	906.6153	380		Kr	909.55	30	N
Kr I	904.004	14	A	N I	906.617	12		P III	909.581	4	
Cu IV	904.029	180		Se II	906.63	600		Mn III	909.622	115	
C II	904.1416	1000	ST	P III	906.660	25		Cu IV	909.672	620	
Ni II	904.205	2		Mn III	906.691	115		Ni II	909.683	10	
Ni III	904.294	50		Kr I	906.697	20	A	N I	909.6976	9	ST
Fe III	904.320	200		N I	906.730	12		Cu IV	909.710	280	
As VI	904.344	42		Ni II	906.730	1	N	Mg III	909.730	7	
Mn III	904.359	130		Cr III	906.844	40		P III	909.818	90	
Ni IV	904.38		F,P	S II	906.87	300		Cu IV	909.913	90	
Cr III	904.479	250		P II	906.89	5	N	Cu IV	910.007	90	
Si V	904.48			Cr III	906.896	60		Cl II	910.25	10	N
C II	904.4801	600	ST	Ni II	906.906	1		N I	910.2785	6	ST
Co IV	904.57		F,P	Sc	906.95	700	N	F III	910.334	6	
F III	904.657	3		P II	906.987	10		Co IV	910.37		F,P
Br II	904.7	1		Si II	907.033	0	Z	Co III	910.415	0	
N II	904.855		P	Fe III	907.041	70		S II	910.49	300	
Kr I	904.862	7	A	Cu IV	907.063	300		Cu II	910.5185	15	
Ga IV	904.866	20		N I	907.069	2	P	P III	910.548	60	
Cu IV	904.867	400		N I	907.275		P	Fe III	910.639	200	
Ar	904.89	80	N	N I	907.337	7		F III	910.645	6	
Ge II	904.93	2	F,P	Mg II	907.3752			N I	910.6456	5	ST
Ni II	904.986	1		Mg II	907.4115			Fe III	910.693	250	
P X	905.		F,P	N I	907.485		P	Co III	910.721	0	
F III	905.048	6		P II	907.56	40		Mn III	910.760	40	
F IV	905.14		Q	P III	907.590	90		Cr III	910.763	10	
Al II	905.152	20		Ni II	907.630	50		Ge VI	910.765	140	
N I	905.223	6		Ni II	907.692	10		Br II	910.8	200	
F IV	905.224	60		Si II	907.762	0	Z	Cu IV	910.878	30	
As II	905.240	100		P III	907.809	120		P II	910.88	5	
Ge VI	905.253	360		Se II	907.81	50		Al II	910.916	10	
Sc	905.28	200	N	Zn XXIII	907.88		F,P	Kr I	910.918	25	A
N II	905.286		P	Fe III	907.891	250		Fe III	910.961	400	
Cu IV	905.331	300		P III	908.032	120		Cu IV	910.993	610	
Fe III	905.338	450		Ga IV	908.050	20		Ni XXIII	911.0		F
Cr III	905.354	60		N IV	908.057		P	Mg IV	911.011	20	
N I	905.411	2	P	Fe III	908.131	300		Ni IV	911.09		F,P
Si V	905.414	5		Cu IV	908.161	20		Ge VI	911.104	250	
P III	905.517	120		Sc	908.18	700	N	Mn III	911.112	80	
Co IV	905.54		F,P	Ni IV	908.19		F,P	Zn III	911.148	2	Q
Mn III	905.597	130		Mn III	908.220	20		F III	911.164	20	
Ni II	905.634	100		Sc	908.23	700	N	Cr III	911.168	60	
Cr III	905.688	90		N I	908.2332	3		Ni II	911.187	15	
Ni II	905.696	3		Ni II	908.258	40		Fe III	911.205	70	
Ni IV	905.71		F,P	P III	908.266	10		Ge II	911.258	15	Z
Si II	905.71	0		Cu IV	908.325	100		Fe III	911.265	150	
N I	905.787	11		Ga IV	908.365	80		Cu IV	911.291	50	
N I	905.839	12		P II	908.38	1		P III	911.379	1	
Cu IV	905.875	450		Si II	908.461	1	Z	Kr II	911.394	360	
Ni VI	905.889	130		Co III	908.491	5		Ni IV	911.40		F,P
Mn XIX	905.9		F,P	Ge II	908.50	10	Z	Ga IV	911.408	90	
N I	905.916	11		Ni II	908.584	20		Cu IV	911.457	20	
S V	905.92	200		Mn III	908.607	10		O I	911.463	2	A
Cr III	905.92	10	N	Sc IV	908.731	110		O I	911.463	2	A
Sc IV	905.922	20		Ti V	908.740	0		Al II	911.497	10	
Si V	905.963	5		N I	908.7958	1		Sc	911.50	200	N
Fe III	905.964	70		Se XX	908.8		F,Q	O I	911.538	5	A

Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes
O I	911.538	5	A	Cu II	913.5018	0		Ni II	915.877	75	
O I	911.611	5	A	P II	913.59	10		Cu IV	915.879	40	
O I	911.611	5	A	O I	913.590	10	A	Ni II	915.920	30	
P III	911.629	40		O I	913.644		A	N II	915.962	700	
Cu II	911.6301	1		O I	913.644	10	A	O I	915.991	5	A
Kr I	911.670	24	A	Ni II	913.678	75		Mn III	916.002	225	
Cu II	911.6793	1		As II	913.727	125		N II	916.012	800	
O I	911.692	5	A	Cr III	913.75	30	N	N II	916.020	600	
O I	911.692	5	A	Ar	913.80	10	N	Co VI	916.11		F, P
Br II	911.7	250		Cu IV	913.807	150		P VI	916.139	100	
S III	911.77	20		O I	913.815	10	A	Cr III	916.200	60	
Mn III	911.783	100		Si II	913.853	20	Z	Si III	916.42	206	N
O I	911.786	5	A	Ni II	913.909	15		O I	916.420	10	A
O I	911.786	5	A	Fe III	913.919	150		Cu IV	916.426	150	N
Cu IV	911.858	570		P III	913.971	300		Mn III	916.428	4	
O I	911.898	5	A	O I	913.997	20	A	H I	916.429	3	
O I	911.898	5	A	O I	914.057	10	A	Ni II	916.449	1	
Al II	911.946	40		O I	914.057	2	A	Si V	916.500	30	
O I	912.012	10	A	Cr III	914.115	4		O I	916.526		P
O I	912.012	10	A	Cr III	914.178	60		Mn III	916.649	90	
Cu II	912.0248	0		Mn III	914.199	0		N II	916.701	1000	
F III	912.090	6		Cu II	914.2133	80		N II	916.710	800	
Sc	912.15	200	N	O I	914.293	5	A	Co III	916.714	1	N
O I	912.155	10	A	Ni II	914.343	50		O I	916.816	10	A
O I	912.155	10	A	Cr III	914.360	25		Cu IV	916.816	420	
Cu IV	912.183	400		Ge II	914.444	2	Z	Ca	916.917	100	N
Fe III	912.197	150		Si II	914.476	2	Z	O I	916.960	5	A
Cr III	912.26	10	N	Ne VI	914.5			Cu IV	916.960	630	
Ga IV	912.301	170		Cl V	914.5			O I	916.960	5	A
O I	912.318	10	A	O I	914.513	10	A	Ni II	917.017	10	
O I	912.318	10	A	Kr I	914.554	0	A	Cu IV	917.096	50	Q
Cl II	912.3468	220		H I	914.576	2		P III	917.120	300	
Cu IV	912.363	540		O I	914.588	10	A	As II	917.131	100	
Si II	912.375	5	Z	Cr III	914.67	10	N	Mn III	917.175	2	
Cu II	912.4162	3		Cr IV	914.714	1		H I	917.181	4	
Mn III	912.442	80		Ni II	914.743	40		O I	917.185	5	A
Si II	912.459	5	Z	As II	914.746	80		Mn III	917.275	4	
O I	912.48	1	A, Z	Cu IV	914.776	40		Ca	917.278	115	N
O I	912.500	10	A	F III	914.836	3		Cu II	917.3058	20	
O I	912.500	10	A	O I	914.854	2	A	O I	917.315	5	A
Cr III	912.587	120		Cl II	914.8574	185		Mn III	917.334	1	
Mn III	912.661	25		O I	914.918	5	A	Ge VI	917.351	240	
Fe III	912.683	300		H I	914.919	2		Cr III	917.40	10	N
O I	912.723	20	A	C VI	914.996		P	Mn III	917.417	190	
O I	912.723	20	A	Ge IV	915.0	160	P	Kr II	917.427	1000	
S II	912.74	300		Cu IV	915.000	550		Sc IV	917.495	5	
Fe III	912.794	200		Ge VI	915.010			K V	917.498	50	N
Co III	912.817	2		Cr III	915.02	20	N	As II	917.513	150	
Si V	912.827	30		Mn VI	915.050	45		Cu IV	917.514	40	
O I	912.843	10	A	O I	915.100	5	A	Mn III	917.603	150	
Se II	912.89	800		O I	915.199	2	A	Fe III	917.684	150	
Ar	912.91	10	N	O I	915.199	2	A	Ar	917.72	10	N
Cr III	912.911	60		Mn III	915.215	170		Cr III	917.75	20	
P III	912.936	10		C VI	915.222		P	Sc IV	917.777	40	
Cu IV	912.950	90		S II	915.27	185	N	Mn III	917.797	8	
O I	912.964	20	A	C VI	915.298		P	Cu IV	917.909	160	
O I	912.964	20	A	Br II	915.3	200		Fe III	917.932	250	
Ni IV	912.99		F, P	O I	915.321	5	A	Se II	917.94	50	
Si II	913.012	10	Z	H I	915.329	2		Ni II	917.962	15	
Cu IV	913.125	380		Cu IV	915.345	30		Mn III	918.007	170	
O I	913.127	5	A	O I	915.381		P	Ni II	918.022	3	N
Fe III	913.132	70		As VI	915.398	64		O I	918.039	10	A
Cr III	913.172	10		As VI	915.436	63		As II	918.115	150	
Ni II	913.187	2		Fe III	915.455	200		Fe II	918.118	1	
Co III	913.239	2		Ni II	915.471	1		H I	918.129	5	
O I	913.250	20	A	O I	915.499	2	A	Cu IV	918.139	260	
O I	913.250	20	A	Cu IV	915.590	20		O I	918.149	5	A
Si II	913.264	3	Z	N II	915.612	700		Cu IV	918.172	60	
Ni II	913.279	3		Cr III	915.631	150		Cr III	918.183	40	
F III	913.303	3		Si IV	915.67	219	N	Br III	918.2	400	Q
Fe III	913.324	70		Mn III	915.802	225		Cl IX	918.2		
Mn III	913.353	15		O I	915.821	10	A	Mn III	918.201	0	
Cu IV	913.358	30		H I	915.824	3		Ni IV	918.22		F, P
O I	913.483	10	A	Sc	915.85	200	N	O I	918.221	5	A
Br II	913.5	10		O I	915.877	10	A	Co III	918.233	1	N

Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes
Ga IV	918.270	25		Ni II	921.228	2	N	Cr III	924.310	300	
Ge VI	918.278	360		Cu IV	921.244	380		Cu IV	924.357	70	
O I	918.293		P	O I	921.247	2	A	Cu IV	924.512	500	
Kr	918.34	400	N	O IV	921.296	120		Cl II	924.5764	75	
Mn III	918.43	1		Ni II	921.299	1		Si VI	924.62	50	
Cu IV	918.449	280		Si V	921.31			Cu IV	924.668	290	
P IV	918.497	200		O IV	921.366	150		Ni II	924.710	1	
Mn III	918.500	190		Al II	921.367	75		F III	924.716	6	
Cr III	918.571	25		Zn III	921.434	0	Q	P IV	924.719	1	
K VI	918.581	100	N	Mn III	921.495	150		Ni IV	924.75		F,P
P III	918.665	350		Ga IV	921.539	110		Mn III	924.773	25	
Mn III	918.678	3		O I	921.575	2	A	Ni II	924.783	10	
As II	918.706	10		Si V	921.583	70		Ni II	924.912	20	
O I	918.724	2	A	Mn VI	921.600	10		Mn III	924.947	130	
Mn III	918.771	0		Ni II	921.730	75		O I	924.952	5	A
Fe III	918.800	70		Cu IV	921.735	30		Fe II	924.970	2	
Cu IV	918.815	40		Ni IV	921.79		F,P	V XVIII	925.		F,P
S II	918.82	300		P III	921.849	250		As IV	925.0	350	
Se II	918.84	150		O I	921.860	10	A	Cr III	925.026	350	
Mn III	918.849	3		Si V	921.862	10		Si VI	925.03	5	
Cr III	918.859	25		N IV	921.992	720		Co III	925.045	8	
F IX	918.912		P	O I	922.0081	70	Z	Co IV	925.07		F,P
Ni II	918.946	4	N	Cu II	922.0190	60		Cu II	925.0992	30	
Ni II	918.994	150		Si VI	922.063	90		Ni II	925.100	2	N
Ge VI	919.024	100		O I	922.0727	20	Z	Cu II	925.1098	30	
Mg IV	919.025	80		Cr III	922.171	250		Mn III	925.122	50	
Si VI	919.034	30		Cu IV	922.172	160		Cu II	925.1263	30	
Mn III	919.078	0		Ni II	922.176	5	N	Be II	925.20	100	
Fe II	919.095	0		O I	922.200	5	A	Co III	925.230	0	
Cr III	919.095	10		Mn III	922.252	150		Cr III	925.237	25	
Kr III	919.146	30		Ni II	922.331	15		Mn III	925.291	150	
As II	919.152	150		Cu II	922.4161	20		Cr III	925.343	250	
Cr III	919.200	120		Cu IV	922.417	50		O I	925.442	5	A
S II	919.24	100		O I	922.46	5	A,Z	Ge VI	925.473	300	
Ge VI	919.287	200		Se VII	922.516	12		Cr III	925.487	250	
Mn III	919.288	0		Cr III	922.517	120		Ni II	925.544	3	N
H I	919.351	7		N IV	922.519	700		Si V	925.565	30	
O I	919.376	5	A	Ni II	922.571	1	N	Ni II	925.578	1	
O I	919.559	5	A	Br II	922.6	300		Cu IV	925.756	480	
As VI	919.568	58		Mn III	922.623	130		Mn III	925.776	115	
Cu IV	919.595	700		Ga IV	922.674	40		P VI	925.852	150	
Ge II	919.65	15	F,P	Kr I	922.738	23	A	Co IV	925.93		F,P
O I	919.658	10	A	D I	922.899			Cr III	925.945	25	
Al II	919.672	30		Se II	922.90	1		Mn III	925.974	50	
Ge VI	919.754	120		Cu IV	922.916	50		D I	925.974		
Ar II	919.7810	1000	st	Cu IV	922.986	740		Zn	926.083	10	N
Ti XV	919.79		F,P	N IV	923.057	680		Mn III	926.191	170	
P IV	919.799	90		Co III	923.075	10		Fe II	926.215	5	
Cu IV	919.856	110		H I	923.150	10		H I	926.226	20	
F IX	919.904		P	O I	923.200	10	A	Cr IV	926.261	1	
O I	919.908	5	A	Fe III	923.215	70		O I	926.295	10	A
O I	919.971	2	A	N IV	923.220	800		Se II	926.38	10	
Cu IV	920.062	570		O IV	923.367	200		Ge II	926.4736	20	
Cr III	920.119	25		Mn VI	923.400	55		Cr III	926.510	300	
Cu IV	920.188	190		O IV	923.433	120		Cr VII	926.520	20	
F IX	920.210		P	Cr III	923.543	250		Mn III	926.532	150	
Si V	920.305	5		O I	923.549		P	Cu IV	926.560	100	
Al II	920.317	50		N IV	923.675	700		Co III	926.591	0	
Co III	920.371	2		Mn III	923.712	150		Fe II	926.618	1	
Mn III	920.382	150		Kr I	923.712	25	A	Cu IV	926.637	20	
Ni II	920.451	10		Cr III	923.784	150		Mn III	926.698	130	
Cr III	920.511	25		Mn III	923.784	130		Cr III	926.703	90	
Ge VI	920.516	340		O I	923.790		P	O I	926.809	5	A
Ca XV	920.54		F,P	Fe II	923.880	2		Ge VI	926.824	1000	
Ge II	920.5537	400		Cu IV	923.908	20	N	Mn III	926.826	150	
Sc IV	920.665	5		Zn II	923.969	0		Cu IV	926.833	200	
Cr III	920.699	90		Cr III	924.045	350		Zn	926.892	10	N
D I	920.712			S IV	924.08	212	N	Fe II	926.900	2	
Al II	920.716	50		O I	924.135		P	O I	926.903	5	A
Ge II	920.7195			S VII	924.2		N	Ge II	926.93	2	N
Ga IV	920.951	30		Cu II	924.2386	50		Cl II	926.9588	340	
H I	920.963	9		Cu IV	924.240	20	N	Cu IV	926.975	150	
O I	921.005	10	A	N IV	924.283	720		Ga IV	926.975	35	
Se II	921.12	250		Si VI	924.290	100		Cr III	927.173	300	
Br II	921.2	250		Cl II	924.3022	100		Fe II	927.178	2	

Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes
K VIII	927.213	1		Fe II	930.219	1		Mn III	934.594	10	
Co III	927.224	5		Si II	930.242	0	Z	Fe III	934.703	450	
Ga IV	927.310	10		O I	930.2566	5		Cu IV	934.738	30	
Kr	927.37	120	N	K VI	930.318	50	N	Mn III	934.761	150	
O I	927.394		P	Ni II	930.351	10	N	Cu IV	934.812	20	N
Mn III	927.463	100		D I	930.495			Ar	934.84	20	N
As III	927.57	200		Fe II	930.558	1		Ca	934.875	50	N
Mn VI	927.614	60		Sc	930.67	500	N	Mn III	934.950	20	
Fe II	927.632	1		Mn III	930.707	7		Cr III	934.991	4	
Ga IV	927.701	60		Ni II	930.707	3		Co III	935.003	3	
P II	927.771	10		H I	930.748	30		Al II	935.020	100	
Mn III	927.812	35		Cr III	930.794	25		As VI	935.054	62	
Cu IV	927.816	590		As IV	930.8	400		Cu II	935.0577	60	
Ni II	927.820	5		O I	930.8862	5		Ni II	935.085	2	N
F IV	927.837	10		Cl III	930.94	100		Cu II	935.0855	60	
Mn III	927.881	25		Fe III	931.124	70		O I	935.1930	90	Z
Cr III	927.897	10		Fe II	931.142	2		Ni II	935.200	1	N
Fe III	928.004	250		Ni II	931.191	1		Cu II	935.2325	40	
Mn III	928.039	35		Si II	931.200	5		Al II	935.275	100	
S IV	928.06	100	N	Co IV	931.27		F,P	Cu IV	935.276	720	
Fe II	928.107	1		Ge II	931.32	3	N	Cu II	935.3434	20	
Ge VI	928.133	200		Sc IV	931.418	70		Mn III	935.36	1	
Mn III	928.288	130		Kr	931.47	250	N	Ga IV	935.518	15	
Si II	928.297	5	Z	O I	931.4820	5		Mn III	935.539	150	
Mn III	928.313	130		Ni II	931.501	2		Mn III	935.563	0	
Ni IV	928.37		F,P	Zn III	931.564	0	Q	Cr III	935.575	40	
Fe II	928.470	2		O I	931.6282	5		Fe II	935.783	0	
Fe III	928.474	300		Ti V	931.652	0		Ga IV	935.888	60	
Ti V	928.507	1		Si II	931.667	5	Z	Cu II	935.8977	60	
P II	928.550	10		Fe II	931.709	1		Ge VI	935.912	200	
Mn III	928.574	150		Zn III	931.766	0	Q	Mn III	935.919	130	
Cu IV	928.637	770		Cu IV	931.835	30		Cu IV	935.941	90	
Mn III	928.676	150		Zn III	931.860	0	Q	Si III	936.056	25	
Kr I	928.710	13	A	K	931.864	20	N	Si III	936.058	2	
Mn III	928.815	115		Cu IV	931.944	90		Si III	936.060	1	
O III	928.82		Q	Ar II	932.0537	1000	st	Si III	936.077	18	
Mn III	928.886	250		Ar I	932.058	15	F,A	Si III	936.079	2	
As II	928.941	100		Cu IV	932.161	50		Mn III	936.091	35	
Ni II	928.953	3		O I	932.2249			Si III	936.100	12	
Mn III	928.959	60		Fe II	932.244	0		Si IV	936.15	217	N
Mn III	929.131	80		Cu IV	932.269	30	N	Mn VI	936.183	7	
Fe III	929.163	300		Ni II	932.321	2	N	Ni II	936.188	1	
As VI	929.186	58		Sc	932.40	300	N	Cl III	936.28	100	
Si II	929.206	1	Z	Al II	932.408	20		Mg IV	936.288	40	
Cu IV	929.207	550		Mn VI	932.476	5		Ti XV	936.32		F,P
K VI	929.374	50	N	Cu IV	932.510	240		Cu IV	936.352	80	
Si V	929.389	100		Sc	932.58	300	N	Mn III	936.470	30	
Si IV	929.39	153	N	Cu IV	932.605	110		Fe II	936.484	1	
Ge VI	929.429	250		Fe II	932.687	0		Cr VII	936.492	1	
Mn III	929.477	150		Co III	932.733	3		V VI	936.557	40	
O I	929.5168	10		Kr	932.88	10	N	Cr III	936.560	4	
Fe II	929.538	1		As VI	932.885	58		Cu IV	936.615	100	
Cu IV	929.567	260		Al II	932.938	40		O I	936.6295	10	
Ni II	929.586	1		Cu II	932.9387	60		Co III	936.639	30	
Fe II	929.612	1		Cl II	932.9780	220		Cu IV	936.675	350	
Ge VI	929.626	340		Ga IV	933.100	20		Ge IV	936.7	160	P
P II	929.642	10		Cr IV	933.172	0		Ni II	936.704	15	N
Ni II	929.681	3		Ni II	933.339	2		Sc	936.77	600	N
Cu II	929.7020	2		S VI	933.38	400		Mn III	936.778	15	
Mg IV	929.774	60		Cu IV	933.383	20		Mn III	936.880	40	
Si II	929.810	20	Z	Al II	933.408	50		Cr III	937.040	90	
Cr III	929.831	10		Ni II	933.421	1	N	Cu IV	937.151	30	
Ni II	929.831	5		Mn III	933.555	20		Mn III	937.199	80	
Cu II	929.8930	5		Co VI	933.59		F,P	As VI	937.256	70	
Cu IV	929.957	300		Cu IV	933.682	40		As III	937.26	300	
Ga IV	929.970	60		Mn III	933.735	150		Mn III	937.287	130	
Co III	929.970	5		Ge VI	933.766	290		Sc	937.30	700	N
Fe II	930.030	1		Mn VI	933.785	90		Co III	937.310	20	
Cu IV	930.047	280		Ga IV	933.859	60		S II	937.41	300	
Ge VI	930.074	500		Ni II	933.866	1		D I	937.548	40	
Fe III	930.086	250		Al II	933.938	75		Cu IV	937.613	680	
Co XX	930.11		F,P	Al II	934.015	100		Mn III	937.642	100	
S IV	930.16	104	N	Cu IV	934.017	20		S II	937.69	300	
Fe II	930.165	1		Sc IV	934.391	20		S X	937.7		P
Co IV	930.20		F,P	Ga IV	934.539	10		H I	937.803	40	

Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes
Cu II	937.8175	5		Fe II	941.660	1		P III	945.151	60	
O I	937.8405			P V	941.692	4		C I	945.191	20	Z
Mn III	937.864	150		Co III	941.756	0		Co III	945.198	0	
Cu IV	937.908	70		Ge II	941.8962	50		Na VI	945.223	5	N
Mn III	937.928	150		As IV	941.9	250		C I	945.338	50	Z
Si V	937.973	5		Ni II	941.972	10		Mg IV	945.342	20	
O I	938.0200	5		Ni II	941.996	4	N	Kr I	945.441	37	A
Mn III	938.047	150		Co III	942.051	0	N	Cu II	945.5249	60	
Co III	938.077	10		Si II	942.20	159	N	C I	945.579	75	Z
Cu IV	938.101	20		N V	942.278		P	Mn III	945.632	200	
Se III	938.2	150		Si V	942.294	80		Cu IV	945.719	20	N
K VI	938.287	100	N	Ni II	942.360	2	N	Cu II	945.8769	40	
Cu IV	938.296	20		Fe III	942.363	150		Cu IV	945.911	450	
Sc	938.35	100	N	N V	942.380		P	Cu II	945.9648	50	
Ca III	938.497	20		Co III	942.388	20		Ni II	945.965	75	
F III	938.538	1		He II	942.490		P	C II	945.977	100	Z
Cu IV	938.559	20		Ge VI	942.515	150		P VI	946.00	30	
Br II	938.6	500		Cr III	942.534	40		Cu IV	946.011	200	
Ga IV	938.601	60		He II	942.538		P	Mn III	946.050	3	
O I	938.6249			Ge VI	942.573	160		Fe II	946.051	0	
Co III	938.647	5		As II	942.585	100		Fe III	946.056	400	
Ca	938.699	50	N	Ni II	942.587	5		Na VI	946.064	20	Q
Zn II	938.719	1		Fe II	942.589	0		Cu IV	946.139	20	
Si V	938.753	70		Cr VI	942.610	520		C II	946.198	200	Z
Ge IV	938.9	80	P	Cr III	942.694	10		S I	946.3		A, Z
Fe II	938.967	1		Co III	942.696	1		As IV	946.5	450	
Co III	939.060	30		Mn III	942.704	50		Co III	946.526	10	
Cu IV	939.061	60		Ge V	942.720	30		K	946.534	20	N
Si III	939.093	140		Cu IV	942.813	630		Kr I	946.536	34	A
Si VI	939.10			Ge II	942.845	8	Z	Ge VI	946.589	450	
Ge VI	939.156	220		Cr III	942.849	150		Co III	946.594	20	
Fe II	939.159	2		Ga IV	942.871	80		Ni II	946.657	15	
P V	939.20	1		Mn III	942.903	50		Mg II	946.7032	80	
O I	939.2346			Cr III	943.045	150		Mn III	946.722	150	
Ni II	939.276	30		Mn III	943.052	150		Ni II	946.769	3	
Cl III	939.31	10		Cr III	943.204	40		Mg II	946.7694	90	
Cu IV	939.323	550		C III	943.218			Mn III	946.802	120	
Mn VI	939.329	13		Cl III	943.22	100		Ar I	946.816	15	F, A
Mn III	939.396	40		Fe II	943.267	1		Cu IV	946.910	20	
Cu IV	939.499	640		Cu II	943.3348	60		Cl III	946.97	100	
Cu II	939.5232	10		Si V	943.335	10		Br II	947.0	20	
Mn III	939.543	70		Mn III	943.347	6		Si V	947.108	10	
P III	939.576	40		Be II	943.481	30		Mn III	947.141	170	
Br VI	939.6	250		Be II	943.540	70		Cu IV	947.179	160	
Mn III	939.618	50		Mn III	943.565	3		Ni II	947.195	2	
P III	939.730	60		Ga V	943.58	10		Ga IV	947.201	100	
O I	939.8412	5		Se II	943.61	50		Mn III	947.315	115	
Cu IV	939.908	20	N	Ge II	943.75	1	N	Si V	947.359	2	
Cr III	939.926	120		Mn III	943.796	2		Cu IV	947.380	170	
Ge II	940.04	1	N	Fe II	943.910	2		Mn III	947.448	130	
Mn III	940.366	150		Si VIII	944.		F, P	Co IV	947.47		F, P
Cr III	940.384	200		P III	944.016	10		Kr	947.52	10	N
Ge VI	940.448	290		Co III	944.084	1		Fe II	947.564	0	
Cu IV	940.537	530		Cl VII	944.1		P	Mn III	947.614	130	
Si V	940.61	5		P III	944.178	1		Ga IV	947.623	20	
Mn III	940.698	150		Cu XV	944.2		F, Q	Cu II	947.7003	2	
Cr III	940.704	10		Mn III	944.206	90		Co IV	947.73		F, P
Br II	940.8	150		Kr	944.28	60	N	Ga IV	947.810	60	
K	940.839	50	N	Ni II	944.343	1		Co III	947.838	10	
Ni II	940.886	20		S VI	944.52	500		Ge VI	947.937	530	
Ga IV	940.894	25		Mn III	944.573	80		C IV	948.098	50	
Cu IV	940.901	240		Ca XIV	944.6		F, P	Mn III	948.144	170	
Mn III	940.922	0		Al V	944.62	60		N IV	948.155	100	
S I	941.0		A, Z	Ni II	944.634	30		C IV	948.214	25	
Mn III	941.064	130		Li II	944.73	5		N IV	948.244	200	
Cu IV	941.113	440		Mn III	944.746	30		Co IV	948.28		F, P
Ar I	941.288	14	F, A	Co III	944.768	20		Fe III	948.322	300	
Mn III	941.311	130		Ni II	944.842	10		Ni VI	948.324	40	
P IV	941.363	1		Ge VI	944.846	70		Ga IV	948.434	10	
Cu IV	941.368	100		Mn III	944.862	0		Mn III	948.495	90	
Cu III	941.369	1		Mn III	944.906	1		Co III	948.501	5	
Mn III	941.380	150		K XIII	945.		F, P	N IV	948.540	250	
Cu IV	941.425	350		P III	945.000	40		Ge VI	948.553	35	
Mn III	941.563	170		Fe II	945.095	3		N VII	948.584		P
Mn III	941.599	150		Mn III	945.124	0		Cl III	948.67	100	P

Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes
O I	948.6855	10		N I	952.4151	14	ST	F I	955.545	750	
V III	948.84	75	N	Fe II	952.470	1		Cu IV	955.571	370	
Kr III	948.843	5		Ge II	952.500	20	Z	Fe III	955.572	300	
Fe III	948.918	250		Cu IV	952.501	140		Cl VI	955.6		
Si VIII	949.		F, P	N I	952.5231	10	ST	Ni II	955.601	10	
Br II	949.0	1000	N	P III	952.559	25		Cu IV	955.608	480	
N VII	949.004		P	Mn III	952.610	115		N I	955.8814	5	
Cu IV	949.005	20		Al II	952.630	75		Mn III	955.897	115	
Ni II	949.024	0		Co IV	952.77		F, P	Ge II	955.96	0	Z
Zn	949.063	12	N	Ge III	952.8	40	P	As II	955.976	125	
Mn III	949.086	190		Cu XVI	952.8		F	Al II	955.977	125	
Cl VII	949.1		P	Co III	952.812	2		Mn III	956.061	3	
Ni II	949.137	1		Co IV	952.82		F, P	Cu IV	956.198	80	
N VII	949.141		P	P III	952.822	10		Cu II	956.2903	25	
Cl VI	949.2			Ge XVII	952.9		F, Q	Si V	956.292	50	
Mn III	949.235	2		O I	952.9413	2		Cu IV	956.292	80	N
He II	949.305	9	P	Mn III	953.020	115		Mn III	956.316	0	
He II	949.354	17	P	Ni II	953.033	10		Fe III	956.355	70	
Zn II	949.455	10		Mn II	953.04	1		P VI	956.359	80	
D I	949.485	70		Ni IV	953.10		F, P	Ga IV	956.753	90	
Ga IV	949.556	40		Ge VI	953.144	140		Mn III	956.770	190	
Mn III	949.741	0		Al II	953.182	100		Mn III	956.784	190	
H I	949.743	70		As IV	953.3	400		As IV	956.9	450	
Be II	949.75	100		Mn III	953.309	0		Mn III	956.906	80	
Si V	949.842	100		Ga IV	953.338	30		Cu IV	956.911	100	
Mn III	949.881	80		Fe III	953.383	200		Ni II	956.912	3	
Cu IV	949.927	20		Cl III	953.40	200		Ni IV	956.94		F, P
Si IX	950.	4	F, P	Kr I	953.403	25	A	Cr VI	957.009	600	
Se II	950.02	50		N I	953.4150	25		Ga IV	957.010	100	
O I	950.1121	5		As III	953.55	200		Mn III	957.036	150	
Cu IV	950.113	20	N	Cu IV	953.644	20		Mn II	957.20	0	
Mn III	950.114	20		N I	953.6548	27		Si V	957.265	3	
Si V	950.224	20		Se III	953.7	250		Mn III	957.349	170	
Fe III	950.334	650		V III	953.70	25	N	Cu IV	957.461	440	
Mn III	950.335	115		S X	953.8		P	Mn III	957.488	20	
Cu IV	950.381	40		Si V	953.84	3		S X	957.5		P
Mn III	950.435	130		Se II	953.88	150		Cu IV	957.513	40	
Co IV	950.60		F, P	Ni II	953.937	2		Ge VI	957.543	360	
Co IV	950.64		F, P	Cr III	953.94	100	N	Si V	957.649	80	
P IV	950.655	1000		N I	953.9698	30		Mn III	957.748	180	
Fe III	950.722	200		Co III	953.977	2		S II	957.88	100	Q
O I	950.7327	2		Cr III	954.07	100	N	Ge VI	957.884	850	
Co XX	950.78		F, P	Ga IV	954.097	40		Mn III	957.992	45	
Cu IV	950.880	20	N	N I	954.1040	30		Cu IV	958.085	350	
O I	950.8846	10		Cu IV	954.156	300		Ge VI	958.100	650	
Co IV	950.90		F, P	Ca VII	954.270	150	N	Cu II	958.1542	40	
Kr I	951.055	21	A	Al II	954.305	125		V VI	958.156	1	
N I	951.0791	5		Cu II	954.3830	20		Cu IV	958.253	240	
Mn III	951.140	5		Se III	954.4	200		Mn III	958.387	0	
Cu IV	951.150	120		Mn III	954.475	340		Ge V	958.508	60	
Se II	951.26	100		Al V	954.49	40		Cu IV	958.513	190	
Co III	951.264	0		Fe II	954.496	0		F I	958.524	500	
N I	951.2947	3		Ge VI	954.506	240		Mn III	958.607	80	
V III	951.35	50	N	Mn III	954.619	60		Ga II	958.67	30	
Cu II	951.4079	5		Cu IV	954.619	270		He II	958.675	13	P
Al V	951.55	40		S I	954.7		A	Cu IV	958.686	20	
Mn III	951.630	3		Se III	954.7	200		Si V	958.709	60	
Cu IV	951.663	20		Si VI	954.70	5		V VI	958.716	1	
Ga IV	951.694	10		Kr III	954.775	80		He II	958.724	22	P
Ge VI	951.746	310		Fe II	954.786	0		Mn III	958.794	0	
V VI	951.753	20		F I	954.825	1000		Cu IV	958.974	240	
Mn III	951.765	130		Al II	954.847	100		Mn III	959.021	2	
F I	951.871	500		Ni II	954.911	1		Fe III	959.070	70	
Ga IV	951.936	100		Cu IV	954.955	20		Cr VI	959.093	300	
Si V	951.94	5		Si V	955.059	20		As VI	959.204	65	
P VIII	952.		F, P	Mn III	955.077	35		Fe III	959.329	70	
Ni II	952.027	1		Fe III	955.141	150		Si V	959.33	5	
Mn III	952.051	45		P VI	955.170	150		Mn III	959.468	0	
S I	952.2		A, Z	V III	955.20	5	N	N I	959.4936	5	
Ni II	952.266	8		N I	955.2647	4	ST	Cu IV	959.514	20	
Co III	952.279	2		Cu II	955.3297	5		Fe III	959.552	250	
Ga IV	952.280	30		N IV	955.335	1000		Se IV	959.6	300	
N I	952.3037	18	ST	N I	955.4376	4	ST	Cu IV	959.693	120	
O I	952.3178	2		Mn II	955.48	0		Ni IV	959.71		F, P
Ni II	952.340	1		N I	955.5292	3		O I	959.80	1	A, Z

Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes
Mn III	959.866	10		P III	963.962	60		Mn III	967.818	70	
Ni II	959.931	5		Co IV	963.97		F,P	Cu IV	967.818	60	
Ti XII	959.945	1		N I	963.9904	25	ST	Cu II	967.8729	0	
Ge VI	960.084	300		P II	964.09	10		Si III	967.946	180	
N I	960.2017			Mn III	964.208	0		Cu IV	967.954	90	
Ni II	960.261	5		P III	964.224	90		Mn III	967.971	35	
Ni II	960.269	5		V VI	964.341	1		Cr III	968.021	25	
Cu IV	960.295	20		Ni IV	964.42		F,P	P III	968.034	25	
Cu IV	960.328	20	N	Sc	964.46	1000	N	Cu II	968.0343	25	
Cu II	960.4135	20		Ge VI	964.463	140		Cu IV	968.068	730	
Cu III	960.431	3		Ge VI	964.567	300		Ni III	968.100	20	
Fe III	960.454	70		Cr III	964.615	25		P II	968.17	1	
Ga II	960.57	1		N I	964.6258	23	ST	P III	968.175	90	
Cu IV	960.588	160		Cr III	964.770	120		Ca V	968.236	150	N
Mn III	960.611	10		Cu III	964.789	5	N	Al V	968.25	40	
Mn III	960.885	80		Cu IV	964.799	750		P III	968.262	40	
Cl VI	961.0			Ge VI	964.813	50		Cu IV	968.358	60	N
P II	961.04	1		Si V	964.861	10		S II	968.37	50	
Sc III	961.052	2		P II	964.95	10		Cu IV	968.403	20	Q
Ni IV	961.09		F,P	Cr III	964.956	90		V III	968.41	0	
Ni IV	961.11		F,P	Kr II	964.971	1000		Co IV	968.43		F,P
Cu IV	961.149	40		S I	965.0		A,Z	Cu IV	968.456	100	N
Mn III	961.209	0		Cu IV	965.025	370		Co IV	968.48		F,P
Sc	961.32	600	N	N I	965.0415	23	ST	K VI	968.518	250	N
Ni IV	961.36		F,P	Ge VI	965.203	140		Br XXVIII	968.6		F,P
Ti V	961.376	0		Ga IV	965.238	180		Si VI	968.655	60	
As II	961.443	0		Cu IV	965.270	100		Cr V	968.703	220	
Cl II	961.4997	440		Ni VI	965.287	20		Ge VI	968.723	530	
Fe XXV	961.5		P	Cr III	965.295	4		Ni II	968.784	20	
Ni II	961.516	1		Mn III	965.319	60		Ti XVI	968.8		F,P
Al V	961.54	2		P II	965.43	20		Mn III	968.852	90	
Si V	961.633	30		Sc III	965.4484	4		Fe III	968.955	250	
As VI	961.670	63		As VI	965.451	24		Mn III	968.961	0	
Mn III	961.680	80		Ni II	965.470	20		Cu IV	968.981	290	
Fe III	961.709	150		Ge II	965.48	3	Z	Ge VI	969.003	340	
Si VI	961.766	40		Ge V	965.499	50		Mn III	969.132	60	
Se II	961.77	50		Ga IV	965.572	55		Al V	969.26	30	
Fe III	961.901	450		Fe III	965.717	70		Cr III	969.272	200	
S	962.	10	N	Ge VI	965.914	460		Ga II	969.29	30	
V V	962.031	150		Cu IV	965.963	20		P II	969.38	5	
Fe III	962.108	70		Ca III	966.186	20		Fe III	969.423	150	
P II	962.13	5		Cu II	966.2287	3		Mn III	969.478	10	
O III	962.47		N	Cu IV	966.230	340		Cu IV	969.493	20	
Ni II	962.526	1		Cr III	966.238	200		S I	969.5		A,Z
Ge II	962.537	5	Z	Co IV	966.25		F,P	Ge VI	969.568	140	
P II	962.57	5		Mn III	966.264	40		Ca VI	969.652	300	N
F III	962.580	6		Sc III	966.293	3		Mn III	969.661	120	
Mn III	962.622	150		Co IV	966.30		F,P	Cr III	969.703	120	
Fe III	962.655	300		Cu IV	966.327	30		V III	969.77	0	
Mn III	962.71	0		Mn III	966.361	0		Cu IV	969.804	630	
Ni II	962.750	1		Cr III	966.410	25		Cl I	969.917	10	
Ca V	962.896	100	N	Ca V	966.466	300	N	Cu IV	969.931	20	N
Co IV	963.13		F,P	P II	966.52	10		Fe III	969.954	200	
Fe III	963.172	50	P	Co IV	966.56		F,P	Mn III	970.033	150	
Cu IV	963.227	70	Q	Cu IV	966.591	40		Cu IV	970.164	230	
Fe III	963.246	100	P	Si V	966.607	300		O III	970.25		N
F III	963.322	3		Cu IV	966.710	50		Fe III	970.381	150	Q
Cr III	963.352	150		Ni IV	966.74		F,P	Fe III	970.435	150	
Mn III	963.353	1		Mn III	966.801	90		Ni III	970.478	50	
Cu IV	963.371	290		Ni IV	966.86		F,P	Cu IV	970.552	420	
Kr I	963.374	19	A	Mn III	966.882	35		Sc III	970.638	4	
Co IV	963.40		F,P	Ni IV	966.97		F,P	Ni VI	970.672	20	
K	963.538	20	N	Mn III	967.087	25		Mn III	970.692	30	
P II	963.59	1		Si V	967.193	250		P IV	970.694	4	
Ni IV	963.60		F,P	Fe III	967.197	400		Cu IV	970.715	20	
Ga IV	963.603	20		Ga IV	967.218	10		Si V	970.720		
Si V	963.666	40		Ge VI	967.300	380		Sc III	970.740		
Cr III	963.683	25		Si V	967.338	100		Ni III	970.790	20	
Ni IV	963.77		F,P	Na VI	967.480	20	N	Cr III	970.840	90	
As III	963.80	400		Cu IV	967.509	50	N	Ca VII	970.887	100	N
P II	963.81	5		Cr III	967.555	250		Ge VI	970.976	140	
Cu IV	963.826	290		Cu IV	967.699	30		Mn III	970.986	60	
Ni II	963.855	15	N	P IV	967.741	10		Cu IV	971.038	20	N
Fe III	963.880	200		O III	967.80		N	As IV	971.1	500	
Mn III	963.892	90		V III	967.81	0		P III	971.137	10	



Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes
P III	971.236	60		Se II	974.94	100		Cu II	979.4209	5	
O II	971.26		N	Sc III	974.965	6		V V	979.547	10	
Ge V	971.351	300		N II	975.012		P	Ni III	979.589	400	
Ge VI	971.384			O I	975.04		P	Cr V	979.590	1	
Ni II	971.415	50		Sc	975.04	200	N,Z	Ga V	979.60	15	
Mn III	971.454	150		Ca VI	975.055	150	N	Mn III	979.630	130	
Mn III	971.587	90		Mn II	975.19	8		Cu IV	979.677	20	N
Zn II	971.699	2	N	Ni IV	975.20		F,P	Fe III	979.704	150	
V VI	971.700	1		Mn III	975.284	0		Ni VI	979.761	50	
O I	971.7381	15		Zn	975.438	10	N	N III	979.842	400	
Cr III	971.758	60		O I	975.574		P	S III	979.85	224	N
Mn III	971.903	60		Cu IV	975.646	20		Ge VI	979.903	170	
Fe III	971.929	200		Mn III	975.664	150		N III	979.919	450	
He II	972.088	18	P	Si V	975.8			Cr V	979.934	1	
He II	972.138	32	P	Si V	975.825	250		Cl I	979.963	1	
O I	972.143		P	Ca V	975.825	200	N	Mn III	979.963	170	
Cu IV	972.187	20		Ge VI	975.993	240		Cu IV	979.965	210	
Ti V	972.188	0	Q	Mn III	975.994	150		Mn III	980.248	115	
Si III	972.21	182	N	Al V	976.05	2		Ni II	980.290	3	N
P II	972.24	5		F I	976.217	100		Si V	980.310	200	
Cu II	972.2674	2		Mn III	976.360	130		Fe III	980.416	70	
D I	972.272	140		O I	976.4481	10		Cl I	980.5061	3	
Ni IV	972.30		F,P	Cl I	976.452	1		As IV	980.6	500	
F I	972.401	20		Ga IV	976.488	70		Zn	980.623	10	N
P III	972.439	40		F I	976.505	40		Mn III	980.669	60	
Cu IV	972.499	20		Mn III	976.529	80		Cu IV	980.688	70	
H I	972.537	130		Cu II	976.5532	10		Ge VI	980.697	120	
P III	972.545	25		Cu II	976.7176	10		O I	980.792		P
Mn II	972.55	10		Si V	976.73	5		Cu IV	980.836	20	N
P II	972.807	30		V VI	976.767	5		P III	980.892	4	
P III	972.821	60		Mn II	976.96	7		Cl I	980.9191	4	
Ni IV	972.85		F,P	C III	977.020	1000		Si V	980.955	70	
Co IV	973.01		F,P	P III	977.121	4		Ga V	980.98	10	
Cu IV	973.064	20		P II	977.258	1		P VI	980.99	200	
Ni II	973.121	1		Ni II	977.276	10	N	O VI	981.		ZZ
Cu IV	973.140	20	N	Cu IV	977.284	20		Fe III	981.084	70	
Ga IV	973.167	90		P III	977.355	1		Mn III	981.268	70	
Cl IV	973.21	500		Zn	977.536	12	N	Fe III	981.373	650	
Be II	973.213	150		Cl IV	977.56	600		Be II	981.4		ZZ
O I	973.2342	9		Cu IV	977.567	20	N	Mn III	981.462	0	
Be II	973.276	350		Cu II	977.5674	25		Ni VI	981.539	20	
Sc III	973.295	8		F I	977.745	100		Ti V	981.585	0	P
Ge VI	973.353	600		Cu IV	977.779	20	N	Mn III	981.598	45	
Ti V	973.357	0		Fe III	977.790	150		Mn III	981.750	70	
Cr III	973.374	10		Ge V	977.798	20		Ni II	981.768	50	
Mn III	973.386	0		Mn III	977.801	130		Ga IV	981.822	130	
Ca V	973.437	315	N	Cr III	977.809	90		Cl I	981.879	2	
Cu II	973.4995	2		P III	977.886	120		S III	982.00	252	N
Fe III	973.505	250		Cl IV	977.90	400		Cu IV	982.089	100	
Si VI	973.57	5		O I	977.9594	6		K VI	982.115	100	N
O I	973.640		P	Mn III	977.964	150		Ga IV	982.187	10	
Ni III	973.786	300		Cr V	978.064	1		Zn	982.253	10	N
P V	973.793	50		Ni II	978.108	25	N	Cl I	982.285	2	
O I	973.8852	3		Mn II	978.11	5		Cu IV	982.317	540	
F I	973.895	350		V V	978.166	100		P III	982.452	1	
Na VI	974.034	10	N	Si VI	978.167	70		Cu IV	982.688	30	
O I	974.070		P	Cu IV	978.266	150		Cr V	982.736	70	
Se III	974.1	150		Cl I	978.2844	13		Mn II	982.90	25	
O I	974.292		P	Ga V	978.34	10		Ni II	983.004	3	
Cu IV	974.312	150	N	Cu IV	978.437	20		Cu IV	983.149	320	
P II	974.36	5		P III	978.442	1		Cu IV	983.236	120	
Cu IV	974.433	30		As VI	978.488	8		Mn II	983.24	20	
Cu IV	974.483	40		Mn III	978.544	40		Co IV	983.32		F,P
N II	974.563		P	S III	978.56	212	N	Mn III	983.369	20	
As IV	974.6	450		P IV	978.614	25		Mn II	983.40	15	
Sc	974.65	300	N	O I	978.6170	2		Ni II	983.431	1	
As II	974.712	190		Mn II	978.70	0		Ca VII	983.432	200	N
Cu II	974.7589	20		Cu IV	978.919	20		Fe III	983.510	150	
P III	974.761	90		B II	978.938	10		Ni II	983.592	2	
Cu IV	974.768	20		Cr XIX	979.0		F	V VI	983.632	1	
Sc	974.81	600	N	Fe III	979.032	300		Ge VI	983.652	50	
Cu IV	974.821	20	N	Co IV	979.10		F,P	Ga IV	983.839	10	
Fe XVIII	974.86		F	Ge VI	979.258	180		Mn III	983.857	150	
Se III	974.9	300		O I	979.272		P	Fe III	983.860	400	P
Cr III	974.915	4		P III	979.312	4		Cu IV	983.908	80	Q

Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes
Fe III	983.909	250	P	K	986.763	50	N	Zn	990.443	15	N
F III	983.927	1		Ga IV	986.825	120		Cl I	990.4591	5	
Se II	983.94	350		Zn IV	986.960	2		Cl II	990.5327	160	
Cu II	983.9802	1		Ni II	986.992	2	N	Cu IV	990.543	260	
Be II	983.984	50		Ge V	987.064	10		Si VI	990.59	50	
Be II	984.048	150		Mn III	987.102	60		Ni II	990.626	100	
Ga V	984.05	5		K	987.140	20	N	Cl I	990.629	2	
Mn VI	984.111	40		Mn III	987.219	150		Ge V	990.661	300	
Mn III	984.129	450		Cu IV	987.221	20		Cu IV	990.799	20	
Zn II	984.139	10		Kr III	987.289	300		Fe III	990.800	400	
Si V	984.236	80		Ca	987.336	250	N	O I	990.8010	5	
Cu IV	984.258	20		Ni II	987.339	4	N	Ga IV	990.811	100	
Cl I	984.2864	7		Zn	987.445	10	N	Ni V	990.816	30	
Cl I	984.3230	8		Cu IV	987.494	330		Al II	990.862	125	
Cu IV	984.329	20		Kr III	987.530	60		Ni V	990.867	90	
V VI	984.419	1		Ga IV	987.537	80		As II	991.068	0	
Mn III	984.455	115		Cl I	987.599	1		F III	991.102	3	
Sc	984.49	300	N	Cr III	987.611	10		Fe III	991.232	600	
Ti V	984.530	1		As II	987.634	125		S XV	991.47	125	P
Cu II	984.5336	10		K	987.639	20	N	Mn III	991.498	190	
Cr III	984.54	10		Cu II	987.6570	10		N III	991.514	700	
Mn III	984.572	0		Ca V	987.680	150	N	Cu IV	991.550	150	N
Mn III	984.655	115		Mn III	987.698	130		N III	991.579	1000	
Cu IV	984.658	180	Q	As V	987.7	500		Cl I	991.640	2	
B II	984.673	100		Br II	987.7	300	Q	S II	991.73	142	N
Cu IV	984.737	120		Al II	987.777	150		Fe III	991.829	400	
Mn III	984.883	600		Si V	987.809	250		Ge VI	991.882	120	
Br II	984.9	500	N	Ca VII	987.867	150	N	Mn III	991.942	350	
Mn III	984.904	6		Cl I	987.885	2		Cu IV	991.967	30	
As II	984.919	200		Cl I	987.916	1		Co III	992.145	5	
Ca III	984.919	25		Mn III	987.994	0		Mn III	992.169	90	
Ge V	984.924	150		Ge V	988.132	200		Mn III	992.241	80	
Cl I	984.939	2		Fe III	988.148	150		Ne II	992.253	30	
Cr III	984.95	10		Ge VI	988.180			Ge V	992.308	150	
Cl IV	984.95	700		Ni II	988.338	10	N	Cu IV	992.324	80	
Mn III	984.982	5		V XXIII	988.357		P	V V	992.330	100	
Ti XVII	985.01		F,P	Cu IV	988.378	500		Fe III	992.337	150	
Cu XXII	985.07		F,P	Cl I	988.410	2		He II	992.338	27	P
Kr XXV	985.1		F,P	O IV	988.523	25		Ge VI	992.341		
Cr III	985.189	4		O IV	988.571	40		Ga IV	992.346	100	
Na VI	985.190	5	N	O I	988.5778			He II	992.391	48	P
Sc	985.20	800	N	O IV	988.628	40		Cu IV	992.426	50	
Cu IV	985.233	20		Mn III	988.632	115		Ni II	992.516	20	
As II	985.345	220		Cu IV	988.646	20	N	Cr III	992.572	120	
Cu IV	985.495	70		O I	988.6549	4		Cu IV	992.597	80	
Cu IV	985.611	20		Si VI	988.664	30		Cl I	992.679	1	
Cu IV	985.685	130		Zn IV	988.667	5		Si II	992.6826	200	
Cl IV	985.75	400		O IV	988.713	40		S X	992.7		P
Ga IV	985.772	40		Cu IV	988.772	70		Ca VII	992.740	50	N
Fe III	985.824	550		O I	988.7734	20		Mn III	992.868	80	
As II	985.847	220		Cl I	988.9436	5		Cl I	992.9098	8	
Ni II	985.918	10	N	Ge III	989.0	240	P	Cl I	992.9470	5	
Mn VI	985.951	15		Cu IV	989.034	200		Cu II	992.9532	25	
Mn III	985.974	2		Al II	989.052	75		Ga IV	992.975	90	
Al II	985.989	100		Co III	989.169	1	N	Ne VI	993.0		
Si IX	986.		F,P	Cu II	989.2365	8		Cl I	993.007	2	
Cr V	986.035	110		Mn III	989.414	0		Cu IV	993.042	120	Q
Cu IV	986.110	20		Fe III	989.467	250		Ge VI	993.047	35	
Cu IV	986.201	640		Cl I	989.484	2		Fe III	993.080	450	
K	986.203	50	N	Ga IV	989.639	140		Ni II	993.128	15	
Mn III	986.239	0		Al II	989.648	100		Cu IV	993.180	220	
Cr III	986.250	10		Cl I	989.6543	4		F IV	993.19	10	P
Mn III	986.322	60		Cl I	989.713	1		Mn III	993.216	150	
Mn III	986.495	70		N III	989.790	900		Cu IV	993.268	80	
Cu IV	986.513	20		Ga IV	989.845	100		F III	993.281	6	
Fe III	986.514	250		Si II	989.8730	100		Ni II	993.341	1	
Zn II	986.516	8		S I	989.9		A,Z	Cu IV	993.343	40	
Cu IV	986.564	20	N	Ca VII	989.973	150	N	B I	993.380		A,Z
P IV	986.569	1		Mn III	990.066	10		Mn III	993.388	60	
Al II	986.571	125		Si V	990.083			Si III	993.519	200	
S III	986.60	114	N	Cu IV	990.126	20		Cu IV	993.567	70	
Mn III	986.606	70		O I	990.1269	4		Cu IV	993.649	60	
Fe III	986.637	300		Cu IV	990.203	20	N	Ni V	993.676	110	
V VI	986.681	5		O I	990.2043	10		Cu IV	993.783	170	
Se II	986.71	1		Fe III	990.235	250		Mn III	993.789	150	

Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes
Ga IV	993.819	70		Ne VI	997.4			Cu IV	1000.113	70	N
As VI	993.820	39		Cl I	997.5099	4		Cl I	1000.113	2	
Ne II	993.884	60		Cl I	997.5375	4		Ar VI	1000.16	40	
Cu IV	993.978	300	Q	Ca IV	997.579	350	N	N I	1000.183	6	
K XIII	994.		F,P	Fe III	997.599	400		Fe II	1000.183	0	
Cr III	994.08	20	N	V XVII	997.6		F,P	Cl I	1000.278	2	
Cu IV	994.096	120		P V	997.617	250		Cr III	1000.291	40	
Ni VI	994.120	390		Co IV	997.70		F,P	Ca V	1000.310	300	N
Cl I	994.1414	3		Cr V	997.709	1		P V	1000.381	150	
Mn III	994.153	80		Mg XI	997.71		P	S I	1000.4		A
Fe III	994.257	200		Cu IV	997.784	540		Se III	1000.4	150	N,Z
Ca IV	994.311	300	N	Fe III	997.794	70		Cr III	1000.421	40	
Cr III	994.313	40		Ca III	997.804	50		S II	1000.48	200	
Sc	994.36	300	N	Cu IV	997.868	20		As II	1000.538	220	
Cu IV	994.409	220		Cu IV	997.944	20		Cu IV	1000.601	800	
Mn III	994.475	170		Ni II	997.974	1		Cu IV	1000.661	310	
Fe III	994.724	400		Mn III	997.995	70		Fe II	1000.665	0	
Mn III	994.752	80		P III	997.999	200		S II	1000.75	65	Q
Cu IV	994.759	300	N	Cu IV	998.082	70		Cr III	1000.813	120	
Si III	994.787	260		Cu IV	998.192	40	N	Cu IV	1000.824	310	
Sc	994.86	400	N	Co IV	998.27		F,P	Cr III	1000.882	150	
Ni II	994.867	10		Cl I	998.294	2		Zn	1000.885	12	N
Cu IV	994.870	270	N	Cu II	998.3060	8		F IV	1000.89	1	
Mn III	994.893	50		Cu IV	998.312	20	Q	Mn II	1000.96	25	
F III	994.899	6		Zn IV	998.357	8	Q	Cu II	1001.0130	8	
Ca V	994.946	150	N	Cl I	998.3723	9		Cr III	1001.028	150	
Cl I	994.9965	4		Cu IV	998.391	40		Kr I	1001.060	44	A
F IV	995.12	1		Ca	998.397	150	N	Si VI	1001.09	5	
Mn III	995.122	50		Ar VI	998.43	30		Zn IV	1001.156	2	
Ca III	995.135	10		Cl I	998.4319	9		Cr III	1001.277	120	
Fe III	995.150	400		Cu IV	998.475	70		Ar II	1001.29	1	Q
Cu IV	995.194	20	N	Zn	998.496	10	N	Li III	1001.347		P
Fe III	995.223	150		Cu IV	998.519	60	Q	Cu IV	1001.351	470	
P III	995.232	1		Ga II	998.52	30		Cu IV	1001.351	470	
Ni II	995.256	30	N	Co IV	998.63		F,P	Cu IV	1001.401	220	N
Ge VI	995.296	170		Cu IV	998.668	100	N	Li III	1001.428		P
Cu IV	995.364	280		Cu IV	998.733	190		Cl I	1001.4491	3	
Mn III	995.403	40		Mn III	998.818	700		Cu IV	1001.454	300	
Ni II	995.445	4		F IV	998.86	15		Li III	1001.457		P
Ni II	995.453	3		Co IV	998.88		F,P	Cr III	1001.531	60	
Sc	995.52	200	N	Si VI	998.884	60		Ca V	1001.544	150	N
Sc XVI	995.57		F,P	Fe II	999.003	0		Se IV	1001.7	85	
Zn IV	995.584	5	Q	K	999.027	20	N	V VI	1001.714	1	
Ge III	995.7	300	P	Cr III	999.082	150		Cu IV	1001.770	290	
P III	995.705	40		Ge II	999.1011	500		P IV	1001.811	1	
As II	995.772	190		Sc	999.12	200	N	Cu IV	1001.868	60	
Fe II	995.829	1		F IV	999.14	60		P IV	1001.875	1	
S II	996.00	200		Mn III	999.236	600		Co IV	1001.9		F,P
Sc	996.01	300	N	Si V	999.28	30		Zn	1001.932	20	
Cr III	996.084	150		As IV	999.3	450		P IV	1001.950	1	N
Ga IV	996.254	70		Cu IV	999.362	50	N	Cr V	1002.024	1	
P III	996.332	1		Cr III	999.363	150		Ar III	1002.10	150	
Cu IV	996.339	50		Cl I	999.3638	8		Cu IV	1002.107	560	
Ni VI	996.349	360		Fe III	999.376	300		Ca III	1002.143	25	
Cu IV	996.452	460		As IV	999.4	100		As II	1002.261	250	
Ge III	996.5	200	P	Zn	999.413	10	N	Mn III	1002.279	100	
Cr III	996.50	10		Co IV	999.42		F,P	F IV	1002.33	5	
Mn III	996.510	80		As II	999.465	190		Cl I	1002.3464	20	
V V	996.521	50		Cl I	999.4929	5		Cu IV	1002.370	140	
Cl I	996.5402	3		O I	999.4974	40	Z	Ti III	1002.384	3	
Co III	996.558	8	N	Cu IV	999.502	70	N	Cr IV	1002.39	30	N
Cl I	996.5591	3		Cr III	999.541	10		Cu IV	1002.394	130	
Cu IV	996.562	70	N	Ne VI	999.6			Ca VII	1002.398	250	N
F III	996.616	3		S VI	999.6		P	Ni V	1002.410	180	
F IV	996.62			Cr XVIII	999.72		F,P	Cr III	1002.469	40	
Se IV	996.7	350		Ga IV	999.725	50		Cr III	1002.518	25	
Ge II	996.83		F,P	F IV	999.79	15		Ni VI	1002.559	280	
Cu IV	996.839	120		Cu II	999.7940	5		Mn III	1002.578	0	
Se II	997.06	50		Cu IV	999.801	420		Cu IV	1002.807	90	
Fe III	997.081	450		Cr III	999.837	150		Cr III	1002.872	200	
Cl I	997.1064	4		Co IV	999.85		F,P	Cl I	1002.8952	3	
Se II	997.14	10		P VI	999.870	500		Ga II	1002.95	50	
Cu IV	997.212	40		Cu IV	1000.031	730		Cr III	1002.964	200	
Co IV	997.36		F,P	K VI	1000.056	100	N	Sc	1003.00	700	N
Si III	997.389	320		Mn III	1000.091	40		Mn II	1003.00	22	

Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes
As VI	1003.075	21		Ti III	1005.798	3		S III	1009.03	112	N
Cu IV	1003.164	630		Cu IV	1005.811	70		O II	1009.04		N
Cl I	1003.191	2		Cl I	1005.956	1		Zn	1009.049	12	N
Cr III	1003.213	10		N III	1006.015	300		V III	1009.10	100	
Ni V	1003.233	270		Ne VI	1006.1			Cu IV	1009.113	310	
Mn III	1003.239	60		S II	1006.15	270	Q	Cl I	1009.1857	4	
Cu IV	1003.270	100		P IV	1006.229	120		F IV	1009.34	10	
K	1003.293	20	N	Fe III	1006.341	150		V III	1009.36	50	
O III	1003.35		P	Zn	1006.347	10	N	Cu IV	1009.423	50	
Cr III	1003.37	90	N	Cu IV	1006.366	140		As II	1009.427	220	
As IV	1003.4	400		Cl I	1006.3957	3		Mn II	1009.45	10	
V III	1003.42	25		Co IV	1006.4		F,P	Ca III	1009.546	50	
F IV	1003.45	10		Cu IV	1006.443	140	N	Mn II	1009.56	6	
Cu IV	1003.487	100		V III	1006.46	500		Ca V	1009.638	150	N
Cu IV	1003.518	90	N	Cl I	1006.495	1		Cu IV	1009.642	430	
Zn	1003.523	12	N	Co IV	1006.5		F,P	Zn	1009.648	10	N
Kr I	1003.550	31	A	Ni VI	1006.593	420		V III	1009.73	75	
P III	1003.598	250		Ni II	1006.712	1	N	V VI	1009.758	110	
Ca VII	1003.611	100	N	Mn II	1006.72	7		Cu IV	1009.790	130	Q
Co IV	1003.7		F,P	Co IV	1006.8		F,P	Ni VI	1009.797	560	
Cu IV	1003.717	180		Mn III	1006.859	70		C II	1009.858	400	
Cu IV	1003.760	300	Q	S II	1006.95	35	Q	Cu IV	1009.910	810	
Ga IV	1003.780	20		Si VI	1006.96	5		Cu IV	1009.986	670	
Cu IV	1003.795	390		Cu II	1006.9841	1		Ni VI	1009.992	560	
Cl I	1003.8093	5		Si VII	1007.		F,P	Fe III	1010.005	250	
Mn III	1003.940	30		V III	1007.10	50		C II	1010.083	600	
Co IV	1004.0		F,P	Fe III	1007.113	200		Cu IV	1010.216	290	
V III	1004.02	50		Cu IV	1007.133	330		Fe VII	1010.260	4	
Cu II	1004.0554	30		Ti III	1007.163	25		Cu II	1010.2690	30	
Ga IV	1004.135	120		Cl I	1007.1647	8		Ni V	1010.338	540	
Ni II	1004.170	5	N	Cu IV	1007.177	80		Cu IV	1010.350	800	
Ni VI	1004.309	430		Cr III	1007.220	90		C II	1010.371	1000	
V VI	1004.361	70		Si V	1007.295	20		P IV	1010.417	25	
Ga IV	1004.370	50		Cl I	1007.3626	3		Cu II	1010.4450	10	
Ge V	1004.384	300		Ni VI	1007.513	320		Ne VI	1010.6		
Cu IV	1004.458	20		Cu IV	1007.516	20	Q	O II	1010.63		N
F IV	1004.59	5		Mn II	1007.53	15		Cu II	1010.6395	3	
Zn	1004.598	12	N	Mn II	1007.61	15		As II	1010.647	190	
Co IV	1004.6		F,P	F IV	1007.64	10		Mn III	1010.649	50	
Mn III	1004.605	0		Fe II	1007.657	2		Cu IV	1010.753	40	
Ga IV	1004.648	30		F IV	1007.74	5	N	Cr III	1010.810	1	
Cu IV	1004.654	210		F IV	1007.88	5		Cu IV	1010.888	80	Q
Ge VI	1004.667	100		O III	1007.90		Q	Cr III	1010.888	4	
Ti III	1004.670	40		Cu IV	1007.967	600		B I	1010.902		A,Z
Cl I	1004.6776	8		Fe II	1007.975	3		Zn IV	1011.003	0	
Zn IV	1004.931	2		Cu IV	1008.057	130		Fe II	1011.037	3	
V III	1004.96	10		Ti III	1008.119	7		Cu IV	1011.044	20	Q
Ca III	1005.000	10		Ge V	1008.128	50		B I	1011.058		A,Z
Mn II	1005.02	20		Cu IV	1008.218	20	N	Mn III	1011.106	60	
Ni II	1005.021	8	N	Ni II	1008.218	10	N	Se II	1011.15	50	
Cu IV	1005.048	160	Q	V III	1008.26	40		Ge III	1011.2	300	P
Fe II	1005.082	0		Ni V	1008.269	140		Cu IV	1011.232	20	
Fe III	1005.106	150		Cu IV	1008.270	50		Ga IV	1011.253	40	
Cu IV	1005.131	20	Q	Mn III	1008.276	115		Cu II	1011.4358	2	
Cu IV	1005.218	20		Cl I	1008.3859	5		Mn II	1011.51	5	
Mn III	1005.244	10		Mn III	1008.437	10		Zn IV	1011.605	7	
Ga IV	1005.275	15		Cu IV	1008.454	220	N	Cl II	1011.6472	60	
Cl III	1005.28	500		Cu IV	1008.481	170		Cu IV	1011.667	40	Q
Ge V	1005.304	50		Mn III	1008.520	60		Ni VI	1011.667	20	
Si III	1005.349	60		O III	1008.56		P	Se II	1011.84	100	
P VI	1005.35	200		Cu II	1008.5688	30		Cu IV	1011.843	540	
Si III	1005.353	5		Cu IV	1008.643	210		Cl I	1011.8492	10	
Si III	1005.357	1		Cr III	1008.647	4		S III	1011.91	180	N
Si III	1005.374	40		Ni VI	1008.665	20		Ni VI	1011.978	240	
Si III	1005.378	5		V VI	1008.709	1		Cu IV	1012.059	390	
Zn IV	1005.400	0	Q	Cu II	1008.7284	30		Fe II	1012.088	2	
Si III	1005.403	30		Mg IV	1008.763	80		P IV	1012.108	1	
Cu IV	1005.408	300		Cl III	1008.78	600		Ca III	1012.125	10	
V III	1005.41	40		Cu IV	1008.787	40		Cl I	1012.1505	6	
Ni VI	1005.497	580		Ga IV	1008.839	25		Zn IV	1012.192	5	
Mn III	1005.501	0		Cu IV	1008.847	160		Cu IV	1012.194	750	
V III	1005.64	0		Mn II	1008.85	12		Br II	1012.2	500	Q
Cu IV	1005.683	170	N	Ni VI	1008.944	780		Cu IV	1012.243	800	
Br II	1005.7	400	Q	Cu IV	1008.945	570		Ge III	1012.3	200	P
Mn II	1005.70	22		Co III	1008.997	2		Mn III	1012.324	500	

Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes
Ga II	1012.38	120		Mn III	1015.893	130		Cu IV	1018.912	540	
Fe III	1012.411	200		Cu IV	1015.984	30		Cr III	1018.962	10	
Fe II	1012.417	25		Zn	1016.017	10	N	N V	1018.973		P
Ni VI	1012.437	410		Sc	1016.04	500	N	Cu IV	1018.982	750	
S III	1012.49	300		Fe VII	1016.072	1		Cu IV	1019.028	460	
Cu IV	1012.492	70		Cu IV	1016.078	440		Ni II	1019.067	5	N
As II	1012.546	125		V VI	1016.204	220		Si V	1019.084	30	
Cu IV	1012.587	20	N	Mn III	1016.212	100		Ga II	1019.10	50	
Cu II	1012.5971	25		Cr III	1016.295	150		Cu IV	1019.122	80	
Cu III	1012.608	1	N	Cu IV	1016.319	350		V VI	1019.249	110	
Ca V	1012.613	150	N	Cl I	1016.3558	3		N V	1019.288		P
Mn III	1012.662	100		O IV	1016.39		N	Cu IV	1019.346	120	
Cu III	1012.665	2		Cr III	1016.405	200		Cl I	1019.3644	4	
Ar VI	1012.67	10		C III	1016.5	25		Ca IX	1019.371	100	Q
Cu II	1012.6833	3		Mn III	1016.518	60		Cu IV	1019.392	250	
Mn II	1012.71	4		Cu IV	1016.562	330		Cu IV	1019.410	240	
Cu IV	1012.794	660		Cu IV	1016.606	180		S II	1019.53	200	
S X	1012.8		P	Ni II	1016.622	20	N	Cr III	1019.60	10	Q
Cu IV	1012.834	390		Mn III	1016.628	70		Cu II	1019.6545	15	
Mn III	1012.844	1		Ge II	1016.6377	500		Cu IV	1019.657	150	
F IV	1012.90	5		Ge V	1016.665	300		Ga V	1019.71	90	
Se XXVII	1013.		F, P	Ni II	1016.677	8	N	Fe III	1019.789	400	
Ge III	1013.1	40	P	Sc	1016.72	400	N	Si V	1019.792	20	
Mn II	1013.35	0		S III	1016.85	253	N	Ca VII	1019.799	150	N
Cu IV	1013.390	170		Mn III	1016.897	150		Cr III	1019.914	4	
Cu II	1013.3999	1		P IV	1016.931	4	Z	Cl I	1019.9400	9	
Se II	1013.40	800		Cr III	1016.983	25		V III	1019.97	10	
Cu IV	1013.522	300		Ge II	1017.0600	300		Fe III	1020.022	150	
Ge VI	1013.527	180		Cr III	1017.064	60		Mn III	1020.049	350	
Cl I	1013.6635	30		Cr III	1017.148	500		Ca III	1020.071	300	
Ni VI	1013.680	260		Cu IV	1017.180	570		Cu IV	1020.072	620	
Ca III	1013.715	50		Cu IV	1017.216	520		Si V	1020.09	5	
Cu IV	1013.806	20		Fe III	1017.254	600		Cu II	1020.1076	15	
Mn XX	1014.		F, P	Cr III	1017.304	300		Cr III	1020.181	40	
Se II	1014.01	800		K	1017.337	50	N	Cr III	1020.273	40	
Cr III	1014.031	10		Cu IV	1017.353	760		Cu IV	1020.276	820	
S II	1014.09	50		Ga IV	1017.369	40		Mn III	1020.337	300	
Ca V	1014.162	200	N	Mn III	1017.385	115		As II	1020.379	200	
Cr III	1014.193	150		Br II	1017.4	20		Ni V	1020.382	340	
Mn III	1014.344	80		Zn	1017.431	12	N	Al V	1020.52	20	
Cu IV	1014.350	280		Si VI	1017.48	40		K	1020.566	20	N
S II	1014.42	200		Cu IV	1017.504	100		Si II	1020.6988	25	
Ga V	1014.47	90		K V	1017.51		P	Ni V	1020.707	320	
V VI	1014.565	70		Cr III	1017.564	400		Co II	1020.757	5	
Cu IV	1014.641	820		Cu IV	1017.577	20	N	Cu IV	1020.880	180	
P VI	1014.675	100		Cu IV	1017.671	670		Cu IV	1020.897	180	
Ge II	1014.71	10	F, P	Mn III	1017.674	2		Cr III	1020.929	150	
Cu IV	1014.738	150		Fe III	1017.745	550		Cu IV	1020.980	60	N
Cu IV	1014.820	200		Cu IV	1017.760	280		Ga IV	1020.985	10	
Mn III	1014.836	180		Cu IV	1017.850	40		Ar XII	1021.		F, P
Ga V	1014.85	15		Li II	1017.88	5		Cr III	1021.029	10	
Cu IV	1014.932	400		Al IV	1017.940	30		Cu IV	1021.030	160	
Cr III	1015.007	60		Cu IV	1017.994	20	N	Ni II	1021.060	5	N
Cl III	1015.02	700		Cu II	1017.9980	15		Cu IV	1021.089	310	
Cu IV	1015.029	80		Sc XIV	1018.		F, P	S III	1021.10	100	
Fe II	1015.083	1		Se IV	1018.0	30	N	Ca V	1021.139	150	N
Cu IV	1015.136	330	N	Mn III	1018.008	115		Cr III	1021.230	4	
As II	1015.375	300		Cu II	1018.0642	15		S III	1021.32	200	
V III	1015.40	5		Zn	1018.107	10	N	K V	1021.332	100	N
P II	1015.47	100		Al IV	1018.168	100		Ca VI	1021.508	200	N
Sc	1015.50	900	N	V III	1018.18	50		Ni V	1021.536	140	
S III	1015.51	200		Mn III	1018.239	300		Fe III	1021.561	250	
Cl I	1015.5139	6		Fe III	1018.286	550		Cu IV	1021.617	200	
Fe II	1015.520	2		Ca III	1018.302	100		Cr III	1021.642	150	
Cu IV	1015.548	760		Cu IV	1018.370	80		Cu IV	1021.667	500	
Br II	1015.6	1000		Cu IV	1018.453	500		Ni VI	1021.804	170	
Ga V	1015.62	20		Zn	1018.456	10	N	Cu IV	1021.817	280	
Cr III	1015.664	40		Cu IV	1018.506	100	N	Ni VI	1021.923	600	
Sc	1015.71	500	N	Cr III	1018.594	10		Mn III	1021.950	80	
Cu IV	1015.730	130	N	Ca III	1018.600	100		As II	1021.965	350	
Cu IV	1015.749	150	N	Mn III	1018.605	250		Ga V	1021.98	10	
Ni VI	1015.756	60		Cu IV	1018.643	860		Cu IV	1021.987	170	Q
S III	1015.76	100		Cu II	1018.7073	50		Ca VII	1022.010	100	N
Cr III	1015.770	90		Cu IV	1018.810	670		Cl I	1022.0478	3	
Ni VI	1015.877	20		Fe VI	1018.835	10		Al IV	1022.082	200	

Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes
Ni XIII	1022.1		F, P	He II	1025.246	42	P	Al V	1028.17	5	
Cu II	1022.1021	5		Cl I	1025.2821	7		Cl I	1028.1739	6	
Se II	1022.11	10		He II	1025.302	77	P	Ni II	1028.208	20	N
Cu IV	1022.191	780		Cu IV	1025.372	350		Cu IV	1028.253	110	N
K	1022.202	20	N	Cu IV	1025.436	800		Mn III	1028.307	0	
Cu IV	1022.267	180		D I	1025.443	320		Cu IV	1028.317	130	
Ni VI	1022.270	140		Cu IV	1025.518	60		Cu II	1028.3279	25	
Ga IV	1022.307	70		Cl I	1025.5528	22		Cr III	1028.336	250	
Al IV	1022.362	100		Mn III	1025.557	130		Ca VII	1028.366	100	N
Cl I	1022.4143	15		P IV	1025.563	570		Cu IV	1028.368	110	
Cu IV	1022.496	400		Ni II	1025.591	2	N	Cl I	1028.4075	8	
Mn III	1022.536	150		Cr III	1025.633	200		Cu IV	1028.452	650	
Cu IV	1022.562	60		Ni II	1025.641	5	N	Ca	1028.560	200	N
Cu IV	1022.835	740		Cu IV	1025.660	440		Cu IV	1028.563	140	
Sc XIV	1023.		F, P	P IV	1025.678	4		P III	1028.603	4	
Se IV	1023.0	25		H I	1025.722	300		Cl I	1028.6162	15	
K	1023.009	20	N	O I	1025.7618	25		N I	1028.68	2	P
Ga IV	1023.119	60		Cl I	1025.8444	8		Cu IV	1028.752	80	
P IV	1023.182	40		Cu IV	1025.898	60		Mn III	1028.754	650	
Cu IV	1023.217	800		Mg II	1025.9681	140		P III	1028.797	40	
F III	1023.270	3		Cu IV	1026.002	450		O I	1028.870		P
Zn	1023.423	10	N	Mg II	1026.1133	120		Cu IV	1028.926	580	
Cu IV	1023.438	160		Mn III	1026.130	150		Br II	1029.0	10	
Ge VI	1023.497	70		Cu IV	1026.191	30		V VI	1029.044	110	
Mn III	1023.502	40		Cu IV	1026.265	40	N	Cu IV	1029.058	850	
Cr III	1023.512	60		Ni V	1026.306	280	N	Cu IV	1029.202	680	
Mn II	1023.55	20		Cr III	1026.369	120		Cl I	1029.2023	3	
Ni VI	1023.645	200		Mg IV	1026.406	100		Cl I	1029.3432	7	
Mn III	1023.663	115		Zn IV	1026.414	4		As V	1029.5	500	
Cu IV	1023.691	90		P IV	1026.418	10		N I	1029.50	1	P
Si II	1023.7002	50		O I	1026.476		P	Cu IV	1029.523	20	
Mn III	1023.797	0	N	Ca III	1026.495	100		Fe III	1029.551	150	
Ga II	1023.80	120		Ni V	1026.504	220		Se II	1029.56	350	
Ca III	1023.849	100		Fe VI	1026.560	10		Ca IV	1029.566	150	N
V III	1023.87	50		Ga IV	1026.765	40		Cr III	1029.567	120	
Sc	1023.90	200	N	Fe III	1026.790	400		Mn III	1029.627	300	
Al IV	1023.93	5		Cu IV	1026.800	180		Ni VI	1029.628	560	
Ni II	1023.961	3		Cu IV	1026.855	100		Cu IV	1029.650	20	
Ni II	1023.999	15	N	P IV	1026.874	10		Cu II	1029.7508	10	
Ni XXII	1024.		F, P	Be II	1026.890	200		Cr III	1029.785	90	
Ni VI	1024.030	630		Be II	1026.959	400		Cr III	1029.835	120	
Fe III	1024.108	200		Ni VI	1026.968	130		Cr V	1029.842	70	
Cu IV	1024.136	40		Ni II	1026.981	5	N	Mn III	1029.843	0	
Mn III	1024.160	50		Kr XXIV	1027.		F, P	Cu IV	1030.011	840	
Al IV	1024.248	150		Cu IV	1027.025	390		Kr I	1030.022	12	A
Zn IV	1024.255	2		Mn III	1027.073	150		Cr III	1030.092	150	
Cu IV	1024.265	370		Al IV	1027.08	5		Cu IV	1030.161	250	
Ca IV	1024.339	250	N	Ca VII	1027.110	150	N	Cu II	1030.2633	20	
Ge VI	1024.374	70		Zn IV	1027.118	6		Ca IV	1030.273	200	N
Mn III	1024.437	45		K V	1027.174	100	N	Co III	1030.280	0	N
Cu IV	1024.446	120		Cl I	1027.1785	10		Sc	1030.32	800	N
Ni V	1024.462	50		V VI	1027.219	1		K VI	1030.345	20	N
Cu IV	1024.506	780		Br II	1027.3			N I	1030.446		P
Ge V	1024.540	50		Ca IV	1027.309	250	N	Cr III	1030.461	400	
Cu IV	1024.642	80		Cl I	1027.3386	15		Cu IV	1030.462	20	
P III	1024.656	25		Al IV	1027.343	500		Sc IV	1030.50	200	
V VI	1024.663	70		Mn III	1027.370	130		P IV	1030.517	570	
Br II	1024.7	0		Cu IV	1027.411	830		Cu IV	1030.530	80	
Mn III	1024.717	80		O I	1027.4307	15		Se IV	1030.6	30	N
Ni II	1024.720	50		Cr III	1027.456	120		Ni VI	1030.722	200	
Cu IV	1024.797	540		Mn III	1027.495	0		N I	1030.76	2	P
P III	1024.844	4		Cu IV	1027.606	790		Cr III	1030.762	40	
Fe VI	1024.898	40		Cu IV	1027.606	790		Cu IV	1030.779	20	
Al V	1024.91	50		Cu IV	1027.694	850		Fe III	1030.844	150	
Mn III	1024.950	10		Cu IV	1027.787	490		As II	1030.846	200	
Cu IV	1024.965	320		Mn III	1027.791	20		S II	1030.87	100	
Cu IV	1025.080	200		Cu II	1027.8311	50		Mn II	1030.87	10	
B IV	1025.10	20		Cu IV	1027.932	350		Cl I	1030.8845	10	
Li III	1025.127		P	Mn II	1027.99	18		Cr III	1030.890	150	
Cr III	1025.137	40		Fe X	1028.04		F, P	Fe III	1030.924	400	
P III	1025.140	4		Si V	1028.06	2		Mn III	1030.973	30	
Cu IV	1025.192	580		P IV	1028.096	500		Cu IV	1031.009	600	
Li III	1025.211		P	Cu IV	1028.137	20	Q	Cu IV	1031.054	600	
Li III	1025.241		P	O I	1028.145			Cu IV	1031.093	600	N
Cu IV	1025.243	390		O I	1028.1571	5		Mn III	1031.093	170	

Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes
Cr V	1031.105	110		Cu IV	1033.426	700		Fe III	1035.768	400	
P III	1031.107	10		Ge V	1033.428	150		Co II	1035.778	3	
Si III	1031.169	140		Cr III	1033.433	350		Cr III	1035.785	200	
Cr III	1031.239	120		Ni II	1033.443	10		Cu IV	1035.850	660	
Cu IV	1031.241	110		Co VI	1033.45		P	Mn III	1035.875	170	
P III	1031.295	1		Cr V	1033.452	110		Mn III	1035.895	700	
Ni II	1031.306	1		Ga V	1033.55	20		Cr III	1035.938	350	
S II	1031.34	100		Cu IV	1033.562	880		Li II	1036.		N
Cl I	1031.3486	20		Cu II	1033.5677	10		As II	1036.004	100	
Al IV	1031.39	100		Se II	1033.60	1000		Cu IV	1036.029	110	
Mn III	1031.404	700		Cr III	1033.606	150		Cr III	1036.035	350	
Cu IV	1031.410	640		Cu IV	1033.664	170		Mn III	1036.081	20	
Cu IV	1031.452	280		Ga II	1033.69	250		Cu IV	1036.099	160	Q
Cr III	1031.466	90		Cr III	1033.693	300		Ga IV	1036.105	70	
Ni VI	1031.470	500		N I	1033.70	0	P	N IV	1036.16	400	
Cl I	1031.5070	15		Cu IV	1033.755	350		Se II	1036.16	100	
Co II	1031.560	1		Mn III	1033.774	150		Ni VI	1036.166	360	
Cr III	1031.586	10		Cr III	1033.807	90		Ni II	1036.182	2	
N I	1031.62	2	P	Cu IV	1033.865	100		Cu IV	1036.199	880	
Cl I	1031.6704	6		K	1033.875	100	N	Be II	1036.299	550	
Ca	1031.760	200	N	F III	1033.898	1		Be II	1036.319	250	
Cu II	1031.7662	8		Si III	1033.920	160		Cr III	1036.334	250	
Cu IV	1031.769	110	N	Cr III	1033.986	150		C II	1036.3367	800	ST
Cu IV	1031.900	880		Cu IV	1034.044	720		Mn III	1036.344	130	
O VI	1031.924	850		Fe III	1034.054	150		Cu IV	1036.428	700	
Cu IV	1032.035	840		Cu IV	1034.108	260		Cu II	1036.4695	60	
Cr III	1032.053	25		Co II	1034.148	0	N	Co IV	1036.5		F,P
Cu IV	1032.113	850		Ni II	1034.155	15	N	Zn IV	1036.551	3	
Fe III	1032.123	550		Cu IV	1034.156	390		Cl I	1036.5734	5	
N I	1032.18	1	P	Cr III	1034.199	120		Ni VI	1036.656	50	
Co II	1032.185	1		Mn III	1034.212	150		Fe III	1036.659	150	
Mn III	1032.251	20		Co II	1034.229	3		Ca III	1036.766	150	
Cu IV	1032.279	280	N	Ni II	1034.249	10		Zn IV	1036.773	2	
Fe III	1032.337	150	P	Si III	1034.287	80		Cu IV	1036.806	60	N
F VI	1032.34			Cu IV	1034.318	730		Cu IV	1036.880	750	
Fe III	1032.352	100	P	Co II	1034.334	0		Br II	1037.0	350	
Cu IV	1032.368	730		N I	1034.37	2	P	C II	1037.0182	1000	ST
Ga V	1032.38	10		Ni XIV	1034.41		F,P	Si III	1037.053	140	
Cu IV	1032.388	670		Cr III	1034.428	120		Cu IV	1037.121	770	
Cr III	1032.421	60		Mn III	1034.480	750		As II	1037.169	160	
Cu IV	1032.522	200		Cu IV	1034.490	200		Co III	1037.174	0	N
Ge III	1032.6	160	P	Cu IV	1034.620	550		Cu IV	1037.292	100	Q
Ca VI	1032.612	100	N	Ca III	1034.650	250		Mn III	1037.361	130	
Cu IV	1032.637	440	N	Fe III	1034.654	150		N I	1037.382	5	
Mn III	1032.646	90		N I	1034.67	0	P	Mg IV	1037.395	100	
Mn II	1032.69	2		Mn III	1034.698	1		Co IV	1037.4		F,P
Cu IV	1032.695	820		Cu IV	1034.731	800		Fe III	1037.462	70	
Mn III	1032.737	60		Cu IV	1034.748	810		Cu IV	1037.551	200	N
Ni II	1032.749	2	N	Cr III	1034.853	150		Cl I	1037.5871	27	
K	1032.768	100	N	Cu IV	1034.882	660		O VI	1037.614	750	
Ni VI	1032.799	770		Mn III	1034.917	650		N I	1037.64	1	P
Cu IV	1032.844	850		Cu IV	1034.929	770		Mn III	1037.691	170	
Si III	1032.851	60		Si II	1034.967	0	Z	Mn III	1037.746	750	
Ca III	1032.862	200		N I	1035.00	1	P	Cu IV	1037.771	160	
Ni VI	1032.908	320		Cr III	1035.031	60		Cr III	1037.807	250	
Mn III	1032.912	100		Cr V	1035.037	5		Ar IV	1037.93	40	
Ni XV	1033.		F,P	Co IV	1035.1		F,P	Cu IV	1037.964	170	
Cu IV	1033.007	820		P III	1035.102	4		C VI	1038.056		P
P VI	1033.049			Mn III	1035.138	115		Cu IV	1038.094	550	
Mn III	1033.067	130		Cu II	1035.1628	8		Mn III	1038.107	170	
Fe III	1033.079	70		Cr III	1035.212	40		Cr III	1038.163	300	
P IV	1033.111	500		Cl I	1035.2148	30		N I	1038.28	3	P
Cu IV	1033.145	880		Cr III	1035.291	250		Cu IV	1038.286	740	
Ge VI	1033.173	100		P III	1035.294	25		C VI	1038.339		P
Fe III	1033.225	150		Cu IV	1035.337	510		Fe III	1038.355	400	
Cr III	1033.228	350		Cu IV	1035.369	390		Mn III	1038.356	130	
Cu IV	1033.232	360		Mn III	1035.392	0		Se II	1038.36	100	
Fe III	1033.298	300		Co IV	1035.5		F,P	N I	1038.366		P
Cu IV	1033.304	840		Ge V	1035.512	20		Fe II	1038.370	1	
Cr III	1033.339	90		P IV	1035.517	500		Ge V	1038.397	250	
Mn III	1033.341	50		Cr III	1035.565	250		C VI	1038.434		P
Sc	1033.38	400	N	Ca III	1035.607	50		Cu IV	1038.443	40	
P II	1033.41	100		Mn III	1035.645	80		Co IV	1038.7		F,P
Cu III	1033.419	5		Si III	1035.657	60		N I	1038.73	1	P
N I	1033.42	3	P	K V	1035.67		P	Mn III	1038.752	20	

Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes
Ga V	1038.76	30		Co II	1041.917	1		Cr III	1044.729	60	
Cu IV	1038.763	30		As XXVI	1042.		F, P	Cu II	1044.7435	80	
Cl I	1038.7779	25		Cr III	1042.036	40		Mn III	1044.790	700	
Cr III	1038.794	90		Cu IV	1042.057	30		Ni II	1044.871	2	
Ni VI	1038.830	120		Al IV	1042.169	800		Cu IV	1044.912	110	
Cu IV	1038.849	260		Cu IV	1042.259	670		P III	1044.963	4	Z
Ni II	1038.866	5		Fe VI	1042.352	5		Cr V	1045.044	220	
N I	1038.90	1	P	Cu IV	1042.374	20		Cr III	1045.06	400	
Cu IV	1038.917	210		Ni VI	1042.418	650		Ni II	1045.073	15	
V VI	1038.953	1		Cu IV	1042.466	490		P III	1045.089	1	Z
Cu IV	1038.970	550		Ni VI	1042.493	280		Cr III	1045.150	150	
Cr III	1038.976	60		Cu IV	1042.497	430		Cu IV	1045.182	110	
Ti V	1039.125	1		Ga IV	1042.523	40		F III	1045.236	3	
O I	1039.2304	20		Cr V	1042.544	40		F IV	1045.24	5	
Cu II	1039.3477	60		Cr III	1042.578	40		Mn III	1045.240	0	
Cu IV	1039.357	800		O III	1042.63		N	Cu IV	1045.249	630	
Cr III	1039.40	20	N	Cu IV	1042.640	190	Q	Cu IV	1045.291	790	
Cu IV	1039.416	500		Ni II	1042.704	2		Cr III	1045.306	1	
Cu IV	1039.511	210		Cu IV	1042.718	480		Se II	1045.31	150	
Ni VI	1039.537	410		Cu IV	1042.768	120		O IV	1045.384	15	
Cu IV	1039.552	580		Cl I	1042.7793	8		Cu IV	1045.404	20	N
Cu II	1039.5821	60		O I	1042.86		P, Z	Si IV	1045.500		
Cu IV	1039.636	240		Cr III	1042.866	60		Cu IV	1045.541	300	
Cu IV	1039.651	220		Cu III	1042.934	10		P IV	1045.550	4	
Mn VI	1039.690	18		P VI	1042.942	400		Cu IV	1045.600	300	
Cu IV	1039.745	550		Cu IV	1042.951	260	N	P V	1045.631	30	
Co IV	1039.8		F, P	Mn II	1042.98	3		V III	1045.64	5	
Cu IV	1039.826	440		Zn	1042.980	10	N	V V	1045.711	20	
Mn III	1039.850	250		Cu IV	1042.997	190		Ge V	1045.713	900	
Ge VI	1039.892	300		K XIV	1043.		F, P	Cr III	1045.719	60	
Cu IV	1039.903	680		Ni VI	1043.057	680		Cr V	1045.733	5	
Fe V	1039.96		F, P	N I	1043.080	8		S II	1045.74	65	Q
Cu IV	1039.968	400		N I	1043.166	8		Cu IV	1045.746	20	
V III	1040.04	0		Ni V	1043.230	150		Al IV	1045.766	200	
Cr III	1040.046	150		Co III	1043.243	15		Ga V	1045.80	15	
Cu IV	1040.154	390		Cu IV	1043.259	210		Ni II	1045.813	5	
Cr III	1040.173	150		Cu IV	1043.366	30		Mn II	1045.89	4	
Ga V	1040.20	5		Cr III	1043.389	40		P VI	1045.944	250	
Cu IV	1040.318	730		Mn II	1043.46	3		Mn III	1045.984	30	
Mn III	1040.323	80		Cu IV	1043.517	500		Cu IV	1046.033	350	N
Al IV	1040.340	30		Cr III	1043.529	25		Ge II	1046.05	2	Z
Cl I	1040.3475	30		Cu IV	1043.566	820		P III	1046.052	25	Z
V III	1040.37	0		Ni VI	1043.596	20		Cu IV	1046.088	160	
Cu IV	1040.381	780		Cu IV	1043.673	520		Mn III	1046.167	700	
Ni VI	1040.388	260		N I	1043.739	6		Cr V	1046.294	20	
Cr III	1040.410	150		Cu IV	1043.748	410		O IV	1046.316	25	
Co II	1040.452	1		N I	1043.845	6		P III	1046.333	40	Z
Cu IV	1040.512	880		Cu IV	1043.847	500		Cu IV	1046.350	650	
Cr III	1040.521	250		Cl I	1043.9857	7		Cr V	1046.364	40	
Mn II	1040.54	8		Cu IV	1043.987	870		Cu IV	1046.413	110	
Cu IV	1040.614	150		N I	1043.991	6		Mn III	1046.473	80	
Cu IV	1040.666	340		Cu IV	1044.061	620		Cu IV	1046.499	860	
Ni II	1040.668	1	N	Al IV	1044.064	200		Ni II	1046.537	8	
Ca III	1040.705	100		N I	1044.069		P	Cr V	1046.542	20	
C III	1040.715			N I	1044.087	8		P III	1046.739	60	Z
Cr III	1040.723	40		Cu IV	1044.150	70	Q	Co III	1046.760	3	
Cu IV	1040.8		F, P	N I	1044.171		P	Zn	1046.867	10	N
Ge III	1040.8	240	P	N I	1044.188	7		Ge II	1046.88	5	N
Cr III	1040.811	120		V III	1044.19	0		Cu IV	1046.881	330	
Cu IV	1040.856	30		Ge II	1044.24	20	Z	Cu IV	1046.911	530	N
Br II	1040.9	500	N	Cu IV	1044.266	50		Cu IV	1046.966	240	
O I	1040.9425	12		Co III	1044.281	20		Cu IV	1047.016	590	
Mn VI	1041.121	20		Mn III	1044.312	60		Cr III	1047.061	25	
Cr III	1041.135	90		Cu IV	1044.333	730		Mn III	1047.090	60	
Cl I	1041.1480	15		Ni II	1044.349	30		Cu IV	1047.142	810	
Cu IV	1041.155	340		Mg IV	1044.366	100		Cu IV	1047.215	700	
Cu IV	1041.176	460		Cu IV	1044.491	880		Si IV	1047.271		
Mn III	1041.191	180		Zn IV	1044.502	1		P III	1047.283	90	Z
Cu IV	1041.248	280		Ca III	1044.518	10		O I	1047.376		P
Cr III	1041.345	120		Cu II	1044.5188	80		Mn II	1047.40	1	
P VI	1041.404	250		V III	1044.60	0		Ni V	1047.429	550	
Cu IV	1041.669	230	Q	N I	1044.606		P	Cu IV	1047.443	660	
O I	1041.6876	4		Mn III	1044.610	50		Co III	1047.471	2	
Cl I	1041.7148	4		Ni V	1044.633	20		Cr V	1047.494	5	
Cu IV	1041.795	600		N I	1044.633	8		Ni II	1047.497	1	N



Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes
Ga V	1047.50	30		Mn III	1049.816	650		Mn III	1053.070	150	
S II	1047.56	35	Q	S I	1049.82		A, Z	N I	1053.088	11	
B I	1047.647		A, Z	P III	1049.825	90		Br II	1053.1	50	Q
Cu IV	1047.654	460		Si V	1049.915	10		Cu IV	1053.102	300	
Se II	1047.67	10		Al II	1049.923	190		N I	1053.184	8	
Cu IV	1047.695	730		Cu IV	1049.934	630		N I	1053.184	8	
B I	1047.695		A	F IV	1049.96	1		S II	1053.21	35	Q
B I	1047.825		A, Z	Mn III	1050.034	130		N I	1053.231		P
S II	1047.86	35	Q	Cu IV	1050.040	840		Co III	1053.257	10	
B I	1047.867		A, Z	Ge V	1050.053	400		N I	1053.33	5	P
Al II	1047.889	150		Mn III	1050.122	80		Cu IV	1053.415	730	
Cu IV	1047.907	380		Cu II	1050.1536	10		N I	1053.496		P
Ni VI	1047.928	220		Cu IV	1050.160	540	N	Mn XXIV	1053.63		P
Mn II	1047.95	4		S I	1050.30		A, Z	N I	1053.656	7	
Cu IV	1047.976	150	N	Cu IV	1050.328	680		Ni VI	1053.7		F, P
Cu IV	1048.085	240		Mn III	1050.354	200		Ni II	1053.729	15	N
P III	1048.120	4	Z	Cu II	1050.4028	10		Cu IV	1053.731	850	
Cu IV	1048.121	500		As VI	1050.429	4		N I	1053.744	7	
Be II	1048.147	200		Ga V	1050.48	120		N I	1053.988	12	
N V	1048.20	40		P III	1050.491	60		Al VII	1054.		F, P
Cu IV	1048.213	130	Q	Cr III	1050.494	60		Cr III	1054.000	40	
Ar I	1048.2199	1000	st	Se II	1050.57	50		Cr III	1054.093	60	
Be II	1048.220	400		N IV	1050.602		P	Ni VI	1054.105	290	
Cr V	1048.236	20		Cu IV	1050.606	860		P IV	1054.114	60	
Cu IV	1048.276	820		Ni II	1050.718	3		S I	1054.17		A, Z
P IV	1048.277	1		Cu IV	1050.731	480		Cr III	1054.313	120	
Cu IV	1048.287	820	N	Co III	1050.762	20		N I	1054.333	20	P
Cu IV	1048.354	430		Mn II	1050.78	2		N I	1054.430		P
Ni II	1048.400	6		P III	1050.810	120		Cr III	1054.451	4	
S II	1048.43	35	Q	Mn III	1050.889	650		Mn III	1054.523	115	
Cu IV	1048.439	130		Cr V	1050.901	70		Ga V	1054.56	80	
Ni VI	1048.468	590		Co III	1050.977	10		Ge V	1054.590	300	
Al IV	1048.515	700		Cu IV	1051.003	210	Q	Cu IV	1054.591	260	
Al II	1048.559	170		As II	1051.005	150		Al II	1054.603	100	
Mn III	1048.586	10		Mn III	1051.196	150		Cu IV	1054.632	140	
Cu IV	1048.630	780		Cu IV	1051.258	370		Cr III	1054.655	150	
Ni VI	1048.664	170		Cu IV	1051.357	140		Mn III	1054.684	170	
B II	1048.70	1		Cl I	1051.3787	9		Cu II	1054.6901	60	
Cu IV	1048.804	370		Cr III	1051.532	40		Ni VI	1054.7		F, P
V III	1048.83	0		Cu IV	1051.586	860		S I	1054.81		A, Z
Co III	1048.879	3	N	As V	1051.6	200		N V	1054.871		P
Cu III	1048.880	40	N	Mn III	1051.617	115		Ni VI	1054.879	270	
Mn III	1048.886	50		Cu IV	1051.713	760		Cu IV	1054.946	410	
Sc	1048.89	300	N	N I	1051.868	7		Mn III	1054.955	115	
F III	1048.898	3		Cu IV	1051.897	120		Cr V	1054.991	1	
Cu IV	1048.925	250		Cr III	1051.905	120		Ge II	1055.0261	100	
Ni II	1048.936	1		N I	1051.956	5		Ni VI	1055.037	510	
Ni II	1048.982	3		Cu IV	1052.020	170		Mn III	1055.136	90	
Sc XVI	1049.		F, P	Mn II	1052.04	5		N V	1055.238		P
Si VII	1049.		F, P	N I	1052.082	9		Ni II	1055.246	15	
Br II	1049.0	1000		Se II	1052.09	100		Ni VI	1055.260	250	
Ni II	1049.051	1		Cu II	1052.1747	20		Fe II	1055.262	5	P
S II	1049.06	35		Mn III	1052.193	100		Al II	1055.280	125	
P III	1049.083	1	Z	Ni VI	1052.2		F, P	Mn III	1055.289	80	
Cu IV	1049.093	540		N I	1052.215	9		Ni II	1055.291	30	
Mn III	1049.105	0		Cu IV	1052.284	30		Cu IV	1055.407	850	
O I	1049.115		P	Co III	1052.287	1		O V	1055.451	40	
Cu IV	1049.122	750		Co II	1052.333	2		Cr III	1055.459	25	
Ni II	1049.137	8		Cu IV	1052.354	150		Mn III	1055.523	350	
Cr III	1049.152	25		Cr III	1052.365	40		P VI	1055.542	350	
Cu IV	1049.284	420		Cu IV	1052.387	240		Mg IV	1055.752	80	
Cu II	1049.3640	20		Mn III	1052.431	30		Cr III	1055.763	25	
B V	1049.409		P	Cl I	1052.4631	4		V III	1055.79	50	
Se II	1049.51	1000		Cu IV	1052.533	780		Cu II	1055.7968	40	
Cu IV	1049.553	550		Ni II	1052.534	10		Mn III	1055.839	0	
Cu IV	1049.623	230	Q	V VI	1052.591	1		Cu IV	1055.885	780	
P IV	1049.647	200		Mn II	1052.60	5		Cr III	1055.885	400	
N V	1049.65	50		Mn III	1052.718	450		Cu IV	1055.968	780	
Se II	1049.65	1000		Cu IV	1052.833	340		Mn III	1056.028	150	
Ca III	1049.673	150		N I	1052.834	8		Cr III	1056.131	120	
B V	1049.675		P	Cr III	1052.901	25		Cu IV	1056.133	560	
Cu IV	1049.683	490		N I	1052.909	6		Ni VI	1056.2		F, P
Ni II	1049.755	100		Cu IV	1052.950	620		Cu IV	1056.245	50	
Cu II	1049.7554	50		Ni II	1052.983	2		Cr III	1056.250	40	
B V	1049.764		P	S V	1053.	10	N	Mn III	1056.271	30	

Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes
Mn III	1056.322	150		Fe II	1059.564	5	P	Fe II	1063.021	2	P
Cu IV	1056.326	110		F IV	1059.63	35		Cr III	1063.089	40	
Cu IV	1056.365	100		Al V	1059.65	5		Cu IV	1063.128	20	
Fe V	1056.39		F, P	Cu IV	1059.690	40	N	Fe II	1063.176	5	P
Cu IV	1056.448	250		F IV	1059.73	1		Mn III	1063.182	30	
Cu IV	1056.566	50	Q	Mn III	1059.749	150		Fe III	1063.188	250	
Al II	1056.661	150		Cu IV	1059.783	230		Cu IV	1063.208	30	
Cu IV	1056.663	630		O V	1059.930	7		Al V	1063.27	3	
S I	1056.67		A, Z	Mn II	1059.98	1		Cu IV	1063.273	20	N
As V	1056.7	250	N	Cr III	1060.150	400		C II	1063.285	5	
Br II	1056.7	250		Fe III	1060.258	250		Fe III	1063.309	200	
Cu IV	1056.757	470		Li III	1060.330		P	C II	1063.313	5	
V III	1056.76	5		Cu IV	1060.344	730		Cu IV	1063.343	170	
Mn III	1056.771	150		O V	1060.380	7		N II	1063.350		P
Mn II	1056.80	4		Cu IV	1060.398	110		Mn III	1063.356	150	
Ni VI	1056.820	20		Li III	1060.420		P	N II	1063.362		P
Ni II	1056.837	2	N	Fe II	1060.442	5	P	Cu IV	1063.405	100	
Mn III	1056.846	150		Li III	1060.452		P	Mn II	1063.43	1	
Cu IV	1056.869	340		Mn III	1060.562	130		Ni VI	1063.435	310	
Si II	1056.899	2	Z	Cu II	1060.6343	60		Cu IV	1063.440	100	
Cu II	1056.9546	60		Cr V	1060.651	285		Cu IV	1063.478	110	
Al VII	1057.		F, P	Fe III	1060.723	250		Al V	1063.53	10	
Ar XII	1057.		F, P	Ca III	1060.751	50		Ar VII	1063.55		
Cu IV	1057.036	690		Mn III	1060.758	170		Fe II	1063.625	1	P
Cr III	1057.041	1		Cu III	1060.815	10		Fe II	1063.633	1	P
Si II	1057.050	30	Z	Cu IV	1060.822	200	N	Cr III	1063.663	40	
Ni VI	1057.1		F, P	Cu IV	1060.887	720		P IV	1063.677	1	
Fe VI	1057.153	10		Cr III	1061.035	350		Cu IV	1063.719	290	
Cu IV	1057.230	50		Fe III	1061.127	250		Mn III	1063.745	20	
Cr III	1057.30	5		Al IV	1061.135	40		Ga V	1063.81	10	
Cu IV	1057.303	40		Cu IV	1061.159	210		Ni VI	1063.811	810	
Al V	1057.36	1		Cu IV	1061.211	130		Cl II	1063.8311	775	
Cu IV	1057.377	210		Fe III	1061.245	300		Cu IV	1063.841	750	
Se II	1057.41	800		Ni VI	1061.319	660		Fe III	1063.872	550	
V VI	1057.438	1		Cu IV	1061.327	490		Fe II	1063.972	1	P
Cu IV	1057.456	770		Mn III	1061.383	90		Cu IV	1064.036	860	
Mn III	1057.470	150		Cu IV	1061.428	540		N II	1064.142		P
Si II	1057.503	15	Z	Al IV	1061.429	500		N II	1064.153		P
Mn III	1057.520	150		Co VI	1061.58		P	N II	1064.220		P
Cu IV	1057.552	120		Cu IV	1061.605	870		Al V	1064.24	70	
Cu IV	1057.620	730		Mn II	1061.64	1		Cr III	1064.324	300	
Si II	1057.690	2	Z	Fe III	1061.708	400		Cr III	1064.422	300	
Cu IV	1057.751	880		Cu IV	1061.732	160		N II	1064.443		P
Cr III	1057.840	200		O IV	1061.780	25		Si V	1064.450	70	
Cu IV	1057.853	410		Mn III	1061.825	150		Mn III	1064.485	70	
Mn III	1057.983	170		Fe III	1061.827	250		Ni V	1064.534	100	
Al VIII	1058.		F, P	Cu IV	1061.862	80		Co III	1064.568	0	N
Cu IV	1058.023	840		O IV	1061.952	25		Ni VI	1064.595	20	
Cu IV	1058.097	360		O IV	1062.133	40		Fe III	1064.611	70	
F IV	1058.10	10		Fe II	1062.152	2	P	P IV	1064.612	120	
Ga V	1058.12	90		Cu IV	1062.158	30		Br II	1064.7	450	
O V	1058.149	15		Zn IV	1062.240	1		Cu IV	1064.798	500	
Ni V	1058.190	110		Ni II	1062.243	1	N	P II	1064.80	150	
Mn III	1058.270	120		O IV	1062.271	40		Cu IV	1064.856	110	N
Cu IV	1058.288	610		Fe III	1062.272	200		Al IV	1064.891	600	
Cr V	1058.298	110		O IV	1062.434	10		Ca III	1064.899	50	
V III	1058.48	50		Cr III	1062.475	1		Fe II	1064.921	0	P
F IV	1058.50	10		Cu IV	1062.503	360		N II	1064.947		P
Cu III	1058.542	1		Mn III	1062.505	130		N II	1064.958		P
Cu IV	1058.551	480		Mn II	1062.51	30		S I	1065.		A, Z
Cu IV	1058.600	160		Cu IV	1062.614	20		Cu IV	1065.066	180	
Cr III	1058.63	3		Mn III	1062.622	130		Cr III	1065.085	90	
Cu II	1058.7988	40		Ga V	1062.66	80		Mn III	1065.117	170	
Cu IV	1058.818	420		Cr III	1062.660	300		Cr III	1065.152	90	
Ge III	1058.9	240	P	S IV	1062.671	360		P IV	1065.237	25	
Al IV	1058.901	500		Cu IV	1062.725	100		F III	1065.268	60	
Cu IV	1058.947	300		Fe II	1062.750	2	P	Ga V	1065.37	5	
O V	1058.998	7		Cu IV	1062.788	160		Cu IV	1065.387	20	N
Cu II	1059.0960	60		O IV	1062.840	10		Cr III	1065.398	40	
Cr III	1059.116	350		Cu III	1062.854	3		Cu IV	1065.478	180	
Al V	1059.14	2		Cr V	1062.933	1		Ni VI	1065.478	780	
Cu IV	1059.149	740		Ni II	1062.965	1		V III	1065.51	10	
Al IV	1059.396	150		Fe V	1062.976	5		P IV	1065.544	90	
Cu IV	1059.449	50	N	Cu II	1063.0052	60		Mn II	1065.56	25	
Mn II	1059.53	1		Co VI	1063.01		P	Cu IV	1065.655	110	

Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes
Cu II	1065.7821	20		Cr III	1068.401	400		Cu IV	1071.110	640	
Cu IV	1065.840	850		Ge V	1068.429	300		Cu IV	1071.174	310	
Fe II	1065.843	2	P	N I	1068.477	13		Ga V	1071.19	55	
C II	1065.8913	700	ST	Si V	1068.48	40		P VI	1071.215	600	
C II	1065.9199	100	ST	N I	1068.512	8	P	Al IV	1071.241	100	
Cu IV	1066.026	80		Ga V	1068.59	35		Fe II	1071.247	2	P
C II	1066.1332	500	ST	Ni VI	1068.606	410		Mn III	1071.334	150	
Cu II	1066.1343	20		N I	1068.612	8	P	Cu IV	1071.372	400	
Fe III	1066.143	350		N I	1068.644	4	P	N I	1071.441		P
Fe III	1066.181	300		Ne II	1068.649	70		Ni VI	1071.450	670	
Cr III	1066.213	350		N I	1068.668	2	P	Co II	1071.477	1	
F III	1066.251	6		N I	1068.681	10	P	Cu IV	1071.574	20	N
Cu IV	1066.269	480		Cr III	1068.682	1		Fe II	1071.584	5	P
Mn III	1066.287	10		Cu IV	1068.772	300		P IV	1071.656	1	
Cr III	1066.356	90		Ni VI	1068.796	730		Ni VI	1071.676	310	
Cu IV	1066.385	710		Se III	1068.8	10		Al III	1071.730		
Cu IV	1066.431	170		Cu IV	1068.806	280		Cu IV	1071.740	30	
Ni II	1066.476	1	N	Br I	1068.849	3		Fe III	1071.746	300	
Zn IV	1066.520	1		Cu IV	1068.880	630		Al III	1071.757		
Fe II	1066.529	5	P	N II	1068.962		P	Cl II	1071.7667	770	
Cr III	1066.531	90		Mn III	1068.977	170		Mn III	1071.802	190	
Al IV	1066.567	500		Se XXI	1069.		F, P	S II	1071.83	50	N
Si IV	1066.629	550		Fe III	1069.019	300		Cu IV	1071.862	530	
P IV	1066.652	40		Mn II	1069.11	20		Br II	1071.9	750	Q
Ar I	1066.6599	500	st	N I	1069.110	8		O III	1072.02		N
Ga V	1066.69	80		Ge V	1069.133	400		Cu IV	1072.051	230	Q
Cu IV	1066.746	220		Cu II	1069.1954	50		Cr III	1072.114	200	
Ne II	1066.764	30		N I	1069.206	9		Fe III	1072.217	250	
Cu IV	1066.772	330		Cu IV	1069.267	620		Mn III	1072.262	130	
Cu IV	1066.784	320		N I	1069.374	7		Cu IV	1072.345	650	
Cu IV	1066.924	540		Cu IV	1069.394	190		Mn III	1072.372	120	
N I	1066.992	10		Al IV	1069.437	600		Cu IV	1072.462	100	
Cu IV	1066.993	30		Ga V	1069.45	30		Zn IV	1072.496	1	
Mn III	1067.049	150		Cr III	1069.45	20	N	Cu IV	1072.527	690	
Cu IV	1067.064	200	N	N I	1069.468	6		P III	1072.533	40	
N I	1067.092		P	Cu IV	1069.495	10		Mn III	1072.598	400	
Cu IV	1067.100	340		Ga V	1069.60	60		P III	1072.661	10	
Cr III	1067.145	120		N II	1069.626		P	Ge V	1072.664	700	
N I	1067.206		P	F III	1069.636	6		Mn III	1072.727	50	
Cu IV	1067.227	20		Se III	1069.7	10		Cu III	1072.974	4	
Cr III	1067.289	150		Cu IV	1069.734	330		Cu IV	1072.978	30	
N I	1067.308	8		V III	1069.74	50		S IV	1072.990	450	
Mn III	1067.343	0		Mn II	1069.77	10		Al V	1073.02	200	
N I	1067.386	10		Ni VI	1069.927	20		Zn IV	1073.027		
Cu IV	1067.395	300		Cu IV	1069.973	440		Mn III	1073.027	30	
N I	1067.399	1	P	Cr III	1069.979	60		Mn III	1073.108	190	
Ni VI	1067.460	20		N I	1069.990	11		F IV	1073.22	5	
N I	1067.493		P	N I	1070.012		P	Cu IV	1073.232	40	
Fe II	1067.544	5	P	Mn III	1070.033	150		Fe II	1073.321	2	P
Br I	1067.559	10		Cu IV	1070.038	130		Cr V	1073.367	20	
Cu IV	1067.580	20		N I	1070.111		P	P III	1073.383	60	
N I	1067.616	15		Fe II	1070.135	1	P	Fe II	1073.384	2	P
Mn III	1067.710	130		Ni VI	1070.238	280		Ge IV	1073.4	20	P
Mn II	1067.73	25		Fe III	1070.284	250		S IV	1073.520	70	
Cu IV	1067.734	120	N	Cu II	1070.3112	15		Cu IV	1073.625	820	
Ca III	1067.781	25		Cu IV	1070.313	510		Ni VI	1073.638	780	
Br I	1067.805	15		Cu IV	1070.401	730		Cr III	1073.727	150	
O IV	1067.810	120		Cr III	1070.55	30		Cu II	1073.7454	30	
Al V	1067.87	80		Fe III	1070.556	200		Ga V	1073.77	80	
N II	1067.877		P	Ni II	1070.590	10		Ne II	1073.781	50	
Cr III	1067.910	120		Co II	1070.594	1		Mn III	1073.789	800	
Cl II	1067.9442	550		F III	1070.623	20		Cu III	1073.822	10	
N I	1067.953		P	Cu IV	1070.679	100		Cu IV	1073.825	80	N
Cu IV	1068.100	240		Ni VI	1070.695	350		Cu IV	1073.880	280	
Ni VI	1068.132	180		Mn III	1070.812	40		Br I	1073.912	70	
Fe III	1068.190	300		N I	1070.821	1		Ni VI	1073.924	670	
N I	1068.221		P	N I	1070.834		P	Fe VII	1073.953	40	
Br I	1068.256	10		Cu IV	1070.857	60		Ni VI	1073.975	700	
Al V	1068.26	250		N I	1070.935		P	Cr III	1073.993	10	
Fe III	1068.299	200		Cu IV	1070.982	660		Ni XXII	1074.		F, P
Fe XIX	1068.3		F, P	Ge XXV	1071.0		F, P	Fe III	1074.061	70	
N I	1068.321		P	Cl II	1071.0358	950		F IV	1074.10	1	
Fe II	1068.346	5	P	S II	1071.04	51	N	Cu IV	1074.179	420	
Ni VI	1068.350	760		V IV	1071.054	20		Ni II	1074.224	1	N
N I	1068.376		P	Ga V	1071.11	45		Br I	1074.243	70	

Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes
Mn III	1074.270	100		Ge IV	1078.0	40	F, P	O IV	1081.645	10	
Ne II	1074.313	10		Ni VI	1078.035	620		Cu IV	1081.667	100	
Si VI	1074.36	50		Cu IV	1078.036	60	N	Cu III	1081.679	5	
Cu IV	1074.420	50	N	Br I	1078.124	15		Cu IV	1081.750	20	Q
Mn III	1074.460	80		Co III	1078.127	2	N	P IV	1081.835	4	
Co II	1074.488	0		Se IV	1078.2	20		Cu IV	1081.862	110	N
Ni VI	1074.535	720		Cu IV	1078.214	270		B II	1081.875	300	
Cr III	1074.546	60		Br I	1078.242	30		Fe II	1081.875	30	P
Cu IV	1074.550	800		O II	1078.29		N	Cu IV	1081.933	20	
Fe II	1074.641	0	P	Cu III	1078.350	1		Co II	1081.978	5	
Ni V	1074.646	150		Cu IV	1078.354	20	Q	V III	1081.98	0	
Ca III	1074.667	10		Ni VI	1078.509	680		B II	1082.073	300	
Cu IV	1074.722	330		Fe VI	1078.541	5		Cu IV	1082.098	20	
V III	1074.76	0		Mn III	1078.572	20		Cr III	1082.098	150	
Br I	1074.803	10		Cu IV	1078.679	60		Ni VI	1082.141	680	
Cu IV	1074.816	710		N IV	1078.708	300		Mn III	1082.195	150	
Ni VI	1074.856	350		Cu IV	1078.771	740		Cr III	1082.231	25	
Ga V	1074.89	5		Cr III	1078.794	40		Mn III	1082.300	800	
Cu IV	1074.910	720		Ga V	1078.83	90		F V	1082.313	100	
Si VI	1074.98	5		Co VI	1078.98		P	As II	1082.350	350	
Fe III	1075.024	250		Cu IV	1078.987	430		Si II	1082.400	2	N
F IV	1075.05	5		Co II	1079.006	0		Co II	1082.422	5	
Ge II	1075.0720	300		Cl II	1079.0796	700		Cr III	1082.444	25	
Ni V	1075.182	300		Co III	1079.098	2	N	Cu IV	1082.453	30	
Cl II	1075.2293	700		Ni VI	1079.144	800		Cu IV	1082.562	70	
Cu IV	1075.264	150		O II	1079.23		N	Cu III	1082.569	1	
Al V	1075.28	10		Br I	1079.320	30		Mn III	1082.588	650	
Br I	1075.345	15		Co II	1079.348	10		Cu IV	1082.608	120	
Cu IV	1075.481	460		Cu IV	1079.395	320		Sc	1082.62	200	N
Ni II	1075.551	3		Al V	1079.41	30		Mn IV	1082.64	100	
Fe II	1075.635	2	P	P IV	1079.416	1		Mn III	1082.655	170	
Cu IV	1075.636	850		Cr III	1079.423	120		Co VI	1082.67		P
Ne II	1075.688	20		Ni VI	1079.472	690		Fe III	1082.838	250	
Ni VI	1075.781	790		As IV	1079.5	350		Ti III	1082.899	1	
Ni II	1076.006	2		Ga V	1079.60	110		Mn III	1082.924	90	
Cr III	1076.147	150		Zn	1079.655	10	N	Cu IV	1082.979	80	
Cu IV	1076.208	100		V III	1079.72	5		Fe III	1083.176	150	
Co II	1076.274	5		Se III	1079.8	250		Co II	1083.178	5	
Cu IV	1076.281	170		Si VI	1079.809	30		Si III	1083.210	120	
Ni VI	1076.344	370		Cu IV	1079.821	750		Cr III	1083.230	90	
Ni VI	1076.542	780		Cl I	1079.8821	30		Cu IV	1083.241	20	
Fe III	1076.556	2	Q	Cr III	1079.97	10	N	Mn III	1083.276	1	
O III	1076.60		N	Cu IV	1080.092	690		P IV	1083.375	1	
Cr III	1076.641	25		P IV	1080.096	10		O IV	1083.382	10	
Al V	1076.73	30		Cr III	1080.211	10		Cu IV	1083.400	20	
Cu IV	1076.738	240		Cu IV	1080.217	190		Fe II	1083.420	1	P
Cr III	1076.746	120		Ni VI	1080.255	180		Ni VI	1083.487	430	
Cr III	1076.833	10		Cu IV	1080.275	20		Si V	1083.54	10	
Fe II	1076.852	1	P	Mn II	1080.29	5		Mn III	1083.551	190	
F IV	1076.86	5		Cu III	1080.380	5		Cu IV	1083.571	470	
Br I	1076.964	20		Cu IV	1080.383	50	N	O IV	1083.613	10	
Co II	1076.975	0		Mn III	1080.386	100		Cr III	1083.72	20	N
Ni XXI	1077.		F, P	Mn III	1080.445	100		Cu III	1083.732	20	N
Mn II	1077.02	3		Cu III	1080.513	2		Mn III	1083.795	300	
Cu IV	1077.105	710		Cu IV	1080.525	370		Cu IV	1083.841	20	
S III	1077.13	800		Ni VI	1080.537	820		Cr III	1083.889	10	
Ni II	1077.163	4		Ga V	1080.55	10	Q	V VI	1083.917	20	
Ti III	1077.234	0		Fe VII	1080.637	10		P VI	1083.986	80	
Br III	1077.3	50	Q	Ni VI	1080.694	810		N II	1083.990	400	
Cu IV	1077.307	800		Fe VII	1080.736	1		Se IV	1084.0	35	
Al V	1077.35	40		Cu IV	1080.832	90		Cu IV	1084.061	20	
Cr III	1077.378	10		Ni VI	1080.875	750		Si II	1084.144	3	N
Ni VI	1077.412	120		Br I	1080.882	50		O IV	1084.189	40	
Co III	1077.530	2	N	Mn III	1080.928	170		Cr III	1084.26	20	N
Cu IV	1077.533	20		O IV	1080.965	60		Ni VI	1084.296	570	
Se II	1077.54	150		Ga V	1080.99	60		As II	1084.370	190	
Cr III	1077.598	10		Ni II	1081.035	200		Cu IV	1084.430	110	
Ni VI	1077.635	70		P VI	1081.078	150		Mn III	1084.485	450	
F IV	1077.640	4		As II	1081.090	190		Co II	1084.520	5	
Cu IV	1077.661	780		Ni V	1081.097	640		N II	1084.562	150	
Cu IV	1077.801	60		Cu IV	1081.221	20	N	N II	1084.580	750	
Br I	1077.873	15		Ti III	1081.225	0		Cl I	1084.6671	40	
Cu II	1077.8759	1		Ni VI	1081.320	650		Cu IV	1084.669	180	
Mn III	1077.920	250		Ni IV	1081.6		F, P	Ni VI	1084.672	820	
V XVIII	1078.		F, P	Mn III	1081.636	0		Be IV	1084.700		P

Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes
Cu IV	1084.759	440		Mn III	1087.862	0		F IV	1091.35	10	
Br I	1084.810	10		Se IV	1087.9	30		Ni II	1091.407	4	
Be IV	1084.827		P	Fe II	1087.956	10	P	P IV	1091.442	200	
Cr III	1084.84	20	N	Se XIX	1088.		F, P	Ni VI	1091.509	200	
Be IV	1084.871		P	Mn III	1088.040	115		Fe II	1091.523	1	P
P IV	1084.874	4		Cl I	1088.062	60		V III	1091.53	5	
Cu IV	1084.898	90	N	Ga V	1088.08	30		Cr III	1091.546	25	
He II	1084.913	73	P	Mn III	1088.185	650		Fe II	1091.560	1	P
Ni VI	1084.946	590		Ni VI	1088.223	810		Cu IV	1091.649	470	
He II	1084.975	132	P	Fe III	1088.224	70		Ni VI	1091.651	20	
Ga V	1085.01	250		Cr III	1088.28	10	N	Ga V	1091.71	90	
Br I	1085.050	15		Mn III	1088.334	170		Ni VI	1091.745	70	
Mn III	1085.081	150		F V	1088.387	150		Ni VI	1091.851	350	
Cl I	1085.1709	40		Cu II	1088.3953	20		V III	1091.86	5	
Ni VI	1085.226	790		Ge III	1088.4	800	P	P IV	1091.874	25	
F III	1085.297	3		Co III	1088.486	1		C II	1091.937	100	Z
Ni IV	1085.3		F, P	Al V	1088.52	100		P VI	1091.97	30	
Cl I	1085.3035	45		P IV	1088.614	150		V V	1092.00	10	
Si V	1085.318	90		Na VI	1088.636	20	N	Mn III	1092.002	300	
Al IV	1085.331	5		Al V	1088.67	500		Co VI	1092.08		P
Cr III	1085.344	40		Zn	1088.711	10	N	Ge V	1092.089	300	
Mn III	1085.423	600		Mn III	1088.725	190		Cl I	1092.1287	40	
Ni II	1085.441	150		S IV	1088.83	10	P	Cr IV	1092.23	10	N
Ge II	1085.513	100		Mn III	1088.889	150		C II	1092.232	10	Z
N II	1085.529			Ni IV	1089.0		F, P	P IV	1092.428	10	
N II	1085.546	400		Br I	1089.039	30		C II	1092.431	10	Z
Mn II	1085.62	2		Fe III	1089.061	200		Cl I	1092.4366	45	
N II	1085.701	1000		Cr V	1089.079	5		F IV	1092.45	5	
As II	1085.729	150		Cu IV	1089.196	250		Co III	1092.581	10	
V VI	1085.742	5		Br I	1089.203	15		S I	1092.62		A, Z
Mn III	1085.772	850		Cu II	1089.2447	3		Cu IV	1092.645	320	N
Se II	1085.88	250		Cu III	1089.246	1	N	Cr III	1092.665	60	
Br I	1085.896	5		Cr III	1089.30	10		C II	1092.726	200	Z
Al V	1085.92	70		Mn III	1089.313	250		Ni IV	1092.8		F, P
Cr III	1085.96	20	N	Br I	1089.322	20		Si III	1092.915		
Cu IV	1086.003	20		Zn IV	1089.334	0		Cu IV	1092.926	50	
Mn V	1086.042	150	Q	Fe III	1089.416	250		Si III	1092.940		
Ni VI	1086.069	130		Ni V	1089.481	170		Cu IV	1092.966	100	
N IV	1086.084		P	Ge V	1089.491	800		Si III	1092.969		
Cu II	1086.1102	5		Fe III	1089.671	250		S I	1092.99		A, Z
Mn III	1086.249	190		Fe II	1089.688	5	P	Ge II	1093.01	1	N
N IV	1086.269	50		Mn III	1089.718	150		Fe II	1093.058	2	P
V IV	1086.382	5		Cr III	1089.761	60		Co III	1093.066	5	
Zn III	1086.437	0	Q	Ni VI	1089.885	830		Si III	1093.105		
Mn III	1086.457	150		Co III	1089.899	1		Si III	1093.133		
Fe II	1086.458	0	P	P XIV	1089.92		P	V III	1093.15	0	
Ni VI	1086.489	540		Cu IV	1089.937	80		Cr III	1093.17	50	
Ni II	1086.503	4		Mn II	1089.98	1		Al V	1093.22	8	
V III	1086.53	0		Ni VI	1089.992	550		Mn II	1093.22	0	
Mn III	1086.533	90		Al VIII	1090.		F, P	Si III	1093.293		
Cu IV	1086.555	60		Cu IV	1090.102	200		P IV	1093.324	120	
Ge V	1086.651	600		Mn III	1090.126	150		Fe III	1093.332	150	
Cr VI	1086.681	12		Al V	1090.14	300		Cu IV	1093.339	40	
Mn III	1086.688	400		Cl I	1090.2706	55		Ni VI	1093.380	810	
N IV	1086.691	100		Cu IV	1090.275	220		Mn III	1093.575	70	
Ni VI	1086.727	40		Cr III	1090.282	90		P III	1093.606	40	
Fe III	1086.748	300		Se II	1090.43	10		Cu IV	1093.650	90	
Mn III	1086.773	170		Ni VI	1090.445	20		Cu IV	1093.705	120	
Ni VI	1086.931	410		Cu IV	1090.475	330		Mn III	1093.844	70	
P IV	1086.944	120		Co III	1090.554	0		Ni VI	1093.853	190	
Mn III	1087.369	150		Cr III	1090.564	1		Cu IV	1093.893	220	
Ga V	1087.37	80		Br I	1090.623	85		Zn IV	1094.128		
Ni VI	1087.457	190		Ne II	1090.628	50		Cu IV	1094.168	430	
Br I	1087.468	30		Co III	1090.668	0	N	As II	1094.183	225	
P IV	1087.537	10		Co II	1090.690	3		Mn III	1094.203	10	
Co II	1087.586	5		Cl I	1090.7386	40		F III	1094.277	3	
Br I	1087.687	40		Cr IV	1090.97	30	N	S I	1094.3		A, Z
Mn III	1087.699	40		Cl I	1090.9815	45		Ga V	1094.36	100	
Cr III	1087.70	10	N	Cu IV	1091.053	210		Cr III	1094.387	150	
Co II	1087.710	3		Co II	1091.066	3		Cu II	1094.4025	30	
Ne II	1087.789	40		Ni VI	1091.097	810		Zn IV	1094.429	8	
Br I	1087.819	20		Co II	1091.167	0		Cr III	1094.557	60	
F V	1087.820	35		Mn III	1091.233	40		Ni VI	1094.560	780	
Ge V	1087.854	500		Cu II	1091.2916	5		Ti V	1094.583	30	
Fe VII	1087.861	10		Cu IV	1091.344	60		F III	1094.660	6	

Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes
Fe II	1094.678	2	P	Fe III	1097.782	2	Q	Na III	1100.49	100	N
Se V	1094.7	300		P IV	1097.790	40		Fe II	1100.517	1	P
Br I	1094.722	100		Se III	1097.8	150		Cr III	1100.585	300	
Ga V	1094.74	15		Se II	1097.82	600		Al V	1100.60	10	
Al V	1094.75	10		N I	1097.821		P	V III	1100.75	100	
Ni V	1094.767	230		Mn III	1097.893	115		Si V	1100.865	30	
Cl I	1094.7686	60		P III	1097.916	25		V III	1100.87	5	
Mn III	1094.773	750		Ni VI	1097.931	780		Cu IV	1100.978	60	
Ni VI	1095.092	380		S I	1097.96		A, Z	Ge II	1100.98	10	Z
F III	1095.095	10		N I	1097.995	8		Ni VI	1100.991	230	
Ga V	1095.10	80		Ca XV	1098.		F, P	P IV	1101.070	40	
Cl I	1095.1483	55		Cr IV	1098.06	10	N	Cu IV	1101.143	60	
Cu IV	1095.174	50		Cl I	1098.0682	40		S I	1101.2		A, Z
Cu IV	1095.242	150	N	Ge II	1098.08	2	Z	Cr III	1101.247	90	
Ni VI	1095.271	510		N I	1098.097	17		N I	1101.2910	45	
Cu IV	1095.315	20	N	Cu IV	1098.129	20		Cl I	1101.3381	50	
Fe VII	1095.343	90		P IV	1098.186	120		Al IV	1101.34	20	
Co III	1095.443	15		V V	1098.222	20		Br I	1101.347	50	
Fe III	1095.476	300		Cr III	1098.231	60		Cu IV	1101.350	160	
Br I	1095.481	100		Fe II	1098.244	4	P	V III	1101.42	25	
S I	1095.59		A, Z	Fe III	1098.247	300		Cu IV	1101.421	160	
Ni VI	1095.631	700		Fe II	1098.257	1	P	Cr III	1101.422	250	
Cu IV	1095.637	30		N I	1098.261	17		Br I	1101.456		P
Cu IV	1095.655	150	N	Cu IV	1098.364	20	Q	Br I	1101.498	210	
Cl I	1095.6619	55		Cu IV	1098.436	40		Br II	1101.5	50	
Cu III	1095.742	1		N I	1098.625	12		Fe II	1101.526	2	P
Cl I	1095.7971	60		Cr III	1098.626	40		Ni VI	1101.585	80	
Fe II	1095.802	1	P	Ge II	1098.710	200		P IV	1101.599	60	
Co II	1095.833	0		Al IV	1098.718	200		Ga V	1101.62	70	
Fe II	1095.911	1	P	Cr III	1098.740	25		Mn III	1101.711	10	
N I	1095.942	13		Mn III	1098.758	10		P IV	1101.784	40	
Cr III	1095.983	40		N I	1098.759	6		Cu II	1101.8362	1	
Mn III	1096.033	750		Cu III	1098.775	1		Cu IV	1101.893	600	
N I	1096.046		P	Co II	1098.802	0		Ni II	1101.893	2	N
N I	1096.220		P	Br I	1098.881	100		Zn IV	1101.896	2	
N I	1096.325	11		Cr III	1098.888	120		Cr III	1101.907	120	
V IV	1096.375	2		Cu IV	1098.889	20		Fe V	1101.921	1	
S II	1096.57	200		S II	1098.91	220	N	Cl I	1101.9362	40	
S I	1096.6		A, Z	N I	1098.952	9		Ni II	1101.956	5	
Fe III	1096.606	200		V III	1098.96	75		Co XXII	1102.		F, P
Fe II	1096.607	5	P	Cr III	1098.989	60		Cu IV	1102.010	800	
Mn III	1096.612	25		Cu XV	1099.		F, P	V III	1102.19	5	
Cr III	1096.644	150		N I	1099.042	8		Cu IV	1102.206	290	
Cu IV	1096.695	220		Fe III	1099.061	150		Ni VI	1102.262	470	
N I	1096.749	13		Se III	1099.1	300		Se IV	1102.3	15	
N I	1096.769		P	S I	1099.1		A	S II	1102.32	300	
Fe II	1096.782	1	P	Fe II	1099.132	2	P	Fe II	1102.384	0	P
Br I	1096.788	100		N I	1099.150	13		C I	1102.409		P
F I	1096.8		ZZ	N I	1099.263	8		Al IV	1102.417	200	
Cl I	1096.8098	45		Fe II	1099.321	0	P	N I	1102.509		P
N I	1096.874		P	Cu IV	1099.418	120		Fe II	1102.538	0	P
Ni VI	1096.875	600		Cu IV	1099.454	140		C I	1102.550		P
Fe II	1096.877	30	P	Cr III	1099.454	150		Cu IV	1102.588	160	
Cr III	1096.899	120		Al IV	1099.461	300		C I	1102.666		P
N I	1096.945		P	Ni II	1099.471	1		Fe II	1102.71	1	P
Kr XXIII	1097.		F, P	Ca III	1099.495	50		Cl I	1102.755	40	
Fe II	1097.019	1	P	Cl I	1099.5230	40		Ni VI	1102.8		F, P
Cu II	1097.0529	25		S IV	1099.53	177	N	Zn IV	1102.805	0	Q
Ni VI	1097.055	630		P IV	1099.581	90		C I	1102.81		P
Cu V	1097.104	130	N	Fe II	1099.639	0	P	Ga V	1102.83	160	
Cu III	1097.134	1	N	Cr III	1099.802	90		Cr III	1102.869	200	
Mn III	1097.158	0		Mn III	1099.858	750		Mn III	1102.893	130	
N I	1097.237	21		S I	1099.87		A, Z	C I	1102.97		P
Cr III	1097.25	100		Ni VI	1099.960	790		Cl XI	1103.		F, P
Si V	1097.308	20		Se II	1099.97	100		Cu IV	1103.010	690	
S I	1097.31		A, Z	Ga XXIV	1100.0		F, P	Ga V	1103.03	140	
Cl I	1097.3692	50		Fe II	1100.020	5	P	Cl I	1103.069	50	
Cr III	1097.438	60		Ni VI	1100.235	300		P IV	1103.129	10	
N I	1097.492		P	N I	1100.3593	50		C I	1103.185		P
Ni VI	1097.539	660		Ga V	1100.39	40		Mn III	1103.190	650	
Ti V	1097.585	1		Cu IV	1100.404	510		Ni VI	1103.249	650	
Cu IV	1097.608	350		Fe II	1100.429	1	P	Cu IV	1103.351	20	
Fe III	1097.649	70		Cu IV	1100.456	260		C I	1103.36		P
N I	1097.716		P	N I	1100.4649	15		N I	1103.362		P
S I	1097.74		A, Z	Cu IV	1100.466	240		Cr V	1103.390	40	

Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes
N I	1103.468		P	Al IV	1105.738	400		Ni VI	1108.3		F,P
Cu IV	1103.494	270		Fe II	1105.754	2	P	Ni VI	1108.3		F,P
P IV	1103.590	60		C I	1105.757		P	Cr V	1108.322	5	
C I	1103.60		P	Cr III	1105.797	90		Si III	1108.368	280	
S I	1103.60		A	Si V	1105.831	60		Cu IV	1108.415	300	
C I	1103.629		P	Br I	1105.844	50		C I	1108.441		P
Cr III	1103.630	25		Br I	1105.994	70		C I	1108.462		P
Cr III	1103.727	4		Ca XIII	1106.		F,P	S IV	1108.48	200	
Ni VI	1103.8		F,P	C I	1106.063		P	Mn III	1108.482	750	
C I	1103.828		P	C I	1106.076		P	C I	1108.484		P
Al V	1103.85			Co VI	1106.09		P	C I	1108.488		P
C I	1103.865		P	Se IV	1106.2	25		Fe II	1108.512	1	P
Ni VI	1103.9		F,P	Al V	1106.20	20		Cu IV	1108.591	110	
Br I	1103.924	60		Fe II	1106.203	2	P	V III	1108.71	5	
Cr VI	1103.926	12		Cu V	1106.235	420		Ni II	1108.729	30	N
N I	1104.008		P	C I	1106.250		P	C I	1108.794		P
P IV	1104.108	40		Cr V	1106.250	20		C I	1108.804		P
Ni VI	1104.150	140		C I	1106.263		P	Cl I	1108.8113	15	
C I	1104.157		P	Cu IV	1106.283	290		C I	1108.816		P
C I	1104.165		P	Si V	1106.338	150		P VI	1108.82	100	
Br I	1104.168	60		Fe II	1106.362	5		Si VI	1108.85	40	
Ti III	1104.233	0		Ni VI	1106.366	440		Ni VI	1108.863	710	
Fe II	1104.272	1	P	Al V	1106.41	70		Cu V	1108.874	250	N
Al IV	1104.285	70		Cu II	1106.4471	3		Ni VI	1108.909	730	
Cr V	1104.296	160		C I	1106.450		P	Cu IV	1108.933	120	N
Co IV	1104.3		F,P	Ni VI	1106.479	230		Ni II	1109.022	1	N
V VI	1104.300	5		Ga XXIV	1106.5		F,P	C I	1109.031		P
Cu IV	1104.322	160		N I	1106.547	6	Z	Mn III	1109.073	300	
C I	1104.374		P	Mn III	1106.614	35		C I	1109.233		P
Se IV	1104.4	10		Ti III	1106.661	1		F III	1109.262	3	
C I	1104.427		P	Ge II	1106.737	200		Ni VI	1109.3		F,P
Cr III	1104.444	150		C I	1106.781		P	Cu IV	1109.376	250	
N IV	1104.542		P	C I	1106.800		P	Sc	1109.40	200	N
C I	1104.543		P	Cu IV	1106.811	220		Ni VI	1109.410	880	
Cu IV	1104.554	20		Cu IV	1106.883	20		Br I	1109.422	20	
Zn III	1104.584	0	Q	Co V	1106.889	60		Cu IV	1109.478	20	
Ni II	1104.602	1		Ni VI	1106.948	540		V III	1109.49	5	
Al IV	1104.617	20		Ni VI	1107.102	330		C I	1109.565		P
C I	1104.627		P	Sc	1107.13	200	N	Cu V	1109.584	520	N
C I	1104.644		P	C I	1107.146		P	C I	1109.605		P
Cr III	1104.672	60		Cr VI	1107.225	150		C I	1109.634		P
Cu IV	1104.771	30		Cu V	1107.302	190		C I	1109.676		P
Ni VI	1104.773	430		Ni VI	1107.319	200		Fe II	1109.716	1	P
Ga V	1104.93	60		Mn III	1107.322	80		Cr V	1109.731	5	
C I	1104.942		P	C I	1107.347		P	Cu II	1109.7445	1	
C I	1104.957		P	V III	1107.36	100		Ni VI	1109.760	820	
C I	1104.966		P	Cu IV	1107.429	20		C I	1109.836		P
Fe II	1104.969	0	P	Fe II	1107.430	1	P	Ga V	1109.85	10	
Ni VI	1104.977	170		Br I	1107.442	50		C I	1109.878		P
S I	1105.		A	As II	1107.476	300		Zn IV	1109.919	35	
V XVII	1105.		F,P	Mn III	1107.510	115		Mn III	1109.962	115	
Cu V	1105.138	220		Br I	1107.512	50		Si III	1109.965	320	
C I	1105.142		P	Cl I	1107.5282	70		Fe II	1110.005	0	P
V III	1105.17	25		Al V	1107.55	20		Cu IV	1110.121	30	N
Cu II	1105.1765	5		Cu III	1107.574	1		P IV	1110.126	10	
Ni VI	1105.193	460		C I	1107.591		P	C I	1110.169		P
O I	1105.20		P,Z	C IV	1107.600	50		C I	1110.198		P
Cu V	1105.235	120		C I	1107.679		P	C I	1110.211		P
Ni VI	1105.284	490		C I	1107.703		P	Cl I	1110.2948	60	
Ni II	1105.315	1	N	Cu V	1107.726	480		Co VI	1110.30		P
Mn III	1105.325	35		Co VI	1107.74		P	V III	1110.45	25	
C I	1105.329		P	V III	1107.76	25		Ni VI	1110.503	900	N
Fe II	1105.350	0	P	Ga V	1107.76	75		Mn III	1110.508	150	
Ga V	1105.36	20	N	Sc	1107.77	200	N	V IV	1110.720	2	
Ni VI	1105.393	770		Mn III	1107.814	350		Mn III	1110.807	130	
Al IV	1105.402	50		Cu IV	1107.867	100		Ni VI	1110.842	870	
Br I	1105.460	50		C I	1107.908		P	Br I	1110.904	100	
C I	1105.472		P	Cu IV	1107.912	180		V III	1110.92	25	
C I	1105.477		P	C IV	1107.933	100		Sc	1110.96	200	N
Cu IV	1105.503	740		S IV	1108.01	107	N	C I	1111.010		P
C I	1105.532		P	Cr III	1108.098	200		Cu V	1111.056	420	N
Mn III	1105.541	30		C I	1108.109		P	S IV	1111.08	200	
Ni V	1105.561	600		Mn III	1108.164	20		Mn III	1111.105	10	
Ga V	1105.62	75		C I	1108.260		P	Fe II	1111.119	1	P
C I	1105.732		P	C I	1108.283		P	P IV	1111.167	120	

Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes
Cr IV	1111.17	10	N	Fe V	1114.054	30		C I	1117.674		P
Cu IV	1111.414	90		Cr VI	1114.114	200		Cu V	1117.693	220	
C I	1111.421		P	Ni VI	1114.236	540		C I	1117.724	50	
Al V	1111.48	100		Ni II	1114.260	2	N	V III	1117.78	5	
Cu V	1111.542	350		C I	1114.332		P	Cu V	1117.801	660	
Ni VI	1111.557	810		Cr V	1114.350	285		Ni VI	1117.812	170	
Br I	1111.579	50	N	C I	1114.380		P	Mn III	1117.843	40	
C I	1111.624		P	Co III	1114.405	1	N	C I	1117.866		P
Mn III	1111.664	115		Mn II	1114.44	8		Cr III	1117.867	60	
Br I	1111.751	40		C I	1114.457	50		As II	1117.903	200	
Cu II	1111.7577	0		Mn II	1114.50	0		S VI	1117.91	100	
F III	1111.782	3		Cu V	1114.518	330		Al V	1117.93	50	
Fe V	1111.830	40		Mn III	1114.53	1		P V	1117.978	900	
Ni VI	1111.854	790		P V	1114.550	50		F II	1118.017	10	
Cu V	1111.896	200		Cu V	1114.560	460	N	Mn III	1118.068	0	
Mn II	1111.90	10		Ni VI	1114.590	580		Fe XIX	1118.07		F
Zn IV	1111.935	2		C I	1114.628		P	C I	1118.070		P
C I	1111.957		P	P IV	1114.685	40		Fe II	1118.116	0	P
C I	1112.003		P	Be III	1114.69	10		Cr V	1118.157	220	
V III	1112.03	100		Mn III	1114.765	80		Al III	1118.173		
Fe II	1112.048	30	P	C I	1114.832		P	Br I	1118.173	90	
C I	1112.058	10		Mn III	1114.931	80		Mn III	1118.179	150	
Fe II	1112.086	35		Ni VI	1115.017	580		C I	1118.180	50	
Na X	1112.10		P	Al V	1115.04	10		Al III	1118.202		
F II	1112.110	10		Fe II	1115.044	0	P	F III	1118.320	10	
P IV	1112.121	4		Fe VI	1115.094	50		Ga V	1118.34	80	
Cu V	1112.170	280		Mn III	1115.147	90		Al III	1118.353		
Mn II	1112.19	0		C I	1115.168		P	Fe V	1118.384	30	
V IV	1112.199	5		Cu V	1115.184	160		Ni II	1118.404	20	N
Co IV	1112.2		F,P	C I	1115.225		P	C I	1118.408		P
B IV	1112.20	70		Ni V	1115.298	420		C I	1118.491		P
Cu V	1112.233	360		Cu V	1115.337	270		Cr V	1118.518	5	
C I	1112.269		P	Fe II	1115.349	0	P	Cr III	1118.541	250	
Mn III	1112.288	190		P V	1115.413	12		Ni II	1118.547	25	N
F II	1112.302	100		Br I	1115.448	30		P IV	1118.551	570	
Ni VI	1112.305	780		Mn II	1115.53	6		Cu V	1118.554	200	
Cu V	1112.348	310		Ga V	1115.55	40		Mn III	1118.674	80	
Cu IV	1112.397	430		Zn II	1115.657	8		Cu V	1118.730	250	
Cu II	1112.407	5	N	Fe II	1115.661	0	P	Ni VI	1118.783	330	
V IV	1112.436	5		V III	1115.71	50		Si V	1118.807	200	
Cr V	1112.452	220		Zn IV	1115.801	3		Al IV	1118.824	600	
C I	1112.472		P	F II	1115.946	40		F III	1118.854	3	
F III	1112.507	6		Cu V	1116.034	120		Ni II	1118.921	10	
Al V	1112.51	20		Br I	1116.105	40		Se II	1119.04	10	
Cu V	1112.552	130		Mn III	1116.149	170		Br I	1119.140	60	
Cu IV	1112.570	70		Ni VI	1116.192	840		Se III	1119.2	350	
Cr III	1112.60	10	N	Ni VI	1116.235	790		Fe II	1119.204	0	P
Fe V	1112.651	40		Li III	1116.240		P	Ga II	1119.25	50	
Br I	1112.743	20		Li III	1116.339		P	Cu IV	1119.289	20	
C I	1112.806		P	Ni VI	1116.368	510		Mn III	1119.303	300	
C I	1112.825		P	Mn II	1116.37	6		Ni II	1119.330	75	
P IV	1112.842	10		Li III	1116.374		P	Ni V	1119.345	580	
Cu V	1112.852	210		Cr V	1116.478	450		Fe II	1119.370	1	P
Cu IV	1112.907	170		Ni II	1116.557	40		Al V	1119.39	30	
Fe II	1112.937	0	P	Cu V	1116.758	150		Cr III	1119.400	25	
Cu V	1113.102	450		Na VI	1116.780	15	N	Cu IV	1119.426	250	
S III	1113.15	135	N	Ge V	1116.944	1000		Co VI	1119.62		P
Mn III	1113.18	5		Ni VI	1116.962	810		V III	1119.66	50	
Si V	1113.213			P IV	1116.985	120		F III	1119.673	6	
Cu V	1113.225	770	N	C I	1117.000		P	Br I	1119.725	90	
Si III	1113.228	360		C I	1117.132		P	Mn III	1119.779	25	
Mn II	1113.23	9		Mn III	1117.150	20		Ni VI	1119.867	700	
F III	1113.244	3		Cr III	1117.174	250		Cr III	1119.892	25	
Cr III	1113.245	250		C I	1117.205		P	Al V	1119.94	10	
Mn II	1113.39	0		C I	1117.337		P	Cu II	1119.9470	15	
F III	1113.463	20		Zn	1117.393	10	N	Sc XV	1120.		F,P
Fe II	1113.467	0	P	Cu V	1117.431	580	N	Cu IV	1120.104	160	
Cu V	1113.529	140	N	Ni VI	1117.445	20		Mn III	1120.128	40	
Cu IV	1113.654	90		Mn III	1117.499	115		Ni VI	1120.165	250	
Mn III	1113.677	20		C I	1117.542		P	Ga V	1120.29	20	
C I	1113.793		P	Cr V	1117.559	360		Cu IV	1120.316	40	N
Ga II	1113.87	10		Cu V	1117.578	100		Ni VI	1120.334	210	
Cr III	1113.921	25		Fe VII	1117.580	90		Ge II	1120.458	200	
Ti V	1113.952	50		C I	1117.581	20		Fe II	1120.559	1	P
C I	1113.996		P	S III	1117.65	110	N	Co XIV	1120.6		F,P



Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes
Cu IV	1120.754	550		Cr III	1123.587	150		Mn III	1127.093	150	
Mn III	1120.768	0		Cu IV	1123.647	140		Fe II	1127.098	5	P
Si V	1120.780	70		Ga V	1123.66	80		Ni II	1127.112	4	N
Ni VI	1120.801	780		N IV	1123.8		P	Ni VI	1127.206	750	
Ni V	1120.894	820		Cl II	1123.8445	15		Cu V	1127.295	610	
Fe VI	1120.934	20		Fe V	1123.865	20		Mn III	1127.314	650	
Cr V	1121.066	650		Sc	1123.96	200	N	Ga V	1127.34	10	
V III	1121.16	15		As II	1123.977	225		Si II	1127.442	20	Z
Ni II	1121.162	125		Zn III	1124.021	2		Cu V	1127.452	240	
Cu V	1121.202	670		Br I	1124.038	120		Ge II	1127.48	5	Z
Cu V	1121.245	640		Ca III	1124.039	100		Ni II	1127.486	5	
Cr III	1121.359	90		Mn III	1124.109	400		Cr V	1127.631	650	
Mn III	1121.413	1		Fe II	1124.123	10	P	Cr III	1127.706	250	
C I	1121.452		P	C VI	1124.164		P	Ga V	1127.75	80	
Br I	1121.473	120		Ni VI	1124.195	890		Ni VI	1127.766	80	
Cu V	1121.651	560		Cl II	1124.2757	125		V IV	1127.836	20	
C I	1121.658		P	Ni V	1124.311	820		Cu IV	1127.845	30	
Cu V	1121.719	330		Co VI	1124.32		P	Fe II	1127.860	10	P
Al V	1121.79	20		Mn III	1124.333	80		Cu V	1127.879	180	
Cu IV	1121.833	40		S II	1124.39	100		Si II	1127.907	40	Z
Br I	1121.839	80		Cr III	1124.405	40		N III	1127.931		F,P
Ni VI	1121.881	620		Cu V	1124.461	240	N	Ni VI	1127.935	880	
Fe II	1121.975	40	P	Mn III	1124.713	130		Cl XI	1128.		F,P
C I	1121.998		P	C VI	1124.747		P	P V	1128.007	700	
S V	1122.0			V III	1124.76	5		Fe II	1128.046	40	P
Ge V	1122.006	300		Fe III	1124.883	600		Fe III	1128.050	550	
C I	1122.098	20		C VI	1124.930		P	Cu V	1128.077	570	
Mn III	1122.113	0		P II	1124.945	10		C I	1128.079		P
P III	1122.118	4		Co XII	1125.		F,P	Ga V	1128.10	130	
V III	1122.13	75		S II	1125.00	100		Mn III	1128.157	150	
S IV	1122.13	166	N	Cl II	1125.0403	50		Fe II	1128.180	5	Q
Mn III	1122.186	115		Ni VI	1125.050	660		Br XXIV	1128.2		F,P
Cr V	1122.255	5		Ni V	1125.053	540		C I	1128.252	50	
C I	1122.260	50		Mn III	1125.065	0		C I	1128.287		P
Na III	1122.30	10	N	Cr III	1125.257	120		N III	1128.300		F,P
Cu IV	1122.311	40		Ni VI	1125.305	370		Zn II	1128.300	2	
Sc	1122.32	200	N	Cu V	1125.329	120		Si IV	1128.325		
C I	1122.334	100	P	Ni VI	1125.395	520		Si IV	1128.340	650	
P IV	1122.376	40		Cu V	1125.402	120		Cu V	1128.346	850	N
Mn III	1122.397	450		Ge V	1125.418	150		Ga V	1128.53	120	
S III	1122.42	200		Fe II	1125.448	30	P	Ti V	1128.546	150	
Cr III	1122.43	150		Ni VI	1125.481	220		Fe II	1128.557	1	P
C I	1122.438	20	P	Al IV	1125.613	500		Cu V	1128.573	230	
Si IV	1122.486	550		V III	1125.70	200		Cu V	1128.573	230	
Fe III	1122.526	600		Br I	1125.728	200		Mn III	1128.577	120	
Zn IV	1122.587	3		Cu V	1125.732	20		Al V	1128.62	2	
V III	1122.62	5		Cr III	1125.736	300		V III	1128.63	75	
C I	1122.644		P	Cr III	1125.902	90		C I	1128.631		P
Al V	1122.66	50		Cl II	1125.9030	140		S IV	1128.68	116	N
Ni VI	1122.689	340		Cl II	1125.959	3		C I	1128.686	20	
C I	1122.725	50		Cu IV	1125.981	20		Fe III	1128.723	450	
Fe V	1122.734	1		Al IV	1126.001	5		Cu IV	1128.747	180	
C I	1122.794	20		Cr V	1126.090	20		C I	1128.752	100	
Mn III	1122.799	40		Cu V	1126.111	20	N	Cr III	1128.757	90	
Fe II	1122.843	30	P	V III	1126.13	0		Sc	1128.79	400	N
Cr III	1122.870	90		Mn III	1126.152	150		Cu V	1128.804	760	
Al V	1122.88	200		Cu V	1126.296	20		Mn III	1128.825	120	
C I	1122.985		P	Se III	1126.3	50		Cr III	1128.878	120	
Ca XV	1123.		F,P	Cr III	1126.35	10	N	Fe II	1128.899	20	P
V III	1123.00	75		Ga V	1126.40	120		C I	1128.903	20	
Cu III	1123.01		F,P	Fe II	1126.421	20	P	Si VI	1128.99	30	
C I	1123.107	20		Cu IV	1126.501	20		Zn XXIII	1129.		F,P
Ni II	1123.113	2		S III	1126.55	50	P	Cu V	1129.017	370	
F III	1123.126	20		Fe II	1126.591	20	P	C I	1129.030	100	
Ga V	1123.18	55		Zn II	1126.611	2		Cu IV	1129.092	170	
Cu IV	1123.191	550		P IV	1126.658	40		Cu V	1129.117	410	
Cu IV	1123.226	290		Fe III	1126.728	400		C I	1129.141	200	P
Cu II	1123.2260	5		Cu IV	1126.830	100		P IV	1129.154	25	
Ti V	1123.288	4		Fe II	1126.840	20	P	C I	1129.161		
Cu V	1123.333	530	N	S III	1126.85	100		Ni VI	1129.173	840	
Cu IV	1123.357	600		N III	1126.900		F,P	Fe III	1129.190	450	
Cu III	1123.36		F,P	Ni VI	1126.917	230		C I	1129.196		
Cr III	1123.37	30		Fe II	1126.955	20	P	Ni VI	1129.325	310	
Ni VI	1123.412	660		Co XXI	1127.		F,P	C I	1129.405	20	
V III	1123.53	50		Co VI	1127.04		P	Al V	1129.43	80	

Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes
Cu V	1129.475	50		Ni VI	1132.759	850		Fe II	1135.577	1	P
Cu V	1129.582	40		Br I	1132.822	100		Be IV	1135.609		P
Al V	1129.62	60		Cl I	1132.8528	45		V III	1135.92	0	
Fe II	1129.621	5	P	Cu III	1132.874	3		Mn III	1135.934	40	
C I	1129.624	50		Mn III	1132.875	50		F II	1135.938	10	
B I	1129.701		A, Z	S I	1132.88		A, Z	Mn III	1135.992	40	
C I	1129.749	20		S	1133.	100	N	Cu V	1135.998	100	
F II	1129.758	200		Br I	1133.116	200		Ti III	1136.041	1	
Fe II	1129.765	1	P	N IV	1133.117	200		Ti V	1136.050	4	
Se II	1129.79	1		Si III	1133.18	226	N	Ga V	1136.07	130	
B I	1129.881		A, Z	Ni VI	1133.236	660		Cu V	1136.085	130	
Ni VI	1129.917	310		Ga V	1133.24	25		Ni VI	1136.127	800	
C I	1129.924	50		Br I	1133.251	80		Cl II	1136.1849	10	
Cu V	1129.938	250		Ni VI	1133.295	280		N IV	1136.241	100	
Ga V	1129.94	100		Si III	1133.35	163	N	Br I	1136.294	210	
Br I	1129.979	35		Cu V	1133.386	400	N	Ni VI	1136.298	270	
Ti XVI	1130.		F, P	Fe II	1133.405	40	P	Ni VI	1136.352	660	
Al V	1130.00	2		Ni VI	1133.442	270		Ni II	1136.360	1	N
Ni VI	1130.049	820		Sc	1133.53	200	N	P IV	1136.396	40	
C I	1130.171	20		Cu IV	1133.6		F, P	Zn IV	1136.406	40	
Cu V	1130.293	280		Mn III	1133.613	500		Cu V	1136.516	220	
Co II	1130.378	1		Fe II	1133.654	5	P	P IV	1136.528	60	
Fe III	1130.404	300		Fe II	1133.665	20	P	Cr III	1136.535	90	
Fe II	1130.443	30	P	Fe II	1133.675	15	P	V III	1136.54	0	
Ni VI	1130.477	840		Co VI	1133.71		P	Cl II	1136.5905	50	
Se II	1130.48	10		F II	1133.714	100		Zn III	1136.594	5	Q
Fe II	1130.560	0	P	Ni II	1133.730	75		S III	1136.60	95	N
Ga II	1130.81	120		Zn IV	1133.744	15		Cr III	1136.666	400	
Fe II	1130.863	0	P	Cu V	1133.855	590		Fe II	1136.780	0	P
Cu II	1130.8853	1		Cu V	1133.855	590		Cu IV	1136.799	90	
Cu II	1130.8978	1		Se II	1133.89	10		Ni VI	1136.820	680	
P II	1130.925	10		Cr III	1133.913	90		Al IV	1136.821	400	
Si VI	1130.983	100		S V	1133.93	64	N	Mn III	1136.867	80	
Mn III	1131.017	30		Cl I	1133.9341	50		Cr III	1136.91	10	N
S II	1131.05	200		Ni VI	1133.935	460	N	Ni VI	1136.922	820	
V III	1131.05	60		P III	1133.975	10		Cu IV	1136.976	20	
Ni VI	1131.064	880		Al VI	1134.		F, P	Ne V	1137.0		
Co VI	1131.09		P	Co XIII	1134.		F, P	Zn III	1137.030	3	
Br I	1131.171	80		Ca XIII	1134.		F, P	Ga IV	1137.061	60	
Fe III	1131.194	450		Se IV	1134.0	35		Cr III	1137.091	90	
V IV	1131.255	20		Ge II	1134.02	20	Z	Ni II	1137.091	100	
Ga V	1131.43	80		Cl II	1134.04	100		Mn III	1137.180	115	
Zn III	1131.434	1	Q	Cu IV	1134.089	20		Cu V	1137.180	220	N
P IV	1131.488	120		V III	1134.16	50		Zn IV	1137.243	3	
N IV	1131.488		P	N I	1134.1651	560		Fe II	1137.258	0	P
Ni VI	1131.508	730		Cu V	1134.169	180		Si V	1137.267	80	
Ni VI	1131.508	730		Fe II	1134.170	0	P	P IV	1137.281	120	
Fe II	1131.594	2	P	P III	1134.201	25		Cr III	1137.408	10	
S II	1131.65	200		Cr III	1134.256	60		Ni VI	1137.491	840	
Ne II	1131.724	90		Cu V	1134.387	390		Mn III	1137.518	0	
Zn III	1131.728	2	Q	N I	1134.4147	550		Cr V	1137.529	160	
Cl II	1131.794	6		Ni VI	1134.470	580		Cu V	1137.593	310	
Cu V	1131.799	320		P IV	1134.481	90		Ni VI	1137.598	720	
Al V	1131.84	10		Ni II	1134.533	150		Fe II	1137.681	0	P
Ne II	1131.848	100		Br I	1134.588	220		Cu V	1137.681	400	
Cu V	1131.877	610		Ga V	1134.69	10		Cu V	1137.725	400	N
Li II	1131.884	15		Cr V	1134.768	40		Cu IV	1137.763	40	Q
Cl II	1131.888	3		F IV	1134.78	35		Ni V	1137.829	180	
Cr III	1131.90	150	N	Br I	1134.888	200		Ge III	1137.9	200	P
Fe III	1131.914	200		S I	1134.98		A, Z	Cu V	1137.910	250	
Fe II	1132.001	1	P	N I	1134.9801	780		Fe II	1138.038	0	P
Ga V	1132.08	30		Ni VI	1134.989	360		S IV	1138.12	100	
Cu V	1132.094	290		Ni V	1135.020	440		Zn	1138.175	10	N
Ga V	1132.16	30		Ni VI	1135.179	820		Cr V	1138.177	20	
Ni VI	1132.190	160		N IV	1135.244	150		F III	1138.182	6	
Cl II	1132.1919	100		Ni VI	1135.299	400		Ni VI	1138.186	360	
N IV	1132.225		P	Fe II	1135.302	1	P	Ga V	1138.20	65	
Ti V	1132.237	80		Cu V	1135.307	210		Cu V	1138.207	370	
Cl II	1132.2939	40		Cl I	1135.3310	50		Co VI	1138.24		P
Cu V	1132.537	450		S I	1135.37		A, Z	V III	1138.32	15	
Ni VI	1132.550	150		Ni II	1135.412	1	N	S I	1138.35		A, Z
Co VI	1132.64		P	Be IV	1135.424		P	Se II	1138.36	1	
Zn III	1132.700	5	Q	Se XX	1135.5		F, P	C I	1138.383	20	
Al II	1132.726	35		Fe II	1135.548	0	P	Ni VI	1138.484	620	
Cr III	1132.742	150		Be IV	1135.561		P	Zn II	1138.524	8	N

Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes
O III	1138.545	100		Cr III	1141.155	10		Ni II	1143.397	50	
Ni II	1138.547	10	N	Mn III	1141.171	150		Cu IV	1143.5		F, P
C I	1138.557	30		N I	1141.19	1	P	Fe III	1143.545	70	
C I	1138.595	20		V III	1141.20	5		Ni V	1143.576	50	
Fe II	1138.632	40	P	Fe III	1141.272	200		Cu V	1143.620	230	
Cu V	1138.636	220		C I	1141.327	20		Cr III	1143.63	150	N
Si V	1138.752	80		Ge II	1141.36	10	Z	N I	1143.6458	15	
S I	1138.79		A, Z	Mn III	1141.368	45		N I	1143.6508	30	
Cr III	1138.797	90		Cu IV	1141.379	30		S I	1143.66		A, Z
Ni VI	1138.799	520		Ni VI	1141.386	280		Fe III	1143.671	200	
C II	1138.9358	200	ST, Z	Al V	1141.39	1		P II	1143.71	1	N
Fe II	1138.941	1	P	Fe VII	1141.435	250		Mn III	1143.808	45	
C I	1138.946	50		Ni VI	1141.563	550		Cu IV	1144.005	110	
Li II	1139.		P, ZZ	Br I	1141.564	25		Co VI	1144.02		P
Ni II	1139.009	3		Cu V	1141.576	160	N	Ni VI	1144.047	740	
Cr III	1139.024	10		Ni II	1141.579	2	N	Fe II	1144.052	5	
Ni VI	1139.040	500		Si III	1141.580	140		Cr III	1144.096	250	
Ni V	1139.055	530		N I	1141.60	2	P	N I	1144.16	2	P
C I	1139.093	100		C II	1141.6246	300	ST	Ni V	1144.197	690	
N I	1139.14	1	P	C II	1141.6574	30	ST	Cu V	1144.207	100	
Ni VI	1139.168	860		C I	1141.678	20		Fe II	1144.273	40	P
Ge V	1139.184	150		V III	1141.68	25		Ni VI	1144.290	890	
Cl II	1139.2145	280		Cu IV	1141.698	90		Cl I	1144.2909	60	
P IV	1139.222	10		C II	1141.7445	200	ST	Cu IV	1144.299	140	
Al V	1139.25	1		Ni V	1141.758	20		Si III	1144.306	160	
Ti V	1139.275	4		F III	1141.857	3		Cr III	1144.308	200	
C I	1139.300	20		Ni VI	1141.889	810		Cu IV	1144.378	20	
Cu IV	1139.306	30	Q	Ni II	1141.891	1	N	Mn III	1144.516	40	
C II	1139.3317	300	ST, Z	Cu IV	1141.893	180		Ni V	1144.602	450	N
Br I	1139.350	100		Se II	1141.94	800		Ni VI	1144.686	770	
As II	1139.395	500		Zn IV	1141.955	20		Mn III	1144.724	130	
Cu IV	1139.406	180		Al IV	1142.058	200		Ni VI	1144.790	60	
C I	1139.426	50		F IV	1142.07	5		Cu V	1144.842	220	
Sc IV	1139.449	160		V III	1142.08	5		Cu II	1144.8556	30	
C II	1139.4730	10	ST, Z	B I	1142.105		P, Z	Ni II	1144.874	5	N
Cu V	1139.479	150		Cu III	1142.133	3		Fe II	1144.939	110	P
F VI	1139.496	100		Ni VI	1142.171	670		Si III	1144.959	120	
C I	1139.514	20		Cr III	1142.226	25		Mn III	1144.965	70	
Sc	1139.53	200	N	B I	1142.269		A, Z	Ni VI	1144.973	130	
V III	1139.54	15		Si III	1142.282	120		Kr XX	1145.		F, P
Br I	1139.544	120		B I	1142.304		A, Z	P II	1145.01	1	
Ni II	1139.638	75		Fe II	1142.312	20	P	Ni VI	1145.048	750	
C I	1139.650	20		Ni VI	1142.313	140		Ca III	1145.062	100	
V III	1139.67	25		F III	1142.332	10		Si III	1145.122	150	
C I	1139.766	150		V III	1142.34	10		Si III	1145.149	13	
C I	1139.793		P	Fe II	1142.366	20	P	Si III	1145.16	1	
C I	1139.812	150		Cu V	1142.383	630		Si III	1145.177	80	
Ni VI	1139.825	800		Si VI	1142.43	50		Si III	1145.19	10	
Mn III	1139.842	70		Fe III	1142.464	250		Si III	1145.22	50	
V III	1139.85	75		Zn III	1142.477	1	Q	Ti V	1145.256	80	
C I	1139.865	50		Ni VI	1142.478	290		Br I	1145.268	80	
C I	1140.005	50		Mn III	1142.532	40		N I	1145.27	2	P
C I	1140.223	20		Cu II	1142.6405	20		Cu IV	1145.311	100	
Cu V	1140.224	150		N I	1142.70	2	P	Ni V	1145.318	450	
Cu V	1140.337	100	N	V V	1142.737	150		Mn IV	1145.36	120	
Ni VI	1140.347	780		Cu IV	1142.761	100		Cl I	1145.3941	30	
C I	1140.357	100		Co VI	1142.77		P	Ni VI	1145.398	150	
Mn III	1140.396	200		Zn	1142.865	10	N	Ni VI	1145.453	160	
Ni II	1140.459	75		P II	1142.88	20		Fe II	1145.515	2	P
Cr V	1140.489	160		Zn II	1142.904	2	Z	Cu V	1145.668	150	
Si III	1140.545	120		Al II	1142.953	100		Si III	1145.669		
Mn III	1140.552	150		Fe III	1142.955	300		Mn III	1145.744	0	
Ni VI	1140.571	320		Be II	1142.956	250		Cu V	1145.760	200	
C I	1140.574	20		Be II	1143.039	500		Ni VI	1145.835	620	
Cu V	1140.638	80		Mn III	1143.051	80		Br I	1145.854	60	
C I	1140.641	150		S I	1143.07		A, Z	F IV	1145.89	10	
V III	1140.66	10		Cu IV	1143.130	20		N I	1145.90	1	P
Br I	1140.732	20		V III	1143.19	15		Ga V	1145.98	20	
N I	1140.74	2	P	Fe II	1143.226	90	P	Ne V	1146.1		
Cu V	1140.848	40		Ge II	1143.25	40	Z	Zn III	1146.105	50	
Zn IV	1140.849	8		N I	1143.31	1	P	Cu V	1146.300	250	
Mn III	1140.856	0		F IV	1143.35	5		P IV	1146.331	1	
P II	1141.00	5		Ga V	1143.35	30		Mn III	1146.335	30	
Ni VI	1141.084	70		F III	1143.354	1		Cr III	1146.335	300	
Ni V	1141.140	90		V V	1143.395	10		Ni VI	1146.342	440	

Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes
Fe II	1146.364	1	P	V III	1149.94	500		P II	1152.81	50	
Cu IV	1146.410	20		P II	1149.96	70		Cu V	1152.828	160	
Zn	1146.465	15	N	Ni VI	1149.979	720		Br I	1152.833	40	
Si V	1146.583	200		S I	1149.99		A, Z	Cr III	1152.859	40	
Cu I	1146.61		A, Z	Co II	1149.996	2		Si VI	1152.862	70	
Cr V	1146.668	40		F IV	1150.07	10		Fe II	1152.875	10	P
V III	1146.75	75		Ga V	1150.09	45		Al V	1152.89	30	
Cu V	1146.775	330		Ni V	1150.096	540		Cu V	1152.940	70	N
Ni VI	1146.776	840		Zn II	1150.223	0	Q	Zn	1152.957	10	N
Si IV	1146.78	128	N	Mn III	1150.226	7		Br I	1152.989	60	
Fe II	1146.831	20	P	Ga V	1150.23	130		Na III	1153.04	40	N
Fe II	1146.952	20	P	Co VI	1150.23		P	Ni VI	1153.121	770	
Ge II	1146.972	3	Z	Cu V	1150.246	160	N	Cu V	1153.159	170	
Zn	1147.006	10	N	V III	1150.25	60		V III	1153.18	25	
Ni VI	1147.038	80		Ni VI	1150.267	850		Fe II	1153.272	20	P
Cu I	1147.25		A, Z	Fe II	1150.290	10	P	Ti V	1153.274	80	
Cu V	1147.268	280		Al V	1150.30	300		Br II	1153.3	10	
Fe II	1147.409	55	P	Br I	1150.312	80		Zn II	1153.398	5	
N I	1147.42	4	P	Fe II	1150.469	30	P	Ni II	1153.439	2	N
Ti V	1147.571	1		Zn IV	1150.481	30		N I	1153.453	2	
Fe II	1147.576	2	P	Ni V	1150.482	170	N	Cu V	1153.492	490	N
Cu V	1147.593	50		Cu V	1150.547	170		Co VI	1153.56		P
Ni II	1147.633	1		Ge III	1150.6	240	P	Cr III	1153.580	200	
Mn III	1147.641	40		Al V	1150.67	10		Cu V	1153.595	410	
Br I	1147.689	80		Fe II	1150.685	30	P	Ni VI	1153.654	240	
Sc	1147.69	300	N	Se IV	1150.7	10		Co VI	1153.72		P
Co II	1147.728	5		Zn II	1150.758	1	Q, Z	O III	1153.773	150	
Cu V	1147.751	120		S I	1150.82		A, Z	Co VI	1153.88		P
Cu II	1147.7617	8		Cu V	1150.851	350		Fe II	1153.950	1	P
Cu III	1147.815	1		Al IV	1150.870			P II	1153.99	120	
Ni VI	1147.855	100		O III	1150.882	100		Ni V	1153.994	70	
Br I	1147.943	60		Cu V	1150.929	440		Se XX	1154.0		F, P
Zn	1148.062	12	N	Se V	1151.0	200		Cr III	1154.109	200	
Fe II	1148.079	40	P	V III	1151.05	150		Co II	1154.118	0	
Sc III	1148.241	15		Ni V	1151.066	690		Cu IV	1154.176	30	
Ni VI	1148.257	330		Sc	1151.09	200	N	N I	1154.19	3	P
Fe II	1148.277	90	P	Fe II	1151.146	70	P	V III	1154.23	250	
Ca III	1148.399	100		B I	1151.207		A, Z	S I	1154.27		A, Z
Ga V	1148.42	30		Ni VI	1151.253	640		Fe II	1154.399	5	P
V III	1148.46	100		B I	1151.281		A, Z	Zn IV	1154.402	25	
Co II	1148.518	10		V III	1151.30	25		Ni II	1154.416	150	
Cu V	1148.582	540		Br I	1151.381	100		Co VI	1154.47		P
Si VI	1148.630	90		B I	1151.422		A, Z	Cr III	1154.479	25	
Cu V	1148.687	370		Cu I	1151.43		A, Z	Sc III	1154.523	20	
Fe II	1148.719	0	P	B I	1151.489		A, Z	Ni VI	1154.605	880	
Fe II	1148.733	1	P	Cu V	1151.653	150	N	Cu V	1154.620	220	N
Cu V	1148.736	400		Cu IV	1151.662	30		Mn III	1154.634	40	
N I	1148.77	4	P	Ni VI	1151.857	130		Co VI	1154.64		P
Fe II	1148.772	1	P	Cu IV	1151.953	20		Br I	1154.640	15	
Ni VI	1148.861	670		Si V	1151.963	250		Ga V	1154.69	10	
Co VI	1148.90		P	Ni V	1151.972	660		Cr XXIII	1154.73		P
Fe II	1148.956	5	P	Zn II	1152.139	4	N	Al IV	1154.730	250	
Ni VI	1149.000	570		N I	1152.15	4	P	V III	1154.77	75	
Cu V	1149.059	540		O I	1152.1512	10		Ni VI	1154.804	220	
V III	1149.08	25		V III	1152.17	150		Cu III	1154.825	5	
Fe V	1149.118	10		Ni V	1152.179	310		Co VI	1154.88		P
Ni VI	1149.153	740		Cu V	1152.201	480		Ni V	1154.888	280	
Cu IV	1149.178	130		Mn III	1152.251	35		Cu V	1154.894	380	
P IV	1149.190	4		Zn IV	1152.278	20		Al V	1154.90	10	
Ni II	1149.239	1	N	Cu V	1152.322	580		Ni VI	1154.960	810	
As II	1149.306	600		Cu I	1152.33		A, Z	Fe VII	1154.992	40	
N I	1149.39	2	P	Ni VI	1152.355	570		Si III	1154.998	120	
Cu III	1149.405	1		Ni V	1152.403	460		P II	1155.00	40	
Al IV	1149.450	200		Br I	1152.418	100		Co VI	1155.03		P
Co II	1149.464	5		Fe II	1152.428	1	P	Mn III	1155.105	40	
Ge II	1149.547	20	Z	Ni VI	1152.492	640		V III	1155.11	75	
Mn III	1149.572	550		Ti V	1152.509	0		Fe II	1155.273	2	
Fe II	1149.589	20	P	Ni V	1152.533	490		Cu V	1155.349	400	N
O III	1149.603	50		N I	1152.63	1	P	Cr III	1155.378	150	
Zn IV	1149.610	25		Ni V	1152.687	780		Zn IV	1155.384	5	
Cu III	1149.75		F, P	Ca III	1152.706	100		S III	1155.41	200	P
Ni VI	1149.828	450		Mn III	1152.716	700		V III	1155.41	5	
Ca III	1149.848	150		Co VI	1152.72		P	Ni V	1155.471	40	
Mn III	1149.888	35		Fe VI	1152.770	300		Cu V	1155.472	650	
Ni V	1149.889	310		Ni VI	1152.788	710		Zn III	1155.497	60	

Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes
Mn III	1155.544	300		Cu II	1157.8807	8		Co VI	1160.36		P
Cu V	1155.679	160		Cu V	1157.894	680		N I	1160.39	3	P
Cr III	1155.710	4		C I	1157.910	730		Al IV	1160.42	1	P
Ni VI	1155.735	180		C I	1158.019	750		Co VI	1160.43		P
C I	1155.809	50		F III	1158.073	6		Co II	1160.437	1	
Zn IV	1155.850	40		Si III	1158.102	140		N I	1160.476	1	
Ni VI	1155.857	210		Fe II	1158.115	1	P	Fe VI	1160.504	50	
Be II	1155.9		ZZ	Ni V	1158.127	420		N I	1160.713	2	
Ni V	1155.929	30		C I	1158.132	400		Cu V	1160.724	540	
Si III	1155.957	120		Al II	1158.210	100		V III	1160.77	300	
Ga V	1155.96	20		Cu V	1158.218	90		Ni II	1160.776	2	
Se II	1155.99	500		Zn III	1158.251	0	Q	S I	1160.78		A, Z
S I	1155.99		A	C I	1158.324	100		Ge III	1160.8	160	P
C I	1156.028	150		C I	1158.397	100		Ni VI	1160.823	400	
Co VI	1156.06		P	Cu V	1158.453	590		Ni II	1160.823	1	N
Ga IV	1156.187	110		C I	1158.492	20		Ga V	1160.83	15	
C I	1156.199	20		Cu I	1158.52		A, Z	Co VI	1160.90		P
S I	1156.26		A, Z	Cu V	1158.561	260		Sc	1160.91	200	N
Al IV	1156.263	150		C I	1158.674	100		N I	1160.9370	2	
Ni II	1156.319	2	N	Cu III	1158.697	1		Cu III	1160.99		F, P
Mn II	1156.34	30		C I	1158.732	100		Cu V	1160.995	450	
C I	1156.389	100		Kr III	1158.737	110		N I	1161.118	2	
Cu IV	1156.4		F, P	Zn III	1158.737	10	Q	Cu V	1161.208	50	N
Cr III	1156.42	20	N	F III	1158.781	10		Mn II	1161.29	20	
Ge II	1156.462	20	Z	Ni VI	1158.792	590		Ni II	1161.297	15	N
V III	1156.47	15		Ni II	1158.830	100		Sc II	1161.347	4	
Cu V	1156.488	80		Cu V	1158.830	120		S I	1161.35		A, Z
Ga V	1156.51	120		V III	1158.86	50		Co VI	1161.37		P
C I	1156.560	200		C I	1158.907	50		Cr III	1161.428	350	
Fe II	1156.575	2		As II	1158.908	300		Ni VI	1161.533	440	
Cu V	1156.596	190		Cu V	1158.957	570		Cu V	1161.539	480	
Ni VI	1156.632	400		C I	1158.967	200		S I	1161.57		A, Z
Mn II	1156.66	25		Ni VI	1158.996	860		Si III	1161.579	160	
Ni VI	1156.730	180		Cu XXII	1159.		F, P	Mn II	1161.61	3	
C I	1156.765	20		Cu IV	1159.0		F, P	Sc II	1161.624	1	
Si III	1156.782	80		Ni V	1159.021	790		Cu V	1161.718	360	
Mn II	1156.83	20		Mn III	1159.022	150		S I	1161.72		A, Z
Ni VI	1156.844	190		Br I	1159.030	80		Mn II	1161.76	20	
Zn III	1156.853	1	Q	Ge II	1159.066	50	Z	Sc II	1161.781	1	
Co VI	1156.90		P	P II	1159.08	80		Zn II	1161.813	1	Q, Z
As II	1156.908	10		Si V	1159.095	400		Ni VI	1161.825	500	
Se II	1156.91	600		Cr III	1159.096	25		P IV	1161.87	40	N
Mn II	1156.92	20		Co VI	1159.12		P	Ni VI	1161.872	250	
Cu V	1156.928	250		C I	1159.126	2		Al IV	1161.885	300	
Ni VI	1156.955	360		Cu V	1159.166	170		Cl VIII	1161.9		
P II	1156.96	50		Ni VI	1159.178	780		Ni II	1161.927	1	
Cu V	1157.019	270	N	N I	1159.193	4		Ni VI	1161.952	880	
Cu II	1157.0206	5		Ge III	1159.2	160	P	S I	1161.97		A, Z
Mn V	1157.028	80		F III	1159.227	20		Cu III	1161.993	2	
Al II	1157.088	125		N I	1159.273	1		Ni VI	1162.007	840	
Co II	1157.088	5		Ga V	1159.33	5		V III	1162.02	250	
Ni II	1157.132	1		Fe II	1159.334	10	P	Mn II	1162.02	50	
Cu III	1157.149	20		N I	1159.344	3		Cu V	1162.193	160	
V III	1157.18	400		Cu V	1159.420	250		Fe II	1162.332	0	P
C I	1157.186	20		Ni II	1159.510	150		Ni II	1162.361	1	N
Cu V	1157.200	540		V V	1159.516	60		Sc III	1162.4431	20	
Zn III	1157.289	40		Ni V	1159.521	190		Ni II	1162.492	8	N
Se IV	1157.3	120		Ni VI	1159.574	80		Ge XVIII	1162.5		F, P
Se II	1157.31	150		Ge III	1159.6	160	P	S III	1162.52	100	
C I	1157.330	50		V III	1159.75	200		Sc II	1162.544	1	
Cu V	1157.340	600		Cu V	1159.770	800		Al III	1162.588	10	
Ni V	1157.343	150		N I	1159.8172	4		Co II	1162.600	0	
S I	1157.40		A, Z	Cu I	1159.93		A, Z	Ni II	1162.601	1	N
C I	1157.405	150		Zn III	1160.079	1	Q	Cu II	1162.6010	3	
Ni V	1157.450	260		Fe II	1160.089	0	P	Cr III	1162.610	10	
Ge II	1157.50	50	Z	Co VI	1160.09		P	Al III	1162.621	5	
Cu V	1157.544	720		Cu V	1160.110	80		Cu I	1162.71		A, Z
Ni VI	1157.552	830		Zn III	1160.118	1	Q	Ni II	1162.748	150	
V V	1157.575	250		Ni V	1160.120	320	N	Sc	1162.77	200	N
Cu V	1157.662	550		N I	1160.171	1		V III	1162.81	50	
Br II	1157.7	10		Sc II	1160.212	1		Cu IV	1163.141	20	
Ga V	1157.74	35		Ni VI	1160.221	680		Cu I	1163.17		A
C I	1157.770	350		Cu IV	1160.247	20		Ga V	1163.17	2	
Ni VI	1157.805	760		Si III	1160.255	120		Cu V	1163.219	400	N
Cu II	1157.8719	8		Br I	1160.332	100		Ni VI	1163.252	860	

Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes
V III	1163.26	75		S III	1166.13	50		N IV	1168.599	150	
Zn	1163.315	15	N	Mn II	1166.16	10		Sc III	1168.6077	25	
Mn II	1163.32	40		Cu I	1166.18		A, Z	Ni V	1168.626	390	
Ni V	1163.362	130		Fe VII	1166.183	150		Cr III	1168.726	120	
Ge V	1163.390	700		Ni V	1166.226	240		Ni VI	1168.788	510	
Cu V	1163.406	460		Cr III	1166.23	10	N	C IV	1168.873	150	
O VIII	1163.426		P	V III	1166.29	75		Sc III	1168.883	10	
Sc II	1163.464	1		Cu I	1166.29		A	B IV	1168.90	450	
Cr VII	1163.516	5		Cu III	1166.295	5		Ti V	1168.927	30	
Ti V	1163.520	50		Cu V	1166.360	310		Cu I	1168.95		A, Z
Ni V	1163.523	450		Co VI	1166.38		P	Cu V	1168.967	190	
Mn III	1163.549	150		V III	1166.45	75		Ni VI	1168.981	200	
Ga IV	1163.607	100		Ni V	1166.475	320		C IV	1168.990	200	
Ni II	1163.645	50		Se II	1166.53	250		Cu III	1169.022	1	
Ni V	1163.688	260		V III	1166.58	75		N IV	1169.063	100	
Zn III	1163.705	1	Q	Li II	1166.63	5		V III	1169.11	75	
Ni II	1163.729	8		Ni V	1166.683	370		Cu I	1169.11		A
Cu I	1163.79		A, Z	Co VI	1166.69		P	O IV	1169.160	2	
Cu V	1163.826	360		Zn III	1166.790	25		Fe II	1169.190	10	P
Ni V	1163.865	630		Se IV	1166.8	85		Cr III	1169.208	25	
V III	1163.87	60		Mn II	1166.81	8		V III	1169.26	100	
Fe VII	1163.879	60		V III	1166.86	0		Mn II	1169.28	15	
Ni II	1163.880	4	N	Cu III	1166.954	3	N	Ni VI	1169.297	710	
N I	1163.8835	150		Fe II	1166.974	1	P	Cu III	1169.312	0	
Cu V	1163.930	340		Ti V	1166.982	0		Cu III	1169.376	5	
Cr VII	1163.947	1		Ni II	1167.030	25		Co VI	1169.40		P
S I	1163.98		A, Z	Ni V	1167.113	650		Mn V	1169.472	50	
N I	1164.0016	30		Mn II	1167.13	20		N IV	1169.478	50	
Mn III	1164.019	60		Cl I	1167.1479	100		Mn II	1169.53	15	
Cr VI	1164.146	12		Cu V	1167.207	130		Co II	1169.544	5	
Ni VI	1164.200	140		Ni VI	1167.219	90		Co VI	1169.55		P
N I	1164.2064	60		Cr VI	1167.222	110		Cl VIII	1169.6		
Mn II	1164.21	30		S I	1167.3		A, Z	Se IV	1169.6	40	
Ge II	1164.273	100		Mn II	1167.31	9		Cu I	1169.64		A, Z
Ni II	1164.279	150		Ni VI	1167.319	30		N I	1169.6933	80	
Cu IV	1164.289	20		Cu V	1167.349	640		Cu IV	1169.785	30	
O IV	1164.320	25		Al IV	1167.36	150		Ni II	1169.919	3	N
N I	1164.3246	95		F V	1167.372	1		Al VI	1170.		F
Ni VI	1164.329	430		Cu I	1167.39		A, Z	Br II	1170.0	10	
O VIII	1164.416		P	N I	1167.4484	350		Cu V	1170.075	550	
Cu I	1164.42		A, Z	Cu V	1167.501	450		Co VI	1170.08		P
Fe II	1164.474	5	P	N I	1167.502		P	Cr III	1170.111	90	
O IV	1164.545	40		Cu I	1167.53		A, Z	Cr VII	1170.143	5	
Ni II	1164.574	100		O IV	1167.532	10	N	Zn III	1170.149	50	
Ti V	1164.634	1		Co VI	1167.62		P	N I	1170.1572	10	
Cu V	1164.666	20		Ga II	1167.62	10		Ni II	1170.169	20	
Cu IV	1164.688	80		Fe VI	1167.699	500		N I	1170.220	6	
O VIII	1164.727		P	N I	1167.743		P	Cu V	1170.245	170	
Kr I	1164.867	71	A	Ni VI	1167.748	870		Ni V	1170.254	290	
Cu III	1165.037	2	N	Zn III	1167.764	30		Mn III	1170.267	40	
Ni V	1165.098	850		Co VI	1167.79		P	Cr III	1170.273	90	
Cu V	1165.132	110		Ni II	1167.803	10		N I	1170.2766	80	
Fe II	1165.232	5	P	N I	1167.862		P	Fe VI	1170.279	50	
Cu I	1165.24		A, Z	Ni V	1167.893	20		Fe II	1170.297	2	P
Ge V	1165.261	300		Fe VI	1167.923	40		Cu III	1170.31		F, P
Al V	1165.42	350		Mn XVII	1168.		F, P	Ni VI	1170.327	740	
Zn III	1165.559	10	Q	S I	1168.04		A, Z	N I	1170.4165	5	
Mn III	1165.579	130		Ni II	1168.040	75		N I	1170.432	7	
Cu V	1165.581	210		Ti V	1168.043	50		Br I	1170.479	150	
N I	1165.5943	40		Ni VI	1168.061	550		N I	1170.485		P
Ni V	1165.596	70		Mn II	1168.07	5		N I	1170.499	3	
Ni II	1165.646	5	N	Ni V	1168.166	50		S I	1170.5		A, Z
Fe VI	1165.672	250		N I	1168.2154	50		N I	1170.536		P
C III	1165.698	10		Mn II	1168.25	15		Ga IV	1170.586	220	
N I	1165.717		P	Fe II	1168.252	2	P	Co VI	1170.63		P
Ni II	1165.798	12		Cr III	1168.292	25		Ni VI	1170.631	100	
Mn II	1165.82	25		N I	1168.3344	200		Cr III	1170.64	30	N
N I	1165.8358	15		N I	1168.4167	60		N I	1170.6743	20	
Ni V	1165.861	180		Cu IV	1168.479	160		Se II	1170.76	50	
C III	1165.870	100		Al V	1168.48	250		N I	1170.815	2	
Ni VI	1165.907	120		Cu V	1168.525	680		Ni VI	1170.846	850	
F III	1165.961	10		Se II	1168.53	600		B IV	1170.86	70	
Mn III	1165.990	150		N I	1168.5358	300		Co VI	1170.86		P
N I	1166.003		P	Br I	1168.542	150		Cu V	1170.918	250	
Fe II	1166.042	2	P	Fe II	1168.552	10	P	Cu I	1170.95		A, Z

Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes
S	1171.	50	N	Ge III	1173.8	200	P	Si III	1178.004	160	
N I	1171.0834	60		Cu V	1173.803	20		Mn III	1178.034	150	
Ni II	1171.117	15		Br I	1173.827	175		Se II	1178.05	150	
Ni V	1171.138	450		Zn	1173.854	50	N	Co VI	1178.1		F, P
Cu I	1171.14		A, Z	Fe VII	1173.915	4		Mn II	1178.14	15	
Cu V	1171.202	580		Fe II	1173.921	1	P	Ni VI	1178.217	820	
Be IV	1171.254		P	Cu I	1173.99		A, Z	Ni II	1178.224	8	N
V III	1171.27	20		Fe II	1174.059	0	P	Ni V	1178.227	610	
Ni II	1171.291	100		Ni V	1174.202	800		Ga V	1178.23	5	
P IV	1171.316	60		Si III	1174.369	100		Mn II	1178.34	12	
Ni VI	1171.324	120		Si III	1174.432	120		Ni VI	1178.364	300	
Zn II	1171.343	0	Q, Z	Ni VI	1174.495	720		Ni V	1178.382	170	
N I	1171.418	6		Cu III	1174.588	20		Co VI	1178.39		P
Ni V	1171.450	350		Ni VI	1174.590	860		Zn IV	1178.391	15	
N I	1171.502	3		Cu V	1174.696	300		Cu I	1178.49		A, Z
Be IV	1171.558		P	Ni XIV	1174.72	0	F	Mn III	1178.508	150	
Si V	1171.559	100		Mn III	1174.810	10		Cr III	1178.55	30	N
Co VI	1171.58		P	Cr III	1174.825	300		Cu III	1178.554	3	
Al IV	1171.59	5		Ni VI	1174.885	780		Ni II	1178.571	30	
Fe II	1171.633	1	P	C III	1174.933	800		Co V	1178.578	200	
Be IV	1171.657		P	Al IV	1174.967			Co VI	1178.63		P
Ni V	1171.712	240		Cu V	1175.045	600	N	F III	1178.642	3	
Ga IV	1171.712	10		C III	1175.263	700		Mn II	1178.76	5	
N I	1171.722	4		S I	1175.28	50	A, Z	Cr III	1178.80	20	N
Cu V	1171.855	400		Mn III	1175.362	225		Ni V	1178.806	20	
Si V	1171.857	300		Cu V	1175.378	550		Zn III	1178.835	25	
N I	1171.904	5		Cu IV	1175.473	30		Cu V	1178.874	620	
Zn II	1171.943	5	Z	C III	1175.590	600		Br I	1178.895	240	
Cu V	1171.981	430		Fe II	1175.699	1		Ni V	1178.914	710	
Cu IV	1172.048	80		C III	1175.711	1000		Zn	1178.929	60	N
Cu I	1172.07		A, Z	Ni VI	1175.926	440		Ga V	1178.95	40	
Mn V	1172.071	80		C III	1175.987	700		Ge II	1178.957	100	Z
Ni V	1172.128	150		S I	1176.0		A, Z	Ni VI	1178.959	310	
As III	1172.16	500		Cu V	1176.140	540		Cr III	1178.99	10	
Cu V	1172.164	640		Cu V	1176.228	630		Cu I	1179.00		A, Z
Co VI	1172.20		P	C III	1176.370	800		P IV	1179.022	90	
Cu V	1172.239	620		Se IV	1176.4	60		F III	1179.035	6	
Zn IV	1172.304	30		Ni VI	1176.461	220		Cl II	1179.1097	50	
Co V	1172.334	70		N I	1176.5097	350		Cu III	1179.186	25	
Ti V	1172.340	1		Cu V	1176.533	770		Ni V	1179.234	560	
N I	1172.42	3	P	N I	1176.6304	180		Co VI	1179.25		P
Ni V	1172.468	420		Ge V	1176.689	200		Cu III	1179.270	3	
V III	1172.47	5		Co II	1176.802	1		Cl I	1179.2927	250	
Si III	1172.529	80		Ni VI	1176.803	170		S I	1179.30		A, Z
S IV	1172.58	107	N	Zn	1176.846	10	N	Al II	1179.354	125	
Ni VI	1172.591	770		Ni VI	1176.937	870		Cl II	1179.4619	100	
S I	1172.7		A, Z	Cu V	1176.968	650	N	Mn III	1179.476	190	
Cu V	1172.704	450		Ni V	1176.986	760		Zn IV	1179.478	50	
Mn III	1172.721	20		Ar XIII	1177.		F, P	Ti V	1179.541	0	
Cu V	1172.869	620	N	Ni II	1177.006	1		Cu V	1179.596	710	N
Co VI	1172.88		P	Zn II	1177.052	8	Q	Cu I	1179.60		A, Z
Co VI	1172.90		P	Cu V	1177.052	390		Co V	1179.603	570	
P IV	1172.996	4		Ni II	1177.109	50		Al IV	1179.666	20	
Sc	1173.03	300	N	Sc	1177.14	200	N	Cr III	1179.68	30	N
P IV	1173.094	4		Cu I	1177.16		A, Z	Cu III	1179.807	4	
Mn III	1173.099	15		Ni V	1177.178	180		Zn IV	1179.814	25	
Co II	1173.114	0		Br I	1177.233	210		Mn III	1179.85	20	
Ni II	1173.121	1		Ni VI	1177.256	740		Mn III	1179.85	20	
Cu V	1173.154	730		Se II	1177.31	10		Al V	1179.86	20	
P IV	1173.189	4		Cu III	1177.311	4	N	Mn III	1179.928	170	
Cr III	1173.19	40	N	Cu V	1177.328	740		Ni VI	1179.960	840	
Cu V	1173.271	750		Al II	1177.437	125		Ni V	1179.970	700	N
Ni II	1173.298	50		Cr VI	1177.469	80		Zn III	1180.000	1	Q
Cr III	1173.34	50	N	Zn IV	1177.484	60		Co VI	1180.01		P
Al V	1173.47	200		Mn III	1177.484	6		Ge II	1180.10	1	N
Mn III	1173.476	115		Mn II	1177.52	20		Fe II	1180.109	1	P
Ni II	1173.477	75		Ni V	1177.601	160		Cu V	1180.200	590	N
Cu I	1173.58		A, Z	Zn III	1177.651	50		Cu I	1180.25		A, Z
Br III	1173.6	500	Q	N I	1177.6948	320		Ni V	1180.256	570	
Cu V	1173.690	440		Cu I	1177.70		A, Z	Ni II	1180.271	150	
Ge II	1173.707	75	Z	Ti V	1177.719	50		Zn IV	1180.274	4	
Al IV	1173.719	10		Mn II	1177.89	18		Ni VI	1180.295	850	
Cr III	1173.77	100	N	Cu V	1177.890	700		Ni VI	1180.363	840	
Ga II	1173.78	30		F III	1177.988	3		Co VI	1180.39		P
Ni VI	1173.786	550		Ti XVII	1178.		F, P	Na III	1180.40	160	N

Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes
Fe II	1180.430	2	P	N I	1183.400		P	Cu III	1186.223	2	
Zn III	1180.443	2	Q	Fe II	1183.438		P	Cr III	1186.254	120	
Cu III	1180.559	2		Co V	1183.440	80		P IV	1186.295	10	
Cr III	1180.579	4		Zn II	1183.488	2	N	P III	1186.304	10	
Mn II	1180.69	1		Cu I	1183.49		A,Z	Ni II	1186.347	1	
Cu V	1180.707	290		Cu IV	1183.558	340	N	Cu V	1186.404	30	
Co V	1180.759	340		Cu III	1183.606	3	N	Cu III	1186.405	1	
Cr III	1180.81	60	N	Al V	1183.62	120		Mn III	1186.425	80	
Fe VII	1180.823	40		Co V	1183.622	610		Zn III	1186.442	5	Q
Ga V	1180.96	10		Cu V	1183.628	840		Cr VII	1186.561	5	
Cr III	1181.03	10	N	Ga V	1183.63	25		Fe VI	1186.580	200	
F III	1181.061	10		Ti IV	1183.635	150		Cu V	1186.590	460	
Ni II	1181.075	30		Ni VI	1183.671	700		Cu III	1186.801	50	
Cu I	1181.10		A,Z	Cu III	1183.747	20		Mn III	1186.808	25	
Co VI	1181.11		P	Ni V	1183.767	260		Ga II	1186.81	50	
Ti V	1181.192	12		Zn	1183.824	12	N	V III	1186.89	25	
Ge II	1181.194	150	Z	Fe II	1183.829	10	P	Ni II	1186.933	8	
P III	1181.224	25		Mn III	1183.860	25		Mn III	1186.933	25	
Cu V	1181.267	650		Mn III	1183.878	225		Cu V	1186.935	610	N
Ni VI	1181.293	590		Ni VI	1183.897	710		Cu I	1186.95		A,Z
Cu V	1181.327	680		Co V	1183.900	210		Ni VI	1186.984	440	
Fe II	1181.362	1	P	Se II	1183.99	50		Ni II	1186.993	1	
Cu III	1181.391	1		Ni VI	1183.991	20		Cu III	1187.006	15	
Cr III	1181.45	10	N	F III	1184.039	3		Ni II	1187.102	20	
Co VI	1181.49		P	P III	1184.043	1		Ni V	1187.197	20	
As II	1181.506	550		Co VI	1184.12		P	Cu I	1187.25		A,Z
Cu V	1181.526	340		V VI	1184.130	1		Ca III	1187.303	250	
Zn	1181.539	20	N	N I	1184.235		P	Ni V	1187.321	200	
Mn III	1181.579	40		Ni VI	1184.311	100		Ge II	1187.323	50	Z
S I	1181.59		A,Z	Cu IV	1184.318	80		Cr III	1187.350	150	
Ni II	1181.620	15		N I	1184.357		P	Cu V	1187.379	540	
Cr III	1181.63	50		Cu V	1184.385	430		Cu III	1187.393	3	
Ni VI	1181.641	150		Ni VI	1184.445	20		Zn	1187.404	50	N
Ge II	1181.650	150	Z	Ni II	1184.512	20		Co II	1187.413	2	
Cr III	1181.723	90		N III	1184.514	400	P	Fe II	1187.417	10	P
Fe II	1181.891	1	P	Zn II	1184.528	8	Z	Mn III	1187.468	150	
Ni VI	1181.899	370		Cu III	1184.635	3		Cu V	1187.517	360	
F III	1181.909	3		Ni VI	1184.659	860		Ni VI	1187.529	570	
Sc	1181.91	300	N	Co V	1184.685	360		Ge II	1187.539	50	Z
Mn III	1181.912	45		Ni VI	1184.753	170		P III	1187.542	25	
Cr VII	1181.920	40		Zn II	1184.858	40		P IV	1187.542	25	
Co VI	1181.94		P	Cu I	1184.91		A,Z	Fe V	1187.6		F,P
Cu I	1181.97		A,Z	Ni II	1184.980	3		B IV	1187.60	5	
Ca III	1181.988	150		N I	1184.984		P	Ni II	1187.608	15	
Cu V	1182.011	650		P III	1185.015	1		Cr III	1187.637	250	
Zn IV	1182.016	50		Ni VI	1185.024	210		Fe II	1187.705	0	P
Si III	1182.018	60		Mn III	1185.045	0		Mn III	1187.735	250	
Fe VI	1182.140	100		Ni VI	1185.140	430		Cu III	1187.746	40	
Ni II	1182.169	75		Ni II	1185.146	2		Ni V	1187.781	350	
Br I	1182.171	150		Ge II	1185.154	3	Z	Ar IV	1187.80	40	
Cu I	1182.21		A,Z	Cu I	1185.16		A,Z	Mn III	1187.862	115	
Co VI	1182.27		P	Ga IV	1185.225	160		Cu V	1187.912	440	
Co V	1182.383	390		Fe V	1185.23		F,P	Cl II	1187.9150	140	
F III	1182.427	3		Ni V	1185.236	30		P III	1187.934	1	
Ni V	1182.506	70		Cu V	1185.312	160		Cl II	1187.963	5	
Cu V	1182.601	770		Co V	1185.399	260		N IV	1188.006	300	
Ni VI	1182.605	690		Ge IV	1185.5	10	P	Cu V	1188.056	810	N
Ni V	1182.615	620		Co VI	1185.53		P	V VI	1188.159	360	
Se II	1182.65	100		Br II	1185.6	100		V V	1188.161	40	
Ni V	1182.724	20		Zn II	1185.610	1	Z	Cl II	1188.3235	80	
Cu V	1182.746	200	N	Cu III	1185.638	2	N	Ni VI	1188.364	840	
Mn III	1182.825	350		Fe II	1185.712	2	P	Ni VI	1188.5		F,P
P III	1182.868	10		Zn III	1185.840	3	Q	Mn II	1188.502	50	
Cu III	1182.887	15		Fe II	1185.857	1	P	Cu V	1188.509	540	N
Cu I	1182.97		A,Z	Cu II	1185.8991	2		Co VI	1188.55		P
Cu V	1183.022	340	N	Co VI	1185.92		P	Cu V	1188.586	600	
N III	1183.030	350		Ni V	1185.948	770		Ca III	1188.606	400	
Ga V	1183.13	15		Zn III	1185.980	3	Q	Cu I	1188.62		A,Z
Cu V	1183.236	130	N	Ni XV	1186.		F,P	Al V	1188.67	15	
N I	1183.278		P	Fe XX	1186.		F,P	Co VI	1188.68		P
Ge IV	1183.3	300	P	Cu IV	1186.035	50		Ge II	1188.732	200	
Cu I	1183.30		A,Z	Ga IV	1186.058	25		Cl I	1188.7515	50	
Mn III	1183.304	30		Mn III	1186.14	10		Cl I	1188.7743	130	
Ti XXII	1183.306		P	Br I	1186.161	150		Ti V	1188.796	30	
Ge IV	1183.4	300	P	Al V	1186.18	100		Fe II	1188.815	1	P



Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes
Si VI	1188.829	50		Ni V	1191.082	220		Ni VI	1193.458	70	
C I	1188.833	200		Co V	1191.163	170		Cr III	1193.466	200	
Cu V	1188.839	790	N	Ti V	1191.195	80		Cr VII	1193.492	70	
Cu V	1188.925	590		Al V	1191.20	8		Cu V	1193.500	690	
N I	1188.971	14		Ge II	1191.264	100	Z	Ni V	1193.612	90	
Cu III	1188.981	20		Fe II	1191.356	1	P	C I	1193.679	500	
C I	1188.992	500		Cu I	1191.36		A, Z	Sc	1193.69	400	N
Ge IV	1189.0	400	P	Fe II	1191.474	1	P	Ca III	1193.697	150	
C I	1189.065	200		V III	1191.50	0		N I	1193.735		P
Al II	1189.185	125		Cu IV	1191.518	60		Al V	1193.76	50	
Cu V	1189.242	850		Cu V	1191.536	420		Cu V	1193.870	220	N
C I	1189.249	250		Zn III	1191.597	10		Ni VI	1193.883	400	
N I	1189.249	14		Ni VI	1191.6		F, P	Ni V	1193.887	440	
Br I	1189.279	300		N I	1191.603	2		Cr III	1193.89	10	
Ni VI	1189.300	870		Mg VI	1191.64	1	F	Cu I	1193.94		A, Z
Br I	1189.378	210		Ge II	1191.719	15	Z	Cr V	1193.950	450	
Co II	1189.428	1		Mn III	1191.730	15		C I	1193.996	120	
C I	1189.447	500		Al II	1191.811	190		S III	1194.02	400	
Br I	1189.498	300		C I	1191.838	120		C I	1194.064	350	
Ni VI	1189.5		F, P	Zn III	1191.864	40		Zn IV	1194.068	30	
Ni V	1189.544	550		Cu I	1191.87		A, Z	Al V	1194.10	10	
Fe VI	1189.550	300		Ni VI	1191.898	190		C I	1194.229	120	
Zn IV	1189.565	35		Al IV	1191.907	200		Ni VI	1194.274	440	
Cu III	1189.60		F, P	N I	1191.925	8		Ni V	1194.282	550	
Ge II	1189.623	150	Z	Cu IV	1191.978	50		C I	1194.301	120	
C I	1189.631	700		Ni XXI	1192.		F, P	Cu V	1194.308	570	N
Cr VII	1189.640	5		Fe II	1192.030	10	P	S III	1194.40	300	
Cu V	1189.672	770	N	V III	1192.06	00		C I	1194.406	200	
Ni V	1189.687	20		Ni VI	1192.110	560		Br I	1194.413	200	
Cu I	1189.70		A, Z	Fe II	1192.148	0	P	Cr III	1194.44	30	
Al IV	1189.711	50		Al IV	1192.212	150		Cu I	1194.46		A, Z
Fe II	1189.726	0	P	C I	1192.218	70		V IV	1194.462	20	
Cu V	1189.837	830		Si III	1192.228			C I	1194.488	350	
Mg VII	1189.84	1	F	Si III	1192.258			Ni V	1194.498	30	
Ni VI	1189.859	20		Cu II	1192.261	2	N	Si II	1194.5001	250	
As II	1189.870	550		Cu V	1192.280	550		Cu V	1194.506	710	
Cu I	1189.93		A, Z	Se II	1192.29	1000		Ni V	1194.576	20	
Cu V	1189.939	700		Si III	1192.293			C I	1194.615	250	
Co XX	1190.		F, P	Ni II	1192.306	5		Cu V	1194.648	20	
Cu XIV	1190.		F, P	Mn II	1192.313	40		Fe II	1194.657	2	P
Mn XVIII	1190.		F, P	Ni VI	1192.346	50		Ni VI	1194.7		F, P
C I	1190.021	35		Ti V	1192.353	200		Si V	1194.74	200	
N I	1190.031	5		Cu V	1192.410	760		Ge II	1194.787	500	Z
Al II	1190.052	150		Cu I	1192.45		A, Z	Cu V	1194.792	230	
Cu III	1190.054	25		C I	1192.451	120		P III	1194.792	40	
Mg VI	1190.07	2	F	Ni VI	1192.469	790		Ni II	1194.857	15	
Co VI	1190.09		P	Cu V	1192.535	760		Ni V	1194.862	390	
Cu IV	1190.111	310		N I	1192.563	4		Cu V	1194.909	700	N
Cu V	1190.113	340		Ni II	1192.596	0		P III	1194.945	25	
Cu I	1190.12		A, Z	Ni VI	1192.6		F, P	V VI	1194.950	1	
S III	1190.17	200		Cr III	1192.686	150		Cr III	1194.96	30	N
Cu V	1190.198	470		Ni V	1192.687	330		S I	1195.		A, Z
Ni VI	1190.237	390		Cl II	1192.6978	4		Mn II	1195.00	30	
C I	1190.253	35		N I	1192.718	4	P	Zn	1195.019	12	N
Ni VI	1190.326	310	N	Mn III	1192.78	8		Cu I	1195.02		A, Z
Ni V	1190.334	550		C I	1192.83	3		Ga IV	1195.029	250	
Ar IV	1190.35	80		Cu V	1192.843	300		Fe II	1195.055	0	P
Co VI	1190.37		P	Ni V	1192.849	20		Fe V	1195.103	60	
Si II	1190.4157	100		Zn II	1192.961		N	Cu I	1195.11		A, Z
Cu V	1190.422	720	N	Ni II	1192.983	3		Ni V	1195.192	710	
Ni II	1190.442	1		C I	1193.009	700		Ti IV	1195.208	250	
N I	1190.494	6		Ga IV	1193.028	180		Cu V	1195.274	20	
B IV	1190.56	5	N	Ni II	1193.028	2	N	Zn III	1195.366	25	Q
N I	1190.688	2		C I	1193.031	300		Al V	1195.37	200	
Cu I	1190.82		A, Z	Cu I	1193.07		A, Z	N IV	1195.400		P
N I	1190.855	6		Cu V	1193.077	520		P III	1195.410	60	
Ca III	1190.864	250		Ni VI	1193.159	480		Cr III	1195.42	10	N
Ga IV	1190.866	220		Cu V	1193.185	740		Fe II	1195.465	2	P
Cr VII	1190.867	20		Zn II	1193.231	60	N	N IV	1195.567		P
N I	1190.923	8		C I	1193.240	850		Mn III	1195.678	10	
Cu V	1190.974	810		C I	1193.264	150		Zn III	1195.729	3	Q
Ni VI	1191.015	300		Ni II	1193.267	5		Ni V	1195.825	120	
N I	1191.019	12		Si II	1193.2894	200		N IV	1195.852		P
F IV	1191.055	40		Cu I	1193.31		A, Z	Sc IV	1195.869	5	
V III	1191.07	0		C I	1193.393	350		Ni VI	1195.948	20	

Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes
Mn II	1195.97	30		Ni V	1197.998	230		Ca III	1200.772	50	
Cu V	1195.983	300		Mn II	1198.00	10		Cr V	1200.834	70	
Zn	1196.009	35	N	Cu I	1198.03		A, Z	Zn III	1200.854	50	
Ni V	1196.036	100		Cu V	1198.038	620		Co VI	1200.88		P
Cr III	1196.04	30		Fe II	1198.064	0	P	Cr III	1200.91	50	N
Cr V	1196.042	360		Li II	1198.082	700		Ni V	1200.947	230	
B IV	1196.06	5		Fe II	1198.087	0	P	Cu III	1200.956	50	
Cu V	1196.066	530		Ni VI	1198.111	590		S III	1200.97	400	
Ni V	1196.118	630		Cu V	1198.146	700	N	Cr III	1201.00	50	N
Cu V	1196.178	520	N	Ni VI	1198.239	330		Ni II	1201.002	3	
S X	1196.26	1	F	Ni V	1198.278	410		Cu V	1201.024	370	
Co VI	1196.26		P	Si III	1198.297			Ni V	1201.087	290	
Fe II	1196.263	1	P	Cr III	1198.31	70		Ni II	1201.119	8	
Cu I	1196.31		A, Z	Zn III	1198.322	6	Q	Mn II	1201.124	20	
Cr III	1196.328	90		Fe II	1198.366	1	P	Ni V	1201.197	440	
Ni VI	1196.328	590		Br I	1198.371	255		Cu V	1201.217	830	
Mn II	1196.33	25		Co II	1198.418	1		Mn II	1201.23	5	
Br I	1196.370	200		Cu V	1198.473	790		Cr III	1201.247	400	
As II	1196.383	600		Cr VII	1198.481	20		Cu III	1201.287	10	
Cu III	1196.385	1		Al IV	1198.500	400		Zn IV	1201.292	25	
Cu I	1196.39		A, Z	Mn III	1198.510	115		Ni V	1201.324	460	
Se II	1196.40	50		Ni V	1198.525	710		Cl I	1201.3527	100	
Si III	1196.436			Cu I	1198.54		A, Z	F III	1201.358	3	
Cu III	1196.450	18		C IV	1198.58	50		Cu I	1201.40		A, Z
Si III	1196.470			Fe V	1198.593	50		Fe II	1201.415	1	P
Br I	1196.477	200		V III	1198.61	100		Cr III	1201.426	300	
Ni VI	1196.477	20		Mn II	1198.63	10		Cu V	1201.477	560	
Cu V	1196.487	90		Ti V	1198.659	250		Zn IV	1201.489	50	
Mn II	1196.52	20		Fe II	1198.660	0	P	Fe II	1201.506	1	P
As II	1196.561	600		Ni V	1198.699	210		Fe II	1201.549	0	P
V III	1196.63	0		Cu V	1198.802	750	N	Ga IV	1201.550	110	
Fe II	1196.671	1	P	Ni VI	1198.893	420		Cr V	1201.556	110	
Mn II	1196.724	25		Ni V	1198.898	270	N	Mn II	1201.57	40	
Cu V	1196.731	650		Fe II	1198.931	55	P	Co VI	1201.59		P
Ni VI	1196.788	310		Mn III	1199.001	30		Ni V	1201.594	340	
Ni VI	1196.867	540		S V	1199.18	18	N	Cu II	1201.6258	2	
Ni VI	1196.967	40		Co V	1199.199	570	N	P IV	1201.642	10	
Ni V	1196.975	300		Fe II	1199.236	40	P	Ni V	1201.644	240	
Be II	1197.094	330		P IV	1199.243	150		S III	1201.71	200	
Zn	1197.098	10	N	Cu I	1199.30		A, Z	Mn III	1201.739	40	
Cu V	1197.100	450		Mn II	1199.34	30		Ni V	1201.760	460	
Zn II	1197.149	40		Mn II	1199.38	50		Ni V	1201.834	350	
Mn II	1197.17	40		Cu III	1199.39		F, P	Ni II	1201.838	5	
Be II	1197.188	670		Ni V	1199.402	800		Cu V	1201.852	640	N
Cu III	1197.235	1	N	Zn	1199.415	60	N	Ni V	1201.857	290	
Ni V	1197.274	370		N I	1199.5490	1000	ST	Se IV	1201.9	40	
Cu V	1197.351	670		Cu V	1199.561	210		Cu V	1201.912	690	
Cr III	1197.365	500		Fe II	1199.671	20	P	Ni II	1201.957	3	
Ni V	1197.378	370		Mn V	1199.696	15		Al V	1202.00	10	
Si II	1197.3936	100		Se II	1199.72	1		Cu IV	1202.008	20	
Cu V	1197.421	680		Zn	1199.748	15	N	S I	1202.04		A
Fe II	1197.435	1	P	Ni VI	1199.764	620		Ni V	1202.040	750	
Zn IV	1197.440	30		Cu III	1199.793	35		Cr III	1202.043	60	
Fe II	1197.498	1	P	Cu V	1199.832	670		S III	1202.10	50	
Cu III	1197.535	10	N	Cu V	1199.953	690		Ni VI	1202.128	30	
Mn II	1197.57	10		K XII	1200.		F, P	Zn III	1202.152	30	Q
Co VI	1197.59		P	Cu I	1200.00		A, Z	Cu V	1202.154	530	
Ti V	1197.598	50		Ni VI	1200.041	560		V III	1202.25	50	
Cr III	1197.60	10	N	Ni II	1200.077	1	N	Ni V	1202.261	380	
Zn III	1197.646	0	Q	Fe V	1200.183	30		Fe VI	1202.281	30	
Cu III	1197.685	8		N I	1200.2238	950	ST	Ca III	1202.309	200	
Cu IV	1197.697	20	N	Cu IV	1200.237	20		P I	1202.393	3	
Fe VI	1197.728	80		Cu I	1200.24		A, Z	Ni V	1202.427	290	
Zn III	1197.745	1	Q	Fe II	1200.240	20	P	Ni II	1202.452	8	
Ni VI	1197.754	470		Ni II	1200.307	1		Cr III	1202.460	120	
Co II	1197.793	1		Cu V	1200.343	660		Ni II	1202.511	10	N
Cu V	1197.814	330	N	Cu III	1200.374	1	N	Co V	1202.523	340	
P IV	1197.82	40	N	Cu III	1200.449	1	N	Cu V	1202.591	80	
Ar IV	1197.84	40		Al V	1200.56	20		Fe II	1202.591	2	N
C I	1197.877	1		Cr III	1200.567	120		S I	1202.61		A
Mn V	1197.885	20		Si XIII	1200.62		P	Mn III	1202.807	0	
Cl II	1197.9053	75		Zn III	1200.635	60		V III	1202.87	5	
Cu I	1197.92		A, Z	Cu IV	1200.679	20		Co V	1202.908	190	
Zn III	1197.973	20		Co V	1200.709	120		Ni II	1202.911	3	
Ni V	1197.975	230		N I	1200.7113	700	ST	Ti V	1203.011	50	

Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes
Mn II	1203.07	8		Ni V	1205.310	600		Fe II	1207.360	1	P
Cu V	1203.078	450		Ni II	1205.314	8	N	Ni V	1207.394	670	
Zn III	1203.200	8	Q	Co V	1205.361	120		Co II	1207.417	1	
Cu I	1203.22		A, Z	Mn II	1205.42	20		P I	1207.436	0	
Cu V	1203.242	490		Cu V	1205.445	440	N	As II	1207.441	350	
Mn II	1203.25	30		Ni V	1205.453	640		V III	1207.45	100	
Zn III	1203.270	50		Co VI	1205.49		P	Ni V	1207.452	490	
Ni V	1203.285	780		P I	1205.528	1		Co V	1207.460	180	
Ni V	1203.314	790		Ni II	1205.552	10		Si III	1207.517	180	
Cu V	1203.317	550	N	Ni V	1205.559	640		Cu V	1207.525	640	
Br I	1203.353	200		S I	1205.59		A	Cu I	1207.53		A, Z
Ni V	1203.361	630		Zn IV	1205.594	25		Co V	1207.538	400	
P IV	1203.41	40	N	P I	1205.647	3		Fe VI	1207.566	60	
Zn IV	1203.430	40		Co VI	1205.67		P	Ni II	1207.567	0	
S I	1203.44		A	Se II	1205.69	500		Cr III	1207.580	350	
Cu III	1203.472	3	N	Cu V	1205.694	370		Ni II	1207.620	4	
Mn III	1203.476	90		Co VI	1205.77		P	V III	1207.63	50	
Ca III	1203.507	10		Cr III	1205.787	120		Ni V	1207.636	90	
Cu V	1203.550	180		Cu IV	1205.787	50		Ni II	1207.654	3	
Co II	1203.598	0		Ni V	1205.794	210		Si VI	1207.68	200	
Cr III	1203.604	150		Co V	1205.889	180		Ni VI	1207.735	130	
Sc II	1203.635	1		Cr XX	1205.9		F	Zn III	1207.737	10	
Cu III	1203.725	25		Cu II	1205.9029	2		S I	1207.76		A
Cu V	1203.761	310		Cu V	1205.926	530		Ca III	1207.838	200	
Ni V	1203.776	740		Ni V	1205.957	530		Cr VII	1207.866	220	
Cu III	1203.782	3	N	Fe II	1205.997	2	P	Fe II	1207.898	2	N
V III	1203.86	0		Cu III	1206.014	10		Ga V	1207.95	10	
Ni V	1203.871	720		Fe VI	1206.032	500		Ni V	1207.989	210	
Cr III	1203.95	20	N	Co VI	1206.08		P	Zn	1208.034	20	N
Fe II	1204.035	5	P	Cr III	1206.12	10	N	Ca III	1208.046	150	
Zn IV	1204.038	30		S I	1206.13		A	Fe VI	1208.151	250	
Si VI	1204.05	80		Co VI	1206.17		P	Ni V	1208.210	130	
Cu V	1204.061	580		Cu I	1206.23		A, Z	Fe II	1208.237	1	P
Ni VI	1204.085	850		Cu V	1206.245	630		Fe V	1208.257	40	
Ni II	1204.102	30		Ni II	1206.246	7		Ni V	1208.266	20	
Cr V	1204.126	70		Cu III	1206.303	20		Cu V	1208.313	460	N
P IV	1204.30	40	N	Kr III	1206.35	100		Al II	1208.352	150	
S V	1204.30	4		Cr III	1206.381	570		B II	1208.36	1	
Co VI	1204.31		P	P IV	1206.422	200		Fe VII	1208.375	40	
Zn III	1204.310	60		Mn III	1206.425	20		Al IV	1208.401	10	
S I	1204.35	500	A	Se III	1206.5	150	N	P IV	1208.419	40	
Cr III	1204.375	1		Si III	1206.510	600		P I	1208.430	1	
F III	1204.380	6		Zn II	1206.525	30	N	Ni II	1208.433	1	
Cr III	1204.440	90		Si III	1206.533	600		Mn III	1208.476	800	
Co VI	1204.49		P	Mn II	1206.55	10		Sc IV	1208.521	20	
Co VI	1204.55		P	Cu I	1206.58		A, Z	B II	1208.546	40	
Cr III	1204.580	60		Si V	1206.612		P	P I	1208.617	1	
Cu V	1204.612	560	N	Cr III	1206.70	30		Cr III	1208.684	25	
Cu II	1204.6158	1		Ge II	1206.725	3	Z	Cu V	1208.702	560	
Mn II	1204.62	25		Cu II	1206.7691	0		Ca III	1208.716	50	
Cu II	1204.6356	1		Cu I	1206.77		A, Z	Fe VI	1208.781	80	
Cu II	1204.6531	1		Cu V	1206.785	470		B II	1208.825	10	
Al IV	1204.722	1		Co V	1206.808	240		Mn II	1208.83	8	
Ni V	1204.738	120		P I	1206.831	1		S I	1208.86		A
Cu III	1204.791	5	N	Mn II	1206.87	5		Ni V	1208.908	650	
Cu V	1204.896	770	N	Ga IV	1206.890	260		Ni V	1208.966	480	
Cr III	1204.929	350		Cr III	1206.99	20		Mn III	1208.985	225	
Mn II	1204.95	15		V III	1206.99	200		Ni V	1209.099	530	
Zn	1204.964	10		Cu V	1206.992	600		Cr III	1209.133	500	
K XIV	1205.		F, P	Cu III	1206.996	10		Ni II	1209.170	7	
Ge II	1205.049	15	Z	Cr III	1207.017	200		Al II	1209.191	100	
Cu IV	1205.063	40	N	S I	1207.04		A	Ni V	1209.225	300	
Cu III	1205.067	20		Mn II	1207.05	2		As III	1209.29	500	
Ni II	1205.088	15		Si V	1207.052		P	Mn III	1209.326	80	
Fe II	1205.117	2	P	Ni VI	1207.107	330		F II	1209.345	40	
Co V	1205.121	530		P I	1207.113	1		Cr III	1209.42	10	
Cu II	1205.1467	0		Fe V	1207.115	10		Ni VI	1209.427	90	
Cr III	1205.15	10	N	Mn II	1207.12	2		Ni V	1209.431	220	
Cu II	1205.1944	0		Cr III	1207.124	200		Fe II	1209.431	1	P
Ni II	1205.201	1		Cu V	1207.247	680	N	Co VI	1209.47		P
Cu II	1205.2024	0		Cu III	1207.300	5		Ni II	1209.492	1	
Se II	1205.25	100		Cr III	1207.340	90		Mn III	1209.559	100	
Ni VI	1205.264	700		Ca III	1207.341	150		Ni V	1209.607	700	
Ni II	1205.266	20		Cu V	1207.345	640	N	Cr III	1209.66	10	
Ga V	1205.27	5		Ni V	1207.345	800		P I	1209.706	3	

Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes
Br I	1209.756	285		Zn III	1212.255	40		Fe II	1214.398	1	P
Ni V	1209.771	790		F III	1212.255	6		Ni V	1214.410	700	
S I	1209.87		A	F III	1212.321	1		Zn III	1214.436	1	Q
Fe II	1209.929	1	P	Cu III	1212.342	4		Ni VI	1214.453	820	
Cu V	1209.945	220		V III	1212.38	100		Cu II	1214.5399	1	
K XIV	1210.		F,P	Cu I	1212.38		A	Cu II	1214.5546	1	
Al II	1210.082	125		Ge III	1212.4	160	P	V III	1214.56	100	
Cu V	1210.082	450		Mn II	1212.40	5		Ni VI	1214.581	520	
Ni IV	1210.116	0	N	Co V	1212.417	110		Ni V	1214.595	630	
S I	1210.18		A	Zn	1212.471	40	N	Cu V	1214.615	170	
Cu V	1210.188	30	N	Ni V	1212.474	150		S I	1214.66		A
Ni II	1210.192	10		Fe VI	1212.577	150		Cu III	1214.709	2	
Ti V	1210.290	0		Cu V	1212.590	500		Fe V	1214.711	20	
Mn II	1210.33	5		Ni V	1212.592	590		B V	1214.752		P
F III	1210.349	3		S I	1212.66		A	Be IV	1214.845		P
Co II	1210.358	1		Ca III	1212.682	200		F III	1214.864	0	
Fe VI	1210.379	200		Zn IV	1212.693	25		Cu IV	1214.888	20	
Ni V	1210.399	810		Ni V	1212.780	780		Li III	1214.945		P
Si III	1210.456	200		Co VI	1212.81		P	B V	1214.947		P
Cr V	1210.499	220		V III	1212.82	10		S I	1214.98		A,Z
Ni V	1210.509	850		S I	1212.82		A	Be IV	1215.000		P
Ni VI	1210.512	860		Ni V	1212.889	460		B V	1215.014		P
Mn III	1210.523	40		Zn III	1212.930	0	Q	Be IV	1215.053		P
Cu V	1210.575	610		Cu III	1212.941	3		Li III	1215.060		P
P III	1210.601	40		Ni II	1212.959	0		Cu IV	1215.062	40	
Ni V	1210.638	190		Fe II	1212.966	2	P	He II	1215.095	143	P
Si IV	1210.652			Cr III	1212.98	50		Li III	1215.100		P
Ni II	1210.729	3		Cr XIX	1213.		F,P	Ni V	1215.133	690	
Br I	1210.734	300		S X	1213.00	3	F	He II	1215.171	260	P
Ni V	1210.736	480		O IV	1213.035	60		He II	1215.175	30	P
Cu V	1210.759	670		Be III	1213.12	20		Ni V	1215.272	750	
Co V	1210.771	370		Fe II	1213.149	20		Fe VI	1215.296	400	
P I	1210.788	3		Ni II	1213.149	7	N	D I	1215.3376	330	P
Ni II	1210.790	1		Cu III	1213.163	5		D I	1215.3430	670	P
Ni V	1210.799	420		Ga V	1213.17	80		Ti V	1215.373	50	
Co VI	1210.87		P	O IV	1213.196	40		S I	1215.45		A
Mg IV	1210.967	160		Zn III	1213.199	1	Q	Cu V	1215.495	400	
Co V	1211.033	500		Ni V	1213.237	200		H I	1215.6683	670	P
O IV	1211.043	5	N	Ca III	1213.301	300		H I	1215.6737	330	P
P IV	1211.052	120		F III	1213.353	20		P III	1215.886	60	
Cu V	1211.076	660		Ni II	1213.361	7		Cu V	1215.943	750	N
Mn III	1211.116	60		Al V	1213.48	50		Mg VII	1216.		F,P
Cu V	1211.121	680		Co V	1213.494	130		S	1216.	100	N
Cr III	1211.123	400		Mn II	1213.50	0		Br I	1216.006	280	
As II	1211.170	800		Cr III	1213.51	50		P I	1216.055	1	
S I	1211.22		A	Ni V	1213.589	520		Mn IV	1216.06	0	
Ni VI	1211.271	30		Ni VI	1213.704	120		Si II	1216.117	10	N
S I	1211.38		A	Fe II	1213.738	2	P	P III	1216.127	120	
Cu V	1211.399	670	N	Fe II	1213.759	3	P	Ni V	1216.151	670	
Ni II	1211.403	1		Cr III	1213.82	10	N	Ga IV	1216.172	40	
Ni V	1211.424	240		Ni V	1213.859	660		Cu III	1216.176	5	N
Fe VI	1211.503	400	P	Cu V	1213.930	580	N	Mn III	1216.301	260	
F III	1211.585	6		Ni V	1213.943	780		Cu III	1216.395	12	
P IV	1211.612	60		P I	1213.965	3		Fe XIII	1216.43	6	F
Mn III	1211.632	115		S I	1213.99		A	Cu V	1216.433	520	
Al IV	1211.724	40		As III	1214.00	100		Cu V	1216.433	520	
Mn III	1211.725	40		Ti V	1214.000	0		S I	1216.45		A
Si IV	1211.757			Cu III	1214.005	15	N	Cu III	1216.532	2	
P I	1211.804	0		Ni II	1214.104	3		Ni V	1216.539	280	
Ca III	1211.822	450		Zn IV	1214.121	15		P I	1216.602	1	
Cr III	1211.84	10	N	Fe II	1214.150	1	P	Mn III	1216.639	20	
Zn II	1211.841	25		Ni II	1214.153	40		Al IV	1216.723	300	
Ca III	1211.889	250	N	Cu III	1214.173	1	N	Ni VI	1216.798	870	
Cu I	1211.89		A,Z	Ni V	1214.174	710		Cu V	1216.826	720	
Al II	1211.898	150		Fe VI	1214.212	80		Kr III	1216.90	100	
Al II	1211.953	125		Cu V	1214.214	330		Ni VI	1216.977	10	
P IV	1211.984	90		S I	1214.295	1		S I	1217.05		A
Fe II	1211.986	2	P	S I	1214.318	7		Ni V	1217.062	640	
Ni V	1211.999	210		Be III	1214.32	10		Ni V	1217.112	740	
Si III	1212.011	40		Cu III	1214.323	1		Ni II	1217.180	100	
Cu V	1212.023	640		Ni II	1214.350	1		S I	1217.27		A
Cu III	1212.073	2	N	Cu V	1214.362	710		Cu V	1217.317	690	
Cu V	1212.098	390		F III	1214.368	3		Cu III	1217.361	5	
Zn IV	1212.110	12		Cl II	1214.3851	35		Ni VI	1217.419	20	
Si III	1212.247			P I	1214.389	7		Ca III	1217.450	50	

Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes
Zn III	1217.494	3	N	Zn	1219.671	12	N	S I	1222.33		A
Co VI	1217.50		P	Cu I	1219.72		A,Z	Ti V	1222.359	250	
Ni V	1217.502	320		Cu III	1219.725	30	N	Ni II	1222.395	20	
Ni VI	1217.572	720		Mn III	1219.801	30		Zn III	1222.427	0	Q
Ni V	1217.576	750		Fe II	1219.802	30	P	Mn IV	1222.49	70	
Cu III	1217.580	50		Ni V	1219.886	250		Cu V	1222.528	390	
V III	1217.64	150		Zn	1219.901	12	N	Mn IV	1222.58	80	
O I	1217.6477	40	Z	Cu V	1219.921	310		Si II	1222.635	5	
Si VI	1217.65	10		Cu I	1219.95		A,Z	Ni II	1222.678	1	
Cu I	1217.66		A,Z	V III	1220.09	15		Cu V	1222.711	720	N
Ni VI	1217.672	510		Cr III	1220.14	200	N	Mn II	1222.785	30	
Ni II	1217.692	1	N	Cu IV	1220.141	130		Ni V	1222.788	510	
Cu III	1217.703	2		S I	1220.162	5		Cu III	1222.796	30	
Co VI	1217.71		P	Cu IV	1220.186	40		S I	1222.799	1	
Ni V	1217.761	810		Ni VI	1220.191	380		Fe VI	1222.824	300	
Ti V	1217.779	30		Ni V	1220.317	360		Ca III	1222.895	200	
Cu V	1217.832	640		Fe VI	1220.388	400		Cu V	1222.944	510	
Fe II	1217.848	2	P	Ni VI	1220.428	470		P I	1222.963	0	N
P I	1217.852	3		Cu V	1220.438	530		Ni II	1222.989	1	
Cu V	1217.950	70		Cu III	1220.493	5	N	P I	1223.017	7	
Fe V	1217.993	50		Ni II	1220.530	3		Cu III	1223.019	3	
Se II	1218.01	150		V III	1220.54	0		Cu IV	1223.086	40	N
Mn V	1218.059	100		Al IV	1220.546	400		P IV	1223.098	40	
Ni V	1218.061	410		Ni VI	1220.709	150		As II	1223.149	350	
Fe II	1218.088	0	P	Ni VI	1220.781	110		Mn II	1223.15	8	
As II	1218.099	800		Ni V	1220.836	250		Zn IV	1223.181	60	
Fe II	1218.231	2	Q	Fe VI	1220.841	300		Ca III	1223.185	450	
Cu I	1218.26		A,Z	Fe II	1220.872	1	P	Cu V	1223.197	660	
Se II	1218.27	50		Ni V	1220.879	300		Ni V	1223.204	380	
S I	1218.30		A	Mg IV	1220.900	180		Cu III	1223.217	25	N
Cu III	1218.371	5		Fe VI	1220.926	200		Br I	1223.240	300	
P I	1218.400	0		Mn III	1220.940	750		Cr III	1223.286	25	
O V	1218.406	3		Ni II	1220.950	1		Co VI	1223.32		P
Co V	1218.435	670	N	Fe VI	1221.002	100		Cu III	1223.347	75	
Zn III	1218.459	2	Q	Co V	1221.016	360		Ni V	1223.390	520	
Cu V	1218.463	690		P I	1221.051	7		Na III	1223.44	80	N
Si VI	1218.50	100		Cr III	1221.076	350		Ni V	1223.444	760	
V III	1218.50	125		Cu V	1221.100	330	N	Ni II	1223.466	2	
S I	1218.51		A	Mn II	1221.11	6		Cu III	1223.507	10	
P I	1218.547	3		Ni V	1221.113	640		Mn IV	1223.56	20	
S I	1218.571	2		Na III	1221.12	100	N	Mn III	1223.591	150	
S I	1218.595	10		Br I	1221.128	300		Cu V	1223.622	670	
Cr III	1218.60	100	N	S I	1221.13		A	Cu III	1223.639	40	
Mn III	1218.678	150		Co V	1221.132	170		Ni II	1223.643	5	
Cu V	1218.702	580		P I	1221.150	7		Zn IV	1223.680	30	
Co V	1218.705	290		Ni II	1221.213	1		Ni V	1223.685	60	
Ni V	1218.726	160		F II	1221.235	100		P I	1223.693	15	
Ca III	1218.738	50		Ni II	1221.289	1		Cu V	1223.719	690	
Cu V	1218.876	180		Cu I	1221.29		A,Z	Ni II	1223.775	1	
Cr III	1218.89	50	N	Cu V	1221.344	700		Cl II	1223.7814	200	
Mn V	1218.891	40		Cu I	1221.39		A,Z	Mn III	1223.836	20	
Mn II	1218.94	8		Cr III	1221.45	10	N	Cu V	1223.866	760	
S I	1218.95		A	P III	1221.471	40		Si II	1223.907	20	
As II	1218.95	225		F II	1221.536	40		Cu III	1223.959	25	N
Zn III	1218.953	1	Q	Cu III	1221.678	5		Fe VI	1223.969	400	
Mg IV	1218.992	160		Ni V	1221.699	810		Ti XVI	1224.		F,P
Mn IV	1219.02	0	N	Cu III	1221.742	10	N	Co XX	1224.		F,P
F III	1219.032	150		S I	1221.753	6		Ni II	1224.033	75	
Ni VI	1219.164	20		Ga V	1221.87	10		Zn IV	1224.052	50	
Al IV	1219.171	300		Ni V	1221.870	320		Co VI	1224.12		P
Co VI	1219.27		P	Br I	1221.870	295		Fe II	1224.132	40	P
P I	1219.286	3		P I	1221.881	7		Cu V	1224.140	750	
Cu III	1219.299	300		Cr III	1221.908	400		Zn IV	1224.179	20	
Co VI	1219.31		P	Se II	1221.94	50		V III	1224.19	125	
Cu II	1219.3337	1		Ni II	1221.992	40		Cu V	1224.243	740	N
V III	1219.38	5		Br II	1222.0	10		Si II	1224.252	20	
Sc IV	1219.399	285		Ga V	1222.15	10		Cu III	1224.253	35	
Co V	1219.488	130		S IV	1222.18	88	N	Ni II	1224.268	1	
P IV	1219.495	40		Ni V	1222.189	540		Ni V	1224.335	500	
Mn II	1219.50	0		Cu V	1222.209	430		Zn IV	1224.348	20	
Cu III	1219.511	4	N	Ni II	1222.220	1		Cu IV	1224.378	70	
Cr III	1219.55	50	N	Zn III	1222.266	8		Br I	1224.408	320	
Cu V	1219.615	720	N	Si II	1222.288	0		Fe V	1224.417	10	
Ni VI	1219.662	910		Cu V	1222.288	540	N	S I	1224.424	1	
S I	1219.67		A	Ge V	1222.301	700		Cr III	1224.43	30	N

Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes
Co VI	1224.46		P	N I	1226.833	8	P	Mn III	1228.972	100	
Ti V	1224.469	0		Si II	1226.887	20		Mn VII	1229.0		P
S I	1224.479	7		Br I	1226.899	320		Si VI	1229.01	300	
S I	1224.544	7		Ni VI	1226.961	110		Se II	1229.04	50	
Ni V	1224.558	680		Mn IV	1226.97	50		Zn IV	1229.062	15	
Co VI	1224.56		P	Si II	1226.986	40		Mg IV	1229.066	80	
Se II	1224.63	100		Ni V	1227.057	240		Ni VI	1229.084	20	
Na III	1224.73	80	N	S I	1227.089	4		Cu III	1229.108	3	
Mn II	1224.733	30		Mn IV	1227.09	30		N I	1229.174	14	
Ni V	1224.758	580		Ga II	1227.10	1		Zn	1229.253	20	N
Cu III	1224.784	25		Cr III	1227.11	20		Si II	1229.388	200	
Cu V	1224.806	430		Mn III	1227.117	60		Mg III	1229.389	4	
Ni II	1224.839	2		Cu V	1227.182	720		Ni V	1229.400	810	
Cu I	1224.85		A, Z	Ni V	1227.196	420		Ni V	1229.400	810	
Cu III	1224.870	3	N	N I	1227.241	7		Co VI	1229.42		P
Ni V	1224.875	510		Zn III	1227.263	1	Q	Cu III	1229.439	50	
Mn II	1224.928	6		Ni II	1227.267	15		Co VI	1229.49		P
Ni V	1224.948	810		Cr IV	1227.43	10	N	Co V	1229.507	100	
N IV	1224.960	50		Cu IV	1227.444	570		Cu V	1229.509	470	
Si II	1224.972	10		S II	1227.45	100		Cr III	1229.552	200	
S I	1224.99		A	Cu V	1227.476	770		S I	1229.608	10	
Ni XII	1225.		F, P	Ni V	1227.480	20		Mn II	1229.65	25	
Cr III	1225.02	100	N	Ni II	1227.491	5		Ni V	1229.680	200	
N I	1225.027	21		Ni VI	1227.556	20		Ni II	1229.684	10	
Ni V	1225.112	530		N I	1227.586		P	Ne II	1229.688	70	
Mn III	1225.133	350		Se V	1227.6	350		Cu III	1229.771	3	
V VI	1225.178	40		Si II	1227.604	100		Ge IV	1229.8	400	P
O I	1225.180		P	Zn IV	1227.615	15		Cu V	1229.831	380	N
O I	1225.181		P	Mn II	1227.638	23		Ne II	1229.832	90	
O I	1225.182		P	S I	1227.692	5		Cu III	1229.847	25	
N IV	1225.192	150		N I	1227.793	8		Al IV	1229.908	40	
Al IV	1225.236	10		Cu III	1227.830	15		Cu V	1229.944	420	N
Cr III	1225.263	300		P IV	1227.839	60		Fe VI	1229.948	400	
Cu III	1225.269	1		Cu V	1227.880	310		P I	1229.965	7	
Cu I	1225.29		A, Z	Fe VI	1227.882	300		C IV	1230.046	100	
Cr III	1225.32	150	N	Ni VI	1227.957	20		Cu V	1230.053	340	
Ca III	1225.321	200		Ga IV	1227.996	600		P I	1230.062	7	
N I	1225.374	20		Zn IV	1228.003	1		Ni V	1230.062	600	
Fe II	1225.497	20	P	Cr III	1228.03	10	N	Cu V	1230.106	760	
Co V	1225.499	560		Br I	1228.049	280		Mn II	1230.11	20	
Cu III	1225.526	20		Fe V	1228.126	20		Ni II	1230.116	8	
Cr III	1225.645	300		Ni V	1228.168	190		Mn III	1230.12	20	
Ca III	1225.699	350		Sc IV	1228.204	360		Ga V	1230.13	25	
N IV	1225.719	200		Cu III	1228.210	150		Mn II	1230.15	15	
Cu IV	1225.731	150		P I	1228.253	7		B II	1230.160	300	
P VI	1225.770	900		Zn II	1228.261	0	Z	Cu V	1230.204	720	
Cu III	1225.778	20		Cu IV	1228.288	70		P I	1230.251	3	
Cu V	1225.822	710		Co VI	1228.30		P	Cr III	1230.35	10	N
P I	1225.825	1		Al IV	1228.310	300		P I	1230.350	3	
F II	1225.854	40		Ca III	1228.317	200		Ti V	1230.361	300	
Cu V	1225.920	570		Si IV	1228.349			Ni II	1230.367	1	
Br II	1226.0	10		Cr III	1228.37	10	N	S I	1230.374	2	
N I	1226.060		P	N I	1228.4067	265	P	Cu V	1230.400	560	
Cu III	1226.091	10		N I	1228.4125	225	P	Cu III	1230.412	1	
Cu IV	1226.121	20	N	Mn II	1228.423	20		Ni V	1230.439	640	
N I	1226.143		P	Ni V	1228.426	700		Zn III	1230.451	25	
F II	1226.161	10		Si II	1228.437	10		Mn II	1230.46	1	
Cr III	1226.18	10	N	P I	1228.465	15		S I	1230.473	4	
Cu V	1226.245	230		Zn IV	1228.482	60		Cr III	1230.49	10	N
F II	1226.267	40		Fe II	1228.521	20	P	C IV	1230.511	150	
Ni V	1226.276	380		Ni II	1228.581	0		N I	1230.5434	40	P
Zn IV	1226.325	8		Fe VI	1228.604	500		N I	1230.5492	40	P
Co VI	1226.40		P	Si II	1228.617	25		Fe II	1230.597	1	P
Mn II	1226.40	25		Zn IV	1228.646	50		Mn II	1230.62	1	
Cu V	1226.521	730	N	Cr III	1228.647	350		Ni V	1230.731	320	
V IV	1226.523	60		Fe VI	1228.725	200		Ni II	1230.782	40	
Cu V	1226.560	730	N	Si II	1228.746	150		Si IV	1230.795		
Ti V	1226.588	1		F II	1228.763	40		Cr III	1230.802	250	
Ni II	1226.628	25		N I	1228.7852	225	P	Ni V	1230.821	580	
Fe VII	1226.653	60		N I	1228.7911	325	P	Cu V	1230.827	540	
S II	1226.70	100		Cu IV	1228.872	700		Ni II	1230.869	50	
P I	1226.716	1		Br III	1228.9	20	Q	Mn II	1230.87	10	
Cr III	1226.735	150		Ni VI	1228.903	300		Ni V	1230.875	760	
Zn III	1226.805	1	Q	N I	1228.907		P	Cu IV	1230.885	60	N
Si II	1226.814	50		Fe VI	1228.961	250		Ni II	1230.889	25	

Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes
Fe VI	1230.926	150		Ni V	1233.884	880		Co VI	1236.47		P
Fe II	1230.927	10	P	Cr III	1233.919	200		Ni II	1236.474	0	
Cu V	1230.930	190		S I	1233.922	3		Cr III	1236.51	10	
Zn III	1230.949	1		Zn III	1233.948	50		Mn II	1236.54	15	
Ca III	1230.975	400		Mn II	1233.952	30		Cu V	1236.540	360	
Ni V	1231.030	600		Ni II	1234.092	0		S I	1236.632	4	
Ni II	1231.041	100		S II	1234.14	300		Ni V	1236.664	620	
Ni V	1231.090	720		Ni V	1234.163	820		Ni V	1236.696	690	
Mn IV	1231.10	30		Ni V	1234.257	300		Cr III	1236.71	10	N
Mn II	1231.10	8		Co VI	1234.27		P	Zn II	1236.768	1	Q, Z
P II	1231.18	50		Mn II	1234.30	5		Mn II	1236.77	20	
Cu V	1231.197	100		N I	1234.300		P	Cu III	1236.776	5	N
Mn II	1231.35	5		Cu V	1234.315	640		Ni II	1236.799	25	
Si II	1231.406	5		Co II	1234.353	0		Mn II	1236.87	20	
Cu V	1231.409	700		Ni II	1234.375	4		Mg IV	1236.936	220	
Zn IV	1231.458	25		Fe II	1234.386	5	P	Cu V	1236.950	410	N
Co VI	1231.47		P	Ni V	1234.390	810		Fe VI	1236.967	200	
N I	1231.5756	120	P	Ca III	1234.400	100		Co VI	1237.00		P
N I	1231.5815	120	P	Mn II	1234.51	8		Ti III	1237.018	0	
Mn V	1231.661	30		Ni V	1234.579	770		Ni II	1237.049	10	
Cu V	1231.697	260		Ni IV	1234.6		F, P	Ge II	1237.0589	500	
Co VI	1231.76		P	Co VI	1234.63		P	Ni V	1237.119	270	
Cr III	1231.878	500		Fe V	1234.648	150		P IV	1237.165	10	
Ni V	1231.881	760		Ni II	1234.659	1	N	Sc II	1237.170	1	
Co V	1231.914	650		Ni V	1234.697	440		Al IV	1237.187	900	
Cu V	1231.922	830		Cu V	1234.797	240		Ni V	1237.197	740	
Co VI	1232.08		P	Cu IV	1234.807	120	N	Fe XI	1237.2		F, P
Cu I	1232.09		A, Z	Co VI	1234.82		P	Cu III	1237.204	50	N
Ni II	1232.107	1		Zn IV	1234.857	20		Fe V	1237.221	20	
Co II	1232.253	0		Mn II	1234.871	25		Ni II	1237.247	1	
Ni V	1232.341	180		Se II	1234.88	500		Zn IV	1237.250	25	
Zn III	1232.425	2	Q	Se IV	1234.9	60		P III	1237.252	1	Z
Br I	1232.431	500		Cu III	1234.932	1	N	Ni II	1237.260	1	
Cu III	1232.469	1	N	Co VII	1235.		F, P	Li II	1237.287	10	
Fe VI	1232.479	300		Mn II	1235.06	8		F III	1237.308	6	
V III	1232.49	50		Ni II	1235.069	6		Sc II	1237.317	4	
Ni V	1232.517	860		Cu III	1235.071	20		Ni VI	1237.325	320	
Cu V	1232.622	780		Ni II	1235.112	20		Ni V	1237.328	560	
Co VI	1232.68		P	Mn II	1235.27	10		Si II	1237.36	3	N
P I	1232.687	7		Ni V	1235.305	270	N	Cu III	1237.441	1	
Ni II	1232.773	2		F III	1235.316	10		Co VI	1237.46		P
Ni V	1232.801	850		Cu III	1235.326	30	N	P I	1237.470	7	
Co V	1232.805	100		Co VI	1235.36		P	Co VI	1237.51		P
Cu V	1232.843	470		Na II	1235.40	80	N	Cu V	1237.517	740	N
Ni II	1232.886	3		Ni II	1235.405	10		Mn II	1237.59	2	
Cu IV	1232.899	20		Cu I	1235.42		A, Z	Se II	1237.61	100	
Ni VI	1232.957	800		Ni V	1235.430	160		Al IV	1237.744	10	
Ni V	1232.965	850		Si III	1235.431	140		Cu III	1237.745	20	N
Cr III	1232.975	570		Si V	1235.453		P	Cu IV	1237.765	840	
Ni II	1233.036	15		Mn II	1235.46	25		Mn II	1237.78	1	
Ni V	1233.120	710		Ti III	1235.495	7		Cu III	1237.780	50	
S I	1233.132	1		S I	1235.624	7		Cu III	1237.905	10	N
N I	1233.238	4	P	Sc IV	1235.627	110		Fe II	1237.93	0	
Ni II	1233.250	150		Cu III	1235.643	15	N	Mn II	1237.95	1	
Ni V	1233.268	860		Ni V	1235.764	680		Co V	1237.956	300	
Cu I	1233.28		A	Mn II	1235.79	10		Ni II	1237.961	4	
Cr III	1233.28	10	N, Z	Ni V	1235.831	860		Ni V	1237.972	380	
Cu III	1233.309	3	N	Kr I	1235.838	100	A	Ni II	1237.976	8	
Ni V	1233.324	810		Mn II	1235.87	25		Cu V	1238.064	730	
Cu V	1233.347	560	N	Cu II	1235.8729	0		Ni V	1238.111	640	
Si II	1233.354	5	N	Mg IV	1235.873	200		Zn III	1238.156	2	Q
S II	1233.36	50		Si II	1235.920	10	N	Cu V	1238.183	710	
Sc IV	1233.376	160		Ca III	1236.102	50		Ni V	1238.209	490	
Ti V	1233.387	0		Cu III	1236.131	50	N	Fe II	1238.257	2	P
Ni VI	1233.436	160		Mn II	1236.15	25		Co VI	1238.28		P
Ni II	1233.484	10		Cr III	1236.197	500		Cu IV	1238.315	500	N
P I	1233.495	1		Cu V	1236.213	220	N	Cu III	1238.323	60	
Ni V	1233.500	750		Mn VI	1236.230	230		S I	1238.340	5	
Ni II	1233.557	100		Mn IV	1236.24	70		Mn II	1238.35	5	
Ni V	1233.596	690		Cu III	1236.260	1	N	Co V	1238.373	290	
Fe II	1233.661	10	P	Ni V	1236.267	810		Zn III	1238.379	3	Q
Cu III	1233.788	30		Fe II	1236.34	0		Cr III	1238.529	400	
Cu V	1233.799	150		Co VI	1236.36		P	Ni V	1238.548	380	
Zn IV	1233.806	10		Ga IV	1236.369	150		Ga IV	1238.554	200	
Ni V	1233.850	440		Cr III	1236.424	40		Sc II	1238.571	4	

Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes
Ni VI	1238.637	600		Sc II	1240.810	4		As II	1243.081	950	
Ni V	1238.637	600		Cu V	1240.860	460		Cu II	1243.0857	1	
Cu V	1238.685	340		Al IV	1240.861	700		Ni II	1243.093	75	
Ni V	1238.698	830		Ni II	1240.877	50		Ni II	1243.126	6	N
Fe VI	1238.698	150		Cu V	1241.003	560		C I	1243.14	7	
Sc II	1238.813	30		Ni V	1241.044	590		Cu V	1243.147	550	N
N V	1238.821	1000		Sc II	1241.166	10		Zn IV	1243.157	40	
Mn II	1238.84	7		Ni V	1241.166	120		N I	1243.1711	50	P
Co V	1238.864	280		Ni II	1241.189	1		N I	1243.1786	700	P
Ni II	1238.919	1		Fe VI	1241.192	50		Ni V	1243.218	800	
Cu V	1238.955	770		Ni II	1241.233	2		Co VI	1243.23		P
P IV	1238.958	90		Cu III	1241.244	30		N I	1243.3058	600	P
Ni V	1238.962	690		P IV	1241.246	40		Cu IV	1243.308	90	
Sc II	1238.963	1		Ni VI	1241.254	230		Si VI	1243.31	50	
Ni VI	1238.970	680		Sc II	1241.283	4		N I	1243.3133	50	P
Mn III	1239.000	170		C I	1241.293	1		Ni V	1243.326	560	
Ne II	1239.018	80		As II	1241.311	750		Ni II	1243.345	1	
Ni VI	1239.041	680		Cr III	1241.32	20	N	P I	1243.374	25	
Ni V	1239.051	700		Ni II	1241.320	10		Cu I	1243.40		A, Z
Ni II	1239.061	25		Ni V	1241.326	780		Ni V	1243.407	530	
Zn IV	1239.102	40		Cu IV	1241.370	90		Cu III	1243.42		F, P
Co VI	1239.16		P	Ni V	1241.422	810		Cr III	1243.43	20	N
Ne II	1239.167	60		Cu III	1241.43		F, P	Ni V	1243.495	770	
Mn III	1239.24	50		C I	1241.472	1		C I	1243.518	8	
P IV	1239.276	60		P I	1241.475	15		Co VI	1243.55		P
Cu IV	1239.323	30		Ni II	1241.548	3		Cu V	1243.620	550	
S I	1239.33		A	Cu III	1241.574	5		Ni II	1243.622	3	
Zn III	1239.355	3		Ni II	1241.588	10		Cr III	1243.627	25	
Co VI	1239.40		P	C I	1241.617	1		Ni V	1243.660	230	
P I	1239.476	7		Mn II	1241.63	10		V IV	1243.718	10	
Ni II	1239.506	12		Ni V	1241.630	840		N IV	1243.73		
Mn II	1239.51	1		Ti V	1241.671	300		Mn III	1243.769	30	
Ni V	1239.549	780		Co VI	1241.77		P	C I	1243.784	2	
P I	1239.568	0		Cu V	1241.781	790		O V	1243.801	3	
P IV	1239.587	120		Ga IV	1241.803	40		Zn III	1243.833	20	
Zn IV	1239.602	40		Ni II	1241.827	1		Mg IV	1243.840	140	
Ni V	1239.664	400		Zn II	1241.874	0	Z	Ni II	1243.848	5	
Fe VII	1239.690	60		S I	1241.905	30		F III	1243.888	6	
Cu V	1239.727	800		Cu V	1241.906	620		Br I	1243.897	320	
Ni V	1239.769	240		Ni VI	1241.907	250		Cr III	1243.97	40	N
P I	1239.826	1		Fe II	1241.928	5	P	C I	1243.998	7	
Mg III	1239.827	4		Cu II	1241.9641	2		Ni V	1244.015	750	
Ni II	1239.832	60		P I	1241.972	15		Fe VI	1244.068	30	
Ca III	1239.863	150		Ni V	1241.975	810		Cu III	1244.082	2	
Fe II	1239.871	5	P	Sc II	1241.979	1		P I	1244.089	7	
Mg II	1239.9252	250		Fe XII	1242.03	14	F	Mn II	1244.10	0	
Cu III	1239.927	8	N	Fe II	1242.046	1	P	Ni II	1244.104	3	
Cu V	1239.941	710		P IV	1242.050	60		C I	1244.127	4	
Ni V	1239.950	660		Ni V	1242.072	860		Ni V	1244.174	880	
Sc II	1239.952	50		Cr III	1242.08	10	N	Ni VI	1244.177	850	
Ti V	1239.958	375		Ni II	1242.099	30		P I	1244.199	7	
Ca III	1239.976	400		P I	1242.111	15		Mn IV	1244.24	80	
Ni II	1240.012	1		Ni V	1242.134	700		Ni II	1244.255	5	
Cu V	1240.026	660		V IV	1242.248	3		Ni V	1244.272	520	N
Cu II	1240.0272	1		Mn IV	1242.25	900		Mn II	1244.28	15	
Ni II	1240.029	2	N	C I	1242.278	6		V IV	1244.287	2	
Mn II	1240.04	0		Cu III	1242.282	20		Ni IV	1244.3		F, P
Co VI	1240.05		P	Zn III	1242.411	50		Cu III	1244.378	200	
Fe VI	1240.067	250		Cu III	1242.439	2	N	Ti V	1244.405	0	
Cu III	1240.126	6		P IV	1242.456	1		Cr III	1244.41	10	
Ni V	1240.152	210		Cu IV	1242.534	30		Fe VII	1244.442	1	
P IV	1240.181	40		Cu I	1242.57		A, Z	Mn IV	1244.50	900	
Al IV	1240.206	600		F III	1242.585	3		C I	1244.535	10	
Cu III	1240.216	15	N	Ni II	1242.627	6		Cu III	1244.538	75	
Ni V	1240.309	650		Ni V	1242.645	540		Ni II	1244.560	50	
Cu III	1240.363	40		Fe VI	1242.664	150		Cu IV	1244.566	750	
Co V	1240.370	270		Sc II	1242.693	1		Cr III	1244.58	100	
Cu IV	1240.383	280		Cu V	1242.790	670	N	Cu V	1244.586	750	
Mg II	1240.3947	200		N V	1242.804	800		Ni V	1244.650	170	
Sc II	1240.415	4		Mn III	1242.809	35		Fe II	1244.750	2	P
Zn II	1240.625	3	Z	Co VI	1242.88		P	Ni V	1244.772	610	
Sc II	1240.656	10		Co V	1242.954	240		Ni II	1244.811	100	N
Zn III	1240.750	50		Ca III	1243.008	350		Cu III	1244.841	18	N
Ni VI	1240.767	240		Cu III	1243.016	1	N	Zn II	1244.848	2	Z
Cu V	1240.784	660		Cu V	1243.041	780		Mn IV	1244.88	0	



Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes
Co VI	1244.91		P	Co VI	1247.24		P	Br I	1249.589	285	
N IV	1244.92	50		P I	1247.31	2	N	Zn IV	1249.676	40	
Cu V	1244.955	550		Ni II	1247.333	20		Cu V	1249.742	750	
Ni V	1244.955	790		Zn III	1247.355	5	N	Ni VI	1249.792	310	
C I	1244.996	5		Ni V	1247.368	830		Fe II	1249.798	2	P
Ni V	1245.054	690		C III	1247.383	600		P II	1249.82	200	
Cu V	1245.080	760	N	Cu III	1247.463	10		Mg II	1249.932	80	
Cr III	1245.097	90		Ni II	1247.509	6		Cu V	1249.953	650	
Mn II	1245.14	20		Ni VI	1247.513	460		Cu IV	1250.021	70	
Ni V	1245.176	870		Ni II	1247.568	1		Ni VI	1250.031	780	
C I	1245.183	9		Ni V	1247.600	740		Ni V	1250.033	830	
P I	1245.193	25		Mn II	1247.66	15		Cu II	1250.0483	10	
Cu III	1245.204	15		Ni V	1247.664	570		As II	1250.058	300	
Cr III	1245.231	200		Cu V	1247.696	580		Cu V	1250.080	640	
Cu III	1245.24		F,P	Mn IV	1247.73	850		Si II	1250.089	100	Z
Ni V	1245.263	530		Fe II	1247.816	2	Q	Ni VI	1250.2		F,P
P I	1245.334	7		Fe IV	1247.823	30		Mn II	1250.22	1	
Fe II	1245.340	2	N	Sc II	1247.834	1		Cu V	1250.308	850	
Ni V	1245.353	690		Cr III	1247.846	350		Cr III	1250.33	20	N
Ni V	1245.439	850		C I	1247.867	15		Zn III	1250.336	30	
Co VI	1245.45		P	As II	1247.949	0		Ni V	1250.384	890	
Cu IV	1245.470	40		C I	1248.009	30		C I	1250.423	30	
Ga IV	1245.521	600		Ni V	1248.031	650		Cu III	1250.429	15	N
Ni V	1245.522	650		S I	1248.045	22		Si II	1250.433	150	Z
C I	1245.538	5		Ni V	1248.081	380		Zn IV	1250.466	30	
Mn II	1245.55	15		Mn II	1248.15	5		Ni II	1250.467	6	
Ni IV	1245.631	60		Zn IV	1248.184	15		Cu IV	1250.490	90	
Cu III	1245.643	5		Cu III	1248.198	3	N	S II	1250.50	300	
Cu V	1245.653	790	N	P I	1248.20	1	N	Ni V	1250.541	740	
Sc IV	1245.661	160		Cu V	1248.217	730		Co VI	1250.56		P
As II	1245.668	850		Ni V	1248.217	240		Cr III	1250.57	20	
Mn III	1245.673	750		Ne IX	1248.28		P	Fe II	1250.597	5	N
Ni IV	1245.7		F,P	Ni II	1248.413	9		Ni V	1250.675	430	
Cu III	1245.724	30		Si II	1248.426	150		Mn II	1250.681	7	
Si V	1245.737	500		Ni V	1248.435	550		Ni II	1250.685	4	
Co VI	1245.77		P	Cu IV	1248.455	50		Co V	1250.694	100	
Cl VI	1245.77			Ni II	1248.467	10		Fe V	1250.736	200	
Cu V	1245.875	710		Co VI	1248.47		P	Ni V	1250.772	480	
C I	1245.943	10		Ni V	1248.485	730		Co II	1250.804	0	
Cu V	1245.971	730	N	Cu V	1248.500	540	N	S I	1250.814	12	
Mn III	1245.975	700		Mg II	1248.511	60		Cu V	1250.893	420	
Ni II	1245.977	1	N	Co VI	1248.54		P	Ni V	1250.893	260	
Ni V	1245.988	80		P I	1248.61	1	N	Ni II	1250.901	1	N
Co VII	1246.		F,P	Cr III	1248.621	90		V IV	1250.918	20	
Cu V	1246.092	610		Mn IV	1248.64	300		Co VI	1250.97		P
Ni V	1246.115	350		V III	1248.65	10		Zn III	1251.021	40	
Ti V	1246.131	150		Al IV	1248.790	700		Cu V	1251.110	340	
C I	1246.180	4		Cu II	1248.7916	5		Si II	1251.164	200	
Sc IV	1246.224	40		Ni VI	1248.807	420		C I	1251.176	40	
Mn II	1246.24	12		Ni V	1248.814	630		Co VI	1251.23		P
Zn IV	1246.260	3		Mn II	1248.83	4		Al IV	1251.235	150	
Ni V	1246.353	250		Ni II	1248.844	4		Ni VI	1251.240	110	
N IV	1246.51	100		Cu V	1248.845	670		Ni V	1251.283	220	
Co VI	1246.52		P	Ni VI	1248.9		F,P	Si V	1251.390	600	
Cu IV	1246.523	130	N	C I	1249.004	10		Ni II	1251.394	10	
Cu V	1246.533	340		Zn IV	1249.083	3		Cr III	1251.424	250	
Ni V	1246.535	570		Ni II	1249.101	100		Ni II	1251.438	16	
P I	1246.566	7		Cu III	1249.108	15	N	Ni VI	1251.467	700	
Ni II	1246.598	150		Cu V	1249.143	670		Cu V	1251.572	600	
Cu V	1246.656	730		Se IV	1249.2	25		Si V	1251.639	450	
Si II	1246.738	100		Fe	1249.20		N	Br I	1251.664	340	
Fe II	1246.760	2	N	Ni II	1249.213	8		Cu III	1251.681	20	
Ni V	1246.821	710		Mn II	1249.31	6		Ni V	1251.821	890	
Cr III	1246.83	100	N	Cu III	1249.322	5		Cu V	1251.928	270	N
Cu IV	1246.832	460		Co V	1249.341	90		Mn IV	1251.93	950	
Fe VI	1246.833	200		Cu IV	1249.368	30		Co VI	1251.99		P
C I	1246.862	30		Ni II	1249.369	3		Ni V	1252.055	790	
Cu V	1246.990	790		Cu III	1249.376	20		Cu III	1252.073	1	
Zn IV	1247.000	10		Zn IV	1249.402	5		V III	1252.11	500	
Ni VI	1247.062	20		C I	1249.405	20		Ni V	1252.155	880	
V IV	1247.069	30		Ni V	1249.432	930		C I	1252.208	12	
Cu III	1247.113	12		Fe V	1249.496	20		Co VI	1252.25		P
Cu V	1247.125	690		Ni V	1249.520	860		Ni V	1252.267	830	
P I	1247.142	7		Mn III	1249.529	0		Mn III	1252.289	30	
S I	1247.160	45		Cu IV	1249.543	110		Ni V	1252.336	680	

Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes
Ni V	1252.383	620		P I	1254.412	15		Mn III	1256.675	150	
Ni VI	1252.411	310		Ni V	1254.412	790		Na IV	1256.68	20	Q,Z
Ni V	1252.467	440		Ca III	1254.413	100		Ni II	1256.708	1	
Cr III	1252.616	350		Ni II	1254.471	1		Cu V	1256.709	720	N
Cu V	1252.704	680		Co VI	1254.50		P	Cr III	1256.754	150	
Ni V	1252.707	720		C I	1254.513	15		Ni II	1256.764	1	N
Co V	1252.723	150		Ni V	1254.530	470		Cu V	1256.817	450	
Ni V	1252.765	870		Cu V	1254.597	650		Ni V	1256.818	490	N
Fe VI	1252.769	200	P	Cu III	1254.711	100		Cu III	1256.822	20	N
Cu III	1252.783	1		Ni II	1254.721	50		Ni V	1256.900	730	
Fe VI	1252.789	500	P	P I	1254.758	3		Ni II	1256.905	6	
Zn III	1252.873	3		Cu III	1254.777	20	N	P III	1256.926	40	Z
Ni II	1252.879	1		Se III	1254.8	0		Ni II	1256.930	40	
Mn IV	1252.88	450		Cu V	1254.839	290	N	Mn II	1256.96	10	
Cu III	1252.884	50	N	Ni V	1254.850	550		Ni V	1256.989	410	
Mn II	1252.91	15		Cu III	1254.875	12	N	Ni II	1257.116	8	
As II	1252.916	5		Al III	1254.933			Ni V	1257.129	500	
Co V	1252.984	140		Al III	1254.969			Fe II	1257.18	0	Q
Co VII	1253.		F,P	Ni II	1254.978	7		Ne III	1257.19	600	
Ni V	1253.004	680		K XII	1255.		F,P	Cu III	1257.273	50	
Fe VI	1253.054	200		Mn XIX	1255.		F,P	Mn IV	1257.28	950	
Cu V	1253.068	650		Mn II	1255.01	1		Zn IV	1257.291	30	
Cu V	1253.070	650		Ne III	1255.03	200		Co VI	1257.30		P
Ni VI	1253.079	400		Ni II	1255.034	8		Co V	1257.300	650	
Ti V	1253.079	1		Mn III	1255.078	10		Ti V	1257.442	30	
Ni V	1253.086	580		Cu III	1255.082	15		V III	1257.50	75	
P IV	1253.099	1		Ni VI	1255.1		F,P	Fe V	1257.531	10	
Al V	1253.11	3		P III	1255.116	60	Z	C I	1257.565	20	
Ni II	1253.122	50		Cu II	1255.1571	1		Ni V	1257.620	860	
Cu I	1253.15		A,Z	Mn III	1255.21	20		Al IV	1257.624	900	
Cu II	1253.1809	5		Ni VI	1255.260	160		Cu III	1257.672	75	
Ni V	1253.191	850		Cu V	1255.261	690		Cu II	1257.6833	1	
Sc IV	1253.195	220		Si I	1255.276	10	Z	P III	1257.702	4	Z
Zn III	1253.201	10		Al III	1255.284			Ni II	1257.829	2	N
Cu III	1253.261	20		Cu V	1255.299	370		Mn III	1257.885	0	
Ni V	1253.290	810		Cu III	1255.314	35		P III	1257.917	40	Z
S I	1253.297	20		Mn III	1255.324	30		Ni V	1258.014	660	
Cu V	1253.302	200		Ni II	1255.335	6		Fe VI	1258.022	100	P
Li II	1253.324	5		Co V	1255.384	130		Mn II	1258.028	15	
S I	1253.325	40		Fe II	1255.406	20	P	Fe VI	1258.031	200	P
Zn III	1253.345	60		Fe VI	1255.476	200		Mn IV	1258.13	750	
Mn II	1253.37	15		Ni VI	1255.5		F,P	Ni V	1258.238	620	
Ni VI	1253.398	790		Ni IV	1255.5		F,P	Ni II	1258.303	0	
Ca III	1253.464	300		Cu I	1255.53		A,Z	Mn VI	1258.413	100	
C I	1253.467	50		Ni V	1255.565	220		Cu V	1258.431	20	
Cu V	1253.471	20		Zn	1255.619	15	N	Ni V	1258.452	460	
Ni II	1253.477	75		Sc IV	1255.663	5		P III	1258.457	25	Z
Ni V	1253.486	820		Ne III	1255.68	500		Mn II	1258.51	15	
Ni VI	1253.581	260		Ni V	1255.732	740		Ni V	1258.525	620	
Ni V	1253.588	610		Mn VI	1255.766	90		Mn III	1258.55	30	
Ni II	1253.599	4		Br I	1255.799	300		Fe V	1258.564	2	
Cu III	1253.631	30		Ni V	1255.810	520		Cr III	1258.568	250	
Ni V	1253.654	850		Cr VI	1255.832	200		Zn II	1258.581	0	Z
Zn IV	1253.664	40		Cu III	1255.848	35		As II	1258.585	800	
Fe VI	1253.676	400		Ni VI	1255.881	110		Cu IV	1258.686	700	
Cu V	1253.703	610		Cl VI	1256.0			Co II	1258.737	5	
P I	1253.737	25		Ni VI	1256.0		F,P	Kr III	1258.74	60	
Al V	1253.76	2		Ni V	1256.019	760		Si I	1258.795	50	Z
Co V	1253.788	160		Ni II	1256.029	5		Ga IV	1258.812	1000	
S II	1253.79	500		Cr III	1256.066	20	N	Al II	1258.858	125	
Fe IV	1253.807	80		Al IV	1256.083	40		Fe VI	1258.879	200	
Cr III	1253.87	5		S I	1256.093	22		P III	1258.904	10	Z
Mn II	1253.880	15		Mn II	1256.18	6		Co XIII	1259.		F,P
Ni VI	1253.9		F,P	Ni II	1256.187	6		Fe XIX	1259.0		F,P
Ni V	1253.983	870		Ni V	1256.209	170		Cr III	1259.014	570	
Cu III	1253.984	25		Cu IV	1256.291	130		Ni V	1259.024	530	
V III	1254.01	400		Ni V	1256.292	210		Mn II	1259.05	12	
Cu III	1254.136	25		Cu III	1256.409	20		Cu III	1259.052	50	
Ni V	1254.187	710		Ni V	1256.422	590		Fe II	1259.053	10	P
Ni VI	1254.2		F,P	Ni II	1256.459	0		Cu IV	1259.075	270	
Mn II	1254.20	10		Mn IV	1256.46	40		Ni V	1259.118	780	
Ni II	1254.290	2		Mn II	1256.47	8		Cu V	1259.167	590	
Zn III	1254.316	25		C III	1256.47	100		Fe II	1259.179	10	P
Ni II	1254.346	0		Si I	1256.490	40	Z	Ni V	1259.183	650	
Mn II	1254.410	15		C I	1256.498	200		Br I	1259.199	340	

Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes
Ca III	1259.209	150		Cu III	1261.616	2	N	Al IV	1264.181	800	
Zn III	1259.302	0	Q	Br I	1261.658	320		Zn IV	1264.205	0	
Kr III	1259.31	60		C I	1261.719	30		Cr III	1264.206	350	
P III	1259.311	4	Z	Ni V	1261.745	850		Co V	1264.240	740	
Cu IV	1259.351	180		Ni II	1261.786	12		Co V	1264.240	740	
P I	1259.413	15		Ni VI	1261.8		F,P	Ni V	1264.245	90	
Cr III	1259.487	400		F III	1261.859	6		Ni V	1264.253	90	
Se IV	1259.5	60		Cr III	1261.864	570		Cu III	1264.305	1	
Cu III	1259.503	12	N	Ni VI	1261.9		F,P	Cu V	1264.347	390	
Ni II	1259.506	1	N	Ge II	1261.9053	1000		Mn IV	1264.41	900	
S II	1259.53	500		Cu III	1261.928	3	N	Ni V	1264.426	710	
Mn II	1259.56	8		Ni II	1261.975	10		Mn II	1264.45	12	
Mn III	1259.572	170		Ni VI	1262.1		F,P	P II	1264.47	30	
Ni V	1259.576	800		Ni VI	1262.120	30		Ni V	1264.518	870	
Cu III	1259.576	8	N	Ni V	1262.134	20	N	Zn III	1264.627	2	Q
Fe II	1259.636	0	P	Fe II	1262.141	10	P	Ni V	1264.629	430	
Zn IV	1259.673	5		Fe II	1262.212	10	P	Ga IV	1264.635	300	
P III	1259.685	1	Z	Cr III	1262.229	40		Ti V	1264.659	80	
Ni VI	1259.7		F,P	Ni II	1262.239	8		Al V	1264.67	10	P
Ni V	1259.716	800		Al III	1262.248			Ge II	1264.7096	300	
Co VI	1259.73		P	Cu V	1262.272	690		Zn III	1264.732	10	Q
Fe V	1259.759	20		Cu IV	1262.309	170		Si II	1264.7374	1000	
Cr III	1259.794	250		P I	1262.311	3		Ni V	1264.739	700	N
Zn	1259.843	10	N	Cr III	1262.347	250		Cr VI	1264.746	50	
Ni II	1259.886	1		Mn II	1262.35	4		Co V	1264.837	630	
Zn III	1259.912	20		Se IV	1262.4	50		F III	1264.870	3	
Cu III	1259.934	150		Co II	1262.401	0		Ni V	1264.920	670	
Co V	1259.935	450		Al III	1262.440			Cu IV	1264.940	360	
Mn II	1259.97	6		Ni V	1262.535	700		Si II	1265.0010	100	
Cr V	1259.986	220		Zn III	1262.541	50		Al IV	1265.03	1	
Co VII	1260.		F,P	Al IV	1262.544	300		Zn II	1265.065		N
Cu I	1260.12		A,Z	Mn II	1262.57	4		Zn III	1265.065	2	Q
Cu III	1260.226	15		Co V	1262.577	530		Fe II	1265.071	1	P
Cu V	1260.244	700		Cu III	1262.637	40		Ti IV	1265.138	4	P
Sc IV	1260.248	1		Ni V	1262.644	200		Ni II	1265.157	14	
Co VI	1260.27		P	Ca III	1262.653	500		Cu III	1265.164	10	
V V	1260.278	10		Cu III	1262.725	2		Zn IV	1265.223	3	
Fe VI	1260.314	700		Ni V	1262.727	490		Cr III	1265.239	200	
P III	1260.322	1	Z	Co V	1262.770	140		Ni VI	1265.280	400	
Ni V	1260.401	820		Cu V	1262.856	510		Cu V	1265.281	360	
Zn III	1260.411	10	Q	S I	1262.8596	70		Co V	1265.304	330	
Si II	1260.4212	500		Cu II	1262.9249	3		Kr III	1265.32	80	
P I	1260.422	1		Ni V	1262.974	20		Zn III	1265.370	60	
Mn II	1260.52	1		Ni II	1262.979	2		Mn II	1265.39	10	N
Cu V	1260.529	450	N	Ni VI	1263.0		F,P	Co VI	1265.44		P
Fe II	1260.533	110	P	Fe II	1263.055	0	P	Ga V	1265.45	30	
C I	1260.613	200		Cr III	1263.064	200		Cu II	1265.5062	15	
Cu III	1260.658	15		Ni V	1263.090	110		Mn II	1265.57	2	
C I	1260.736	250		Ni VI	1263.1		F,P	Fe II	1265.639	10	P
Fe VI	1260.741	600		Co V	1263.162	140		Sc II	1265.653	1	
Ni V	1260.748	180		V III	1263.20	150		Ni V	1265.655	860	
Mn II	1260.77	1		Fe II	1263.200	0	P	Na III	1265.66	40	N
Fe II	1260.829	5	P	Ni V	1263.290	690		Zn IV	1265.716	60	
Ni V	1260.870	80		Ni II	1263.294	100		Ni V	1265.722	830	
Mn III	1260.907	40		Ni V	1263.333	770		Cu V	1265.727	600	
C I	1260.927	200		Co VI	1263.37		P	Fe II	1265.781	10	P
C I	1260.996	150		Co V	1263.373	380		Fe VI	1265.874	400	
Fe VI	1261.060	500		Mg III	1263.375	7		Ni V	1265.874	290	
Ni II	1261.068	1		Zn II	1263.412	40		Ni VI	1265.9		F,P
Ni V	1261.109	100		Cr V	1263.501	450		Co II	1265.934	20	
C I	1261.122	250		Ni V	1263.569	410		V XXII	1265.98		P
Cr VI	1261.128	150		Cr III	1263.617	300		Cr III	1266.000	40	
Cu III	1261.204	30		Ni V	1263.622	330		Ni II	1266.065	1	
Cu II	1261.2154	0		V III	1263.68	125		Cu V	1266.076	590	
Ni V	1261.222	820		Fe II	1263.704	1	P	Fe VI	1266.103	500	
Mn II	1261.27	8		As II	1263.770	950		Ni V	1266.124	280	
Cu III	1261.301	60		Mn II	1263.79	1		Cr III	1266.125	300	
Ni V	1261.330	850		Fe V	1263.844	10		Mn II	1266.13	8	
Ca III	1261.381	150		Fe VII	1263.844	10		Cu III	1266.134	40	
Cu III	1261.388	40		Ni IV	1263.863	10		Ni VI	1266.2		F,P
C I	1261.426	250		P I	1263.869	15		Br I	1266.200	320	
Ni V	1261.430	800		Cu IV	1263.976	100		Fe II	1266.234	5	P
Cr III	1261.53	20		F III	1263.987	6		Sc II	1266.246	1	
C I	1261.552	500		Ni V	1264.002	20		Fe II	1266.253	15	P
Ni V	1261.564	90		Mn VI	1264.101	200		C I	1266.270	20	

Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes
Ti IV	1266.272	10	P	Fe II	1268.557	1	P	Cu III	1271.231	100	
Cu II	1266.3101	10		F III	1268.573	35		Fe II	1271.232	2	P
As II	1266.340	800		Cu II	1268.6686	0		Mg II	1271.2388	80	
Cu III	1266.380	15	N	Cu IV	1268.743	430		Ni V	1271.252	640	
Ni V	1266.395	870		Ni V	1268.746	480		Zn III	1271.291	8	
C I	1266.415	100		Zn III	1268.792	10		Cu II	1271.3178	2	
Cu V	1266.432	570	N	Ni V	1268.871	750		Fe II	1271.347	1	P
C I	1266.517	15	P	Mn II	1268.90	10		Cu V	1271.399	630	
Cu V	1266.519	400	N	As III	1268.95	300		Co V	1271.415	270	
Fe V	1266.524	20		Co V	1268.957	140		Ni V	1271.432	720	
Fe II	1266.525	5	P	Fe II	1269.040	2	P	Cu V	1271.475	600	N
Cr III	1266.551	40		Ni IV	1269.056	10		Fe II	1271.592	1	P
C I	1266.604	10	P	Ni II	1269.059	1		Ni VI	1271.718	120	
Ni II	1266.608	8		Mn III	1269.104	800		Co V	1271.758	110	
Al II	1266.648	150		Cr III	1269.110	400		Mg III	1271.784	2	
Fe II	1266.677	30	P	Ni VI	1269.113	220		Cu III	1271.826	75	
Ni V	1266.697	510		Zn IV	1269.144	4		Cu IV	1271.830	560	
Cu V	1266.758	490		S I	1269.2086	50		Cr III	1271.839	250	
Ni V	1266.859	800		Al IV	1269.209	20		Co II	1271.936	40	
F III	1266.867	150		Ni V	1269.243	710		Mg II	1271.9402	90	
Cu V	1266.886	790	N	Cu III	1269.254	4	N	Fe II	1271.983	55	P
Cu IV	1266.908	580		Ca III	1269.333	10		Cu III	1271.988	40	
Co VII	1267.		F,P	Cu V	1269.351	770		Ni II	1271.993	1	
Co V	1267.024	480		Fe II	1269.353	1	P	Kr XXV	1272.0		F,P
Ni V	1267.027	470		Cu III	1269.36		F,P	Ni V	1272.025	660	
P II	1267.06	5		F III	1269.368	20		Zn III	1272.037	50	
Co V	1267.090	310		Ni V	1269.372	810		Cu II	1272.0417	8	
Cu I	1267.10		A,Z	Co II	1269.383	0		Fe VI	1272.065	800	
Ni V	1267.140	260	N	Mn II	1269.42	5		S I	1272.0749	30	
Ga IV	1267.186	350		Cu II	1269.4464	1		Ni II	1272.080	1	
Co V	1267.238	80		Co V	1269.485	660		Ni V	1272.148	50	
Ga III	1267.25	150		Mn II	1269.54	0		N IV	1272.150	200	
Cu III	1267.252	10		F III	1269.559	60		Mn II	1272.18	6	
Ni V	1267.275	860		Cu III	1269.587	60		Zn IV	1272.192	50	
Mn VII	1267.3		P	Ni V	1269.620	580		Fe II	1272.250	5	P
Zn IV	1267.397	40		Cu V	1269.675	170	N	Co II	1272.282	20	
Co V	1267.422	350		Fe V	1269.784	20		Co III	1272.416	3	N
Fe II	1267.422	55	P	Fe II	1269.823	1	P	Co VI	1272.43		P
Ni II	1267.478	6		Ni VI	1269.870	100		Mn VI	1272.444	500	
Cu V	1267.480	440		Co V	1269.886	180		Cu III	1272.449	2	
Co V	1267.541	730		Ni II	1269.917	2		F III	1272.463	3	
Cu I	1267.55		A,Z	Fe II	1269.959	1	P	Ca III	1272.544	100	
As II	1267.588	800		Co XXI	1270.		F,P	Ni VI	1272.6		F,P
C I	1267.596	50		Ni II	1270.061	1		Fe II	1272.613	35	P
Sc IV	1267.628	110		As II	1270.110	5		Ni II	1272.634	2	N
Si V	1267.638	550		C I	1270.144	3		Ni V	1272.637	700	
Cu V	1267.660	150		Ni II	1270.180	15		Fe II	1272.655	5	P
Co V	1267.679	90		Cu III	1270.181	8		Cu V	1272.699	240	
F III	1267.711	200		Co V	1270.182	70		Ni V	1272.710	660	
Fe VI	1267.748	10		Ni V	1270.186	600		Cu III	1272.710	8	N
Cu V	1267.758	90		Kr III	1270.20	100		Mg II	1272.7212	80	
Ni V	1267.803	850		N IV	1270.280	250		Co V	1272.737	420	
Cu III	1267.855	15	N	Cu III	1270.327	20		N IV	1272.74	100	
Ni V	1267.885	780		Ca III	1270.333	450		Al IV	1272.763	1000	
Ni V	1267.985	390		Co V	1270.374	210		Ni V	1272.775	110	N
Ni II	1268.007	8		Sc IV	1270.408	70		F III	1272.795	6	
Cr III	1268.025	250		C I	1270.408	2		Cu IV	1272.841	90	
C I	1268.051	2		Fe V	1270.470	30		Ni V	1272.857	30	
Zn III	1268.077	50		Cu III	1270.484	2		Fe VI	1272.859	200	
Co V	1268.089	770		Zn III	1270.573	50		Cu IV	1272.864	20	
Fe II	1268.143	5	P	Co III	1270.646	2	N	Zn IV	1272.963	60	
Cu V	1268.147	600	N	Cu III	1270.646	20		V IV	1272.972	30	
Cr III	1268.148	60		Cu V	1270.653	200	N	Fe II	1273.036	2	P
Ni V	1268.170	640		Ni V	1270.677	870		Cu IV	1273.077	330	N
F III	1268.27	3		Co V	1270.729	210		Fe II	1273.097	5	P
Cu V	1268.295	760	N	S I	1270.7821	100		Cu III	1273.129	30	N
Cu III	1268.346	4		Co V	1270.821	270		Cu IV	1273.146	440	
Co II	1268.348	3		Co V	1270.952	460		Ni V	1273.198	870	
Ni VI	1268.350	60		Kr XXI	1271.		F,P	Cu III	1273.231	15	
Ni II	1268.359	2		Cu III	1271.071	8		Cr III	1273.312	200	
Zn III	1268.423	50		F III	1271.075	10		Cu IV	1273.353	40	
Ge II	1268.444	2	Z	Fe VI	1271.095	250		Mg II	1273.4232	110	
Ar II	1268.483	100		Cu I	1271.12		N,A	N IV	1273.47	150	
Ti V	1268.490	200		V IV	1271.153	2		Cu V	1273.485	550	N
Cu IV	1268.543	440		Mn II	1271.22	2		Ni II	1273.488	2	

Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes
V IV	1273.529	10		N II	1276.201	200		P II	1278.094	5	
Cu II	1273.7007	2		Zn III	1276.219	60		Ni VI	1278.173	90	
Cu III	1273.703	35		C I	1276.220	20	P	Cu V	1278.195	780	
N IV	1273.716	100		N II	1276.225			Cu III	1278.22		F, P
Ni II	1273.717	1		Mn II	1276.24	20		Al IV	1278.265	50	
Ni V	1273.728	560		Cu III	1276.280	20		Fe VI	1278.291	600	
Ca III	1273.775	100		C I	1276.287	50		P IV	1278.33	10	
Cu III	1273.790	10		Cu III	1276.29		F, P	Mn II	1278.369	10	
Ni V	1273.809	830		F III	1276.352	3		P IV	1278.38	10	
Zn IV	1273.818	30		Ni V	1276.415	850		Ni V	1278.387	20	
Fe VI	1273.837	200		Mn II	1276.45	8		Ca III	1278.392	550	
Cu III	1273.904	2	N	Mn III	1276.467	50		Zn IV	1278.491	20	
Sc XV	1274.		F, P	C I	1276.483	100		Cu V	1278.504	530	
Cu III	1274.007	25		P I	1276.498	7		P I	1278.593	15	
Co V	1274.007	50		Co V	1276.502	340		Ni II	1278.637	100	
Fe II	1274.063	2	P	Na II	1276.597	30		Cr III	1278.71	20	
Cu II	1274.0708	3		Ni II	1276.602	2	N	Mn II	1278.75	15	
Mn II	1274.08	2		Ni V	1276.603	160		Sc IV	1278.784	70	
Ge II	1274.100	5	Z	Cu IV	1276.631	770		Co IV	1278.8		F, P
C I	1274.109	50		Fe V	1276.647	30		F III	1278.810	60	
Ni II	1274.180	2		Mn III	1276.691	70		Cu V	1278.857	250	
Ni V	1274.252	780		Cu III	1276.691	5	N	Ni V	1278.874	140	
As III	1274.27	450		C I	1276.750	200		Mn II	1278.90	2	
Ni II	1274.270	100		Cr III	1276.76	200		Co V	1278.924	150	
Si II	1274.300	3	N	Cu IV	1276.766	290		Cu III	1278.928	12	
Zn III	1274.383	60		Co V	1276.769	270		Kr III	1278.94	20	
Se IV	1274.4	30		Mn II	1276.77	10		Zn III	1279.021	50	
Cu II	1274.4651	3		N II	1276.800	100		Ni V	1279.050	170	
Cu III	1274.476	15		Fe II	1276.801	10	P	C I	1279.056	100	
Cu IV	1274.491	70		Se II	1276.84	50		Mn II	1279.09	10	
Ni V	1274.491	20	N	Cu V	1276.844	660	N	Fe II	1279.101	5	P
C I	1274.624	3		Ga V	1276.85	30		Fe VI	1279.129	100	
Cu V	1274.733	800		Ni II	1276.859	1		Cu III	1279.142	100	
C I	1274.756	20		Fe VI	1276.876	700		Cu V	1279.155	570	
Ni II	1274.802	10		Ni V	1276.882	360		C I	1279.229	150	
Mg III	1274.831	100		Co II	1276.902	20		Ga IV	1279.268	300	
Co V	1274.834	710		Ni V	1276.945	690		Ni V	1279.329	590	
Mn II	1274.84	2		Cu IV	1276.985	70		Ni II	1279.400	1	
Cu IV	1274.843	860		Co V	1277.023	830		Cu III	1279.422	8	N
Cu V	1274.907	690	N	C I	1277.041	5		Co II	1279.434	0	
Cu III	1274.969	30		Cu V	1277.074	390	N	Mn II	1279.44	2	
C I	1274.984	150		Fe VI	1277.077	250		Br I	1279.477	300	
Ni VI	1275.029	20		Cu III	1277.081	30	N	C I	1279.498	70	
N II	1275.038	300		Ni II	1277.086	1	N	Co V	1279.571	700	
Mn II	1275.10	20		Zn IV	1277.110	60		Fe V	1279.591	50	
Fe II	1275.144	20	P	Mn II	1277.12	20		Ni VI	1279.6		F, P
C I	1275.146	2	P	Cr III	1277.174	25		Cu V	1279.661	670	
N II	1275.251			Ni V	1277.183	220		Ni V	1279.708	650	
N II	1275.275			S I	1277.199	40		Co V	1279.808	210	
C I	1275.288	12		Si VI	1277.20	500		P VI	1279.814	500	
Co XIV	1275.3		F, P	S I	1277.216	90		C I	1279.890	250	
Cr III	1275.34	150		Ni XIII	1277.23	0	F	Cr III	1279.906	250	
Fe II	1275.349	2	P	Ni II	1277.243	20		Ni V	1279.926	120	
Cu V	1275.442	320	N	C I	1277.245	300		Cu II	1279.9615	0	
Mn III	1275.461	190		Cu V	1277.257	220		Al V	1280.01	8	
Cu II	1275.5717	30		C I	1277.282	700		Ge II	1280.050	2	Z
Ni II	1275.640	10		Co IV	1277.3		F, P	S I	1280.0991	50	
Si II	1275.662	5	N	Zn II	1277.306	60		Ni V	1280.105	520	
Co V	1275.694	150		Fe VI	1277.316	200		Mn II	1280.11	10	
Al IV	1275.731	5		Ni II	1277.344	1		C I	1280.135	200	
Zn IV	1275.756	40		Cu IV	1277.427	390		Ar II	1280.225	100	
Fe II	1275.778	55	P	C I	1277.513	100		Cu II	1280.2682	5	
V III	1275.78	75		Zn II	1277.523	40		Ni V	1280.274	80	
Fe II	1275.807	60	P	C I	1277.550	1000		C I	1280.333	700	
Cu III	1275.808	5		Ni II	1277.617	1		Cu IV	1280.346	800	
Fe II	1275.820	10	P	Mn IV	1277.63	100		Si III	1280.354	120	
Ni V	1275.906	720		Co II	1277.642	10		Co V	1280.377	90	
Co V	1275.955	780		Fe II	1277.643	60	P	C I	1280.404	75	
Mn II	1275.97	40		Ni V	1277.658	290		Zn IV	1280.443	60	
Cu V	1275.982	620	N	Fe II	1277.685	10	P	Cu V	1280.464	530	N
Sc XVI	1276.		F, P	C I	1277.723	250		Fe V	1280.471	100	
Si V	1276.007	600		Ni II	1277.725	2		Fe II	1280.526	5	P
Mn III	1276.092	700		Mn II	1277.82	20		Mn III	1280.583	60	
P I	1276.186	15		C I	1277.954	70		C I	1280.597	200	
Co V	1276.192	730		Ni II	1277.967	18		Fe V	1280.650	50	

Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes
Co II	1280.681	8		Cu V	1283.139	380		P I	1285.862	25	
Cu V	1280.687	740		Cu IV	1283.169	150		Cr III	1285.90	10	N
Mg III	1280.702	2		Ni V	1283.177	120		Ca III	1285.908	400	
Ti IV	1280.788		P	Cu IV	1283.294	750		Fe V	1285.918	70	
C I	1280.847	250		Kr III	1283.31	60		Cu II	1285.9222	1	
Co V	1280.862	130		Ti IV	1283.334	4	P	Mn II	1285.95	8	
Cu IV	1280.886	610		Fe VI	1283.388	200		Ni VI	1285.975	90	
Co VI	1280.9		F,P	Ni II	1283.399	12		Ti V	1286.036	12	
Co II	1280.960	15		Cu V	1283.440	580		Co II	1286.087	10	
Co V	1280.964	240		Cu IV	1283.454	280		Fe VI	1286.092	200	
As II	1280.987	700		Ti V	1283.463	1		Ni V	1286.111	270	
Cr III	1281.055	1		Al IV	1283.484	40		Cu V	1286.134	680	
Ni II	1281.056	1		Zn IV	1283.497	50		S IV	1286.17	100	
Cu III	1281.064	18		Cu V	1283.504	610	N	Ti III	1286.233	60	
Ti V	1281.091	0		Co II	1283.513	0		Fe VI	1286.235	200	
Cu V	1281.123	630		Mn III	1283.581	500		Br I	1286.259	300	
P I	1281.246	3		Fe V	1283.613	20		Cu III	1286.276	8	
Cu II	1281.2570	3		Ga V	1283.64	15		Ni II	1286.338	50	
Ni V	1281.269	210		Cu V	1283.671	760		Cu V	1286.339	500	
Zn IV	1281.292	15		Ni II	1283.731	3		Ti III	1286.369	360	
Na II	1281.308	15		Cu III	1283.744	2	N	Co V	1286.372	760	
Cu V	1281.365	630		Kr III	1283.80	60		Ga II	1286.38	120	
Fe V	1281.367	50		Cu III	1283.829	2		Ni II	1286.396	3	
Co V	1281.389	130		Cu II	1283.8298	1		Se II	1286.41	100	
Cr VI	1281.439	80		Mn III	1283.882	115		P I	1286.449	60	
Cu II	1281.4616	8		P I	1283.884	40		Ni V	1286.465	20	
Zn III	1281.508	40		Ni V	1283.941	160		Ca III	1286.523	600	
Ti V	1281.541	2		Zn III	1283.941	50		Cu V	1286.551	770	
Ca III	1281.553	500		Fe VI	1283.998	150		Ni II	1286.561	50	
Zn	1281.573	20	N	Co II	1284.029	10		Co III	1286.626	2	N
Co V	1281.583	540		Mn III	1284.058	30		Cu III	1286.631	12	
Ni II	1281.609	5		Cr III	1284.103	200		S VI	1286.8		P
Cu III	1281.617	3	N	F III	1284.105	3		Co II	1286.848	5	
Fe V	1281.652	20		Fe V	1284.109	80		Fe II	1286.914	1	P
Co V	1281.668	790		Ni VI	1284.137	560		Co V	1286.930	740	
Ni II	1281.704	4		Zn IV	1284.185	40		Mn III	1287.004	60	
Ni II	1281.723	12		N IV	1284.218	150		Fe VI	1287.030	300	
Mn IV	1281.73	30		Co II	1284.244	1		Cr III	1287.05	400	
Cu V	1281.787	460	N	Cu III	1284.259	18		Co IV	1287.1		F,P
Co V	1281.797	70		V III	1284.27	150		Fe V	1287.101	125	
Mn III	1281.812	30		Co V	1284.296	440		Mn III	1287.137	15	
Ni II	1281.834	50		P II	1284.31	5		Cu III	1287.139	50	
Cu V	1281.859	290	N	Ni II	1284.327	25		Cu IV	1287.153	630	
Ni V	1281.875	60		Zn IV	1284.382	50		V III	1287.19	50	
Co II	1281.890	10		Cr III	1284.46	10	N	Cu III	1287.256	12	N
Cr III	1281.977	300		Ni V	1284.470	560		Cu I	1287.28		A,Z
Zn IV	1282.027	20		Co V	1284.546	140		Ni II	1287.329	15	
Cu V	1282.043	620		Ni V	1284.550	470		V III	1287.34	75	
Fe V	1282.058	70		Cu IV	1284.695	570		Co II	1287.381	10	
Ni II	1282.179	2		Zn IV	1284.715	50		Ni IV	1287.406	20	N
Ti IV	1282.195	10	P	Mn II	1284.76	2		Fe II	1287.423	1	P
F III	1282.240	10		Ni VI	1284.782	180		Ni II	1287.432	8	N
Ni V	1282.247	600		Ar II	1284.793	100		Cu II	1287.4683	15	
Mn III	1282.295	150		P I	1284.805	40		Cu V	1287.5		F,P
Ge II	1282.345	15	Z	Cu II	1284.8712	8		As II	1287.538	700	
Zn IV	1282.363	50		Cu III	1284.877	35		Ni V	1287.576	610	
Fe VI	1282.452	500		Co VII	1285.		F,P	Mn III	1287.589	400	
Cu II	1282.4547	15		Cu IV	1285.060	330		Co V	1287.590	350	
Ti III	1282.484	60		Mn VI	1285.102	700		C I	1287.609	5	
Cu V	1282.5		F,P	Na II	1285.117	12		Ni V	1287.656	590	
Cu III	1282.57		F,P	Mn III	1285.164	70		Cu V	1287.691	720	
Ar II	1282.620	100		Ga IV	1285.337	300		Al V	1287.70	500	
P I	1282.624	40		Fe VI	1285.366	700		Cu IV	1287.781	560	
Cu IV	1282.704	20		Si V	1285.457	400		Ni V	1287.800	480	
Ni II	1282.732	1		Cu II	1285.5186	1		C I	1287.805	1	
Ni V	1282.740	550		Mn III	1285.547	15		Cu IV	1287.849	410	N
Ni IV	1282.750	60	N	Sc IV	1285.595	160		V III	1287.87	500	
Ni II	1282.825	10		Co V	1285.598	670		Mn II	1287.978	15	
Cu IV	1282.826	400		Co II	1285.639	15		Ca III	1288.029	100	
P I	1282.921	40		Cu V	1285.663	370		C I	1288.037	200	
P I	1282.980	40		Cu III	1285.677	15		Fe V	1288.169	125	
Co II	1283.018	100		Na II	1285.686	25		Al V	1288.23	100	
Fe II	1283.063	20	P	Zn III	1285.752	40		Co II	1288.243	10	
F III	1283.098	6		Mn III	1285.755	7		Cu I	1288.28		A,Z
Cr III	1283.132	60		Ni V	1285.808	300		Fe VI	1288.294	200	

Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes
Ni IV	1288.316	0	N	Cu IV	1290.969	720		Ni II	1293.533	6	
C I	1288.422	500		Se II	1290.97	600		Fe II	1293.543	0	
Cu V	1288.515	160		Cu IV	1291.081	640		Cr III	1293.569	200	
Ni V	1288.519	30		Fe V	1291.191	125		Mn III	1293.661	200	
V III	1288.63	100		Co V	1291.199	710		Co II	1293.666	30	
Mn III	1288.682	50		Cr III	1291.240	60		Co V	1293.698	280	
Co IV	1288.7		F, P	Ni II	1291.251	10		Cu I	1293.71		A, Z
C I	1288.710	100		C I	1291.304	100		Ti V	1293.710	4	
Fe V	1288.720	2		C VI	1291.389		P	Cu IV	1293.778	70	
Zn III	1288.767	40		Si V	1291.390	450		Ca III	1293.871	450	
Mn III	1288.793	115		V III	1291.40	15		Cu I	1293.88		A, Z
Zn IV	1288.875	40		Cu V	1291.419	240	N	Mg V	1293.9		F, P
Cu V	1288.876	420		Fe VI	1291.436	200		Ne II	1293.902	70	
C I	1288.917	100		Cu III	1291.504	2	N	Mn II	1293.92	1	
Cu IV	1288.955	520		Cr III	1291.531	350		Mn IV	1293.93	150	N
Cu IV	1289.011	420		F III	1291.565	1		Na II	1293.974	60	
Ni II	1289.024	9		Mn II	1291.58	10		Kr III	1293.99	60	
Fe II	1289.094	1	P	Fe II	1291.581	30	P	Co V	1294.024	680	
Cu III	1289.123	2		Ti III	1291.581			Zn III	1294.095	1	Q
Mn II	1289.13	15		V III	1291.59	5		Cu IV	1294.139	720	
Co V	1289.170	170		Ni II	1291.614	10		F III	1294.279	1	
Na II	1289.213	60		Co V	1291.616	250		Zn IV	1294.306	10	
Ni II	1289.298	3		Mn III	1291.618	300		Se II	1294.41	100	
Ti III	1289.299	160		Ti III	1291.624	160		Mn II	1294.437	2	
S VI	1289.3		P	Mn II	1291.70	10		Ni II	1294.500	10	
Fe II	1289.312	5	P	Mn III	1291.714	600		Co V	1294.503	110	
Mn II	1289.35	8		V III	1291.76	25		Si III	1294.543	340	
Ni II	1289.354	7		Cr III	1291.763	400		Fe VI	1294.545	600	
Ni II	1289.369	11		Cu III	1291.773	3	N	Co V	1294.547	110	
Cu IV	1289.415	870		Zn IV	1291.795	50		P II	1294.64	150	
V III	1289.42	400		C VI	1291.806		P	Ti III	1294.673	200	
Co V	1289.476	100		Al	1291.81	10	N	Ti III	1294.716	160	
Ni II	1289.513	2		Ge II	1291.82	2	Z	Mn II	1294.803	10	
Fe V	1289.533	20		Cu III	1291.860	10		V III	1294.82	50	
Cu V	1289.557	310		Cu V	1291.874	420	N	F III	1294.83	1	
P II	1289.57	30		Al V	1291.91	30		Fe II	1294.906	30	P
Ni VI	1289.6		F, P	C VI	1291.943		P	Ni II	1294.968	2	
Cu III	1289.647	3	N	Zn II	1292.00	3		Mn II	1295.15	10	
Ni II	1289.656	6		Cu III	1292.011	12	N	Fe VI	1295.201	400	
Ni II	1289.682	1		Ni V	1292.013	320		Cu III	1295.206	15	
Cr III	1289.824	250		Co V	1292.015	290		Ni V	1295.286	420	
Ni V	1289.830	310		Ni II	1292.033	2		Ni IV	1295.3		F, P
C I	1289.891	50		Cu V	1292.075	670		Ni VI	1295.315	210	
O VI	1289.9		P	Cu V	1292.170	510		Zn III	1295.318	50	
Zn III	1289.935	50		Cu III	1292.201	10		Cu V	1295.389	130	
C I	1289.977	300		Ni II	1292.224	2		Ga III	1295.45	100	
Ca XIV	1290.		F, P	Zn III	1292.231	50		Zn III	1295.465	10	
S	1290.	50	N	Ni II	1292.331	6	N	Co II	1295.535	25	
Zn III	1290.051	50		P III	1292.348	4		Co V	1295.647	90	
Ge II	1290.07	100	Z	Cu V	1292.375	20		S I	1295.6526	110	
P III	1290.074	1		Fe II	1292.406	1	P	Cu III	1295.701	60	
Fe II	1290.194	40	P	Al V	1292.44	200		Ni IV	1295.736	10	
Mn III	1290.225	25		Zn IV	1292.484	60		Mn II	1295.74	6	
Ni V	1290.393	380		Mn II	1292.57	10		V III	1295.76	150	
Ni VI	1290.4		F, P	Fe VI	1292.638	100		Ni V	1295.761	490	
Co V	1290.439	80		Ni II	1292.669	5	N	Fe VI	1295.813	300	
Zn IV	1290.440	40		Cu V	1292.676	590		Cu III	1295.852	2	N
Ni II	1290.442	1		Co V	1292.758	90		Co II	1295.860	30	
V III	1290.46	100		V III	1292.79	250		Ga IV	1295.876	650	
Ni V	1290.479	220		Cu V	1292.842	280	N	Ti III	1295.884	160	
Al IV	1290.486	20		Mn II	1292.87	15		Fe II	1295.903	1	P
Si VI	1290.49	100		Fe II	1293.044	2	Q	Cu III	1295.944	30	
Mn II	1290.52	8		Fe V	1293.125	20		Cr III	1296.01	40	N
Co V	1290.557	140		Cl II	1293.134	6		Mn II	1296.03	3	
Cu III	1290.598	35		Ni V	1293.178	50		Cu III	1296.075	20	
Cu V	1290.617	680		Cu V	1293.223	280		Fe II	1296.084	40	P
Co V	1290.762	140		Ti III	1293.226	160		Ni II	1296.126	1	N
V III	1290.77	300		Ni II	1293.232	5		S I	1296.1738	70	
Fe II	1290.772	20	P	Cu III	1293.286	2		Co V	1296.186	220	
Zn III	1290.789	5		Fe V	1293.305	100		Ni V	1296.198	490	
Co V	1290.834	230		Fe V	1293.377	100		Co V	1296.230	170	
Ni V	1290.872	20		Cu IV	1293.461	860		Fe II	1296.287	1	P
Ni II	1290.908	4		V VI	1293.483	70		Br III	1296.3	1000	Q
Mn II	1290.93	10		Ga III	1293.50	200		Cu V	1296.3		F, P
Cr III	1290.940	300		Al V	1293.51	30		C III	1296.33	200	

Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes
Mn II	1296.43	6		F III	1299.055	3		Zn IV	1301.865	40	
Cu IV	1296.486	50		V III	1299.07	50		P II	1301.87	200	
Zn IV	1296.589	50		Mn II	1299.09	5		Mn II	1302.12	1	
N IV	1296.600	250		Cu V	1299.138	720	N	Al IV	1302.13	100	N
S IV	1296.61	200		Cu III	1299.216	20	N	O I	1302.1685	1000	
Co V	1296.662	510		Cu V	1299.221	730		Ni V	1302.175	490	N
Mn II	1296.67	5		V III	1299.25	50		Ni II	1302.246	10	
Co VI	1296.68		P	Cu II	1299.2678	10		S I	1302.3370	100	
Si III	1296.726	280		As IV	1299.3	500		Cu V	1302.350	220	N
Zn IV	1296.730	50		Fe II	1299.432	30	P	Ni V	1302.380	530	
Co V	1296.733	730		Co V	1299.434	410		Co II	1302.392	30	
Fe VI	1296.738	300		Cu IV	1299.471	20		Co V	1302.409	650	
Fe VI	1296.871	600		Ga IV	1299.478	600		Cr III	1302.45	20	N
F III	1296.940	20		Cr III	1299.56	40	N	Co IV	1302.5		F,P
Ni II	1296.950	13		Co II	1299.576	40		Cu III	1302.547	35	
Ni VI	1296.970	320		Zn III	1299.612	1	Q	Cr VII	1302.551	360	
Cu V	1296.997	330		Mn II	1299.66	5		Kr III	1302.59	40	
Ar XIII	1297.		F,P	Sc II	1299.787	4		F III	1302.599	6	
Ni II	1297.087	2		N II	1299.788		P	Co IV	1302.6		F,P
Co II	1297.099	20		Fe II	1299.804	0	P	Ni VI	1302.6		F,P
Co V	1297.172	380		Cu III	1299.807	20		Ni II	1302.603	1	
F III	1297.188	60		N II	1299.814		P	Mn II	1302.61	9	
Cu V	1297.214	680		Cu IV	1299.824	310		Fe VI	1302.646	5	
Ni VI	1297.239	20		Fe VI	1299.844	100		Cr III	1302.739	4	
Ni II	1297.417	3		Cu III	1299.987	30		Cu IV	1302.744	140	
Cu III	1297.438	30		Fe II	1299.994	1	P	Co V	1302.745	640	
Ni II	1297.442	1	N	N II	1300.035		P	Ni V	1302.833	100	
Ni IV	1297.481	0		Cu III	1300.093	15		Cr III	1302.85	5	
F III	1297.537	100		Cu V	1300.1		F,P	S I	1302.8633	80	
Fe V	1297.547	250		Cu V	1300.147	330		Co V	1302.864	460	
Cu II	1297.5498	2		Cu I	1300.17		A,Z	Fe II	1303.030	2	Q
Cu III	1297.580	5	N	Ni V	1300.224	160		Ni II	1303.078	4	
Cu III	1297.729	10		P I	1300.225	0	N	Fe V	1303.081	10	
Ni V	1297.731	30		Cu III	1300.272	1		S I	1303.1105	80	
F III	1297.757	1		Cu V	1300.329	140		Co V	1303.118	180	
Cu III	1297.809	2	N	Ni VI	1300.331	110		Mn II	1303.12	1	
Na II	1297.856	12		Sc IV	1300.393	20		Ni II	1303.170	2	
Fe II	1297.933	10	P	F III	1300.466	3		Ni II	1303.237	0	
V III	1297.94	50		Mn II	1300.52	1		Co V	1303.270	120	
Mn IV	1297.95	0		Cu IV	1300.571	140		Ni II	1303.283	5	
Cu II	1297.978	1	N	Fe V	1300.608	200		Ni V	1303.317	660	
Ni V	1297.983	70		Co V	1300.613	110		Si III	1303.320	320	
Cu IV	1297.992	150		Cu V	1300.696	610		Fe II	1303.355	5	P
Mn XVIII	1298.		F,P	Si III	1300.703			S I	1303.4295	85	
P IV	1298.022	40		Fe V	1300.846	150		Co V	1303.433	260	
Ca III	1298.035	600		S I	1300.91		A,Z	Cr III	1303.47	40	N
Ne II	1298.046	80		Co V	1300.933	250		Fe V	1303.489	150	
F III	1298.072	6		Ni V	1300.981	610		Ni VI	1303.5		F,P
Cu IV	1298.087	250		Co IV	1301.0		F,P	Mn II	1303.52	4	
Co V	1298.106	10		Cu III	1301.005	15		Ga IV	1303.538	1000	
Fe II	1298.116	2	P	Mn II	1301.06	4		Zn III	1303.551	50	
Na II	1298.142	15		Zn IV	1301.082	30	Q	Co V	1303.563	280	
Cu II	1298.3949	15		Al V	1301.13	10		Co IV	1303.6		F,P
Cu III	1298.433	40		Si III	1301.146	280		F III	1303.624	6	
Zn III	1298.539	50		Fe VI	1301.172	200		Cu III	1303.64		F,P
P IV	1298.573	40		Ni VI	1301.2		F,P	Cu II	1303.6602	2	
Cu IV	1298.603	290		Zn IV	1301.204	50		Cu III	1303.708	12	
Ti III	1298.634	700		Cu III	1301.235	15		Co V	1303.749	260	
Cu III	1298.653	3		Ni V	1301.243	390		F III	1303.871	35	
Zn III	1298.689	50		Co V	1301.279	660		Fe II	1303.899	2	P
Ti III	1298.698	300		Mn II	1301.31	3		Cu III	1303.945	5	
Fe XXV	1298.7		P	Zn III	1301.371	40		Na II	1303.957	15	
Ni V	1298.733	630		Co V	1301.387	320		Ni V	1303.968	170	
Cu IV	1298.752	310		Cu IV	1301.430	910		Cu II	1303.9783	2	
Zn	1298.783	10	N	Co V	1301.544	600		V IV	1304.173	30	
Mn II	1298.800	6		Fe VI	1301.584	150		Sc II	1304.182	1	
Fe II	1298.802	5	P	Mn V	1301.590	20		Cu V	1304.284	620	
Si III	1298.891	300		Ni V	1301.600	90		Cu III	1304.362	35	
Cu II	1298.9053	1		Cu III	1301.603	2		F III	1304.368	20	
P IV	1298.931	25		Zn III	1301.687	50		Si II	1304.3720	100	
Si III	1298.960	360		Cu III	1301.699	15		Fe II	1304.436	5	P
Co V	1298.961	650		Co V	1301.729	140		P II	1304.47	200	
Ti III	1298.997	640		Cu III	1301.779	2		Cu III	1304.504	35	
Cr XVII	1299.		F,P	Na II	1301.782	15	Q	Cu V	1304.540	610	
Na II	1299.018	30		Fe VI	1301.796	600		Na II	1304.546	15	



Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes
Al IV	1304.547	30		Na II	1306.618	20		Se II	1308.89	600	
Ni II	1304.555	1		Ni II	1306.621	6		Fe II	1308.968	0	P
Cu III	1304.572	50		Zn IV	1306.641	60		Cu V	1309.056	610	N
Ni II	1304.594	10		Cu V	1306.672	160		Cu III	1309.069	15	
Co IV	1304.6		F, P	Mg II	1306.7139	110		Ni II	1309.079	0	
Cu III	1304.634	40		Zn II	1306.741	5		Cu V	1309.1		F, P
P II	1304.68	150		Fe II	1306.742	20	P	Cu III	1309.113	25	
F III	1304.705	1		Cu III	1306.750	10		Ni V	1309.149	100	N
Cu III	1304.743	30		Co II	1306.759	20		Co V	1309.267	360	
N II	1304.769		P	Co IV	1306.8		F, P	Si II	1309.2769	200	
Zn III	1304.769	50		Mn II	1306.81	10		Mn II	1309.29	1	
N II	1304.795		P	Fe II	1306.830	2	Q	S I	1309.3		A, Z
Cu III	1304.804	40		Co V	1306.858	130		Ni IV	1309.332	20	
Fe V	1304.816	200		Cu V	1306.863	210		Cr III	1309.348	350	
O I	1304.8576	600		Cu III	1306.864	12		Cu IV	1309.414	930	
Ni V	1304.866	630		Co IV	1306.9		F, P	Ca III	1309.418	50	
Cu III	1304.944	12		N IV	1306.909		P	Mg II	1309.4434	140	
Co V	1304.967	280		Co II	1306.953	80		Si II	1309.458	20	
Ar XI	1305.		F, P	F III	1306.991	6		Cu II	1309.4633	15	
P I	1305.004	15		Co IV	1307.0		F, P	V IV	1309.502	10	
F III	1305.008	0		Cu III	1307.117	2	N	Fe V	1309.521	70	
Ti V	1305.018	0		Ni II	1307.146	10		Zn II	1309.521	1	
Ni V	1305.061	420		Cu III	1307.186	5		Fe II	1309.555	30	P
Ni II	1305.083	6		Mn III	1307.192	20		N IV	1309.557	200	
Cr III	1305.088	25		Se IV	1307.2	200		Fe II	1309.581	10	P
Mn II	1305.136	10		Fe V	1307.219	100		Co V	1309.603	760	
Cu III	1305.161	40		Co VI	1307.23		P	Ni V	1309.656	530	
Ni II	1305.169	25		Cr III	1307.24	100	N	Ga IV	1309.696	500	
Co IV	1305.2		F, P	Fe II	1307.263	2	P	Cu V	1309.715	650	
Al IV	1305.21	1		Ni II	1307.276	50		Mn II	1309.72	3	
Cu V	1305.342	560		Zn III	1307.384	60		Si II	1309.77	2	
Ni III	1305.344	100		Co V	1307.391	620		Co V	1309.783	70	
Se IV	1305.4	45		Mn II	1307.41	1		Cu IV	1309.836	490	N
V IV	1305.420	40		Fe V	1307.424	200		P II	1309.87	250	
P II	1305.48	350		Cr III	1307.47	10	N	Cu III	1309.882	50	
Fe II	1305.520	1	P	Cu III	1307.573	100		Br I	1309.908	400	
Cu II	1305.5608	5		Ni V	1307.595	590		Fe VI	1309.911	600	
Si II	1305.590	50	Z	Cu III	1307.610	50		Fe II	1309.929	1	P
Mn II	1305.63	15		Cr III	1307.64	60	N	Co V	1309.936	420	
Ni V	1305.696	610		Cr VII	1307.696	160		Cu IV	1310.050	70	
F III	1305.697	3		As II	1307.74	350		Co V	1310.070	570	
As II	1305.701	700		Ni V	1307.755	100		Ni V	1310.082	530	
Co V	1305.710	280		Al IV	1307.762	60		F III	1310.117	3	
P I	1305.717	25		Co V	1307.872	80		Zn III	1310.117	60	
Fe II	1305.784	0	P	Mg II	1307.8754	120		Fe II	1310.151	1	P
Mn II	1305.87	5		Mg IV	1307.9	120		Cr III	1310.179	60	
F III	1305.870	35		Na II	1307.936	10		Co V	1310.182	330	
S I	1305.8834	95		Co II	1307.976	0		C I	1310.187	10	
Co II	1305.926	2		P IX	1308.		F, P	S I	1310.1940	100	
Ni V	1305.933	550	N	V IV	1308.061	50		Ni V	1310.249	480	
Fe V	1305.971	100		Cu V	1308.108	520		Mg III	1310.271	2	
Co V	1306.013	230		Al V	1308.16	5		Cu IV	1310.319	310	
O I	1306.0286	200		Mn II	1308.16	1		Ni II	1310.358	1	
P I	1306.036	40		S I	1308.2		A, Z	Ni II	1310.457	15	
F III	1306.04	60		Fe IV	1308.238	1		Br III	1310.5	100	Q
Fe V	1306.080	150		Cr III	1308.27	150	N	Co VI	1310.51		P
Zn IV	1306.097	40		Mg II	1308.2809	120		N I	1310.5401	200	
Ti V	1306.108	200		Cu V	1308.284	550		Fe II	1310.588	1	P
F III	1306.122	20		Cu II	1308.2971	30		Co V	1310.599	130	
Cr III	1306.168	10		Co V	1308.298	90		Cu V	1310.6		F, P
Mn II	1306.17	5		Co V	1308.412	80		Fe VI	1310.621	150	
V III	1306.21	50		Zn III	1308.450	5		Mg III	1310.633	7	
Ni IV	1306.225	140		Ni VI	1308.496	250		C I	1310.637	200	
Co V	1306.227	250		Zn III	1308.569	60		Ca III	1310.669	450	
Ni V	1306.237	660		Br III	1308.6	500	Q	P II	1310.70	600	
Cu III	1306.246	100		Fe VI	1308.645	500		Mg III	1310.720	2	
Ni II	1306.279	4		Ni V	1308.649	460		Fe V	1310.751	2	
Cu V	1306.308	620	N	Mg III	1308.654	2		Cu V	1310.774	520	N
Zn III	1306.322	50		C III	1308.70	200		Ni V	1310.819	250	
Cu III	1306.409	20		Ni II	1308.714	8		Ni VI	1310.863	130	
Al IV	1306.432	200		Ni VI	1308.781	90		Cl II	1310.8951	50	
Cr III	1306.479	25		Cu IV	1308.811	880		Fe VI	1310.917	60	
Ni II	1306.528	1		Co II	1308.834	3		N I	1310.9429	150	
Mg III	1306.59			Co III	1308.850	1	N	N I	1310.9495	25	
Ni V	1306.614	700		Ni II	1308.869	16		Fe VI	1310.986	40	

Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes
Fe II	1311.062	30	P	Se I	1313.53	30		Ni V	1316.307	50	N
Zn III	1311.104	50		Fe V	1313.585	80		Cr III	1316.386	300	
Ni V	1311.106	670		C I	1313.629	3	P	F III	1316.401	35	
Co II	1311.122	40		Co V	1313.636	130		Fe II	1316.492	5	P
Cu III	1311.124	60		Cu III	1313.697	50		Ni II	1316.502	4	
Co V	1311.150	70		Co V	1313.719	320		Co II	1316.521	1	
Ni II	1311.152	1		Ni VI	1313.720	210		F III	1316.531	35	
Na II	1311.158	10		Ni IV	1313.750	20		S I	1316.5423	160	
Co IV	1311.2		F, P	Mn II	1313.77	10		Mn V	1316.555	80	
Fe V	1311.239	150		V II	1313.82	5		S I	1316.6183	120	
Cu V	1311.242	340		Co V	1313.822	130		P I	1316.654	1	
Ge II	1311.249	50	Z	Se IV	1313.9	10		Co V	1316.708	430	
Si II	1311.265	2	N	Ni II	1313.903	2		Cu V	1316.735	150	
P IV	1311.349	1		Cu III	1314.062	50		Br I	1316.735	400	
Ga V	1311.35	10		Zn III	1314.065	60		Mn V	1316.793	15	
C I	1311.363	1000		Mn I	1314.100	300	A, Z	Ni V	1316.912	590	
Ni II	1311.365	5	N	Cu II	1314.1495	15		Co V	1316.964	640	
Cu IV	1311.508	140		Ge II	1314.15	10	Z	Fe II	1317.030	5	P
Ni V	1311.551	580		Cu V	1314.188	260	N	Ni V	1317.035	420	
Ni IV	1311.573	30		Co V	1314.238	70		Ni II	1317.045	6	
Mg IV	1311.650	240		Ni V	1314.330	710		Ni II	1317.122	10	
Fe II	1311.762	2	P	Ni V	1314.330	710		Ni II	1317.220	500	
Cu II	1311.7947	1		Cu II	1314.3366	30		Cu IV	1317.233	50	
Fe V	1311.828	150		Se IV	1314.4	250		V III	1317.27	300	
Cu III	1311.847	75		Mg III	1314.50			Cu III	1317.312	20	
Co II	1311.857	40		Fe V	1314.529	200		Br I	1317.372	300	
C I	1311.924	200		Cu V	1314.535	530		Mn II	1317.39	3	
Mg IV	1311.930	140		Mn III	1314.633	5		Ni V	1317.436	670	
Zn IV	1311.939	50		Ni IV	1314.660	240		Zn III	1317.509	0	
F III	1311.963	1		Ni V	1314.681	700		Ni II	1317.531	15	
Cu III	1312.001	10		Co V	1314.681	660		Fe II	1317.545	5	P
Na II	1312.026	30		P III	1314.728	60		V IV	1317.566	5	
Ni IV	1312.028	260		Ni IV	1314.757	20		Cu III	1317.58		F, P
Ni V	1312.031	610		Ni II	1314.771	12		Co V	1317.613	150	
Si VI	1312.11	50		Zn III	1314.796	60		Br I	1317.695	360	
Al IV	1312.135	20		Co V	1314.840	200		Ca III	1317.699	550	
Co V	1312.148	270		Ga IV	1314.845	650		Mn II	1317.70	4	
C I	1312.247	100		Ni II	1314.847	12		Fe VI	1317.736	400	
Co V	1312.257	630		Cu V	1314.9		F, P	Ni IV	1317.738	0	
Cr VII	1312.307	220		Co VI	1314.90		P	Sc IV	1317.742	220	
Cu III	1312.391	200		Ni V	1314.909	330	P	F III	1317.744	3	
Al V	1312.43	10		Cu III	1314.933	25		B V	1317.768		P
Na II	1312.587	20		Cr III	1314.968	150		Co V	1317.822	110	
Si III	1312.590	260		P I	1314.988	7		Fe V	1317.862	400	
Cu III	1312.630	5		Ni V	1314.992	300	P	Ni V	1317.962	330	
Mn I	1312.646	150	A, Z	Cr IV	1315.00	100	N	F III	1317.975	6	
Ni V	1312.706	650		Mn V	1315.008	450		Zn IV	1317.975	50	
V IV	1312.717	20		Cu V	1315.021	370		B V	1317.993		P
Cu IV	1312.727	930		Ni III	1315.085	3	N	S	1318.	10	N
F III	1312.763	1		Cu III	1315.208	5		P IX	1318.		F, P
Mn II	1312.80	2		Ni II	1315.255	70		Cu V	1318.0		F, P
C I	1312.853	3		Zn	1315.262	15	N	Co V	1318.014	310	
N I	1312.866		P	Ni V	1315.269	550	N	Ni II	1318.017	100	
Cu III	1312.867	30		Ni IV	1315.286	20		Fe II	1318.065	1	P
Cu V	1312.9		F, P	Co VI	1315.3		F, P	B V	1318.070		P
Co II	1312.901	10		Fe VI	1315.339	20		Mg III	1318.078	12	
Zn III	1312.904	35		Co II	1315.417	30		Mn II	1318.09	3	
Co V	1312.944	340		N I	1315.429		P	Cu IV	1318.134	920	
Cu V	1312.946	220		Cr III	1315.450	60		Ni V	1318.148	520	
Cu III	1312.950	30		Cu III	1315.455	40		Co V	1318.152	110	
Ni VI	1313.049	20		Ni II	1315.558	3		Co II	1318.186	20	
N I	1313.071		P	Ni V	1315.663	450		Se IV	1318.2	60	
Mn I	1313.103	200	A, Z	Cr IV	1315.69	125	P	Se II	1318.25	500	
Co V	1313.146	130		Ti V	1315.712	0		Fe V	1318.354	300	
Cu V	1313.180	220		C I	1315.918	200		Ni V	1318.360	670	N
S I	1313.2493	60		Ni V	1315.975	110		Ni IV	1318.379	100	
Cu III	1313.295	75		Cu IV	1316.029	700		Cu III	1318.483	20	
Br III	1313.3	500	N	N I	1316.035		P	N I	1318.500		P
Ni V	1313.303	630		Mn III	1316.091	80		Ni V	1318.513	690	
V III	1313.35	400		Co II	1316.094	30		Fe II	1318.565	0	P
C I	1313.387	100		Cu III	1316.131	100		Cu III	1318.574	60	
Ni II	1313.403	7		Cr III	1316.151	350		Co II	1318.596	30	
Mn II	1313.41	2		Mn II	1316.16	9		Ni IV	1318.652	40	
C I	1313.464	300		Se I	1316.26	30		Cu IV	1318.666	290	
Cu V	1313.491	340	N	N I	1316.2906	2		P I	1318.678	3	

Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes
Cu III	1318.689	30		Co V	1321.273	90		Co VI	1323.97		P
Ni VI	1318.7		F, P	Fe V	1321.341	300		N IV	1323.98	100	
Fe II	1318.726	0	P	P I	1321.427	25		Ni V	1323.986	650	
Mn III	1318.815	20		Ni II	1321.432	3		C II	1323.9955	30	ST
N I	1318.8224	5		Fe V	1321.490	300		Cl XII	1324.		F, P
N I	1318.8293	12	P	F II	1321.515	10	Z	B II	1324.		Q
Co V	1318.838	20		Mn IV	1321.59	20		Cu III	1324.025	50	
Cu V	1318.892	550	N	Cu V	1321.596	140		Cu V	1324.098	420	
P III	1318.901	25		Cr III	1321.639	40		Cu III	1324.108	25	
Ni V	1318.920	70		Co V	1321.669	70		N III	1324.188		P, Z
N I	1318.9981	150		P III	1321.681	90		Co V	1324.251	820	
N I	1319.0048	80		Ni II	1321.704	2		Fe II	1324.254	5	P
P I	1319.020	7		V IV	1321.719	10		Fe VI	1324.283	300	
Zn III	1319.096	60		Co II	1321.725	5		N III	1324.361	90	P, Z
Ni V	1319.153	420		Co II	1321.7962	5		N III	1324.40	150	P
Cu IV	1319.196	40		Ni III	1321.804	10		Fe V	1324.403	80	
Zn IV	1319.200	5		Fe V	1321.850	100		Cu V	1324.410	220	N
Cu III	1319.204	25		Cu III	1321.859	2	N	Cr III	1324.415	250	
Mn II	1319.21	10		V IV	1321.917	10		Mg V	1324.45	0	F
Cu V	1319.293	500		Ni III	1321.94		F, P	Zn III	1324.455	20	
Ge II	1319.3	10	Z	Cu V	1321.947	270	N	Ni V	1324.466	440	
Ni II	1319.310	8		Se I	1322.06	10		Ni II	1324.475	25	
Co V	1319.353	560		Ni VI	1322.078	20		Cu III	1324.502	3	N
Cu IV	1319.434	770		Mn XII	1322.08	0	F, P	Ar II	1324.51	30	Q
Cr IV	1319.49	150	P	Mn III	1322.186	40		Cu III	1324.594	5	
Cu V	1319.5		F, P	P III	1322.188	1		Cu III	1324.685	35	
Al IV	1319.57	1		Cu V	1322.223	110	N	Cu V	1324.7		F, P
Si V	1319.601	500		Na II	1322.295	12		Cu IV	1324.706	60	N
Cu V	1319.629	360		Zn IV	1322.308	50		Ni V	1324.751	440	
Co V	1319.646	140		Zn IV	1322.414	50		Co II	1324.791	8	
N I	1319.6693	50		Sc IV	1322.588	5		Br III	1324.8	500	Q
N I	1319.6760	250		Cu II	1322.6326	6		Zn III	1324.826	2	Q
Ni V	1319.745	220		Cu III	1322.655	30		Cr IV	1324.85	200	P
Na II	1319.815	30		P III	1322.707	1		Ni IV	1324.867	200	
Co II	1319.844	20		Co V	1322.741	190		Cu III	1325.042	40	
Sc IV	1319.853	1		Cu V	1322.816	360	N	Ni V	1325.081	420	
Cu III	1319.870	15		Cr III	1322.819	250		Ni II	1325.105	1	
Cr VII	1319.885	220		Ni II	1322.825	2		Co V	1325.172	120	
Mg III	1320.022	4		Co II	1322.879	3		F III	1325.214	6	
Fe VI	1320.058	10		Cu V	1322.9		F, P	Cu III	1325.241	20	
Fe II	1320.060	2	P	Co V	1322.981	240		Ni II	1325.242	1	
Ni VI	1320.2		F, P	Ni IV	1323.031	120		Cu II	1325.2421	1	
Ni V	1320.200	100		Co II	1323.036	2		Ni II	1325.359	100	
F III	1320.203	3		Fe II	1323.084	1	P	P III	1325.465	40	
Cu III	1320.208	4		Fe V	1323.097	10		Cu II	1325.5135	3	
Fe V	1320.312	100		Ge III	1323.1	80	P	Cu III	1325.521	40	
Fe II	1320.327	0	P	Ni II	1323.107	1		Fe III	1325.61	2	Q
Cu IV	1320.346	530		As I	1323.12	3	P	Cu IV	1325.615	420	
Fe V	1320.410	300		Ga III	1323.15	300		Zn IV	1325.659	5	
F III	1320.451	1		Cu II	1323.2042	3		Cr IV	1325.66	50	P
Cu III	1320.469	40		Cr III	1323.240	10		N IV	1325.685	50	
Cu III	1320.513	50	N	Fe II	1323.258	1	P	Ni II	1325.691	4	
Cu IV	1320.544	600		Fe V	1323.269	400		Na III	1325.70	150	
Fe II	1320.559	1	P	Cu V	1323.278	650	N	Cu III	1325.734	20	
Fe VI	1320.649	60		Ni V	1323.296	60		Co V	1325.780	640	
Co V	1320.667	60		F III	1323.311	3		Fe V	1325.781	125	
Cu II	1320.6858	10		Fe II	1323.351	0	P	Ni V	1325.822	20	
Cu III	1320.697	25		Ni II	1323.417	25		Zn III	1325.831	30	
Zn IV	1320.699	50		Co III	1323.456	20		Cu IV	1325.898	190	
Ni V	1320.707	560		Co V	1323.467	240		Fe II	1325.991	0	P
Al	1320.71	10	N	Cu IV	1323.493	360		Co V	1326.019	380	
Fe II	1320.765	1	P	Cu III	1323.501	20		Cu III	1326.080	10	
Ni II	1320.799	0		Zn III	1323.512	50		Cu III	1326.174	15	
Fe IV	1320.800	1		S I	1323.5153	180		Ti V	1326.279	1	
Cr III	1320.844	60		S I	1323.5220	45		Ni II	1326.292	7	
Ni V	1320.896	240		Ni V	1323.550	560		Cu III	1326.314	15	
P III	1320.941	25		Cu III	1323.575	40		Cu III	1326.362	75	
Cu III	1320.985	10		Mn II	1323.76	11	P	Cu II	1326.3954	10	
Co V	1320.987	290		Mn II	1323.78	4	P	Cu III	1326.453	8	N
Co V	1321.070	20		Cu II	1323.7943	6		Ni II	1326.548	11	
Fe II	1321.096	1	P	Mn II	1323.81	1	P	N I	1326.5639	10	
Cu IV	1321.168	700		C II	1323.8617	30	ST	N I	1326.5707	50	
Zn IV	1321.188	50		C II	1323.9059	300	ST	Ni II	1326.623	12	
Ni V	1321.252	350		Zn III	1323.909	12	Q	Mn II	1326.63	10	
P III	1321.259	25		C II	1323.9513	450	ST	S I	1326.6432	160	

Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes
V IV	1326.666	5		Ca III	1328.945	500		V III	1331.30	100	
Zn IV	1326.708	50		Ni II	1328.964	25		Zn I	1331.375		A
Co V	1326.788	510		Fe V	1329.025	50		Zn IV	1331.390	40	
V IV	1326.807	5		V III	1329.05	25		Kr II	1331.402	1	
Co V	1326.825	610		Zn IV	1329.061	5		Ni V	1331.413	70	
Co V	1326.825	610		P IV	1329.070	120		Mn II	1331.42	8	
Cu III	1326.828	15		C I	1329.0863	150	ST	Co V	1331.501	810	
Se I	1326.83	20		C I	1329.1001	200	ST	Ar XIII	1331.52		F
Zn III	1326.899	50		Cr III	1329.11	20	N	Cr III	1331.543	150	
F III	1326.926	20		Mn III	1329.120	15		Mg IV	1331.592	140	
N IV	1326.964	20		C I	1329.1230	110	ST	Zn I	1331.610		F,A
Fe VI	1326.988	70		Fe VI	1329.172	500		Fe V	1331.640	150	
F II	1327.058	200		C III	1329.187			Co V	1331.652	250	
Co V	1327.073	690		Cu V	1329.215	640		V IV	1331.665	0	
Fe V	1327.101	125		Cu III	1329.230	25		Cu I	1331.72		A,Z
Al XII	1327.14		P	Mn III	1329.248	15		Cr IV	1331.73	50	P
Fe II	1327.14	0	P	Mn II	1329.25	1		Cu III	1331.741	50	
Cu III	1327.171	150		V IV	1329.288	10		Zn III	1331.823	50	
Cr III	1327.180	40		Cr III	1329.29	20	N	Cu II	1331.8907	5	
Ni II	1327.187	3		P III	1329.318	10		P IV	1331.981	90	
Cu III	1327.265	20		Ni V	1329.372	640		V III	1331.99	500	
Ni II	1327.319	20		Cu V	1329.4		F,P	Ni V	1332.005	230	
Cu III	1327.399	75		C I	1329.5775	600	ST	F II	1332.042	100	
Ni V	1327.473	210		Mg III	1329.583	60		Cu III	1332.062	75	
Mn II	1327.48	12		C I	1329.6005	200	ST	Cu II	1332.2228	5	
Mg III	1327.512	4		Cu II	1329.6696	1		Co V	1332.252	110	
P III	1327.531	25		F III	1329.704	1		Cr IV	1332.27	250	P
Cu III	1327.551	8		Co V	1329.708	310		Mg III	1332.310	4	
Ti III	1327.609	230		Co V	1329.791	410		Fe VII	1332.381	90	
Ni V	1327.640	590		Ti III	1329.819	25		Co V	1332.459	70	
Ni IV	1327.665	40		Ni II	1329.857	13		V IV	1332.459	3	
P IV	1327.670	25		Cu III	1329.861	60		Cu III	1332.469	5	
Si III	1327.703			Fe IV	1329.868	30		F II	1332.512	100	
Ni II	1327.730	8		Ni IV	1329.885	10		Cu III	1332.554	40	
Na II	1327.742	50		F III	1329.892	6		P III	1332.600	4	
Ni II	1327.755	50		Zn IV	1329.923	40		Mn IV	1332.66	20	
Se I	1327.80	10		Co V	1329.952	500		Co V	1332.688	480	
Cr III	1327.806	120		V IV	1329.968	10		Ni II	1332.706	1	
Ga II	1327.81	120		Fe II	1330.01	1	P	Ni II	1332.766	6	
V III	1327.87	150		Co V	1330.024	720		Ni II	1332.808	7	
N I	1327.9170	25		Fe II	1330.052	2	N	Ni IV	1332.843	210	
N I	1327.9238	15		Al V	1330.06	400		Ni V	1332.845	610	N
Cr XVIII	1328.		F,P	Ni V	1330.063	150		Se IV	1332.9	45	N
Ni V	1328.019	610		P IV	1330.075	25		Fe V	1332.968	2	
Ni III	1328.084	75		Zn III	1330.087	40		Cu III	1332.971	300	
Br III	1328.1	750	N	Zn III	1330.178	40		Co V	1332.981	470	
F II	1328.108	300		Si VI	1330.27	90		Ni V	1332.989	470	
S III	1328.12	50		Zn IV	1330.297	40		Cu II	1333.0452	20	
Mn V	1328.190	5		Cu III	1330.352	75		F III	1333.139	60	
Cu V	1328.2		F,P	V IV	1330.355	10		As II	1333.147	750	
Cu III	1328.316	50		Fe V	1330.401	400		Zn IV	1333.168	40	
Cu IV	1328.369	690		Fe II	1330.405	1	P	Co V	1333.170	470	
Zn III	1328.372	50		Fe II	1330.412	0	P	Ni II	1333.171	3	
Cu II	1328.4129	5		F III	1330.490	6		Cu III	1333.280	3	
Cr III	1328.421	25		Br III	1330.5	500	Q	Zn IV	1333.296	50	
Co V	1328.432	370		Co V	1330.532	30		As IV	1333.3	100	
Ni IV	1328.480	20		Se I	1330.55	40		Se II	1333.32	100	
Na II	1328.497	12		Mn II	1330.61	12		Ni V	1333.351	500	
S III	1328.52	50		Co V	1330.729	160		Zn I	1333.422		A
Mn IV	1328.56	0		Ni III	1330.787	2	N	Mn IV	1333.56	10	N
Zn III	1328.561	40		Zn III	1330.897	40		Ni V	1333.561	120	
Ti V	1328.572	50		Co V	1330.932	530		F II	1333.588	200	
Cu V	1328.646	90	N	Kr II	1330.948	1		Zn I	1333.721		F,A
Fe XIX	1328.7		F,P	Fe II	1330.952	10	P	Co V	1333.723	410	
Se I	1328.75	40		Fe VI	1330.968	300		Cu III	1333.735	60	
Cu V	1328.777	530		Co V	1331.016	800		S I	1333.792	2	
Cr III	1328.78	10		Ni III	1331.14		F,P	Mn VI	1333.874	1000	
Fe II	1328.786	0	P	Cu III	1331.147	15		Ni V	1333.958	540	
Fe II	1328.793	1	P	Ni III	1331.153	3		Zn II	1334.029	1	Q,Z
Si III	1328.806			Mn III	1331.176	15		V VI	1334.039	5	
P IV	1328.826	10		Fe VI	1331.184	250		Co V	1334.080	620	
C I	1328.8332	150	ST	Fe V	1331.185	150		Ni II	1334.101	10	
Fe IV	1328.842	4		Cu III	1331.187	20		Ni V	1334.184	510	
Ni II	1328.847	3		Cr III	1331.224	25		Co V	1334.205	130	
Cu III	1328.854	25		Ni II	1331.264	9		Ni II	1334.287	12	

Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes
F III	1334.292	3		Co V	1337.070	40		Ni II	1340.374	20	
Ni II	1334.320	7	N	Cu III	1337.116	3		Co V	1340.421	460	
Mg III	1334.359	30		F III	1337.196	6		Cu IV	1340.513	110	
Cu III	1334.367	150		Se II	1337.23	1		Al V	1340.52	10	
V IV	1334.493			Fe V	1337.287	70		Co V	1340.563	510	
Cu II	1334.5063	2		Na III	1337.358	350		Mn IV	1340.62	250	N
C II	1334.5323	800	ST	Cu IV	1337.371	680		Zn III	1340.656	3	
Cu II	1334.6546	2		Ca III	1337.466	200		Na III	1340.674	400	
Ni II	1334.656	1	N	P III	1337.500	40		Cu IV	1340.769	790	
Cu III	1334.685	10	N	Cu III	1337.508	50		Cu III	1340.880	15	
Ni II	1334.689	1	N	Cu II	1337.5114	0		Cu II	1340.9141	3	
Co V	1334.782	70		Cu III	1337.567	150		Ge II	1340.92	5	
P III	1334.808	500		Zn III	1337.571	20		Ge XIX	1341.		Z, F, P
Cu III	1334.832	10	N	Sc II	1337.684	1		Ni V	1341.074	360	
Ni V	1334.992	560	N	Fe VI	1337.695	250		Cu III	1341.157	100	
Cu V	1335.0		F, P	P III	1337.702	120		Cr III	1341.17	10	N
Ni IV	1335.030	0	N	Ni IV	1337.751	100		Ni II	1341.226	0	
Co V	1335.035	333		Fe VI	1337.788	400		Na II	1341.369	35	
Cu IV	1335.043	750		Cu IV	1337.861	470		Co V	1341.389	30	
Co V	1335.110	250		Co V	1337.875	370		Ni III	1341.421	10	
V III	1335.12	500		Al IV	1337.898	400		Mn IV	1341.46	300	
Ca III	1335.129	550		Ni II	1337.958	15		Si III	1341.465	160	
Co VI	1335.13		P	Ni IV	1337.973	40		Cu III	1341.470	100	
Cu III	1335.181	0		Na III	1337.995	100		Si III	1341.496		
N I	1335.182		P	Cr XVII	1338.		F, P	Cu III	1341.515	100	
Co II	1335.188	1		Cr IV	1338.02	10	P	As II	1341.549	950	
Ni II	1335.203	400		Mn IV	1338.06	350		Co V	1341.675	110	
Mn II	1335.27	25		Co V	1338.084	290		Cu IV	1341.679	790	
Co V	1335.304	580		Ga IV	1338.124	1000		Cu III	1341.766	5	
Fe II	1335.410	2	P	Ni II	1338.195	10	N	Cu III	1341.817	25	
Ni III	1335.53		F, P	Co V	1338.233	120		Ca II	1341.889	240	
Cu IV	1335.557	770		Ni II	1338.402	1		Cu III	1341.997	40	
Ni IV	1335.623	220		Sc II	1338.413	4		Se I	1342.04	40	N
C II	1335.6627	100	ST	Na II	1338.575	35		Ni IV	1342.060	10	N
P IV	1335.705	200		O IV	1338.612	200		Cu III	1342.093	75	
C II	1335.7077	1000	ST	Zn III	1338.659	20		Co IV	1342.1		F, P
Mn III	1335.721	70		Ni IV	1338.796	70		Sc II	1342.130	10	
Cl I	1335.7257	250		Fe V	1338.808	150		Ni III	1342.148	50	
Ni II	1335.779	18		Cu III	1338.849	75		Mg IV	1342.163	300	
Zn III	1335.846	50		Zn III	1338.939	50		Cu III	1342.177	150	
Mg III	1335.951	2		Co V	1338.948	730		Ni V	1342.177	630	
Fe V	1336.039	80		Ni IV	1339.070	430		Cr III	1342.24	40	N
Zn I	1336.067		A	Ni V	1339.072	670		Ni II	1342.242	20	
Fe IV	1336.099	4		Sc II	1339.077	10		Si III	1342.351		
S VI	1336.1	100	P	Cu IV	1339.187	550		Na III	1342.390	450	
Mn IV	1336.12	450		Ni II	1339.221	3		Si III	1342.392	140	
Ni V	1336.157	650		Co V	1339.226	450		Na II	1342.401	20	
Ni IV	1336.164	170	N	Cu III	1339.271	30		Si III	1342.432		
Cu III	1336.184	60		V IV	1339.335	5		Co V	1342.448	700	
Fe V	1336.20		F, P	Co V	1339.337	630		Cu III	1342.503	3	
Ni II	1336.201	2		F III	1339.337	6		Ca II	1342.535	120	
Sc IV	1336.259	20		Cu III	1339.345	20		Co II	1342.593	0	
Co V	1336.287	650		Ni II	1339.394	1		Kr III	1342.68	20	
Cu III	1336.310	30		Cr IV	1339.41	50	P	As IV	1342.7	350	
Fe II	1336.386	1	P	Cu III	1339.484	200		Zn IV	1342.720	50	
N I	1336.394		P	Ni II	1339.487	3		Na III	1342.729	500	
Zn I	1336.451		F, A	Cu II	1339.4952	0		Cr VI	1342.741	50	
Co II	1336.482	0		Zn I	1339.569		A	Cu IV	1342.749	920	
Ni V	1336.539	180		Co VI	1339.60		P	Fe VI	1342.859	100	
Cl II	1336.5928	125		Ni IV	1339.674	350		Ni V	1342.902	230	
Co V	1336.630	70		Fe V	1339.691	200		O IV	1342.992	120	
Ni V	1336.636	170		Ti III	1339.703	40		Ni XII	1343.		F, P
Cl II	1336.6431	85		Co V	1339.752	240		Cu III	1343.007	100	
Cl II	1336.6895	65		Cu III	1339.761	60		Fe V	1343.121	100	
Fe II	1336.712	1	P	Cu II	1339.7713	5		Mn III	1343.141	20	
Na III	1336.76	350		Co IV	1339.9		F, P	Cu III	1343.164	25	
Ni IV	1336.805	30		Co V	1339.924	360		Co V	1343.227	480	
Fe VI	1336.843	250		Zn I	1340.001		A	S III	1343.25	50	
Mg IV	1336.850	200		Ni II	1340.007	15		N II	1343.338	200	
Cu III	1336.859	40		Zn I	1340.074		F, A	Zn III	1343.355	60	
Zn IV	1336.889	40		Cu IV	1340.084	950		Fe VI	1343.380	150	
As IV	1336.9	20		Zn IV	1340.162	50		Si III	1343.388	120	
Mn IV	1336.92	400	N	Sc II	1340.237	4		Co V	1343.487	780	
Zn III	1336.996	2		Fe II	1340.260	1	P	O IV	1343.512	275	
Ni V	1337.049	560		Ni V	1340.350	370		Ni II	1343.544	10	

Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes
N II	1343.574			Co V	1346.479	290		Fe II	1349.592	5	P
F II	1343.603	300		Co II	1346.503	2		Ni II	1349.594	0	
S III	1343.61	50	P	Mg IV	1346.543	500		Co V	1349.601	560	
Ni V	1343.633	190		Se I	1346.58	0		Cu IV	1349.606	560	
Ni II	1343.642	2		Mn III	1346.58	100		Mn III	1349.782	0	
Cu III	1343.721	100		Cu I	1346.63		A, Z	Ni II	1349.791	12	
Zn IV	1343.794	50		Mg IV	1346.633	300		Cu III	1349.851	40	
P III	1343.81	70	P, Z	Co II	1346.739	0		Zn IV	1349.872	50	
Co V	1343.884	80		Co IV	1346.82	30	P	Cu V	1349.9		F, P
Ni V	1343.898	380		Mn III	1346.854	50		Cu III	1350.032	20	
P III	1343.957	90		Mn IV	1346.86	0		Si II	1350.057	150	
Cu IV	1344.000	650		Si II	1346.873	100		Ni V	1350.065	560	N
Cu IV	1344.034	620		Cu III	1346.903	60		Co V	1350.071	740	
F II	1344.037	200		P III	1346.93	200	P, Z	Fe VI	1350.072	300	
Zn IV	1344.063	50		Mn II	1346.94	1		Mg III	1350.156	12	
Ni IV	1344.099	140		P IV	1346.945	1		Al II	1350.178	150	
Mn II	1344.14	50		Co V	1346.997	350		Cu IV	1350.182	930	
Cl II	1344.188	3		Cu III	1347.013	100		Cu III	1350.208	40	
Ni II	1344.196	2		V IV	1347.030	1		Ni IV	1350.218	510	
Cl II	1344.258	2		Cu III	1347.059	75		Ni II	1350.256	5	
F II	1344.295	100		Ga IV	1347.077	250		Cu III	1350.280	80	
Cl II	1344.298	1		Mn III	1347.087	0		Ni II	1350.321	10	
P III	1344.327	650		Co II	1347.175	1		Cu III	1350.364	150	
Ni II	1344.334	1		Ni V	1347.222	170		Zn III	1350.377	50	
Zn I	1344.343		A	Cl I	1347.2397	550		Cu IV	1350.416	980	
Mn II	1344.35	6		Fe II	1347.265	10	P	As I	1350.44	2	P
Cu III	1344.351	100		Zn III	1347.286	50		Co II	1350.450	30	
Si VI	1344.40	80		Se II	1347.31	10		Ni IV	1350.515	90	
Co V	1344.460	50		Co V	1347.317	220		Al V	1350.518	400	
V IV	1344.493	0		Cu IV	1347.427	300		Si II	1350.520	20	
Ni II	1344.614	50		Co V	1347.442	420		Fe V	1350.535	125	
Ni IV	1344.702	0	N	Ni IV	1347.447	0		Cu III	1350.557	3	
P VI	1344.735			P III	1347.46	10	P, Z	Co V	1350.561	740	
P III	1344.845	300		As IV	1347.5	450		Cu II	1350.5938	15	
Zn I	1344.956		A	Se I	1347.50	10		Co V	1350.625	460	
Cu IV	1345.005	690		N III	1347.52	10	P, Z	Zn III	1350.638	50	
Zn I	1345.023		F, A	Na II	1347.543	45		Si II	1350.658	20	
N II	1345.076			Mn III	1347.62	80		Fe V	1350.677	50	
Cr III	1345.12	100	N	Ni V	1347.743	550		Co IV	1350.7		F, P
Co V	1345.200	370		Cu IV	1347.800	950		Cu III	1350.712	60	
Co V	1345.267	230		Zn IV	1347.949	50		Cu III	1350.816	15	
N II	1345.313	100		Fe II	1348.005	5	P	Ni V	1350.868	190	
N II	1345.340			Cu III	1348.061	60		Fe V	1350.948	10	
Cu IV	1345.370	400	N	Fe VI	1348.074	100		Zn III	1350.968	10	
Fe II	1345.382	5	P	Co V	1348.236	130		S III	1351.	10	
Co II	1345.399	3		Cu III	1348.268	30		Co II	1351.025	3	
Cr III	1345.46	70	N	Ni II	1348.333	30		Zn II	1351.030	1	Q
Cu III	1345.483	80		Mg III	1348.342	7		Ni V	1351.070	220	
Mn VI	1345.494	800		Zn IV	1348.354	40		Ga IV	1351.072	150	
Se I	1345.54	40		Co V	1348.376	120		Zn I	1351.098		A
Fe V	1345.611	300		Se I	1348.40	50		Cu III	1351.244	150	
Mn II	1345.62	2		Cr IV	1348.44	20	N	Ni III	1351.256	30	
Zn IV	1345.622	10		P III	1348.45	10	Z	Co V	1351.269	160	
Cu IV	1345.641	960		P IV	1348.479	4		Cu IV	1351.269	910	
Mg IV	1345.643	160		Si II	1348.543	100		Ni II	1351.287	10	
Co V	1345.660	840		Cu III	1348.566	150		As IV	1351.3	350	
Ni IV	1345.718	580		Ni V	1348.683	110		Ar II	1351.333	100	
Mn II	1345.77	15		Cu III	1348.714	40		Ni V	1351.419	640	
N III	1345.78	200	P, Z	Ar II	1348.751	100		Ni IV	1351.419	170	
Co V	1345.850	420		Cu III	1348.831	50		Ni IV	1351.574	20	
Ni II	1345.882	50		Fe V	1348.838	70		Se I	1351.62	40	
C IV	1346.		ZZ	Cu IV	1348.840	910		Mg IV	1351.620	260	
Mn IV	1346.01	0		Cu IV	1348.933	900		Cr IV	1351.63	40	N
Cu III	1346.050	100		Co V	1348.985	70		Cl I	1351.6568	350	
Ni IV	1346.083	470		P III	1349.12	200	P, Z	Ni IV	1351.733	50	
Zn III	1346.146	50		Mg III	1349.132	12		Fe V	1351.755	100	
Ni III	1346.15		F, P	Ni IV	1349.151	20		Na II	1351.799	12	
N III	1346.18	200	P, Z	Co II	1349.267	5		Cu II	1351.8366	25	
Cu IV	1346.209	210	N	Zn III	1349.270	2	Q	Ni II	1351.862	35	
Ni II	1346.334	1		Mg III	1349.365	2		F IV	1351.924	10	
N II	1346.413			Fe XII	1349.38	8	F	Cu IV	1351.929	960	
Cr IV	1346.44	10	P	Mn II	1349.41	5		Cr III	1351.94	10	N
N II	1346.441	10		Cu III	1349.420	300		Ni III	1351.94		F, P
Mn III	1346.448	25		Co V	1349.431	230		Si V	1351.990	100	
Mg III	1346.46			Co VI	1349.45		P	Fe VI	1352.000	40	

Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes
Zn I	1352.003		A	Ni VI	1354.4		F,P	Cu III	1357.023	40	
Mg IV	1352.020	320		Fe II	1354.459	1	P	Ni IV	1357.068	690	
Zn I	1352.048		F,A	Ni V	1354.535	120		Fe V	1357.114	100	
Ni III	1352.052	20		Cu IV	1354.610	910		Ni II	1357.132	11	
Co V	1352.058	670		Se I	1354.63	50		C I	1357.134	300	
Cu III	1352.085	2		Zn III	1354.650	1		Cr III	1357.180	200	
Na II	1352.118	35		Cu III	1354.658	30		Fe IV	1357.247	12	
Mn II	1352.17	4		N III	1354.698		F,P	Cu III	1357.308	50	
Ni II	1352.237	10		Cr III	1354.735	25		Ni II	1357.371	5	
Zn IV	1352.247	40		Fe II	1354.747	2	P	Ar II	1357.435	20	
Fe VI	1352.478	20		Co IV	1354.8		F,P	Mn II	1357.45	5	
Co V	1352.512	60		Fe V	1354.847	150		Ni V	1357.493	350	
Cu IV	1352.584	980		Fe II	1354.87	0	Q	Zn III	1357.496	15	
Si II	1352.635	100		Co V	1354.889	110		Cu IV	1357.499	130	
Mn III	1352.636	20		Ar II	1354.915	200		Co V	1357.508	510	
Cu III	1352.691	4	N	P III	1354.923	25		Cu IV	1357.638	630	
C I	1352.745	1		Cu III	1354.923	30		C I	1357.659	100	
Co V	1352.757	250		Ni IV	1354.975	0		Fe V	1357.675	200	
Ni VI	1352.8		F,P	Co VI	1355.04		P	Ni IV	1357.679	60	N
Mg III	1352.80			Cu IV	1355.071	680		Cr III	1357.69	20	N
Al III	1352.810	100		As IV	1355.1	100		Mn I	1357.717	100	A,Z
Al III	1352.816	5		V IV	1355.131	80		Co V	1357.720	770	
Mn II	1352.83	1		Co V	1355.271	800		Zn IV	1357.787	50	
Al III	1352.858	70		Na III	1355.281	550		Se I	1357.79	0	
Al V	1352.871			Cu II	1355.3053	15		Fe II	1357.796	20	P
Be IV	1352.873		P	Zn II	1355.332	25		Ni III	1357.802	50	
Zn IV	1352.876	60		Cu IV	1355.343	820		Sc II	1357.843	1	
Na III	1352.9	650		Ca III	1355.415	450		Cr III	1357.85	5	
Cu IV	1352.956	960		Mn IV	1355.44	250		Fe V	1357.857	50	
Co IV	1353.0		F,P	Cu III	1355.442	100		V III	1357.90	40	
Se I	1353.02	70	N	Cu IV	1355.461	960		Mn II	1357.91	1	
Fe II	1353.023	2	P	Zn III	1355.518	30		Sc XV	1358.		F,P
V III	1353.05	100		Ni V	1355.541	370		Se XXII	1358.		F,P
Mn III	1353.053	30		O I	1355.5977	100		Ge XVIII	1358.0		F,P
Be IV	1353.061		P	Fe V	1355.624	100		Cu III	1358.105	75	
Co V	1353.109	410		Cu III	1355.631	20	N	Ni V	1358.166	100	
Be IV	1353.125		P	Mg IV	1355.651	80		C I	1358.188	85	
Ni V	1353.134	180		Ni III	1355.69		F,P	Sc II	1358.246	10	
Co V	1353.248	110		Co V	1355.701	120		Fe VI	1358.280	150	
Cu IV	1353.253	710		N III	1355.794		F,P	Ni VI	1358.3		F,P
P IV	1353.303	120		C I	1355.844	750		Mn II	1358.32	1	
Mn II	1353.33	6		Ni II	1355.849	10	N	Ni V	1358.339	150	
Co V	1353.392	140		Mn II	1355.90	1		Fe V	1358.386	50	
Zn IV	1353.476	3		As II	1355.933	750		Cu III	1358.428	75	
Co V	1353.495	600		Mn III	1355.959	20		V III	1358.44	50	
Ni III	1353.512	20		Zn IV	1355.967	40		V II	1358.44	50	
Cu III	1353.545	50		Ni IV	1356.087	570		Ni II	1358.475	25	
Cu IV	1353.589	750		Mg IV	1356.108	260		O I	1358.5123	60	
Ni II	1353.606	8		Zn IV	1356.178	50		Fe V	1358.567	125	
Si II	1353.718	100		Fe V	1356.232	70		Mn IV	1358.59	450	
Cu IV	1353.728	760		Cr III	1356.25	10	N	Zn IV	1358.608	30	
Al V	1353.745			Sc II	1356.287	1		Co II	1358.633	3	
Al IV	1353.745	150		Cl VII	1356.3			Cr III	1358.65	30	N
Mg III	1353.804	7		Ni II	1356.318	5		Fe VI	1358.679	80	
Ni II	1353.821	15		As IV	1356.4	100		Co V	1358.692	50	
Se I	1353.86	70		Cu III	1356.406	150		Cr III	1358.75	20	N
Ni V	1353.878	260		Mn IV	1356.44	0		V II	1358.769	0	
As IV	1353.9	300		Ni II	1356.469	20		Cu II	1358.7730	30	
Mn II	1353.90	1		Fe II	1356.483	0	P	Fe II	1358.788	2	N
Mg III	1353.915	2		Co V	1356.502	30		Fe II	1358.937	20	P
Ga III	1353.94	400		Zn III	1356.519	50		Mn III	1358.958	40	
Cu III	1353.943	100		V IV	1356.529	10		Ni II	1358.992	15	N
Zn III	1353.953	50		Ni IV	1356.550	20	Q	Mn XVIII	1359.		F,P
Fe II	1354.013	1	P	Se II	1356.57	1		Fe V	1359.006	400	
Ni II	1354.023	2		Zn	1356.608	10	N	Cu II	1359.0091	20	
Mn II	1354.08	5		Ni II	1356.653	9		F IV	1359.053	15	
Fe XXI	1354.08		F	Ti V	1356.724	1		Na II	1359.055	20	
Ni IV	1354.149	40		Mn II	1356.74	1		Fe II	1359.063	20	P
Cr III	1354.16	10	N	Ni IV	1356.813	0		Ni IV	1359.242	390	
Co II	1354.179	10		Mn VI	1356.852	600		Mn V	1359.268	800	
Zn III	1354.189	50		Cr III	1356.86	20	N	C I	1359.275	200	
C I	1354.288	500		Sc II	1356.868	1		Cu III	1359.298	8	
Ni VI	1354.3		F,P	Cu IV	1356.916	880		Cu III	1359.355	5	N
Co V	1354.300	200		S I	1356.97		A,Z	Fe V	1359.406	150	
Cu IV	1354.328	770		Na VI	1357.		F,P	C I	1359.438	50	

Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes
Sc II	1359.439	4		Mn II	1361.60	2		Ni V	1363.929	80	
Ni IV	1359.442	40		Fe V	1361.692	200		Cu III	1364.014	15	
V III	1359.45	5		Si III	1361.719			Ni II	1364.067	25	
Zn IV	1359.460	50		Ni II	1361.757	5		Cu V	1364.1		F, P
Al IV	1359.49	10	N	Fe VI	1361.819	600		Cu III	1364.117	40	
Cu III	1359.529	15		Fe V	1361.825	600		C I	1364.164	600	
C I	1359.531	5	P	Cu IV	1361.830	410		Co V	1364.180	440	
Mn XI	1359.59	0	F	Co V	1361.860	520		Ni II	1364.202	25	
Zn III	1359.604	50		Ni V	1361.880	20		Cu III	1364.227	100	
Cu III	1359.615	75		Ni II	1361.885	50		Cr III	1364.26	50	N
Al V	1359.64	150		Na III	1361.896	600		F III	1364.291	10	
Se I	1359.66	20	P	V VI	1361.923	40		Mn I	1364.314	600	N, A
Mn I	1359.681	120	N, A	P IV	1361.956	1		Zn III	1364.323	60	
Sc II	1359.688	10		Zn III	1361.979	60		Cu IV	1364.378	800	
Si III	1359.751			S	1362.	50	N	Fe II	1364.384	20	P
Se I	1359.78	10	P	Mn IV	1362.00	0		Ni II	1364.440	1	N
Zn III	1359.804	50		Mn I	1362.033	150	N, A	Cu III	1364.440	50	
Cu III	1359.815	75		Cu IV	1362.047	960		Cr IV	1364.49	10	
Mn II	1359.86	2		Ca III	1362.222	200		Ni II	1364.505	20	
Mn IV	1359.89	350		Fe II	1362.267	2	P	Cu III	1364.548	5	
Ni IV	1359.911	60		Zn III	1362.335	5		Fe II	1364.578	40	P
Cu IV	1359.912	700		Be III	1362.36	20	P	Mn III	1364.65	5	
F III	1359.921	100		Si III	1362.366	100		Ga IV	1364.692	200	
Cr IV	1359.93	10	N	Ni IV	1362.426	0		Fe II	1364.756	20	P
Cu II	1359.9362	5		B II	1362.461	600		Ni II	1364.793	2	
Mn X	1360.		F, P	Zn I	1362.483		F, A	Ni IV	1364.795	200	
Ca III	1360.010	500		Co V	1362.489	760		Fe V	1364.824	200	
Co V	1360.022	80		Mg IV	1362.504	140		Se II	1364.83	50	
Cu III	1360.087	25		V III	1362.51	50		Cu III	1364.867	60	
Fe II	1360.16	12	Q	Zn III	1362.523	60		Co V	1364.914	250	
Zn III	1360.220	0		Zn I	1362.526	60		Fe V	1364.984	250	
Sc II	1360.221	4		Fe II	1362.535	1	P	Na V	1365.		F, P
Mn II	1360.24	0		Cu III	1362.559	50		Ti III	1365.029	0	
Al IV	1360.298	100		Cu II	1362.5997	20		Ni II	1365.048	25	
Si III	1360.360	20		Mn I	1362.626	100	A, Z	Cr III	1365.06	40	N
Cr III	1360.40	60	N	Cu IV	1362.640	570		Fe V	1365.115	250	
Fe II	1360.450	5	P	Fe II	1362.748	10	P	Ni III	1365.151	10	
Cu III	1360.454	25		Ni III	1362.783	3	N	Ni IV	1365.162	70	
Cr VI	1360.504	80		Ni III	1362.82		F, P	P I	1365.195	25	
Cr III	1360.56	20	N	Cu IV	1362.823	910		Mn III	1365.199	800	
Co II	1360.577	8		Cu III	1362.840	50		Cu IV	1365.201	890	
Mn III	1360.718	1000		Cr III	1362.85	50	N	Zn IV	1365.233	60	
Ar II	1360.735	100		Fe V	1362.864	250		Na VI	1365.248	10	N
Cu III	1360.761	25		Ni II	1362.926	20	N	Si III	1365.253	160	
Ni V	1360.815	50		Cu III	1362.960	40		Cr III	1365.257	300	
Fe II	1360.858	20	P	Ni IV	1363.012	10	Q	Cu III	1365.275	20	
Se II	1360.86	1		Ar II	1363.032	200		Ni IV	1365.283	30	
V II	1360.896	3		Si I	1363.045	1	P, Z	Si III	1365.292		
Cu III	1360.902	75		Cu IV	1363.075	940		Si III	1365.337		
Ni II	1360.956	14		Fe V	1363.077	300		Mg II	1365.5442	140	
Cr III	1360.960	40		Cu III	1363.083	150		Si IV	1365.549		
Cu III	1360.987	60		Ni IV	1363.135	60	N	Fe V	1365.571	300	
Ge XVII	1361.		F, P	Ti V	1363.148	0		Fe II	1365.678	10	P
Mn III	1361.032	10		Ni IV	1363.267	450		Zn III	1365.702	60	
Cr III	1361.106	250		Al V	1363.351	400		Co V	1365.732	250	
Zn I	1361.111		A	Fe V	1363.376	100		Ni II	1365.760	4	
Cu IV	1361.155	950		Zn IV	1363.413	60		Co V	1365.809	360	
Cu III	1361.224	50		Ni II	1363.421	3		Cu III	1365.836	60	
Mn III	1361.26	1		Cl I	1363.4471	600		Fe V	1365.876	100	
Cr III	1361.276	300		Si III	1363.459	140		Cu IV	1365.885	960	
Fe V	1361.279	300		Ni IV	1363.475	40	N	Cr III	1365.921	60	
S I	1361.28		A, Z	Co V	1363.499	110		Na V	1366.		F, P
Zn IV	1361.321	50		Cu II	1363.5031	5		Ni XII	1366.		F, P
Sc II	1361.345	4		Si III	1363.504			Ni V	1366.027	150	
Fe II	1361.366	25	P	Cu IV	1363.510	290		Cr III	1366.06	70	N
Co V	1361.370	60		Cu III	1363.516	30		P III	1366.114	4	
Fe II	1361.373	30	P	Ni II	1363.540	2		Co V	1366.126	530	
Fe V	1361.447	300		Ni II	1363.617	2		Co V	1366.217	350	
Mg IV	1361.493	160		Fe V	1363.642	300		Cu III	1366.241	40	
Fe II	1361.504	1	P	Cr III	1363.73	20		Na II	1366.242	15	
Cu III	1361.517	30		Se I	1363.80	10		Co V	1366.372	330	
Cu IV	1361.540	460		Co V	1363.810	190		Cu III	1366.375	100	
P III	1361.548	10		Kr III	1363.85	40		Zn	1366.390	10	N
Mn III	1361.548	20		Ni II	1363.861	1	N	Fe II	1366.394	20	P
Si III	1361.597	160		Zn IV	1363.913	60		Mn III	1366.46	4	



Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes
Sc II	1366.591	1		Co V	1369.165	90		Ni IV	1371.697	600	
Cr III	1366.63	120	N	Cu IV	1369.180	750		Mn II	1371.73	5	
Zn II	1366.682	60		Mn V	1369.184	150		Ni II	1371.733	1	
Ni V	1366.690	70	N	Cu III	1369.189	50		Co V	1371.753	80	
Co V	1366.690	250		Al V	1369.20	600		Mg III	1371.769	4	
P IV	1366.695	500		Ni IV	1369.212	0	N	Co III	1371.779	3	
Fe II	1366.720	30	P	Co V	1369.295	180		Ni IV	1371.780	540	
Mg IV	1366.733	20		Mg II	1369.4231	180		Co V	1371.832	270	
Se I	1366.78	10		Co V	1369.426	270		Cu II	1371.8399	20	
Cr III	1366.88	20	N	Mn III	1369.430	400		Cu IV	1371.891	150	N
Ni IV	1366.895	0		Si III	1369.437	100		Fe V	1371.987	150	
Cu IV	1366.900	400	N	Zn IV	1369.497	60		Ni IV	1372.006	10	
Ni II	1366.947	5		Cu IV	1369.506	940		P III	1372.02	100	P, Z
Cu IV	1366.971	470		Mn III	1369.535	700		P I	1372.033	60	
Cu IV	1366.971	470		Ni II	1369.560	1	N	V II	1372.115	2	
Zn III	1366.978	60		Cr IV	1369.58	20	N	Cu IV	1372.136	970	
S	1367.	50	N	Cu III	1369.593	100		Fe II	1372.226	0	P
Co V	1367.028	510		Sc II	1369.647	10		Cr III	1372.27	60	N
Si III	1367.049	140		Ni II	1369.651	20		Fe II	1372.292	40	P
Ni II	1367.067	20		Ni IV	1369.690	0	Q	Na III	1372.340	550	
F III	1367.083	60		V III	1369.70	100		Cu IV	1372.380	960	
Mn V	1367.126	100		Fe II	1369.707	20	P	V III	1372.43	10	
Cr III	1367.13	40		As II	1369.770	950		Mn II	1372.48	2	
Cu IV	1367.154	950		Cu III	1369.838	50		Se II	1372.51	10	
Fe II	1367.161	2	P	Fe II	1369.856	10	P	Co III	1372.536	0	N
Fe V	1367.183	50		Cu III	1369.958	60		Zn III	1372.541	50	
Mg II	1367.2568	150		S	1370.	50	N	V II	1372.547	3	
Cr IV	1367.39	150	N	Ni IV	1370.062	10	Q	Ni V	1372.552	130	
Ni II	1367.394	1		Fe IV	1370.08	1	F, P	Co II	1372.573	0	
V III	1367.48	100		Fe	1370.11	4	N	P III	1372.65	300	P, Z
Cu IV	1367.559	970		Ni II	1370.136	500		Fe V	1372.651	70	
Mn I	1367.574	650	N, A	Fe II	1370.191	2	P	P IV	1372.674	400	
Cu III	1367.627	150		Cr III	1370.20	20	N	Co V	1372.870	70	
Cu IV	1367.634	970		Cu II	1370.2520	1		Cu III	1372.878	75	
Co V	1367.645	160		V III	1370.26	100		Cu III	1372.947	100	
Mg II	1367.7082	150		Fe V	1370.303	125		Sc II	1373.020	4	
Cu III	1367.791	30		Zn IV	1370.385	60		Co V	1373.023	460	
Ti V	1367.797	12		P III	1370.45	10	P, Z	Se I	1373.03	20	
Se I	1367.91	0		Zn III	1370.532	60		Si III	1373.030	100	
Cu IV	1367.918	900		Fe II	1370.532	0	P	Cl I	1373.1163	200	
Fe II	1367.950	2	N	Ni II	1370.549	25		Fe II	1373.122	5	P
Cu II	1367.9509	25		Cu II	1370.5600	2		Co V	1373.168	520	
Zn III	1368.027	60		Fe VI	1370.728	500		Mn II	1373.17	2	
Fe II	1368.094	10	P	Cr III	1370.74	20	N	Mg IV	1373.187	260	
Zn IV	1368.135	8		Co VI	1370.76		P	Zn III	1373.200	1	
Ni II	1368.171	10		Fe XIII	1370.8		F, P	Co II	1373.233	2	
Mn III	1368.20	20		Ni II	1370.804	4		Cu III	1373.282	75	
Ni IV	1368.208	40		Cu III	1370.855	30		Cu IV	1373.292	890	
Cr III	1368.23	20		P I	1370.921	7		V III	1373.34	5	N
Cu III	1368.257	50		Cu III	1370.936	40		Zn III	1373.381	1	
Fe II	1368.262	2	P	Fe V	1370.947	250		Ni V	1373.413	290	
P IV	1368.265	40		Ni XII	1371.		F, P	Cr IV	1373.46	20	
Co V	1368.292	530		Fe II	1371.022	55	P	P I	1373.500	60	
V III	1368.31	100		Mg IV	1371.033	280		Mn V	1373.512	450	
Ni V	1368.371	270		Fe VI	1371.056	100	P	Fe V	1373.587	700	
Ti III	1368.444	7		Fe VI	1371.073	300	P	As II	1373.650	800	
Co V	1368.453	210		Cu III	1371.123	75		Fe V	1373.674	600	
Fe II	1368.493	1	P	Zn IV	1371.176	50		Zn III	1373.687	60	
Mn II	1368.53	2		Fe V	1371.217	50		Al V	1373.70	300	
Cr III	1368.563	200		Fe II	1371.232	0	P	Fe II	1373.718	30	P
Si IV	1368.571			Al II	1371.240	150		Ni II	1373.746	4	
Si IV	1368.573			O V	1371.26	15		Cu IV	1373.753	970	
Fe II	1368.575	2	P	Cu III	1371.267	25		Ni IV	1373.774	20	
P III	1368.668	10		O V	1371.292	640		Cu IV	1373.803	970	
Cu III	1368.778	3		Fe II	1371.390	5	P	Fe V	1373.967	250	
Co II	1368.798	5		Ni IV	1371.411	240		Mn V	1373.995	900	
Fe II	1368.807	5	P	Co III	1371.419	2		Zn III	1374.005	3	
Cu III	1368.898	100		Cu III	1371.441	50		Fe II	1374.005	0	P
Sc II	1368.927	10		Cu II	1371.451	2	N	Cu III	1374.014	75	
Co V	1368.976	510		Mn I	1371.536	300	N, A	Ni II	1374.075	150	
Ni IV	1368.987	10	Q	Mn III	1371.540	115		Co V	1374.077	70	
Cu IV	1368.993	940		Fe IV	1371.561	30		Fe V	1374.116	300	
Co XII	1369.		F, P	Co V	1371.575	560		Zn III	1374.130	1	
V III	1369.06	50		Mn III	1371.647	300		Fe V	1374.261	30	
Cu III	1369.130	40		Si III	1371.652	60		Zn III	1374.269	3	Q

Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes
Cu III	1374.275	100		Cu III	1376.530	50		Na VI	1379.		F,P
Mn V	1374.275	200		Cu IV	1376.576	700		Co V	1379.101	380	
V II	1374.279	10		Co III	1376.576	0		Zn III	1379.161	60	
Fe II	1374.393	1	P	Al IV	1376.618	500		B I	1379.166	10	A,Z
Cu III	1374.436	25		Zn II	1376.633	1	Q,Z	Fe V	1379.206	20	
Ni III	1374.491	5	N	Fe II	1376.668	10	P	Ni V	1379.217	160	
Cu IV	1374.580	940		Mg III	1376.713	7		Zn I	1379.329		A
Co V	1374.614	230		Cu III	1376.787	300		Ni IV	1379.337	0	
Fe VI	1374.627	300		Co IV	1376.8		F,P	Mn III	1379.351	25	
Zn III	1374.638	60		Cr III	1376.800	60		Cu III	1379.362	75	
Cu IV	1374.657	940		Zn I	1376.911		A	Ar II	1379.378	100	
Ni III	1374.660	10		Ar II	1376.956	100		P I	1379.429	80	
Na II	1374.688	90		Ni II	1377.001	10	N	Fe II	1379.470	55	P
P III	1374.70	100	P,Z	Se I	1377.04	20		Se I	1379.50	0	N
P I	1374.732	40		Ni III	1377.077	15		Cl I	1379.5278	900	
Cu III	1374.751	100		P I	1377.080	60		Ni V	1379.556	30	N
Fe V	1374.789	250		Si III	1377.082	60		Ni II	1379.586	50	
Cu I	1374.80		A,Z	V III	1377.15	125		Fe II	1379.615	5	P
Mn II	1374.81	1		Co V	1377.168	210		P V	1379.615	150	
Fe II	1374.827	5	P	Cu III	1377.174	40		Cu IV	1379.654	960	
Co IV	1374.9		F,P	Br III	1377.2	400	Q	Al III	1379.670	600	
Cr III	1374.91	10	N	Ar II	1377.211	400		Ni VI	1379.7		F,P
Fe II	1374.939	10	P	Si III	1377.238	40		Cu III	1379.726	60	
Se I	1375.03	20		P IV	1377.282	350		Cu III	1379.769	70	
As II	1375.074	1000		V II	1377.295	10		Ar II	1379.884	300	
Si III	1375.083	40		Zn III	1377.346	40		P III	1379.911	40	
P III	1375.091	1	Z	Cu IV	1377.368	690		Ti III	1379.963	7	
As IV	1375.1	500		Mg IV	1377.373	140		Ni II	1379.980	12	
Zn III	1375.105	20		Cu I	1377.38		A,Z	Cu IV	1380.027	920	
Cu III	1375.108	3		Ar II	1377.442	20		Co II	1380.098	5	
Mn II	1375.11	4		Cu II	1377.477	3	N	V VI	1380.105	110	
Fe II	1375.172	55	P	Cu III	1377.489	200		Fe V	1380.112	250	
Co V	1375.204	530		Co V	1377.500	530		Co V	1380.239	660	
Zn IV	1375.304	60		Cu III	1377.548	75		Mn II	1380.32	1	
F II	1375.319	100		Zn IV	1377.621	60		Fe II	1380.411	10	P
Cu III	1375.337	2	N	Ni IV	1377.644	20		Ge II	1380.425	100	
Ni V	1375.376	200		Cu III	1377.656	30		Ni II	1380.440	2	N
Fe VI	1375.412	100		Fe II	1377.676	0	P	P III	1380.463	250	
P III	1375.453	4		Fe V	1377.723	60		Ni V	1380.514	100	
Mg IV	1375.497	240		Cu IV	1377.818	970		Co V	1380.518	390	
Ni VI	1375.5		F,P	Kr III	1377.83	40		Zn III	1380.554	12	
Cu II	1375.5019	3		Ni II	1377.912	7		Fe II	1380.711	2	P
Cr IV	1375.56	200	N	Zn III	1377.915	50		Ar II	1380.728	100	
Co V	1375.571	30		P I	1377.937	60		Co III	1380.775	5	
Cu III	1375.598	150		Mn II	1377.94	15		Ni II	1380.793	20	
Na II	1375.618	15		Se I	1377.98	100		Zn III	1380.828	50	
Si III	1375.688	40		V III	1377.99	100		Co II	1380.829	0	
Cu III	1375.693	40		Fe II	1377.99	2	Q	Cu IV	1380.831	970	
As II	1375.783	750		Fe II	1378.036	30	P	Cu III	1380.883	100	
Fe V	1375.784	80		Co II	1378.069	8		Ti V	1380.935	0	
Al V	1375.79	100		Fe V	1378.092	250		Se II	1380.96	10	
Cu IV	1375.800	990		Ni VI	1378.1		F,P	Zn III	1380.986	60	
Ni II	1375.822	50		Cu III	1378.124	60		Ni IV	1381.051	10	N
Cu III	1375.824	30		B II	1378.18	1		Cu IV	1381.054	930	
Fe II	1375.859	1	P	Co III	1378.208	2		P III	1381.089	150	
Cu III	1375.909	100		Cu III	1378.214	75		Fe II	1381.221	10	P
Zn IV	1375.954	40		Fe II	1378.280	2	P	Na II	1381.236	30	
Cl II	1375.9678	185		Fe II	1378.347	2	P	Ni II	1381.295	200	
V III	1375.98	5		Mn V	1378.497	800		Ni IV	1381.307	150	
Ca XV	1375.98	0	F	Cu IV	1378.502	960		Zn III	1381.314	40	
Cl II	1376.0241	170		Ti V	1378.552	110		Cu III	1381.395	50	
Cl II	1376.0707	100		Fe V	1378.560	500		Ni II	1381.423	6	
Cl II	1376.1000	80		Ni II	1378.578	1		Cu III	1381.437	30	N
Ar II	1376.106	50		Ca III	1378.584	250		P I	1381.469	80	
Cu IV	1376.142	500		Cu III	1378.644	75		Cu IV	1381.502	700	
Ni III	1376.183	15		B I	1378.654	10	A,Z	Ne II	1381.509	40	
Ni V	1376.195	440		Co III	1378.665	10		Fe IV	1381.523	80	
Co V	1376.203	340		Mg III	1378.700	40		Co V	1381.546	500	
Cu III	1376.208	30		Ni IV	1378.708	160		S I	1381.5521	650	
V II	1376.220	15		Co V	1378.770	510		P I	1381.637	60	
Cu III	1376.278	10		B I	1378.875	20	A,Z	P III	1381.644	90	
Ni V	1376.315	240		Mg III	1378.891	2		Cr III	1381.67	30	N
Fe V	1376.337	500		As I	1378.94	4	P	Ni II	1381.694	4	
Cu IV	1376.346	950		B I	1378.943	40	A,Z	As IV	1381.7	300	
Fe V	1376.455	300		Zn I	1378.987		F,A	Fe II	1381.730	20	P

Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes
Ni VI	1381.8		F,P	Mn III	1384.640	1		Ne II	1387.665	20	
Cu IV	1381.852	400		Fe II	1384.671	5	P	Zn IV	1387.695	50	
Ne II	1381.894	10		Fe V	1384.688	80		Ni II	1387.745	10	
Ni IV	1381.905	20	N	P I	1384.699	0		Mn II	1387.75	6	
Fe II	1381.954	1	P	Cu III	1384.718	15		Ni II	1387.851	5	
Zn IV	1382.035	15		Na II	1384.794	10		Fe II	1387.87	0	Q
Ni III	1382.077	10		Cu III	1384.822	150		Ni III	1387.870	3	
Cu III	1382.120	50		Ni V	1384.873	540		Zn III	1387.925	3	
Cr III	1382.19	100	N	Cu III	1384.897	100		Fe V	1387.938	800	
Cu III	1382.211	20		Ni VI	1384.9		F,P	Fe II	1387.94	10	Q
Ar II	1382.228	200		Cu IV	1385.012	970		Si III	1387.948	25	
Fe V	1382.270	20		S I	1385.041	1		Fe VI	1387.95		F,P
Ni IV	1382.290	30	N	P V	1385.048	250		Si III	1387.979	10	
Mn II	1382.30	10		P IV	1385.048	200		Cu III	1387.992	25	
Fe II	1382.394	2	P	Cr III	1385.07	10	N	Si III	1387.994	8	
Fe V	1382.414	60		Ni II	1385.179	1	N	N III	1387.995	40	
V III	1382.45	100		P IV	1385.192	40		Si III	1388.011	50	
Ni IV	1382.459	400		Ni II	1385.216	6		Fe V	1388.040	10	
Cu III	1382.472	40		Fe II	1385.272	2	P	Si III	1388.052	8	
Cu III	1382.542	100		Ni IV	1385.274	20		Si III	1388.098	1	
Mg IV	1382.544	320		Fe V	1385.313	200		Cr III	1388.13	40	N
Cu IV	1382.558	960		V III	1385.34	15		Cu III	1388.153	40	
Se I	1382.56	30		Cu III	1385.366	60		Fe V	1388.195	200	
Fe V	1382.560	40		Ca III	1385.426	550		Mn II	1388.21	2	
Fe II	1382.565	1	P	Mn II	1385.43	4		Cr III	1388.24	20	N
Co V	1382.676	270		Fe II	1385.456	1	P	Cu III	1388.254	80	
Ni II	1382.695	2		Zn IV	1385.473	4		Zn IV	1388.258	50	
Fe II	1382.732	1	P	S I	1385.5100	550		Fe V	1388.328	250	
Ni IV	1382.745	10		Se I	1385.54	80		Cu III	1388.412	50	
Ar II	1382.770	100		Cu IV	1385.623	90	N	S I	1388.4347	950	
Cu III	1382.811	50		Fe V	1385.685	300		Cu III	1388.485	30	
Fe III	1382.857	70		Mg IV	1385.740	320		Cr IV	1388.49	20	N
Mn V	1382.881	250		Ni IV	1385.763	20		Ne II	1388.491	50	
Ni V	1383.017	170		Mn II	1385.89	10		Fe II	1388.524	5	P
Co II	1383.044	1		Cu III	1385.896	100		Fe II	1388.597	5	P
Mn II	1383.05	4		Zn IV	1385.908	6		Ni III	1388.629	5	N
Cu III	1383.136	10		Ni V	1385.923	530		Ni IV	1388.702	20	
Cu IV	1383.136	940		Ne II	1385.937	30		Al IV	1388.789	500	
Fe II	1383.139	2	P	Co II	1385.966	3		Ni II	1388.796	1	
Co V	1383.160	370		Ni II	1386.063	1		Cu IV	1388.797	960	
Cu III	1383.184	30		Mg IV	1386.155	120		Mn II	1388.87	3	
Cr IV	1383.24	10	N	Fe II	1386.182	20	P	Ni V	1388.879	20	
Cu III	1383.341	40		Ni IV	1386.230	470	N	Fe V	1389.000	200	
Ni II	1383.356	1	N	Cu IV	1386.253	550		Ni V	1389.047	240	
Co II	1383.357	5		Co V	1386.270	150		Co III	1389.079	10	
Cu IV	1383.359	300		Cu III	1386.292	35		Ni III	1389.149	1	
Ni V	1383.489	20		Fe II	1386.462	1	P	S I	1389.1538	450	
Fe II	1383.580	70	P	Fe V	1386.467	10		Cl II	1389.327	3	
Co V	1383.593	80		Ni VI	1386.6		F,P	Ni V	1389.447	220	
Zn III	1383.700	60		Cu III	1386.689	50		Mg III	1389.504	4	
Ni IV	1383.727	20		Mg III	1386.691	2		Cu III	1389.508	150	
Cr III	1383.749	350		Ni IV	1386.711	290		N V	1389.514	50	
Ni IV	1383.805	50		Co V	1386.734	380		Cr III	1389.55	70	
Ni IV	1383.899	20		Fe II	1386.797	1	P	Cu III	1389.551	60	
Zn III	1383.920	1		Mn III	1386.833	0		Zn III	1389.604	60	
Ni II	1383.966	0		Co V	1386.899	80		Fe II	1389.660	2	
Co III	1383.971	20		Cu III	1386.948	50		Cl I	1389.6928	1000	
Fe V	1384.055	80		Ti XXI	1386.96		P	Cr III	1389.699	250	
Cu IV	1384.077	920		Ni IV	1386.991	70	N	Cu III	1389.708	15	
Al III	1384.132	800		V XVI	1387.		F,P	Ni III	1389.735	20	
Co III	1384.187	50		Co VI	1387.0		F,P	Fe V	1389.762	25	
Fe V	1384.201	80		Zn IV	1387.046	50		Co II	1389.779	2	
Cu III	1384.264	75		Fe V	1387.092	200		V III	1389.79	200	
Co V	1384.286	620		Ni V	1387.174	70		N V	1389.822	40	
Cu III	1384.324	100		Zn IV	1387.215	50		Cu III	1389.877	40	
Ni II	1384.327	12		Fe II	1387.219	55	P	Cu I	1389.88		N,A
Zn IV	1384.341	40		N III	1387.303	50	P	Cl I	1389.9569	900	
Co II	1384.397	8		N III	1387.382	100	P	Cu IV	1390.120	600	
Cr III	1384.420	60		V III	1387.40	15		Cu III	1390.272	150	
Mg IV	1384.425	400		Zn III	1387.440	50		Fe II	1390.318	5	P
Co V	1384.489	510		Fe II	1387.445	1	P	As I	1390.35	4	P
V III	1384.49	75		Cu III	1387.459	60		Zn II	1390.372	40	
Ni IV	1384.574	50		Mg IV	1387.494	340		Cu III	1390.389	30	
Br I	1384.598	580		Ne II	1387.515	80		Cu IV	1390.443	940	
Se I	1384.63	20		Cu IV	1387.518	920		Co II	1390.447	1	

Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes
Cu I	1390.54		A, Z	Co V	1393.305	420		Co V	1396.291	310	
Co V	1390.573	150		Ni II	1393.330	100		Cu III	1396.394	60	
Ni IV	1390.614	20		Cr VII	1393.366	110		Cr III	1396.42	100	N
Cu IV	1390.638	510		Mg III	1393.391	350		Cl I	1396.5267	600	
Co V	1390.666	200		Al IV	1393.42	60		Ni IV	1396.560	400	
S III	1390.67	50		Zn III	1393.460	50		Co V	1396.580	480	
As IV	1390.7	20		P I	1393.462	0	N	Cu IV	1396.589	800	
Fe V	1390.713	80		Fe II	1393.49	1	Q	Cr III	1396.63	30	N
Cu III	1390.715	60		Fe VI	1393.499	20		Ni II	1396.695	10	
Cr III	1390.760	120		Co V	1393.507	400		Mn VI	1396.708	180	
Cu III	1390.827	1		Co V	1393.744	680	N	Ni II	1396.790	14	N
Fe VI	1390.840	60		Si IV	1393.755	1000		P I	1396.863	1	
Ni V	1390.921	490		Cu I	1393.76		N, A	Co II	1396.915	0	
Cu III	1390.923	30		Ni II	1393.867	12		Mn III	1396.946	10	
Fe V	1390.972	70		Cr III	1393.98	10	N	Fe II	1396.964	1	P
Mn III	1390.983	1		Fe III	1394.024	70		Fe II	1396.974	0	P
Se I	1390.99	60		Mn III	1394.051	10		P I	1397.008	1	
P I	1391.027	0		Ni IV	1394.103	60		Cr III	1397.033	60	
Co V	1391.070	460		Co V	1394.156	250		Fe V	1397.106	150	
V IV	1391.105	20		Fe V	1394.272	250		Cu IV	1397.124	600	
Mn VI	1391.173	500		Co V	1394.321	580		Mn II	1397.17	3	
Zn III	1391.216	60		Cr III	1394.33	100	N	O IV	1397.20	10	
Mn VI	1391.218	750		Mg IV	1394.356	100		P I	1397.301	0	
Cr III	1391.247	40		Ni V	1394.375	560		Ni IV	1397.364	620	
Mn III	1391.266	15		Co VI	1394.4		F, P	Mn II	1397.39	6	
Mg III	1391.271	200		Cu III	1394.428	5		Ni VI	1397.4		F, P
Fe II	1391.309	1	P	V III	1394.46	5		Cr III	1397.40	30	N
Se I	1391.32	40	P	Zn IV	1394.509	50		Co V	1397.440	330	
Cu III	1391.443	2		Fe VI	1394.55		F, P	Ni II	1397.480	2	
Fe VI	1391.548	60		Mn V	1394.552	150		Sc II	1397.505	30	
Cu III	1391.551	50		Cr III	1394.58	70	N	Ni V	1397.550	460	
Cr III	1391.580	250		Fe V	1394.599	50		Fe II	1397.572	30	P
Cu III	1391.647	100		As II	1394.64	800		Se I	1397.59	20	P
Ni V	1391.672	120		Fe V	1394.665	250		V III	1397.62	60	
Ne II	1391.704	60		Fe II	1394.713	1	P	Ca III	1397.687	550	
Ni II	1391.761	2		Ni IV	1394.739	30		Cr III	1397.69	10	N
Cr III	1391.78	10	N	Co V	1394.778	590		Fe V	1397.753	100	
Zn III	1391.790	40		Fe IV	1394.829	80		Fe II	1397.845	40	P
Ne II	1391.854	70		Zn III	1394.911	60		Ni II	1397.858	2	
Cu III	1392.036	35		V IV	1395.001	60		Fe VI	1397.87		F, P
Co V	1392.083	590		Ni IV	1395.031	10		Cr III	1397.90	30	N
Cu IV	1392.113	960		Cu IV	1395.053	710		Co V	1397.905	390	
Ar XI	1392.12	0	F	Ni IV	1395.190	30		Cu IV	1397.963	100	
Fe II	1392.149	70	P	Fe III	1395.213	200		Fe V	1397.972	400	
Se I	1392.17	50	P	Cu III	1395.250	150		Ni II	1398.009	3	
Zn III	1392.170	30		Cu IV	1395.350	830		Cr III	1398.090	150	
Ge II	1392.265	100		Mn III	1395.381	1		Co V	1398.113	580	
Fe V	1392.269	100		Fe III	1395.382	20		S IV	1398.13		
Na II	1392.316	10		V III	1395.44	0		Na II	1398.143	12	
Al IV	1392.33	40		Fe V	1395.442	80		Fe V	1398.166	2	
P I	1392.348	1		Ni III	1395.459	10		F III	1398.190	10	
Ni III	1392.377	30		F VIII	1395.48		P	Ni IV	1398.193	760	
Cr III	1392.40	100		Se I	1395.50	100	P	Mn I	1398.210	100	A, Z
Co V	1392.430	460		Mn III	1395.517	7		Co II	1398.226	0	
Cu IV	1392.439	880		Ga IV	1395.541	450		Cu III	1398.333	60	
Ni V	1392.484	600		Cu III	1395.567	40		Co V	1398.355	70	
S I	1392.5878	650		Cu IV	1395.587	190	N	Cu III	1398.379	80	
Cu III	1392.631	50		Mg III	1395.642	4		Fe II	1398.380	10	P
Se II	1392.81	1		Zn III	1395.652	60		Mn III	1398.400	4	
Fe II	1392.817	90	P	Ni IV	1395.734	20		V III	1398.47	75	
Cr II	1392.83	10		Fe III	1395.750	150		Mn III	1398.550	2	
Cu III	1392.885	10		Co II	1395.757	2		P I	1398.563	0	
P III	1392.924	40		Mn III	1395.767	10		Cu III	1398.602	50	
Na II	1392.940	15		Cr IV	1395.83	30	N	Ni II	1398.612	40	
Fe V	1392.941	50		Co V	1395.860	320		Co V	1398.623	500	N
Cu III	1392.944	15		Se I	1395.88	100		Fe II	1398.629	0	P
Cr III	1393.00	10	N	Co II	1395.905	0		Cu IV	1398.632	660	
Zn IV	1393.019	50		Ni IV	1395.993	450		Cu II	1398.6419	10	
Cu IV	1393.019	790		S I	1396.1122	1000		Ni II	1398.758	16	
Se I	1393.07	40	P	Co III	1396.210	2		Mg IV	1398.795	20	
Fe V	1393.073	200		Fe II	1396.228	2	P	Ni IV	1398.838	450	N
Cu III	1393.117	80		Ar II	1396.231	100		P I	1398.881	1	
Cu II	1393.1275	10		Fe II	1396.234	5	P	Co V	1398.893	240	
Fe II	1393.214	2	P	Fe IV	1396.252	4		P I	1398.950	1	
Cr III	1393.22	10	N	Cr III	1396.26	10	N	Cu III	1399.000	60	

Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes
Ni II	1399.026	80		Cu IV	1401.290	840		Co III	1404.009	10	
Cu III	1399.035	50		Cu III	1401.333	25		Fe V	1404.048	10	
Cr III	1399.05	100	N	Cu III	1401.364	25		Ni IV	1404.084	30	N
Mn V	1399.051	100		Fe IV	1401.366	4		Fe II	1404.119	1	P
Fe II	1399.057	2	P	S I	1401.5136	100		Zn I	1404.119	20	
Na II	1399.070	30		Be III	1401.52	10		Co V	1404.165	230	
Mn II	1399.15	2		Fe V	1401.535	50		Si II	1404.170	1	
Cu III	1399.171	150		Cr III	1401.55	100	N	P I	1404.215	0	
P I	1399.189	1		Cu III	1401.566	60		Fe V	1404.260	100	
Mn II	1399.24	3		Cu III	1401.623	100		As II	1404.323	5	
Cu II	1399.3527	3		P III	1401.725	25		Mn I	1404.337	100	A, Z
Ni II	1399.361	12	N	Zn III	1401.762	60		V VI	1404.376	450	
Mn II	1399.39	4		Fe II	1401.774	30	P	Fe VI	1404.420	50	
Cr III	1399.415	60		F III	1401.794	3		Si II	1404.478	6	
Cu III	1399.485	20		Cr IV	1401.822	220		Se I	1404.50	80	P
F III	1399.491	6		Ni IV	1401.895	360		Cr III	1404.50	10	N
Cr IV	1399.50	10	N	P III	1401.946	1		Fe VI	1404.57		F, P
Ne II	1399.532	80		Se I	1401.95	40	P	Ni IV	1404.609	20	
Cu III	1399.574	40		Al V	1402.021	100		Mn I	1404.632	100	A, Z
Zn III	1399.599	2		Cr III	1402.07	30	N	Mg IV	1404.663	320	
Ni IV	1399.604	30		Zn IV	1402.097	20		Na II	1404.675	90	Q
Si III	1399.615			As II	1402.114	10		Al IV	1404.751	300	
Cu IV	1399.652	890		Ni IV	1402.133	30	N	S IV	1404.77	70	
O IV	1399.774	25		Co II	1402.153	10		O IV	1404.812	15	
F III	1399.839	60		Co V	1402.220	680		Zn III	1404.853	3	
Na II	1399.860	12		Cu III	1402.226	100		Cu III	1404.963	30	
Co V	1399.921	300		Co II	1402.352	0		V XVII	1405.		F, P
Ni IV	1399.947	660		Ni II	1402.379	20	N	P IV	1405.013	150	
Ne II	1399.956	20		Fe V	1402.388	800		Co III	1405.032	5	
Fe II	1399.962	1	P	Ni IV	1402.391	120		Cu IV	1405.069	850	
Cl XII	1400.		F, P	Cu III	1402.407	60		Cu III	1405.082	30	
Cr III	1400.036	25		Co III	1402.415	10		Cu III	1405.099	30	
Cu III	1400.081	15		Zn IV	1402.500	35		P I	1405.116	0	
Zn IV	1400.111	50		Ni IV	1402.542	150		V III	1405.14	5	
Co VI	1400.2		F, P	Cr III	1402.589	10		Mn VI	1405.156	55	
Ni IV	1400.211	100		Ga IV	1402.597	200		Mg III	1405.170	80	
Fe V	1400.243	600		Co V	1402.613	590		Mn III	1405.244	40	
As II	1400.306	800		Cu IV	1402.617	550		Ni III	1405.279	10	
Cr III	1400.316	250		Se I	1402.63	10	N	Ga IV	1405.327	80	
Zn III	1400.344	8		Co V	1402.759	720	N	Cr III	1405.37	30	
Cu IV	1400.357	860		Si IV	1402.770	800		Ne II	1405.373	80	
Ni IV	1400.376	270		Al IV	1402.776			Se I	1405.39	100	P
V IV	1400.416	5		Cu II	1402.7770	15		Ni III	1405.421	10	
Fe II	1400.452	0	P	Mg III	1402.82			Co III	1405.451	1	
Co V	1400.523	280		Cu III	1402.885	50		Cu IV	1405.486	910	
Mn II	1400.54	2		Cr III	1402.985	40		P I	1405.569	0	
Mn II	1400.57	3		Mn I	1403.026	500	N, A	Fe II	1405.608	40	P
Ni IV	1400.570	310	N	Fe II	1403.101	1	P	Cr III	1405.657	40	
Co V	1400.584	290		Ni III	1403.113	15		Cu IV	1405.661	860	
Mn I	1400.590	400	N, A	Ne II	1403.135	50		Fe IV	1405.708	12	
F II	1400.611	300		Cu III	1403.152	100		Cr III	1405.72	20	
Cr III	1400.62	10		F III	1403.153	1		V III	1405.74	5	
Ni II	1400.644	30		Cr III	1403.200	10		Co II	1405.798	5	
Mn II	1400.66	2		Ne II	1403.202	20		Fe II	1405.800	30	P
Ni IV	1400.678	630		Co V	1403.205	240		Ti V	1405.911	12	
Cr III	1400.72	10	N	P I	1403.245	7		Ni IV	1405.940	30	N
P I	1400.740	1		Fe II	1403.255	10	P	Ni IV	1406.058	40	N
Ni IV	1400.782	290		Ti V	1403.280	0		S IV	1406.06	30	
Cu III	1400.783	20		Fe V	1403.370	200		Ni III	1406.061	3	
V III	1400.80	10		Cu III	1403.371	100		Ge II	1406.105	20	
Ne II	1400.809	40		Cu IV	1403.416	930		Ni III	1406.250	50	
Ne II	1400.868	20		Cr III	1403.42	70	N	Ge II	1406.269	20	
Co V	1400.894	300		Ti V	1403.562	4		Cr III	1406.31	40	N
Kr III	1400.90	20	N	V IV	1403.618	8		Zn III	1406.326	60	
Cu III	1400.926	20		Sc II	1403.645	4		Se I	1406.35	100	P
Mn III	1400.955	40		Ne II	1403.679	80		Ni IV	1406.458	90	
Se II	1401.01	1		Cu III	1403.750	30		V III	1406.52	50	
Ni IV	1401.027	20		Co III	1403.755	5		Se I	1406.55	100	P
P I	1401.043	3		Co V	1403.779	500		Co V	1406.553	590	
O IV	1401.156	60		Si II	1403.783	5		Sc II	1406.615	1	
Cl II	1401.16	10	N	Cu III	1403.873	15		Fe V	1406.669	400	
Co V	1401.190	510		Cr III	1403.906	120		Cu III	1406.708	8	
Ni III	1401.214	15		P I	1403.931	0		Fe II	1406.718	1	P
Fe II	1401.229	0	P	Ni IV	1403.944	30		Fe V	1406.824	500	
Ge II	1401.235	200		Zn IV	1403.954	40		Mn III	1406.880	10	

Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes
Cr II	1406.90	100		Mn III	1409.286	20		Ni IV	1411.229	20	
Cu IV	1406.911	130	N	Fe II	1409.307	10	P	Fe IV	1411.237	50	
Cu III	1406.946	8		Co II	1409.324	20		Mn II	1411.28	4	
Mn III	1406.957	0		Mg IV	1409.336	360		Cu IV	1411.286	520	
Ni II	1406.970	7		S I	1409.3369	125		Zn III	1411.287	40	
V XVI	1407.		F,P	Co III	1409.340	50	N	Ne II	1411.306	10	
Fe V	1407.007	100		Zn IV	1409.370	60		P I	1411.309	15	
Mn III	1407.024	1		Mn V	1409.436	150		Ti V	1411.309	200	
Zn III	1407.039	40		Fe V	1409.451	600		Fe II	1411.424	15	P
Cu III	1407.044	20		Ni III	1409.471	2	N	Ni IV	1411.453	740	
Cu III	1407.105	50		Al IV	1409.490	100		Sc II	1411.472	4	
F II	1407.135	200		Mn II	1409.51	25		Fe II	1411.485	25	P
Cu IV	1407.152	940		Ni II	1409.612	15	N	P I	1411.487	7	
Cu II	1407.1689	15		Co II	1409.616	0		Cr III	1411.53	10	
Zn II	1407.189	2		Cu III	1409.637	30	N	Na II	1411.536	7	
Zn II	1407.215	3		Mn II	1409.69	5		Mn II	1411.55	4	
Cr III	1407.22	10	N	Fe V	1409.723	80		Fe V	1411.566	200	
Co V	1407.242	480		Ne II	1409.747	60		Cu IV	1411.588	970	
Fe V	1407.246	400		Cr III	1409.796	90		Co V	1411.600	300	
Zn II	1407.259	7	N	Br II	1409.8	100		Zn III	1411.647	60	
Co II	1407.269	1		Sc II	1409.802	1		P I	1411.740	7	
As I	1407.34	2		Cu III	1409.820	15		Co II	1411.823	0	
O IV	1407.386	25		Fe V	1409.846	150		Co V	1411.841	240	
Zn I	1407.438		F,A	Ni IV	1409.847	640		Co II	1411.907	10	
Ni IV	1407.440	180		Zn III	1409.855	50		N I	1411.9318	150	
Fe II	1407.483	5	P	Mn III	1409.888	30		Mn V	1411.939	500	
Fe V	1407.568	150		Co VI	1409.9		F,P	N I	1411.9395	30	
Cu III	1407.574	35		Si II	1409.90	2		Ni IV	1411.941	110	
Cu IV	1407.618	950		Ni III	1409.974	5		N I	1411.9494	300	
Zn III	1407.619	40		F III	1409.982	10	P	Co III	1412.012	5	
Co V	1407.664	820		Cu II	1410.002	1	N	Cu IV	1412.016	380	
Fe IV	1407.774	12		V IV	1410.018	8		P IV	1412.076	25	
Co VI	1407.8		F,P	Cr III	1410.03	20		Cu IV	1412.228	970	
Mg III	1407.880	40		Cu IV	1410.044	970		Cr IV	1412.24	30	N
Cr III	1407.89	40	N	V VI	1410.054	40		Al IV	1412.24	10	N
Co V	1407.957	780		F III	1410.096	15	P	Ni III	1412.304	50	
Cu III	1408.006	100		Ni III	1410.126	10		Co II	1412.368	3	
P IV	1408.055	10		Fe II	1410.139	1	P	Cu III	1412.451	15	
Fe V	1408.117	250		Fe IV	1410.156	12		Sc II	1412.487	4	
Cu III	1408.119	15		Co V	1410.157	420		Co VI	1412.5		F,P
Co II	1408.149	5		Si II	1410.219	20		Cu III	1412.555	40	
P I	1408.187	7		Ni II	1410.219	4		Cu IV	1412.572	960	
Fe IV	1408.227	4		Fe II	1410.273	1	P	Cu III	1412.605	30	
Ni IV	1408.231	20		Zn IV	1410.310	25		Co V	1412.619	190	
Cu III	1408.291	50		Cu III	1410.336	40		Sc II	1412.669	1	
Mn VI	1408.312	120		Ni III	1410.344	15		Cr III	1412.67	30	N
Mn III	1408.350	30		Cr IV	1410.37	20	N	V IV	1412.686	20	
V VI	1408.381	40		Na II	1410.374	12		Cu III	1412.709	75	
Cu I	1408.42		A,Z	Cu III	1410.377	20	N	Al V	1412.772	100	
P I	1408.461	0		Cu III	1410.415	50		Cu III	1412.776	60	
Cr III	1408.477	10		Zn II	1410.443	100		Fe IV	1412.778	30	
Fe II	1408.478	110	P	Ni III	1410.446	3		Zn	1412.818	12	N
Cu III	1408.505	50		Mn III	1410.476	1		Fe II	1412.842	70	P
Co V	1408.534	440		Cu IV	1410.543	950		Ni II	1412.868	30	
V IV	1408.639	8		Cu II	1410.570	2	N	S I	1412.8726	100	
Co II	1408.643	10		Cu III	1410.597	75		As I	1412.95	2	N
Zn III	1408.687	70		Cr XVI	1410.6		F,P	Co III	1412.974	10	
Cr III	1408.688	120		F II	1410.618	100		Zn IV	1412.996	10	
Ni IV	1408.711	630		Fe II	1410.621	0	P	Cu III	1412.997	75	
P I	1408.744	3		P I	1410.630	7		Se XXI	1413.		F,P
Cu IV	1408.777	880		Ni III	1410.642	5		Cu IV	1413.043	970	
Ni II	1408.796	10	N	Co II	1410.681	5		Ni IV	1413.124	0	N
Fe V	1408.801	150		Cu III	1410.732	40		Cu III	1413.147	2	
Zn I	1408.803		A	P V	1410.795	4		Zn III	1413.168	2	
Co III	1408.808	5		Cr III	1410.82	20	N	Cu III	1413.190	1	
Cu II	1408.8124	2		Co II	1410.833	3		Ni III	1413.211	5	
Ni III	1409.000	15		Mn II	1410.913	25		Mn V	1413.215	30	
Fe V	1409.026	300		P I	1410.940	7		Fe VI	1413.281	20	
Zn III	1409.050	30		Ni IV	1410.953	30	N	Co V	1413.292	460	
P I	1409.060	7		Zn IV	1411.015	60		Cr III	1413.32	10	N
Si II	1409.073	10		Fe V	1411.069	80		Mn III	1413.387	0	
Cr III	1409.10	10	N	Ni II	1411.071	100		Cl IV	1413.39	100	
Co V	1409.133	80		Cu III	1411.085	30		P I	1413.406	7	
Fe V	1409.220	300		Cu IV	1411.102	640		Co V	1413.420	760	
Cu III	1409.224	50		Fe VI	1411.22		F,P	Sc II	1413.436	30	

Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes
Ni IV	1413.673	20		Fe II	1415.934	1	P	Zn III	1418.152	0	
Ni II	1413.679	10	N	Co V	1415.965	650		P I	1418.173	7	
Fe II	1413.702	70	P	Sc II	1415.968	50		Co V	1418.204	280	
Cr III	1413.77	40	N	Cu III	1416.025	20		Cu III	1418.279	15	
Zn IV	1413.867	50		Mn III	1416.031	1		Fe II	1418.286	1	P
Mg IV	1413.868	120		Zn III	1416.048	40		Ni III	1418.292	5	
Sc II	1413.868	10		Ni II	1416.060	12		Sc II	1418.301	80	
Co III	1413.884	10		Cu III	1416.153	40		Sc II	1418.322	80	
Kr II	1413.894	1		Fe V	1416.216	200		Sc II	1418.334	80	
Ni III	1413.938	3		Cr III	1416.315	90		Ni IV	1418.337	230	
B I	1413.940		A, Z	Mn III	1416.322	2		Cu III	1418.358	50	
Ne II	1413.956	70		Co V	1416.352	460		Ne II	1418.375	90	
Co VI	1414.0		F, P	Ni IV	1416.403	390		Mg IV	1418.378	180	
Cu III	1414.060	60		V VI	1416.416	110		O V	1418.393	15	
P I	1414.134	0		Ni IV	1416.535	430		Co VI	1418.4		F, P
Mn II	1414.18	4		Cu III	1416.610	20		Cu II	1418.4265	25	
Se II	1414.25	50		Fe II	1416.630	1	P	Mn II	1418.48	15	
Fe IV	1414.255	200		Ni II	1416.660	0		Zn III	1418.482	1	
Ni IV	1414.279	90		Fe VI	1416.678	5		Ni IV	1418.508	130	
Cu III	1414.291	8		Sc II	1416.698	30		V IV	1418.533	30	
Ni II	1414.299	15		Fe II	1416.710	0	P	Na III	1418.559	450	
S I	1414.365	2		Fe II	1416.732	5	P	Na II	1418.579	20	
Ni III	1414.389	20		Fe V	1416.832	40		Fe II	1418.587	1	P
Co II	1414.398	0		Se I	1416.84	80		Mn II	1418.63	12	
Cu III	1414.399	75		Cu IV	1416.841	550		Sc II	1418.650	30	
Mn II	1414.40	30		Cu III	1416.906	15		Zn IV	1418.667	40	
V IV	1414.409	50		S IV	1416.93	10		Ne II	1418.687	20	
Cu IV	1414.437	920		Ni III	1416.956	75		Ne II	1418.745	80	
Ga II	1414.44	1000		Ni IV	1416.960	590		Sc II	1418.773	110	
Ni II	1414.444	1		Sc II	1416.968	50		Cu III	1418.782	100	
P I	1414.445	1		Si II	1416.972	10	Z	Ni IV	1418.786	60	N
Co V	1414.451	140		Fe V	1417.001	100		Sc II	1418.793	110	
Cu III	1414.481	65		Ni II	1417.007	10		Fe II	1418.853	20	P
Cu IV	1414.561	930		Cu III	1417.024	40		V IV	1418.921	10	
Fe VI	1414.578	40		Sc II	1417.028	50		O V	1419.009	7	
Mn IV	1414.60	10		Cu IV	1417.050	500		Mn I	1419.017	100	N, A
Ni IV	1414.603	650		Cu III	1417.096	50		Ni IV	1419.124	610	
Cr III	1414.62	50	N	Cr III	1417.13	70	N	P I	1419.172	0	
P I	1414.677	3		Sc II	1417.139	1		Co II	1419.268	3	
Fe II	1414.699	2	P	Ni III	1417.249	2	N	Cr III	1419.294	10	
Mn II	1414.73	6		Zn III	1417.252	5	Q	Na II	1419.311	15	Q
Ni IV	1414.773	390		Ni IV	1417.282	380		Fe II	1419.325	10	P
Cr III	1414.780	10		Ni III	1417.387	2		Cu III	1419.378	5	
Fe V	1414.832	200		Cr IV	1417.418	450		Ni III	1419.382	10	
V IV	1414.842	20		Fe II	1417.469	2	P	Zn II	1419.416	3	
Sc II	1414.879	30		Cu III	1417.513	100		Fe II	1419.445	1	P
Fe II	1414.882	2	P	Ni II	1417.553	1		Ni IV	1419.456	590	
Cu II	1414.8980	10		Al IV	1417.558	100		Si V	1419.484	70	
Ni IV	1414.899	190	N	Ni IV	1417.587	410		F II	1419.485	10	
Ni III	1414.916	15		Cu IV	1417.631	900		Sc IV	1419.537	160	
Fe II	1414.943	1	P	Mn III	1417.632	1		Cu III	1419.552	3	
Sc II	1415.050	10		Cr VI	1417.659	800		Zn IV	1419.572	40	
Fe V	1415.146	200		Cr III	1417.667	25		Ni IV	1419.577	690	
Mn II	1415.15	30		Zn III	1417.682	5		V IV	1419.580	80	
Fe V	1415.196	400		Ni II	1417.699	10		Fe II	1419.603	1	P
Cr III	1415.235	60		Co II	1417.708	0		Mn V	1419.605	500	
Cu IV	1415.269	880		V III	1417.71	50		Mn II	1419.61	40	
Mn II	1415.43	6		P I	1417.726	0		Cu III	1419.691	10	
Cu III	1415.439	20		Fe II	1417.733	40	P	Mn I	1419.710	200	N, A
Cu III	1415.464	30		Ni III	1417.736	20		Ni IV	1419.725	130	
Ni III	1415.467	3		O V	1417.740	3	P	F III	1419.740	1	
Sc IV	1415.477	5		Si II	1417.781	5	Z	Cu II	1419.7455	2	
Cu III	1415.695	35		Sc IV	1417.824	110		Fe II	1419.771	0	P
Ne II	1415.716	70		Ni III	1417.841	10		Cu IV	1419.807	650	
Ni II	1415.728	20		P I	1417.862	7		Mn I	1419.828	150	N, A
Cl II	1415.7360	100		Zn III	1417.868	40		As II	1419.855	0	
Mn II	1415.75	35		O V	1417.908	7		Sc II	1419.948	10	
Fe II	1415.763	2	P	Mn II	1417.95	10		Sc II	1419.959	10	
Cr III	1415.81	10	N	Cu III	1417.960	30		Zn II	1419.982	200	
Ni II	1415.846	1	N	Fe VI	1418.05		F, P	Cu IV	1420.005	930	
Cl II	1415.8503	60		Ni IV	1418.076	290	N	Cu IV	1420.005	930	
Cu III	1415.855	10		Ni III	1418.105	3	N	Co V	1420.025	720	N
Co V	1415.881	360		Si II	1418.110	0	Z	Ti III	1420.033	160	
Ni III	1415.909	5		Fe V	1418.123	300		Mn III	1420.041	1	
Cl II	1415.9323	20		Mn II	1418.13	18		Ca III	1420.067	200	

Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes
P I	1420.090	15		Na II	1421.889	7		Mn II	1424.49	5	
Fe V	1420.124	200		Ni II	1421.913	1		Ni III	1424.511	100	
Ni IV	1420.136	540		Cu III	1421.963	30		Fe II	1424.597	2	P
Na II	1420.216	12		Cl IV	1421.97	100		Cr IV	1424.62	100	N
Fe IV	1420.224	50		Fe V	1421.981	25		F III	1424.64	3	
Mn II	1420.24	8		Fe IV	1421.986	4		Sc IV	1424.663	360	
P I	1420.246	3		Mn IV	1422.04	10		Fe II	1424.717	55	P
Ni IV	1420.281	80		Cu III	1422.049	5		F II	1424.737	1	
Co VI	1420.3		F, P	Fe II	1422.080	5	P	F III	1424.74	1	
Cu III	1420.316	30		Mg III	1422.118	7		Si III	1424.775	40	
Fe II	1420.356	1	P	Fe IV	1422.131	150		Mn V	1424.777	700	
Fe II	1420.368	0	P	Ni III	1422.143	2		Co II	1424.778	15	
P I	1420.379	7		Al IV	1422.176	200		Fe II	1424.786	10	P
Ge II	1420.385	200		Cu III	1422.202	40		Zn III	1424.890	5	Q
Sc II	1420.400	10		Ni II	1422.320	8	N	Ni II	1424.890	3	
Fe V	1420.419	470		Sc IV	1422.343	20		V IV	1424.916	10	
Ti III	1420.438	160		Mn II	1422.36	3		Co II	1424.989	1	
Ni III	1420.448	75		Ti III	1422.408	230		Al IV	1424.995	250	
Fe V	1420.465	600		Mn II	1422.42	2		Zn IV	1425.002	25	
Cu IV	1420.481	870		Cr III	1422.47	40		Ni II	1425.025	10	N
Zn III	1420.509	10		Fe V	1422.481	200		Mn II	1425.03	3	
Cu IV	1420.547	860		Kr II	1422.512	4		S I	1425.0301	300	
Fe II	1420.575	1	P	Fe II	1422.532	10	P	Mn III	1425.05	2	
Fe II	1420.585	1	P	Cr III	1422.58	20	N	Cu III	1425.050	75	
Fe V	1420.602	200		Ni IV	1422.607	160		Fe V	1425.088	150	
P I	1420.618	3		Cu IV	1422.621	920		Li I	1425.11		ZZ
Se I	1420.62	60	P	Cu IV	1422.686	920		Mn I	1425.110	500	N, A
As II	1420.624	0		Be III	1422.86	50		S I	1425.1882	90	
Mn V	1420.630	80		Cu I	1422.87		A, Z	Zn IV	1425.210	50	
Ni II	1420.674	5		Fe IV	1422.927	50		S I	1425.2190	65	
Fe II	1420.674	1	P	As I	1422.95	2	N	Cu III	1425.253	50	
Se I	1420.68	20	P	Cu III	1422.964	30		P I	1425.294	15	
Cu IV	1420.724	540		Zn III	1422.976	50		Cr III	1425.30	10	N
Fe V	1420.749	100		Mn V	1422.991	100		Co III	1425.329	1	
Cu IV	1420.809	800		Na II	1422.996	12		Cu III	1425.352	20	
Cr III	1420.81	100	N	Co V	1423.072	330		P I	1425.381	3	
Ni II	1420.843	18		Fe V	1423.082	50		Mn II	1425.40	12	
Co V	1420.846	400		V VI	1423.100	40		Cu IV	1425.459	930	
Na III	1420.885	500		Fe IV	1423.145	80		Fe IV	1425.480	375	
Li II	1420.891	60		Cr IV	1423.16	100	N	Na II	1425.499	7	
Fe II	1420.912	40	P	Ni II	1423.212	16		V VI	1425.525	20	
Zn III	1420.920	60		Fe V	1423.233	50		Co II	1425.526	1	
Cu III	1420.945	30		Mn I	1423.334	200	N, A	Mn II	1425.544	20	
Cl X	1421.		F, P	Si V	1423.36	60		Ni II	1425.579	6	
Co V	1421.010	330		V IV	1423.420	10		Mg IV	1425.597	160	
Fe V	1421.016	150		Ni IV	1423.437	220		Ni II	1425.604	3	
Cu IV	1421.023	920		Fe IV	1423.475	12		Fe II	1425.610	2	Q
Ni III	1421.082	10	N	Cu III	1423.475	150		Al V	1425.64	80	
Cr III	1421.091	40		Mn II	1423.48	2		Co III	1425.650	3	
Fe II	1421.180	1	P	Ni IV	1423.524	190		Co V	1425.659	420	
Mn I	1421.197	500	A, Z	Kr III	1423.55	20		Zn	1425.709	10	N
Cr III	1421.20	50	N	Mn II	1423.55	4		Fe IV	1425.728	450	
Ni IV	1421.218	740		Ne II	1423.564	80		Ni III	1425.737	5	N
Co V	1421.256	340		Cu IV	1423.700	400		Mn I	1425.746	200	N, A
Be III	1421.26	100		V IV	1423.719	30		Ni IV	1425.791	230	
P I	1421.280	1		Ni III	1423.722	10		Cu III	1425.904	50	
Fe IV	1421.305	4		Li III	1423.739		P	Mn II	1425.93	12	
Cu III	1421.353	10		Ni II	1423.786	11		Co III	1425.984	1	N
Zn III	1421.361	1	Q	Sc II	1423.818	4		Cu III	1425.997	10	N
Cu II	1421.3737	5		F III	1423.831	10		Co II	1426.034	0	
Fe II	1421.441	1	P	S IV	1423.89	0		Fe IV	1426.040	200	
Zn III	1421.494	50		Li III	1423.892		P	Na II	1426.048	7	N
Mg III	1421.538	20		Fe II	1423.922	5	N	Co V	1426.108	320	
P I	1421.594	3		Li III	1423.944		P	Be I	1426.117	125	
Ti III	1421.640	160		Cu III	1423.984	75		Mn II	1426.15	1	
Co VI	1421.7		F, P	Ni II	1423.994	1	N	Zn III	1426.150	25	
Cu III	1421.701	3	N	Fe II	1424.08	8	P	Cu III	1426.171	30	
Sc II	1421.709	30		Ti III	1424.136	160		P IV	1426.180	1	
Mn II	1421.71	5		P I	1424.145	3		Fe II	1426.21	10	
Ti III	1421.755	160		V IV	1424.197	0		C III	1426.22	10	
Cu II	1421.7589	25		Co V	1424.211	680		Fe IV	1426.234	200	
Mn II	1421.77	2		Mn V	1424.217	400		Cu III	1426.259	20	
Cr III	1421.80	10	N	Co VI	1424.3		F, P	Mn V	1426.263	150	
Ni IV	1421.806	0	N	Fe II	1424.309	2	P	Mn II	1426.32	10	
Mn II	1421.87	3		Cu IV	1424.486	900		V VI	1426.335	20	



Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes
Co V	1426.359	290		Fe IV	1428.884	80		Na II	1431.015	7	
Ni IV	1426.369	660		Ni IV	1428.929	670		Ni IV	1431.016	600	
Mn II	1426.43	3		C III	1428.95	100		Mn II	1431.046	20	
Fe V	1426.432	10		Co II	1429.002	20	N	P I	1431.055	25	
C III	1426.45	400		Fe V	1429.004	150		Mg III	1431.136	100	
Ni IV	1426.505	80	N	Mn II	1429.02	2		Co VI	1431.2		F,P
Zr IV	1426.58	10	N	Cu III	1429.020	75		Na II	1431.228	15	
Zn III	1426.611	60		Co V	1429.027	150		Ni II	1431.270	8	
Cr VII	1426.644	220		Cr III	1429.04	50	N	Co III	1431.323	30	
Se II	1426.65	250		Cu IV	1429.045	890		Mn II	1431.36	3	
Cu IV	1426.650	930		C III	1429.10	10		Fe IV	1431.432	520	
V IV	1426.654	100		V IV	1429.114	10		Mn I	1431.434	500	N,A
Fe II	1426.761	1	P	Mg IV	1429.166	140		P I	1431.489	15	
Ni II	1426.783	5	N	Cr III	1429.17	50	N	Ni II	1431.492	25	
Ni IV	1426.794	390	N	Cu III	1429.179	100		Mn II	1431.52	2	
C III	1426.80	100		P III	1429.184	25		Co II	1431.522	0	
Co V	1426.831	780		Ti V	1429.222	12		Cu III	1431.550	20	
Cu IV	1426.847	950		Co III	1429.236	0		Zn IV	1431.592	8	
Cl IV	1426.89	100		Fe II	1429.276	1	P	C I	1431.597	100	Z
Ni IV	1426.941	30	N	Co III	1429.324	0		Cr III	1431.620	1	
Cr III	1426.988	200		Fe V	1429.330	30		Cu III	1431.662	100	
Ni XI	1427.		F,P	Fe II	1429.391	1	P	Cr III	1431.758	250	
Cu IV	1427.028	940		Cr IV	1429.41	10	N	Co III	1431.800	10	
Ni III	1427.087	5		Na VI	1429.430	10	Q	As II	1431.817	0	
Fe II	1427.148	2	P	Fe V	1429.472	250		Ni IV	1431.818	120	N
Cu III	1427.161	60		Cu IV	1429.533	960		Cu III	1431.875	75	
Cr III	1427.20	10	N	Al	1429.57	10	N	Fe V	1431.891	100	
Mn III	1427.238	6		Mn II	1429.60	1		Al IV	1431.935	600	
Fe IV	1427.268	300		Mn II	1429.66	2		Cu IV	1431.950	950	
Na III	1427.27	10	N	Cr III	1429.703	10		Al V	1431.961		
Mn I	1427.287	600	N,A	Co V	1429.766	380		Mn V	1431.981	400	
Co III	1427.308	2		P I	1429.770	15		Ca XIV	1432.		F,P
Fe IV	1427.346	250		P I	1429.891	3		Cu III	1432.017	50	
Ni II	1427.448	1	N	Cu III	1429.904	100		Cu IV	1432.031	960	
Ni IV	1427.450	700		Cu III	1429.960	80		Co III	1432.065	10	
P I	1427.458	7		Na II	1429.963	10		C I	1432.105	75	Z
Fe IV	1427.511	250		Cr III	1430.023	4		Zn III	1432.143	60	
Fe IV	1427.553	250		Zn III	1430.107	50		Co II	1432.143	2	
Cu II	1427.5912	10		P I	1430.135	25		Mn II	1432.18	1	
Ni III	1427.639	20	N	Cr III	1430.15	30	N	Cu III	1432.249	100	
Fe IV	1427.657	30		Fe II	1430.167	10	P	Ni IV	1432.283	110	N
Cr III	1427.71	10		Co III	1430.177	30		Cu III	1432.453	30	
Mg IV	1427.710	220		Ni IV	1430.188	660		Ni IV	1432.453	520	
P I	1427.755	15		Cu IV	1430.205	800		Mn I	1432.480	500	N,A
Zn IV	1427.759	10		Cu II	1430.2428	40		Fe II	1432.492	10	P
Cu III	1427.762	20		P I	1430.277	15		Ca II	1432.503	120	
Ni II	1427.782	10	N	Zn II	1430.285	15		C I	1432.530	50	Z
Fe II	1427.798	2	P	Fe V	1430.309	150		Co III	1432.556	10	N
Fe V	1427.815	100		Cu III	1430.330	60		V VI	1432.593	20	
Cu II	1427.8290	20		Cu III	1430.364	40		Co II	1432.608	2	
C III	1427.85	300		Mn II	1430.37	0		Zn III	1432.716	2	
Se I	1427.87	60		P III	1430.410	40		Cu III	1432.759	8	N
Ge II	1427.877	200		Cr III	1430.42	50	N	Mg IV	1432.767	200	
Zn IV	1427.879	40		Ni IV	1430.431	630		Mn II	1432.78	40	
Fe II	1427.879	2	P	Mn I	1430.431	1000	N,A	Fe II	1432.822	10	P
Ni IV	1427.906	50	N	Ni III	1430.438	10		Cu III	1432.847	2	N
Ni III	1427.914	3	N	Fe IV	1430.517	200		Mn V	1432.858	500	
P I	1428.045	7		Co III	1430.530	30		Fe II	1432.875	15	P
Cu III	1428.064	150		Fe V	1430.573	800		Fe V	1432.936	100	
Co V	1428.080	500		Se I	1430.58	60		Mn II	1432.95	5	
Fe V	1428.090	125		Cu III	1430.587	5		Al IV	1432.97	10	
C III	1428.17	200		P I	1430.602	7		Ni XI	1433.		F,P
Mn II	1428.19	0		Ni III	1430.630	10	N	Fe II	1433.044	5	P
Co III	1428.331	2	N	Mn V	1430.713	800		As II	1433.053	0	
Cu II	1428.3580	25		P I	1430.732	60		Mn II	1433.08	4	
Cr III	1428.46	10		Fe V	1430.751	150		Ni IV	1433.088	440	
C III	1428.50	200		Mn II	1430.77	10		Fe V	1433.1		F,P
Sc XXI	1428.571		P	Fe II	1430.781	30	P	V VI	1433.189	110	
Ne II	1428.579	90		Mn III	1430.784	20		Cr III	1433.26	50	N
C III	1428.66	10		Co V	1430.857	350		Ni IV	1433.260	180	
Fe II	1428.688	2	Q	Fe II	1430.893	30	P	Mn II	1433.27	4	
Cu IV	1428.762	580		Ni IV	1430.935	520		Fe VI	1433.272	60	
Fe	1428.84	1	N	Cu III	1430.948	100		V IV	1433.276	1	
Mn II	1428.85	2		Cu IV	1430.971	900		Mn XXIV	1433.28		P
Ni III	1428.870	200		Zn II	1430.992	150		S I	1433.2800	225	

Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes
S I	1433.3105	100		Ni III	1435.609	10		Si II	1438.576	2	
Ni IV	1433.338	80		Co V	1435.668	500	N	Ni IV	1438.590	20	
Cu IV	1433.374	810		Kr II	1435.676	4		Co II	1438.689	10	
P I	1433.434	15		Mn II	1435.68	1		Si III	1438.702	40	
Ge II	1433.48	5	N	Na II	1435.776	10		Mn II	1438.71	1	
Mn II	1433.50	15		Si III	1435.776	160		Zn III	1438.808	10	
Fe II	1433.568	0	P	Se I	1435.78	120	P	Ni IV	1438.816	700	
Mn II	1433.63	6		Ni IV	1435.793	240		Cu IV	1438.853	920	
Si III	1433.690	120		As IV	1435.8	200		Cr III	1438.90	5	N
Ni II	1433.745	1		Co III	1435.840	5		Si II	1438.931	4	
Ca II	1433.749	200		Fe II	1435.848	2	P	Co V	1439.010	590	N
P I	1433.757	0		Mn II	1435.87	4		Fe V	1439.052	200	
Cu III	1433.760	30		Sc IV	1435.890	5		Ni IV	1439.060	560	
Cu II	1433.8404	10		Zn	1435.914	20	N	Zn II	1439.091	500	
Ti III	1433.85	40	N	Fe II	1436.041	1	P	Ni II	1439.094	8	N
Zn III	1433.853	50		Zn III	1436.075	40		Mn II	1439.16	15	
Ni II	1433.893	1	N	Ne II	1436.086	90		Co V	1439.168	370	
Mn V	1433.932	400		Cu IV	1436.090	930		Cu III	1439.264	80	
Zn III	1434.027	25		P IV	1436.114	1		Ni II	1439.283	1	
V IV	1434.092	15		Ni II	1436.165	50		Al III	1439.311		
Ni III	1434.133	30		Si III	1436.166	140		Ni II	1439.352	8	
Fe II	1434.145	2	Q	Na III	1436.21	240	N	Si III	1439.391	40	
Si V	1434.17	60		Zn III	1436.219	15		Fe II	1439.427	30	P
Cu IV	1434.183	350	P	Cu II	1436.2359	25		Ni IV	1439.497	260	N
Cr III	1434.19	10	N	Co III	1436.236	20		Cu III	1439.572	20	
Zn	1434.219	10	N	Cu III	1436.251	50		Ni IV	1439.584	580	
Cu IV	1434.247	380	P	Cu III	1436.363	60		Fe II	1439.600	2	P
Co III	1434.259	200		Fe II	1436.438	2	P	Fe IV	1439.688	80	
Mn II	1434.26	10		Fe II	1436.447	0	P	Al III	1439.726		
Ni III	1434.306	200		Co II	1436.503	0		Mg III	1439.770	4	
Fe IV	1434.314	80		Zn IV	1436.577	40		Ni IV	1439.773	290	
Ni II	1434.317	1	N	Cr III	1436.65	20	N	Ni III	1439.809	20	N
Cu IV	1434.342	890		Cu IV	1436.670	480		V IV	1439.834	1	
Ni II	1434.373	12		F III	1436.687			Cr XI	1439.85	0	F
Fe IV	1434.387	150		Co V	1436.707	360		P I	1439.908	7	
Si II	1434.400	1		Si III	1436.724	80		Ni III	1439.938	3	F, P
Mn II	1434.44	30		Cu III	1436.820	100		Ti XV	1440.		
Ni III	1434.446	2	N	Mn V	1436.917	600		As IV	1440.0	100	
Ni II	1434.493	14		S I	1436.9675	125		Zn III	1440.159	12	
P I	1434.536	0		Cu III	1436.973	100		P I	1440.231	25	
Si II	1434.542	2		Ni IV	1436.984	170		Mn V	1440.318	300	
Ni II	1434.546	12		Mn II	1437.13	15		Mn IV	1440.32	70	
Fe VI	1434.58		F, P	Ni IV	1437.168	470		Cu III	1440.417	75	
Co III	1434.642	1		Cr III	1437.17	70	N	Si VIII	1440.49	0	F
As I	1434.66	1	N	Zn III	1437.296	12		Fe II	1440.510	1	P
Ni IV	1434.665	10	N	Co VI	1437.3		F, P	Fe II	1440.523	1	P
Fe II	1434.669	1	P	Mn II	1437.32	1		Fe V	1440.528	800	
Ni II	1434.688	1		Ni IV	1437.393	610		Cu IV	1440.584	250	
Cu II	1434.7699	15		Mn V	1437.409	500		Ni IV	1440.617	230	
As I	1434.77	3		Mn II	1437.42	4		Fe	1440.63	7	N
Mn II	1434.79	1		Mg IV	1437.51	300		Mn II	1440.63	8	
Cu III	1434.831	75		Cu III	1437.518	75		Be III	1440.77	20	
Ni II	1434.837	1		Ni IV	1437.552	200		Fe II	1440.775	5	P
V IV	1434.842	15		Fe V	1437.561	70		Na III	1440.775	350	
P I	1434.856	0		Mg IV	1437.61	340		Fe V	1440.792	300	
Si V	1434.86	40		Cu III	1437.623	100		Mn II	1440.81	0	
Mg IV	1434.866	260		Mn II	1437.70	3		Zn III	1440.876	1	Q
Cu II	1434.9037	125		Cr III	1437.76	20	N	Si III	1440.908		
Ni IV	1434.953	230		Ni IV	1437.761	180		Fe II	1440.910	2	P
Fe II	1434.996	55	P	Zn III	1437.767	1		Fe IV	1440.946	110	
Ni IV	1435.031	480		Cu IV	1437.782	670		Cl IV	1440.95	10	
Zn III	1435.037	2		Mg IV	1437.8			Mn II	1440.96	1	
Fe V	1435.046	150		Cu III	1437.817	20		Co V	1440.974	420	
Kr II	1435.085	25		Ni IV	1437.943	660		Zn III	1441.017	15	
Be III	1435.17	10		Cr III	1438.03	10	N	Fe V	1441.049	250	
Ni IV	1435.235	670		Cu IV	1438.078	930		Cr III	1441.06	60	N
Cu III	1435.265	30		Fe II	1438.133	20	P	Cu III	1441.076	75	
Co VI	1435.3		F, P	Fe II	1438.135	10	P	Fe II	1441.119	5	P
Cu II	1435.3155	10		Ni III	1438.152	2		Ni III	1441.159	2	N
Ni II	1435.348	5		Si III	1438.228	40		Cu III	1441.163	40	
Se I	1435.35	120	P	Mg IV	1438.244	300		Ne II	1441.188	40	
Ni IV	1435.385	170	N	N IV	1438.37	150		Co IV	1441.2		F, P
Co III	1435.426	100		Fe II	1438.445	5	P	Ni IV	1441.269	290	N
Fe II	1435.475	1	P	Co II	1438.507	0		Cu III	1441.306	40	
Mg III	1435.550	40		Zn IV	1438.558	15		Mn II	1441.37	1	

Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes
Cu III	1441.411	30		Cu II	1443.5419	3		N IV	1446.114	250	
Ti V	1441.426	2		Mn I	1443.684	200	A, Z	Co II	1446.114	3	
Zn II	1441.4697	220		Fe II	1443.737	20	P	Ni III	1446.154	2	N
Cl III	1441.474	50		Mg III	1443.738	60		Fe IV	1446.154	30	
Cl II	1441.5265	220		Cu IV	1443.774	970		Ne II	1446.183	20	
Fe II	1441.575	5	P	Cr III	1443.82	60	N	P I	1446.191	0	
Cl II	1441.5793	220		Ni II	1443.838	10		Cr III	1446.247	90	
Cl II	1441.6021	125		Mn II	1443.85	10		Mg III	1446.254	40	
Co II	1441.610	1		Mn I	1443.966	225	A, Z	Fe V	1446.285	80	
Cu III	1441.611	75		Mn II	1444.01	6		P I	1446.331	15	
Ni IV	1441.620	480	P	Ni IV	1444.043	90		Cu IV	1446.332	920	
Ti V	1441.713	50		Cu III	1444.053	10		Ni IV	1446.376	210	
Fe II	1441.725	2	P	Mn IV	1444.08	100		Mn III	1446.467	5	
Si III	1441.732	100		Sc IV	1444.096	360		Mn V	1446.475	700	
Co IV	1441.8		F, P	Cu II	1444.1304	2		Cu III	1446.508	5	
Al IV	1441.825	700		Ni IV	1444.137	220		Cr III	1446.511	300	
Se I	1441.84	50	P	Mn II	1444.19	6		Co V	1446.535	360	
Cr III	1441.90	50	N	Fe II	1444.193	1	P	Ni II	1446.589	20	
Co V	1441.917	200		Na III	1444.194	500		Fe V	1446.618	800	
Mn III	1442.047	10		Zn III	1444.216	10		Cr III	1446.673	250	
Fe II	1442.104	2	P	Mn I	1444.283	250	A, Z	Mn I	1446.700	350	A, Z
Ni IV	1442.134	640		Cu IV	1444.285	880		Cu IV	1446.711	450	
Cu II	1442.1386	5		Fe IV	1444.294	30		Fe II	1446.737	0	P
Mn I	1442.147	100	A, Z	S I	1444.2967	30		Cu III	1446.737	25	
Co V	1442.165	300		Cr III	1444.305	1		Mn IV	1446.74	60	
F III	1442.192	3		Co II	1444.334	3		Ni III	1446.748	15	
Fe V	1442.221	400		Kr II	1444.343	25		Cu III	1446.824	25	
Ni III	1442.235	5		Fe IV	1444.403	200		Se I	1446.83	100	P
Cu IV	1442.241	860		Cu IV	1444.406	940		Co II	1446.845	1	
Mn I	1442.260	110	A, Z	Ni IV	1444.425	620		Cu II	1446.9006	1	
Fe II	1442.278	2	P	Cu III	1444.565	15		Mn II	1446.908	20	
Mn II	1442.28	10		Cu IV	1444.565	850		Zn III	1446.915	40	
Mn I	1442.384	120	A, Z	Mn II	1444.58	3		Ni IV	1446.935	60	
Ni IV	1442.414	200	P	Ni IV	1444.604	110		Cr IV	1447.03	10	
Cu III	1442.414	100	N	Mn I	1444.641	275	A, Z	Se I	1447.04	100	P
Cu IV	1442.429	960		Cu III	1444.653	50		V IV	1447.120	0	
Fe II	1442.433	5	P	V III	1444.75	1		Cu III	1447.147	5	
Co IV	1442.5		F, P	Mn V	1444.779	400		Ni IV	1447.193	20	
Ni IV	1442.500	270	P	Cr III	1444.84	20	N	Si III	1447.196	120	
Zn III	1442.512	60		Se I	1444.88	100	P	Co III	1447.216	3	N
Mn I	1442.518	130	A, Z	Ni IV	1444.899	660		Cu IV	1447.249	710	
Cu IV	1442.557	890		Cu III	1444.919	60		Mg III	1447.260	30	
Mn II	1442.594	25		Ni II	1444.940	1	N	Fe II	1447.272	10	P
Co IV	1442.6		F, P	Fe II	1444.981	10	P	Cr III	1447.284	40	
Mn I	1442.667	140	A, Z	Sc IV	1445.003	70		Mg IV	1447.395	280	
Ni IV	1442.675	370		V III	1445.03	00		Mn I	1447.440	375	A, Z
As I	1442.69	5		Zn II	1445.042	700		Mn II	1447.49	15	
Fe II	1442.746	20	P	Mn I	1445.051	300	A, Z	Cr III	1447.50	20	
P I	1442.764	25		Ni IV	1445.078	540		P I	1447.504	60	
Sc IV	1442.769	5		Ni II	1445.098	13		Al IV	1447.512	800	
Cr III	1442.78	10	N	Cu III	1445.108	40		Ni IV	1447.576	240	
Mn IV	1442.81	80		V III	1445.21	00		Cu III	1447.636	20	
Mn I	1442.831	150	A, Z	Cu III	1445.217	35	N	Fe V	1447.709	100	
V III	1442.85	5		P I	1445.344	7		Fe IV	1447.742	50	
Na II	1442.907	30		Ni III	1445.374	40		P V	1447.827	375	
Zn II	1442.962	5	Z	Fe II	1445.400	2	P	Na III	1447.85	100	
Cu III	1442.968	40		Co III	1445.427	2	N	Mn II	1447.86	10	
Mn I	1443.010	160	A, Z	Mn II	1445.43	2		P I	1447.913	1	
Cu IV	1443.023	960		Ni II	1445.460	14	N	Si V	1447.95	40	
Fe II	1443.031	1	P	Cu III	1445.501	40		Co II	1448.012	15	
Cr III	1443.08	20	N	Mn I	1445.523	300	A, Z	Mn II	1448.08	15	
Ni II	1443.080	13		Co II	1445.547	5		Cu IV	1448.092	180	
Mn V	1443.084	90		P I	1445.676	15		Mn V	1448.130	600	
Co IV	1443.1		F, P	Fe V	1445.686	200		Ni III	1448.175	30	
P I	1443.124	15		Na III	1445.731	350		Fe II	1448.194	1	P
Cu IV	1443.140	970		Si VIII	1445.76	9	F	Mg IV	1448.217	160	
Fe V	1443.163	100		Al V	1445.87	400		Cr III	1448.221	4	
Co IV	1443.2		F, P	Cr III	1445.876	10		S I	1448.2290	125	
Mn I	1443.209	170	A, Z	Fe V	1445.910	150		P I	1448.239	15	
Mn V	1443.322	600		Cu II	1445.9835	20		Mn I	1448.322	400	A, Z
Cu III	1443.384	30		Ni V	1446.0		F, P	Mn III	1448.351	2	
Mn I	1443.435	180	A, Z	Fe IV	1446.000	150		Fe II	1448.393	40	P
Mn II	1443.46	7		P I	1446.010	25		Co VI	1448.4		F, P
Fe II	1443.481	1	P	Mn I	1446.067	350	A, Z	Mg IV	1448.456	160	
Cu IV	1443.524	800		Zn III	1446.086	50		Cr VII	1448.457	40	

Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes
Mn II	1448.47	4		Fe V	1451.103	100		Ne II	1454.390	5	
Cu III	1448.493	60		Zn III	1451.147	50		Mn II	1454.40	1	
Fe V	1448.494	250		Fe V	1451.264	80		Cu III	1454.425	25	
Cl II	1448.4940	15		Ni IV	1451.347	470		Zn IV	1454.465	25	
V III	1448.58	10		Fe V	1451.38		F, P	Fe V	1454.471	2	
As II	1448.593	500		C I	1451.448	2		Ni IV	1454.501	310	
Cu II	1448.6383	1		Mg IV	1451.457	40		Fe IV	1454.585	250	
Mn II	1448.714	15		V IV	1451.496	10		C I	1454.599	2	
Na III	1448.73	150		Ni III	1451.504	200		Al V	1454.65	30	
Mn V	1448.787	600		V VI	1451.517	160		Cu IV	1454.661	800	
Mn IV	1448.79	120		Fe II	1451.616	1	P	Fe V	1454.701	200	
Ni IV	1448.805	320		Ti IV	1451.736	800		Zn	1454.804	10	N
Mn II	1448.83	12		N I	1451.741		P	Fe II	1454.830	1	P
Fe V	1448.846	700		Ar II	1451.879	100		Ni II	1454.852	200	
Co III	1448.890	1	N	N I	1451.925		P	Cu III	1454.861	25	
Cl II	1448.9013	15		Cu IV	1451.936	430		Cu IV	1454.896	420	
P I	1448.905	0	N	Cr III	1451.95	80	N	Mn IV	1454.96	60	
Cu III	1448.933	10		Fe II	1451.989	10	P	Co II	1454.962	50	N
Ni IV	1449.011	730		Cu IV	1452.006	290		Mn II	1454.97	20	
Fe IV	1449.028	30		Mn II	1452.05	6		Zn XXIII	1455.		F, P
P I	1449.034	1		Fe V	1452.2		F, P	Cu III	1455.063	10	
Cu II	1449.0580	20		Mn I	1452.211	600	A, Z	Cu III	1455.174	50	
Mn III	1449.07	20		Ni IV	1452.220	760		Fe II	1455.186	2	P
Ne II	1449.132	40		Cu III	1452.228	20		Ti III	1455.195	850	
Se I	1449.16	150		Fe V	1452.252	10	N	Ni V	1455.2		F, P
Ni IV	1449.193	90		Cu II	1452.2935	20		Cu IV	1455.236	850	N
V II	1449.262	5		C I	1452.338	10		Al V	1455.265	300	
Fe XXV	1449.3		P	Fe IV	1452.393	150		Cr VI	1455.282	700	
Na III	1449.311	600		Fe IV	1452.478	150		Mn II	1455.33	5	
Mn V	1449.328	150		Ni III	1452.532	20	N	Ni IV	1455.424	700	
Mn I	1449.374	450	A, Z	Cu III	1452.544	10		Ar II	1455.484	100	
Ni IV	1449.464	230		Ni IV	1452.549	330	N	Fe V	1455.559	300	
Ga II	1449.49	120		Ni II	1452.558	15		Mn III	1455.596	7	
Zn IV	1449.496	40		Cu II	1452.6956	0		Ni IV	1455.602	410	
V IV	1449.681	20		Mn V	1452.774	450		Zn IV	1455.630	30	
Cu IV	1449.689	910		Mn IV	1452.89	200		Cu II	1455.6624	3	
Al IV	1449.70	10	N	P II	1452.89	300		Cu III	1455.669	15	
Mn II	1449.74	4		Mn V	1452.897	1000		Fe V	1455.707	50	
Fe V	1449.757	100		Na III	1452.911	400		Fe IV	1455.712	30	
Ni IV	1449.782	550		Fe V	1452.967	70		Ti III	1455.733	3	
Zn IV	1449.832	40		Mn V	1452.977	500		Si V	1455.83	50	
Cr III	1449.89	20		Mn II	1452.99	3		Cu III	1455.842	40	
Br I	1449.903	400		V III	1453.00	5		Co II	1455.881	15	
Fe V	1449.928	400		P I	1453.018	45	P	Ni IV	1455.897	140	
Ni II	1450.005	14		Fe IV	1453.089	300		Na II	1455.969	12	
Fe II	1450.020	2	P	F IV	1453.14	1		C I	1456.149	15	
Cu IV	1450.032	900		Ca III	1453.157	650		Fe V	1456.161	700	
Cu III	1450.04		F, P	Cu III	1453.213	15		Fe V	1456.285	150	
C I	1450.07	1		P I	1453.350	25		Ni IV	1456.314	20	Q
Cr III	1450.22	5	N	C I	1453.357	4		Se I	1456.34	120	P
Mn II	1450.23	10		Ni II	1453.359	15		Cu III	1456.390	15	
Zn II	1450.234	5	Z	Ni IV	1453.495	470		Mn II	1456.45	2	
Fe IV	1450.252	12		V II	1453.515	2		Fe II	1456.472	20	P
Cu II	1450.3035	40		Cu III	1453.525	2		Ni IV	1456.516	380	
Ti III	1450.305			Ni III	1453.603	2	N	Mn I	1456.611	700	A, Z
Mn IV	1450.32	120		Fe V	1453.618	250		Zn III	1456.707	60	
Ti III	1450.360	15		Mn V	1453.621	150		Fe IV	1456.751	150	
Ni IV	1450.366	40		Mn IV	1453.63	20		Ni IV	1456.862	130	N
P I	1450.382	25		Zn III	1453.644	1	Q	Cu III	1456.905	45	
Mn XI	1450.43		F, P	Ni IV	1453.653	50		Zn II	1456.907	500	
Mn II	1450.46	12		Sc IV	1453.861	220		Ni II	1456.913	16	N
Cr III	1450.52	10	N	Ni III	1453.882	50	N	Na IV	1456.943	220	
P I	1450.577	3		Fe IV	1453.962	80		F III	1457.145	3	
N I	1450.592		P	Cr III	1454.00	50		Ni IV	1457.165	10	N
Mn I	1450.648	500	A, Z	V IV	1454.000	40		Cu II	1457.1759	10	
P I	1450.704	7		Mn II	1454.03	6		Mg IV	1457.212	200	
Mn II	1450.71	15		Cu IV	1454.091	780		Cr III	1457.22	30	N
C I	1450.73	3		Mn I	1454.153	700	A, Z	Si III	1457.253	100	
Zn II	1450.778	700		Mg IV	1454.171	100		Cu IV	1457.255	440	
N I	1450.816		P	Mn II	1454.18	6		Mn II	1457.30	5	
Mn II	1450.82	4		Fe V	1454.243	100		Ni II	1457.359	5	
P I	1450.904	15		Cu III	1454.246	15		Fe IV	1457.369	300	
Ni IV	1450.926	20	Q	Ni II	1454.292	2		Zn II	1457.422	100	
N I	1451.000		P	Fe II	1454.311	40	P	Ni IV	1457.422	90	
V IV	1451.042	30		Ni IV	1454.376	220		Ni III	1457.430	10	

Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes
Fe II	1457.431	0	P	Cu III	1459.991	20		Mn II	1462.87	5	
F III	1457.441	1		Co II	1460.038	2		P I	1462.884	0	
Mn V	1457.454	350		Ni II	1460.078	6		Cu III	1462.885	60	
Mn IV	1457.46	80	N	P I	1460.126	7		Ni II	1462.944	20	
C I	1457.468	10		Ni II	1460.136	1		Kr XXIII	1463.		F,P
Cu III	1457.499	8		Al IV	1460.168	250		Mn II	1463.02	8	
Zn I	1457.570	20		Ar III	1460.17	200	P	Co III	1463.037	3	N
Ni III	1457.575	10		Mn III	1460.182	2		Fe V	1463.067	30	
Mn II	1457.67	7		Ge XVIII	1460.2		F,P	Ni II	1463.113	14	
V XIX	1457.7		F,P	Fe IV	1460.229	200		Ar II	1463.155	200	
Fe V	1457.727	250		Ni II	1460.312	1		Fe II	1463.204	40	P
Ni III	1457.829	50	N	Ar III	1460.32	100	P	V III	1463.21	5	
Ni IV	1457.862	500		Mn I	1460.385	200	N,A	Mn I	1463.235	200	N,A
Ni II	1457.863	4		Ni II	1460.408	2		P I	1463.240	1	
Zn III	1457.922	10	Q	Ni IV	1460.430	400		Ni IV	1463.248	540	N
Na III	1457.939	100		C I	1460.455	10		Zn IV	1463.283	30	
Al IV	1457.956	600		C I	1460.53	4		Zn I	1463.304		F,A
Ge II	1457.96	2	N	Ni IV	1460.543	590		Ca III	1463.335	750	
V XIX	1458.		F,P	Zn II	1460.616	12	Z	C I	1463.3360	600	
Cu II	1458.0016	15		V III	1460.64	15		P I	1463.358	3	
C I	1458.078	7		Ne II	1460.716	30		Fe V	1463.364	70	P
Cu IV	1458.094	860		Ti V	1460.723	12		Co IV	1463.4		F,P
C I	1458.114	8		Fe V	1460.726	400		Fe X	1463.50	2	F
Cr III	1458.17	10	N	F III	1460.750	1		Cu III	1463.537	60	
Ni II	1458.170	4		Fe IV	1460.859	150		C I	1463.552	40	
Mg III	1458.172	20		Mn V	1460.892	150		Fe II	1463.592	1	P
Mn II	1458.18	3		Cu III	1460.893	75		Ga II	1463.65	30	
Sc IV	1458.212	5		P III	1460.906	1		Ni IV	1463.683	380	
Ni III	1458.284	5		Cu III	1460.953	10		Fe IV	1463.751	12	
Se I	1458.33	80	P	V VI	1460.991	5		Cu II	1463.7515	100	
Ni II	1458.342	4		Cr IV	1461.04	20	N	V III	1463.76	00	
Cu III	1458.370	30		Fe V	1461.050	125		F III	1463.808	3	
Cr III	1458.41	80	N	Ni IV	1461.068	220		As I	1463.81	5	P
Zn II	1458.455	20	Z	Fe II	1461.145	0	P	Cu II	1463.8381	25	
Ni IV	1458.483	80		Na III	1461.153	350		Cr III	1463.87	10	N
Fe IV	1458.524	250		Ni IV	1461.478	460		Co III	1463.936	2	N
Mn I	1458.555	100	N,A	Mn II	1461.48	5		Mn I	1463.981	450	A,Z
Cu III	1458.602	60		Cu II	1461.5539	15		Mn I	1464.042	250	N,A
Zn III	1458.622	2	Q	Cu III	1461.604	15		Kr II	1464.072	4	
Ge II	1458.64	1	Z	Ni III	1461.649	10		As I	1464.10	2	
Mn VI	1458.660	30		Ni IV	1461.762	130		Ar II	1464.176	100	
Fe IV	1458.763	110		Ni II	1461.840	8		Zn III	1464.198	75	
Mn V	1458.787	200		Fe II	1461.840	1	P	Fe V	1464.224	40	
F III	1458.802	6		C I	1461.854	7		Cu III	1464.234	50	
Mn III	1458.90	10		Co II	1461.856	3		Ni II	1464.301	8	
Ni IV	1458.904	380		Ca III	1461.875	550		Ni IV	1464.335	50	
C I	1459.0317	300		As I	1461.92	3		Cl II	1464.3649	140	
Cu IV	1459.091	650		Sc IV	1461.931	70		Ni II	1464.369	10	
Ni IV	1459.211	10		Ge II	1461.970	5	Z	Cu IV	1464.429	50	
Fe V	1459.254	250		P I	1461.974	3		Mn II	1464.572	30	
Fe IV	1459.257	250		Se I	1461.99	60		Fe V	1464.683	700	
Fe II	1459.304	40	P	Ni IV	1462.005	460		Fe IV	1464.694	300	
Mg IV	1459.39	200	P	Cr III	1462.12	30	N	Cu IV	1464.711	780	
C I	1459.41	5		Ni IV	1462.144	470		Co III	1464.733	2	N
Cu II	1459.4117	25		Na II	1462.160	10		Ni III	1464.778	2	
Ni II	1459.459	4	N	Ni III	1462.239	5		Cl II	1464.7860	200	
F III	1459.503	10		Fe IV	1462.240	200		Cu III	1464.792	50	
Mg IV	1459.521	260		Mn III	1462.243	60		Ni V	1464.8		F,P
Cu III	1459.556	50		Mn II	1462.27	3		Fe II	1464.817	1	P
Mg IV	1459.605	300		Mg III	1462.305	20		Fe V	1464.876	200	
Ni II	1459.611	1	N	Co II	1462.308	1		Co III	1464.932	2	N
Cu III	1459.630	20		F III	1462.313	6		P I	1464.939	3	
Ni II	1459.640	1		Fe II	1462.318	2	P	Ni III	1464.989	5	N
Ni II	1459.715	12		P I	1462.321	0		Cl XII	1465.		F,P
Mn II	1459.72	2		Ge II	1462.388	10	Z	Cr IV	1465.00	30	Q
Co II	1459.720	0		Cu IV	1462.448	120		C I	1465.023	20	
Fe V	1459.763	150		Ni II	1462.482	8		Fe II	1465.040	40	P
Cu III	1459.778	10		Zn III	1462.485	5	Q	Cu III	1465.040	3	
Mn I	1459.786	600	A,Z	Cu III	1462.511	4		Co III	1465.101	2	N
Ca III	1459.787	600		Fe V	1462.563	100		Ar II	1465.153	100	
Ni II	1459.809	9		Fe V	1462.631	500		Cu III	1465.174	20	
Fe V	1459.831	500		Cu IV	1462.654	390		Fe III	1465.291	50	P
Cu IV	1459.874	890		Zn II	1462.743	150		Fe III	1465.320	150	P
Ar II	1459.878	100		Ne II	1462.744	40		Mn I	1465.358	800	N,A
Zn IV	1459.964	40		F II	1462.842	1	Z	Fe V	1465.380	100	P

Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes
Zn IV	1465.386	20		Co III	1467.663	10		Zn II	1470.222	2	Z
Mn V	1465.388	500		C I	1467.668	8		Co III	1470.282	1	N
Al V	1465.392	10		Cr III	1467.68	50	N	Ni II	1470.322	1	
Fe V	1465.401	400	P	Ni II	1467.694	10		Mn II	1470.33	0	
Ca III	1465.477	300		Fe III	1467.746	250	P	Mn I	1470.372	400	N,A
Si V	1465.531	700		Ni II	1467.762	100		Ni II	1470.386	2	
Cu II	1465.5408	15		P I	1467.849	3		Fe IV	1470.421	80	
B I	1465.548	30	A,Z	Cu III	1467.857	30		Ni IV	1470.422	440	
Co III	1465.558	3		Zn II	1467.867	4	Z	C I	1470.447	8	
Ni III	1465.606	10		C I	1467.877	30		Fe II	1470.447	1	P
Ar III	1465.62	100	P	Ni IV	1467.881	90	N	Zn	1470.452	15	N
B I	1465.663	40	A,Z	P IV	1467.898	90		Cu III	1470.502	10	N
Ti V	1465.683	110		Ar III	1467.92	150	P	Fe IV	1470.514	110	
Ge II	1465.73	1	Z	Na III	1468.00	550		Cr III	1470.60	10	N
Zn III	1465.744	60		Co III	1468.010	2	N	Ni III	1470.642	2	
Fe III	1465.746	150	P	Mn II	1468.03	20		Fe II	1470.662	5	P
P III	1465.766	4		Kr II	1468.039	1	P	Ni II	1470.666	5	
Fe III	1465.775	50	P	Ni IV	1468.041	570		N III	1470.68	4	P,Z
Ar III	1465.78	150	P	Cr III	1468.05	50	N	Cu II	1470.6974	150	
B I	1465.801	20	A,Z	Ar III	1468.07	100	P	Co III	1470.700	1	N
Fe III	1465.839	20	P	Zn III	1468.113	4		Mn II	1470.73	8	
Ga IV	1465.857	150		Ni IV	1468.159	400		Mg IV	1470.777	240	
Cr V	1465.861	650		Co II	1468.224	10		Cu III	1470.807	60	
Cl II	1465.9037	125		Ni II	1468.268	30		Co V	1470.9		F,P
Cu IV	1465.917	330		Ni VI	1468.3		F,P	Co II	1470.900	2	
Na III	1465.926	450		Co II	1468.384	15		Na II	1470.916	10	Q
Zn III	1465.952	15		C I	1468.410	100		N III	1470.98	40	P,Z
Ni III	1466.027	5	N	As I	1468.42	2	N	Cu IV	1470.999	360	
Cu II	1466.0702	70		Ni IV	1468.422	130		Mn II	1471.024	5	
Cr IV	1466.14	20	N	Ni II	1468.465	25		Fe III	1471.051	20	
Ni III	1466.156	5	N	Fe III	1468.524	20	P	Cl II	1471.06	200	N
Cu IV	1466.175	780		Fe II	1468.610	30	P	Mn I	1471.079	300	N,A
Co II	1466.211	20		Cu IV	1468.818	400		Co III	1471.140	2	N
Fe II	1466.220	2		Zn I	1468.846	3		Cr IV	1471.151	70	
Al IV	1466.24	15		Mg IV	1468.868	80		Mn II	1471.19	7	
P III	1466.286	1		Fe V	1468.870	150		P III	1471.198	10	
Cu IV	1466.356	690		Fe V	1468.911	150		Fe V	1471.205	70	
Kr II	1466.460	1		Ni IV	1468.925	620		Zn III	1471.224	30	
V VI	1466.460	220		Zn III	1468.978	3	Q	Ni V	1471.3		F,P
Fe III	1466.484	250	P	Fe III	1468.986	150		Al IV	1471.303	40	
Ni IV	1466.501	80		Co III	1468.992	10		Co III	1471.328	2	
Cu II	1466.5240	4		Fe V	1469.000	500		Fe V	1471.331	80	
P III	1466.536	10		B I	1469.015		A,Z	Mn I	1471.335	5	A,Z
Co III	1466.579	5		B I	1469.070		A,Z	Mn V	1471.368	20	
Mg IV	1466.635	220		C I	1469.119	10		P I	1471.389	1	
Fe V	1466.649	400		Mn I	1469.119	700	N,A	Br XXIV	1471.4		F,P
P I	1466.650	0		Ti IV	1469.188	350		Ni II	1471.466	10	
Zn II	1466.697	15		Ni II	1469.200	10		Ni III	1471.468	2	
Cu II	1466.7284	5		Cu III	1469.238	40		Cu III	1471.488	10	
P IV	1466.787	90		B I	1469.297		A,Z	Co III	1471.575	1	
Fe IV	1466.820	200		Fe II	1469.383	5	P	Mn II	1471.586	8	
Co III	1466.919	3		Cu III	1469.406	40		N III	1471.63	60	P,Z
Cu III	1466.919	15		Cu III	1469.452	50		Fe III	1471.638	70	
Ni IV	1466.932	20		Cr III	1469.55	50	N	Mn I	1471.683	100	N,A
Mn V	1466.935	250		Fe V	1469.599	100		Si II	1471.775	2	Z
Fe IV	1466.966	110		Ni II	1469.601	3		Cu III	1471.797	45	
Fe II	1466.988	2	P	Fe II	1469.68	0	Q	S I	1471.832	25	
V XVIII	1467.		F,P	Cu II	1469.6928	15		Cr III	1471.842	60	
Cr III	1467.04	20	N	P I	1469.706	25		Zn II	1471.862	50	Z
Fe XI	1467.08	6	F	Co II	1469.725	12		Co II	1471.868	20	
Cu III	1467.118	35		Ni IV	1469.737	80		Ni IV	1471.893	30	
Ni IV	1467.140	120		Ni III	1469.836	3	N	Co V	1471.9		F,P
Cu III	1467.188	15	N	Ni II	1469.847	1	N	P IV	1471.926	60	
Mg III	1467.188	12		Fe III	1469.876	400	P	Mn II	1471.93	2	
Ni II	1467.265	60		Mn I	1469.976	250	A,Z	Ni II	1471.961	1	
Mn II	1467.31	1		Ge XXVII	1470.		F	Co III	1472.019	20	
Ti IV	1467.338	1000		Ni VI	1470.0		F,P	Fe II	1472.044	20	P
Co III	1467.394	10		Fe II	1470.015	2	P	Mn II	1472.08	2	
C I	1467.402	350		Al IV	1470.024	30		Fe V	1472.098	250	
P IV	1467.427	150		P I	1470.037	3		Ne II	1472.121	20	
Fe IV	1467.501	12		As I	1470.09	3	N	C I	1472.231	60	
Mn II	1467.53	10		C I	1470.094	100		Co II	1472.245	1	
P I	1467.587	25		Fe II	1470.162	1	P	Zn IV	1472.256	20	
Cu III	1467.596	5		Ni VI	1470.2		F,P	As I	1472.32	4	
Ni II	1467.637	10		Fe II	1470.203	1	P	Fe IV	1472.395	50	

Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes
Cu II	1472.3950	15		Mg III	1474.898	4		Ni IV	1477.284	80	
Cr III	1472.45	20	N	Ni II	1474.901	2	N	Mn I	1477.331	300	N,A
V III	1472.45	5		Ni II	1474.910	1		Mg III	1477.416	2	
Sc IV	1472.456	70		Cu II	1474.9348	40		Mn V	1477.475	300	
As IV	1472.5	50		Co III	1474.953	3	N	Ni IV	1477.485	250	
Ni IV	1472.500	40		Cu IV	1474.971	710		Cr III	1477.49	10	N
S I	1472.503	4		P IV	1475.013	40		Fe II	1477.491	5	P
Fe V	1472.512	250		Fe II	1475.019	1	P	Co II	1477.526	8	
P I	1472.559	15		Co II	1475.023	5		Fe V	1477.536	80	
Ni II	1472.571	10		Cr IV	1475.10	10	N	Fe II	1477.558	2	P
Mn II	1472.62	3		Mn II	1475.11	3		Ni IV	1477.576	160	
Ni IV	1472.633	690		Cu III	1475.113	50		Mn II	1477.61	3	
Co III	1472.756	3	N	Si II	1475.188	5		C III	1477.68	300	
Zn III	1472.769	2		Cu III	1475.189	10		Cl II	1477.6980	140	
Fe V	1472.805	100		Co III	1475.266	1		Cr V	1477.769	5	
Ni II	1472.835	5		Ni II	1475.270	3		Fe V	1477.798	100	
Zn III	1472.838	3	Q	Fe V	1475.302	70		Ni V	1477.8		F,P
Cu III	1472.858	100		Ni IV	1475.338	150		Ni III	1477.801	10	
Ni II	1472.889	2		Ni III	1475.368	15		Mn V	1477.810	800	
Co II	1472.896	30		Cu II	1475.369	20		Mn II	1477.83	5	
As IV	1472.9	50		Mn II	1475.46	6		Ni IV	1477.838	500	
Mn I	1472.954	60	A,Z	Cu III	1475.509	25		Cu III	1477.876	40	
Mg IV	1472.963	200		Zn III	1475.591	50		Zn II	1477.938	5	Z
Fe II	1472.966	0	P	Fe V	1475.604	300		Mg II	1478.0037	250	
Mn I	1472.971	1000	A,Z	Co III	1475.635	20		Ni IV	1478.041	110	
S I	1472.972	225		Al V	1475.64	600		Cl II	1478.0495	100	
S I	1473.019	120		Ni II	1475.645	1		C III	1478.05	200	
Fe II	1473.090	1	P	Ni III	1475.662	5	N	Cr III	1478.08	20	N
P II	1473.129	10		Fe II	1475.694	10	P	Fe II	1478.105	10	P
Fe IV	1473.201	450		Mn II	1475.72	5		Mn I	1478.201	200	A,Z
C I	1473.242	40		Ni II	1475.734	3		Zn II	1478.216	300	
Ni II	1473.249	1		Cu III	1475.747	20		F III	1478.224	3	
Co III	1473.303	2	N	P I	1475.774	7		Cu II	1478.2363	2	
Mn II	1473.32	0		Cu IV	1475.778	30	N	Mg IV	1478.240	300	
Cr III	1473.32	30	N	F III	1475.787	3		Ni III	1478.252	10	
Zn III	1473.394	75		Ni II	1475.801	2		Fe V	1478.288	70	
C I	1473.473	5		Co II	1475.813	30		C III	1478.30	100	
P III	1473.492	4		Fe II	1475.839	5	P	Ni IV	1478.323	620	
Co III	1473.528	5	N	Cu II	1475.846	60	N	Cu III	1478.325	40	
Cu II	1473.5299	8		P III	1475.939	1		Fe II	1478.344	1	P
P I	1473.658	25		Ne II	1475.959	80		Co III	1478.367	50	
Ga II	1473.73	50		Mn V	1475.980	500		Mn I	1478.393	300	N,A
Cr III	1473.82	10	N	Mg II	1475.9998	200		Fe II	1478.431	1	P
F III	1473.820	3		Fe II	1476.030	10	P	Cl II	1478.4781	160	
Fe II	1473.833	40	P	Mn II	1476.04	12		Mn II	1478.59	25	
Mg XI	1473.84		P	Cr III	1476.04	50	N	Cr III	1478.64	20	N
Ne II	1473.894	10		F III	1476.043	1		Ni VI	1478.7		F,P
Fe IV	1473.926	80		Ni II	1476.043	25		Ni IV	1478.743	20	N
Ni III	1473.939	5		Cu II	1476.0593	25		Fe V	1478.785	200	
Cu II	1473.9785	25		P I	1476.115	25		Mn V	1478.787	200	
S I	1473.995	350		V II	1476.116	0		Mn II	1478.79	20	
Mn XII	1474.		F,P	Cu IV	1476.214	220	N	Ni III	1478.854	10	N
Fe II	1474.033	0	P	Ni IV	1476.233	660		Co III	1478.858	2	N
Zn III	1474.132	15		Ni IV	1476.296	660	N	F III	1478.879	1	
Mn II	1474.18	1		Co III	1476.366	5		Ni VI	1479.2		F,P
Zn III	1474.270	20		Cu III	1476.405	10		Ni IV	1479.209	320	
Fe V	1474.275	100		Zn IV	1476.410	40		Cu III	1479.351	15	
Co III	1474.278	3	N	Ni IV	1476.429	490		Fe V	1479.388	20	
Ni V	1474.3		F,P	Ni III	1476.527	3	N	Co III	1479.393	3	N
Si II	1474.304	1		Mn II	1476.64	12		Ni II	1479.443	10	
Ni II	1474.312	1		Co II	1476.672	10		Fe V	1479.471	500	
S I	1474.380	125		Mn IV	1476.74	0		Cu III	1479.524	15	
Ni III	1474.402	5		Ni IV	1476.815	680		Mn V	1479.531	350	
Ar II	1474.537	100		O III	1476.89	600		V III	1479.57	150	
Mn II	1474.54	10		Co III	1476.895	5	N	V II	1479.720	5	
S I	1474.572	60		Si II	1476.928	1		Mn I	1479.728	1000	N,A
Mn I	1474.580	100	N,A	Mn I	1476.952	700	N,A	Mn II	1479.76	1	
Ni II	1474.597	4		Ni IV	1476.954	80		Fe II	1479.848	2	P
Ni IV	1474.626	220		Mn II	1476.98	5		Co III	1479.880	2	N
Si II	1474.649	15		K XIV	1477.		F,P	Cu III	1479.917	50	
V III	1474.71	125		Zn II	1477.016	400		Cr III	1480.16	100	N
Fe II	1474.723	1	P	Ni II	1477.063	1		Mn II	1480.16	2	
C I	1474.748	15		Ni II	1477.227	4		Ni II	1480.274	4	N
Cu III	1474.796	8	N	Co III	1477.260	2		Ni II	1480.331	30	
V II	1474.876	0		Ni II	1477.264	1		Ni IV	1480.345	570	

Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes
Co II	1480.346	0		Ni IV	1483.211	510		Fe V	1485.450	150	
Ni VI	1480.4		F,P	Cu III	1483.232	40		P II	1485.49	250	
Fe II	1480.42	0	P	S I	1483.233	125		Co III	1485.510	2	N
Ca III	1480.425	450		Mn II	1483.25	3		Si II	1485.513	100	Z
V II	1480.487	10		Fe V	1483.259	200		Fe II	1485.566	1	P
Ni IV	1480.490	260		Zn III	1483.266	30		Cu III	1485.595	15	
Ca III	1480.527	450		Ni II	1483.277	40		Cu II	1485.6102	2	
As IV	1480.6	450		Co III	1483.363	10	N	S I	1485.622	150	
Mn V	1480.753	250		Fe II	1483.377	2	P	Cu II	1485.6778	6	
Mn II	1480.85	10		Kr III	1483.43	40		Fe V	1485.927	80	
Fe IV	1480.863	150		Ni IV	1483.432	30		Na II	1485.987	25	
Mg II	1480.8797	200		Cr III	1483.45	10	N	Ni II	1485.987	2	
Co II	1480.955	20		Ne II	1483.502	60		Cr III	1486.02	10	N
C I	1480.998	10		Na II	1483.507	15		Cu III	1486.021	50	
Mn III	1480.998	25		Ga II	1483.52	50		Fe IV	1486.040	110	
K XIII	1481.		F,P	Ni II	1483.554	15		Al V	1486.05	300	
Fe IV	1481.017	12		Fe II	1483.554	5	P	Zn II	1486.065	700	
Cu III	1481.050	50		Fe II	1483.556	5	P	Mn II	1486.068	8	
Ni II	1481.091	75		Mn I	1483.595	150	N,A	Ni VI	1486.1		F,P
C I	1481.118	65		Fe II	1483.642	1	P	V II	1486.153	1	
Mn I	1481.152	600	N,A	Mn II	1483.685	10		Cu III	1486.165	40	
Fe III	1481.169	150		Cr III	1483.75	50	N	Ni IV	1486.204	530	
Ni II	1481.210	9	N	Ni IV	1483.754	180		Fe III	1486.254	450	P
Cu III	1481.229	300		Ni II	1483.760	1	N	Cu III	1486.257	35	
Zn IV	1481.232	30		Co III	1483.800	20	N	Ni II	1486.372	5	
Al IV	1481.26	10	N	Cu III	1483.816	150		Cu III	1486.396	5	
Fe II	1481.349	2	P	Ni IV	1483.849	110		Mn II	1486.40	1	
Mn II	1481.35	5		Mn I	1483.873	150	N,A	Ni III	1486.456	3	N
Ni IV	1481.411	440		Ga II	1483.95	50		Ni IV	1486.461	40	
Fe II	1481.417	1	P	Zn III	1483.979	8		Fe II	1486.479	10	P
Fe II	1481.441	1	P	Cu III	1483.997	75		Co II	1486.494	30	
C I	1481.451	12		Fe II	1484.072	2	P	Mn V	1486.494	900	
Mg IV	1481.490	320		V II	1484.135	1		Mn III	1486.494	300	N
Cu II	1481.5438	10		Fe V	1484.209	80		N IV	1486.496	100	
Ni II	1481.560	15		Ni II	1484.227	25		Cr III	1486.54	10	N
Na II	1481.578	15		Ni IV	1484.232	230		Mn II	1486.55	12	
Cr V	1481.651	220		Fe III	1484.241	20		Mg III	1486.624	12	
S I	1481.665	170		Co II	1484.261	20		Cu III	1486.655	150	
S I	1481.712	100		Ni III	1484.268	3		Mn II	1486.66	3	
Ni II	1481.744	15		As I	1484.36	5	N	Ni II	1486.668	7	
C I	1481.7635	450		Fe V	1484.372	10		Mn V	1486.704	700	
Zn IV	1481.837	25		Cr III	1484.39	10	N	Ni IV	1486.805	20	
Mg IV	1481.840	180		Ni V	1484.4		F,P	Fe II	1486.834	1	P
Ni II	1481.883	12		Ni IV	1484.442	330		Zn	1486.884	25	N
Ni II	1481.898	4		Mn II	1484.45	0		Al IV	1486.887	700	
Co III	1481.905	100		Fe V	1484.47		F,P	Cu III	1486.892	100	
Ni III	1481.923	5	N	Zn III	1484.484	5		F III	1486.913	3	
Ni II	1481.982	10		P IV	1484.507	500		Ni IV	1487.011	410	
Sc IV	1482.042	220		Fe III	1484.546	70		Cr III	1487.03	40	N
Cr IV	1482.07	20	N	Co III	1484.565	1		Ni IV	1487.064	420	
Zn II	1482.139	80	Z	Ni II	1484.592	1		Co V	1487.1		F,P
Cu IV	1482.229	450		Ni IV	1484.640	200		S I	1487.150	200	
Ni II	1482.240	100		Cl II	1484.66	10	N	Ni II	1487.242	50	
Ni IV	1482.246	730		Cr V	1484.666	220		Mg IV	1487.265	20	
Cr IV	1482.36	20	N	Na II	1484.677	15	N	Cu III	1487.282	5	N
Ni II	1482.393	8		Cu III	1484.831	40		Fe II	1487.377	1	P
Fe II	1482.393	0	P	Zn III	1484.833	5	Q	Ni II	1487.438	5	
Mn II	1482.40	0		Ca III	1484.869	800		Na III	1487.438	250	
Co VI	1482.5		F,P	Mn I	1484.869	900	N,A	Ni II	1487.455	6	
Ni IV	1482.556	30		Si II	1484.873	15		Mn I	1487.489	100	N,A
Cu III	1482.622	4		Fe II	1485.003	5	P	Ni V	1487.5		F,P
Mg III	1482.67			Fe V	1485.017	150		Cu III	1487.541	60	
Ni IV	1482.670	450		Cu III	1485.022	5		Zn III	1487.566	25	
C I	1482.716	20		Si II	1485.024	90	Z	Ni II	1487.778	5	N
Cr V	1482.757	220		Cr IV	1485.052	220		P IV	1487.788	400	
Cu IV	1482.771	710		Ni IV	1485.121	60		Cr III	1487.86	10	N
Mg II	1482.8903	300		Co III	1485.170	15	N	Mn II	1487.86	50	
Mn I	1483.030	180	N,A	Cu III	1485.170	20		Ni IV	1487.865	300	
S I	1483.039	280		Ni II	1485.185	10		Co III	1487.962	2	
Ni III	1483.044	10		Si II	1485.224	30		Ni II	1487.970	2	N
Mn V	1483.072	700		Cu II	1485.3277	6		Zn	1487.996	10	N
Cu III	1483.084	4		Fe II	1485.342	2	P	P I	1488.029	80	
Cr III	1483.11	20	N	Ni II	1485.375	60		Co V	1488.1		F,P
Fe IV	1483.145	375		Cl II	1485.3814	125		Ni II	1488.109	1	N
Mn I	1483.187	180	N,A	Mg IV	1485.421	220		Co III	1488.174	5	N



Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes
Ni III	1488.424	3		Ni III	1491.111	1		Cu II	1493.3665	20	
Cu IV	1488.446	90		Ni II	1491.176	5		Cu III	1493.437	60	
Br I	1488.452	850		Co III	1491.273	10	N	Cr III	1493.462	10	
Co III	1488.465	1	N	Cu III	1491.300	40		Sc III	1493.502	1	
Cu III	1488.471	30		Ni II	1491.308	4		Zn III	1493.506	30	
Cu II	1488.6372	900		Ni III	1491.309	2		Cu III	1493.559	2	
Cu III	1488.706	10		Mn V	1491.329	600		Co III	1493.595	3	
Cr III	1488.72	20	N	P I	1491.359	100		Fe III	1493.626	600	P
Ni II	1488.730	16		Fe II	1491.365	5	P	Fe II	1493.629	5	P
Co III	1488.753	2	N	Cr III	1491.50	20	N	Ni IV	1493.672	740	
Mn VI	1488.755	23		Mn IV	1491.58	0		Cr III	1493.68	10	N
Fe IV	1488.810	1		Ni II	1491.588	4		Sc IV	1493.722	1	
Cu II	1488.8311	10		Co II	1491.701	10	N	Cu III	1493.843	40	
Ni II	1488.845	5		Be I	1491.765	250		Cu IV	1493.879	150	
Ni II	1488.896	100		Ni II	1491.776	6		Fe II	1493.967	2	P
Zn II	1488.926	120		Ni II	1491.823	3		Ni IV	1493.993	290	
Co III	1488.975	1	N	Li I	1491.87		ZZ	Fe II	1494.081	0	P
Ni IV	1489.006	20		Ni II	1491.899	40		Co II	1494.124	0	N
Cr X	1489.04	0	F	Ni III	1491.899	10	N	Ni II	1494.151	50	
Ni II	1489.079	35		Ni IV	1491.907	430		Ni II	1494.236	6	
P IV	1489.098	300		Mg IV	1491.968	240		Fe II	1494.376	1	P
Cr III	1489.10	20		Ti III	1491.976	15		Cr III	1494.45	50	N
Mn II	1489.13	12		Cu IV	1492.032	790		Fe IV	1494.467	150	
Fe V	1489.237	150		P III	1492.048	40		Cu III	1494.481	5	
Co III	1489.243	0		Fe II	1492.049	2	P	Sc III	1494.506	1	
Zn III	1489.245	40		Cr III	1492.05	40	N	C I	1494.532	25	
Fe II	1489.250	1	P	Zn II	1492.121	30	Z	Mn I	1494.552	200	A, Z
Cu III	1489.347	20		Cu II	1492.1525	4		Fe II	1494.586	10	P
Cr III	1489.35	20	N	Cu III	1492.16		F, P	Cu III	1494.590	60	
Ni V	1489.4		F, P	Ni IV	1492.168	0		Fe II	1494.595	20	P
Fe II	1489.410	2	P	Cr II	1492.23	40		Mg IV	1494.624	180	
Zn	1489.492	10	N	Sc IV	1492.247	220		Fe V	1494.639	40	
Ni IV	1489.534	670		Co II	1492.257	10		Cu II	1494.6526	5	
Fe IV	1489.534	450		As I	1492.34	4		P III	1494.667	25	
Co III	1489.550	1	N	Mn I	1492.353	100	A, Z	N I	1494.6751	400	
Co II	1489.564	5		Zn II	1492.369	2	Z	F III	1494.680	100	
S XI	1489.6		F, P	Fe II	1492.462	2	P	Ni II	1494.701	10	
V II	1489.620	10		Co III	1492.528	5	N	Na II	1494.729	20	N
Sc IV	1489.637	285		C I	1492.575	30		Mn II	1494.754	20	
Co II	1489.659	10	N	Fe II	1492.577	20	P	Mn V	1494.771	700	
Mn III	1489.669	10		P I	1492.588	25		Fe II	1494.776	10	P
Zn III	1489.708	3		Ni III	1492.622	30	N	Al IV	1494.791	800	
Cr V	1489.711	450		N I	1492.6254	620		Sc IV	1494.854	20	
Ni II	1489.729	5		Ni IV	1492.649	610		Ge IV	1494.9	40	P
Cu IV	1489.770	330		Cu II	1492.6817	5		Ni VI	1494.9		F, P
Ni IV	1489.833	720		C I	1492.738	60		Cu III	1494.94		F, P
P II	1489.834	10		Co II	1492.798	10		Mn II	1494.97	7	
Cu III	1489.880	40		Fe V	1492.8		F, P	P II	1494.990	10	
Co III	1489.899	20	N	As I	1492.81	1	N	Cr III	1495.01	20	N
Cr III	1489.93	40	N	N I	1492.8195	100		B V	1495.016		P
Fe II	1489.932	30	P	Cu II	1492.8343	40		Ti III	1495.08	20	N
Ni IV	1490.080	390		Ni V	1492.9		F, P	Ga III	1495.10	500	
V V	1490.107	200		Li II	1492.931	300		Ga II	1495.11	50	
Ni II	1490.262	7		P I	1492.940	60		Br I	1495.132	5	
Mn I	1490.302	1000	A, Z	Li II	1492.973	500		Fe IV	1495.185	450	
Cu III	1490.344	15		Cr III	1492.98	50	N	Cr III	1495.21	20	
Mg IV	1490.433	320		Ni III	1492.990	30	N	Na II	1495.212	45	Q
Fe V	1490.454	5		Ti XVI	1493.		F, P	Fe III	1495.213	70	P
Co III	1490.511	1	N	Ni IV	1493.007	690		Mn II	1495.26	1	
Fe II	1490.605	5	P	P I	1493.008	40		B V	1495.298		P
Mn V	1490.664	800		Ni II	1493.022	15		Cu III	1495.320	10	
Mn I	1490.728	200	N, A	Fe IV	1493.026	250		Cr III	1495.36	20	N
Ni IV	1490.748	20		Li II	1493.036	100		Ni II	1495.383	40	
Fe II	1490.757	1	P	F II	1493.091	450		B V	1495.392		P
Co II	1490.764	0		Mg III	1493.097	12		Cu IV	1495.392	760	
Fe VII	1490.80	0	F, P	Zn II	1493.133	300		Ni VI	1495.4		F, P
V II	1490.837	4		Co III	1493.152	20		Cu II	1495.4298	20	
Cu III	1490.844	15		F II	1493.235	300		Mg IV	1495.482	280	
Fe V	1490.9		F, P	As II	1493.259	0		N V	1495.5	40	
Kr II	1490.928	4		Fe IV	1493.270	30		Ni II	1495.570	20	
Zn III	1490.943	50		C I	1493.273	10		Fe V	1495.616	80	
Ni IV	1490.982	20		Fe II	1493.279	1	P	Ni III	1495.641	20	
Mn V	1491.038	200		F II	1493.311	200		Fe V	1495.70		F, P
Fe IV	1491.095	250		Ni II	1493.315	2		Cu IV	1495.713	80	
Kr II	1491.104	60		P I	1493.363	40		Zn III	1495.715	15	

Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes
Kr II	1495.769	25		F III	1498.933	300		P I	1501.400	3	
Cu III	1495.778	20		S I	1498.942	1		Mn II	1501.44	0	
Ni IV	1495.795	640		Ne II	1499.006	40		Mg IV	1501.513	180	
P I	1495.875	3		Cu IV	1499.013	120		P III	1501.575	90	
Mg IV	1495.985	120		Zn II	1499.052	20	Z	Zn III	1501.655	8	Q
Cr IX	1496.		F, P	Zn II	1499.077	20	Z	Fe II	1501.680	1	P
Zn II	1496.001	5	Z	As II	1499.108	0		Fe IV	1501.688	50	
Na II	1496.011	40		Co III	1499.124	50		Si III	1501.780		
Fe II	1496.019	0	P	Ni IV	1499.136	510		S V	1501.799		
Mn III	1496.133	2		As II	1499.168	0		P I	1501.825	60	
Mn I	1496.174	7	A, Z	Ti III	1499.176	80		Si III	1501.827		
P I	1496.233	0		Fe V	1499.233	10		Si III	1501.870	180	
Fe V	1496.266	250		Ni IV	1499.248	380		Ni II	1501.885	20	
P III	1496.295	25		Ge III	1499.3	10	P	Ni IV	1501.898	100	
Ni II	1496.308	10		Fe II	1499.339	1	P	P I	1501.902	15	
Ni II	1496.409	2		Zn III	1499.400	70		Ni II	1501.962	6	
Ni IV	1496.412	60		F III	1499.425	150		Na II	1501.995	25	
Se I	1496.44	30		Fe IV	1499.439	200		Mn XVIII	1502.		F, P
P II	1496.44	5		Cu III	1499.452	6		S	1502.	500	N
Ni II	1496.463	1		Cl II	1499.4764	30		F III	1502.014	400	
Cr III	1496.47	10		Cu II	1499.5132	3		Zn III	1502.077	5	
Fe II	1496.526	40	P	P I	1499.525	40		Co II	1502.091	0	
Cu III	1496.545	2	N	V V	1499.596	100		Cu III	1502.093	100	
Ti III	1496.596	7		P IV	1499.602	90		Ni V	1502.1		F, P
As II	1496.598	0		Mn II	1499.61	1		Ni II	1502.150	75	
Ni IV	1496.623	0	Q	Ni II	1499.704	15		Co IV	1502.19	300	P
Cu II	1496.6867	50		Ni IV	1499.754	0	N	P I	1502.195	60	
Mn II	1496.78	4		Mn IV	1499.77	0		P III	1502.228	350	
Ca III	1496.884	600		Zn III	1499.780	5		P I	1502.241	15	
Cu III	1496.927	4		Cu IV	1499.806	780		Mn V	1502.316	1000	
P III	1496.932	10		Mn II	1499.84	8		Ti III	1502.318	25	
Mn V	1497.024	700		P III	1499.855	10		Mn II	1502.38	1	
Fe II	1497.065	2	P	Co III	1499.877	5		Co III	1502.531	5	
Mn V	1497.125	400		Mn II	1499.95	20		Se I	1502.57	20	
Sc IV	1497.260	5		Ni IV	1499.972	670		As II	1502.615	0	
Cl II	1497.2715	10		Cl II	1500.0065	185		Fe IV	1502.652	110	
Zn III	1497.327	10		Cu III	1500.060	40		Ni II	1502.669	20	
Mg IV	1497.388	180		As II	1500.074	0		Sc II	1502.828	10	
Mn I	1497.398	300	A, Z	Mg IV	1500.118	120		Cu III	1502.832	15	
Zn II	1497.410	80	Z	Ni IV	1500.130	350		Na IV	1502.85	360	N
Fe IV	1497.492	250		Ni V	1500.2		F, P	Ni IV	1502.867	20	N
Mn III	1497.543	7		Si III	1500.241	240		Cr III	1502.87	30	N
As II	1497.547	0		Cl II	1500.2465	100		Mg IV	1502.942	200	
Cu III	1497.548	35		Mn II	1500.26	5		Cu IV	1502.950	620	N
Ni IV	1497.596	380		Co III	1500.269	20		Fe III	1502.951	150	P
Co II	1497.675	10	N	Ni IV	1500.292	110	N	Ca XIV	1503.		F, P
Na II	1497.731	45	Q	Zn III	1500.398	60		Cu V	1503.0		F, P
Ni V	1497.9		F, P	Mn II	1500.41	0		Mn II	1503.02	3	
Cu III	1497.900	40		Fe IV	1500.412	200		Mn III	1503.066	5	
Ni IV	1497.930	530		Ni II	1500.437	200		Zn IV	1503.079	30	
Cu II	1497.956	1	N	Cr IV	1500.46	10	N	Zn II	1503.109	20	N
Cr V	1497.966	650		Cu IV	1500.567	350		P I	1503.123	15	
Cu III	1498.004	75		Fe V	1500.581	40		Ni II	1503.123	7	
Ni IV	1498.051	150		Ge IV	1500.6	120	P	Ni IV	1503.172	290	
As II	1498.058	0		Ni II	1500.651	7		Ni II	1503.209	12	
V II	1498.114	6		Cu III	1500.670	10		Fe IV	1503.243	250	
Co III	1498.144	2		Cl II	1500.7415	50		Cl II	1503.2483	160	
Ni IV	1498.278	490		Co II	1500.897	20	N	Mn V	1503.365	350	
Fe II	1498.287	20	P	Se I	1500.98	150	P	Cu II	1503.3682	10	
Ni III	1498.338	5		Cl II	1500.9869	200		Sc II	1503.395	1	
V III	1498.39	10		Mn II	1500.99	4		As I	1503.47	1	N
Mn V	1498.509	400		Sc XIV	1501.		F, P	P I	1503.475	15	
Cu II	1498.5756	3		Fe II	1501.027	5	P	Ni IV	1503.479	430	
Mn II	1498.60	8		Ni III	1501.063	3	N	Mn II	1503.54	1	
Cu III	1498.604	50	N	P III	1501.093	1		Mn III	1503.561	1	
V II	1498.604	4		Ni VI	1501.1		F, P	Mn V	1503.581	800	
Ti III	1498.695	160		Si III	1501.150			Cr III	1503.65	30	N
Ni IV	1498.707	680		Cl II	1501.1520	140		Ni IV	1503.653	110	
Ni II	1498.734	1		Cu III	1501.171	100		Zn II	1503.653	25	
Ni IV	1498.774	710		Si III	1501.191	200		Mn I	1503.681	350	A, Z
Zn III	1498.778	60		Ni IV	1501.204	30	N	Cu III	1503.691	10	
Fe III	1498.821	70	P	Cu III	1501.255	20		Ni IV	1503.787	20	
Co III	1498.830	20	N	Ni III	1501.311	5		Zn III	1503.803	0	
S I	1498.850	2		Cu II	1501.3363	5		Sc II	1503.850	4	
Ni IV	1498.898	720		Cr III	1501.38	30		Ni III	1503.850	2	N

Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes
V III	1503.95	0		F III	1506.300	500		P I	1508.74	9	N
As XXII	1504.		F,P	Na II	1506.407	80	F	Cr III	1508.740	4	
Na IV	1504.		F,P	P II	1506.44	30		Si II	1508.741	3	
Co IV	1504.0		F,P	Ni III	1506.518	1		Na IV	1508.754	285	
Fe III	1504.002	150		Fe II	1506.539	10	P	Ni II	1508.816	100	
Zn II	1504.034	5	Z	V III	1506.57	15		Mg IV	1508.821	280	
As I	1504.09	2		Ni II	1506.585	25		Cu III	1508.830	1	
Cu I	1504.091	0	N	Cu IV	1506.594	200		Fe IV	1508.856	110	
Fe IV	1504.118	50		O V	1506.623	60	P	B I	1508.872		A
Cu IV	1504.158	260		Mn II	1506.63	7		Fe II	1508.877	2	P
Cr II	1504.16	20		P I	1506.650	40		Cr IV	1508.89	120	N
F III	1504.177	300		O V	1506.709	80	P	Cu IV	1508.946	650	
Zn III	1504.188	15		Cu III	1506.716	50		Si II	1509.101	100	
As II	1504.20	150		O V	1506.762	100	P	Ni IV	1509.108	570	
Fe II	1504.277	20	P	F III	1506.767	300		Ni II	1509.113	1	
Fe V	1504.329	60		Fe II	1506.787	1	P	Cl VII	1509.2		Q
Mn V	1504.341	900		Ni VI	1506.8		F,P	B I	1509.220		A
Co III	1504.362	3		Cr III	1506.82	10	N	Co II	1509.228	20	
Fe IV	1504.379	300		B I	1506.820		A	Fe II	1509.279	0	P
P I	1504.381	60		Mg III	1506.826	7		Ni II	1509.308	12	
Ga II	1504.41	50		Ni II	1506.851	7	N	Cr III	1509.31	30	N
Ni IV	1504.470	10	Q	Co II	1506.856	1		Ni II	1509.345	8	
Ni II	1504.485	75		Ca III	1506.876	550		Cu III	1509.392	40	
Cu III	1504.521	15		Fe II	1506.903	20	P	Fe II	1509.414	1	P
Ni IV	1504.544	10		Na II	1506.914	60		Fe II	1509.435	1	P
Ni II	1504.590	5		Ni IV	1506.946	220		Cu III	1509.484	30	
Ti III	1504.624	15		Cr III	1506.95	10	N	As I	1509.60	3	
P III	1504.663	250		Ni II	1506.968	10		Ni II	1509.602	4	
Sc II	1504.673	4		P II	1506.975	10		Co II	1509.654	0	
P I	1504.711	15		P I	1506.984	25		As I	1509.70	3	N
Zn	1504.754	12	N	As I	1506.99	2		Ni II	1509.767	100	
Cu II	1504.7571	30		Ni II	1506.995	5		Fe V	1509.792	70	
Si V	1504.76	30		Ti XV	1507.		F,P	Cr IV	1509.85	10	N
F III	1504.785	600		Ni IV	1507.055	500		Co II	1509.946	10	
Ni IV	1504.800	170		P IV	1507.067	60		Cu III	1509.955	125	
Fe V	1504.848	20		Mn V	1507.107	800		V III	1510.02	15	
Cu III	1504.853	15		As II	1507.145	5		Zn II	1510.045	5	Z
Ni IV	1504.900	20	Q	Sc IV	1507.156	20		Cr III	1510.05	10	
Cu III	1504.955	15		B I	1507.168		A	Ni II	1510.067	1	
P IV	1504.970	10		Fe II	1507.198	5	P	Ni IV	1510.106	70	
Ti III	1504.977	7		Co II	1507.313	0		Cu IV	1510.118	310	N
Mn II	1504.99	1		Ni IV	1507.338	0	N	Mn II	1510.14	0	
Fe II	1504.996	0	P	Al IV	1507.442	300		Fe II	1510.148	1	P
Ga II	1505.01	50		Ni II	1507.465	18		Ni II	1510.232	16	N
V III	1505.02	25		Fe III	1507.512	150	P	Zn II	1510.363	150	
Fe III	1505.152	650	P	Mn V	1507.59	4	P	Ni II	1510.366	4	
Ni III	1505.165	5	N	Cu III	1507.711	3		Cl II	1510.3849	100	
Ni IV	1505.170	360		Fe II	1507.779	1	P	As I	1510.41	6	
B I	1505.171		A	Mn II	1507.78	4		Co III	1510.489	2	
Cu III	1505.197	5		Zn III	1507.862	15		Cu II	1510.5058	30	
Zn III	1505.234	20		Cr III	1507.93	30	N	Cu IV	1510.509	60	
Co III	1505.249	10		Ni II	1507.961	15		Ni IV	1510.569	10	Q
Fe II	1505.37	0	P	Cu V	1508.0		F,P	Cr III	1510.62	10	N
Cu II	1505.3878	10		Fe IV	1508.049	50		Fe II	1510.661	20	P
Sc II	1505.459	1		V II	1508.078	10	N	C I	1510.668	25	
Ga I	1505.5		P,Z	Fe II	1508.107	1	P	Mg IV	1510.670	280	
B I	1505.517		A	Cr III	1508.122	200		Ni II	1510.690	3	
As II	1505.556	2		Fe V	1508.153	70		As I	1510.70	6	N
Ni II	1505.642	13		Cu II	1508.1846	15		Na II	1510.701	35	
Cr III	1505.76	100	N	Zn III	1508.220	10		Ni II	1510.741	5	
Ni IV	1505.763	180		Fe II	1508.223	5	P	Fe II	1510.801	1	P
Fe IV	1505.766	200		Ni II	1508.249	10	N	Ni II	1510.859	75	
Cu III	1505.804	5		Ni II	1508.262	7		C I	1510.981	100	
P I	1505.825	7		Fe II	1508.277	2	P	Cu IV	1511.075	400	
Fe IV	1505.848	80		Ni II	1508.315	10		Fe III	1511.138	150	P
Cu II	1505.8572	5		Cu III	1508.336	30		Mn V	1511.149	800	
Sc II	1505.886	4		Ni II	1508.352	7	N	Ni II	1511.185	8	
Zn III	1505.903	75		Al V	1508.37	700		Se I	1511.27	20	N
Mn III	1505.961	1		Zn II	1508.453	0	Q,Z	Ni II	1511.314	3	
Si III	1506.060	120		Fe II	1508.467	2	P	Fe IV	1511.365	50	
Se I	1506.09	30		Ni II	1508.498	4		Co III	1511.404	5	N
Ti III	1506.101	15		Mg IV	1508.516	160		Fe V	1511.429	60	
Ni II	1506.184	16		Cu II	1508.6323	10		Mn V	1511.451	350	
Sc II	1506.208	1		Zn II	1508.645	70	Z	B I	1511.465		A
Sc II	1506.257	1		Co III	1508.683	1		Fe II	1511.467	1	P

Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes
Ni II	1511.467	10	N	Ni V	1513.8		F,P	Co III	1515.982	3	N
Fe III	1511.594	200	P	Mn IV	1513.87	0		Zn II	1516.045	35	Z
Ni IV	1511.597	10	N	Ni IV	1513.904	90	Q	Ni II	1516.048	17	
V II	1511.606	2		Zn II	1513.982	2	Q,Z	Fe IV	1516.081	250	
Fe III	1511.622	50	P	Mn II	1514.03	1		V VI	1516.104	285	
Fe III	1511.656	50	P	Ni II	1514.222	50		Sc II	1516.137	10	
Zn II	1511.694	12	Z	Cu II	1514.2339	4		Mn I	1516.204	400	N,A
Zn II	1511.718	15	Z	As II	1514.260	2		Fe III	1516.214	200	P
Co III	1511.730	3	N	Mn III	1514.306	12		Ni II	1516.215	50	
Cr III	1511.78	80	N	Ni II	1514.336	10	N	Ni VI	1516.3		F,P
B I	1511.816		A	Ni II	1514.372	80		P IV	1516.316	4	
Mn II	1511.84	4		Fe II	1514.375	10	P	Co II	1516.342	5	
Al IV	1511.88	100		Ni II	1514.411	17	N	Mn II	1516.36	5	
Mn V	1511.887	350		Mn V	1514.444	500		Mn I	1516.379	150	A,Z
C I	1511.907	25		Zn II	1514.479	25	N	Co II	1516.447	10	
Co III	1511.920	5		Cu II	1514.4924	200		Ni II	1516.503	3	
S	1512.	10	N	Ni II	1514.552	5		Fe II	1516.569	0	P
Ni XI	1512.		F,P	Fe III	1514.552	150	P	Fe IV	1516.577	250	
V II	1512.018	2		Ga II	1514.57	120		Cu IV	1516.584	380	
Ni III	1512.046	10		Fe III	1514.571	20	P	Fe III	1516.594	20	P
Fe II	1512.055	30	P	Kr II	1514.585	1		Ni IV	1516.666	700	
Si II	1512.072	50		Cu III	1514.593	100		Cu III	1516.711	10	
Fe III	1512.165	150	P	Ni II	1514.633	6	N	Mn II	1516.75	8	
Cu II	1512.1739	5		Ni II	1514.644	2	N	Mn V	1516.756	1000	
Mn III	1512.177	5		Co II	1514.740	1		Mn III	1516.76	5	
Cr III	1512.205	300		Zn II	1514.763	120		Fe III	1516.785	20	P
Fe II	1512.214	1	P	F II	1514.789	100		Ni VI	1516.8		F,P
Ni II	1512.237	1		B I	1514.816		A	Fe V	1516.804	100	
Fe II	1512.246	1	P	Fe V	1514.834	70		Cu IV	1516.823	340	
Be II	1512.269	555		Ni II	1514.856	8		P IV	1516.879	40	
Fe III	1512.279	20	P	Ni IV	1514.862	20		Cu II	1516.9010	5	
Fe III	1512.341	150	P	Fe V	1514.881	40		Si II	1516.910	60	Z
Ni IV	1512.351	190		Cu III	1514.946	20		As I	1516.97	1	
Cl II	1512.3604	125		Fe III	1514.955	20	P	Si I	1517.035	1	N,A
Fe III	1512.364	50	P	Sc IV	1514.961	285		Co III	1517.070	2	N
Be II	1512.407	1000		Cr III	1515.01	20	N	Ni IV	1517.080	20	
Be II	1512.419	110		Fe IV	1515.012	30		Zn	1517.117	15	N
Cu II	1512.4646	4		V VI	1515.020	650		Si I	1517.130	1	A,Z
Se IV	1512.5	0		Co III	1515.027	50	N	Co III	1517.153	2	N
Zn III	1512.611	2		F II	1515.034	40		Cu II	1517.1599	5	
V VI	1512.655	360		Cu III	1515.063	40		Si I	1517.169	1	A,Z
Ni IV	1512.704	350	P	P I	1515.10	6	N	Si I	1517.207	1	A,Z
Fe IV	1512.728	80		Fe II	1515.117	2	P	Zn	1517.209	20	N
Ni II	1512.742	11		Ni II	1515.157	15		Si I	1517.214	1	A,Z
Ni IV	1512.772	350	P	B I	1515.168		A	Si I	1517.264	1	A,Z
Fe III	1512.844	20	P	Fe II	1515.171	2	P	Si I	1517.306	1	A,Z
P II	1512.87	5		Ga II	1515.19	50		Zn	1517.314	25	N
Fe III	1512.888	150	P	As II	1515.207	20		Cu IV	1517.338	290	
Cu III	1512.948	20		Na II	1515.229	30		Si I	1517.369	1	A,Z
Co III	1512.997	5		Ni II	1515.269	25		Si I	1517.426	1	A,Z
Ni II	1513.016	11		Cu IV	1515.275	880		Cr III	1517.43	20	
Na II	1513.102	70	Q	Zn III	1515.289	10		Ni II	1517.449	25	
Ni IV	1513.132	10		Ni II	1515.329	8		Ni II	1517.480	40	
C I	1513.150	50		Mn III	1515.34	1		Co III	1517.482	15	
Cu IV	1513.179	110		Se I	1515.39	80	P	Si I	1517.490	1	A,Z
Cr III	1513.18	10		Zn IV	1515.425	15		Si I	1517.554	1	A,Z
Al IV	1513.20	10		Cr III	1515.44	80	N	Mg IV	1517.596	100	
Fe II	1513.316	2	P	As I	1515.48	20	N	Zn III	1517.611	20	Q
Mn II	1513.32	2		Fe III	1515.480	300	P	Si I	1517.624	1	A,Z
Cu II	1513.3659	15		Ni II	1515.518	5		Cu II	1517.6310	10	
Cr III	1513.39	10	N	Fe V	1515.533	10		Si I	1517.703	1	A,Z
Ni IV	1513.494	530		Co III	1515.638	2	N	Co III	1517.724	10	
Fe III	1513.511	50	P	V II	1515.675	1		Fe III	1517.777	20	P
Fe III	1513.520	250	P	Ni II	1515.692	1		Fe IV	1517.780	200	
Zn II	1513.522	20	Z	Na II	1515.709	30		Si I	1517.782	1	A,Z
Si III	1513.533	40	Q,Z	Cu IV	1515.749	810		Cr III	1517.85	20	N
Ni II	1513.550	1		P IV	1515.751	25		Si I	1517.867	5	A,Z
Si II	1513.570	30	Z	Co III	1515.776	2	N	Ni II	1517.894	100	
Fe IV	1513.587	150		Ni II	1515.791	30		Cu II	1517.9300	4	
Cu IV	1513.603	280		Co II	1515.805	5		V VI	1517.931	360	
Mn III	1513.635	10		Ni II	1515.825	40		Si I	1517.963	5	A,Z
Mn IV	1513.64	20	N	Zn III	1515.833	80		Ni II	1517.984	15	
Mn III	1513.67	1		Fe II	1515.877	5	P	Si I	1518.069	5	A,Z
Co III	1513.706	5	N	Ni VI	1515.9		F,P	Ni VI	1518.1		F,P
Ni II	1513.783	15		Fe II	1515.937	5	P	As I	1518.10	1	N

Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes
Si I	1518.107	5	N,A	Si I	1520.291	5	A,Z	Si I	1522.131	10	A,Z
F III	1518.137	3		Ni II	1520.294	10		Si I	1522.169	1	N,A
Zn III	1518.150	3		Si I	1520.324	5	A,Z	Ni VI	1522.2		F,P
Ti V	1518.181	0		Si I	1520.353	5	A,Z	Ni IV	1522.209	10	N
Si I	1518.187	5	A,Z	Si I	1520.389	5	A,Z	Si I	1522.231	5	A
Mn III	1518.207	1		Ni II	1520.392	30		Cu I	1522.252	0	N
Si II	1518.221	5	Z	Fe II	1520.416	1	P	Si I	1522.280	5	N,A
Ni VI	1518.3		F,P	Si I	1520.423	5	A,Z	Cr III	1522.29	5	
Si I	1518.307	5	A,Z	Si I	1520.463	5	A,Z	Si I	1522.315	10	A,Z
Zn III	1518.396	6		Ni II	1520.467	40		Si I	1522.345	1	N,A
Si I	1518.434	5	A,Z	Co IV	1520.5		F,P	P II	1522.392	10	
Mn II	1518.48	0		Si I	1520.503	10	A,Z	Mn II	1522.420	3	
Cr III	1518.48	40	N	Co II	1520.523	10		Si I	1522.433	10	A,Z
Na II	1518.505	35		Zn II	1520.527	50	Z	Se I	1522.45	60	
Si I	1518.594	5	A,Z	Cu II	1520.5396	15		Si I	1522.482	1	N,A
Ni VI	1518.6		F,P	Si I	1520.540	5	A,Z	V IV	1522.493	40	
Zn II	1518.631	3	Z	Si I	1520.586	5	A,Z	Ni II	1522.506	2	
Co III	1518.636	1		Ni IV	1520.626	730		Si I	1522.510	15	A,Z
Fe II	1518.685	1	P	Si I	1520.637	5	A,Z	Ni II	1522.517	0	
Si I	1518.720	5	A,Z	Si I	1520.685	5	A,Z	Mn XXIV	1522.53		P
Si I	1518.763	5	A,Z	Zn III	1520.713	60		Si I	1522.557	1	N,A
Fe III	1518.829	300	P	F III	1520.716	3		Ni II	1522.569	30	
Zn III	1518.829	3	Q	Si I	1520.732	5	A,Z	Cu II	1522.5768	7	
Si I	1518.926	5	A,Z	Zn	1520.780	30	N	Mn III	1522.577	8	
Ni IV	1518.951	20		Cr III	1520.79	40	N	P II	1522.59	5	
Mn III	1518.956	12		Si I	1520.796	5	A,Z	Ni V	1522.6		F,P
Zn III	1518.979	2		Se XX	1520.8		F,P	P III	1522.607	25	
S XI	1519.		F,P	Si I	1520.859	5	A,Z	Si I	1522.642	1	N,A
Cr V	1519.030	750		Ni IV	1520.864	220		Fe II	1522.684	10	P
Al IV	1519.07	400		Fe II	1520.874	5	P	Ni II	1522.691	10	
Si I	1519.125	5	A,Z	Si I	1520.892	5	A,Z	Si I	1522.734	15	A,Z
Ni VI	1519.2		F,P	Si I	1520.926	5	A,Z	Mn IV	1522.80	0	
Co IV	1519.2		F,P	Ni II	1520.932	10		Si I	1522.829	1	N,A
B I	1519.246		A	Ni II	1520.944	20		Ni II	1522.846	12	
Co III	1519.326	15		Mg IV	1520.967	280		Co III	1522.885	20	
Si I	1519.364	5	A,Z	Si I	1520.996	10	A,Z	Si V	1522.944	400	
Ni II	1519.371	40		Zn II	1520.998	15	Z	Si I	1522.960	5	A,Z
Co II	1519.394	15		N VII	1521.061		P	Si I	1522.983	15	A,Z
Fe II	1519.437	1	P	Si I	1521.073	10	A,Z	Ni II	1522.990	11	
Cu II	1519.4918	100		Ni II	1521.119	100		Cu III	1523.023	3	
Fe II	1519.504	1	P	Si I	1521.156	10	A,Z	Si I	1523.043	5	N,A
Mn III	1519.51	5		Se I	1521.20	30		Ni II	1523.102	3	
Ni II	1519.513	15		Si I	1521.246	10	A,Z	Si I	1523.109	5	A
Mn V	1519.515	350		Ni IV	1521.250	0		Si I	1523.122	1	N,A
Fe V	1519.519	50		Zn II	1521.276	40	Z	Cr III	1523.133	200	
Si I	1519.584	10	A,Z	Cr III	1521.29	10	N	Mn II	1523.14	12	
Mn V	1519.597	800		Si I	1521.338	15	A,Z	Co III	1523.153	10	N
B I	1519.598		A	N VII	1521.368		P	Ni II	1523.160	6	
Ni IV	1519.604	400		Si I	1521.415	5	A	Si I	1523.174	1	N,A
Na II	1519.629	60		Mn II	1521.42	2		F II	1523.197	100	
Cr III	1519.66	10		Ni IV	1521.438	20		Si I	1523.200	5	A
Ni II	1519.745	4		Si I	1521.445	5	A,Z	Cr III	1523.21	80	
Mn V	1519.746	400		Si I	1521.559	10	A,Z	Si I	1523.235	1	A,Z
Mn II	1519.79	5		Fe II	1521.586	1	P	Zn III	1523.241	2	Q
Ni VI	1519.8		F,P	Cr III	1521.59	30	N	Si I	1523.259	10	A,Z
Ga I	1519.8		P	F II	1521.590	10	Z	Ni II	1523.278	30	
Cu II	1519.8371	200		Ni II	1521.596	15		Fe II	1523.280	1	P
Si I	1519.857	10	A,Z	P II	1521.62	300		Si I	1523.308	1	N,A
Mn V	1519.879	500		Co IV	1521.64	250	P	Cu I	1523.371	1	N
Cu IV	1519.882	160		Ni II	1521.673	18		Fe II	1523.374	20	P
Ni II	1519.935	100		Si I	1521.686	10	A,Z	Mn III	1523.395	7	
Se I	1519.99	40		As I	1521.81	1	N	P II	1523.44	10	
S	1520.	50	N	Si I	1521.820	10	A,Z	Si I	1523.458	5	N,A
Ni VI	1520.0		F,P	Sc XX	1521.84		P	Si I	1523.543	5	A,Z
Ni II	1520.008	2	N	Si I	1521.840	10	A,Z	Na III	1523.548	250	
Cr III	1520.01	70	N	Ni II	1521.889	12		Cu III	1523.549	50	N
Zn II	1520.022	2	Z	Fe III	1521.902	20	P	Si I	1523.568	10	A,Z
N VII	1520.076		P	Si I	1521.907	5	N,A	Co II	1523.575	2	
Ni II	1520.077	4		Si I	1521.970	5	A,Z	F II	1523.583	40	
V IV	1520.142	60		Ni II	1521.992	10		Si I	1523.620	5	N,A
Si I	1520.157	5	A,Z	Si I	1522.036	1	A	Si I	1523.701	1	N,A
Ni II	1520.168	14		Co III	1522.049	3	N	Si I	1523.732	1	N,A
Si I	1520.189	5	N,A	Si I	1522.052	1	N,A	Cu II	1523.7413	3	
Si I	1520.202	5	N,A	P II	1522.11	4		Si I	1523.776	1	N,A
V II	1520.241	1		Si I	1522.111	1	A	Si I	1523.806	5	A

Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes
Cu I	1523.851	0	N	Cl II	1525.1345	50		Si I	1526.766	10	N,A
Si I	1523.856	5	N,A	Co III	1525.163	2	N	As I	1526.78	2	
Cu IV	1523.877	740		Fe V	1525.165	70		Ni IV	1526.834	520	
Si I	1523.895	1	A,Z	Si I	1525.191	1	N,A	Cu III	1526.839	25	
Ni II	1523.897	15		Si I	1525.236	10	A,Z	Zn	1526.845	30	N
Zn II	1523.903	150		Si I	1525.254	5	A,Z	Na III	1526.883	300	
Si I	1523.915	15	A	Cr III	1525.27	10		Si I	1526.894	10	N,A
Mn II	1523.92	10		B I	1525.281		A	Fe II	1526.913	10	P
Cu III	1523.921	5	N	Si I	1525.285	10	A,Z	Cu II	1526.9276	5	
Fe IV	1523.921	375		Ge III	1525.3	200	P	Zn II	1526.969	15	Z
F II	1523.925	10		Na III	1525.301	350		Cu III	1526.998	35	
Si I	1523.966	1	A	Ni IV	1525.306	750		Ni II	1526.999	20	
Si I	1523.986	1	N,A	Na II	1525.311	30		Ni XI	1527.		F,P
Fe II	1523.990	2	P	Fe III	1525.346	70	P	S	1527.	10	N
Si I	1524.011	5	A	Zn III	1525.371	8		Zn II	1527.002	20	Z
Cu IV	1524.047	60		Si I	1525.381	5	A	Si I	1527.027	5	A
Si I	1524.067	5	A	Zn	1525.406	10	N	Co IV	1527.1		F,P
Co V	1524.1		F,P	Co III	1525.407	15		Zn II	1527.125	25	N
Co III	1524.113	15		Cr III	1525.42	5		Cu IV	1527.125	300	
Si I	1524.130	5	N,A	Si I	1525.421	5	N,A	Fe III	1527.141	400	P
B I	1524.170		A	Ni II	1525.422	8		Si I	1527.185	10	A
Si I	1524.192	10	A	Kr II	1525.486	1		Ge III	1527.2	40	P
Ni IV	1524.239	360		P I	1525.518	15		V IV	1527.223	15	
Si I	1524.242	1	N,A	Si I	1525.579	1	A	Si I	1527.223	10	A
Si I	1524.269	5	N,A	P II	1525.58	1		Zn III	1527.236	20	Q
Si I	1524.279	5	A,Z	Si I	1525.619	5	N,A	Zn II	1527.236	20	N
Si I	1524.292	5	A,Z	Cu II	1525.6312	10		Fe II	1527.239	20	P
Cu IV	1524.300	320		Fe III	1525.635	150	P	Fe III	1527.248	50	P
Ni II	1524.302	50		B I	1525.637		A	Si I	1527.252	5	A
Si I	1524.316	10	A,Z	Cu II	1525.6409	10		Fe III	1527.257	150	P
Si I	1524.345	10	A	Cu II	1525.6686	10		Si I	1527.301	10	A
Fe IV	1524.368	50		Si I	1525.707	1	N,A	Si I	1527.316	10	A
Cu III	1524.372	8		Cl II	1525.7274	100		Si I	1527.343	10	A
Si I	1524.417	5	N,A	Fe II	1525.743	5	P	Fe II	1527.347	40	P
Co III	1524.472	3	N	Cr III	1525.751	150		Si I	1527.367	10	A
Si I	1524.478	1	A	V IV	1525.756	10		Si I	1527.399	20	A
Ga I	1524.5		P,Z	Si I	1525.758	5	A	Si I	1527.460	5	A
V III	1524.52	60		Cu II	1525.7645	15		Ni IV	1527.487	60	N
Fe III	1524.520	300	P	Si I	1525.792	5	N,A	Ni II	1527.497	15	
Ni IV	1524.527	10	N	Co II	1525.793	10	N	Si I	1527.522	5	N,A
B I	1524.530		A	P III	1525.795	25		F III	1527.524	1	
Si I	1524.535	5	N,A	Fe III	1525.798	400	P	Na II	1527.555	15	N
Cu III	1524.539	4		Si I	1525.832	5	A,Z	Si I	1527.555	5	A
Mn II	1524.55	10		Cu II	1525.8381	8		Si I	1527.588	15	A
Si I	1524.621	5	N,A	Si I	1525.851	5	A,Z	Fe II	1527.645	5	P
Fe III	1524.649	300	P	Cu III	1525.884	100		Ni II	1527.661	1	
Cr III	1524.65	20	N	Si I	1525.886	15	A,Z	Ni IV	1527.685	740	
Si I	1524.690	1	N,A	Cu III	1525.945	20		V IV	1527.721	15	
Mn II	1524.71	4		Si I	1525.983	15	A	Fe III	1527.745	70	P
Si I	1524.723	5	A,Z	Cr III	1525.993	250		Mn II	1527.76	7	
Si I	1524.742	10	A,Z	Cl IX	1526.0			Si I	1527.771	1	N,A
Ni II	1524.758	4		Fe III	1526.024	150	P	Co III	1527.780	20	
Si I	1524.767	5	A,Z	Si I	1526.035	10	N,A	Ni IV	1527.795	740	
Fe III	1524.797	70	P	Mn III	1526.05	10		Se XVIII	1527.8		F
Si I	1524.830	5	N,A	Si I	1526.054	5	A	Cu II	1527.8126	5	
Ni II	1524.834	22		Fe IV	1526.066	375		P IV	1527.836	40	
Si I	1524.852	5	A	Al V	1526.14	1000		Zn II	1527.915	100	Z
Cu II	1524.8601	15		Si I	1526.141	10	A	Ni IV	1527.933	160	N
Si I	1524.873	5	A	Fe II	1526.205	2	P	Si I	1527.941	1	A
Cl II	1524.8894	50		Si I	1526.253	15	N,A	Co III	1527.948	3	
Ni III	1524.891	2		Ni III	1526.305	5	N	Ni II	1527.968	18	
Se I	1524.91	60	P	Fe II	1526.369	5	P	Na II	1527.985	20	
Co III	1524.942	2	N	Zn III	1526.417	2		Si I	1527.989	15	A
Si I	1524.970	5	N,A	Si I	1526.456	1	N,A	Si I	1528.035	1	N,A
Si I	1524.989	1	A	Ni II	1526.480	4		Fe IV	1528.067	150	
Ni II	1524.996	14		Ni IV	1526.505	100		Si I	1528.072	10	A
P III	1525.010	10		Si I	1526.506	10	A	Mn V	1528.127	900	
Fe III	1525.036	350	P	Fe II	1526.536	30	P	Ni IV	1528.138	10	Q
Fe III	1525.051	50	P	Si I	1526.549	1	A	Si I	1528.144	5	A
Si I	1525.056	5	N,A	Si I	1526.585	15	A	Ni II	1528.158	3	N
Fe II	1525.072	2	P	Fe IV	1526.598	520		Si I	1528.185	5	A
Mn V	1525.078	600		Si I	1526.609	1	A	P III	1528.194	1	
Ni IV	1525.088	10	N	Si II	1526.7076	500		Si I	1528.238	10	N,A
Si I	1525.091	5	N,A	Co III	1526.734	30	N	Si I	1528.250	5	N,A
Co V	1525.1		F,P	Ni IV	1526.764	310		Si I	1528.277	10	A

Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes
Si I	1528.328	10	A	Na II	1530.307	50	N	Fe III	1531.862	400	P
Cr III	1528.362	90		Si I	1530.311	1	A	Fe III	1531.864	50	P
Si I	1528.372	15	A	Si I	1530.325	10	A	Si I	1531.904	10	A
Cu IV	1528.373	400		Mn III	1530.364	30		Se I	1531.91	200	P
Si I	1528.426	5	N,A	Co III	1530.385	3	N	Ni II	1531.952	16	
Ni IV	1528.454	40		Si I	1530.412	1	N,A	Ni II	1531.972	20	
Si I	1528.485	10	A	Fe III	1530.426	20	P	Si I	1532.018	5	A
Fe V	1528.490	80		Ni II	1530.428	10		Zn	1532.019	20	N
Ni II	1528.508	22		Fe II	1530.438	5	P	Co III	1532.032	10	
Cr III	1528.517	120		Fe V	1530.439	150		Fe IV	1532.069	150	
Fe IV	1528.529	80		Se I	1530.46	250	P	Si I	1532.077	10	A
Zn	1528.534	30	N	Cl II	1530.4783	35		Ni IV	1532.086	40	
Zn II	1528.550	40	N	P III	1530.492	10		Cr III	1532.09	20	N
Si I	1528.564	5	N,A	Si I	1530.544	1	A	B I	1532.094		A
Cl II	1528.5691	220		Cr III	1530.59	5		Cl IV	1532.10	100	P
Si I	1528.596	15	A	Si I	1530.602	10	A	Mn III	1532.115	2	
Mn III	1528.64	2		P I	1530.617	25		Cu II	1532.1306	90	
P III	1528.654	25		Zn II	1530.620	25	Z	Al IV	1532.16	300	
Cu III	1528.695	10		Ni II	1530.636	75		P I	1532.185	3	
Ni II	1528.703	1		Si I	1530.638	5	A	Zn	1532.188	15	N
Si I	1528.726	1	A	Si I	1530.657	10	A	Si I	1532.210	5	N,A
Na II	1528.742	50	N	Ni II	1530.663	30		Si I	1532.252	1	A
Fe II	1528.742	0	P	Si I	1530.676	4	P	Mn V	1532.286	450	
Zn II	1528.759	9	N	Fe II	1530.680	1	P	Si I	1532.295	10	A
Fe III	1528.864	20	P	Si I	1530.690	15	A	Fe II	1532.301	0	P
Ca III	1528.866	450		Cl II	1530.7333	100		Si I	1532.316	5	A
Si I	1528.871	15	A	Si I	1530.738	15	N,A	Fe V	1532.330	80	
Si I	1528.890	5	A	Co II	1530.746	3		Si I	1532.446	15	A
Cu II	1528.8952	2		Si I	1530.787	15	A	B I	1532.451		A
Cr III	1528.91	20	N	Cu V	1530.8		F,P	Fe IV	1532.485	250	
Fe II	1528.979	0	P	Si I	1530.867	15	P	Si I	1532.490	20	A
Cl II	1528.9839	160		Si I	1530.875	20	A	P II	1532.51	700	
Na IV	1529.		F,P	Co III	1530.906	10		Cr III	1532.517	40	
Si I	1529.004	15	A	Si I	1530.929	20	A	Zn III	1532.588	6	
Si I	1529.022	15	A	Ni IV	1530.981	10	Q	Co IV	1532.6		F,P
Si I	1529.061	15	A	Ni II	1530.995	16		Ni V	1532.6		F,P
Ni IV	1529.092	20		Cl VII	1531.0		Q	Al III	1532.600		
Ni III	1529.096	3		Si I	1531.002	20	A	Cu IV	1532.603	490	
Ni II	1529.148	4		Cu III	1531.002	5		Si I	1532.603	10	A
Cr III	1529.16	20	N	Mn II	1531.01	8		Si I	1532.624	15	A
Si I	1529.202	15	A	Co III	1531.068	15	N	Fe IV	1532.634	600	
Si I	1529.229	5	N,A	Si I	1531.070	15	A	Si I	1532.646	30	A
Mn III	1529.233	12		Zn II	1531.088	30	Z	Fe V	1532.647	740	P
Si I	1529.268	5	A	Si I	1531.116	15	A	Ni II	1532.741	14	
Cl IV	1529.28	10		Cu III	1531.159	20		Cu V	1532.8		F,P
Si I	1529.307	10	A	Co V	1531.18		P	Fe II	1532.815	10	P
Cu IV	1529.331	300		Si I	1531.185	1	N,A	Si I	1532.815	5	A
Zn II	1529.355	3	Q,Z	Fe IV	1531.220	375		Si I	1532.871	5	N,A
Si I	1529.396	15	A	Si I	1531.276	10	A	Cr III	1532.906	4	
Mn III	1529.40	6		Ni II	1531.288	3	N	Fe IV	1532.907	520	
Si I	1529.440	10	N,A	Fe III	1531.294	400	P	Si I	1532.929	15	A
Si I	1529.464	15	A	Ni II	1531.336	1	N	Si I	1532.976	1	N,A
Fe II	1529.509	1	P	Mn III	1531.344	2		Mn V	1533.018	700	
Si I	1529.532	20	A	Zn IV	1531.372	25		Si I	1533.036	10	A
Si I	1529.561	10	A	Si I	1531.373	10	A	P III	1533.063	10	
Mn V	1529.575	250		Zn II	1531.394	3	Z	Zn III	1533.087	30	
Si I	1529.647	15	N,A	Se I	1531.40	150	P	Cr III	1533.094	90	
Na III	1529.67	20	N	V II	1531.405	2		Mn II	1533.10	2	
Si I	1529.686	10	A	Ni II	1531.408	14	N	Si I	1533.166	1	A
Ni IV	1529.691	0	N	Si I	1531.410	1	A	P I	1533.166	3	
Si I	1529.746	1	A	Fe IV	1531.474	200		Cr III	1533.176	4	
Fe III	1529.750	200	P	Si I	1531.491	5	A	Si I	1533.205	5	A
Si I	1529.778	15	A	Cu III	1531.588	30		Cl IV	1533.21	100	P
Ni II	1529.812	0		Si I	1531.602	25	A	Si IV	1533.220		
Si I	1529.826	5	A	Fe II	1531.615	10	P	Fe IV	1533.265	375	
Zn IV	1529.833	25		Fe III	1531.640	550	P	Fe V	1533.387	630	P
Si I	1529.870	15	A	Ni II	1531.640	18		P IV	1533.401	10	
Si I	1529.914	1	N,A	Cu III	1531.653	10		Si I	1533.410	80	P
Ni IV	1529.943	660		Si I	1531.676	5	A	Cr IV	1533.42	20	N
Fe IV	1530.040	150		Ni II	1531.720	1		Si II	1533.4320	1000	
Ni II	1530.080	18		Zn III	1531.725	1		Fe III	1533.450	250	P
Fe IV	1530.125	150		Ni IV	1531.734	520		P I	1533.487	0	N
Fe III	1530.216	150	P	Br I	1531.743	730		Si I	1533.508	10	A
Ni IV	1530.250	10	N	C III	1531.83	200		Fe IV	1533.576	200	
Fe IV	1530.256	520		Cu II	1531.8559	400		As I	1533.60	3	

Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes
Zn IV	1533.667	20		Fe III	1535.427	250	P	Si I	1537.159	15	A
Ni II	1533.669	17	N	Si I	1535.472	15	A	Ni II	1537.216	20	
As I	1533.67	3	N	Ni II	1535.477	12		Ni IV	1537.246	730	
Si I	1533.672	15	A	Ga II	1535.50	250		Cl IV	1537.26	300	P
Sc II	1533.677	1		Cu IV	1535.519	30		Mn III	1537.278	7	
Mn II	1533.68	5		Cu II	1535.5238	10		Si I	1537.297	25	A
Si I	1533.717	15	A	Si I	1535.537	5	N,A	Si I	1537.322	10	A
Si I	1533.791	5	A	Si I	1535.604	1	A	Ni II	1537.322	2	
B I	1533.806		A	Ni IV	1535.612	320		Cu III	1537.332	1	
Fe IV	1533.863	700		Si I	1535.634	5	A	Si I	1537.382	10	A
Ni II	1533.885	12		Cr III	1535.66	10	N	Si I	1537.474	20	A
Si I	1533.937	10	A	Mn II	1535.66	6		Ni II	1537.477	15	
Fe IV	1533.952	520		Si I	1535.705	15	A	Si I	1537.524	15	A
Si I	1533.972	5	A	Fe IV	1535.723	150		P III	1537.527	4	
Cu II	1533.9865	30		Ni IV	1535.733	300	N	Al IV	1537.540	800	
Ni II	1533.991	20		Sc IV	1535.762	285		Cu II	1537.5590	400	
Co IV	1534.00	150	P	Zn II	1535.823	30	Z	Mn II	1537.56	2	
Cr III	1534.09	80	N	Si I	1535.896	15	A	Si I	1537.618	25	A
Si I	1534.112	20	A	P II	1535.90	1000		Si I	1537.696	5	A
Na II	1534.163	10		Mn II	1535.91	0		Si I	1537.714	5	A
B I	1534.166		A	Si I	1535.931	10	A	Co II	1537.769	2	
Si I	1534.184	20	A	Ni II	1535.961	15		Ni II	1537.776	1	
Si I	1534.236	10	A	Cu V	1536.0		F,P	Ni II	1537.859	25	N
Si I	1534.255	10	A	Co II	1536.022	1		Ni IV	1537.875	20	
Co III	1534.268	200		Si I	1536.035	5	A	Si I	1537.935	25	A
P III	1534.291	1		Ni II	1536.051	30		Cr III	1537.997	40	
Si I	1534.299	5	A	Si I	1536.085	20	A	Ni II	1538.022	6	N
Mn II	1534.34	0		Mn II	1536.10	3		Fe II	1538.044	2	P
Co II	1534.340	0		F III	1536.113	150		Ge II	1538.0907	100	
Si I	1534.364	10	A	Ni II	1536.118	15		Si I	1538.109	15	A
Zn	1534.371	15	N	Sc IV	1536.126	5		Fe IV	1538.120	200	
Cr III	1534.40	10	N	Cr III	1536.201	1		Ni IV	1538.123	190	
Ni II	1534.424	5	N	Ni III	1536.246	5		Mn II	1538.14	1	
Si I	1534.431	15	A	Si I	1536.257	1	A	Si I	1538.271	5	A
Na IV	1534.475	650		Si I	1536.285	15	A	Sc II	1538.288	1	
Ni II	1534.484	12	N	Ga II	1536.31	120		Fe IV	1538.289	450	
Al III	1534.489			Si I	1536.366	10	A	Si I	1538.380	10	A
Ga III	1534.51	500		Ni II	1536.367	1		Ni II	1538.388	30	N
Na II	1534.538	25		V VI	1536.373	450		Si I	1538.410	10	A
Ni II	1534.546	11		P II	1536.39	700		Cr III	1538.43	10	
Si I	1534.547	15	A	Ni II	1536.398	20		Mn II	1538.43	0	Z
Zn III	1534.563	2		Zn	1536.405	10	N	Zn II	1538.464	2	Z
Mn II	1534.58	0		Fe III	1536.433	150	P	Cu II	1538.4795	10	
Si I	1534.618	1	N,A	Si I	1536.473	15	A	Ni II	1538.483	30	
Ni II	1534.628	1	N	Co III	1536.554	5		Ti V	1538.546	80	
As I	1534.65	4		Fe IV	1536.584	600		Ni II	1538.567	4	
Si I	1534.707	25	A	Fe III	1536.596	70	P	Cu IV	1538.614	830	
Ni IV	1534.710	760		Si I	1536.624	1	N,A	Fe III	1538.628	650	P
Na II	1534.737	12		Mn II	1536.63	7		Ni II	1538.722	0	
F III	1534.754	60		Fe III	1536.658	150	P	As I	1538.79	20	
P I	1534.757	40		Si I	1536.672	1	A	V II	1538.818	4	
Si I	1534.778	25	A	Co II	1536.678	1		Ni II	1538.831	3	
Mn II	1534.80	5		Si I	1536.699	1	A	Si I	1538.876	20	A
Co II	1534.813	3		Ni II	1536.717	15		Si I	1538.922	10	A
Si I	1534.818	1	A	Zn II	1536.726	20	Z	Ni IV	1538.933	690	
Fe II	1534.838	0	P	Ni II	1536.746	25		Ni II	1538.956	1	
Ni II	1534.861	10		Si I	1536.763	10	A	Fe II	1539.046	0	P
Si I	1534.883	10	A	Ni II	1536.779	10	N	Si I	1539.057	5	A
Se III	1534.9	30		Mn II	1536.808	3		Zn IV	1539.068	6	N
Ni IV	1534.926	460		Fe III	1536.824	70	P	Kr II	1539.075	1	
Si I	1534.928	1	A	Si I	1536.830	10	A	Fe III	1539.123	550	P
Si I	1534.932	20	P	Ni IV	1536.847	310		Al V	1539.124	500	
Si I	1534.996	20	A	Si I	1536.852	5	A	Na III	1539.145	350	
Sc IV	1535.001	1		Ga II	1536.91	10		Ga I	1539.2		P,Z
Cu II	1535.0023	150		Cu IV	1536.916	580		Si I	1539.236	20	A
Fe V	1535.034	2		Ni II	1536.944	12		Cl IV	1539.24	200	P
Zn II	1535.081	200		Si I	1536.953	10	A	Mn II	1539.24	3	
Ni II	1535.083	2	N	Co III	1536.955	5		Co III	1539.255	2	
Cu IV	1535.115	870		Zn III	1536.999	3		Mn II	1539.33	5	
Si I	1535.266	10	A	Si I	1537.016	15	A	Mn V	1539.362	900	
F III	1535.269	100		Ni II	1537.038	12		Si I	1539.384	5	A
Cu III	1535.310	2		V III	1537.07	0		Co II	1539.388	1	
Zn IV	1535.415	25		Mn II	1537.070	1		Co II	1539.456	3	
Mn II	1535.42	1		Si I	1537.086	15	A	Co III	1539.458	20	N
Sc II	1535.421	4		Cr III	1537.133	150		Fe II	1539.462	5	P



Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes
Fe III	1539.474	300	P	Mn III	1541.744	30		Si I	1543.724	35	A
Si I	1539.537	15	A	Cu II	1541.7560	15		B I	1543.763		A
Ni II	1539.649	15	N	Si I	1541.758	10	A	Ni II	1543.806	3	N
Si I	1539.689	9	P	Ni II	1541.801	2		Sc IV	1543.861	360	
Cr III	1539.70	30		Fe III	1541.831	300	P	Zn	1543.868	10	N
Si I	1539.705	25	A	Co VI	1541.9		F,P	Cr III	1543.884	4	
Ni IV	1539.726	20	Q	Cu III	1541.976	100		Sc II	1543.896	10	
Ni II	1539.731	1		Ni VI	1542.0		F,P	Cl II	1543.9084	200	
Si I	1539.738	5	A	Ni II	1542.024	1		Zn III	1543.954	10	
Cu III	1539.76		F,P	Co III	1542.094	100		C I	1543.960	60	
Al II	1539.830	340		Fe IV	1542.157	520		Co III	1543.981	30	
Zn III	1539.845	20		Mn II	1542.16	1		Cu III	1544.056	15	
Na II	1539.895	12		C I	1542.1766	160		Fe III	1544.068	200	P
Ni II	1539.949	2		Si I	1542.185	15	A	Ni IV	1544.082	440	
Mn II	1539.99	0		Ni II	1542.208	18		Co III	1544.129	3	
Ni II	1540.015	1		Zn III	1542.223	25		Cu III	1544.132	50	
Zn II	1540.120	50		Ni II	1542.238	2		Ar II	1544.177	200	
Si I	1540.131	15	A	Ni IV	1542.263	260		Si I	1544.184	15	A
Si I	1540.152	10	A	Ni II	1542.263	3	N	Fe III	1544.232	250	P
Fe III	1540.164	450	P	Si I	1542.270	15	A	Sc II	1544.241	1	
Si I	1540.239	5	A	P II	1542.29	1000		Mn III	1544.25	10	
Cu II	1540.2394	10		Cu IV	1542.329	60		Si I	1544.266	10	A
Ni II	1540.281	25		Ni II	1542.388	1		Ni II	1544.273	3	
Si I	1540.286	15	A	Ni II	1542.401	3		F III	1544.276	3	
Fe III	1540.340	20	P	Si I	1542.432	25	A	Co III	1544.411	30	
Si I	1540.354	15	A	Co V	1542.45		P	Fe IV	1544.489	300	
Cu II	1540.3887	100		Na III	1542.46	450		Cu IV	1544.529	340	
Fe IV	1540.393	375		Na IV	1542.46			Si I	1544.540	10	A
Mn V	1540.415	100		Fe II	1542.508	1	P	Si I	1544.591	15	A
Fe III	1540.439	70	P	Zn II	1542.517	20	N	Fe IV	1544.636	80	
Mn II	1540.47	0		Mn II	1542.52	1		Si I	1544.676	10	A
Si I	1540.544	20	A	Cr III	1542.52	10	N	Cu II	1544.6771	150	
Cu II	1540.5883	200		Cu III	1542.569	15		Ar II	1544.711	200	
Br I	1540.654	700		Co II	1542.598	1		Sc II	1544.733	10	
Ni II	1540.656	1	N	Fe III	1542.614	70	P	Fe II	1544.777	10	P
Si I	1540.707	30	A	Co III	1542.616	10		Co III	1544.880	40	
Fe IV	1540.731	250		Mn I	1542.659	30	A,Z	Fe	1544.90	40	N
Ni III	1540.759	50		Ni IV	1542.662	410		Zn	1544.914	25	N
Ni II	1540.760	35		Fe IV	1542.696	600		Zn II	1544.922	50	N
Zn III	1540.781	5	Q	Ni II	1542.773	15		Ni II	1544.968	5	
Si I	1540.783	30	A	Ni IV	1542.886	410		Ni II	1544.980	10	
Fe III	1540.834	150	P	Ge III	1542.9	20	P	Cl II	1544.9822	160	
Cr III	1540.865	90		As I	1542.94	4		Ti II	1545.009		P
V III	1540.87	250		Cl II	1542.9423	220		Si I	1545.025	10	A
Zn II	1540.895	80	Z	Fe III	1542.949	150	P	Cr III	1545.031	120	
Ni II	1540.908	4		Co II	1542.970	5		Si I	1545.045	10	A
Si I	1540.963	40	A	Mn II	1542.98	0		Zn III	1545.086	20	Q
Si I	1540.978	10	A	Cl X	1543.		F,P	Si I	1545.099	10	A
Mn V	1540.996	700		Zn II	1543.037	50	Z	Mn II	1545.13	1	
Fe II	1541.026	0	P	Mn I	1543.050	1000	A,Z	Si I	1545.163	15	A
Mn II	1541.06	4		P II	1543.09	400		Cl IV	1545.19	200	
Si I	1541.064	5	A	Ni II	1543.132	1		Fe II	1545.202	0	P
C III	1541.115			Si I	1543.158	5	A	C I	1545.249	40	
Mn III	1541.15	15		Cu III	1543.172	20		Mn III	1545.251	20	
Si I	1541.178	5	A	Fe II	1543.234	0	P	Ca III	1545.294	1000	
Na III	1541.19	20	N	Fe V	1543.234	200		Ni IV	1545.402	610	
Si I	1541.198	10	A	Co II	1543.270	0		Fe III	1545.405	200	P
Si I	1541.322	25	A	Fe II	1543.277	1	P	Ni II	1545.408	30	
Ni II	1541.324	14	N	Mn II	1543.28	0		Fe IV	1545.438	150	
Ni II	1541.356	11		P I	1543.287	40		Ni II	1545.453	12	N
Mn II	1541.39	0		V III	1543.33	25		Si I	1545.575	25	A
Si I	1541.397	20	P	Cu III	1543.366	100		Si I	1545.612	20	A
Si I	1541.415	20	A	B I	1543.398		A	Ti II	1545.626		P
Ni IV	1541.435	0		Ni IV	1543.412	750		Si I	1545.664	1	A
C I	1541.510	40		Zn II	1543.428	40	Z	Fe II	1545.677	0	P
Ni II	1541.560	4		Cu III	1543.455	200		Fe II	1545.706	0	P
Si I	1541.569	20	A	Ni IV	1543.562	560		Ni II	1545.717	16	N
Cr III	1541.57	10	N	Si I	1543.593	1	A	Co II	1545.744	1	
Zn	1541.599	15	N	P II	1543.61	150		Si I	1545.749	15	A
Ni VI	1541.6		F,P	Fe II	1543.617	2	P	Fe II	1545.808	2	P
Ni V	1541.6		F,P	Fe III	1543.623	400	P	V III	1545.86	150	
Si I	1541.620	15	A	Si I	1543.631	5	A	Ni II	1545.881	5	
P I	1541.69	30	N	Cr III	1543.665	150		Se XX	1545.9		F
Cu II	1541.7032	1000		Ni VI	1543.7		F,P	P I	1545.946	40	
Zn II	1541.707	40	Z	Si I	1543.710	15	P	Si I	1546.007	5	N,A

Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes
Ni II	1546.053	1		Ni II	1548.344	16		Ni II	1550.912	10	
Ni II	1546.070	4		Mn III	1548.371	1		Zn II	1550.936	80	
Si I	1546.098	5	A	Co III	1548.413	20		Cr III	1550.94	10	N
Fe III	1546.104	250	P	Ni II	1548.416	7	N	Si I	1550.958	20	A
Mn III	1546.197	0		Mn V	1548.430	1000		Cu V	1551.0		F,P
Co VI	1546.2		F,P	Mn VI	1548.430	1000		Zn II	1551.031	75	N
Mn II	1546.22	8	N	Zn II	1548.434	20	Z	Zn	1551.031	20	N
Ni IV	1546.231	740		Fe II	1548.438	1	P	P I	1551.056	60	
P I	1546.319	25		P I	1548.458	80		Fe III	1551.089	150	P
Cr III	1546.34	30	N	Si I	1548.518	20	A	Cu IV	1551.116	840	
Fe IV	1546.400	450		Mn II	1548.634	4		Fe III	1551.156	150	P
B I	1546.423	20	A	N V	1548.647		P	Fe II	1551.17	0	Q
As I	1546.45	2		Si I	1548.649	15	A	Cr IV	1551.20	10	N
Fe II	1546.451	2	P	Co II	1548.665	0		Si I	1551.240	25	A
Zn II	1546.460	10	Z	Na III	1548.68	160	N	Cl IV	1551.27	100	
Co V	1546.54		P	Ni IV	1548.680	410		Fe III	1551.365	250	P
Cr III	1546.55	30	N	Fe II	1548.697	30	P	Cu II	1551.3890	90	
Fe III	1546.551	20	P	Si I	1548.716	25	A	Ni IV	1551.419	10	
Si I	1546.559	1	N	Cr III	1548.86	20		P IV	1551.420	10	
Si I	1546.590	30	A	Cu III	1548.877	150		P I	1551.427	40	
Zn	1546.642	25	N	Cu V	1548.9		F,P	Cr III	1551.43	50	N
Zn II	1546.650	100	N	Zn II	1548.957	3	Z	Si I	1551.454	10	A
Si I	1546.674	25	A	Si I	1548.978	15	A	Fe IV	1551.535	150	
Ni IV	1546.695	0	N	Ni IV	1548.990	20	N	Co III	1551.536	5	
Na II	1546.722	12	N	Cl IV	1549.15	200		P I	1551.538	15	
Cu IV	1546.778	60		Zn III	1549.173	10	Q	Cu IV	1551.656	320	
B I	1546.789	30	A	Cu III	1549.215	50		Na II	1551.793	20	
Si I	1546.869	5	A	Mn II	1549.25	0		Si I	1551.856	20	A
Mn II	1546.87	4		Ni IV	1549.275	0	N	Fe II	1551.930	20	P
Sc II	1546.880	80		Cu III	1549.306	2		Si I	1551.9323	1	N
Ni IV	1546.889	20		Cr III	1549.306	10		Na II	1551.934	20	N
Fe III	1546.918	250	P	N V	1549.336	85	P	Mn III	1551.990	5	
Zn II	1546.991	25	N	Na II	1549.352	20		Co II	1552.002	1	
Cr III	1547.05	30	N	Cu IV	1549.491	170	N	Ni IV	1552.002	0	N
Na II	1547.066	15		F III	1549.492	3		Si I	1552.022	10	A
Si I	1547.079	10	A	Co V	1549.5		F,P	Fe III	1552.064	550	P
Ni IV	1547.121	40	N	Na II	1549.507	20		Ni IV	1552.065	0	N
Si I	1547.129	20	A	Si I	1549.536	10	A	Zn III	1552.090	5	
Se I	1547.18	120	P	Sc IV	1549.552	360		Sc II	1552.107	50	
V II	1547.20	150	N	Ni II	1549.588	1		Si I	1552.180	15	N,A
Si I	1547.214	10	A	Fe II	1549.593	10	Q	Na II	1552.203	20	
Fe II	1547.239	1	P	Cu II	1549.6252	2		Si I	1552.209	45	A
Cu IV	1547.276	90		Ni II	1549.818	0		Fe IV	1552.211	300	
Co III	1547.309	5	N	Co III	1549.940	20		V II	1552.268	1	
Ni II	1547.337	15		Fe IV	1549.959	250		Ni II	1552.276	5	N
Ar II	1547.356	100		Ni II	1549.964	4		Zn III	1552.288	50	
Si I	1547.362	25	A	Ni IV	1550.030	100		Co II	1552.294	2	
Si I	1547.373	1		Cr III	1550.09	20	N	Ni IV	1552.306	70	
Ni II	1547.407	13		Ni IV	1550.191	260		Cr III	1552.31	40	N
Mn III	1547.45	1		Al IV	1550.182	500		Fe IV	1552.353	450	
Si I	1547.452	20	A	Fe III	1550.193	800	P	Ni III	1552.365	10	
Fe III	1547.509	20	P	Mn III	1550.20	2		Si I	1552.490	1	P
Ni II	1547.513	5	N	Fe II	1550.274	90	P	P II	1552.51	5	
Ni II	1547.547	3		Cu II	1550.2967	3		Si I	1552.515	5	A
As I	1547.59	3	N	Na II	1550.348	20		Mn II	1552.60	2	
Co V	1547.63		P	Si I	1550.369	5	A	Cu II	1552.6464	300	
Fe III	1547.637	550	P	Mn II	1550.41	4		Fe II	1552.677	1	P
Ni III	1547.641	20		Fe III	1550.459	300	P	Fe III	1552.682	20	P
Mn III	1547.68	1		V II	1550.47	5		Co V	1552.69		P
Si I	1547.731	5	A	Ni II	1550.479	3		Fe IV	1552.709	450	
Zn	1547.794	20	N	Ni II	1550.495	2		Fe II	1552.716	0	P
Sc II	1547.798	110		Fe II	1550.52	1	Q	Ni IV	1552.749	10	
Zn II	1547.800	20	N	Co V	1550.6		F,P	Co II	1552.750	15	
Fe II	1547.802	1	P	Si I	1550.630	15	A	Fe II	1552.813	1	P
Cu IV	1547.803	540		Fe II	1550.638	1	P	Sc IV	1552.884	5	
Si I	1547.943	15	A	Cu II	1550.6533	25		Zn III	1552.937	30	
Cu II	1547.9582	6		P V	1550.768	1		P II	1552.94	1	
Co II	1547.965	50		C IV	1550.774	950		Si I	1552.948	25	A
Ni IV	1548.043	680		Ni IV	1550.779	630		Cr III	1552.95	10	N
Si I	1548.048	10	A	Sc IV	1550.797	1000		Cl II	1552.9947	160	
C IV	1548.202	1000		Mn II	1550.82	2		S IX	1553.		F,P
Fe II	1548.204	2	P	Mg III	1550.82			Al IV	1553.00	50	N
Fe III	1548.237	300	P	V II	1550.858	3		Ni II	1553.012	0	
P I	1548.245	3		Fe III	1550.862	550	P	Co III	1553.015	5	
Se I	1548.34	80	P	Fe V	1550.907	760	P	F III	1553.023	250	

Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes
Cu IV	1553.055	140		Si I	1555.514	20	A	Mn II	1557.43	1	
Cr IV	1553.09	10	N	Ca III	1555.527	750		Fe IV	1557.450	300	
V II	1553.09	150	N	Ni IV	1555.534	10		Ne II	1557.487	30	
Zn III	1553.106	25		Ni II	1555.585	8		P I	1557.550	1	N
Co V	1553.16		P	Se I	1555.59	40	P	Co II	1557.550	15	
Fe IV	1553.172	200		Ni III	1555.598	2		V II	1557.569	1	
Ca II	1553.176	200		Fe II	1555.655	2	P	Fe III	1557.581	150	P
V III	1553.25	0		Si I	1555.660	25	A	Cu II	1557.5867	20	
Fe IV	1553.296	300		Cu V	1555.7		F, P	F III	1557.592	300	
Cr III	1553.30	40	N	Cu II	1555.7030	300		Cu IV	1557.603	420	
Co V	1553.32		P	Mn V	1555.709	30		Fe V	1557.645	50	
Ni II	1553.346	4	N	Sc IV	1555.724	285		Mn V	1557.776	200	
Si I	1553.370	30	A	Zn II	1555.764	100	N	Zn IV	1557.881	20	
Cu IV	1553.375	80	N	Fe III	1555.851	200	P	Cl II	1558.0222	140	
Cr III	1553.38	50	N	Cu IV	1555.874	420		Ni II	1558.087	10	
P II	1553.392	1	N	Cr III	1555.94	30		Fe V	1558.114	70	
P IV	1553.401	90		Al II	1555.943	1		Cr III	1558.14	30	N
Ni IV	1553.427	620		Si I	1555.946	0	P, Z	Cl II	1558.1445	220	
Sc IV	1553.470	1		Fe IV	1555.950	250		Mn III	1558.182	5	
Ni IV	1553.495	520	N	Ni II	1555.957	13		Si I	1558.238	25	A
Zn	1553.564	20	N	Cu II	1556.0255	8		Ni IV	1558.244	610	
Sc II	1553.660	4		Si I	1556.043	5	A	As I	1558.28	4	N
Sc II	1553.674	4		V II	1556.05	5		Cl II	1558.3023	100	
Co II	1553.748	5		Cu IV	1556.064	40	N	Cu IV	1558.307	920	
Fe	1553.77	10	N	Fe IV	1556.069	300		Fe III	1558.308	20	P
Fe II	1553.810	10	P	Fe III	1556.076	300	P	Cu II	1558.3447	80	
P II	1553.82	10		Mn III	1556.096	12		Si I	1558.349	10	A
Mn II	1553.85	0		Zn	1556.100	10	N	V III	1558.40	10	
Si I	1553.883	5	A	Mn III	1556.121	8		Ni II	1558.443	12	N
Cu II	1553.8962	90		Fe II	1556.129	1	P	Si I	1558.453	15	A
Zn IV	1553.941	20		As I	1556.14	40		Cl II	1558.4726	50	
Ni IV	1553.958	20	N	Si I	1556.160	20	A	Ni II	1558.501	2	
P V	1554.001	4		V III	1556.17	75		Zn	1558.505	10	N
Si I	1554.029	10	A	P I	1556.18	2	N	Fe II	1558.541	70	P
Zn III	1554.030	20		Ni IV	1556.277	30		Ni II	1558.544	5	
Fe II	1554.08	1	P	Fe IV	1556.306	30		Fe III	1558.545		P
Ni II	1554.108	5	N	Ni II	1556.350	7	N	Ni II	1558.597	15	
Ni II	1554.124	50		Na II	1556.370	15		Mn III	1558.602	10	
As I	1554.19	4		Fe III	1556.410	70	P	F III	1558.641	200	
Zn	1554.199	15	N	Fe III	1556.498	550	P	Ni II	1558.655	40	N
Fe V	1554.219	300		Si I	1556.527	30	A	Fe IV	1558.668	200	
Zn II	1554.225	6	N	Cu IV	1556.545	90		Na II	1558.678	7	
Ni II	1554.293	8		Si I	1556.547	20	A	Fe II	1558.692	55	P
Si I	1554.297	5	A	V II	1556.561	2		B I	1558.701	5	A
Ni II	1554.332	8		Se I	1556.57	10	P	Zn III	1558.738	25	
Si I	1554.476	1	A	Fe II	1556.608	1	P	Cr IV	1558.745	5	
Ni II	1554.509	6		Ni IV	1556.675	180		V II	1558.76	150	N
Mn III	1554.604	10		Na II	1556.753	12		Si I	1558.773	20	A
V III	1554.61	0		Ni II	1556.766	10	N	Kr III	1558.80	40	
Cu III	1554.617	20		Fe III	1556.772	70	P	As II	1558.884	500	
Cu IV	1554.623	770		Al IV	1556.88	1		Fe IV	1558.909	30	
Ca II	1554.642	320		Fe III	1556.903	50	P	Al V	1558.92	150	
Fe IV	1554.667	200		Fe III	1556.929	100	P	Zn IV	1558.971	25	
Si I	1554.700	30	A	Mn II	1556.94	2		Si I	1559.004	20	A
Cr III	1554.71	30	N	Zn III	1556.993	15		Sc IV	1559.014	1	
Zn II	1554.740	6	Z	Ni II	1556.997	4		Al IV	1559.03	500	
Fe II	1554.751	1	P	Cr III	1557.01	30	N	B I	1559.071	10	A
Ni IV	1554.789	470		Co II	1557.029	10		Ar II	1559.072	300	
Si I	1554.808	1	A	Fe V	1557.051	100		Fe II	1559.085	110	P
P I	1554.842	15		P IV	1557.054	60		N I	1559.086		P
Fe II	1554.843	0	P	Fe IV	1557.184	300		P I	1559.130	0	
Fe IV	1554.934	50		Ni II	1557.194	1		Ni II	1559.159	18	N
Mn II	1555.01	1		As I	1557.20	30		Fe IV	1559.191	375	
Ni II	1555.062	2		Cl II	1557.2538	100		Mn II	1559.24	3	
Cu II	1555.1344	200		Al IV	1557.254	1000		Fe II	1559.269	5	P
Fe III	1555.154	20	P	Ni IV	1557.276	690		N I	1559.298		P
P I	1555.209	15		Ni II	1557.290	12		Ni IV	1559.340	260	
Si I	1555.233	10	A	Ar II	1557.305	100		V II	1559.347	2	
Mn III	1555.343	0		Fe V	1557.311	100		Si I	1559.362	30	A
Ni II	1555.398	16		Co III	1557.328	5		P IV	1559.407	90	
Mn III	1555.40	1		Mn III	1557.339	12		Zn II	1559.466	10	Z
Zn IV	1555.431	20		Ni II	1557.380	1	N	Fe III	1559.468	150	P
Fe V	1555.442	100		Si I	1557.382	20	A	As I	1559.48	4	N
Si I	1555.463	15	A	Co II	1557.393	15		As I	1559.53	4	
Ni II	1555.496	30		Si I	1557.416	10	A	P I	1559.541	0	

Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes
Cr III	1559.67	10		P I	1562.073	0		Si I	1564.6138	8	
Si I	1559.705	25	A	Fe V	1562.1		F, P	Fe IV	1564.638	150	P
Zn II	1559.709	15	Z	Mn III	1562.212	2		Ti IV	1564.685	4	P
Ni II	1559.822	1		F III	1562.234	100		Fe IV	1564.780	300	
Co II	1559.905	2		Fe IV	1562.259	375		Ti IV	1564.850	10	P
Ni IV	1559.924	660		Fe II	1562.270	20	P	Zn II	1564.885	20	Q, Z
S	1560.	50	N	Si I	1562.286	5	A	Mn II	1564.897	30	
Si I	1560.072	30	A	Ni II	1562.329	18		Sc IV	1564.942	1	
Si I	1560.093	20	A	P I	1562.383	1		V II	1564.999	2	
P I	1560.171	0		Co II	1562.391	5		Ni II	1565.001	1	
Ni IV	1560.177	670		Si I	1562.436	10	A	As I	1565.05	7	
Ar II	1560.191	400		Ar II	1562.442	200		Cl II	1565.0503	220	
N I	1560.224		P	Si II	1562.451	10		Cl II	1565.1142	210	
Co II	1560.226	10		Fe IV	1562.458	450		Sc II	1565.118	10	
Fe II	1560.252	90	P	Ca III	1562.473	900		Fe III	1565.118	200	P
Fe IV	1560.272	375		Mn III	1562.493	0	N	Cl II	1565.1732	210	
C I	1560.3095	250		Se I	1562.50	20		Cl II	1565.201	210	
Co V	1560.32		P	Zn III	1562.538	75		Cu III	1565.202	125	
Se I	1560.33	120	P	Mn II	1562.57	1		Fe VI	1565.263	150	
Ni II	1560.341	6		Fe IV	1562.753	375		Na III	1565.294	500	
Al II	1560.35	1		P I	1562.786	0	N	Si I	1565.322	20	A
Si I	1560.406	15	A	Si II	1562.845	15		Fe II	1565.360	30	P
N I	1560.436		P	Na III	1562.870	550		Ar II	1565.377	100	
Ni II	1560.459	25	N	Sc IV	1562.911	1		Si I	1565.395	15	A
Fe III	1560.469	150	P	As I	1562.95	10		Ni II	1565.399	20	N
Fe III	1560.474	50	P	V II	1562.98	100	N	Cr III	1565.40	20	N
Ni IV	1560.501	120		Zn	1563.035	10	N	Cu IV	1565.457	60	
Ni II	1560.517	10		Ar II	1563.043	100		Sc II	1565.490	1	
Ni II	1560.562	4	N	Ni II	1563.111	7		F III	1565.539	250	
C I	1560.6832	500		Fe IV	1563.133	150		Cr III	1565.54	20	N
C I	1560.7079	200		Co III	1563.158	5		Cu IV	1565.776	250	
Si I	1560.7425	8		Zn III	1563.163	10		Mn III	1565.830	30	
Cu IV	1560.762	460		Cu II	1563.1937	5		Si I	1565.861	10	A
Zn III	1560.780	70		Fe IV	1563.229	200		Fe IV	1565.867	250	
Ni II	1560.796	5		Zn III	1563.280	1	Q	Cu II	1565.9243	100	
Fe III	1560.830	50	P	P I	1563.293	1		Sc II	1565.952	1	
Ni II	1560.831	15		Se I	1563.30	20	P	Ni II	1565.970	3	N
Fe III	1560.849	100	P	Si I	1563.364	25	A	V II	1565.98	80	N
Co II	1560.874	20		Co II	1563.372	0		Ni II	1566.019	7	
Sc IV	1560.916	5		Ni II	1563.376	50		Zn	1566.039	15	N
Si I	1560.934	5	A	Co V	1563.52		P	F III	1566.070	200	
Ni II	1560.935	4		Fe IV	1563.579	375		Sc IV	1566.155	20	
F III	1560.939	60		Al II	1563.580	1		Sc II	1566.161	10	
Co II	1560.966	10		Ni II	1563.604	120		V II	1566.166	1	
Si III	1560.974			Na III	1563.61	150		Mn III	1566.198	40	
Ni II	1561.015	4		Mn II	1563.61	6		Ni IV	1566.234	20	N
Fe II	1561.067	20	P	F III	1563.726	250		Fe IV	1566.256	520	
Ni IV	1561.158	30		Si II	1563.765	10		B I	1566.286	10	A
Mn II	1561.17	4		Fe V	1563.778	100		Cl II	1566.2958	210	
Fe III	1561.172	10	P	Fe II	1563.790	160	P	Si I	1566.303	10	A
Fe IV	1561.193	375		Sc IV	1563.811	360		Fe II	1566.346	2	P
Fe III	1561.197	10	P	Mn III	1563.831	20		P I	1566.371	0	
Ni II	1561.229	15		Ni II	1563.837	1	N	As I	1566.39	15	N
N I	1561.258		P	Si I	1563.886	15	A	Cu V	1566.4		F, P
C I	1561.3407	400		Fe V	1563.934	80		Cu II	1566.4148	150	
Fe IV	1561.355	375		V II	1563.954	2		Fe IV	1566.464	200	
C I	1561.3668	400		Si II	1564.066	5		Mn II	1566.47	40	
C I	1561.4382	1000		Cr III	1564.07	10	N	Fe IV	1566.572	300	
Mn III	1561.570	20		Co II	1564.087	3		B I	1566.660	20	A
Mn III	1561.589	60		Co III	1564.090	2		Cu IV	1566.708	190	N
Cu V	1561.6		F, P	Cr X	1564.10		F	Zn II	1566.736	10	N
Mn II	1561.61	4		Al IV	1564.164	700		Fe IV	1566.747	250	
Mn III	1561.681	40		Fe IV	1564.263	300		Mn III	1566.762	20	
P IV	1561.700	60		Ni II	1564.273	15		Ar II	1566.811	100	
Cr III	1561.72	10		Ni IV	1564.277	20		Zn	1566.822	10	N
Ni II	1561.733	2		Fe III	1564.295	20	P	Fe II	1566.822	110	P
Co III	1561.746	2		Cr III	1564.32	10	N	Ni II	1566.890	1	
Zn II	1561.778	5	Z	Zn II	1564.369	6	Z	Zn III	1566.955	12	
Cu III	1561.793	100		Ni IV	1564.377	0		F II	1566.961	100	
Si I	1561.822	30	A	Ni II	1564.389	8		Ni IV	1566.998	460	
Ni II	1561.968	11		P I	1564.471	0	N	Fe IV	1567.046	30	
Fe V	1561.978	10		Sc II	1564.488	1		Mn II	1567.06	2	
Si I	1562.0065	4		Fe III	1564.513	150	P	Ni II	1567.069	15	
Mn III	1562.033	20		Ni IV	1564.522	70		Sc II	1567.126	1	
Si I	1562.0531	1	N	Fe IV	1564.602	100	P	Co III	1567.173	3	N

Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes
Si I	1567.212	5	A	Zn	1569.307	10	N	Cu IV	1571.767	60	N
Ni II	1567.220	10		Si I	1569.3185	8		Si I	1571.796	35	A
Ni II	1567.298	3		Cr III	1569.36	20	N	Kr II	1571.876	1	
Zn III	1567.310	25		As II	1569.385	10		Fe V	1571.910	125	
Ni II	1567.323	10	N	Al II	1569.385	100		Mn III	1571.920	20	
Ni II	1567.336	12	N	Ni IV	1569.403	0	Q	Cr III	1571.98	50	N
Cu IV	1567.353	910		Ni II	1569.415	1	N	S	1572.	100	N
Ni II	1567.370	3		Cu II	1569.4155	4		Cu IV	1572.009	70	
Mn IV	1567.38	0		Ti V	1569.423	80		Ni II	1572.018	4	N
Cr III	1567.41	80	N	Fe IV	1569.427	80		Ni II	1572.062	4	N
P I	1567.414	0		Ge III	1569.5	10	P	Mn II	1572.13	1	
F II	1567.435	40		Cr III	1569.51	50	N	Cr III	1572.13	20	
Sc II	1567.460	10		Mn III	1569.516	0		Co V	1572.13		P
Si I	1567.465	5	A	Ni II	1569.624	13		Ni IV	1572.132	0	Q
Ne II	1567.526	70		Fe II	1569.674	110	P	Co V	1572.14		P
Co II	1567.567	8		Kr III	1569.89	40		As I	1572.19	1	N
Fe III	1567.628	70	P	Ni IV	1569.913	260		Zn II	1572.198	15	Z
Si I	1567.7263	8		Ni II	1569.972	2		Fe II	1572.21	1	P
Mn III	1567.772	15		Fe V	1569.985	50		Ni IV	1572.260	0	
Cr III	1567.80	10	N	Si I	1570.026	25	A	Co III	1572.266	1	
Si I	1567.808	15	A	Mn II	1570.05	7		Kr II	1572.316	4	P
Zn III	1567.840	25	Q	Zn	1570.065	15	N	Co II	1572.332	8	
Ni II	1567.872	1		Ni IV	1570.108	30		Ge I	1572.339	50	A, Z
Co III	1567.917	0		Mn III	1570.169	0		Ge I	1572.369	10	A
Fe IV	1567.955	375		Fe IV	1570.178	450		Ge III	1572.5	10	P
Ni II	1567.966	4		Cu III	1570.204	200		Al IV	1572.54	100	
Ar II	1567.987	400		P III	1570.215	1		Cr III	1572.54	10	N
Ca XIII	1568.		F, P	Fe V	1570.22		F, P	Ni II	1572.540	25	
Fe II	1568.020	55	P	Fe II	1570.244	110	P	As II	1572.644	10	
Kr II	1568.050	1		Mn V	1570.261	600		Co II	1572.645	10	
Cu III	1568.118	5		Ni II	1570.302	10		Ni II	1572.646	4	
Si I	1568.1963	10		Cu II	1570.3153	2		Ge I	1572.67	75	A, Z
As II	1568.225	225		Ni II	1570.392	60		Zn	1572.703	20	N
Mn I	1568.267	20	A, Z	Fe IV	1570.418	450		Mg III	1572.712	400	
Ni III	1568.269	3	N	Fe II	1570.498	1	P	Si I	1572.718	30	A
Fe IV	1568.274	600		Ni II	1570.512	3		Mn I	1572.725	180	A, Z
Co III	1568.308	1		Si I	1570.5175	3		Fe II	1572.749	5	P
Mn III	1568.325	10		Cu II	1570.5707	3		Fe II	1572.756	5	P
Zn III	1568.345	8	Q	Co II	1570.666	0		Fe III	1572.798	200	P
Cu IV	1568.347	270	N	Cr III	1570.67	40		Fe III	1572.841	300	P
Mn III	1568.380	80		Ni II	1570.701	1		Sc II	1572.842	110	
Fe V	1568.407	60		Si I	1570.808	20	A	Co II	1572.878	5	
Sc II	1568.427	80		Ni II	1570.879	1	N	Cr III	1572.89	20	N
Cr III	1568.471	60		Zn III	1570.900	3		Sc II	1572.901	110	
Mn II	1568.51	20		V III	1570.96	10		Si I	1572.9245	1	N
Cu III	1568.567	50		Cu III	1570.975	1		Si I	1572.947	5	N, A
Ni III	1568.569	5		Co II	1570.988	0		Fe III	1572.964	20	P
Co V	1568.57		P	As II	1570.993	500		Zn II	1572.991	40	N
Si I	1568.6182	3		Zn III	1571.008	3		Ni II	1572.993	1	N
Fe II	1568.646	2	P	Cr III	1571.055	250		Ge I	1572.997	10	A
Cu III	1568.669	40		Mn III	1571.06	2		V X	1573.		F, P
Na II	1568.673	10	Q	Fe II	1571.065	10	P	Ge I	1573.0	20	A
Fe III	1568.696		P	Fe II	1571.137	20	P	Fe II	1573.000	5	P
Ni II	1568.698	1		Ni II	1571.145	12	N	Al II	1573.003	3	
Fe IV	1568.711	375		Ni II	1571.162	12	N	Zn	1573.011	90	N
Fe III	1568.819	200	P	Cu III	1571.166	75		Ni II	1573.071	10	N
Mn V	1568.861	450		Zn IV	1571.207	5		As XXI	1573.1		F, P
Zn	1568.913	10	N	Ge I	1571.23	65	A, Z	Cu II	1573.1668	0	
Ne II	1569.015	40		Fe III	1571.237	70	P	Ge I	1573.255	10	A
Fe III	1569.038	20	P	Fe IV	1571.245	450		Sc II	1573.283	80	
Cu III	1569.044	40		Ni II	1571.257	10	N	B I	1573.301	30	A
Fe III	1569.059	50	P	Cu III	1571.265	20		Cr III	1573.34	10	
Cr III	1569.07	30	N	Ca III	1571.268	650		Si I	1573.3483	1	N
Mn II	1569.08	1		Si I	1571.321	25	A	Kr II	1573.404	10	
Kr II	1569.135	90		Zn III	1571.377	12		Co II	1573.415	1	
Ni II	1569.172	16		Cr III	1571.38	20	N	Na II	1573.430	10	
Ni IV	1569.179	0	Q	Ar II	1571.391	100		Mn II	1573.53	30	
Cu II	1569.2123	4		Se III	1571.4	50		Ge I	1573.544	12	A
Fe IV	1569.221	375		Cu III	1571.402	40		Sc II	1573.579	10	
Al V	1569.25	50		Si I	1571.4058	10		Si I	1573.6350	10	
Mn III	1569.260	7		Ni II	1571.532	2		B I	1573.679	50	A
Co III	1569.264	1		Ni II	1571.550	2		Ge VII	1573.7		F, P
Na II	1569.264	20		Ni IV	1571.655	10	N	Fe IV	1573.770	150	
Ni IV	1569.272	0		P I	1571.673	0		V II	1573.78	5	N
Mn III	1569.304	0		V II	1571.74	20	N	Zn III	1573.809	25	

Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes	Element	Wavelength	Int.	Notes
Fe II	1573.828	55	P	Co II	1575.575	5		Ni II	1577.933	14	
As I	1573.85	60		Ni II	1575.597	9		Fe III	1577.938	150	P
Ge I	1573.868	15	A	Fe IV	1575.613	250		Mn III	1577.939	100	
Cr III	1573.87	70		Mn II	1575.642	40		Se I	1577.96	150	P
Si I	1573.8840	25		N III	1575.65	40		Mn I	1577.994	200	A,Z
Cu IV	1573.920	40	N	Ge I	1575.660	25	A	Cr III	1578.01	10	
Co III	1573.921	10	N	Ni IV	1575.662	30	N	Fe II	1578.012	1	P
Mn X	1574.		F,P	Na II	1575.749	15		Fe IV	1578.023	250	
Cr III	1574.00	40		Mn II	1575.75	3		Co III	1578.093	0	
Mn III	1574.026	15		Fe II	1575.80	1	Q	Fe II	1578.128	2	P
Fe II	1574.038	55	P	Zn II	1575.810	10	N	P I	1578.181	0	
P I	1574.090	3		Ar II	1575.815	300		Fe II	1578.219	5	P
Kr II	1574.103	1		As I	1575.87	20		Si I	1578.258	25	A
Na II	1574.110	12		Mn II	1575.94	10		Mn V	1578.300	450	
Fe	1574.12	0	N	Mn V	1575.968	900		Cu IV	1578.371	70	N
Si I	1574.126	10	A	Co II	1576.019	1		Cr III	1578.39	10	N
Sc II	1574.152	4		Co III	1576.025	2	N	Zn	1578.395	10	N
Ni II	1574.202	18		P I	1576.091	0		P I	1578.460	7	
Mn I	1574.214	150	A,Z	Na II	1576.118	12		Mn III	1578.467	20	
Ge I	1574.232	18	A	Kr II	1576.155	1		Si I	1578.478	25	A
Cu IV	1574.236	120	N	Fe V	1576.212	100		Fe II	1578.495	20	P
Mn II	1574.276	6		Ge I	1576.228	10	A	Fe II	1578.501	20	P
N III	1574.32	25		Cr III	1576.24	20	N	Mg IV	1578.537	140	
Kr II	1574.340	1		Ge I	1576.282	25	A	V II	1578.542	4	
Zn II	1574.381	6	Z	Br I	1576.387	660		Ge II	1578.598	3	Z
Fe II	1574.399	1	P	Co II	1576.387	1		Fe IV	1578.611	110	
Ar II	1574.401	100		Fe II	1576.433	1	P	Cr III	1578.624	120	
Ni II	1574.423	100		Fe IV	1576.442	200		Zn III	1578.642	15	
Ge I	1574.44	75	A,Z	C III	1576.48	300		Co II	1578.679	1	
Co II	1574.552	15		Ge I	1576.495	12	A,Z	P I	1578.732	3	
Sc IV	1574.587	5		Cu IV	1576.509	190		Fe IV	1578.743	375	
Fe IV	1574.602	250		Ni IV	1576.539	0	Q	Fe III	1578.748	150	P
Sc II	1574.619	10		N III	1576.54	25		Na II	1578.807	12	
Si I	1574.625	5	A	Ge I	1576.63	80	A,Z	Ar II	1578.812	300	
Cr III	1574.63	20	N	Mn V	1576.669	100		Ge I	1578.827	40	A
Ge I	1574.648	20	A	Cr IV	1576.691	5		Ni II	1578.865	20	
Na II	1574.664	7		Ni II	1576.747	1	N	Mn II	1578.90	20	
P I	1574.710	3		Co II	1576.780	15		Ni II	1578.990	60	N
As I	1574.72	30		V II	1576.805	0	N	Ge I	1579.019	50	A
Kr II	1574.733	25		Si I	1576.825	40	A	Ni IV	1579.040	20	Q
Fe IV	1574.736	200		Fe IV	1576.845	4		Ni II	1579.073	18	N
Si I	1574.7456	1	N	Ge II	1576.8547	500		P I	1579.087	0	
Fe II	1574.772	30	P	Ar II	1576.898	300		Mn III	1579.116	12	
Ge I	1574.8	20	A	Zn II	1576.905	15	N	Na III	1579.117	400	
Ne V	1574.8		F,P	Mn III	1576.924	10		Cu IV	1579.138	190	
Si I	1574.810	10	A	Ge I	1576.948	15	A	Ni IV	1579.220	0	N
Zn IV	1574.833	20		Ge I	1577.003	30	A	Ge I	1579.233	15	A,Z
Br I	1574.841	730		Ni II	1577.015	30		Fe IV	1579.236	200	
Si I	1574.8435	30		Co II	1577.038	15		Fe II	1579.257	2	P
Si I	1574.847	45	A	Si I	1577.042	30	A	Co II	1579.355	2	
B I	1574.868		A,Z	Fe III	1577.071	200	P	Cu III	1579.361	75	
Fe II	1574.922	70	P	Ge I	1577.1	20	A,Z	Fe IV	1579.368	375	
Sc IV	1574.923	450		Ni II	1577.115	16		P I	1579.371	7	
Ni II	1574.942	20		Cr III	1577.14	100		Al V	1579.38	10	
Ni II	1574.976	5		Fe II	1577.167	55	P	Ge I	1579.405	80	Z
Ar II	1574.993	600		Mn IV	1577.18	350		Zn	1579.446	15	N
Ni II	1575.003	16		Fe IV	1577.205	450		Mn III	1579.457	10	
Sc II	1575.068	10		Ni II	1577.210	7	N	Cu II	1579.4918	6	
Ni II	1575.090	15	N	Mn II	1577.22	3		Kr II	1579.513	4	
Co V	1575.10		P	Cu II	1577.2670	0		Se I	1579.53	150	P
Fe IV	1575.105	200		Sc IV	1577.275	220		V II	1579.550	4	
Ge I	1575.120	20	A	Zn III	1577.275	0		Ni II	1579.563	18	
Si I	1575.1268	10		Se II	1577.29	10		Mn III	1579.567	0	
P I	1575.166	15		C III	1577.30	200		Ni IV	1579.584	0	Q
Fe IV	1575.190	300		Cr III	1577.36	50	N	Co II	1579.600	2	
N III	1575.21	60		Zn IV	1577.504	20		Cu I	1579.650	8	A,Z
Se I	1575.32	150	P	Se I	1577.61	150		Cr V	1579.696	1000	
Mn III	1575.33	1		F III	1577.652	1		Zn III	1579.729	15	
Cu II	1575.3533	5		Fe IV	1577.758	450		Kr II	1579.731	90	
Kr II	1575.375	1		Mn II	1577.774	10		Ni II	1579.791	17	N
Fe IV	1575.409	250		Ge I	1577.784	18	A	Co II	1579.820	0	
Fe II	1575.420	0	P	Ge I	1577.844	35	A	Ni II	1579.877	2	
P I	1575.466	15		C III	1577.89	200		Ge I	1579.945	45	A
Ni III	1575.50		F,P	Na III	1577.90	450		Ni II	1579.959	3	
Ni II	1575.559	1		Al V	1577.90	300		Ni III	1579.999	15	

## List of References

1. Abbink, J. H. and H. B. Dorgelo, *Z. Physik* **47**, 221-32 (1928).
2. Andersson, E. and G. A. Johannesson, *Physica Scripta* **3**, 203-10 (1971).
3. Anderson, E. E. and J. E. Mack, *Phys. Rev.* **59**, 717-23 (1941).
4. Andrew, K. L. and K. W. Meissner, *J. Opt. Soc. Am.* **48**, 31-3 (1958).
5. Artru, M. C. and V. Kaufman, *J. Opt. Soc. Am.* **62**, 949-57 (1972).
6. Avellen, S., *Ark. Fys.* **8**, 211-12 (1954).
7. Andrew, K. L. and K. W. Meissner, *J. Opt. Soc. Am.* **49**, 146-161 (1958).
8. Alexander, E., U. Feldman, B. S. Fraenkel, and S. Hoory, *Nature* **206**, 176 (1965).
9. Alexander, E., U. Feldman, and B. S. Fraenkel, *J. Opt. Soc. Am.* **55**, 650-53 (1965).
10. Alexander, E., U. Feldman, and B. S. Fraenkel, *Physics Letters* **14**, 40-1 (1965).
11. Alexander, E., U. Feldman, B. S. Fraenkel, and S. Hoory, *J. Opt. Soc. Am.* **56**, 651-2 (1966).
12. Alexander, E., U. Feldman, B. S. Fraenkel, *J. Quant. Spectro. Radiat. Transfer* **4**, 501-6 (1964).
13. Badami, J. S., *Proc. Phys. Soc. [London]* **43**, 538-44 (1931).
14. Badami, J. S. and K. R. Rao, *Proc. Roy. Soc. [London]* **140A**, 387-98 (1933).
15. Balloffet, G. and J. Romand, *C. R. Acad. Sci. [Paris]* **242**, 2333-5 (1956).
16. Bartelt, O., *Z. Physik* **88**, 522-31 (1934).
17. Beckman, A., *Bidrag Till Kannedomen Om Skandiums Spektrum I Yttersta Ultraviolet, Almqvist Och Wiksells Boktryckeri, Uppsala* (1937).
18. Beutler, H., *Z. Physik* **86**, 710-18 (1933).
19. Beutler, H., *Z. Physik* **87**, 19-27 (1933).
20. Beutler, H., *Z. Physik* **91**, 131-42 (1934).
21. Beutler, H., *Z. Physik* **93**, 177-96 (1934).
22. Beutler, H. and W. Demeter, *Z. Physik* **91**, 202-18 (1934).
23. Beutler, H. and K. Guggenheimer, *Z. Physik* **87**, 188-91 (1933).
24. Beutler, H. and K. Guggenheimer, *Z. Physik* **88**, 25-42 (1934).
25. Bloch, L. and E. Bloch, *Ann. Phys. [Paris]* **5**, 325-54 (1936).
26. Bloch, L. and E. Bloch, *Ann. Phys. [Paris]* **6**, 561-74 (1936).
27. Bloch, L. and E. Bloch, *C. R. Acad. Sci. [Paris]* **171**, 709-11 (1920).
28. Bloch, L. and E. Bloch, *C. R. Acad. Sci. [Paris]* **208**, 336 (1939).
29. Bloch, L. and E. Bloch, *J. Phys. Radium* **4**, 622-35 (1914).
30. Bloch, L. and E. Bloch, *J. Phys. Radium* **6**, 441-50 (1935).
31. Bloch, L. and E. Bloch, *J. Phys. Radium* **8**, 217-28 (1937).
32. Bloch, L., E. Bloch, and N. Felici, *J. Phys. Radium* **8**, 355-62 (1937).
33. Bloch, L., E. Bloch, and R. Walden, *J. Phys. Radium* **10**, 49-59 (1939).
34. Bockasten, K., *Ark. Fys.* **9**, 457-81 (1955).
35. Bockasten, K., *Ark. Fys.* **10**, 567-82 (1956).
36. Bowen, I. S., *Phys. Rev.* **29**, 231-47 (1927).
37. Bowen, I. S., *Phys. Rev.* **29**, 510-12 (1927).
38. Bowen, I. S., *Phys. Rev.* **31**, 34-8 (1928).
39. Bowen, I. S., *Phys. Rev.* **31**, 497-502 (1928).
40. Bowen, I. S., *Phys. Rev.* **31**, 967-8 (1928).
41. Bowen, I. S., *Phys. Rev.* **39**, 8-15 (1932).
42. Bowen, I. S., *Phys. Rev.* **45**, 82-6 (1934).
43. Bowen, I. S., *Phys. Rev.* **45**, 401-4 (1934).
44. Bowen, I. S., *Phys. Rev.* **46**, 377 (1934).
45. Bowen, I. S., *Phys. Rev.* **46**, 791-2 (1934).
46. Bowen, I. S., *Phys. Rev.* **47**, 924-5 (1935).
47. Bowen, I. S., *Phys. Rev.* **52**, 1153-6 (1937).
48. Bowen, I. S., *Phys. Rev.* **53**, 889-90 (1938).
49. Bowen, I. S. and S. B. Ingram, *Phys. Rev.* **28**, 444-8 (1926).
50. Bowen, I. S. and R. A. Millikan, *Phil. Mag.* **48**, 259-64 (1924).
51. Bowen, I. S. and R. A. Millikan, *Phys. Rev.* **25**, 591-9 (1925).
52. Bowen, I. S. and R. A. Millikan, *Phys. Rev.* **25**, 295-305 (1925).
53. Bowen, I. S. and R. A. Millikan, *Phys. Rev.* **26**, 150-64 (1925).
54. Bowen, I. S. and R. A. Millikan, *Phys. Rev.* **27**, 144-9 (1926).
55. Bowen, I. S. and R. A. Millikan, *Phys. Rev.* **28**, 256-8 (1926).
56. Bowen, I. S. and R. A. Millikan, *Phys. Rev.* **28**, 923-6 (1926).
57. Boyce, J. C., *Phys. Rev.* **46**, 378-81 (1934).
58. Boyce, J. C., *Phys. Rev.* **47**, 718-20 (1935).
59. Boyce, J. C., *Phys. Rev.* **48**, 396-402 (1935).
60. Boyce, J. C., *Phys. Rev.* **49**, 351 (1936).
61. Boyce, J. C., *Phys. Rev.* **49**, 730-2 (1936).
62. Boyce, J. C. and K. T. Compton, *Proc. Nat. Acad. Sci. U. S. A.* **15**, 656-8 (1929).
63. Boyce, J. C. and C. A. Rieke, *Phys. Rev.* **47**, 653-7 (1935).
64. Borgstrom, A., *Physica Scripta* **3**, 157-63 (1971).
65. Boyce, J. C. and H. A. Robinson, *J. Opt. Soc. Am.* **26**, 133-43 (1936).
66. De Bruin, T. L., *Proc. Roy. Acad. Amsterdam* **33**, 198-212 (1930).
67. De Bruin, T. L., *Z. Physik* **61**, 307-20 (1930).
68. De Bruin, T. L. and C. J. Bakker, *Z. Physik* **69**, 19-35 (1931).
69. De Bruin, T. L., C. J. Humphreys, and W. F. Meggers, *J. Res. Nat. Bur. Stand.* **11**, 409-40 (1933).
70. Burns, K. and F. M. Walters, Jr., *Publ. Allegheny Obs.* **8**, 27-35 (1930).
71. Bockasten, K., R. Hallin, and T. P. Hughes, *Proc. Phys. Soc.* **81**, 522-30 (1963).
72. Bockasten, K., R. Hallin, K. B. Johansson, and P. Tsui, *Physics Letters [Neth.]* **8**, 181-2 (1964).
73. Bowen, I. S., *Astrophys. J.* **121**, 306-11 (1955).
74. Bashkin, S., L. Heroux, and J. Shaw, *Physics Letters [Neth.]* **13**, 229-31 (1964).
75. Bryant, B. W., *J. Opt. Soc. Am.* **55**, 771-9 (1965).
76. Blake, R. L., T. A. Chubb, H. Friedman, and A. E. Unzicker, *Astrophys. J.* **142**, 1-12 (1965).
77. Black, W. S., *Et Al, Nature* **206**, 654-8 (1965).
78. Blake, R. L., *Et Al, Science [U. S. A.]* **146**, 1037-8 (1964).
79. De Bruin, T. L. *Proc. Roy. Soc. Amsterdam* **40**, 340-8 (1937).
80. Bromander, J., B. Johansson, and K. Bockasten, *J. Opt. Soc. Am.* **57**, 1158-9 (1967).
81. Burgess, D. D., B. C. Fawcett and N. J. Peacock, *Proc. Phys. Soc.* **92**, 805-16 (1967).
82. Blake, R. L. and L. L. House, *Astrophys. J.* **149**, L33-L35 (1967).
83. Bockasten, K. and K. B. Johansson, *Ark. Fys.* **38**, 563-84 (1968).
84. Burton, W. M., A. Ridgeley and R. Wilson, *Mon. Not. Roy. Astron. Soc.* **135**, 207-23 (1967).
85. Borgstrom, A., *Ark. Fys.* **38**, 243-60 (1968).
86. Bromander, J., *Ark. Fys.* **40**, 257-74 (1969).
87. Brown, R. T., *Astrophys. J.* **158**, 829-37 (1969).
88. Boland, B. C., F. E. Irons and R. W. P. Mcwhirter, *J. Phys. Soc. B* **1**, 1180-91 (1968).
89. Burton, W. M. and A. Ridgeley, *Solar Physics* **14**, 3-28 (1970).
90. Berry, H. G., *J. Opt. Soc. Am.* **61**, 983 (1971).
91. Boiko, V. A., Y. P. Voinov, V. A. Gribkov and G. V. Sklizkov, *Optics and Spectros.* **29**, 545-6 (1970).
92. Bashkin, S. and I. Martinson, *J. Opt. Soc. Am.* **61**, 1686-92 (1971).
93. Behring, W. E., L. Cohen, and U. Feldman, *Astrophys. J.* **175**, 493-523 (1972).
94. Berry, H. G., M. C. Buchet-Poulizac, and J. P. Buchet, *J. Opt. Soc. Am.* **63**, 240-41 (1973).
95. Buchet, J. P. and M. C. Buchet-Poulizac, *J. Opt. Soc. Am.* **63**, 243-44 (1973).
96. Brown, C. M., R. H. Naber, S. G. Tilford and M. L. Ginter, *Appl. Optics* **12**, 1858-64 (1973).
97. Baker, S. C., *J. Phys. B* **6**, 709-14 (1973).
98. Bromander, J., O. Poulsen, and J. L. Subtil, *Physica Scripta* **7**, 283-84 (1973).
99. Bromander, J., *Physica Scripta* **4**, 61-63 (1971).
100. Berry, H. G., I. Martinson, L. J. Curtis, and L. Lundin, *Phys. Rev.* **A3**, 1934-37 (1971).
101. Brown, C. M., S. G. Tilford, and M. S. Ginter, *J. Opt. Soc. Am.* **63**, 1454-62 (1973).

102. Brown, C. M., S. G. Tilford, and M. S. Ginter, *J. Opt. Soc. Am.* **64**, 877-79 (1974).
103. Buchet, J. P. and M. C. Buchet-poulizac, *J. Opt. Soc. Am.* **64**, 1011-14 (1974).
104. Burkhalter, P. G., U. Feldman, and R. D. Cowan, *J. Opt. Soc. Am.* **64**, 1058-62 (1974).
105. Burkhalter, P. G., D. J. Nagel, and R. D. Cowan, *Phys. Rev. A*, **11**, 782-88 (1975).
106. Brown, C. M., S. G. Tilford, R. Tousey, and M. L. Ginter, *J. Opt. Soc. Am.* **64**, 1665-82 (1974).
107. Berry, H. G., R. M. Schectman, I. Martinson, W. S. Bickel, and S. Bashkin, *J. Opt. Soc. Am.* **60**, 335-44 (1970).
108. Bowen, I. S., *Astrophys. J.* **132**, 1-17 (1960).
109. Barrette, L., D. J. G. Irwin, and R. Drouin, *Physica Scripta* **12**, 113-15 (1975).
110. Buchet, J. P. and M. Druetta, *J. Opt. Soc. Am.* **65**, 991-94 (1975).
111. Bashkin, S., J. Bromander, J. A. Leavitt, and I. Martinson, *Physica Scripta* **8**, 285-91 (1973).
112. Brown, C. M. and S. G. Tilford, *J. Opt. Soc. Am.* **65**, 1404-9 (1975).
113. Brillet, W. U. L. and M. C. Artru, *J. Opt. Soc. Am.* **65**, 1399-1403 (1975).
114. Behring, W. E., L. Cohen, G. A. Doschek, and U. Feldman, *J. Opt. Soc. Am.* **66**, 376-78 (1976).
115. Berry, H. G., *Physica Scripta* **13**, 36-38 (1976).
116. Brillet, W. U. L., *Physica Scripta* **13**, 289-92 (1976).
117. Buchet, J. P., M. C. Buchet-poulizac, and M. Druetta, *J. Opt. Soc. Am.* **66**, 842-45 (1976).
118. Cohen, L. and W. E. Behring, *J. Opt. Soc. Am.* **66**, 899-904 (1976).
119. Curtis, L. J., B. Engman, and I. Martinson, *Physica Scripta* **13**, 109-10 (1976).
120. Chipman, E. and E. C. Bruner, Jr., *Astrophys. J.* **200**, 765-72 (1975).
121. Doschek, G. A., U. Feldman, and L. Cohen, *Astrophys. J. Suppl.* **33**, 101-11 (1977).
122. Doschek, G. A. and U. Feldman, *J. Appl. Phys.* **47**, 3083-87 (1976).
123. Beyer, L. M., W. E. Maddox, and L. B. Bridwell, *J. Opt. Soc. Am.* **63**, 365-69 (1973).
124. Carroll, P. K. and E. T. Kennedy, *Phys. Rev. Letters* **38**, 1068-71 (1977).
125. Barrette, L., E. J. Knystautas, and R. Drouin, *Nucl. Instrum. Meth.* **110**, 29-33 (1973).
126. Berry, H. G., J. Desesquelles, and M. Dufay, *Nucl. Instrum. Meth.* **110**, 43-50 (1973).
127. Beyer, L. M., W. E. Maddox, L. B. Bridwell, D. D. Duncan, L. L. Bingham, and J. C. Asbell, *Nucl. Instrum. Meth.* **110**, 61-67 (1973).
128. Cady, W. M., *Phys. Rev.* **43**, 322-8 (1933).
129. Cady, W. M., *Phys. Rev.* **44**, 821-5 (1933).
130. Carroll, J. A., *Trans. Roy. Soc. [London]* **225A**, 357-420 (1925).
131. Catalan, M. A., *An. Real Soc. Espan. Fis. Quim.* **53**, 179-84 (1957).
132. Connerade, J. P., N. J. Peacock and R. J. Speer, *Solar Physics* **18**, 63-71 (1971).
133. Connerade, J. P., *Astrophys. J.* **162**, L139-43 (1970).
134. Clearman, H. E., *J. Opt. Soc. Am.* **42**, 373-9 (1952).
135. Connerade, J. P., W. R. S. Garton and M. W. D. Mansfield, *Astrophys. J.* **165**, 203-12 (1971).
136. Connerade, J. P., N. J. Peacock and R. J. Speer, *Solar Physics* **14**, 159-65 (1970).
137. Cowan, R. D. and K. G. Widing, *Astrophys. J.* **180**, 285-92 (1973).
138. Crawford, M. F. and A. B. Mclay, *Proc. Roy. Soc. [London]* **143A**, 540-57 (1934).
139. Chapman, R. D. and Y. Shadmi, *J. Opt. Soc. Am.* **63**, 1440-45 (1973).
140. Curtis, C. W., *J. Opt. Soc. Amer.* **42**, 300-5 (1952).
141. Curtis, C. W., *Phys. Rev.* **53**, 474-81 (1938).
142. Cowan, R. D., *Astrophys. J.* **147**, 377-8 (1967).
143. Cohen, L., U. Feldman and S. O. Kastner, *J. Opt. Soc. Am.* **58**, 331-4 (1968).
144. Cohen, L., U. Feldman, M. Swartz, and J. H. Underwood, *J. Opt. Soc. Am.* **58**, 843-46 (1968).
145. Codling, K., *Proc. Phys. Soc.* **77**, 797-800 (1961).
146. Cohen, L. and U. Feldman, *Astrophys. J.* **160**, L105-6 (1970).
147. Crosswhite, H. M., G. H. Dieke, and W. J. Carter, *J. Chem. Phys.* **43**, 2047-54 (1965).
148. Catalan, M. A., W. F. Meggers, and O. Garcia-Riguelme, *J. Res. Nat. Bur. Stand.* **68A**, 9-60 (1964).
149. Corliss, C. H. and W. F. Meggers, *J. Res. Nat. Bur. Stand.* **61**, 269-324 (1958).
150. Codling, K. and R. P. Madden, *Phys. Rev. Letters* **12**, 106-8 (1964).
151. Crooker, A. M. and K. A. Dick, *Canad. J. Phys.* **42**, 766-78 (1964).
152. Crooker, A. M., Unpublished Information (1966).
153. Cowan, R. D. and N. J. Peacock, *Astrophys. J.* **142**, 390-6 (1965).
154. Crooker, A. M. and K. A. Dick, *Canad. J. Phys.* **46**, 1241-51 (1968).
155. Dewhurst, R. J., M. A. Khan, and G. J. Pert, *J. Phys. B*, **8**, 2301-10 (1975).
156. Garnir, H. P., *J. Opt. Soc. Am.* **69**, 916-17 (1979).
157. Dingle, H., *Proc. Roy. Soc. [London]* **128A**, 600-24 (1930).
158. Dorgelo, H. B. and J. H. Abbink, *Naturwissenschaften* **14**, 755-6 (1926).
159. Diago, M. C., *An. Real Soc. Espan. Fis. Quim.* **60A**, 229-38 (1964).
160. Deutschman, W. A. and L. L. House, *Astrophys. J.* **144**, 435-7 (1966).
161. Deutschman, W. A. and L. L. House, *Astrophys. J.* **149**, 451-2 (1967).
162. Dick, K. A., *Canad. J. Phys.* **46**, 1291-1302 (1968).
163. Earls, L. T. and R. A. Sawyer, *Phys. Rev.* **47**, 115-22 (1934).
164. Edlen, B., *Ark. Fys.* **4**, 441-52 (1952).
165. Edlen, B., *Svenska Vet. Akad. Handl.* **20**, No. 10, 31 pp (1943).
166. Edlen, B., *Nature* **127**, 405-6 (1931).
167. Edlen, B., *Nature* **159**, 129-30 (1947).
168. Edlen, B., *Nova Acta Reg. Soc. Sci. Uppsala [iv]* **9**, No. 6, 153 pp (1934).
169. Edlen, B., *Phys. Rev.* **62**, 434-7 (1942).
170. Edlen, B., *Z. Physik* **85**, 85-106 (1933).
171. Edlen, B., *Z. Physik* **89**, 179-82 (1934).
172. Edlen, B., *Z. Physik* **89**, 597-600 (1934).
173. Edlen, B., *Z. Physik* **92**, 19-26 (1934).
174. Edlen, B., *Z. Physik* **93**, 433-49 (1935).
175. Edlen, B., *Z. Physik* **93**, 726-30 (1935).
176. Edlen, B., *Z. Physik* **94**, 47-57 (1935).
177. Edlen, B., *Z. Physik* **98**, 561-8 (1936).
178. Edlen, B., *Z. Physik* **100**, 621-35 (1936).
179. Edlen, B., *Z. Physik* **100**, 726-33 (1936).
180. Edlen, B., *Z. Physik* **103**, 536-41 (1936).
181. Edlen, B., *Z. Physik* **104**, 188-93 (1937).
182. Edlen, B., *Z. Physik* **104**, 407-16 (1937).
183. Edlen, B. and A. Ericson, *C. R. Acad. Sci. [Paris]* **190**, 116-8 (1930).
184. Edlen, B. and A. Ericson, *C. R. Acad. Sci. [Paris]* **190**, 173-4 (1930).
185. Edlen, B. and A. Ericson, *Nature* **125**, 233-4 (1930).
186. Edlen, B. and P. Risberg, *Ark. Fys.* **10**, 553-66 (1956).
187. Edlen, B. and J. Soderqvist, *Z. Physik* **87**, 217-19 (1933).
188. Edlen, B. and P. Swings, *Astrophys. J.* **95**, 532-54 (1942).
189. Edlen, B. and F. Tyren, *Z. Physik* **101**, 206-13 (1936).
190. Ekefors, E., *Z. Physik* **51**, 471-80 (1928).
191. Ekefors, E., *Z. Physik* **63**, 437-43 (1930).
192. Ekefors, E., *Z. Physik* **71**, 53-88 (1931).
193. Eliason, A. Y., *Phys. Rev.* **43**, 745-8 (1933).



194. Ellis, C. B. and R. A. Sawyer, *Phys. Rev.* **49**, 145-50 (1936).  
195. Ericsson, A. and B. Edlen, *Z. Physik* **59**, 656-79 (1930).  
196. Eriksson, K. B. S., *Ark. Fys.* **13**, 429-39 (1958).  
197. Edlen, B., *Reports On Progress In Physics* **26**, 181-212 (1963).  
198. Eriksson, K. B. S. and H. B. S. Isberg, *Ark. Fys.* **23**, 527-41 (1963).  
199. Elton, R. C., A. C. Kolb, W. E. Austin, R. Tousey, and K. G. Widing, *Astrophys. J.* **140**, 388-95 (1964).  
200. Eriksson, K. B. S., *Ark. Fys.* **13**, 303-28 (1958).  
201. Edlen, B., *Ark. Fys.* **31**, 509-10 (1966).  
202. Elton, R. C., *Astrophys. J.* **148**, 573-8 (1967).  
203. Edlen, B. and L. A. Svensson, *Ark. Fys.* **28**, 427-46 (1964).  
205. Eriksson, K. B. S., *Ark. Fys.* **33**, 357-60 (1967).  
206. Edlen, B. As Reported In *Trans. I. A. U. XIIA*, 237-162 (1965).  
207. Even-Zohar, M. and B. S. Fraenkel, *J. Opt. Soc. Am.* **58**, 1420-21 (1968).  
208. Feldman, U. and L. Cohen, *Astrophys. J.* **151**, L55-L58 (1968).  
209. Edlen, B., Private Communication (1969).  
210. Eriksson, K. B. S. and H. B. S. Isberg, *Ark. Fys.* **37**, 221-30 (1968).  
211. Edlen, B., H. P. Palenius, K. Bockasten, R. Hallin and J. Bromander, *Solar Physics* **9**, 432-38 (1969).  
212. Edlen, B. and B. Lofstrand, *J. Phys. B* **3**, 1380-88 (1970).  
213. Ekberg, J. O. and L. A. Svensson, *Physica Scripta* **2**, 283-97 (1970).  
214. Eriksson, K. B. S. and J. E. Pettersson, *Physica Scripta* **3**, 211-17 (1971).  
215. Elton, R. C., E. Hintz and M. Swartz, *Proc. Seventh Int. Conf. (1965), On Phenomena In Ionized Gases, Belgrade* (1966).  
216. Elton, R. C. and T. N. Lie, *Space Science Rev.* **13**, 747-60 (1972).  
217. Eidelsberg, M., *J. Phys. B* **5**, 1031-37 (1972).  
218. Ekberg, J. O., *Physica Scripta* **7**, 59-61 (1973).  
219. Ekberg, J. O., *Physica Scripta* **7**, 55-58 (1973).  
220. Ekberg, J. O., *Physica Scripta* **4**, 101-09 (1971).  
221. Eidelsberg, M., *J. Phys. B*, **7**, 1476-85 (1974).  
222. Ekberg, J. O., *Physica Scripta* **8**, 35-39 (1973).  
223. Ekberg, J. O., *Physica Scripta* **9**, 96-98 (1974).  
224. Eriksson, K. B. S., *Physica Scripta* **9**, 151-55 (1974).  
225. Edlen, B., *Solar Physics* **24**, 356-67 (1972).  
226. Edlen, B., *Physica Scripta* **11**, 366-70 (1975).  
227. Edlen, B. and J. W. Swensson, *Physica Scripta* **12**, 21-32 (1975).  
228. Ekberg, J. O., *Physica Scripta* **11**, 23-30 (1975).  
229. Ekberg, J. O., *Physica Scripta* **12**, 42-57 (1975).  
230. Ekberg, J. O. and L. A. Svensson, *Physica Scripta* **12**, 116-18 (1975).  
231. Ferner, E., *Ark. Mat. Astron. Fysik* **28A**, No. 4, 21 pp (1942).  
232. Feldman, U. and L. Cohen, *Astrophys. J.* **149**, 265-7 (1967).  
233. Ferner, E., *Ark. Mat. Astron. Fysik* **36A**, No. 1, 65 pp (1948).  
234. Feldman, U., L. Cohen and W. Behring, *J. Opt. Soc. Am.* **60**, 891-93 (1970).  
235. Feldman, U. and L. Cohen, *Astrophys. J.* **158**, L169-70 (1969).  
236. Flemlberg, H., *Ark. Mat. Astron. Fysik* **28A**, No. 18, 1-47 (1942).  
237. Feldman, U., L. Katz, W. Behring and L. Cohen, *J. Opt. Soc. Am.* **61**, 91-95 (1971).  
238. Fawcett, B. C., *Report ARU-R 2* (1971).  
239. Fawcett, B. C., *J. Phys. B* **4**, 1577-86 (1971).  
240. Fawcett, B. C. and R. W. Hayes, *J. Phys. B* **5**, 366-70 (1972).  
241. Fawcett, B. C., R. D. Cowan, E. Y. Kononov and R. W. Hayes, *J. Phys. B* **5**, 1255-69 (1972).  
242. Fawcett, B. C. *ARU- 4* (1972).  
243. Fowler, A. and L. J. Freeman, *Proc. Roy. Soc. [London]* **114A**, 662-89 (1927).  
244. Fawcett, B. C., *J. Phys. B* **4**, 1115-18 (1971).  
245. Fawcett, B. C., *J. Phys. B* **4**, 981-85 (1971).  
246. Freeman, L. J., *Proc. Roy. Soc. [London]* **121A**, 318-43 (1928).  
247. Freeman, L. J., *Proc. Roy. Soc. [London]* **124A**, 654-67 (1929).  
248. Fawcett, B. C., A. H. Gabriel and T. W. Paget, *J. Phys. B* **4**, 986-94 (1971).  
249. Fawcett, B. C., R. A. Hardcastle and G. Tondello, *J. Phys. B*, **3**, 564-71 (1970).  
250. Fawcett, B., *J. Phys. B* **3**, 1152-63 (1970).  
251. Fawcett, B., *J. Phys. B* **3**, 1732-41 (1970).  
252. Fawcett, B. C., B. B. Jones, and R. Wilson, *Proc. Phys. Soc.* **78**, 1223-6 (1961).  
253. Freytag, E., *Naturwiss* **46**, 314 (1959).  
254. Fawcett, B. C., A. H. Gabriel, W. G. Griffin, B. B. Jones, and R. Wilson, *Nature* **200**, 1303-4 (1963).  
255. Fawcett, B. C., A. H. Gabriel, B. B. Jones, and N. J. Peacock, *Proc. Phys. Soc.* **84**, 257-62 (1964).  
256. Fawcett, B. C. and A. H. Gabriel, *Astrophys. J.* **141**, 343-53 (1965).  
257. Fawcett, B. C. and A. H. Gabriel, *Proc. Phys. Soc.* **84**, 1038-40 (1964).  
258. Feldman, U., B. S. Fraenkel, and S. Hoory, *Astrophys. J.* **142**, 719-24 (1965).  
259. Fawcett, B. C., *Proc. Phys. Soc.* **86**, 1087-9 (1965).  
260. Fawcett, B. C. and A. H. Gabriel, *Proc. Phys. Soc.* **88**, 262-4 (1966).  
261. Feldman, U. and B. S. Fraenkel, *Astrophys. J.* **145**, 959 (1966).  
262. Fawcett, B. C. and F. E. Irons, *Proc. Phys. Soc.* **89**, 1063-4 (1966).  
263. Feldman, U., L. Cohen and M. Swartz, *J. Opt. Soc. Am.* **57**, 535-6 (1967).  
264. Feldman, U., L. Cohen and M. Swartz, *Astrophys. J.* **148**, 585-7 (1967).  
265. Feldman, U. and L. Cohen, *J. Opt. Soc. Am.* **57**, 1128-9 (1967).  
266. Fawcett, B. C., A. H. Gabriel, F. E. Irons, N. J. Peacock, and P. A. H. Saunders, *Proc. Phys. Soc.* **88**, 1051-53 (1966).  
267. Fawcett, B. C., A. H. Gabriel and P. A. H. Saunders, *Proc. Phys. Soc.* **90**, 863-7 (1967).  
268. Fritz, G. Et Al, *Astrophys. J.* **148**, L133-L140 (1967).  
269. Fawcett, B. C., D. D. Burgess and N. J. Peacock, *Proc. Phys. Soc.* **91**, 970-2 (1967).  
270. Fawcett, B. C. and N. J. Peacock, *Proc. Phys. Soc.* **91**, 973-5 (1967).  
271. Fawcett, B. C., N. J. Peacock and R. D. Cowan, *J. Phys. B* **1**, 295-306 (1968).  
272. Goldsmith, S., U. Feldman, L. Oren and L. Cohen, Private Communication (1971).  
273. Goldsmith, S., U. Feldman, L. Oren and L. Cohen, *Astrophys. J.* **174**, 209-14 (1972).  
274. Goorvitch, D. and F. P. J. Valero, *Astrophys. J.* **171**, 643-45 (1972).  
275. Goldsmith, S., L. Oren [Katz] and L. Cohen, *J. Opt. Soc. Am.* **63**, 352-58 (1973).  
276. Gabriel, A. H. and C. Jordan, *Mon. Not. Roy. Astr. Soc.* **145**, 241-48 (1969).  
277. Gabriel, A. H., *Mon. Not. Roy. Astr. Soc.* **160**, 99-119 (1972).  
278. Gabriel, A. H., W. R. S. Garton, L. Goldberg, T. J. L. Jones, C. Jordan, F. J. Morgan, R. W. Nicholls, W. J. Parkinson, H. B. J. Paxton, E. M. Reeves, C. B. Shenton, R. J. Speer, and R. Wilson, *Astrophys. J.* **169**, 595-614 (1971).  
279. Gibbs, R. C. and H. E. White, *Proc. Nat. Acad. Sci. U. S. A.* **12**, 598-601 (1926).  
280. Goldsmith, S., L. Oren, and L. Cohen, *Astrophys. J.* **188**, 197-200 (1974).  
281. Goldsmith, S., L. Oren-Katz, A. M. Crooker, and L. Cohen, *Astrophys. J.* **184**, 1021-26 (1973).  
282. Gruzdev, P. F. and A. V. Loginov, *Optics and Spectros.* **33**, 332-37 (1972).  
283. Feldman, U., G. A. Doschek, D. J. Nagel, R. D. Cowan, and R. Whitlock, *Astrophys. J.* **192**, 213-20 (1974).  
284. Goto, T., M. S. Gautam and Y. N. Joshi, *Physica* **66**, 70-78 (1973).  
285. Gilles, M., *Ann. Phys. [Paris]* **15**, 267-408 (1931).  
286. Gilroy, H. T., *Phys. Rev.* **38**, 2217-33 (1931).  
287. Glad, S., *Ark. Fys.* **7**, 7-32 (1953).  
288. Glad, S., *Ark. Fys.* **10**, 291-334 (1956).

289. Goudet, G., *J. Phys. Radium* **6**, 433-8 (1935).
290. Green, J. B. and R. J. Lang, *Proc. Nat. Acad. Sci. U. S. A.* **14**, 706-10 (1928).
292. Green, L. C., *Phys. Rev.* **55**, 1209-17 (1939).
293. Green, M., *Phys. Rev.* **60**, 117-21 (1941).
294. Gibbs, R. C. and H. E. White, *Phys. Rev.* **33**, 157-62 (1929).
295. Gabriel, A. H., B. C. Fawcett, and C. Jordan, *Proc. Phys. Soc.* **87**, 825-39 (1966).
296. Garton, W. R. S. and K. Codling, *Proc. Phys. Soc.* **86**, 1067-75 (1965).
297. Garton, W. R. S. and M. Wilson, *Proc. Phys. Soc.* **87**, 841-50 (1966).
298. Garstang, R. H., *Publ. Astronom. Soc. Pacific* **78**, 399-406 (1966).
299. Garcia-Riquelme, O., *Physica* **40**, 27-29 (1968).
300. Goldsmith, S., *J. Opt. Soc. Am.* **59**, 1678-79 (1969).
301. Garcia-Riquelme, O., *Optica Pura Y Apl.* **1**, 53-72 (1968).
302. Goldsmith, S. and B. S. Fraenkel, *Astrophys. J.* **161**, 317-20 (1970).
303. Goldsmith, S., U. Feldman, A. Crooker and L. Cohen, *J. Opt. Soc. Am.* **62**, 260-64 (1972).
304. Goldsmith, S., *J. Phys. B* **2**, 1075-79 (1969).
305. Grineva, Yu. I., V. I. Karev, V. V. Korneev, V. V. Krutov, S. L. Mandelstam, L. A. Vainstein, B. N. Vasilyev, and I. A. Zhitnik, *Solar Physics* **29**, 441-46 (1973).
306. Herzberg, G., *Proc. Roy. Soc.* **248a**, 309-32 (1958).
307. Herzberg, G. and H. R. Moore, *Canad. J. Phys.* **37**, 1293-313 (1959).
308. Herzberg, G., *Rep. of Commission on Wavelengths and Tables of Spectra*, In *Trans. Int. Astronom. Union* **11A**, 97-117 (1962).
309. Garcia, J. D. and J. E. Mack, *J. Opt. Soc. Amer.* **55**, 654-85 (1965).
310. Gabriel, A. H., B. C. Fawcett, and C. Jordan, *Nature* **206**, 390-2 (1965).
311. Gabriel, A. H. and B. C. Fawcett, *Nature* **206**, 808-9 (1965).
312. Gluck, G. G., Y. Bordarier, J. Bauche, and T. A. M. Van Kleef, *Physica* **30**, 2068-104 (1964).
313. Hallin, R., *Ark. Fys.* **31**, 511-26 (1966).
314. Hetzler, C. W., R. W. Boreman, and K. Burns, *Phys. Rev.* **48**, 656-9 (1935).
315. Hoory, S., S. Goldsmith, B. S. Fraenkel and V. Feldman, *Astrophys. J.* **160**, 781-84 (1970).
316. House, L. L. and G. A. Sawyer, *Astrophys. J.* **139**, 775-6 (1964).
317. Hinteregger, H. E., L. A. Hall, and W. Schweizer, *Astrophys. J.* **140**, 319-27 (1964).
318. Iglesias, L., *An. Real Soc. Espan. Fis. Quim.* **50A**, 135-44 (1954).
319. Iglesias, L., *An. Real Soc. Espan. Fis. Quim.* **53A**, 249-52 (1957).
320. Iglesias, L., *J. Opt. Soc. Am.* **45**, 856-61 (1955).
321. Iglesias, L., *J. Opt. Soc. Am.* **47**, 852-57 (1957).
322. Ingram, S. B., *Phys. Rev.* **32**, 172-8 (1928).
323. Ingram, S. B., *Phys. Rev.* **33**, 907-13 (1929).
324. Iglesias, L., *An. Real Soc. Espan. Fis. Quim.* **58A**, 191-222 (1962).
325. Iglesias, L., *Optica Pura Y Apl.* **2**, 132-45 (1969).
326. Iglesias, L., *An. Real Soc. Espan. Fis. Quim.* **60A**, 147-52 (1964).
327. Iglesias, L., *Canad. J. Phys.* **44**, 895-915 (1966).
328. Iglesias, L. and R. Velasco, *Publ. No. 23, Instituto De Optica Daza De Valdes De Madrid* (1964).
329. Iglesias, L., *J. Res. Nat. Bur. Stand.* **70A**, 465-66 (1966).
330. Johansson, L., *Physica Scripta* **10**, 236-40 (1974).
331. Johns, M. W., *Canad. J. Res.* **15a**, 193-201 (1937).
332. Johansson, L., *Ark. Fys.* **20**, 489-98 (1961).
333. Johansson, L., *Ark. Fys.* **23**, 119-28 (1962).
334. Kamiyama, M., *Sci. Papers Inst. Phys. Chem. Res. [Tokyo]* **36**, 375-84 (1939).
335. Kayser, H. and R. Ritschl, *Tabelle Der Hauptlinien Der Linienspektren Aller Elemente* [Julius Springer, Berlin, 1939].
336. Kebler, R. W., W. W. McCormick, and R. A. Sawyer, *J. Opt. Soc. Am.* **44**, 270 (1954).
337. Keussler, V., *Z. Physik* **84**, 42-55 (1933).
338. Keussler, V., *Z. Physik* **85**, 1-3 (1933).
339. Kiess, C. C., *J. Res. Nat. Bur. Stand.* **21**, 185-205 (1938).
340. Kiess, C. C., *J. Res. Nat. Bur. Stand.* **47**, 385-426 (1951).
341. Kiess, C. C., *J. Res. Nat. Bur. Stand.* **51**, 247-305 (1953).
342. Kiess, C. C., *J. Res. Nat. Bur. Stand.* **56**, 167-77 (1956).
343. Kiess, C. C., *J. Res. Nat. Bur. Stand.* **60**, 375-422 (1958).
344. Kiess, C. C., Unpublished Data (1958).
345. Kiess, C. C. and T. L. De Bruin, *J. Res. Nat. Bur. Stand.* **23**, 443-70 (1939).
346. Kiess, C. C. and H. K. Kiess, *J. Res. Nat. Bur. Stand.* **5**, 1205-41 (1930).
347. Kiess, C. C. and R. J. Lang, *J. Res. Nat. Bur. Stand.* **5**, 305-24 (1930).
348. Klinkenberg, P. F. A., *Physica* **16**, 618-50 (1950).
349. Klinkenberg, P. F. A. and R. J. Lang, *Physica* **15**, 774-88 (1949).
350. Klinkenberg, P. F. A., W. F. Meggers, R. Velasco and M. A. Catalan, *J. Res. Nat. Bur. Stand.* **59**, 319-48 (1957).
351. Krishnamurty, S. G., *Indian J. Phys.* **10**, 83-90 (1936).
352. Krishnamurty, S. G., *Indian J. Phys.* **10**, 365-73 (1936).
353. Krishnamurty, S. G., *Proc. Roy. Soc. [London]* **151**, 178-187 (1936), CI [Te III].
354. Krishnamurty, S. G. and K. R. Rao, *Proc. Roy. Soc. [London]* **149A**, 56-70 (1935).
355. Kruger, P. G., *Phys. Rev.* **36**, 855-9 (1930).
356. Kruger, P. G. and F. S. Cooper, *Phys. Rev.* **44**, 826-30 (1933).
357. Kruger, P. G. and H. T. Gilroy, *Phys. Rev.* **48**, 720-1 (1935).
358. Kruger, P. G. and H. S. Pattin, *Phys. Rev.* **52**, 621-5 (1937).
359. Kruger, P. G. and L. W. Phillips, *Phys. Rev.* **51**, 1087-9 (1937).
360. Kruger, P. G. and L. W. Phillips, *Phys. Rev.* **52**, 97-9 (1937).
361. Kruger, P. G. and L. W. Phillips, *Phys. Rev.* **55**, 352-7 (1939).
362. Kruger, P. G. and W. E. Shoupp, *Phys. Rev.* **44**, 105-8 (1933).
363. Kruger, P. G. and W. E. Shoupp, *Phys. Rev.* **46**, 124-9 (1934).
364. Kruger, P. G. and S. G. Weissberg, *Phys. Rev.* **48**, 659-63 (1935).
365. Kruger, P. G. and S. G. Weissberg, *Phys. Rev.* **52**, 314-17 (1937).
366. Kruger, P. G., S. G. Weissberg, and L. W. Phillips, *Phys. Rev.* **51**, 1090-1 (1937).
367. Kaporiski, L. N., F. Z. Pedos, N. S. Sventitskii, and Z. I. Shlep-kova, *Bull. Acad. Sci. U. S. S. R., Phys. Ser.* **26**, 975-7 (July, 1962).
368. Kaufman, V. and K. L. Andrew, *J. Opt. Soc. Am.* **52**, 1223-37 (1962).
369. Kiess, C. C. and C. H. Corliss, *J. Res. Nat. Bur. Stand.* **63A**, 1-18 (1959).
370. Kaufman, V., L. J. Radziemski, and K. L. Andrew, *J. Opt. Soc. Am.* **56**, 911-15 (1966).
371. Kaufman, V. and J. F. Ward, *J. Opt. Soc. Am.* **56**, 1591-97 (1966).
372. Kononov, E. Ya., *Optics and Spectros.* **20**, 283-4 (1966).
373. Kelly, R. L. and R. G. Booth, *J. Opt. Soc. Am.* **56**, 1639 (1966).
374. Kelly, R. L. and L. C. Gapenski, Unpublished (1970).
375. Kelly, R. L., Unpublished Work Prepared For This Report.
376. Kaufman, V. and J. F. Ward, *Appl. Optics* **6**, 43-6 (1967).
377. Kononov, E. Ya., *Optics and Spectros.* **23**, 90-91 (1967).
378. Kiess, C. C., V. C. Rubin, and C. E. Moore, *J. Res. Nat. Bur. Stand.* **65A**, 1-29 (1961).
379. Kaufman, V., Unpublished Information (1969).
380. Kononov, E. Y. and K. N. Koshelev, *Optics and Spectros.* **29**, 115-16 (1970).
381. Kononov, E. Y., K. N. Koshelev and A. N. Ryabtsev, *Optics and Spectros.* **30**, 534-36 (1971).
382. Kaufman, V. and L. Minnhagen, *J. Opt. Soc. Am.* **62**, 92-95 (1972).
383. Kernahan, J. A., A. Denis and R. Drouin, *Physica Scripta* **4**, 49-51 (1971).
384. Kasyanov, Y. S., E. Y. Kononov, V. V. Korobkin, K. N. Koshelev, A. N. Ryabtsev, R. V. Serov, and E. V. Skokan, *Optics and Spectros.* **36**, 4-6 (1974).

385. Kaufman, V., M. C. Artru, and W. U. L. Brillet, *J. Opt. Soc. Am.* **64**, 197-201 (1974).
386. Kononov, E. Ya., K. N. Koshelev, and L. I. Podobedova, *Optics and Spectros.* **37**, 1-3 (1974).
387. Kononov, E. Ya., K. N. Koshelev, L. I. Podobedova, and S. S. Churilov, *Optics and Spectros.* **39**, 458-60 (1975).
388. Kovalev, V. I., A. A. Ramonas, and A. N. Ryabtsev, *Liet. Fiz. Rinkings* **15**, 915-27 (1975).
389. Kaufman, V. and B. Edlen, *J. Phys. Chem. Ref. Data* **3**, 825-95 (1974).
390. Kastner, S. O., W. M. Neupert, and M. Swartz, *Astrophys. J.* **191**, 261-70 (1974).
391. Knystautas, E. J. and R. Drouin, *J. Phys. B*, **8**, 2001-6 (1975).
392. Kernahan, J. A., E. H. Pinnington, A. E. Livingston, and D. J. G. Irwin, *Physica Scripta* **12**, 319-22 (1975).
393. Kononov, E. Ya., K. N. Koshelev, L. I. Podobedova, S. V. Chekalin, and S. S. Churilov, *J. Phys. B* **9**, 565-72 (1976).
394. Kononov, E. Ya., K. N. Koshelev, L. I. Podobedova, and S. S. Churilov, *Optics and Spectros.* **40**, 121-23 (1976).
395. Kastner, S. O., W. E. Behring, and L. Cohen, *Astrophys. J.* **199**, 777-80 (1975).
396. Kononov, E. Ya., V. I. Kovalev, A. N. Ryabtsev, and S. S. Churilov, *Soviet J. Quantum Electr.* **4**, 190-93 (1977).
397. Kovalev, V. I., A. A. Ramonas, and A. N. Ryabtsev, *Optics and Spectros.* **43**, 4-7 (1977).
398. Knystautas, E. J. and R. Drouin, *Nucl. Instrum. Meth.* **110**, 95-97 (1973).
399. Lacroute, P., *Ann. Astrophys.* **2**, 318-26 (1939).
400. Lacroute, P., *Ann. Phys. [Paris]* (11) **3**, 5-96 (1935).
401. Lacroute, P., *J. Phys. Radium* **9**, 180-4 (1928).
402. Lang, R. J., *Phys. Rev.* **30**, 762-9 (1927).
403. Lang, R. J., *Phys. Rev.* **31**, 773-5 (1928).
404. Lang, R. J., *Phys. Rev.* **32**, 737-45 (1928).
405. Lang, R. J., *Phys. Rev.* **33**, 547-8 (1929).
406. Lang, R. J., *Phys. Rev.* **34**, 697-711 (1929).
407. Lang, R. J., *Phys. Rev.* **35**, 445-51 (1930).
408. Lang, R. J., *Proc. Nat. Acad. Sci.* **13**, 341-6 (1927).
409. Lang, R. J., *Proc. Nat. Acad. Sci.* **14**, 32-6 (1928).
410. Lang, R. J., *Proc. Nat. Acad. Sci.* **15**, 414-8 (1929).
411. Lang, R. J., *Trans. Roy. Soc. [London]* **224A**, 371-419 (1924).
412. Lang, R. J., In *Verhandelingen, Peter Zeeman, Pub. By Martinus Nyhoff, May, 1935*.
413. Lang, R. J. and R. A. Sawyer, *Z. Physik* **71**, 453-9 (1931).
414. Lang, R. J. and E. H. Vestige, *Phys. Rev.* **42**, 233-41 (1932).
415. Laporte, O., *Nature* **121**, 1021 (1928).
416. Laporte, O. and R. J. Lang, *Phys. Rev.* **30**, 378-86 (1927).
417. Laporte, O., G. R. Miller, and R. A. Sawyer, *Phys. Rev.* **38**, 843-53 (1931).
418. Laporte, O., G. R. Miller, and R. A. Sawyer, *Phys. Rev.* **39**, 458-66 (1932).
419. Laun, D. D., *J. Res. Nat. Bur. Stand.* **21**, 207-24 (1938).
420. Liden, K., *Ark. Fys.* **1**, 229-67 (1949).
421. Livingood, J. J., *Phys. Rev.* **34**, 185-98 (1929).
422. Lyman, T., *Astrophys. J.* **60**, 1-14 (1924).
423. Lyman, T. and F. A. Saunders, *Proc. Nat. Acad. Sci.* **12**, 92-6 (1926).
424. Laun, D. D., *J. Res. Nat. Bur. Stand.* **68a**, 207-52 (1964).
425. Li, H. and K. L. Andrew, *J. Opt. Soc. Am.* **61**, 96-109 (1971).
426. Lundstrom, T., *Physica Scripta* **7**, 62-64 (1973).
427. Lundstrom, T. and L. Minnhagen, *Physica Scripta* **5**, 243-48 (1972).
428. Lofstrand, B., *Physica Scripta* **8**, 57-61 (1973).
429. Lie, T. N. and R. C. Elton, *Phys. Rev. A* **3**, 865-71 (1971).
430. Livingston, A. E., *J. Phys. B*, **9**, L215-L217 (1976).
431. Li, H., *J. Opt. Soc. Am.* **62**, 1483-88 (1972).
432. Fawcett, B. C. and H. F. Henrichs, *Astron. Astrophys. Suppl.* **18**, 157-67 (1974).
433. Henrichs, H. F. and B. C. Fawcett, *Astron. Astrophys. Suppl.* **23**, 139-46 (1976).
434. Nicolosi, P. and G. Tondello, *J. Opt. Soc. Am.* **67**, 1033-39 (1977).
435. Brown, C. M., S. G. Tilford, and M. L. Ginter, *J. Opt. Soc. Am.* **67**, 584-606 (1977).
436. Cohen, L., U. Feldman, and G. A. Doschek, *Astrophys. J. Suppl. Astrophys. J. Suppl. Ser.* **37**, 393-405 (1978).
437. Dere, K. P. *Astrophys. J.* **221**, 1062-67 (1978).
438. Doschek, G. A., U. Feldman, K. P. Dere, G. D. Sandlin, M. E. Van Hoosier, G. E. Brueckner, J. D. Purcell, and R. Tousey, *Astrophys. J.* **196**, L83-86 (1975).
439. Doschek, G. A., U. Feldman, M. E. Van Hoosier, and J. D. F. Bartoe, *Astrophys. J. Suppl.* **31**, 417-43 (1976).
440. Kastner, S. O., A. M. Crooker, W. E. Behring, and L. Cohen, *Phys. Rev A* **16**, 577-82 (1977).
441. Moore, C. E., C. M. Brown, G. D. Sandlin, S. G. Tilford, and R. Tousey, *Astrophys. J. Suppl.* **33**, 393-414 (1977).
442. Sandlin, G. D., G. E. Brueckner, and R. Tousey, *Astrophys. J.* **214**, 898-904 (1977).
443. Widing, K. G., *Astrophys. J.* **197**, L33-35 (1975).
444. Widing, K. G. and J. D. Purcell, *Astrophys. J.* **204**, L151-53 (1976).
445. Moore, C. E., R. Tousey, G. D. Sandlin, C. M. Brown, M. L. Ginter, and S. G. Tilford, *Astrophys. and Space Sci.* **38**, 359-64 (1975).
446. Ivanov, L. N., E. P. Ivanova, and U. I. Safronova, *J. Quant. Spectro. Radiat. Transfer* **15**, 553-59 (1975).
447. Hutcheon, R. J., J. P. Pye, and K. D. Evans, *Mon. Not. Roy. Astr. Soc.* **175**, 489-99 (1976).
448. McCormick, W. W. and R. A. Sawyer, *Phys. Rev.* **54**, 71-5 (1938).
449. McLay, A. B. and M. F. Crawford, *Phys. Rev.* **44**, 986-96 (1933).
450. McLennan, J. C. and A. B. McLay, *Proc. Roy. Soc. [London]* **134A**, 35-41 (1931).
451. McLennan, J. C., A. B. McLay, and M. F. Crawford, *Proc. Roy. Soc. [London]* **125A**, 50-3 (1929).
452. McLennan, J. C., A. B. McLay, and M. F. Crawford, *Proc. Roy. Soc. [London]* **134A**, 41-7 (1931).
453. McLennan, J. C., A. B. McLay, and M. F. Crawford, *Trans. Roy. Soc. Canada* **22** [3], Sec. III, 247-51 (1928).
454. McLennan, J. C. and W. W. Shaver, *Trans. Roy. Soc. Canada* **18** [3], Sec. III, 1-22 (1924).
455. McLennan, J. C. and J. F. T. Young, *Phil. Mag.* **36**, 450-61 (1918).
456. McLennan, J. C., J. F. T. Young, and H. J. C. Ireton, *Proc. Roy. Soc. [London]* **98A**, 95-108 (1920).
457. Martin, W. C. and V. Kaufman, *J. Res. Nat. Bur. Stand.* **74A**, 11-22 (1970).
458. Mc Cavert, P. and M. R. H. Rudge, *J. Phys. B* **5**, 832-37 (1972).
459. Minnhagen, L., *J. Opt. Soc. Am.* **66**, 659-67 (1976).
460. Carroll, P. K., R. E. Huffman, J. C. Larrabee, and Y. Tanaka, *Astrophys. J.* **146**, 553-57 (1966).
461. Hutcheon, R. J., J. P. Pye, and K. D. Evans, *Solar Physics* **46**, 171-77 (1976).
462. Kastner, S. O., W. M. Neupert, and M. Swartz, *Solar Physics* **43**, 111-15 (1975).
463. Firth, J. G., F. F. Freeman, A. H. Gabriel, B. B. Jones, C. Jordan, C. R. Negus, D. B. Shenton, and R. F. Turner, *Mon. Not. Roy. Astr. Soc.* **166**, 543-60 (1974).
464. Parkinson, J. H., *Solar Physics* **42**, 183-207 (1975).
465. Mack, J. E., *Phys. Rev.* **38**, 193-4 (1931).
466. Mack, J. E. and M. Fromer, *Phys. Rev.* **48**, 357-66 (1935).
467. Mack, J. E., O. Laporte, and R. J. Lang, *Phys. Rev.* **31**, 748-72 (1928).
468. Martin, D. C., *Phys. Rev.* **48**, 938-44 (1935).
469. Martin, W. C., *Univ. Microfilms [Ann Arbor, Mich.] Publ. No.* 20133, 126 pp., Dissertation. Princeton Univ. (June 1956).
470. Mazumder, K. C., *Indian J. Phys.* **10**, 171-87 (1936).
471. Mazumder, K. C., *Indian J. Phys.* **17**, 229-38 (1943).
472. Mazumder, K. C., *Trans. Bose Res. Inst. Calcutta* **10**, 181-207 (1934-5).
473. Meggers, W. F., *J. Res. Nat. Bur. Stand.* **24**, 153-73 (1940).

474. Meggers, W. F. and T. L. Debruin, *J. Res. Nat. Bur. Stand.* **3**, 765-81 (1929).
475. Meggers, W. F., T. L. Debruin, and C. J. Humphreys, *J. Res. Nat. Bur. Stand.* **3**, 129-62 (1929).
476. Meggers, W. F., T. L. Debruin, and C. J. Humphreys, *J. Res. Nat. Bur. Stand.* **3**, 731-63 (1929).
477. Meggers, W. F. and C. J. Humphreys, *J. Res. Nat. Bur. Stand.* **28**, 463-78 (1942).
478. Meggers, W. F. and C. E. Moore, *J. Res. Nat. Bur. Stand.* **25**, 83-132 (1940).
479. Meggers, W. F. and B. F. Scribner, *J. Res. Nat. Bur. Stand.* **13**, 625-57 (1934).
480. Meggers, W. F., A. G. Shenstone, and C. E. Moore, *J. Res. Nat. Bur. Stand.* **45**, 346-56 (1950).
481. Mendlowitz, H., *Astrophys. J.* **158**, 385-88 (1969).
482. Meenzies, A. C., *Proc. Roy. Soc. [London]* **122A**, 134-43 (1929).
483. Meekins, J. F. Et Al, *Science* **162**, 891-95 (1968).
484. Millikan, R. A. and I. S. Bowen, *Phys. Rev.* **23**, 1-34 (1924).
485. Millikan, R. A. and I. S. Bowen, *Phys. Rev.* **25**, 600-5 (1925).
486. Molnar, J. P. and W. J. Hitchcock, *J. Opt. Soc. Am.* **30**, 523-35 (1940).
487. Moore, C. E., *U. S. Nat. Bur. Stand., Circ.* 467. *Atomic Energy Levels. Vol. I*, 309 pp (1949), *Vol. II*, 227 pp (1952), *Vol. III*, 245 pp (1958).
488. Moore, C. E., *U. S. Nat. Bur. Stand., Circ.* 488. *Sec. I*, 78 pp (1950), *Sec. II*, 115 pp (1952).
489. Moore, C. E., *Phys. Rev.* **55**, 710-13 (1939).
490. Moore, F. L., Jr., Thesis, Princeton 1949, Univ. Microfilms Publ. No. 10, **972**, 172 pp [Ann Arbor, Mich.].
491. More, K. R. and C. A. Rieke, *Phys. Rev.* **50**, 1054-6 (1936).
492. Morell, L., Thesis, Cornell (1928).
493. Murakawa, K., *Proc. Phys. Math. Soc. Japan* **17**, 14-33 (1935).
494. Murakawa, K., *Z. Physik* **109**, 162-74 (1938).
495. Murakawa, K. and S. Suma, *Reports Inst. Sci. Tech. Tokyo Univ.* **1**, 121-4 (1947).
496. Martin, W. C., *J. Opt. Soc. Am.* **49**, 1071-85 (1959).
497. Martin, W. C., *J. Res. Nat. Bur. Stand.* **64A**, 19-28 (1960).
498. Martin, W. C. and C. H. Corliss, *J. Res. Nat. Bur. Stand.* **64A**, 443-79 (1960).
499. Meggers, W. F., M. A. Catalan, and M. Sales, *J. Res. Nat. Bur. Stand.* **61**, 441-61 (1958).
500. Meissner, K. W., R. D. Vanveld, and P. G. Wilkinson, *J. Opt. Soc. Am.* **48**, 1001-06 (1958).
501. Minnhagen, L., *Ark. Fys.* **14**, 483-95 (1958).
502. Minnhagen, L., *Ark. Fys.* **18**, 97-132 (1960).
503. Minnhagen, L., *Ark. Fys.* **21**, 415-78 (1962).
504. Moore, C. E., *NSRDS-NBS 3*, Section 1 (1965).
505. Madden, R. P. and K. Codling, *J. Opt. Soc. Amer.* **54**, 268-9 (1964).
506. Minnhagen, L., *Ark. Fys.* **25**, 203-84 (1964).
507. Moore, C. E., *NSRDS-NBS 3*, Section 2 (1967).
508. Michels, D. J., Ph. D. Thesis, Univ. of Wisconsin (1970).
509. Minnhagen, L., H. Strihed and B. Petersson, *Ark. Fys.* **39**, 471-93 (1969).
510. Moore, C. E., *NSRDS-NBS 3*, Section 3 (1970).
511. Moore, C. E., *NSRDS-NBS 3*, Section 4 (1971).
512. Minnhagen, L., *J. Opt. Soc. Am.* **61**, 1257-62 (1971).
513. Mansfield, M. W. D. and J. P. Connerade, *Astrophys. J.* **171**, 391-92 (1972).
514. Manson, J. E., *Astrophys. J.* **147**, 703-10 (1967).
515. Manson, J. E., *Appl. Optics* **12**, 1394-96 (1973).
516. Minnhagen, L. and H. Nietsche, *Physica Scripta* **5**, 237-42 (1972).
517. Minnhagen, L., *J. Opt. Soc. Am.* **63**, 1185-98 (1973).
518. Malinovsky, M. and L. Heroux, *Astrophys. J.* **181**, 1009-30 (1973).
519. Mehlman, G. and J. M. Esteva, *Astrophys. J.* **188**, 191-95 (1974).
520. Mewe, R., *Space Sci. Rev.* **13**, 666-67 (1972).
521. Moore, C. E., *NSRDS-NBS 3*, Section 5 (1975).
522. Moore, C. E., *NSRDS-NBS 3*, Section 6 (1972).
523. Moore, C. E., *NSRDS-NBS 3*, Section 7 (1975).
524. Magnusson, C. E. and P. O. Zetterberg, *Physica Scripta* **10**, 177-82 (1974).
525. Minnhagen, L., *Physica Scripta* **11**, 38-42 (1975).
526. Narayan, A. L. and K. R. Rao, *Z. Physik* **45**, 350-63 (1927).
527. Naude, S. M., *Ann. Phys. [Paris]* [5] **3**, 1-26 (1929).
528. Neupert, W. M., *Ann. Astrophys.* **28**, No. 2, 446-56 (1965).
529. Neupert, W. M., W. Gates, M. Swartz and R. Young, *Astrophys. J.* **149**, L79-L83 (1967).
530. Olthoff, J. and R. A. Sawyer, *Phys. Rev.* **42**, 766-76 (1932).
531. Olme, A., *Ark. Fys.* **40**, 35-47 (1969).
532. Olme, A., *Physica Scripta*, **1**, 256-60 (1970).
533. Pihl, J., R. Sjodin, R. Hallin, J. Lindskog, A. Marelus, and K. Sharma, *Report TLU 45/76*, Tandem Accel. Lab., Univ. of Uppsala (1976).
534. Trabert, E., P. H. Heckmann, H. V. Buttler, and K. Brand, *Z. Physik A279*, 127-33 (1976).
535. Parker, W. L. and L. W. Phillips, *Phys. Rev.* **57**, 140-1 (1940).
536. Perevertun, V. M. and S. M. Mukhtarov, *Optics and Spectros.* **26**, 50-51 (1969).
537. Palenius, H. P., *Physica Scripta* **1**, 113-35 (1970).
538. Palenius, H. P., *Ark. Fys.* **39**, 15-64 (1968).
539. Palenius, H. P., *Ark. Fys.* **39**, 425-27 (1969).
540. Paschen, F. and P. G. Kruger, *Ann. Phys. [Leipzig]* **7**, 1-8 (1930).
541. Paschen, F. and P. G. Kruger, *Ann. Phys. [Leipzig]* **8**, 1005-16 (1931).
542. Pattabhiramiah, P. and A. S. Rao, *Indian J. Phys.* **3**, 437-44 (1928).
543. Pattabhiramayya, P. and A. S. Rao, *Indian J. Phys.* **5**, 407-16 (1930).
544. Paul, F. W. and H. D. Polster, *Phys. Rev.* **59**, 424-30 (1941).
545. Paul, F. W. and W. A. Rense, *Phys. Rev.* **56**, 1110-13 (1939).
546. Phillips, L. W., *Phys. Rev.* **53**, 248-9 (1938).
547. Phillips, L. W., *Phys. Rev.* **55**, 708-9 (1939).
548. Phillips, L. W. and P. G. Kruger, *Phys. Rev.* **54**, 839-41 (1938).
549. Phillips, L. W. and W. L. Parker, *Phys. Rev.* **60**, 301-7 (1941).
550. Platt, J. R. and R. A. Sawyer, *Phys. Rev.* **60**, 866-76 (1941).
551. Pecker, C., *C. R. Acad. Sci. [Paris]* **250**, 3779-81 (1960).
552. Pottasch, S. R., *Astrophys. J.* **137**, 945-66 (1963).
553. Plato, M., *Z. Naturforsch.* **19A**, 1324-7 (1964).
554. Petersson, B., *Ark. Fys.* **27**, 317-9 (1964).
555. Peacock, N. J., *Proc. Phys. Soc.* **84**, 803-5 (1964).
556. Palenius, H. P., *Ark. Fys.* **34**, 571-2 (1967).
557. Poppe, R., *Physica* **40**, 17-26 (1968).
558. Persson, W., *J. Opt. Soc. Am.* **59**, 285-87 (1969).
559. Peacock, N. J., R. J. Speer and M. G. Hobby, *J. Phys. B*, **2**, 798-810 (1969).
560. Pinnington, E. H., B. Curnutte and M. Dufay, *J. Opt. Soc. Am.* **61**, 978-80 (1971).
561. Podobedova, L. I., E. Y. Kononov and K. N. Koshelev, *Optics and Spectros.* **30**, 217-20 (1971).
562. Palenius, H. P., *Univ. of Lund [Sweden] Report* (May 1971).
563. Persson, W., *Physica Scripta* **3**, 133-55 (1971).
564. Purcell, J. D. and K. G. Widing, *Astrophys. J.* **176**, 239-47 (1972).
565. Poulizac, M. C. and J. P. Buchet, *Physica Scripta* **4**, 191-94 (1971).
566. Ram, M., *Indian J. Phys.* **8**, 151-61 (1933).
567. Ram, M., *Indian J. Phys.* **8**, 163-70 (1933).
568. Ramanadham, R. and K. R. Rao, *Indian J. Phys.* **18**, 317-22 (1944).
569. Rasmussen, E., *Z. Physik* **83**, 404-11 (1933).
570. Rasmussen, E., *Z. Physik* **86**, 24-32 (1933).
571. Rao, A. S., *Indian J. Phys.* **7**, 561-84 (1932).
572. Rao, A. S., *Proc. Phys. Soc. [London]* **44**, 343-8 (1932).
573. Rao, A. S., *Proc. Phys. Soc. [London]* **44**, 594-607 (1932).
574. Rao, A. S. and S. G. Krishnamurty, *Proc. Phys. Soc. [London]* **46**, 531-6 (1934).

575. Rao, A. S. and A. L. Narayan, *Z. Physik* **57**, 865-8 (1929).  
 576. Rao, A. S. and A. L. Narayan, *Z. Physik* **59**, 687-9 (1930).  
 577. Rao, A. S. and K. R. Rao, *Proc. Phys. Soc. [London]* **46**, 163-8 (1934).  
 578. Rao, B. V. R., *Proc. Indian Acad. Sci.* **1A**, 28-33 (1934).  
 579. Rao, K. R., *Proc. Phys. Soc. [London]* **39**, 161-8 (1927).  
 580. Rao, K. R., *Proc. Phys. Soc. [London]* **43**, 68-71 (1931).  
 581. Rao, K. R., *Proc. Roy. Soc. [London]* **124A**, 465-77 (1929).  
 582. Rao, K. R., *Proc. Roy. Soc. [London]* **125A**, 238-46 (1929).  
 583. Rao, K. R., *Proc. Roy. Soc. [London]* **133A**, 220-8 (1931).  
 584. Rao, K. R., *Proc. Roy. Soc. [London]* **134A**, 604-13 (1932).  
 585. Rao, K. R. and J. S. Badami, *Proc. Roy. Soc. [London]* **131A**, 154-69 (1931).  
 586. Rao, K. R. and S. G. Krishnamurty, *Proc. Roy. Soc. [London]* **161A**, 38-48 (1937).  
 587. Rao, K. R. and S. G. K. Murti, *Proc. Roy. Soc. [London]* **145A**, 681-94 (1934).  
 588. Rao, K. R. and S. G. K. Murti, *Proc. Roy. Soc. [London]* **145A**, 694-8 (1934).  
 589. Rao, K. R. and A. L. Narayan, *Proc. Roy. Soc. [London]* **119A**, 607-27 (1928).  
 590. Rao, K. R., A. L. Narayan, and A. S. Rao, *Indian J. Phys.* **2**, 477-83 (1928).  
 591. Rico, F. R., *An. Real Soc. Espan. Fis. Quim.* **53A**, 185-200 (1957).  
 592. Risberg, P., *Ark. Fys.* **9**, 483-94 (1955).  
 593. Ridgeley, A. and W. M. Burton, *Solar Physics* **27**, 280-85 (1972).  
 594. Robinson, H. A., *Phys. Rev.* **49**, 297-305 (1936).  
 595. Robinson, H. A., *Phys. Rev.* **50**, 99 (1936).  
 596. Robinson, H. A., *Phys. Rev.* **51**, 14-18 (1937).  
 597. Robinson, H. A., *Phys. Rev.* **51**, 726-35 (1937).  
 598. Robinson, H. A., *Phys. Rev.* **52**, 724-5 (1937).  
 599. Ruedy, J. E., *Phys. Rev.* **44**, 757-60 (1933).  
 600. Ruedy, J. E. and R. C. Gibbs, *Phys. Rev.* **46**, 880-8 (1934).  
 601. Russell, H. N., *Astrophys. J.* **66**, 283-328 (1927).  
 602. Russell, H. N., *Phys. Rev.* **34**, 821-57 (1929).  
 603. Russell, H. N., R. B. King, and C. E. Moore, *Phys. Rev.* **58**, 407-36 (1940).  
 604. Russell, H. N. and R. J. Lang, *Astrophys. J.* **66**, 13-42 (1927).  
 605. Russell, H. N. and C. E. Moore, *Trans. Amer. Phil. Soc.* **34**, II, 113-79 (1944).  
 606. Rao, Y. B., *Indian J. Phys.* **32**, 497-515 (1958).  
 607. Reader, J., K. W. Meissner, and K. L. Andrew, *J. Opt. Soc. Am.* **50**, 221-27 (1960).  
 608. Radziemski, L. J. and K. L. Andrew, *J. Opt. Soc. Am.* **55**, 474-91 (1965).  
 609. Rico, F. R., *An. Real Soc. Espan. Fis. Quim.* **61a**, 103-18 (1965).  
 610. Radziemski, L. J., K. L. Andrew, V. Kaufman, and U. Litzen, *J. Opt. Soc. Am.* **57**, 336-40 (1967).  
 611. Radziemski, L. J. and V. Kaufman, *J. Opt. Soc. Am.* **59**, 424-43 (1969).  
 612. Ross, C. B., Ph. D. Thesis, Purdue Univ. (1969).  
 613. Radziemski, L. J. and V. Kaufman, *J. Opt. Soc. Am.* **64**, 366-89 (1974).  
 614. Ryabtsev, A. N., *Optics and Spectros.* **39**, 239-41 (1975).  
 615. Ryabtsev, A. N., *Optics and Spectros.* **39**, 455-57 (1975).  
 616. Reader, J. and J. Sugar, *J. Phys. Chem. Ref. Data* **4**, 353-440 (1975).  
 617. Ryabtsev, A. N., Unpublished Preprint (1975).  
 618. Turechek, J. J. and H. J. Kunze, *Z. Phys.* **A273**, 111-21 (1975).  
 619. Boiko, V. A., S. A. Pikuz, U. I. Safronova, and A. Ya. Faenov, *J. Phys. B* **10**, 1253-63 (1977).  
 620. Flower, D. R. and H. Nussbaumer, *Astron. and Astrophys.* **31**, 353-60 (1974).  
 621. To, K. X., E. J. Knystautas, and R. Drouin, *Canad. J. Spectros.* **19**, 72-75 (1974).  
 622. Henrichs, H. F., *Astron. and Astrophys.* **44**, 41-44 (1975).  
 623. Aglitskii, E. V., V. A. Boiko, S. A. Pikuz, and A. Ya. Faenov, *Soviet J. Quant. Electronics* **4**, 956-62 (1975).  
 624. Aglitskii, E. V., V. A. Boiko, S. M. Zakharov, S. A. Pikuz, and A. Ya. Faenov, *Soviet J. Quant. Electronics* **4**, 500-12 (1974).  
 625. Aglitskii, E. V., V. A. Boiko, S. M. Zakharov, S. A. Pikuz, and A. Ya. Faenov, *Jetp Letters* **19**, 8-10 (1974).  
 626. Safronova, U. I., *Optics and Spectros.* **38**, 118-20 (1975).  
 627. Safronova, U. I., *J. Quant. Spectro. Radiat. Transfer* **15**, 223-29 (1975).  
 628. Moore, C. E., *NSRDS-NBS* **3**, Sect. 8 (1979).  
 629. Goldsmith, S., *J. Phys. B* **7**, 2315-19 (1974).  
 630. Kononov, E. Ya., A. N. Ryabtsev, and S. S. Churilov, *Physica Scripta* **19**, 328-34 (1979).  
 631. Vainstein, L. A. and U. I. Safronova, Preprint No. 6, Isan (1975).  
 632. Vainstein, L. A., and U. I. Safronova, Preprint No. 146, Isan (1976).  
 633. Boiko, V. A., S. A. Pikuz, A. S. Safronova, A. Ya. Faenov, P. O. Bogdanovich, G. V. Merkelis, Z. B. Rudzikas, and S. D. Shadzuvene, Preprint No. 175, Lebedev Phys. Inst. (1977).  
 634. Boiko, V. A., S. A. Pikuz, A. S. Safronova, and A. Ya. Faenov, Preprint No. 191, Lebedev Phys. Inst. (1977).  
 635. Boiko, V. A., A. Ya. Faenov, and S. A. Pikuz, *Mon. Not. Roy. Astr. Soc.* **181**, 107-20 (1977).  
 636. Peacock, N. J., M. G. Hobby, and M. Galanti, *J. Phys. B* **6**, L298-304 (1973).  
 637. King, W. H., *J. Phys. B* **10**, 3381-85 (1977).  
 638. George, S., J. E. Fredrickson, and A. W. Tucker, *Sci. of Light* **26**, 53-60 (1977).  
 639. Gautam, M. S. and Y. N. Joshi, *Canad. J. Phys.* **50**, 2059-62 (1972).  
 640. Goto, T., M. S. Gautam, and Y. N. Joshi, *Canad. J. Phys.* **51**, 1244-46 (1973).  
 641. Joshi, Y. N., T. A. M. Van Kleef, and H. Benschop, *Canad. J. Phys.* **54**, 1545-52 (1976).  
 642. Irwin, D. J. G., J. A. Kernahan, E. H. Pinnington, and A. E. Livingston, *J. Opt. Soc. Am.* **66**, 1396-1400 (1976).  
 643. Boiko, V. A., A. Ya. Faenov, and S. A. Pikuz, *J. Quant. Spectr. Radiat. Transfer* **19**, 11-50 (1978).  
 644. Boiko, V. A., A. Ya. Faenov, S. A. Pikuz, I. Yu. Skobelev, A. V. Vinogradov, and E. A. Yukov, *J. Phys. B* **10**, 3387-94 (1977).  
 645. Sales, M., *An. Real Soc. Espan. Fis. Quim.* **49A**, 15-30 (1953).  
 646. Saunders, F. A., *Proc. Nat. Acad. Sci.* 128556-60 (1926).  
 647. Saunders, F. A., *Proc. Nat. Acad. Sci.* 138596-600 (1927).  
 648. Saunders, F. A. and H. N. Russell, *Astrophys. J.* **62**, 1-7 (1925).  
 649. Saunders, F. A., E. G. Schneider, and E. Buckingham, *Proc. Nat. Acad. Sci.* **20**, 291-6 (1934).  
 650. Sawyer, R. A., *J. Opt. Soc. Am.* **13**, 431-42 (1926).  
 651. Sawyer, R. A. and C. J. Humphreys, *Phys. Rev.* **32**, 583-92 (1928).  
 652. Sawyer, R. A. and R. J. Lang, *Phys. Rev.* **34**, 712-9 (1929).  
 653. Sawyer, R. A. and F. Paschen, *Ann. Phys. [Leipzig]* **84**, 1-19 (1927).  
 654. Schauls, Sister M. R. and R. A. Sawyer, *Phys. Rev.* **58**, 781-83 (1940).  
 655. Schoepfle, G. K., *Phys. Rev.* **43**, 742-4 (1933).  
 656. Schoepfle, G. K., *Phys. Rev.* **47**, 232-4 (1935).  
 657. Schoepfle, G. K., *Phys. Rev.* **50**, 538-42 (1936).  
 658. Selwyn, E. W. H., *Proc. Phys. Soc. [London]* **41**, 392-403 (1929).  
 659. Shaver, W. W., *Trans. Roy. Soc. Canada* **18**, III, 23-34 (1924).  
 660. Shaver, W. W., *Trans. Roy. Soc. Canada* **18**, III, 145-50 (1924).  
 661. Shenstone, A. G., *J. Opt. Soc. Am.* **44**, 749-59 (1954).  
 662. Shenstone, A. G., *J. Opt. Soc. Am.* **45**, 868 (1955).  
 663. Shenstone, A. G., *Phys. Rev.* **30**, 255-65 (1927).  
 664. Shenstone, A. G., *Phys. Rev.* **31**, 30-8 (1928).  
 665. Shenstone, A. G., *Phys. Rev.* **31**, 317-22 (1928).  
 666. Shenstone, A. G., *Phys. Rev.* **36**, 669-78 (1930).  
 667. Shenstone, A. G., *Phys. Rev.* **57**, 894-8 (1940).

668. Shenstone, A. G., *Phys. Rev.* **72**, 411-4 (1947).  
669. Shenstone, A. G., *Proc. Roy. Soc. [London]* **219A**, 419-25 (1953).  
670. Shenstone, A. G., *Trans. Roy. Soc. [London]* **235A**, 195-243 (1936).  
671. Shenstone, A. G., *Trans. Roy. Soc. [London]* **237A**, 453-70 (1938).  
672. Shenstone, A. G., *Trans. Roy. Soc. [London]* **241A**, 297-322 (1948).  
673. Shenstone, A. G., *Canad. J. Phys.* **38**, 677-92 (1960).  
674. Shenstone, A. G., *J. Res. Nat. Bur. Stand.* **67A**, 87-112 (1963).  
675. Shenstone, A. G. and W. F. Meggers, *J. Res. Nat. Bur. Stand.* **61**, 373-411 (1958).  
676. Shenstone, A. G., *Proc. Roy. Soc.* **276A**, 293-307 (1963).  
677. Shenstone, A. G., Unpublished Data (1958).  
678. Shenstone, A. G., *Proc. Roy. Soc.* **261A**, 153-74 (1961).  
679. Lucatoro, T. B. and T. J. McIlrath, *Phys. Rev. Letters* **37**, 428-31 (1976).  
680. Kastner, S. O., A. K. Bhatia, and L. Cohen, *Physica Scripta* **15**, 259-67 (1977).  
681. Shenstone, A. G., Unpublished Data (1958).  
682. Shenstone, A. G., Unpublished Data (1958).  
683. Shenstone, A. G. and J. T. Pittenger, *J. Opt. Soc. Am.* **39**, 219-25 (1949).  
684. Shenstone, A. G. and L. Wilets, *Phys. Rev.* **83**, 104-8 (1951).  
685. Smith, S., *Nature* **127**, 855 (1931).  
686. Smith, S., *Phys. Rev.* **34**, 393-9 (1929).  
687. Smith, S., *Phys. Rev.* **36**, 1-4 (1930).  
688. Smith, S., *Proc. Nat. Acad. Sci.* **13**, 65-7 (1927).  
689. Smith, S., *Proc. Nat. Acad. Sci.* **14**, 878-9 (1928).  
690. Smith, S. and R. J. Lang, *Phys. Rev.* **28**, 36-45 (1926).  
691. Soderqvist, J., *Ark. Mat. Astron. Fysik* **30a**, No. 11, 1-20 (1944).  
692. Soderqvist, J., *Ark. Mat. Astron. Fysik* **32a**, No. 19, 1-33 (1946).  
693. Soderqvist, J., *Nova Acta Reg. Soc. Sci. Uppsala* **9**, No. 7, 102 pp (1934).  
694. Sommer, L. A., *Z. Physik* **39**, 711-50 (1926).  
695. Sporer, H., *Proc. Nat. Acad. Sci. U. S. A.* **13**, 100-4 (1927).  
696. Subbaraya, T. S., *Proc. Indian Acad. Sci.* **1a**, 39-43 (1934).  
697. Subbaraya, T. S., *Proc. Indian Acad. Sci.* **2a**, 113-18 (1935).  
698. Subbaraya, T. S., *Z. Physik* **78**, 541-54 (1932).  
699. Symons, A. S. M. and J. Daley, *Proc. Phys. Soc. [London]* **41**, 431-41 (1929).  
700. Sancho, F. J., *An. Real Soc. Espan. Fis. Quim.* **54A**, 41-64 (1958).  
701. Sugar, J., *J. Opt. Soc. Amer.* **55**, 33-58 (1965).  
702. Sugar, J., *J. Opt. Soc. Amer.* **55**, 1058-61 (1965).  
703. Suga, T., *Sci. Papers, Inst. of Phys. and Chem. Rsch., Tokyo* **34**, 7-31 (1937).  
704. Schubert, K. E. and R. D. Hudson, *Aerospace Corp. Report No. Atn-64 [9233]-2*, (1963).  
705. Sugar, J. and V. Kaufman, *J. Opt. Soc. Am.* **55**, 1283-5 (1965).  
706. Stockhausen, R., *Astrophys. J.* **141**, 277-81 (1965).  
707. Schonheit, E., *Optik* **23**, 409-35 (1966).  
708. Swensson, J. W. and G. Risberg, *Ark. Fys.* **31**, 237-54 (1966).  
709. Sawyer, G. A., F. C. Jahoda, F. L. Ribe and T. F. Stratton, *J. Quant. Spectro. Radiat. Transfer* **2**, 467-75 (1962).  
710. Sulmont, M. C. and P. Felenbok, *Ann. Astrophys.* **30**, 315-40 (1967).  
711. Svensson, L. A. and J. O. Ekberg, *Ark. Fys.* **37**, 65-84 (1968).  
712. Soroka, V. A., I. M. Kustanovich and L. S. Polak, *Optics and Spectros.* **27**, 276 (1969).  
713. Schroder, J. F. and T. A. M. Van Kleef, *Physica* **49**, 388-410 (1970).  
714. Svensson, L. A. and J. O. Ekberg, *Ark. Fys.* **40**, 145-64 (1969).  
715. Svensson, L. A., *Physica Scripta*, **1**, 2461 (1970).  
716. Swartz, M., S. Kastner, E. Rothe and W. Neupert, *J. Phys. B* **4**, 1747-68 (1971).  
717. Svensson, L. A., *Solar Physics* **18**, 232-43 (1971).  
718. Svensson, L. A., *Physica Scripta* **4**, 111-12 (1971).  
719. Sitterley, C. M., *Optica Pura Y Apl.* **5**, 147-58 (1972).  
720. Smitt, R., *Physica Scripta* **8**, 292-300 (1973).  
721. Swensson, J. W. and B. Edlen, *Physica Scripta* **9**, 335-37 (1974).  
722. Sawyer, G. A., A. J. Bearden, I. Henins, F. C. Jahoda, and F. L. Ribe, *Phys. Rev.* **131**, 1891-97 (1963).  
723. Striganov, A. R. and N. S. Sventitskii, *Tables of Spectral Lines of Neutral and Ionized Atoms (I. F. I. /Plenum, 1968)*.  
724. Shenstone, A. G., *J. Res. Nat. Bur. Stand.* **79A**, 497-521 (1975).  
725. Sjodin, R., J. Pihl, R. Hallin, J. Lindskog, R. Marelius, and K. Sharma, *Report UUIP-926, Inst. of Phys., Univ. of Uppsala* (1976).  
726. Smitt, R., L. A. Svensson, and M. Outred, *Physica Scripta* **13**, 293-307 (1976).  
727. Svensson, L. A., *Physica Scripta* **13**, 235-39 (1976).  
728. Scofield, J. H., *Report UCID-16848, Lawrence Livermore Lab, Univ. of Calif.* (1975).  
729. Swartz, M., S. O. Kastner, L. Goldsmith, and W. M. Neupert, *J. Opt. Soc. Am.* **66**, 240-44 (1976).  
730. Sandlin, G. D., G. E. Brueckner, V. E. Scherrer, and R. Tousey, *Astrophys. J.* **205**, L47-L50 (1976).  
731. Walker, A. B. C. Jr. and H. R. Rugge, *Astrophys. J.* **164**, 181-90 (1971).  
732. Yoshino, K., *J. Opt. Soc. Am.* **60**, 1220-29 (1970).  
733. Artru, M. C. and W. U. L. Brillet, *Physica Scripta* **16**, 93-98 (1977).  
734. Eidelsberg, M. and M. C. Artru, *Physica Scripta* **16**, 109-13 (1977).  
735. Engelhardt, W. and J. Sommer, *Astrophys. J.* **167**, 201-2 (1971).  
736. Neupert, W. M., M. Swartz, and S. O. Kastner, *Solar Physics* **31**, 171-95 (1973).  
737. Cheng, C. C., G. A. Doschek, and U. Feldman, *Astrophys. J.* **210**, 836-42 (1976).  
738. Cheng, C. C. and O. K. Moe, *Solar Physics* **52**, 327-35 (1977).  
739. Pegg, D. J., J. P. Forester, S. B. Elston, P. M. Griffin, K. O. Groeneveld, R. S. Peterson, R. S. Thoe, C. R. Vane, and I. A. Sellin, *Astrophys. J.* **214**, 331-33 (1977).  
740. Moore, C. E., *Optica Pura Y Apl.* **10**, 131-45 (1977).  
741. Klapisch, M., J. L. Schwob, B. S. Fraenkel, and J. Oreg, *J. Opt. Soc. Am.* **67**, 148-55 (1977).  
742. Freeman, G. H. C. and W. H. King, *J. Phys. E* **10**, 894-97 (1977).  
743. Freeman, G. H. C. and I. Freeman, *National Physical Lab. Report Qu35* (1977).  
744. Feldman, U., G. A. Doschek, W. E. Behring, and L. Cohen, *Appl. Phys. Lett.* **31**, 571-73 (1977).  
745. Shalimoff, G. V. and J. G. Conway, *J. Opt. Soc. Am.* **68**, 267-68 (1978).  
746. Smitt, R., *Solar Physics* **51**, 113-19 (1977).  
747. Boiko, V. A., S. A. Pikuz, U. I. Safronova, and A. Ya. Faenov, *Optics and Spectros.* **43**, 233-35 (1978).  
748. Johansson, S., *Astrophys. J.* **212**, 923-24 (1977).  
749. Johansson, S., *Physica Scripta* **18**, 217-65 (1978).  
750. Dumont, P. D., H. P. Garnir, and Y. Baudinet-Robinet, *J. Opt. Soc. Am.* **68**, 825-29 (1978).  
751. Kasyanov, Y. S., E. Ya. Kononov, V. V. Korobkin, K. N. Koshelev, and R. V. Serov, *Optics and Spectros.* **35**, 586-89 (1973).  
752. Wu, C. M., *Ph. D. Thesis, Univ. of British Columbia* (1971).  
753. Edlen, B., *Physica Scripta* **17**, 565-74 (1978).  
754. Takahashi, Y., *Ann. Phys. [Leipzig]* **[5] 3**, 27-48 (1929).  
755. Takamine, T. and S. Nitta, *Mem. Co. Sci. Kyoto Imp. Univ.* **2**, 117-35 (1917).  
756. Taylor, L. B., *Proc. Nat. Acad. Sci.* **12**, 658-9 (1926).  
757. Tech, J. L., *J. Res. Nat. Bur. Stand.* **67A**, 505-54 (1963).  
758. Tomboulou, D. H., *Phys. Rev.* **54**, 347-50 (1938).  
759. Tomboulou, D. H., *Phys. Rev.* **54**, 350-4 (1938).

760. Trawick, M. W., *Phys. Rev.* **46**, 63-5 (1934).  
761. Trawick, M. W., *Phys. Rev.* **48**, 223-5 (1935).  
762. Tsien, W. Z., *Chinese J. Phys.* **3**, 117-47 (1939).  
763. Turner, L. A., *Phys. Rev.* **27**, 397-406 (1926).  
764. Tyren, F., *Nova Acta Reg. Soc. Sci. Uppsala* **12**, No. 1, 7-66 (1940).  
765. Tyren, F., *Z. Physik* **98**, 768-74 (1936).  
766. Tyren, F., *Z. Physik* **111**, 314-17 (1938).  
767. Toresson, Y. G., *Ark. Fys.* **17**, 179-92 (1959).  
768. Toresson, Y. G., *Ark. Fys.* **18**, 389-416 (1960).  
769. Toresson, Y. G., *Ark. Fys.* **18**, 417-20 (1960).  
770. Tilford, S. G., *J. Opt. Soc. Am.* **53**, 1051-4 (1963).  
771. Tilford, S. G. and P. G. Wilkinson, *J. Opt. Soc. Am.* **54**, 322-5 (1964).  
772. Tousey, R., *Quart. J. Roy. Astro. Soc.* **5**, 123-44 (1964).  
773. Tilford, S. G. and L. E. Giddings, *Astrophys. J.* **141**, 1222-5 (1965).  
774. Tousey, R., W. E. Austin, J. D. Purcell, and K. G. Widing, *Ann. Astrophys.* **28**, 755-73 (1965).  
775. Toresson, Y. G. and B. Edlen, *Ark. Fys.* **23**, 117-8 (1962).  
776. Tondello, G., *J. Phys. B*, **2**, 727-29 (1969).  
777. Tondello, G. and T. M. Paget, *J. Phys. B*, **3**, 1757-62 (1970).  
778. Tondello, G. and R. W. P. McWhirter, *J. Phys. B* **4**, 715-27 (1971).  
779. Vance, B. B., *Phys. Rev.* **41**, 480-5 (1932).  
780. Vanveld, R. D. and K. W. Meissner, *J. Opt. Soc. Am.* **46**, 598-604 (1956).  
781. Vasiliev, R. I. and A. V. Yakovlieva, *Optics and Spectros.* **5**, 620-21 (1958).  
782. Velasco, R. and N. Gullion, *Optica Pura Y Apl.* **1**, 93-102 (1968).  
783. Venkatesachar, B. and T. S. Subbaraya, *Z. Physik* **73**, 412-18 (1931).  
784. Violet, T., and W. Rense, *Astrophys. J.* **130**, 954-60 (1959).  
785. Weber, R. L. and W. W. Watson, *J. Opt. Soc. Am.* **26**, 307-9 (1936).  
786. Werner, S., *Nature* **116**, 574 (1925).  
787. Werner, S., *Nature* **118**, 154-5 (1926).  
788. Werner, S., *Studier Over Spektroskopiske Lyskilder Til Frembringelse Af Gnist-spektre Med Resultater For Lithiums Gnist-spektrum* (Oaschehoug and Co., Dansk Forlag, Kovenhavn, 1927).  
789. Wheatley, M. A. and R. A. Sawyer, *Phys. Rev.* **61**, 591-600 (1942).  
790. White, H. E., *Phys. Rev.* **33**, 538-46 (1929).  
791. White, H. E., *Phys. Rev.* **33**, 672-83 (1929).  
792. White, H. E., *Phys. Rev.* **33**, 914-24 (1929).  
793. Whitford, A. E., *Phys. Rev.* **46**, 793 (1934).  
794. Wilkinson, P. G., *J. Opt. Soc. Am.* **45**, 862-7 (1955).  
795. Wilkinson, P. G., *J. Opt. Soc. Am.* **47**, 182-5 (1957).  
796. Wilkinson, P. G. and K. L. Andrew, *J. Opt. Soc. Am.* **53**, 710-7 (1963).  
797. Wilson, R., *Ann. Astrophys. [France]* **27**, 771-4 (1964).  
798. Widing, K. G., *Astrophys. J.* **145**, 380-99 (1966).  
799. Yarosewick, S. J. and F. L. Moore, Jr., *J. Opt. Soc. Am.* **57**, 1381-7 (1967), and Private Communication (1980).  
800. Wood, D. R. and K. L. Andrew, *J. Opt. Soc. Am.* **58**, 818-29 (1968).  
801. Widing, K. G. and G. D. Sandlin, *Astrophys. J.* **152**, 545-56 (1968).  
802. Yarosewick, S. J., J. J. Davia and F. L. Moore, *J. Opt. Soc. Am.* **61**, 732-39 (1971).  
803. Williams, M. D., *NASA SP-3068* (1971).  
804. Widing, K. G., G. D. Sandlin and R. D. Cowan, *Astrophys. J.* **169**, 405-11 (1971).  
805. Williams, M. D., *J. Opt. Soc. Am.* **62**, 295-96 (1972).  
806. Wagner, W. J. and L. L. House, *Astrophys. J.* **166**, 683-98 (1971) and **155**, 677-86 (1969).  
807. Williams, M. D., *Solar Physics* **21**, 38-39 (1971).  
808. White, R. S., *Space Physics* (Gordon and Breach, 1970).  
809. Walker, A. B. C., H. R. Ruge, and K. Weiss, *Astrophys. J.* **188**, 423-40 (1974).  
810. Zumstein, R. V., *Phys. Rev.* **38**, 2214-6 (1931).  
811. Zumstein, R. V. and D. S. Marston, *Phys. Rev.* **38**, 305-8 (1931).  
812. Zirin, H., *Astrophys. J.* **140**, 1332-8 (1964).  
813. Zvereva, L. I. and E. Ya. Kononov, *Optics and Spectros.* **24**, 445-6 (1968).  
814. House, L. L., W. A. Deutschmann, and G. A. Sawyer, *Astrophys. J.* **140**, 814-6 (1964).  
815. Hall, L. A., W. Schweizer, L. Heroux, and H. E. Hinteregger, *Astrophys. J.* **142**, 13-15 (1965).  
816. Junkes, J., E. W. Salpeter, and G. Milazzo, *Atomic Spectra In The Vacuum Ultra-Violet*, *Specola Vaticana* (1965).  
817. Jahoda, F. C., F. L. Ribe, G. A. Sawyer, and R. W. P. McWhirter, *Proc. Sixth Internat. Conf. On Ionization Phen. In Gases [Paris]* Vol. III, 347-51 (1963).  
818. Zalubas, R. and M. Wilson, *J. Res. Nat. Bur. Stand.* **69A**, 59-70 (1965).  
819. House, L. L., *Ann. Astrophys. [France]* **27**, 763-4 (1964).  
820. Jordan, C., *Comm. Univ. of London Obs.* No. 68 (Nov. 1965).  
821. Johanson, L., *Ark. Fys.* **31**, 201-35 (1966).  
822. Herman, L. and K. C. Clark, *J. Quant. Spectrosc. Radiat. Transfer* **5**, 765-70 (1965).  
823. Austin, W. E., J. D. Purcell, R. Tousey, and K. G. Widing, *Astrophys. J.* **145**, 373-9, (1966).  
824. Hallin, R., *Ark. Fys.* **32**, 201-10 (1966).  
825. Velasco, R. and J. Adames, *Publ. No. 26, Instituto De Optica Daza De Valdes De Madrid* (1966).  
826. Isberg, B., *Ark. Fys.* **35**, 551-63 (1967).  
827. Jones, B. B., F. F. Freeman and R. Wilson, *Nature* **219**, 252-54 (1968).  
828. Garstang, R. H., *Astrophysics and Space Science* **2**, 336-43 (1968).  
829. Iglesias, L., *J. Res. Nat. Bur. Stand.* **72a**, 295-308 (1968).  
830. Johansson, I. and R. Contreras, *Ark. Fys.* **37**, 513-20 (1968).  
831. Goorvitch, D., G. Mehlman-Balloffet and F. P. J. Valero, *J. Opt. Soc. Am.* **60**, 1458-61 (1970).  
832. Hoory, S., U. Feldman, S. Goldsmith, W. Behring and L. Cohen, *J. Opt. Soc. Am.* **60**, 1449-53 (1970).  
833. Hoory, S., S. Goldsmith, U. Feldman, W. Behring and L. Cohen, *J. Opt. Soc. Am.* **61**, 504-8 (1971).  
834. Goldsmith, S., U. Feldman and L. Cohen, *J. Opt. Soc. Am.* **61**, 615-18 (1971).  
835. Shenstone, A. G., *J. Res. Nat. Bur. Stand.* **74A**, 801-55 (1970).  
836. Dupree, A. K. and E. M. Reeves, *Astrophys. J.* **165**, 599-613 (1971).  
837. Newsom, G. H., *Astrophys. J.* **166**, 243-47 (1971).  
838. Doschek, G. A., J. F. Meekins and R. D. Cowan, *Astrophys. J.* **177**, 261-69 (1972).  
839. Doschek, G. A., *Space Sci. Rev.* **13**, 765-821 (1972).  
840. Van Deurzen, C. H. H., J. G. Conway and S. P. Davis, *J. Opt. Soc. Am.* **63**, 158-63 (1973).  
841. Tondello, G., *Astrophys. J.* **172**, 771-83 (1972).  
842. Valero, F. P. J., D. Goorvitch, B. S. Fraenkel, and B. Ragent, *J. Opt. Soc. Am.* **59**, 1380-81 (1969).  
843. Jordan, C., *Solar Physics* **21**, 381-91 (1971).  
844. Dupree, A. K., M. C. E. Huber, R. W. Noyes, W. H. Parkinson, E. M. Reeves, and G. L. Withbroe, *Astrophys. J.* **182**, 321-33 (1973).  
845. Fraenkel, B. S. and J. L. Schwob, *Phys. Letters* **40A**, 83-85 (1972).  
846. Hermansdorfer, H., *J. Opt. Soc. Am.* **62**, 1149-52 (1972).  
847. Druetta, M., R. U. Datta, and H. J. Kunze, *Astrophys. J.* **174**, 215-17 (1972).  
848. Tondello, G., *J. Opt. Soc. Am.* **63**, 346-52 (1973).  
849. Feldman, U., G. A. Doschek, D. Nagel, W. Behring, and L. Cohen, *Astrophys. J. Lett.* **183**, L43-L45 (1973).  
850. Feldman, U., G. A. Doschek, R. D. Cowan, and L. Cohen, *J. Opt. Soc. Am.* **63**, 1445-53 (1973).



851. Fawcett, B. C., R. D. Cowan, and R. W. Hayes, Unpublished Communication (1976).
852. Fawcett, B. C. and R. W. Hayes, *Physica Scripta* **8**, 244-48 (1973).
853. Fawcett, B. C., R. D. Cowan, and R. W. Hayes, *Astrophys. J.* **187**, 377-83 (1974).
854. Fawcett, B. C., R. D. Cowan, and R. W. Hayes, *J. Phys. B* **5**, 2143-51 (1972).
855. Van Deurzen, C. H. H., Ph. D. Thesis, U. of Calif. [Berkeley], 1973.
856. Fawcett, B. C., *Adv. In Atomic and Molec. Phys.*, Vol. **10** (1974) Academic Press.
857. Dupree, A. K., *Astrophys. J.* **178**, 527-41 (1972).
858. Noyes, R. W., A. K. Dupree, M. C. E. Huber, W. H. Parkinson, E. M. Reeves, and G. L. Withbroe, *Astrophys. J.* **178**, 515-25 (1972).
859. Valero, F. P. J. and D. Goorvitch, *Astrophys. J.* **178**, 271-76 (1972).
860. Doschek, G. A., J. F. Meekins, R. W. Kreplin, T. A. Chubb, and H. Friedman, *Astrophys. J.* **170**, 573-86 (1971).
861. Johannesson, G. A., T. Lundstrom and L. Minnhagen, *Physica Scripta* **6**, 129-37 (1972).
862. Hontzeas, S., I. Martinson, P. Erman and R. Buchta, *Physica Scripta* **6**, 55-60 (1972).
863. Holstrom, J. E., *Physica Scripta* **5**, 249-53 (1972).
864. Valero, F. P. J., *J. Opt. Soc. Am.* **65**, 197-98 (1975).
865. Doschek, G. A., U. Feldman, and L. Cohen, *J. Opt. Soc. Am.* **63**, 1463-66 (1973).
866. Dick, K. A., *J. Opt. Soc. Am.* **64**, 702-5 (1974).
867. Norlen, G., *Physica Scripta* **8**, 249-69 (1973).
868. Fawcett, B. C., M. Galanti, and N. J. Peacock, *J. Phys. B* **7**, 1149-53 (1974).
869. Fawcett, B. C., M. Galanti, and N. J. Peacock, *J. Phys. B* **7**, L106-L107 (1974).
870. Fawcett, B. C. and R. D. Cowan, *Mon. Not. Roy. Astr. Soc.* **171**, 1-7 (1975).
871. Iglesia, L., *Optica, Pura Y Apl.* **5**, 195-202 (1972).
872. Van Deurzen, C. H. H., J. G. Conway, and S. P. Davis, *J. Opt. Soc. Am.* **64**, 498-502 (1974).
873. Artru, M. C. and W. U. L. Brillet, *J. Opt. Soc. Am.* **64**, 1063-71 (1974).
874. Doschek, G. A., U. Feldman, R. D. Cowan, and L. Cohen, *Astrophys. J.* **188**, 417-422 (1974).
875. Feldman, U., G. A. Doschek, D. J. Nagel, W. E. Behring, and R. D. Cowan, *Astrophys. J.* **187**, 417-20 (1974).
876. Jakobsson, L. R., *Ark. Fys.* **28**, 19-31 (1966).
877. Fawcett, B. C. and R. W. Hayes, *Mon. Not. Roy. Astr. Soc.* **170**, 185-97 (1975).
878. Fawcett, B. C. and R. W. Hayes, *J. Opt. Soc. Am.* **65**, 623-27 (1975).
879. Fawcett, B. C., *Atomic and Nuc. Data Tables* **16**, 135-50 (1975).
880. Doschek, G. A., U. Feldman, and L. Cohen, *J. Opt. Soc. Am.* **65**, 463-64 (1975).
881. Aksenov, V. P. and A. N. Rjabtsev, *Optics and Spectros.* **37**, 492-94 (1974).
882. Huber, M. C. E., R. J. Sandeman, and E. F. Tubbs, *Proc. Roy. Soc. London A*, **342**, 431-38 (1975).
883. Holz, E. Ya., E. Ya. Kononov, S. L. Mandelstam, Yu. V. Sidelinikov, and I. A. Zitnik, Preprint (1974).
884. Walker, A. B. C. and H. R. Rugge, *Astron. and Astrophys.* **5**, 4-11 (1970).
885. Denis, A., J. Desesquelles, and M. Dufay, *J. Opt. Soc. Am.* **59**, 976-80 (1969).
886. Jordan, C., *Space Sci. Rev.* **13**, 595-605 (1972).
887. Walker, A. B. C., *Space Sci. Rev.* **13**, 672-730 (1972).
888. Artru, M. C. and V. Kaufman, *J. Opt. Soc. Am.* **65**, 594-99 (1975).
889. Aksenov, V. P. and A. N. Rjabtsev, *Inst. Spectros. Preprint No.* **4** (1975).
890. Goldsmith, S., Private Communication (1975).
891. Hansen, J. E., W. Persson, and A. Borgstrom, *Physica Scripta* **11**, 31-37 (1975).
892. Corliss, C. and J. Sugar, *J. Phys. Chem. Ref. Data* **6**, 1253-1329 (1977).
893. Ekberg, J. O., *Physica Scripta* **14**, 109-21 (1976).
894. Esteva, J. M. and G. Mehlman, *Astrophys. J.* **193**, 747-53 (1974).
895. Walker, A. B. C., H. R. Rugge, and K. Weiss, *Astrophys. J.* **192**, 169-80 (1974).
896. Crosswhite, H. M., *J. Res. Nat. Bur. Stand.* **79a**, 17-69 (1975).
897. Pegg, D. J., D. M. Griffin, H. H. Haselton, R. Laubert, J. R. Mowat, R. S. Thoe, R. S. Peterson, and I. A. Sellin, *Phys. Rev. A* **10**, 745-48 (1974).
898. Druetta, M. and J. P. Buchet, *J. Opt. Soc. Am.* **66**, 433-36 (1976).
899. Fawcett, B. C., *J. Opt. Soc. Am.* **66**, 632-33 (1976).
900. Cohen, L. Private Communication and NRL Solar List (1972).
901. Bearden, J. A., *NSRDS-NBS* **14** (1967).
902. Hutcheon, R. J., *Phys. Letters* **45A**, 463-64 (1973).
903. Poppe, R., *Physica* **81C**, 351-65 (1976).
904. Aglitskii, E. V., V. A. Boiko, S. A. Pikuz, U. I. Safronova, and A. Ya. Faenov, Unpublished Preprint (1976).
905. Andersen, T., A. P. Petkov, and G. Sorensen, *Physica Scripta* **12**, 283-86 (1975).
906. Ekberg, J. O., *Physica Scripta* **13**, 111-16 (1976).
907. Ekberg, J. O., *Physica Scripta* **13**, 245-49 (1976).
908. Feldman, U., C. M. Brown, G. A. Doschek, C. E. Moore, and F. D. Rosenberg, *J. Opt. Soc. Am.* **66**, 853-59 (1976).
909. Garcia-Riquelme, O., *Optica Pura Y Apl.* **8**, 143-48 (1975).
910. Hallin, R., and R. Sjodin, Report, Inst. of Phys., Uppsala Univ. UIIP-929 (1976).
911. Iglesias, L., *Optica Pura Y Apl.* **8**, 149-51 (1975).
912. Hinnov, E., Report Matt-1240, Plasma Phys. Lab., Princeton Univ. (May 1976).
913. Edlen, B., Unpublished (1973).
914. Feldman, U. and G. A. Doschek, Private Communication (1976).
915. Feldman, U., G. A. Doschek, D. K. Prinz, and D. J. Nagel, *J. Appl. Phys.* **47**, 1341-50 (1976).
916. Jones, T. L. J., W. H. Parkinson, R. J. Speer, and C. Yank, *Solar Physics* **21**, 372-80 (1971).
917. Parkinson, W. H., E. M. Reeves, and F. S. Tomkins, *J. Phys. B*, **9**, 157-65 (1976).
918. Ermolaev, A. M. and M. Jones, *J. Phys. B*, **7**, 199-207 (1974).
919. Roig, R. A. and G. Tondello, *J. Phys. B*, **9**, 2373-78 (1976).
920. Van Kleef, T. A. M., A. J. J. Raassen, and Y. N. Joshi, *Physica* **84C**, 401-16 (1976).
921. Meinders, E., *Physica* **84C**, 117-32 (1976).
922. Raassen, A. J. J., T. A. M. Van Kleef, and B. C. Metsch, *Physica* **84C**, 133-46 (1976).
923. Behring, W. E., L. Cohen, U. Feldman, and G. A. Doschek, *Astrophys. J.* **203**, 521-27 (1976).
924. Pinnington, E. H., J. A. Kernahan, and K. E. Donnelly, *J. Opt. Soc. Am.* **67**, 162-68 (1977).
925. Valero, F. P. J., *Appl. Phys. Lett.* **25**, 64-66 (1974).
926. Doschek, G. A., U. Feldman, J. Davis, and R. D. Cowan, *Phys. Rev. A*, **12**, 980-86 (1975).
927. Raassen, A. J. J. and T. A. M. Van Kleef, *Physica* **85C**, 180-90 (1977).
928. Feldman, U., G. A. Doschek, R. D. Cowan, and L. Cohen, *Astrophys. J.* **196**, 613-16 (1975).
929. Van Deurzen, C. H. H., *J. Opt. Soc. Am.* **67**, 476-80 (1977).
930. Van Kleef, T. A. M. and Y. N. Joshi, *J. Opt. Soc. Am.* **67**, 472-76 (1977).
931. Griffin, P. M., D. J. Pegg, I. A. Sellin, K. W. Jones, D. J. Pisano, T. H. Kruse, and S. Bashkin, *Beam-foil Spectroscopy* [I. A. Sellin and D. J. Pegg, Ed.]. Vol. **1**, pp 321-29 (1976).
932. Brand, J. H., C. L. Cocke, and B. Curnutte, *Nucl. Instrum. Meth.* **110**, 127-36 (1973).
933. Pinnington, E. H., H. O. Lutz, and G. W. Carriveau, *Nucl. Instrum. Meth.* **110**, 55-59 (1973).
934. Dumont, P. D., Y. Baudinet-Robinet, and A. E. Livingston, *Physica Scripta* **13**, 365-69 (1976).



935. Edlen, B. and E. Boden, *Physica Scripta* **14**, 31-38 (1976).
936. Magnusson, C. E. and P. O. Zetterberg, *Physica Scripta* **15**, 237-50 (1977).
937. Zetterberg, P. O. and C. E. Magnusson, *Physica Scripta* **15**, 189-201 (1977).
938. Garnir, H. P., A. E. Livingston, Y. Baudinet-Robinet, P. D. Dumont, E. Biemont, and N. Grevesse, *J. Opt. Soc. Am.* **67**, 751-54 (1977).
939. Burkhalter, P. G., G. A. Doschek, U. Feldman, and R. D. Cowan, *J. Opt. Soc. Am.* **67**, 741-47 (1977).
940. Feldman, U. and G. A. Doschek, *J. Opt. Soc. Am.* **67**, 726-34 (1977).
941. Brillet, W. U. L. and M. C. Artru, *Physica Scripta* **14**, 285-89 (1976).
942. To, K. X. and R. Drouin, *Physica Scripta* **14**, 277-80 (1976).
943. Bromage, G. E., R. D. Cowan, and B. C. Fawcett, *Mon. Not. Roy. Astr. Soc.* **183**, 19-28 (1978).
944. Bromage, G. E., R. D. Cowan, and B. C. Fawcett, *Physica Scripta* **15**, 177-82 (1977).
945. Bromage, G. E., R. D. Cowan, B. C. Fawcett, H. Gordon, M. G. Hobby, N. J. Peacock and A. Ridgeley, *Culham Lab. Report CLM-R170* (1977).
946. Bromage, G. E., R. D. Cowan, B. C. Fawcett, and A. Ridgeley, *J. Opt. Soc. Am.* **68**, 48-51 (1978).
947. Bromage, G. E. and B. C. Fawcett, *Mon. Not. Roy. Astr. Soc.* **178**, 591-98 (1977).
948. Bromage, G. E., B. C. Fawcett, and R. D. Cowan, *Mon. Not. Roy. Astr. Soc.* **178**, 599-604 (1977).
949. Bromage, G. E. and B. C. Fawcett, *Mon. Not. Roy. Astr. Soc.* **178**, 605-10 (1977).
950. Bromage, G. E. and B. C. Fawcett, *Mon. Not. Roy. Astr. Soc.* **179**, 683-90 (1977).
951. Cantu, A. M., W. H. Parkinson, G. Tondello, and G. P. Tozzi, *J. Opt. Soc. Am.* **67**, 1030-33 (1977).
952. Kononov, E. Ya., *Physica Scripta* **17**, 425-32 (1978).
953. Garnir, H. P., Y. Baudinet-Robinet, and P. D. Dumont, *Physica Scripta* **17**, 463-65 (1978).
954. Hannebauer, F., H. V. Buttler, and P. H. Heckmann, *Physica Scripta* **17**, 479-82 (1978).
955. Bogdanovich, P. O., G. V. Merkelis, Z. B. Rudzikas, and S. D. Sadziuviene, *Physica Scripta* **17**, 549-55 (1978).
956. Neupert, W. M., *Solar Physics* **18**, 474-88 (1971).
957. Dynefors, B. I. and I. Martinson, *Physica Scripta* **17**, 123-29 (1978).
958. Ekberg, J. O. and B. Edlen, *Physica Scripta* **18**, 107-24 (1978).
959. Garcia-Riquelme, O., *Optica Pura Y Apl.* **10**, 275-91 (1977).
960. Iglesias, L., *Optica Pura Y Apl.* **10**, 267-73 (1977).
961. Kaufman, V. and L. Hagan, *J. Opt. Soc. Am.* **69**, 232-39 (1979).
962. Yoshino, K. and Y. Tanaka, *J. Opt. Soc. Am.* **69**, 159-65 (1979).
963. Sugar, J., T. B. Lucatorto, T. J. McIlrath, and A. W. Weiss, *Optics Lett.* **4**, 109-11 (1979).
964. Boiko, V. A., S. A. Pikuz, A. S. Safronova, and A. Ya. Faenov, *Optics and Spectros.* **44**, 498-500 (1979).
965. Knystautas, E. J., M. C. Buchet-Poulizac, J. P. Buchet, and M. Druetta, *J. Opt. Soc. Am.* **69**, 474-48 (1979).
966. Podobedova, L. I., A. A. Ramonas, and A. N. Ryabtsev, *Optics and Spectros.* **45**, 237-39 (1978).
967. Bogdanovich, P. O., Z. B. Rudzikas, V. I. Safronova, and S. D. Shadzkyuvene, *Optics and Spectros.* **44**, 618-21 (1978).
968. O'Brien, R., J. D. Silver, N. A. Jelley, S. Bashkin, E. Trabert, and P. H. Heckmann, *J. Phys. B* **12**, L41-L44 (1979).
969. Boiko, V. A., S. A. Pikuz, U. I. Safronova, and A. Ya. Faenov, *Mon. Not. Roy. Astr. Soc.* **185**, 789-805 (1978).
970. Kastner, S. O., M. Swartz, A. K. Bhatia, and J. Lapidés, *J. Opt. Soc. Am.* **68**, 1558-64 (1978).
971. Palenius, H. P., R. E. Huffman, J. C. Larrabee, and Y. Tanaka, *J. Opt. Soc. Am.* **68**, 1564-74 (1978).
972. Brown, C. M. and M. L. Ginter, *J. Opt. Soc. Am.* **68**, 1541-58 (1978).
973. Mansfield, M. W. D. and G. H. Newsom, *Proc. Roy. Soc. A* **357**, 77-102 (1977).
974. Connerade, J. P. and M. A. P. Martin, *Proc. Roy. Soc. A* **357**, 103-15 (1977).
975. Mansfield, M. W. D., *Proc. Roy. Soc. A* **346**, 539-53 (1975).
976. Mansfield, M. W. D., *Proc. Roy. Soc. A* **346**, 555-63 (1975).
977. Edlen, B., *Physica Scripta* **19**, 255-66 (1979).
978. Fawcett, B. C., A. Ridgeley, and G. E. Bromage, *Physica Scripta* **18**, 315-22 (1978).
979. Burkhalter, P. G., L. Cohen, R. D. Cowan, and U. Feldman, *J. Opt. Soc. Am.* **69**, 1133-40 (1979).
980. Gruzdev, P. F., *Optics and Spectros.* **27**, 297-99 (1969).
981. Gruzdev, P. F., *Optics and Spectros.* **27**, 391-93 (1969).
982. Iglesias, L., *Optica Pura Y Apl.* **12**, 63-89 (1979).
983. Kastner, S. O. and A. K. Bhatia, *J. Opt. Soc. Am.* **69**, 1391-93 (1979).
984. Odintzova, G. A. and A. R. Striganov, *J. Phys. Chem. Ref. Data* **8**, 63-67 (1979).
985. Raassen, A. J. and T. A. M. Van Kleef, *Physica* **96C**, 367-84 (1979).
986. Shestakov, A. F., *Optics and Spectros.* **46**, 117-18 (1979).
987. Gruzdev, P. F. and A. I. Sherstyuk, *Optics and Spectros.* **46**, 353-55 (1979).
988. Bhatia, A. K. and S. O. Kastner, *Solar Physics* **65**, 181-96 (1980).
990. Breton, C., C. De Michelis, M. Finkenthal, and M. Mattioli, *J. Opt. Soc. Am.* **69**, 1652-58 (1979).
991. Bhardwaj, S. N., H. G. Berry, and T. Mossberg, *Physica Scripta* **9**, 331-34 (1974).
992. Anderson, T., S. M. Bentzen, and O. Poulsen, *Physica Scripta* **22**, 119-22 (1980).
993. Artru, M. C. and V. Kaufman, *J. Opt. Soc. Am.* **70**, 1130-35 (1980).
994. Bhatia, A. K., U. Feldman, and G. A. Doschek, *J. Appl. Phys.* **51**, 1464-80 (1981).
995. Trabert, E. and P. H. Heckmann, *Physica Scripta* **21**, 146-50 (1980).
996. Van Kleef, T. A. M. and Y. N. Joshi, *J. Opt. Soc. Am.* **70**, 491-99 (1980).
997. Buchet, J. P., M. C. Buchet-Poulizac, H. G. Berry, and G. W. F. Drake, *Phys. Rev. A* **7**, 922-24 (1973).
998. Buchet-Poulizac, M. C., *Private Communication* (1980).
999. Denne, B., L. Engstrom, S. Huldt, J. O. Ekberg, L. J. Curtis, K. Ishii, E. Veje, and I. Martinson, *Physica Scripta* **21**, 151-54 (1980).
1000. Meggers, W. F. and H. N. Russel, *J. Res. Nat. Bur. Stand.* **17**, 125-92 (1936).
1001. Gunnvald, P. and L. Minnhagen, *Ark. Fys.* **22**, 327-31 (1962).
1002. Andersen, N., W. S. Bickel, G. W. Carriveau, K. Jensen, and E. Veje, *Physica Scripta* **4**, 113-14 (1971).
1003. Edlen, B., *Solar Physics* **9**, 439-45 (1969).
1004. Edlen, B., A. Olme, G. Herzberg, and J. W. C. Johns, *J. Opt. Soc. Am.* **60**, 889-91 (1970).
1005. Eriksson, K. B. S., *Ark. Fys.* **30**, 199-202 (1965).
1006. Eriksson, K. B. S. and H. B. S. Isberg, *Ark. Phys.* **33**, 593-95 (1966).
1007. Fawcett, B. C. and A. T. Hatter, *Astron. Astroph.* **84**, 78-80 (1980).
1008. Holstrom, J. E. and L. Johansson, *Ark. Fys.* **40**, 133-38 (1969).
1009. Isberg, B., *Ark. Fys.* **35**, 495-98 (1967).
1010. Johansson, I., *Ark. Fys.* **15**, 169-79 (1958).
1011. Johnston, W. D. and H. J. Kunze, *Astrophys. J.* **157**, 1469-70 (1969).
1012. Kaufman, V. and C. J. Humphreys, *J. Opt. Soc. Am.* **59**, 1614-28 (1969).
1013. Corliss, C. and J. Sugar, *J. Phys. Chem. Ref. Data* **8**, 1-62 (1979).
1014. Martin, W. C. and V. Kaufman, *J. Opt. Soc. Am.* **60**, 1096-99 (1970).
1015. Moore, C. E., *NBS Tech. Note* **36** (1959); *Revised Multiplet Table*.
1016. Persson, W. and L. Minnhagen, *Ark. Fys.* **37**, 273-300 (1968).
1017. Risberg, G., *Ark. Fys.* **28**, 381-95 (1964).

1018. Risberg, G., *Ark. Fys.* **37**, 231-49 (1968).  
1019. Risberg, P., *Ark. Fys.* **10**, 583-606 (1956).  
1020. Tech, J. L. and C. H. Corliss, *J. Res. Nat. Bur. Stand.* **65A**, 159-66 (1961).  
1021. Burke, E. W. and J. E. Mack, *J. Opt. Soc. Am.* **46**, 100 (1956).  
1022. Kaufman, A. S., T. P. Hughes, and R. V. Williams, *Proc. Phys. Soc.* **76**, 17-24 (1960).  
1023. Hallin, R. and T. P. Hughes, *Proc. Phys. Soc.* **78**, 201-3 (1961).  
1024. Goldsmith, S. and A. S. Kaufman, *Proc. Phys. Soc.* **81**, 544-52 (1963).  
1025. Kiess, C. C., *J. Res. Nat. Bur. Stand.* **1**, 75-90 (1938).  
1026. Johansson, S. and U. Litzen, *Physica Scripta* **10**, 121-29 (1974).  
1027. Morillon, C. and J. Verges, *Physica Scripta* **10**, 227-35 (1974).  
1028. Russell, H. N. and W. F. Meggers, *Sci. Papers NBS* **22**, 329-73 (1927).  
1029. Paschen, F., *Ann. Phys. [Leipzig]* **60**, 405-53 (1919).  
1030. Meggers, W. F., *Sci. Papers Nat. Bur. Stand.* **22**, 61-71 (1927).  
1031. De Bruin, T. L., *Z. Physik* **77**, 505-514 (1932).  
1032. Fowler, A., *Proc. Roy. Soc. [London] A*, **117**, 317-30 (1928).  
1033. Harper, C. D., S. E. Wheatley, and M. D. Levenson, *J. Opt. Soc. Am.* **67**, 579-83 (1977).  
1034. Lennard, W. N. and C. L. Cocke, *Nucl. Instrum. Meth.* **110**, 137-42 (1973).  
1035. Wilson, C. M. and M. P. Thekaekara, *J. Opt. Soc. Am.* **51**, 289-97 (1961).  
1036. Sugar, J. and C. Corliss, *J. Phys. Chem. Ref. Data* **6**, 317-83 (1977).  
1037. Martin, W. C., *J. Phys. Chem. Ref. Data* **2**, 257-66 (1973).  
1038. Litzen, U., *Physica Scripta* **1**, 251-52 (1970).  
1039. Flower, D. R., *Astron. and Astrophys.* **54**, 163-66 (1977).  
1040. Nussbaumer, H., *Astron. and Astrophys.* **48**, 93-99 (1976).  
1041. Spector, N. and S. Garpman, *J. Opt. Soc. Am.* **67**, 155-61 (1977).  
1042. Erickson, G. W., *J. Phys. Chem. Ref. Data* **6**, 831-69 (1977).  
1043. Berry, H. G., J. Bromander, I. Martinson, and R. Buchta, *Physica Scripta* **3**, 63-67 (1971).  
1044. Penkin, N. P. and L. N. Shabanova, *Optics and Spectros.* **18**, 425-27 (1965).  
1045. Johansson, I. and U. Litzen, *Ark. Fys.* **34**, 573-87 (1966).  
1046. Shamey, L. J., *J. Opt. Soc. Am.* **61**, 942-46 (1971).  
1047. Safronova, U. I., A. N. Ivanova, and N. V. Rabinkina, *Optics and Spectros.* **31**, 266-69 (1971).  
1048. Davis, D. S. and K. L. Andrew, *J. Opt. Soc. Am.* **68**, 206-35 (1978).  
1049. Crance, M., *Atomic Data* **5**, 185-200 (1973).  
1050. Sugar, J. and C. Corliss, *J. Phys. Chem. Ref. Data* **7**, 1191-1262 (1978).  
1051. Warner, B. and R. C. Kirkpatrick, *Mon. Not. Roy. Astr. Soc.* **144**, 397-410 (1969).  
1052. Giuliani, J. F. and M. P. Thekaekara, *J. Opt. Soc. Am.* **54**, 460-63 (1964).  
1053. Martin, W. C. and R. Zalubas, *J. Phys. Chem. Ref. Data* **8**, 817-64 (1979).  
1054. Sugar, J. and C. Corliss, *J. Phys. Chem. Ref. Data* **8**, 865-916 (1979).  
1055. Fawcett, B. C., G. E. Bromage, and R. W. Hayes, *Mon. Not. Roy. Astr. Soc.* **186**, 113-16 (1979).  
1056. Fawcett, B. C., A. Ridgeley, and J. O. Ekberg, *Physica Scripta* **21**, 155-61 (1980).  
1057. Fawcett, B. C., A. Ridgeley, and T. P. Hughes, *Mon. Not. Roy. Astr. Soc.* **188**, 365-70 (1979).  
1058. Feldman, U., G. A. Doschek, C. C. Cheng, and A. K. Bhatia, *J. Appl. Phys.* **51**, 190-201 (1980).  
1059. Feldman, U., G. A. Doschek, and R. W. Kreplin, *Astrophys. J.* **238**, 365-74 (1980).  
1060. Hutcheon, R. J., G. E. Bromage, R. L. Cooke, M. H. Key, and C. L. S. Lewis, *J. Phys. B* **13**, 673-83 (1980).  
1061. Hutcheon, R. J., L. Cooke, M. H. Key, C. L. S. Lewis, and G. E. Bromage, *Physica Scripta* **21**, 89-97 (1980).  
1062. Johansson, S., *Physica Scripta* **15**, 183-88 (1977).  
1063. Johansson, S. and U. Litzen, *Physica Scripta* **22**, 49-60 (1980).  
1064. Johansson, S. and U. Litzen, *Physica Scripta* **21**, 40-46 (1980).  
1065. Kaufman, V. and M. C. Artru, *J. Opt. Soc. Am.* **70**, 1135-39 (1980).  
1066. Martin, W. C. and R. Zalubas, *J. Phys. Chem. Ref. Data* **9**, 1-58 (1980).  
1067. McKenzie, P. B. Landecker, R. M. Broussard, H. R. Ruge, R. M. Young, U. Feldman, and G. A. Doschek, *Astrophys. J.* **241**, 409-16 (1980).  
1068. Rashid, K., *Physica Scripta* **22**, 114-18 (1980).  
1069. Suckewer, S., R. Fonck, and E. Hinnov, *Princeton Univ. Report PPPL-1591* (1979).  
1070. Trabert, E. and B. C. Fawcett, *J. Phys. B* **12**, L441-L447 (1979).  
1071. Trabert, E., P. H. Heckmann, W. Schlagheck, and H. V. Buttlar, *Physica Scripta* **21**, 27-34 (1980).  
1072. Trabert, E. and P. H. Heckmann, *Physica Scripta* **21**, 35-39 (1980).  
1073. Burkhalter, P. G., J. Shiloh, A. Fisher, and R. D. Cowan, *J. Appl. Phys.* **50**, 4532-40 (1979).  
1074. Corliss, C. and J. Sugar, *J. Phys. Chem. Ref. Data* **8**, 1109-45 (1979).  
1075. Kastner, S. O., E. D. Rothe, and W. M. Neupert, *Astron. Astrophys.* **37**, 339-48 (1974).  
1076. Kastner, S. O. and H. E. Mason, *Astron. Astrophys.* **67**, 119-27 (1978).  
1077. Li, H. H. and K. L. Andrew, *J. Opt. Soc. Am.* **70**, 719-24 (1980).  
1078. Livingston, A. E., H. G. Berry, L. J. Curtis, and R. M. Schectman, *Phys. Rev. A Phys. Rev. A* **21**, 771-81 (1980).  
1079. Longmire, M. S., C. M. Brown, and M. L. Ginter, *J. Opt. Soc. Am.* **70**, 423-29 (1980).  
1080. Moore, C. E., *NSRDS-NBS* **3**, Section 9 (1980).  
1081. Stencil, R. E. and K. A. Van Der Hucht, *Astrophys. J. Suppl.* **38**, 29-38 (1978).  
1082. Suckewer, S. and E. Hinnov, *Princeton Univ. Report PPPL-1524* (1979).  
1083. Brown, C. M. and M. L. Ginter, *J. Opt. Soc. Am.* **70**, 87-93 (1980).  
1084. Fawcett, B. C., A. Ridgeley, and A. T. Hatter, *J. Opt. Soc. Am.* **70**, 1349-54 (1980).  
1085. Ramonas, A. A. and A. N. Ryabtsev, *Optics and Spectros.* **48**, 348-51 (1980).  
1086. Svendenius, N., *Physica Scripta* **22**, 240-87 (1980).  
1087. Sugar, J. and C. Corliss, *J. Phys. Chem. Ref. Data* **10**, 1097-1174 (1981).  
1088. Poppe, R., T. A. M. Van Kleef and A. J. J. Raassen, *Physica* **77**, 165-73 (1974).  
1089. Spector, N., A. Zigler, H. Zmora, and J. L. Schwob, *J. Opt. Soc. Am.* **70**, 857-61 (1980).  
1090. Bleach, R. D., *J. Opt. Soc. Am.* **70**, 861-63 (1980).  
1091. Lawson, K. D. and N. J. Peacock, *J. Phys.* **B13**, 3313-34 (1980).  
1092. Meinders, E. and P. Uijlings, *Physica* **100C**, 389-403 (1980).  
1093. Raassen, A. J. J., *Physica* **100C**, 404-24 (1980).  
1094. Gordon, H., M. G. Hobby, and N. J. Peacock, *J. Phys.* **B13**, 1985-99 (1980).  
1095. Podobedova, L. I., A. A. Ramonas, and A. N. Ryabtsev, *Optics and Spectros.* **49**, 247-50 (1980).  
1096. Fawcett, B. C. and G. E. Bromage, *J. Phys. B* **13**, 2711-16 (1980).  
1097. Bitter, M., K. W. Hill, N. R. Sauthoff, P. C. Efthimion, E. Mesurvey, W. Roney, S. Von Goeler, R. Horton, M. Goldman, and W. Stodiek, *Princeton Univ. Report PPPL-1538* (1979).  
1098. Hinnov, E., R. Fonck, and S. Suckewer, *Princeton Univ. Report PPPL-1669* (1980).  
1099. Moos, H. W. and J. T. Clarke, *Astrophys. J.* **247**, 354-61 (1981).  
1100. Sugar, J. and C. Corliss, *J. Phys. Chem. Ref. Data* **9**, 473-511 (1980).  
1101. Ivanov, L. N. and E. P. Ivanova, *Atomic and Nuc. Data Tables* **24**, 95-109 (1979).  
1102. Safronova, U. I. and T. G. Lisina, *Atomic and Nuc. Data Tables* **24**, 49-93 (1979).

1103. Ekberg, J. O., *Physica Scripta* **23**, 7-20 (1981).  
1104. Edlen, B., *Physica Scripta* **22**, 593-602 (1980).  
1105. Safronova, U. I., *Physica Scripta* **23**, 241-48 (1981).  
1106. Suckewer, S., *Physica Scripta* **23**, 72-86 (1981).  
1107. Martin, W. C. and R. Zalubas, *J. Phys. Chem. Ref. Data* **10**, 153-95 (1981).  
1108. Corliss, C. and J. Sugar, *J. Phys. Chem. Ref. Data* **10**, 197-289 (1981).  
1110. Ryabtsev, A. N., Preprint (1981).  
1111. Garcia-Riquelme, O., *J. Opt. Soc. Am.* **48**, 183-84 (1958).  
1112. Klapisch, M., A. Bar Shalom, J. L. Schwob, B. S. Fraenkel, C. Breton, C. De Michelis, M. Finkenthal, and M. Mattioli, *Phys. Lett.* **69A**, 34-36 (1978).  
1113. Garcia-Riquelme, O. and R. Velasco, *An. Real Soc. Espan. Fis. Quim.* **51A**, 41-57 (1955).  
1114. Martin, W. C., *Physica Scripta* **24**, 725-31 (1981).  
1115. Garton, W. R. S. and J. P. Connerade, *Astrophys. J.* **155**, 667-75 (1969).  
1116. Moore, C. E., *NSRDS-NBS* **34** (1970).  
1117. Kelly, R. L. and D. E. Harrison, Jr., *Atomic Data* **3**, 177-93 (1971), and *At. Data and Nuc. Data Tab.* **19**, 301-03 (1977).  
1118. Garton, W. R. S., *Proc. Roy. Soc. [London]* **333a**, 1-16 (1973).  
1119. Kaufman, V., J. Sugar, and D. Cooper, *Physica Scripta* **25**, 623-26 (1982).  
1120. Hinnov, E., S. Suckewer, S. Cohen, and K. Sato, *Princeton Univ. Report PPPL-1848* (81).  
1121. Guennou, H., A. Sureau, A. Carillon, and G. Jamelot, *J. Phys. B* **12**, 1657-64 (1979).  
1122. Edlen, B., *Optica Pura Y Apl.* **10**, 123-29 (1977).  
1123. Rao, A. B., and S. G. Krishnamurty, *Proc. Phys. Soc. [London]* **51**, 772-77 (1939).  
1124. Humphreys, C. J., *Phys. Rev.* **47**, 712-17 (1935).  
1125. Khan, M. A., D. Jacoby, and G. T. Pert, *Opt. Commun.* **20**, 89-93 (1977).  
1126. Curtis, L. J. and P. S. Ramanujam, *Physica Scripta* **23**, 1043-46 (1981).  
1127. Joelsson, I., P. O. Zetterberg, and C. E. Magnusson, *Physica Scripta* **23**, 1087-95 (1981).  
1128. Kastner, S. O. and W. E. Behring, *Astrophys. J.* **243**, L109-L110 (1981).  
1129. Finkenthal, M., R. E. Bell, H. W. Moos, and TRF Group, *Phys. Lett.* **88A**, 165-68 (1982).  
1130. Bhatia, A. K., S. O. Kastner, and W. E. Behring, *Astrophys. J.* **257**, 887-95 (1982).  
1131. Finkenthal, M., E. Hinnov, S. Cohen, and S. Suckewer, *Phys. Lett.* **91**, 284-86 (1982).  
1132. Curtis, L. J. and P. S. Ramanujam, *Phys. Rev. A*, **26**, 3672-75 (1982).  
1133. Feldman, U., S. Goldsmith, L. Cohen, and W. E. Behring, *J. Opt. Soc. Am.* (Unpublished 1983).  
1134. Stratton, B. C., W. L. Hodge, H. W. Moos, J. L. Schwob, S. Suckewer, M. Finkenthal, and S. Cohen, *J. Opt. Soc. Am.* **73**, 877-81 (1983).  
1135. Curtis, L. J. and P. S. Ramanujam, *J. Opt. Soc. Am.* **73**, 979-84 (1983).  
1136. TFR Group, *Phys. Lett.* **74A**, 57-59 (1979).  
1137. Hinnov, E. and S. Suckewer, *Phys. Lett.* **79A**, 298-300 (1980).  
1138. Suckewer, S., J. Cecchi, S. Cohen, R. Fonck, and E. Hinnov, *Phys. Lett.* **80A**, 259-62 (1980).  
1139. Denne, B., E. Hinnov, S. Suckewer, and J. Timberlake, *J. Opt. Soc. Am. B* **1**, 296-99 (1984).  
1140. Kaufman, V., J. Sugar, and D. Cooper, *Physica Scripta* **26**, 163-67 (1982).  
1141. Sugar, J., V. Kaufman, and D. Cooper, *Physica Scripta* **26**, 189-93 (1982).  
1142. Sugar, J., V. Kaufman, and D. Cooper, *Physica Scripta* **26**, 293-95 (1982).  
1143. Moore, C. E., *NSRDS-NBS* **3**, Section 10 (1983).  
1144. Hutcheon, R. J., J. P. Pye, and K. D. Evans, *Astron. Astrophys.* **51**, 451-60 (1976).  
1145. Denne, B., E. Hinnov, S. Suckewer, and S. Cohen, *Phys. Rev. A* **28**, 206-8 (1983).  
1146. Smith, P. L., C. E. Magnusson, and P. O. Zetterberg, *Astrophys. J. Lett. Ed.* **277**, 79-81 (1984).

# Journal of Physical and Chemical Reference Data

## Cumulative Listing of Reprints and Supplements

### Reprints from Volume 1

1. Gaseous Diffusion Coefficients, *T.R. Marrero and E.A. Mason*, Vol. 1, No. 1, pp. 1-118 (1972) \$7.00
2. Selected Values of Critical Supersaturation for Nucleation of Liquids from the Vapor, *G.M. Pound*, Vol. 1, No. 1, pp. 119-134 (1972) \$3.00
3. Selected Values of Evaporation and Condensation Coefficients for Simple Substances, *G.M. Pound*, Vol. 1, No. 1, pp. 135-146 (1972) \$3.00
4. Atlas of the Observed Absorption Spectrum of Carbon Monoxide between 1060 and 1900 Å, *S.G. Tilford and J.D. Simmons*, Vol. 1, No. 1, pp. 147-188 (1972) \$4.50
5. Tables of Molecular Vibrational Frequencies, Part 5, *T. Shimanouchi*, Vol. 1, No. 1, pp. 189-216 (1972) (superseded by No.103) \$4.00
6. Selected Values of Heats of Combustion and Heats of Formation of Organic Compounds Containing the Elements C, H, N, O, P, and S, *Eugene S. Domalski*, Vol. 1, No. 2, pp. 221-278 (1972) \$5.00
7. Thermal Conductivity of the Elements, *C.Y. Ho, R.W. Powell, and P.E. Liley*, Vol. 1, No. 2, pp. 279-422 (1972) \$7.50
8. The Spectrum of Molecular Oxygen, *Paul H. Krupenie*, Vol. 1, No. 2, pp. 423-534 (1972) \$6.50
9. A Critical Review of the Gas-Phase Reaction Kinetics of the Hydroxyl Radical, *Wm. E. Wilson, Jr.*, Vol. 1, No. 2, pp. 535-574 (1972) \$4.50
10. Molten Salts: Volume 3, Nitrates, Nitrites, and Mixtures, Electrical Conductance, Density, Viscosity, and Surface Tension Data, *G.J. Janz, Ursula Krebs, H.F. Siegenthaler, and R.P.T. Tomkins*, Vol. 1, No. 3, pp. 581-746 (1972) \$8.50
11. High Temperature Properties and Decomposition of Inorganic Salts—Part 3. Nitrates and Nitrites, *Kurt H. Stern*, Vol. 1, No. 3, pp. 747-772 (1972) \$4.00
12. High-Pressure Calibration: A Critical Review, *D.L. Decker, W.A. Bassett, L. Merrill, H.T. Hall, and J.D. Barnett*, Vol. 1, No. 3, pp. 773-836 (1972) \$5.00
13. The Surface Tension of Pure Liquid Compounds, *Joseph J. Jasper*, Vol. 1, No. 4, pp. 841-1009 (1972) \$8.50

14. Microwave Spectra of Molecules of Astrophysical Interest, I. Formaldehyde, Formamide, and Thioformaldehyde, *Donald R. Johnson, Frank J. Lovas, and William H. Kirchhoff*, Vol. 1, No. 4, pp. 1011-1046 (1972) \$4.50
15. Osmotic Coefficients and Mean Activity Coefficients of Uni-univalent Electrolytes in Water at 25° C, *Walter J. Hamer and Yung-Chi Wu*, Vol. 1, No. 4, pp. 1047-1099 (1972) \$5.00
16. The Viscosity and Thermal Conductivity Coefficients of Gaseous and Liquid Fluorine, *H.J.M. Hanley and R. Prydz*, Vol. 1, No. 4, pp. 1101-1113 (1972) \$3.00

### Reprints from Volume 2

17. Microwave Spectra of Molecules of Astrophysical Interest, II. Methylenimine, *William H. Kirchhoff, Donald R. Johnson, and Frank J. Lovas*, Vol. 2, No. 1, pp. 1-10 (1973) \$3.00
18. Analysis of Specific Heat Data in the Critical Region of Magnetic Solids, *F.J. Cook*, Vol. 2, No. 1, pp. 11-24 (1973) \$3.00
19. Evaluated Chemical Kinetic Rate Constants for Various Gas Phase Reactions, *Keith Schofield*, Vol. 2, No. 1, pp. 25-84 (1973) \$5.00
20. Atomic Transition Probabilities for Forbidden Lines of the Iron Group Elements. (A Critical Data Compilation for Selected Lines), *M.W. Smith and W.L. Wiese*, Vol. 2, No. 1, pp. 85-120 (1973) \$4.50
21. Tables of Molecular Vibrational Frequencies, Part 6, *T. Shimanouchi*, Vol. 2, No. 1, pp. 121-162 (1973) (superseded by No. 103) \$4.50
22. Compilation of Energy Band Gaps in Elemental and Binary Compound Semiconductors and Insulators, *W.H. Strehlow and E.L. Cook*, Vol. 2, No. 1, pp. 163-200 (1973) \$4.50
23. Microwave Spectra of Molecules of Astrophysical Interest, III. Methanol, *R.M. Lees, F.J. Lovas, W.H. Kirchhoff, and D.R. Johnson*, Vol. 2, No. 2, pp. 205-214 (1973) \$3.00
24. Microwave Spectra of Molecules of Astrophysical Interest, IV. Hydrogen Sulfide, *Paul Helminger, Frank C. De Lucia, and William H. Kirchhoff*, Vol. 2, No. 2, pp. 215-224 (1973) \$3.00

#### Journal of Physical and Chemical Reference Data Reprint and Supplement Orders

To: American Chemical Society  
Distribution Office  
1155 Sixteenth Street, N.W.  
Washington, DC 20036

Name: \_\_\_\_\_

Title: \_\_\_\_\_

Organization: \_\_\_\_\_

Address: \_\_\_\_\_

City: \_\_\_\_\_ State: \_\_\_\_\_

Country: \_\_\_\_\_ Zip: \_\_\_\_\_

I am a member of \_\_\_\_\_  
(ACS, AIP, or Affiliated Society)

ORDERS FOR REPRINTS AND SUPPLEMENTS MUST BE PREPAID.  
\*Foreign orders for Reprints, add \$2.50 for each reprint for postage and handling. Foreign orders for Reprint Packages, add \$5.00 for each Reprint Package for postage and handling. Make checks payable to the American Chemical Society.

BULK RATES: Subtract 20% from the listed price for orders of 50 or more of any one item.

#### Please ship the following reprints and supplements:

Reprint No./Package \_\_\_\_\_, \_\_\_\_\_ copies \$ \_\_\_\_\_

Reprint No./Package \_\_\_\_\_, \_\_\_\_\_ copies \$ \_\_\_\_\_

Reprint No./Package \_\_\_\_\_, \_\_\_\_\_ copies \$ \_\_\_\_\_

Reprint No./Package \_\_\_\_\_, \_\_\_\_\_ copies \$ \_\_\_\_\_

Vol. 2, Suppl. 1  Hardcover \_\_\_\_\_ copies \$ \_\_\_\_\_  
 Softcover

Vol. 3, Suppl. 1  Hardcover \_\_\_\_\_ copies \$ \_\_\_\_\_  
 Softcover

Vol. 6, Suppl. 1  Hardcover \_\_\_\_\_ copies \$ \_\_\_\_\_  
 Softcover

Vol. 10, Suppl. 1  Hardcover \_\_\_\_\_ copies \$ \_\_\_\_\_

Vol. 11, Suppl. 1  Hardcover \_\_\_\_\_ copies \$ \_\_\_\_\_

Vol. 11, Suppl. 2  Hardcover \_\_\_\_\_ copies \$ \_\_\_\_\_

Vol. 13, Suppl. 1  Hardcover \_\_\_\_\_ copies \$ \_\_\_\_\_

Vol. 14, Suppl. 1  Hardcover \_\_\_\_\_ copies \$ \_\_\_\_\_

Vol. 14, Suppl. 2  Hardcover \_\_\_\_\_ copies \$ \_\_\_\_\_

Other Suppl.: \_\_\_\_\_ copies \$ \_\_\_\_\_

Total Enclosed \$ \_\_\_\_\_

## (Continuation of Cumulative Listing of Reprints)

25. Tables of Molecular Vibrational Frequencies, Part 7, *T. Shimanouchi*, Vol. 2, No. 2, pp. 225-256 (1973) (superseded by No. 103) \$4.00
26. Energy Levels of Neutral Helium ( $^4\text{He I}$ ), *W.C. Martin*, Vol. 2, No. 2, pp. 257-266 (1973) \$3.00
27. Survey of Photochemical and Rate Data for Twenty-eight Reactions of Interest in Atmospheric Chemistry, *R.F. Hampson, Editor, W. Braun, R.L. Brown, D. Garvin, J.T. Herron, R.E. Huie, M.J. Kurylo, A.H. Laufer, J.D. McKinley, H. Okabe, M.D. Scheer, W. Tsang, and D.H. Stedman*, Vol. 2, No. 2, pp. 267-312 (1973) \$4.50
28. Compilation of the Static Dielectric Constant of Inorganic Solids, *K.F. Young and H.P.R. Frederikse*, Vol. 2, No. 2, pp. 313-410 (1973) \$6.50
29. Soft X-Ray Emission Spectra of Metallic Solids: Critical Review of Selected Systems, *A.J. McAlister, R.C. Dobbyn, J.R. Cuthill, and M.L. Williams*, Vol. 2, No. 2, pp. 411-426 (1973) \$3.00
30. Ideal Gas Thermodynamic Properties of Ethane and Propane, *J. Chao, R.C. Wilhoit, and B.J. Zwolinski*, Vol. 2, No. 2, pp. 427-438 (1973) \$3.00
31. An Analysis of Coexistence Curve Data for Several Binary Liquid Mixtures Near Their Critical Points, *A. Stein and G.F. Allen*, Vol. 2, No. 3, pp. 443-466 (1973) \$4.00
32. Rate Constants for the Reactions of Atomic Oxygen ( $\text{O}^3\text{P}$ ) with Organic Compounds in the Gas Phase, *John T. Herron and Robert E. Huie*, Vol. 2, No. 3, pp. 467-518 (1973) \$5.00
33. First Spectra of Neon, Argon, and Xenon 136 in the 1.2-4.0  $\mu\text{m}$  Region, *Curtis J. Humphreys*, Vol. 2, No. 3, pp. 519-530 (1973) \$3.00
34. Elastic Properties of Metals and Alloys, I. Iron, Nickel, and Iron-Nickel Alloys, *H.M. Ledbetter and R.P. Reed*, Vol. 2, No. 3, pp. 531-618 (1973) \$6.00
35. The Viscosity and Thermal Conductivity Coefficients of Dilute Argon, Krypton, and Xenon, *H.J.M. Hanley*, Vol. 2, No. 3, pp. 619-642 (1973) \$4.00
36. Diffusion in Copper and Copper Alloys, Part I. Volume and Surface Self-Diffusion in Copper, *Daniel B. Butrymowicz, John R. Manning, and Michael E. Read*, Vol. 2, No. 3, pp. 643-656 (1973) \$3.00
37. The 1973 Least-Squares Adjustment of the Fundamental Constants, *E. Richard Cohen and B.N. Taylor*, Vol. 2, No. 4, pp. 663-734 (1973) \$5.50
38. The Viscosity and Thermal Conductivity Coefficients of Dilute Nitrogen and Oxygen, *H.J.M. Hanley and James F. Ely*, Vol. 2, No. 4, pp. 735-756 (1973) \$4.00
39. Thermodynamic Properties of Nitrogen Including Liquid and Vapor Phases from 63 K to 2000 K with Pressures to 10,000 Bar, *Richard T. Jacobsen and Richard B. Stewart*, Vol. 2, No. 4, pp. 757-922 (1973) \$8.50
40. Thermodynamic Properties of Helium 4 from 2 to 1500 K at Pressures to  $10^8$  Pa, *Robert T. McCarty*, Vol. 2, No. 4, pp. 923-1042 (1973) \$7.00
44. Critical Analysis of Heat-Capacity Data and Evaluation of Thermodynamic Properties of Ruthenium, Rhodium, Palladium, Iridium, and Platinum from 0 to 300 K. A Survey of the Literature Data on Osmium, *George T. Furukawa, Martin L. Reilly, and John S. Gallagher*, Vol. 3, No. 1, pp. 163-209 (1974) \$4.50
45. Microwave Spectra of Molecules of Astrophysical Interest, V. Water Vapor, *Frank C. De Lucia, Paul Helminger, and William H. Kirchhoff*, Vol. 3, No. 1, pp. 211-219 (1974) \$3.00
46. Microwave Spectra of Molecules of Astrophysical Interest, VI. Carbonyl Sulfide and Hydrogen Cyanide, *Arthur G. Maki*, Vol. 3, No. 1, pp. 221-244 (1974) \$4.00
47. Microwave Spectra of Molecules of Astrophysical Interest, VII. Carbon Monoxide, Carbon Monosulfide, and Silicon Monoxide, *Frank J. Lovas and Paul H. Kruperie*, Vol. 3, No. 1, pp. 245-257 (1974) \$3.00
48. Microwave Spectra of Molecules of Astrophysical Interest, VIII. Sulfur Monoxide, *Eberhard Tiemann*, Vol. 3, No. 1, pp. 259-268 (1974) \$3.00
49. Tables of Molecular Vibrational Frequencies, Part 8, *T. Shimanouchi*, Vol. 3, No. 1, pp. 269-308 (1974) (superseded by No. 103) \$4.50
50. JANAF Thermochemical Tables, 1974 Supplement, *M.W. Chase, J.L. Curnutt, A.T. Hu, H. Prophet, A.N. Syverud, and L.C. Walker*, Vol. 3, No. 2, pp. 311-480 (1974) \$8.50
51. High Temperature Properties and Decomposition of Inorganic Salts, Part 4. Oxy-Salts of the Halogens, *Kurt H. Stern*, Vol. 3, No. 2, pp. 481-526 (1974) \$4.50
52. Diffusion in Copper and Copper Alloys, Part II. Copper-Silver and Copper-Gold Systems, *Daniel B. Butrymowicz, John R. Manning, and Michael E. Read*, Vol. 3, No. 2, pp. 527-602 (1974) \$5.50
53. Microwave Spectral Tables I. Diatomic Molecules, *Frank J. Lovas and Eberhard Tiemann*, Vol. 3, No. 3, pp. 609-770 (1974) \$8.50
54. Ground Levels and Ionization Potentials for Lanthanide and Actinide Atoms and Ions, *W.C. Martin, Lucy Hagan, Joseph Reader, and Jack Sugar*, Vol. 3, No. 3, pp. 771-780 (1974) \$3.00
55. Behavior of the Elements at High Pressures, *John Francis Cannon*, Vol. 3, No. 3, pp. 781-824 (1974) \$4.50
56. Reference Wavelengths from Atomic Spectra in the Range 15  $\text{\AA}$  to 25000  $\text{\AA}$ , *Victor Kaufman and Bengt Edlén*, Vol. 3, No. 4, pp. 825-895 (1974) \$5.50
57. Elastic Properties of Metals and Alloys. II. Copper, *H.M. Ledbetter and E.R. Naimon*, Vol. 3, No. 4, pp. 897-935 (1974) \$4.50
58. A Critical Review of H-Atom Transfer in the Liquid Phase: Chlorine Atom, Alkyl, Trichloromethyl, Alkoxy, and Alkylperoxy Radicals, *D.G. Hendry, T. Mill, L. Piszkiwicz, J.A. Howard, and H.K. Eigenmann*, Vol. 3, No. 4, pp. 937-978 (1974) \$4.50
59. The Viscosity and Thermal Conductivity Coefficients for Dense Gaseous and Liquid Argon, Krypton, Xenon, Nitrogen, and Oxygen, *H.J.M. Hanley, R.D. McCarty, and W.M. Haynes*, Vol. 3, No. 4, pp. 979-1017 (1974) \$4.50

### Reprints from Volume 3

41. Molten Salts: Volume 4, Part 1, Fluorides and Mixtures, Electrical Conductance, Density, Viscosity, and Surface Tension Data, *G.J. Janz, G.L. Gardner, Ursula Krebs, and R.P.T. Tomkins*, Vol. 3, No. 1, pp. 1-115 (1974) \$7.00
42. Ideal Gas Thermodynamic Properties of Eight Chloro- and Fluoromethanes, *A.S. Rodgers, J. Chao, R. C. Wilhoit, and B.J. Zwolinski*, Vol. 3, No. 1, pp. 117-140 (1974) \$4.00
43. Ideal Gas Thermodynamic Properties of Six Chloroethanes, *J. Chao, A.S. Rodgers, R.C. Wilhoit, and B.J. Zwolinski*, Vol. 3, No. 1, pp. 141-162 (1974) \$4.00

### Reprints from Volume 4

60. JANAF Thermochemical Tables, 1975 Supplement, *M.W. Chase, J.L. Curnutt, H. Prophet, R.A. McDonald, and A.N. Syverud*, Vol. 4, No. 1, pp. 1-175 (1975) \$8.50
61. Diffusion in Copper and Copper Alloys, Part III. Diffusion in Systems Involving Elements of the Groups IA, IIA, IIIB, IVB, VB, VIB, and VIIB, *Daniel B. Butrymowicz, John R. Manning, and Michael E. Read*, Vol. 4, No. 1, pp. 177-249 (1975) \$6.00

(Continuation of Cumulative Listing of Reprints)

62. Ideal Gas Thermodynamic Properties of Ethylene and Propylene, <i>Jing Chao and Bruno J. Zwolinski</i> , Vol. 4, No. 1, pp. 251-261 (1975)	\$3.00	82. Tables of Critically Evaluated Oscillator Strengths for the Lithium Isoelectronic Sequence, <i>G.A. Martin and W.L. Wiese</i> , Vol. 5, No. 3, pp. 537-570 (1976)	\$4.50
63. Atomic Transition Probabilities for Scandium and Titanium (A Critical Data Compilation of Allowed Lines), <i>W.L. Wiese and J.R. Fuhr</i> , Vol. 4, No. 2, pp. 263-352 (1975)	\$6.00	83. Ideal Gas Thermodynamic Properties of Six Chloro-fluoromethanes, <i>S.S. Chen, R. C. Wilhoit, and B.J. Zwolinski</i> , Vol. 5, No. 3, pp. 571-580 (1976)	\$3.00
64. Energy Levels of Iron, Fe <sub>xxvi</sub> through Fe <sub>xxvii</sub> , <i>Joseph Reader and Jack Sugar</i> , Vol. 4, No. 2, pp. 353-440 (1975)	\$6.00	84. Survey of Superconductive Materials and Critical Evaluation of Selected Properties, <i>B.W. Roberts</i> , Vol. 5, No. 3, pp. 581-821 (1976)	\$12.50
65. Ideal Gas Thermodynamic Properties of Six Fluoroethanes, <i>S.S. Chen, A.S. Rodgers, J. Chao, R.C. Wilhoit, and B.J. Zwolinski</i> , Vol. 4, No. 2, pp. 441-456 (1975)	\$3.00	85. Nuclear Spins and Moments, <i>Gladys H. Fuller</i> , Vol. 5, No. 4, pp. 835-1092 (1976)	\$11.50
66. Ideal Gas Thermodynamic Properties of the Eight Bromo- and Iodomethanes, <i>S.A. Kudchadker and A.P. Kudchadker</i> , Vol. 4, No. 2, pp. 457-470 (1975)	\$3.00	86. Nuclear Moments and Moment Ratios as Determined by Mössbauer Spectroscopy, <i>J.G. Stevens and B.D. Dunlap</i> , Vol. 5, No. 4, pp. 1093-1121 (1976)	\$4.00
67. Atomic Form Factors, Incoherent Scattering Functions, and Photon Scattering Cross Sections, <i>J.H. Hubbell, Wm.J. Veigele, E.A. Briggs, R.T. Brown, D.T. Cromer, and R.J. Howerton</i> , Vol. 4, No. 3, pp. 471-538 (1975)	\$5.50	87. Rate Coefficients for Ion-Molecule Reactions, I. Ions Containing C and H, <i>L. Wayne Sieck and Sharon G. Lias</i> , Vol. 5, No. 4, pp. 1123-1146 (1976)	\$4.00
68. Binding Energies in Atomic Negative Ions, <i>H. Hotop and W.C. Lineberger</i> , Vol. 4, No. 3, pp. 539-576 (1975)	\$4.50	88. Microwave Spectra of Molecules of Astrophysical Interest, XI. Silicon Sulfide, <i>Eberhard Tiemann</i> , Vol. 5, No. 4, pp. 1147-1156 (1976)	\$3.00
69. A Survey of Electron Swarm Data, <i>J. Dutton</i> , Vol. 4, No. 3, pp. 577-856 (1975)	\$12.00	89. Property Index and Author Index to Volumes 1-5 (1972-1976), Vol. 5, No. 4, pp. 1161-1183	\$4.00
70. Ideal Gas Thermodynamic Properties and Isomerization of <i>n</i> -Butane and Isobutane, <i>S.S. Chen, R.C. Wilhoit, and B.J. Zwolinski</i> , Vol. 4, No. 4, pp. 859-869 (1975)	\$3.00		
71. Molten Salts: Volume 4, Part 2, Chlorides and Mixtures, Electrical Conductance, Density, Viscosity, and Surface Tension Data, <i>G.J. Janz, R.P.T. Tomkins, C.B. Allen, J.R. Downey, Jr., G.L. Gardner, U. Krebs, and S.K. Singer</i> , Vol. 4, No. 4, pp. 871-1178 (1975)	\$13.00		
72. Property Index to Volumes 1-4 (1972-1975), Vol. 4, No. 4, pp. 1179-1192 (1975)	\$3.00		

**Reprints from Volume 5**

73. Scaled Equation of State Parameters for Gases in the Critical Region, <i>J.M.H. Levelt Sengers, W.L. Greer, and J.V. Sengers</i> , Vol. 5, No. 1, pp. 1-51 (1976)	\$5.00
74. Microwave Spectra of Molecules of Astrophysical Interest, IX. Acetaldehyde, <i>A. Bauder, F.J. Lovas, and D.R. Johnson</i> , Vol. 5, No. 1, pp. 53-77 (1976)	\$4.00
75. Microwave Spectra of Molecules of Astrophysical Interest, X. Isocyanic Acid, <i>G. Winnewisser, W.H. Hocking, and M.C.L. Gerry</i> , Vol. 5, No. 1, pp. 79-101 (1976)	\$4.00
76. Diffusion in Copper and Copper Alloys, Part IV. Diffusion in Systems Involving Elements of Group VIII, <i>Daniel B. Butrymowicz, John R. Manning, and Michael E. Read</i> , Vol. 5, No. 1, pp. 103-200 (1976)	\$6.50
77. A Critical Review of the Stark Widths and Shifts of Spectral Lines from Non-Hydrogenic Atoms, <i>N. Konjevic and J.R. Roberts</i> , Vol. 5, No. 2, pp. 209-257 (1976)	\$5.00
78. Experimental Stark Widths and Shifts for Non-Hydrogenic Spectral Lines of Ionized Atoms (A Critical Review and Tabulation of Selected Data), <i>N. Konjevic and W.L. Wiese</i> , Vol. 5, No. 2, pp. 259-308 (1976)	\$5.00
79. Atlas of the Absorption Spectrum of Nitric Oxide (NO) between 1420 and 1250 Å, <i>E. Miescher and F. Alberti</i> , Vol. 5, No. 2, pp. 309-317 (1976)	\$3.00
80. Ideal Gas Thermodynamic Properties of Propanone and 2-Butanone, <i>Jing Chao and Bruno J. Zwolinski</i> , Vol. 5, No. 2, pp. 319-328 (1976)	\$3.00
81. Refractive Index of Alkali Halides and Its Wavelength and Temperature Derivatives, <i>H.H. Li</i> , Vol. 5, No. 2, pp. 329-528 (1976)	\$9.50

**Reprints from Volume 6**

90. Diffusion in Copper and Copper Alloys, Part V. Diffusion in Systems Involving Elements of Group VA, <i>Daniel B. Butrymowicz, John R. Manning, and Michael E. Read</i> , Vol. 6, No. 1, pp. 1-50 (1977)	\$5.00
91. The Calculated Thermodynamic Properties of Superfluid Helium-4, <i>James S. Brooks and Russell J. Donnelly</i> , Vol. 6, No. 1, pp. 51-104 (1977)	\$5.00
92. Thermodynamic Properties of Normal and Deuterated Methanols, <i>S.S. Chen, R.C. Wilhoit, and B.J. Zwolinski</i> , Vol. 6, No. 1, pp. 105-112 (1977)	\$3.00
93. The Spectrum of Molecular Nitrogen, <i>Alf Lofthus and Paul H. Krupenie</i> , Vol. 6, No. 1, pp. 113-307 (1977)	\$9.50
94. Energy Levels of Chromium, Cr <sub>I</sub> through Cr <sub>xxiv</sub> , <i>Jack Sugar and Charles Corliss</i> , Vol. 6, No. 2, pp. 317-383 (1977)	\$5.50
95. The Activity and Osmotic Coefficients of Aqueous Calcium Chloride at 298.15 K, <i>Bert R. Staples and Ralph L. Nuttall</i> , Vol. 6, No. 2, pp. 385-407 (1977)	\$4.00
96. Molten Salts: Volume 4, Part 3, Bromides and Mixtures; Iodides and Mixtures-Electrical Conductance, Density, Viscosity, and Surface Tension Data, <i>G.J. Janz, R.P.T. Tomkins, C.B. Allen, J.R. Downey, Jr., and S.K. Singer</i> , Vol. 6, No. 2, pp. 409-596 (1977)	\$9.00
97. The Viscosity and Thermal Conductivity Coefficients for Dense Gaseous and Liquid Methane, <i>H.J.M. Hanley, W.M. Haynes, and R.D. McCarty</i> , Vol. 6, No. 2, pp. 597-609 (1977)	\$3.00
98. Phase Diagrams and Thermodynamic Properties of Ternary Copper-Silver Systems, <i>Y. Austin Chang, Daniel Goldberg, and Joachim P. Neumann</i> , Vol. 6, No. 3, pp. 621-673 (1977)	\$5.00
99. Crystal Data Space-Group Tables, <i>Alan D. Mighell, Helen M. Ondik, and Bettijoyce Breen Molino</i> , Vol. 6, No. 3, pp. 675-829 (1977)	\$8.00
100. Energy Levels of One-Electron Atoms, <i>Glen W. Erickson</i> , Vol. 6, No. 3, pp. 831-869 (1977)	\$4.50
101. Rate Constants for Reactions of ClO <sub>x</sub> of Atmospheric Interest, <i>R.T. Watson</i> , Vol. 6, No. 3, pp. 871-917 (1977)	\$4.50
102. NMR Spectral Data: A Compilation of Aromatic Proton Chemical Shifts in Mono- and Di-Substituted Benzenes, <i>B.L. Shapiro and L.E. Mohrmann</i> , Vol. 6, No. 3, pp. 919-991 (1977)	\$5.50

## (Continuation of Cumulative Listing of Reprints)

103. Tables of Molecular Vibrational Frequencies. Consolidated Volume II. *T. Shimanouchi*, Vol. 6, No. 3, pp. 993-1102 (1977) (supersedes Nos. 5, 21, 25, 49) \$6.50
104. Effects of Isotopic Composition, Temperature, Pressure, and Dissolved Gases on the Density of Liquid Water, *George S. Kell*, Vol. 6, No. 4, pp. 1109-1131 (1977) \$4.00
105. Viscosity of Water Substance—New International Formulation and Its Background, *A. Nagashima*, Vol. 6, No. 4, pp. 1133-1166 (1977) \$4.50
106. A Correlation of the Existing Viscosity and Thermal Conductivity Data of Gaseous and Liquid Ethane, *H.J.M. Hanley, K.E. Gubbins, and S. Murad*, Vol. 6, No. 4, pp. 1167-1180 (1977) \$3.00
107. Elastic Properties of Zinc: A Compilation and a Review, *H.M. Ledbetter*, Vol. 6, No. 4, pp. 1181-1203 (1977) \$4.00
108. Behavior of the AB-Type Compounds at High Pressures and High Temperatures, *Leo Merrill*, Vol. 6, No. 4, pp. 1205-1252 (1977) \$4.50
109. Energy Levels of Manganese, Mn I through Mn xxv, *Charles Corliss and Jack Sugar*, Vol. 6, No. 4, pp. 1253-1329 (1977) \$5.50
123. Thermal Conductivity of Ten Selected Binary Alloy Systems, *C.Y. Ho, M.W. Ackerman, K.Y. Wu, S.G. Oh, and T.N. Havill*, Vol. 7, No. 3, pp. 959-1177 (1978) \$10.00
124. Semi-Empirical Extrapolation and Estimation of Rate Constants for Abstraction of H from Methane by H, O, HO, and O<sub>2</sub>, *Robert Shaw*, Vol. 7, No. 3, pp. 1179-1190 (1978) \$3.00
125. Energy Levels of Vanadium, V I through V xxxiii, *Jack Sugar and Charles Corliss*, Vol. 7, No. 3, pp. 1191-1262 (1978) \$5.50
126. Recommended Atomic Electron Binding Energies, 1s to 6p<sub>3/2</sub>, for the Heavy Elements, Z = 84 to 103, *F.T. Porter and M.S. Freedman*, Vol. 7, No. 4, pp. 1267-1284 (1978) \$4.00
127. Ideal Gas Thermodynamic Properties of CH<sub>4-(a+b+c+d)</sub>F<sub>a</sub>Cl<sub>b</sub>Br<sub>c</sub>I<sub>d</sub> Halomethanes, *Shanti A. Kudchadker and Arvind P. Kudchadker*, Vol. 7, No. 4, pp. 1285-1307 (1978) \$4.00
128. Critical Review of Vibrational Data and Force Field Constants for Polyethylene, *John Barnes and Bruno Fanconi*, Vol. 7, No. 4, pp. 1309-1321 (1978) \$3.00
129. Tables of Molecular Vibrational Frequencies, Part 9, *Takehiko Shimanouchi, Hiroatsu Matsuura, Yoshiki Ogawa, and Issei Harada*, Vol. 7, No. 4, pp. 1323-1443 (1978) \$7.00
130. Microwave Spectral Tables. II. Triatomic Molecules, *Frank J. Lovas*, Vol. 7, No. 4, pp. 1445-1750 (1978) \$13.00

## Reprints from Volume 7

110. Tables of Atomic Spectral Lines for the 10 000 Å to 40 000 Å Region, *Michael Outred*, Vol. 7, No. 1, pp. 1-262 (1978) \$11.50
111. Evaluated Activity and Osmotic Coefficients for Aqueous Solutions: The Alkaline Earth Metal Halides, *R.N. Goldberg and R.L. Nuttall*, Vol. 7, No. 1, pp. 263-310 (1978) \$4.50
112. Microwave Spectra of Molecules of Astrophysical Interest XII. Hydroxyl Radical, *Robert A. Beaudet and Robert L. Poynter*, Vol. 7, No. 1, pp. 311-362 (1978) \$5.00
113. Ideal Gas Thermodynamic Properties of Methanoic and Ethanoic Acids, *Jing Chao and Bruno J. Zwolinski*, Vol. 7, No. 1, pp. 363-377 (1978) \$3.00
114. Critical Review of Hydrolysis of Organic Compounds in Water Under Environmental Conditions, *W. Mabey and T. Mill*, Vol. 7, No. 2, pp. 383-415 (1978) \$4.50
115. Ideal Gas Thermodynamic Properties of Phenol and Creosols, *S.A. Kudchadker, A.P. Kudchadker, R.C. Wilhoit, and B.J. Zwolinski*, Vol. 7, No. 2, pp. 417-423 (1978) \$3.00
116. Densities of Liquid CH<sub>4-a</sub>X<sub>a</sub> (X = Br, I) and CH<sub>4-(a+b+c+d)</sub>F<sub>a</sub>Cl<sub>b</sub>Br<sub>c</sub>I<sub>d</sub> Halomethanes, *A.P. Kudchadker, S.A. Kudchadker, P.R. Patnaik, and P.P. Mishra*, Vol. 7, No. 2, pp. 425-439 (1978) \$3.00
117. Microwave Spectra of Molecules of Astrophysical Interest XIII. Cyanoacetylene, *W.J. Lafferty and F.J. Lovas*, Vol. 7, No. 2, pp. 441-493 (1978) \$5.00
118. Atomic Transition Probabilities for Vanadium, Chromium, and Manganese (A Critical Data Compilation of Allowed Lines), *S.M. Younger, J.R. Fuhr, G.A. Martin, and W.L. Wiese*, Vol. 7, No. 2, pp. 495-629 (1978) \$7.50
119. Thermodynamic Properties of Ammonia, *Lester Haar and John S. Gallagher*, Vol. 7, No. 3, pp. 635-792 (1978) \$8.00
120. JANAF Thermochemical Tables, 1978 Supplement, *M.W. Chase, Jr., J.L. Curnutt, R.A. McDonald, and A.N. Syverud*, Vol. 7, No. 3, pp. 793-940 (1978) \$8.00
121. Viscosity of Liquid Water in the Range -8°C to 150°C, *Joseph Kestin, Mordechai Sokolov, and William A. Wakeham*, Vol. 7, No. 3, pp. 941-948 (1978) \$3.00
122. The Molar Volume (Density) of Solid Oxygen in Equilibrium with Vapor, *H.M. Roder*, Vol. 7, No. 3, pp. 949-957 (1978) \$3.00

## Reprints from Volume 8

131. Energy Levels of Titanium, Ti I through Ti xxii, *Charles Corliss and Jack Sugar*, Vol. 8, No. 1, pp. 1-62 (1979) \$5.00
132. The Spectrum and Energy Levels of the Neutral Atom of Boron (B I), *G.A. Odintzova and A.R. Striganov*, Vol. 8, No. 1, pp. 63-67 (1979) \$3.00
133. Relativistic Atomic Form Factors and Photon Coherent Scattering Cross Sections, *J.H. Hubbell and I. Overbø*, Vol. 8, No. 1, pp. 69-105 (1979) \$4.50
134. Microwave Spectra of Molecules of Astrophysical Interest. XIV. Vinyl Cyanide (Acrylonitrile), *M.C.L. Gerry, K. Yamada, and G. Winnewisser*, Vol. 8, No. 1, pp. 107-123 (1979) \$4.00
135. Molten Salts: Volume 4, Part 4, Mixed Halide Melts. Electrical Conductance, Density, Viscosity, and Surface Tension Data, *G.J. Janz, R.P.T. Tomkins, and C.B. Allen*, Vol. 8, No. 1, pp. 125-302 (1979) \$9.00
136. Atomic Radiative and Radiationless Yields for K and L Shells, *M.O. Krause*, Vol. 8, No. 2, pp. 307-327 (1979) \$4.00
137. Natural Widths of Atomic K and L Levels, K $\alpha$  X-ray Lines and Several KLL Auger Lines, *M.O. Krause and J.H. Oliver*, Vol. 8, No. 2, pp. 329-338 (1979) \$3.00
138. Electrical Resistivity of Alkali Elements, *T.C. Chi*, Vol. 8, No. 2, pp. 339-438 (1979) \$6.50
139. Electrical Resistivity of Alkaline Earth Elements, *T.C. Chi*, Vol. 8, No. 2, pp. 439-497 (1979) \$5.00
140. Vapor Pressures and Boiling Points of Selected Halomethanes, *A.P. Kudchadker, S.A. Kudchadker, R.P. Shukla, and P.R. Patnaik*, Vol. 8, No. 2, pp. 499-517 (1979) \$4.00
141. Ideal Gas Thermodynamic Properties of Selected Bromoethanes and Iodoethane, *S.A. Kudchadker and A.P. Kudchadker*, Vol. 8, No. 2, pp. 519-526 (1979) \$3.00
142. Thermodynamic Properties of Normal and Deuterated Naphthalenes, *S.S. Chen, S.A. Kudchadker, and R.C. Wilhoit*, Vol. 8, No. 2, pp. 527-535 (1979) \$3.00

(Continuation of Cumulative Listing of Reprints)

143. Microwave Spectra of Molecules of Astrophysical Interest. XV. Propyne, <i>A. Bauer, D. Boucher, J. Burie, J. Demaison, and A. Dubrulle</i> , Vol. 8, No. 2, pp. 537-558 (1979)	\$4.00	161. A Compilation of Kinetic Parameters for the Thermal Degradation of <i>n</i> -Alkane Molecules, <i>D.L. Allara and Robert Shaw</i> , Vol. 9, No. 3, pp. 523-559 (1980)	\$5.50
144. A Correlation of the Viscosity and Thermal Conductivity Data of Gaseous and Liquid Propane, <i>P.M. Holland, H.J.M. Hanley, K.E. Gubbins, and J.M. Haile</i> , Vol. 8, No. 2, pp. 559-575 (1979)	\$4.00	162. Refractive Index of Silicon and Germanium and Its Wavelength and Temperature Derivatives, <i>H.H. Li</i> , Vol. 9, No. 3, pp. 561-658 (1980)	\$7.50
145. Microwave Spectra of Molecules of Astrophysical Interest. XVI. Methyl Formate, <i>A. Bauder</i> , Vol. 8, No. 3, pp. 583-618 (1979)	\$4.50	163. Microwave Spectra of Molecules of Astrophysical Interest XIX. Methyl Cyanide, <i>D. Boucher, J. Burie, A. Bauer, A. Dubrulle, and J. Demaison</i> , Vol. 9, No. 3, pp. 659-719 (1980).	\$6.00
146. Molecular Structures of Gas-Phase Polyatomic Molecules Determined by Spectroscopic Methods, <i>Marlin D. Harmony, Victor W. Laurie, Robert L. Kuczkowski, R.H. Schwendeman, D.A. Ramsay, Frank J. Lovas, Walter J. Lafferty, and Arthur G. Maki</i> , Vol. 8, No. 3, pp. 619-721 (1979)	\$6.50	164. A Review, Evaluation, and Correlation of the Phase Equilibria, Heat of Mixing, and Change in Volume on Mixing for Liquid Mixtures of Methane + Propane, <i>R.C. Miller, A.J. Kidnay, and M.J. Hiza</i> , Vol. 9, No. 3, pp. 721-734 (1980)	\$4.00
147. Critically Evaluated Rate Constants for Gaseous Reactions of Several Electronically Excited Species, <i>Keith Schofield</i> , Vol. 8, No. 3, pp. 723-798 (1979)	\$5.50	165. Saturation States of Heavy Water, <i>P.G. Hill and R.D. Chris MacMillan</i> , Vol. 9, No. 3, pp. 735-749 (1980)	\$4.00
148. A Review, Evaluation, and Correlation of the Phase Equilibria, Heat of Mixing, and Change in Volume on Mixing for Liquid Mixtures of Methane + Ethane, <i>M.J. Hiza, R.C. Miller, and A.J. Kidnay</i> , Vol. 8, No. 3, pp. 799-816 (1979)	\$4.00	166. The Solubility of Some Sparingly Soluble Lead Salts: An Evaluation of the Solubility in Water and Aqueous Electrolyte Solution, <i>H. Lawrence Clever and Francis J. Johnston</i> , Vol. 9, No. 3, pp. 751-784 (1980)	\$5.50
149. Energy Levels of Aluminum, Al <sub>I</sub> through Al <sub>XIII</sub> , <i>W.C. Martin and Romuald Zalubas</i> , Vol. 8, No. 3, pp. 817-864 (1979)	\$4.50	167. Molten Salts Data as Reference Standards for Density, Surface Tension, Viscosity, and Electrical Conductance: KNO <sub>3</sub> and NaCl, <i>George J. Janz</i> , Vol. 9, No. 4, pp. 791-829 (1980)	\$5.50
150. Energy Levels of Calcium, Ca <sub>I</sub> through Ca <sub>XX</sub> , <i>Jack Sugar and Charles Corliss</i> , Vol. 8, No. 3, pp. 865-916 (1979)	\$5.00	168. Molten Salts: Volume 5, Part 1, Additional Single and Multi-Component Salt Systems. Electrical Conductance, Density, Viscosity, and Surface Tension Data, <i>G.J. Janz and R.P. Tomkins</i> , Vol. 9, No. 4, pp. 831-1021 (1980)	\$10.50
151. Evaluated Activity and Osmotic Coefficients for Aqueous Solutions: Iron Chloride and the Bi-univalent Compounds of Nickel and Cobalt, <i>R.N. Goldberg, R.L. Nutall, and B.R. Staples</i> , Vol. 8, No. 4, pp. 923-1003 (1979)	\$6.00	169. Pair, Triplet, and Total Atomic Cross Sections (and Mass Attenuation Coefficients) for 1 MeV-100 GeV Photons in Elements Z=1 to 100, <i>J.H. Hubbell, H.A. Gimm, and I. Øverbø</i> , Vol. 9, No. 4, pp. 1023-1147 (1980)	\$8.00
152. Evaluated Activity and Osmotic Coefficients for Aqueous Solutions: Bi-univalent Compounds of Lead, Copper, Manganese, and Uranium, <i>R.N. Goldberg</i> , Vol. 8, No. 4, pp. 1005-1050 (1979)	\$4.50	170. Tables of Molecular Vibrational Frequencies, Part 10, <i>Takehiko Shimanouchi, Hiroatsu Matsuura, Yoshiki Ogawa, and Issei Harada</i> , Vol. 9, No. 4, pp. 1149-1254 (1980)	\$7.50
153. Microwave Spectra of Molecules of Astrophysical Interest. XVII. Dimethyl Ether, <i>F.J. Lovas, H. Lutz, and H. Dreizler</i> , Vol. 8, No. 4, pp. 1051-1107 (1979)	\$5.00	171. An Improved Representative Equation for the Dynamic Viscosity of Water Substance, <i>J.T.R. Watson, R.S. Basu, and J.V. Sengers</i> , Vol. 9, No. 4, pp. 1255-1290 (1980)	\$5.50
154. Energy Levels of Potassium, K <sub>I</sub> through K <sub>XIX</sub> , <i>Charles Corliss and Jack Sugar</i> , Vol. 8, No. 4, pp. 1109-1145 (1979)	\$4.50	172. Static Dielectric Constant of Water and Steam, <i>M. Uematsu and E. U. Franck</i> , Vol. 9, No. 4, pp. 1291-1306 (1980)	\$4.00
155. Electrical Resistivity of Copper, Gold, Palladium, and Silver, <i>R.A. Matula</i> , Vol. 8, No. 4, pp. 1147-1298 (1979)	\$8.00	173. Compilation and Evaluation of Solubility Data in the Mercury (I) Chloride-Water System, <i>Y. Marcus</i> , Vol. 9, No. 4, pp. 1307-1329 (1980)	\$5.00

Reprints from Volume 9

156. Energy Levels of Magnesium, Mg <sub>I</sub> through Mg <sub>XII</sub> , <i>W.C. Martin and Romuald Zalubas</i> , Vol. 9, No. 1, pp. 1-58 (1980)	\$6.00	174. Evaluated Activity and Osmotic Coefficients for Aqueous Solutions: Bi-Univalent Compounds of Zinc, Cadmium, and Ethylene Bis(Trimethylammonium) Chloride and Iodide, <i>R. N. Goldberg</i> , Vol. 10, No. 1, pp. 1-55 (1981)	\$6.00
157. Microwave Spectra of Molecules of Astrophysical Interest. XVIII. Formic Acid, <i>Edmond Willemot, Didier Dangois, Nicole Monnanteuil, and Jean Bellet</i> , Vol. 9, No. 1, pp. 59-160 (1980)	\$7.50	175. Tables of the Dynamic and Kinematic Viscosity of Aqueous KCl Solutions in the Temperature Range 25-150 °C and the Pressure Range 0.1-35 MPa, <i>Joseph Kestin, H. Ezzat Khalifa, and Robert J. Correia</i> , Vol. 10, No. 1, pp. 57-70 (1981)	\$4.00
158. Refractive Index of Alkaline Earth Halides and Its Wavelength and Temperature Derivatives, <i>H.H. Li</i> , Vol. 9, No. 1, pp. 161-289 (1980).	\$8.50	176. Tables of the Dynamic and Kinematic Viscosity of Aqueous NaCl Solutions in the Temperature Range 20-150 °C and the Pressure Range 0.1-35 MPa, <i>Joseph Kestin, H. Ezzat Khalifa, and Robert J. Correia</i> , Vol. 10, No. 1, pp. 71-87 (1981)	\$5.00
159. Evaluated Kinetic and Photochemical Data for Atmospheric Chemistry, <i>D.L. Baulch, R.A. Cox, R.F. Hampson, Jr., J.A. Kerr, J. Troe, and R.L. Watson</i> , Vol. 9, No. 2, pp. 295-471 (1980)	\$10.00	177. Heat Capacity and Other Thermodynamic Properties of Linear Macromolecules. I. Selenium, <i>Umesh Gaur, Hua-Cheng Shu, Aspy Mehta, and Bernhard Wunderlich</i> , Vol. 10, No. 1, pp. 89-117 (1981)	\$5.00
160. Energy Levels of Scandium, Sc <sub>I</sub> through Sc <sub>XXII</sub> , <i>Jack Sugar and Charles Corliss</i> , Vol. 9, No. 2, pp. 473-511 (1980)	\$5.50		



## (Continuation of Cumulative Listing of Reprints)

178. Heat Capacity and Other Thermodynamic Properties of Linear Macromolecules. II. Polyethylene, *Umesh Gaur and Bernhard Wunderlich*, Vol. 10, No. 1, pp. 119–152 (1981) \$5.50
179. Energy Levels of Sodium, Na<sub>I</sub> through Na<sub>XI</sub>, *W. C. Martin and Romuald Zalubas*, Vol. 10, No. 1, pp. 153–195 (1981) \$5.50
180. Energy Levels of Nickel, Ni<sub>I</sub> through Ni<sub>XXVIII</sub>, *Charles Corliss and Jack Sugar*, Vol. 10, No. 1, pp. 197–289 (1981) \$7.00
181. Ion Product of Water Substance, 0–1000 °C, 1–10,000 bars New International Formulation and Its Background, *William L. Marshall and E. U. Franck*, Vol. 10, No. 2, pp. 295–304 (1981) \$4.00
182. Atomic Transition Probabilities for Iron, Cobalt, and Nickel (A Critical Data Compilation of Allowed Lines), *J. R. Fuhr, G. A. Martin, W. L. Wiese, and S. M. Younger*, Vol. 10, No. 2, pp. 305–565 (1981) \$12.50
183. Thermodynamic Tabulations for Selected Phases in the System CaO-Al<sub>2</sub>O<sub>3</sub>-SiO<sub>2</sub>-H<sub>2</sub>O at 101.325 kPa (1 atm) between 273.15 and 1800 K, *John L. Haas, Jr., Gilpin R. Robinson, Jr., and Bruce S. Hemingway*, Vol. 10, No. 3, pp. 575–669 (1981) \$7.00
184. Evaluated Activity and Osmotic Coefficients for Aqueous Solutions: Thirty-Six Uni-Bivalent Electrolytes, *R. N. Goldberg*, Vol. 10, No. 3, pp. 671–764 (1981) \$7.00
185. Activity and Osmotic Coefficients of Aqueous Alkali Metal Nitrites, *Bert R. Staples*, Vol. 10, No. 3, pp. 765–778 (1981) \$4.00
186. Activity and Osmotic Coefficients of Aqueous Sulfuric Acid at 298.15 K, *Bert R. Staples*, Vol. 10, No. 3, pp. 779–798 (1981) \$5.00
187. Rate Constants for the Decay and Reactions of the Lowest Electronically Excited Singlet State of Molecular Oxygen in Solution, *Francis Wilkinson and James G. Brummer*, Vol. 10, No. 4, pp. 809–999 (1981) \$10.00
188. Heat Capacity and Other Thermodynamic Properties of Linear Macromolecules. III. Polyoxides, *Umesh Gaur and Bernhard Wunderlich*, Vol. 10, No. 4, pp. 1001–1049 (1981) \$5.50
189. Heat Capacity and Other Thermodynamic Properties of Linear Macromolecules. IV. Polypropylene, *Umesh Gaur and Bernhard Wunderlich*, Vol. 10, No. 4, pp. 1051–1064 (1981) \$4.00
190. Tables of N<sub>2</sub>O Absorption Lines for the Calibration of Tunable Infrared Lasers from 522 cm<sup>-1</sup> to 657 cm<sup>-1</sup> and from 1115 cm<sup>-1</sup> to 1340 cm<sup>-1</sup>, *W. B. Olson, A. G. Maki, and W. J. Lafferty*, Vol. 10, No. 4, pp. 1065–1084 (1981) \$5.00
191. Microwave Spectra of Molecules of Astrophysical Interest. XX. Methane, *I. Ozier, M. C. L. Gerry, and A. G. Robiette*, Vol. 10, No. 4, pp. 1085–1095 (1981) \$4.00
192. Energy Levels of Cobalt, Co<sub>I</sub> through Co<sub>XXVII</sub>, *Jack Sugar and Charles Corliss*, Vol. 10, No. 4, pp. 1097–1174 (1981) \$6.50
193. A Critical Review of Henry's Law Constants for Chemicals of Environmental Interest, *Donald Mackay and Wan Ying Shiu*, Vol. 10, No. 4, pp. 1175–1199 (1981) \$5.00
194. Property, Materials, and Author Indexes to the Journal of Physical and Chemical Reference Data, Vol. 1–10, pp. 1205–1225 (1972–1981) \$5.00
197. Ideal Gas Thermodynamic Properties of CH<sub>3</sub>, CD<sub>3</sub>, CD<sub>4</sub>, C<sub>2</sub>D<sub>2</sub>, C<sub>2</sub>D<sub>4</sub>, C<sub>2</sub>D<sub>6</sub>, C<sub>2</sub>H<sub>6</sub>, CH<sub>3</sub>N<sub>2</sub>CH<sub>3</sub>, and CD<sub>3</sub>N<sub>2</sub>CD<sub>3</sub>, *Krishna M. Pamidimukkala, David Rogers, and Gordon B. Skinner*, Vol. 11, No. 1, pp. 83–99 (1982) \$6.00
198. Peak Absorption Coefficients of Microwave Absorption Lines of Carbonyl Sulphide, *Z. Kisiel and D. J. Millen*, Vol. 11, No. 1, pp. 99–116 (1982) \$6.00
199. Vibrational Contributions to Molecular Dipole Polarizabilities, *David M. Bishop and Lap M. Cheung*, Vol. 11, No. 1, pp. 119–133 (1982) \$5.00
200. Energy Levels of Iron, Fe<sub>I</sub> through Fe<sub>XXVI</sub>, *Charles Corliss and Jack Sugar*, Vol. 11, No. 1, pp. 135–241 (1982) \$11.00
201. Microwave Spectra of Molecules of Astrophysical Interest. XXI. Ethanol (C<sub>2</sub>H<sub>5</sub>OH) and Propionitrile (C<sub>2</sub>H<sub>5</sub>CN), *Frank J. Lovas*, Vol. 11, No. 2, pp. 251–312 (1982) \$8.00
202. Heat Capacity and Other Thermodynamic Properties of Linear Macromolecules. V. Polystyrene, *Umesh Gaur and Bernhard Wunderlich*, Vol. 11, No. 2, pp. 313–325 (1982) \$5.00
203. Evaluated Kinetic and Photochemical Data for Atmospheric Chemistry: Supplement 1, CODATA Task Group on Chemical Kinetics, *D. L. Baulch, R. A. Cox, P. J. Crutzen, R. F. Hampson, Jr., J. A. Kerr (Chairman), J. Troe, and R. T. Watson*, Vol. 11, No. 2, pp. 327–496 (1982) \$15.00
204. Molten Salts Data: Diffusion Coefficients in Single and Multi-Component Salt Systems, *G. J. Janz and N. P. Bansal*, Vol. 11, No. 3, pp. 505–693 (1982) \$16.00
205. JANAF Thermochemical Tables, 1982 Supplement, *M. W. Chase, Jr., J. L. Curnutt, J. R. Downey, Jr., R. A. McDonald, A. N. Syverud, and E. A. Valenzuela*, Vol. 11, No. 3, pp. 695–940 (1982) \$20.00
206. Critical Evaluation of Vapor-Liquid Equilibrium, Heat of Mixing, and Volume Change of Mixing Data. General Procedures, *Buford D. Smith, OI Muthu, Ashok Dewan, and Matthew Gierlach*, Vol. 11, No. 3, pp. 941–951 (1982) \$5.00
207. Rate Coefficients for Vibrational Energy Transfer Involving the Hydrogen Halides, *Stephen R. Leone*, Vol. 11, No. 3, pp. 953–996 (1982) \$7.00
208. Behavior of the AB<sub>2</sub>-Type Compounds at High Pressures and High Temperatures, *Leo Merrill*, Vol. 11, No. 4, pp. 1005–1064 (1982) \$8.00
209. Heat Capacity and Other Thermodynamic Properties of Linear Macromolecules. VI. Acrylic Polymers, *Umesh Gaur, Suk-fai Lau, Brent B. Wunderlich, and Bernhard Wunderlich*, Vol. 11, No. 4, pp. 1065–1089 (1982) \$6.00
210. Molecular Form Factors and Photon Coherent Scattering Cross Sections of Water, *L. R. M. Morin*, Vol. 11, No. 4, pp. 1091–1098 (1982) \$5.00
211. Evaluation of Binary P<sub>Txy</sub> Vapor-Liquid Equilibrium Data for C<sub>6</sub> Hydrocarbons. Benzene + Cyclohexane, *Buford D. Smith, OI Muthu, Ashok Dewan, and Matthew Gierlach*, Vol. 11, No. 4, pp. 1099–1126 (1982) \$6.00
212. Evaluation of Binary Excess Enthalpy Data for C<sub>6</sub> Hydrocarbons. Benzene + Cyclohexane, *Buford D. Smith, OI Muthu, Ashok Dewan, and Matthew Gierlach*, Vol. 11, No. 4, pp. 1127–1149 (1982) \$6.00
213. Evaluation of Binary Excess Volume Data for C<sub>6</sub> Hydrocarbons. Benzene + Cyclohexane, *Buford D. Smith, OI Muthu, Ashok Dewan, and Matthew Gierlach*, Vol. 11, No. 4, pp. 1151–1169 (1982) \$6.00

### Reprints from Volume 11

195. A Fundamental Equation of State for Heavy Water, *P. G. Hill, R. D. Chris MacMillan, and V. Lee*, Vol. 11, No. 1, pp. 1–14 (1982) \$5.00
196. Volumetric Properties of Aqueous Sodium Chloride Solutions, *P. S. Z. Rogers and Kenneth S. Pitzer*, Vol. 11, No. 1, pp. 15–81 (1982) \$9.00

### Reprints from Volume 12

214. Thermodynamic Properties of Steam in the Critical Region, *J. M. H. Levelt Sengers, B. Kamgar-Parsi, F. W. Balfour, and J. V. Sengers*, Vol. 12, No. 1, pp. 1–28 (1983) \$6.00

(Continuation of Cumulative Listing of Reprints)

215. Heat Capacity and Other Thermodynamic Properties of Linear Macromolecules. VII. Other Carbon Backbone Polymers, *Umesh Gaur, Brent B. Wunderlich, and Bernhard Wunderlich*, Vol. 12, No. 1, pp. 29-63 (1983) \$7.00
216. Heat Capacity and Other Thermodynamic Properties of Linear Macromolecules. VIII. Polyesters and Polyamides, *Umesh Gaur, Suk-fai Lau, Brent B. Wunderlich, and Bernhard Wunderlich*, Vol. 12, No. 1, pp. 65-89 (1983) \$6.00
217. Heat Capacity and Other Thermodynamic Properties of Linear Macromolecules. IX. Final Group of Aromatic and Inorganic Polymers, *Umesh Gaur, Suk-fai Lau, and Bernhard Wunderlich*, Vol. 12, No. 1, pp. 91-108 (1983) \$6.00
218. An Annotated Compilation and Appraisal of Electron Swarm Data in Electronegative Gases, *J. W. Gallagher, E. C. Beaty, J. Dutton, and L. C. Pitchford*, Vol. 12, No. 1, pp. 109-152 (1983) \$7.00
219. The Solubility of Oxygen and Ozone in Liquids, *Rubin Battino, Timothy R. Rettich, and Toshihiro Tominaga*, Vol. 12, No. 2, pp. 163-178 (1983) \$5.00
220. Recommended Values for the Thermal Expansivity of Silicon from 0 to 1000 K, *C. A. Swenson*, Vol. 12, No. 2, pp. 179-182 (1983) \$5.00
221. Electrical Resistivity of Ten Selected Binary Alloy Systems, *C. Y. Ho, M. W. Ackerman, K. Y. Wu, T. N. Havill, R. H. Bogaard, R. A. Matula, S. G. Oh, and H. M. James*, Vol. 12, No. 2, pp. 183-322 (1983) \$13.00
222. Energy Levels of Silicon, Si I through Si XIV, *W. C. Martin and Romuald Zalubas*, Vol. 12, No. 2, pp. 323-380 (1983) \$8.00
223. Evaluation of Binary  $PT_{xy}$  Vapor-Liquid Equilibrium Data for  $C_6$  Hydrocarbons. Benzene + Hexane, *Buford D. Smith, Ol Muthu, and Ashok Dewan*, Vol. 12, No. 2, pp. 381-387 (1983) \$5.00
224. Evaluation of Binary Excess Enthalpy Data for  $C_6$  Hydrocarbons. Benzene + Hexane, *Buford D. Smith, Ol Muthu, and Ashok Dewan*, Vol. 12, No. 2, pp. 389-393 (1983) \$5.00
225. Evaluation of Binary Excess Volume Data for  $C_6$  Hydrocarbons. Benzene + Hexane, *Buford D. Smith, Ol Muthu, and Ashok Dewan*, Vol. 12, No. 2, pp. 395-401 (1983) \$5.00
226. Atlas of the High-Temperature Water Vapor Spectrum in the 3000 to 4000  $cm^{-1}$  Region, *A. S. Pine, M. J. Coulombe, C. Camy-Peyret, and J.-M. Flaud*, Vol. 12, No. 3, pp. 413-465 (1983) \$8.00
227. Small-Angle Rayleigh Scattering of Photons at High Energies: Tabulations of Relativistic HFS Modified Atomic Form Factors, *D. Schaupp, M. Schumacher, F. Smend, P. Rullhusen, and J. H. Hubbell*, Vol. 12, No. 3, pp. 467-512 (1983) \$7.00
228. Thermodynamic Properties of  $D_2O$  in the Critical Region, *B. Kamgar-Parsi, J. M. H. Levelt Sengers, and J. V. Sengers*, Vol. 12, No. 3, pp. 513-529 (1983) \$6.00
229. Chemical Kinetic Data Sheets for High-Temperature Chemical Reactions, *N. Cohen and K. R. Westberg*, Vol. 12, No. 3, pp. 531-590 (1983) \$8.00
230. Molten Salts: Volume 5, Part 2. Additional Single and Multi-Component Salt Systems. Electrical Conductance, Density, Viscosity and Surface Tension Data, *G. J. Janz and R. P. T. Tomkins*, Vol. 12, No. 3, pp. 591-815 (1983) \$19.00
231. International Tables of the Surface Tension of Water, *N. B. Vargaftik, B. N. Volkov, and L. D. Voljak*, Vol. 12, No. 3, pp. 817-820 (1983) \$5.00
232. Evaluated Theoretical Cross Section Data for Charge Exchange of Multiply Charged Ions with Atoms. I. Hydrogen Atom-Fully Stripped Ion Systems, *R. K. Janev, B. H. Bransden, and J. W. Gallagher*, Vol. 12, No. 4, pp. 829-872 (1983) \$7.00
233. Evaluated Theoretical Cross Section Data for Charge Exchange of Multiply Charged Ions with Atoms. II. Hydrogen Atom-Partially Stripped Ion Systems, *J. W. Gallagher, B. H. Bransden, and R. K. Janev*, Vol. 12, No. 4, pp. 873-890 (1983) \$6.00
234. Recommended Data on the Electron Impact Ionization of Light Atoms and Ions, *K. L. Bell, H. B. Gilbody, J. G. Hughes, A. E. Kingston, and F. J. Smith*, Vol. 12, No. 4, pp. 891-916 (1983) \$6.00
235. A Correlation of the Viscosity and Thermal Conductivity Data of Gaseous and Liquid Ethylene, *P. M. Holland, B. E. Eaton, and H. J. M. Hanley*, Vol. 12, No. 4, pp. 917-932 (1983) \$5.00
236. Transport Properties of Liquid and Gaseous  $D_2O$  over a Wide Range of Temperature and Pressure, *N. Matsunaga and A. Nagashima*, Vol. 12, No. 4, pp. 933-966 (1983) \$7.00
237. Thermochemical Data for Gaseous Monoxides, *J. B. Pedley and E. M. Marshall*, Vol. 12, No. 4, pp. 967-1031 (1983) \$9.00
238. Vapor Pressure of Coal Chemicals, *J. Chao, C. T. Lin, and T. H. Chung*, Vol. 12, No. 4, pp. 1033-1063 (1983) \$6.00
- ### Reprints from Volume 13
239. Thermodynamic Properties of Aqueous Sodium Chloride Solutions, *Kenneth S. Pitzer, J. Christopher Peiper, and R. H. Busey*, Vol. 13, No. 1, pp. 1-102 (1984) \$11.00
240. Refractive Index of  $ZnS$ ,  $ZnSe$ , and  $ZnTe$  and Its Wavelength and Temperature Derivatives, *H. H. Li*, Vol. 13, No. 1, pp. 103-150 (1984) \$7.00
241. High Temperature Vaporization Behavior of Oxides. I. Alkali Metal Binary Oxides, *R. H. Lamoreaux and D. L. Hildenbrand*, Vol. 13, No. 1, pp. 151-173 (1984) \$6.00
242. Thermophysical Properties of Fluid  $H_2O$ , *J. Kestin, J. V. Sengers, B. Kamgar-Parsi, and J. M. H. Levelt Sengers*, Vol. 13, No. 1, pp. 175-183 (1984) \$5.00
243. Representative Equations for the Viscosity of Water Substance, *J. V. Sengers and B. Kamgar-Parsi*, Vol. 13, No. 1, pp. 185-205 (1984) \$6.00
244. Atlas of the Schumann-Runge Absorption Bands of  $O_2$  in the Wavelength Region 175-205 nm, *K. Yoshino, D. E. Freeman, and W. H. Parkinson*, Vol. 13, No. 1, pp. 207-227 (1984) \$6.00
245. Equilibrium and Transport Properties of the Noble Gases and Their Mixtures at Low Density, *J. Kestin, K. Knierim, E. A. Mason, B. Najafi, S. T. Ro, and M. Waldman*, Vol. 13, No. 1, pp. 229-303 (1984) \$9.00
246. Evaluation of Kinetic and Mechanistic Data For Modeling of Photochemical Smog, *Roger Atkinson and Alan C. Lloyd*, Vol. 13, No. 2, pp. 315-444 (1984) \$13.00
247. Rate Data for Inelastic Collision Processes in the Diatomic Halogen Molecules, *J. I. Steinfeld*, Vol. 13, No. 2, pp. 445-553 (1984) \$11.00
248. Water Solubilities of Polynuclear Aromatic and Heteroaromatic Compounds, *Robert S. Pearlman, Samuel H. Yalkowsky, and Sujit Banerjee*, Vol. 13, No. 2, pp. 555-562 (1984) \$5.00
249. The Solubility of Nitrogen and Air in Liquids, *Rubin Battino, Timothy R. Rettich, and Toshihiro Tominaga*, Vol. 13, No. 2, pp. 563-600 (1984) \$7.00
250. Thermophysical Properties of Fluid  $D_2O$ , *J. Kestin, J. V. Sengers, B. Kamgar-Parsi, and J. M. H. Levelt Sengers*, Vol. 13, No. 2, pp. 601-609 (1984) \$5.00
251. Experimental Stark Widths and Shifts for Spectral Lines of Neutral Atoms (A Critical Review of Selected Data for the Period 1976 to 1982), *N. Konjević, M. S. Dimitrijević, and W. L. Wiese*, Vol. 13, No. 3, pp. 619-647 (1984) \$6.00

## (Continuation of Cumulative Listing of Reprints)

252. Experimental Stark Widths and Shifts for Spectral Lines of Positive Ions (A Critical Review and Tabulation of Selected Data for the Period 1976 to 1982), *N. Konjević, M. S. Dimitrijević, and W. L. Wiese*, Vol. 13, No. 3, pp. 649–686 (1984) \$7.00
253. A Review of Deuterium Triple-Point Temperatures, *L. A. Schwalbe and E. R. Grilly*, Vol. 13, No. 3, pp. 687–693 (1984) \$5.00
254. Evaluated Gas Phase Basicities and Proton Affinities of Molecules; Heats of Formation of Protonated Molecules, *Sharon G. Lias, Joel F. Liebman, and Rhoda D. Levin*, Vol. 13, No. 3, pp. 695–808 (1984) \$12.00
255. Isotopic Abundances and Atomic Weights of the Elements, *Paul De Bièvre, Marc Gallet, Norman E. Holden, and I. Lynus Barnes*, Vol. 13, No. 3, pp. 809–891 (1984) \$10.00
256. Representative Equations for the Thermal Conductivity of Water Substance, *J. V. Sengers, J. T. R. Watson, R. S. Basu, B. Kamgar-Parsi, and R. C. Hendricks*, Vol. 13, No. 3, pp. 893–933 (1984) \$7.00
257. Ground-State Vibrational Energy Levels of Polyatomic Transient Molecules, *Marilyn E. Jacox*, Vol. 13, No. 4, pp. 945–1068 (1984) \$12.00
258. Electrical Resistivity of Selected Elements, *P. D. Desai, T. K. Chu, H. M. James, and C. Y. Ho*, Vol. 13, No. 4, pp. 1069–1096 (1984) \$6.00
259. Electrical Resistivity of Vanadium and Zirconium, *P. D. Desai, H. M. James, and C. Y. Ho*, Vol. 13, No. 4, pp. 1097–1130 (1984) \$7.00
260. Electrical Resistivity of Aluminum and Manganese, *P. D. Desai, H. M. James, and C. Y. Ho*, Vol. 13, No. 4, pp. 1131–1172 (1984) \$7.00
261. Standard Chemical Thermodynamic Properties of Alkane Isomer Groups, *Robert A. Alberty and Catherine A. Gehrig*, Vol. 13, No. 4, pp. 1173–1197 (1984) \$6.00
262. Evaluated Theoretical Cross-Section Data for Charge Exchange of Multiply Charged Ions with Atoms. III. Nonhydrogenic Target Atoms, *R. K. Janev and J. W. Gallagher*, Vol. 13, No. 4, pp. 1199–1249 (1984) \$8.00
263. Heat Capacity of Reference Materials: Cu and W, *G. K. White and S. J. Collocott*, Vol. 13, No. 4, pp. 1251–1257 (1984) \$5.00
264. Evaluated Kinetic and Photochemical Data for Atmospheric Chemistry: Supplement II. CODATA Task Group on Gas Phase Chemical Kinetics, *D. L. Baulch, R. A. Cox, R. F. Hampson, Jr., J. A. Kerr (Chairman), J. Troe, and R. T. Watson*, Vol. 13, No. 4, pp. 1259–1380 (1984) \$12.00
- Reprints from Volume 14**
265. Thermodynamic Properties of Key Organic Oxygen Compounds in the Carbon Range C<sub>1</sub> to C<sub>4</sub>. Part 1. Properties of Condensed Phases, *Randolph C. Wilhoit, Jing Chao, and Kenneth R. Hall*, Vol. 14, No. 1, pp. 1–175 (1985) \$15.00
266. Standard Chemical Thermodynamic Properties of Alkylbenzene Isomer Groups, *Robert A. Alberty*, Vol. 14, No. 1, pp. 177–192 (1985) \$5.00
267. Assessment of Critical Parameter Values for H<sub>2</sub>O and D<sub>2</sub>O, *J. M. H. Levelt Sengers, J. Straub, K. Watanabe, and P. G. Hill*, Vol. 14, No. 1, pp. 193–207 (1985) \$5.00
268. The Viscosity of Nitrogen, Oxygen, and Their Binary Mixtures in the Limit of Zero Density, *Wendy A. Cole and William A. Wakeham*, Vol. 14, No. 1, pp. 209–226 (1985) \$6.00
269. The Thermal Conductivity of Fluid Air, *K. Stephan and A. Laesecke*, Vol. 14, No. 1, pp. 227–234 (1985) \$5.00
270. The Electronic Spectrum and Energy Levels of the Deuterium Molecule, *Robert S. Freund, James A. Schiavone, and H. M. Crosswhite*, Vol. 14, No. 1, pp. 235–383 (1985) \$14.00
271. Microwave Spectra of Molecules of Astrophysical Interest. XXII. Sulfur Dioxide (SO<sub>2</sub>), *F. J. Lovas*, Vol. 14, No. 2, pp. 395–488 (1985) \$10.00
272. Evaluation of the Thermodynamic Functions for Aqueous Sodium Chloride from Equilibrium and Calorimetric Measurements below 154 °C, *E. Colin W. Clarke and David N. Glew*, Vol. 14, No. 2, pp. 489–610 (1985) \$12.00
273. The Mark–Houwink–Sakurada Equation for the Viscosity of Linear Polyethylene, *Herman L. Wagner*, Vol. 14, No. 2, pp. 611–617 (1985) \$5.00
274. The Solubility of Mercury and Some Sparingly Soluble Mercury Salts in Water and Aqueous Electrolyte Solutions, *H. Lawrence Clever, Susan A. Johnson, and M. Elizabeth Derrick*, Vol. 14, No. 3, pp. 631–680 (1985) \$8.00
275. A Review and Evaluation of the Phase Equilibria, Liquid-Phase Heats of Mixing and Excess Volumes, and Gas-Phase PVT Measurements for Nitrogen + Methane, *A. J. Kidnay, R. C. Miller, E. D. Sloan, and M. J. Hiza*, Vol. 14, No. 3, pp. 681–694 (1985) \$5.00
276. The Homogeneous Nucleation Limits of Liquids, *C. T. Avedisian*, Vol. 14, No. 3, pp. 695–729 (1985) \$7.00
277. Binding Energies in Atomic Negative Ions: II, *H. Hotop and W. C. Lineberger*, Vol. 14, No. 3, pp. 731–750 (1985) \$6.00
278. Energy Levels of Phosphorus, P I through P xv, *W. C. Martin, Romuald Zalubas, and Arlene Musgrove*, Vol. 14, No. 3, pp. 751–802 (1985) \$8.00
279. Standard Chemical Thermodynamic Properties of Alkene Isomer Groups, *Robert A. Alberty and Catherine A. Gehrig*, Vol. 14, No. 3, pp. 803–820 (1985) \$6.00
280. Standard Chemical Thermodynamic Properties of Alkyl-naphthalene Isomer Groups, *Robert A. Alberty and Theodore M. Bloomstein*, Vol. 14, No. 3, pp. 821–837 (1985) \$6.00
281. Carbon Monoxide Thermophysical Properties from 68 to 1000 K at Pressures to 100 MPa, *Robert D. Goodwin*, Vol. 14, No. 4, pp. 849–932 (1985) \$10.00
282. Refractive Index of Water and Its Dependence on Wavelength, Temperature, and Density, *I. Thormählen, J. Straub, and U. Grigull*, Vol. 14, No. 4, pp. 933–945 (1985) \$5.00
283. Viscosity and Thermal Conductivity of Dry Air in the Gaseous Phase, *K. Kadoya, N. Matsunaga, and A. Nagashima*, Vol. 14, No. 4, pp. 947–970 (1985) \$6.00
284. Charge Transfer of Hydrogen Ions and Atoms in Metal Vapors, *T. J. Morgan, R. E. Olson, A. S. Schlachter, and J. W. Gallagher*, Vol. 14, No. 4, pp. 971–1040 (1985) \$9.00
285. Reactivity of HO<sub>2</sub>/O<sub>2</sub><sup>-</sup> Radicals in Aqueous Solution, *Benon H. J. Bielski, Diane E. Cabelli, Ravindra L. Arudi, and Alberta B. Ross*, Vol. 14, No. 4, pp. 1041–1100 (1985) \$8.00
286. The Mark–Houwink–Sakurada Equation for the Viscosity of Atactic Polystyrene, *Herman L. Wagner*, Vol. 14, No. 4, pp. 1101–1106 (1985) \$5.00
287. Standard Chemical Thermodynamic Properties of Alkylcyclopentane Isomer Groups, Alkylcyclohexane Isomer Groups, and Combined Isomer Groups, *Robert A. Alberty and Young S. Ha*, Vol. 14, No. 4, pp. 1107–1132 (1985) \$6.00
- Reprints from Volume 15**
288. Triplet–Triplet Absorption Spectra of Organic Molecules in Condensed Phases, *Ian Carmichael and Gordon L. Hug*, Vol. 15, No. 1, pp. 1–250 (1986) \$20.00
289. Recommended Rest Frequencies for Observed Interstellar Molecular Microwave Transitions—1985 Revision, *F. J. Lovas*, Vol. 15, No. 1, pp. 251–303 (1986) \$8.00

## (Continuation of Cumulative Listing of Reprints)

290. New International Formulations for the Thermodynamic Properties of Light and Heavy Water, *J. Kestin and J. V. Sengers*, Vol. 15, No. 1, pp. 305-320 (1986) \$5.00
291. Forbidden Lines in  $ns^2np^k$  Ground Configurations and  $nsnp$  Excited Configurations of Beryllium through Molybdenum Atoms and Ions, *Victor Kaufman and Jack Sugar*, Vol. 15, No. 1, pp. 321-426 (1986) \$11.00
292. Thermodynamic Properties of Twenty-One Monocyclic Hydrocarbons, *O. V. Dorofeeva, L. V. Gurchich, and V. S. Jorish*, Vol. 15, No. 2, pp. 437-464 (1986) \$6.00
293. Evaluated Kinetic Data for High-Temperature Reactions. Volume 5. Part 1. Homogeneous Gas Phase Reactions of the Hydroxyl Radical with Alkanes, *D. L. Baulch, M. Bowers, D. G. Malcolm, and R. T. Tuckerman*, Vol. 15, No. 2, pp. 465-592 (1986) \$12.00
294. Thermodynamic Properties of Ethylene from the Freezing Line to 450 K at Pressures to 260 MPa, *Majid Jahangiri, Richard T. Jacobsen, Richard B. Stewart, and Robert D. McCarty*, Vol. 15, No. 2, pp. 593-734 (1986) \$13.00
295. Thermodynamic Properties of Nitrogen from the Freezing Line to 2000 K at Pressures to 1000 MPa, *Richard T. Jacobsen, Richard B. Stewart, and Majid Jahangiri*, Vol. 15, No. 2, pp. 735-909 (1986) \$15.00
296. A Critical Review of Aqueous Solubilities, Vapor Pressures, Henry's Law Constants, and Octanol-Water Partition Coefficients of the Polychlorinated Biphenyls, *Wan Ying Shiu and Donald Mackay*, Vol. 15, No. 2, pp. 911-929 (1986) \$6.00
297. Computer Methods Applied to the Assessment of Thermochemical Data. Part I. The Establishment of a Computerized Thermochemical Data Base Illustrated by Data for  $TiCl_4(g)$ ,  $TiCl_4(l)$ ,  $TiCl_3(cr)$ , and  $TiCl_2(cr)$ , *S. P. Kirby, E. M. Marshall, and J. B. Pedley*, Vol. 15, No. 3, pp. 943-965 (1986) \$6.00
298. Thermodynamic Properties of Iron and Silicon, *P. D. Desai*, Vol. 15, No. 3, pp. 967-983 (1986) \$6.00
299. Cross Sections for Collisions of Electrons and Photons with Nitrogen Molecules, *Y. Itikawa, M. Hayashi, A. Ichimura, K. Onda, K. Sakimoto, K. Takayanagi, M. Nakamura, H. Nishimura, and T. Takayanagi*, Vol. 15, No. 3, pp. 985-1010 (1986) \$6.00
300. Thermochemical Data on Gas-Phase Ion-Molecule Association and Clustering Reactions, *R. G. Keesee and A. W. Castleman, Jr.*, Vol. 15, No. 3, pp. 1011-1071 (1986) \$8.00
301. Standard Reference Data for the Thermal Conductivity of Liquids, *C. A. Nieto de Castro, S. F. Y. Li, A. Nagashima, R. D. Trengove, and W. A. Wakeham*, Vol. 15, No. 3, pp. 1073-1086 (1986) \$5.00
302. Chemical Kinetic Data Base for Combustion Chemistry. Part I. Methane and Related Compounds, *W. Tsang and R. F. Hampson*, Vol. 15, No. 3, pp. 1087-1279 (1986) \$17.00
303. Improved International Formulations for the Viscosity and Thermal Conductivity of Water Substance, *J. V. Sengers and J. T. R. Watson*, Vol. 15, No. 4, pp. 1291-1314 (1986) \$6.00
304. The Viscosity and Thermal Conductivity of Normal Hydrogen in the Limit of Zero Density, *M. J. Assael, S. Mixafendi, and W. A. Wakeham*, Vol. 15, No. 4, pp. 1315-1322 (1986) \$5.00
305. The Viscosity and Thermal Conductivity Coefficients of Gaseous and Liquid Argon, *B. A. Younglove and H. J. M. Hanley*, Vol. 15, No. 4, pp. 1323-1337 (1986) \$5.00
306. Standard Chemical Thermodynamic Properties of Alkyne Isomer Groups, *Robert A. Alberty and Ellen Burmenko*, Vol. 15, No. 4, pp. 1339-1349 (1986) \$5.00
307. Recent Progress in Deuterium Triple-Point Measurements, *L. A. Schwabbe*, Vol. 15, No. 4, pp. 1351-1356 (1986) \$5.00
308. Rate Constants for Reactions of Radiation-Produced Transients in Aqueous Solutions of Actinides, *S. Gordon, J. C. Sullivan, and Alberta B. Ross*, Vol. 15, No. 4, pp. 1357-1367 (1986) \$5.00
309. Thermodynamic Properties of Key Organic Oxygen Compounds in the Carbon Range  $C_1$  to  $C_4$ . Part 2. Ideal Gas Properties, *Jing Chao, Kenneth R. Hall, Kenneth N. Marsh, and Randolph C. Wilhoit*, Vol. 15, No. 4, pp. 1369-1436 (1986) \$9.00

## Reprints from Volume 16

310. Thermochemical Data on Gas Phase Compounds of Sulfur, Fluorine, Oxygen, and Hydrogen Related to Pyrolysis and Oxidation of Sulfur Hexafluoride, *John T. Herron*, Vol. 16, No. 1, pp. 1-6 (1987) \$5.00
311. The Thermochemical Measurements on Rubidium Compounds: A Comparison of Measured Values with Those Predicted from the NBS Tables of Chemical and Thermodynamic Properties, *V. B. Parker, W. H. Evans, and R. L. Nuttall*, Vol. 16, No. 1, pp. 7-59 (1987) \$8.00
312. Standard Thermodynamic Functions of Gaseous Polyatomic Ions at 100-1000 K, *Aharon Loewenschuss and Yitzhak Marcus*, Vol. 16, No. 1, pp. 61-89 (1987) \$6.00
313. Thermodynamic Properties of Manganese and Molybdenum, *P. D. Desai*, Vol. 16, No. 1, pp. 91-108 (1987) \$6.00
314. Thermodynamic Properties of Selected Binary Aluminum Alloy Systems, *P. D. Desai*, Vol. 16, No. 1, pp. 109-124 (1987) \$5.00
315.  $^{13}C$  Chemical Shielding in Solids, *T. M. Duncan*, Vol. 16, No. 1, pp. 125-151 (1987) \$6.00
316. The Mark-Houwink-Sakurada Relation for Poly(Methyl Methacrylate), *Herman L. Wagner*, Vol. 16, No. 2, pp. 165-173 (1987) \$5.00
317. The Viscosity of Carbon Dioxide, Methane, and Sulfur Hexafluoride in the Limit of Zero Density, *R. D. Trengove and W. A. Wakeham*, Vol. 16, No. 2, pp. 175-187 (1987) \$5.00
318. The Viscosity of Normal Deuterium in the Limit of Zero Density, *M. J. Assael, S. Mixafendi, and W. A. Wakeham*, Vol. 16, No. 2, pp. 189-192 (1987) \$5.00
319. Standard Chemical Thermodynamic Properties of Alkanethiol Isomer Groups, *Robert A. Alberty, Ellen Burmenko, Tae H. Kang, and Michael B. Chung*, Vol. 16, No. 2, pp. 193-208 (1987) \$5.00
320. Evaluation of Binary Excess Volume Data for the Methanol + Hydrocarbon Systems, *R. Srivastava and B. D. Smith*, Vol. 16, No. 2, pp. 209-218 (1987) \$5.00
321. Evaluation of Binary Excess Enthalpy Data for the Methanol + Hydrocarbon Systems, *R. Srivastava and B. D. Smith*, Vol. 16, No. 2, pp. 219-237 (1987) \$6.00
322. Extinction Coefficients of Triplet-Triplet Absorption Spectra of Organic Molecules in Condensed Phases: A Least-Squares Analysis, *Ian Carmichael, W. P. Helman, and G. L. Hug*, Vol. 16, No. 2, pp. 239-260 (1987) \$6.00
323. Evaluated Chemical Kinetic Data for the Reactions of Atomic Oxygen  $O(^3P)$  with Unsaturated Hydrocarbons, *R. J. Cvetanović*, Vol. 16, No. 2, pp. 261-326 (1987) \$9.00
324. Spectral Data for Molybdenum Ions,  $Mo_{VI}$ - $Mo_{XLI}$ , *Toshizo Shirai, Yohta Nakai, Kunio Ozawa, Keishi Ishii, Jack Sugar, and Kazuo Mori*, Vol. 16, No. 2, pp. 327-377 (1987) \$8.00
325. Standard Chemical Thermodynamic Properties of Alkanol Isomer Groups, *Robert A. Alberty, Michael*

(Continuation of Cumulative Listing of Reprints)

<i>B. Chung, and Theresa M. Flood</i> , Vol. 16, No. 3, pp. 391-417 (1987)	\$6.00	328.The Thermochemistry of Inorganic Solids IV. Enthalpies of Formation of Compounds of the Formula $MX_aY_b$ , <i>Mohamed W. M. Hisham and Sidney W. Benson</i> , Vol. 16, No. 3, pp. 467-470 (1987)	\$5.00
326.High-Temperature Vaporization Behavior of Oxides II. Oxides of Be, Mg, Ca, Sr, Ba, B, Al, Ga, In, Tl, Si, Ge, Sn, Pb, Zn, Cd, and Hg, <i>R. H. Lamoreaux, D. L. Hildenbrand, and L. Brewer</i> , Vol. 16, No. 3, pp. 419-443 (1987)	\$6.00	329.Chemical Kinetic Data Base for Combustion Chemistry. Part 2. Methanol, <i>Wing Tsang</i> , Vol. 16, No. 3, pp. 471-508 (1987)	\$7.00
327.Equilibrium and Transport Properties of Eleven Polyatomic Gases at Low Density, <i>A. Boushehri, J. Bzowski, J. Kestin, and E. A. Mason</i> , Vol. 16, No. 3, pp. 445-466 (1987)	\$6.00	330.Phase Diagrams and Thermodynamic Properties of the 70 Binary Alkali Halide Systems Having Common Ions, <i>James Sangster and Arthur D. Pelton</i> , Vol. 16, No. 3, pp. 509-561 (1987)	\$8.00

## Special Reprints Packages

These special reprints packages offer selected articles in specific subject areas from the JOURNAL OF PHYSICAL AND CHEMICAL REFERENCE DATA, and they are offered at a better rate than when purchased individually. You will have available a complete library of literature for your specific requirements at a fraction of the cost of purchasing back issues of the journal.

Look over the reprints packages available—they are listed by subject area. In the Cumulative Listing of Reprints you will find the titles corresponding to the reprint numbers. You are sure to find building your information bank in this manner to be thorough and economical.

Package C1 (5 Parts) MOLECULAR VIBRATIONAL FREQUENCIES. Consisting of Reprint Nos. 103, 129, 170, 257, NSRD 39.  
If purchased individually: \$ 33.00  
*Special package price:* \$ 26.00

Package C2 (22 Parts) ATOMIC ENERGY LEVELS. Consisting of Reprint Nos. 26, 54, 64, 68, 94, 100, 109, 125, 126, 131, 132, 149, 150, 154, 156, 160, 179, 180, 192, 200, 222, 278.  
If purchased individually: \$121.00  
*Special package price:* \$ 96.00

Package C3 (6 Parts) ATOMIC SPECTRA. Consisting of Reprint Nos. 33, 56, 77, 78, 110, 132.  
If purchased individually: \$ 33.00  
*Special package price:* \$ 27.00

Package C4 (5 Parts) ATOMIC TRANSITION PROBABILITIES. Consisting of Reprint Nos. 20, 63, 82, 118, 182.  
If purchased individually: \$ 35.00  
*Special package price:* \$ 28.00

Package C5 (7 Parts) MOLECULAR SPECTRA. Consisting of Reprint Nos. 4, 8, 53, 79, 93, 130, 146.  
If purchased individually: \$ 51.50  
*Special package price:* \$ 41.00

Package C6 (9 Parts) THERMODYNAMIC PROPERTIES OF ELECTROLYTE SOLUTIONS. Consisting of Reprint Nos. 15, 95, 111, 151, 152, 174, 184, 185, 186.  
If purchased individually: \$ 46.00  
*Special package price:* \$ 37.00

Package C7 (12 Parts) IDEAL GAS THERMODYNAMIC PROPERTIES. Consisting of Reprint Nos. 30, 42, 43, 62, 65, 66, 70, 80, 83, 113, 115, 141.  
If purchased individually: \$ 38.00  
*Special package price:* \$ 31.00

Package C8 (7 Parts) RESISTIVITY. Consisting of Reprint Nos. 138, 139, 155, 221, 258, 259, 260.  
If purchased individually: \$ 47.50  
*Special package price:* \$ 39.00

Package C9 (7 Parts) MOLTEN SALTS. Consisting of Reprint Nos. 10, 41, 71, 96, 135, 167, 168.  
If purchased individually: \$ 62.50  
*Special package price:* \$ 44.00

Package C10 (4 Parts) REFRACTIVE INDEX. Consisting of Reprint Nos. 81, 158, 162, 240.  
If purchased individually: \$ 32.50  
*Special package price:* \$ 26.00

## Supplements to JPCRD

When the topic demands it, and the quality of the data justifies it, the JOURNAL OF PHYSICAL AND CHEMICAL REFERENCE DATA issues a special Supplement. Each Supplement is a monograph—collected tables of highly significant physical or chemical property data in one complete volume. Listed below are the special Supplements to JPCRD that have been published. Each is a valuable resource for the physical chemist and chemical physicist.

ATOMIC ENERGY LEVELS OF THE IRON-PERIOD ELEMENTS: POTASSIUM THROUGH NICKEL by J. Sugar and C. Corliss. (Supplement No. 2 to Volume 14) 1985, 664 pages. Hardcover.  
U.S. & Canada: \$50.00  
Abroad: \$58.00

JANAF THERMOCHEMICAL TABLES, Third Edition by M. W. Chase, Jr., C. A. Davies, J. R. Downey, Jr., D. J. Frurip, R. A. McDonald, and A. N. Syverud. (Supplement No. 1 to Volume 14) 1985, 1896 pages, 2 volumes. Hardcover.  
U.S. & Canada: \$130.00  
Abroad: \$156.00

HEAT CAPACITIES AND ENTROPIES OF ORGANIC COMPOUNDS IN THE CONDENSED PHASE by E.S. Domalski, W.H. Evans, and E.D. Hearing. (Supplement No. 1 to Volume 13) 1984, 288 pages. Hardcover.  
U.S. & Canada: \$40.00  
Abroad: \$48.00

THE NBS TABLES OF CHEMICAL THERMODYNAMIC PROPERTIES. SELECTED VALUES FOR INORGANIC AND C<sub>1</sub> AND C<sub>2</sub> ORGANIC SUBSTANCES IN SI UNITS by D.D. Wagman, W.H. Evans, V.B. Parker, R.H. Schumm, I. Halow, S.M. Bailey, K.L. Churney, and R.L. Nuttall. (Supplement No. 2 to Volume 11) 1982, 394 pages. Hardcover.  
U.S. & Canada: \$40.00  
Abroad: \$48.00

THERMOPHYSICAL PROPERTIES OF FLUIDS. 1. ARGON, ETHYLENE, PARAHYDROGEN, NITROGEN,

NITROGEN TRIFLUORIDE, AND OXYGEN by B.A. Younglove. (Supplement No. 1 to Volume 11) 1982, 368 pages. Hardcover.  
U.S. & Canada: \$40.00  
Abroad: \$48.00

EVALUATED KINETIC DATA FOR HIGH TEMPERATURE REACTIONS: VOLUME 4, HOMOGENEOUS GAS PHASE REACTIONS OF HALOGEN- AND CYANIDE-CONTAINING SPECIES by D.L. Baulch, J. Duxbury, S.J. Grant, and D.C. Montague. (Supplement No. 1 to Volume 10) 1981, 721 pages. Hardcover.  
U.S. & Canada: \$80.00  
Abroad: \$96.00

ENERGETICS OF GASEOUS IONS by H.M. Rosenstock, K. Draxl, B.W. Steiner, and J.T. Herron. (Supplement No. 1 to Volume 6) 1977, 783 pages.\*  
U.S. & Canada: \$70/\$65  
Abroad: \$84/\$78

THERMAL CONDUCTIVITY OF THE ELEMENTS: A COMPREHENSIVE REVIEW by C.Y. Ho, R.W. Powell, and P.E. Liley. (Supplement No. 1 to Volume 3) 1974, 796 pages.\*  
U.S. & Canada: \$60/\$55  
Abroad: \$72/\$66

PHYSICAL AND THERMODYNAMIC PROPERTIES OF ALIPHATIC ALCOHOLS by R.C. Wilhoit and B.J. Zwolinski. (Supplement No. 1 to Volume 2) 1973, 420 pages.\*  
U.S. & Canada: \$33/\$30  
Abroad: \$40/\$36

\*Prices are for hardcover/softcover.

**Part I contains tables for hydrogen  
through chromium (pp. 1–649).**

**Part II contains tables for manganese  
through krypton (pp. 651–1369).**

**Part III contains the Finding List  
(pp. 1371–1678).**