Atomic Spectral Tables for the Chandra X-ray Observatory. Part II. Si VI–Si XII

L. I. Podobedova,[a] D. E. Kelleher, J. Reader, and W. L. Wiese
National Institute of Standards and Technology, Gaithersburg, Maryland 20899-8420

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Tables of critically compiled wavelengths, energy levels, line classifications, and transition probabilities are given for spectra of ionized silicon (Si VI–Si XII) in the region 25–170 Å. These tables provide data of interest for the Emission Line Project in support of analyses of astronomical data from the Chandra X-ray Observatory. They will also be useful for the diagnostics of plasmas encountered in fusion energy research. The transition probabilities were obtained mainly from recent sophisticated calculations carried out with complex computer codes. [DOI: 10.1063/1.1637922]

Key words: far ultraviolet; Si VI, Si VII, Si VIII, Si IX, Si X, Si XI, Si XII, silicon; soft x rays; transition probabilities; wavelengths.

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Symbols for indication of data accuracy

A uncertainty within 3%,
B uncertainty within 10%,
C uncertainty within 25%,
D uncertainty within 50%,
E uncertainty greater than 50%.

Symbols used for the table headings

E_i: lower energy level,
E_k: upper energy level,
g_i: statistical weight of the lower level,
g_k: statistical weight of the upper level,
A_{ki}: atomic transition probability for spontaneous emission,
f_{ik}: (absorption) oscillator strength,
S: line strength.

Abbreviations appearing in the column labeled Ref.

LS: decomposition from multiplet value according to LS rules.

In all tables, we have shown the power of 10 by the exponential notation. For example, 3.88E−03 stands for 3.88×10^{-3}.

1. Introduction

The Chandra X-ray Observatory was designed to observe x rays from high-energy regions of the universe, as for example remnants of exploded stars. It was launched by the Space Shuttle Columbia in July 1999. In Part I of this series of papers[1] containing data for the Chandra X-ray observatory, we presented data for S VIII–S XIV in the 21–170 Å region. This is the region covered by the Low Energy Trans-

[a]Electronic mail: larissa.podobedova@nist.gov

mission Grating (LETG) on the observatory. These tables are compiled to assist the Emission Line Project situated at the Smithsonian Astrophysical Laboratory. The present tables provide data for the cosmically abundant element Si in the region 25–170 Å. Similar tables are being prepared for neon and magnesium. These tables will also be of use for the diagnostics of plasmas found in fusion energy research devices such as tokamaks.

The wavelengths in the tables are Ritz-type values derived from experimental energy level values in the NIST Atomic Spectra Database (ASD)[2] and the compilation of Martin and Zalubas.[3] That is, the wave number of a particular transition is found as the difference of the values of the combining energy levels in cm^{-1}, and the wavelength in vacuum is the reciprocal of the wave number. Except for Li-like ions, only transitions are considered for which experimental energies are known for both lower and upper levels. For Li-like ions extremely precise *ab initio* calculations provide values for some energy levels that have uncertainties comparable to experimental values. Thus, for some levels of Li-like ions that have not been observed experimentally (Martin and Zalubas[3]) we have used level values, and in turn wavelengths, obtained from such precise calculations. Where this has been done, the levels are specifically denoted in the tables.

The ionization energies given in the text portion for each ion were taken from ASD. The values in cm^{-1} were converted to electron volts[4] with the factor 1 eV/hc $=8065.544\,77(32)$ cm^{-1}. In compiling the transition probabilities we selected only values obtained with the most advanced theoretical and experimental methods. Our general evaluation criteria were those that have been developed at NIST.[5,6] Normally, we only tabulate values having estimated uncertainties of $\pm 50\%$ or less. A few exceptions have been made for important lines. Because experimental results for highly ionized ions are not generally available, for most transitions we had to rely on theoretical data.

The most extensive source of theoretical data was the Opacity Project (OP),[7] in which multiplet *f* values for the spectra of many elements were produced. However, since the OP calculations do not normally include spin–orbit interactions they do not provide values for individual lines of a multiplet. For the present compilation the average OP values for LS multiplets were decomposed into their LSJ fine structure components using LS coupling rules.[8] For the ions of this compilation, LS coupling should generally be a good approximation. When this is not the case, we used results of calculations that do include spin–orbit and other relativistic effects. Tachiev and Froese Fischer have performed calculations for B-, C-, N-, O-, and F-like ions with the multiconfiguration Hartree–Fock (MCHF)[9] method with Breit–Pauli corrections and have made their results available on the World Wide Web. Blackford and Hibbert have carried out extensive calculations for F-like ions[10] with the configuration interaction code-version 3 (CIV3).[11] The same method was used by Aggarwal for several C-like ions.[12] For Be-like and B-like ions, the data of Safronova and co-workers were found to be very useful.[13–15] Their calculations were performed using relativistic many-body perturbation theory (MBPT). Vilkas and coworkers applied many-body perturbation theory including Breit–Pauli corrections to obtain transition probabilities for ions of C, N, and O.[16–18] For Li-like silicon most of the transition probabilities were taken from the OP results; part of the data are from calculations of Zhang, Sampson, and Fontes,[19] who used the Dirac equation with a relativistic Dirac–Fock–Slater central potential.

2. Graphical and Numerical Comparisons in Support of the Assessment Procedure

In order to put the uncertainty estimates for the transition probabilities of the present compilation on a firm basis, we made graphical and numerical comparisons of the results of different advanced calculations for as many transitions as possible, regardless of wavelength. We then selected data for the Chandra spectral range 10–170 Å. To fit the data into systematic trends, or deviations from them, we found the theoretically predicted trends of data along isoelectronic sequences useful. If available, we always selected data from detailed configuration-interaction calculations with intermediate coupling. Usually, such calculations were performed for transitions to the ground state or between low excited configurations. For transitions involving high-lying configurations, only OP data are available. For the stronger transitions of many spectra, good agreement exists between the OP data and data from more detailed calculations that consider spin–orbit interactions. However, for weaker transitions large disagreements are often observed, especially when appreciable cancellation of positive and negative components of the transition integral is encountered. Agreement between the OP calculations and various relativistic calculations also becomes worse for transitions between levels where one or both are appreciably mixed due to breakdown of LS coupling.

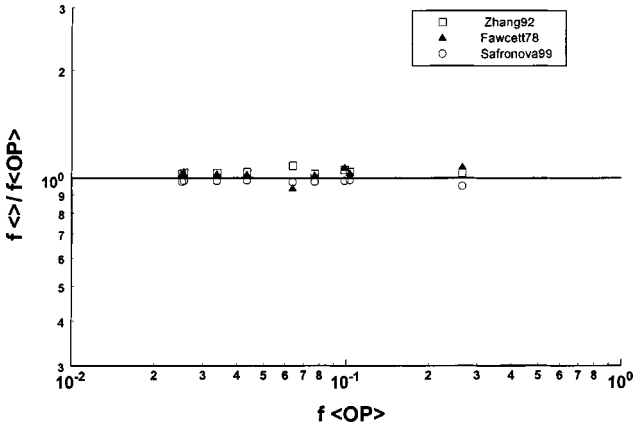

FIG. 1. Ratios of oscillator strengths calculated[13,20,21] for some strong allowed $2s^2-2s2p$ and $2s2p-2p^2$ transitions of Be-like Si XI to values from the Opacity Project (OP).[7]

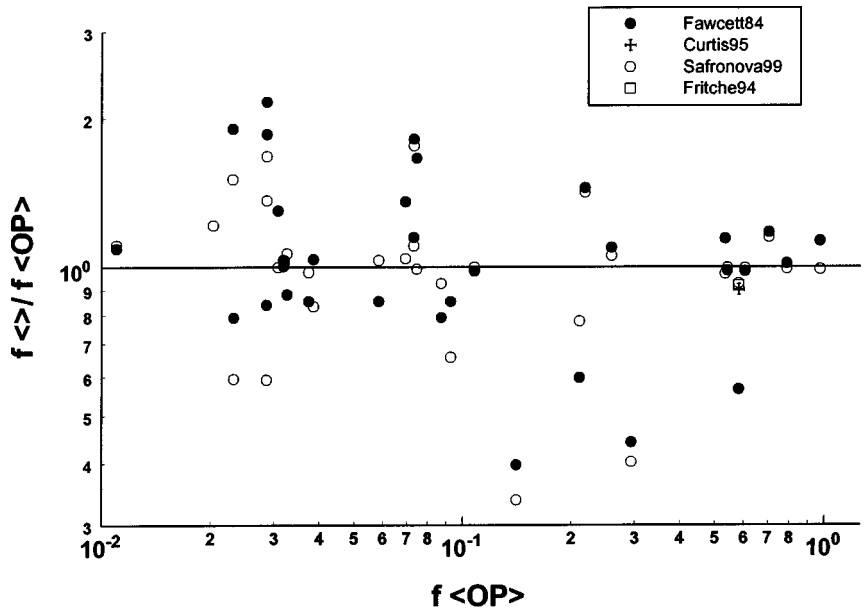

FIG. 2. Ratios of oscillator strengths calculated[13,14,22–24] for some strong allowed $2s2p-2s3s$, $2s2p-2s3d$, and $2p2p-2p3p$ transitions of Be-like Si XI to values from the Opacity Project (OP).[7]

Comparisons of oscillator strengths for the strong transitions of the Be-like ion Si XI are shown in Fig. 1 ($2s^2-2s2p$ and $2s2p-2p^2$ transitions) and in Fig. 2 ($2s2p-2s3s$, $2s3d$, and $2p3p$ transitions). Here, the ratios of oscillator strengths from several calculations[13,14,20–24] to the OP oscillator strengths[7] are plotted against the OP oscillator strength on a logarithmic scale. For the 2–2 transitions the agreement is better than 5%. For the 2–3 transitions the agreement with the OP data is not as good.

A comparison of oscillator strengths for the C-like spectrum Si IX is given in Fig. 3, where the ratios of the CIV3 oscillator strengths[12] to the MCHF values[9] are plotted against the MCHF oscillator strengths on a logarithmic scale. Transitions of the type $2s^22p^2-2s^22p3s$, $2s^22p^2-2s^22p3d$, $2p^4-2s^22p3s$, and $2p^4-2s^22p3d$ in the Chandra range 54–125 Å are represented here. Agreement is good for the transitions with large oscillator strengths, but decreases sharply for transitions with smaller oscillator strengths.

The dependence of the reliability of the data on the purity of LS coupling was illustrated by an example for the fluorine-like ion S VIII in our first publication of this series.[1] Large discrepancies in transition probabilities for F-like spectra between the OP results[7] and CIV3 data[10] were discussed earlier by Wiese and Kelleher.[25] At that time, ex-

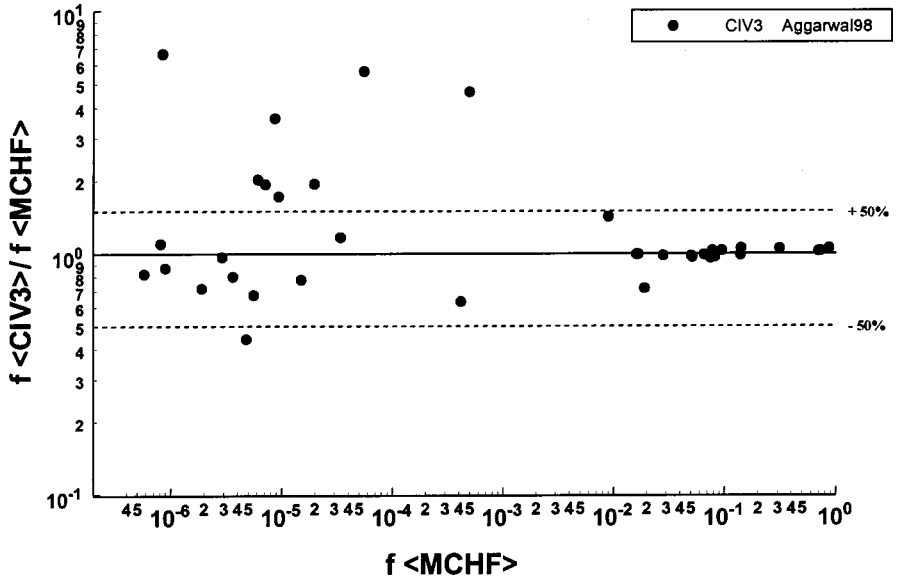

FIG. 3. Ratios of oscillator strengths for some $2s^22p^2-2s^22p3s$, $2s^22p^2-2s^22p3d$, and $2p^4-2s^22p3d$ transitions of C-like Si IX calculated with the CIV3 code[12] to MCHF values.[9]

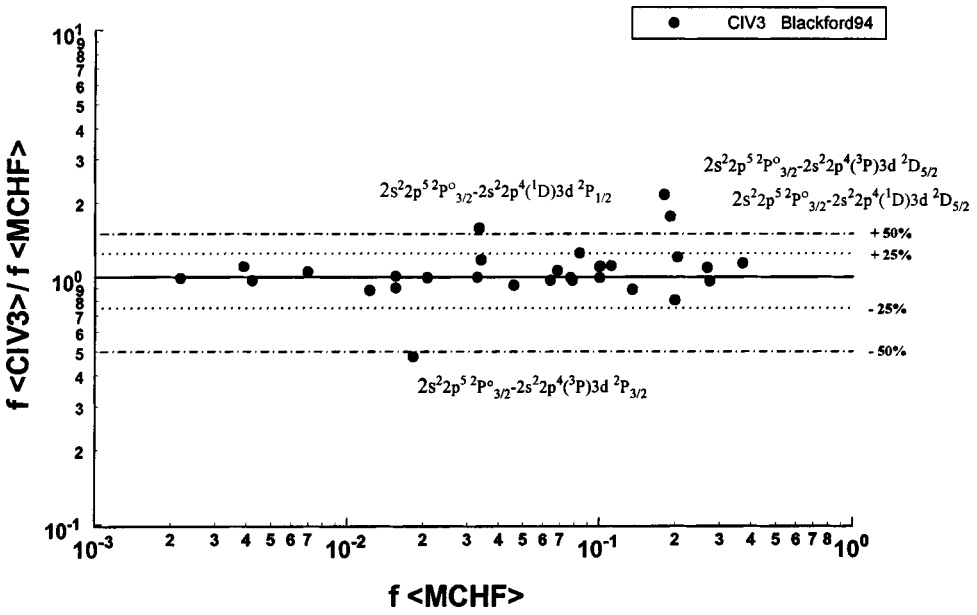

FIG. 4. Ratios of oscillator strengths for transitions of F-like Si VI calculated with the CIV3 code[10] to MCHF values.[9]

tended relativistic calculations for individual lines were available only from CIV3 data.[10] More recently, MCHF calculations[9] have become available. Figure 4 shows a comparison between oscillator strengths from CIV3[10] and the MCHF[9] calculations for the F-like ion Si VI in the range of from 77 to 146 Å. It is seen that the agreement is better than 25% for most transitions. However for the five transitions, for which spectroscopic designations are given in the graph, the disagreements are greater than 50%.

The numerical values for Fig. 4 along with wavelengths and classifications are given in Table 1. Here, *i* and *k* indicate the lower and upper levels, respectively. The largest contribution to the eigenvector percentage composition of each upper level is also given. Percentages are not given for the lower levels as they are all nearly pure in LS coupling. It is seen that for transitions with large deviations in Fig. 4, the leading percentages for the upper levels are: for $2s^2 2p^4(^3\mathrm{P})3d\ ^2\mathrm{P}_{3/2}$ 68%; $2s^2 2p^4(^1\mathrm{D})3d\ ^2\mathrm{P}_{1/2}$ 85%; $2s^2 2p^4(^1\mathrm{D})3d\ ^2\mathrm{D}_{5/2}$ 77%; $2s^2 2p^4(^3\mathrm{P})3d\ ^2\mathrm{D}_{5/2}$ 86%. This suggests that when both levels have a principal component larger than about 85%, the agreement is better than 10%. If one of the combining levels has a main contribution of less than 85%, the oscillator strengths may disagree by as much as 50%. The study of such dependence on LS coupling is important when we have transition probabilities available from only one source and need to estimate their accuracy on the basis of extrapolation from comparisons with other sources in overlapping areas.

3. Arrangement of the Tables

The tables are ordered by increasing ionization stage. Individual lines are arranged in order of wavelength. For each transition we give the wavelength, the energy of the lower level (*i*), the energy of the upper level (*k*), the level designations, and the statistical weights of the levels ($g=2J+1$). In some cases the designations in ASD are given with a question mark. In the present tables we omitted these question marks because the designations were confirmed by later calculations in Refs. 7, 9–18. If an energy level was given in ASD with a question mark to indicate that its existence is uncertain, we have retained the question mark and have added it to the Ritz wavelength as well. Levels whose values are noted with a $+x$ are not connected to the main system of levels by observed transitions. These level values were estimated by theoretical methods so that the unknown quantity x will be minimized.

Following the statistical weights we give the transition probability for spontaneous emission A_{ki} (in units of $10^8\ \mathrm{s}^{-1}$), the absorption oscillator strength f_{ik} (dimensionless), the line strength S (in atomic units, a.u.), and $\log g_i f$. For electric dipole transitions, E1, $1\ \mathrm{a.u.}=a_0^2 e^2=7.188\times10^{-59}\ \mathrm{m}^2\ \mathrm{C}^2$, where a_0 is the Bohr radius and e is the electron charge. For conversion factors and more details on the units, refer to Wiese *et al.*[5] The power of 10 is indicated by exponential notation (E−02 indicates 10^{-2}). Finally, the estimated uncertainty and the references are given. The estimated uncertainty is indicated by the following code letters, which are the same as used in earlier NIST publications:[5,6] All of the present values are for electric dipole transitions, E1. A—uncertainty less than 3%, B—uncertainty less than 10%, C—uncertainty less than 25%, D—uncertainty less than 50%, and E—uncertainty greater than 50%.

4. Acknowledgments

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TABLE 1. Oscillator strengths of Si VI

λ (Å)	Config. (*i*)	Config. (*k*)	Terms *i*−*k*	J_i	J_k	LS principal contribution to upper level *k*	*f*(MCHF)	*f*(CIV3)/ *f*(MCHF)	Agreement (%)
96.018	$2s^22p^5$	$2s^22p^4(^1D)3s$	$^2P^\circ-^2D$	3/2	3/2	98%	4.19E−03	0.97	−3
77.412	$2s^22p^5$	$2s^22p^4(^1S)3d$	$^2P^\circ-^2D$	3/2	3/2	98%	6.95E−03	1.05	5
91.370	$2s^22p^5$	$2s^22p^4(^1S)3s$	$^2P^\circ-^2S$	3/2	1/2	97%	1.23E−02	0.89	−11
83.284	$2s^22p^5$	$2s^22p^4(^3P)3d$	$^2P^\circ-^2P$	3/2	1/2	87%	1.55E−02	1.01	1
91.797	$2s^22p^5$	$2s^22p^4(^1S)3s$	$^2P^\circ-^2S$	1/2	1/2	97%	1.55E−02	0.90	−10
83.005	$2s^22p^5$	$2s^22p^4(^3P)3d$	$^2P^\circ-^2P$	3/2	3/2	68%	1.82E−02	0.48	−52
99.096	$2s^22p^5$	$2s^22p^4(^3P)3s$	$^2P^\circ-^2P$	3/2	1/2	98%	2.08E−02	0.99	−1
99.966	$2s^22p^5$	$2s^22p^4(^3P)3s$	$^2P^\circ-^2P$	1/2	3/2	96%	3.28E−02	1.00	−1
80.490	$2s^22p^5$	$2s^22p^4(^1D)3d$	$^2P^\circ-^2P$	3/2	1/2	85%	3.33E−02	1.58	58
80.395	$2s^22p^5$	$2s^22p^4(^1D)3d$	$^2P^\circ-^2D$	3/2	3/2	91%	3.39E−02	1.18	18
83.639	$2s^22p^5$	$2s^22p^4(^3P)3d$	$^2P^\circ-^2P$	1/2	1/2	87%	4.57E−02	0.93	−7
96.023	$2s^22p^5$	$2s^22p^4(^1D)3s$	$^2P^\circ-^2D$	3/2	5/2	98%	6.39E−02	0.97	−3
77.429	$2s^22p^5$	$2s^22p^4(^3P)3d$	$^2P^\circ-^2D$	3/2	5/2	98%	6.81E−02	1.06	6
99.599	$2s^22p^5$	$2s^22p^4(^3P)3s$	$^2P^\circ-^2P$	1/2	1/2	98%	7.66E−02	0.99	−1
96.490	$2s^22p^5$	$2s^22p^4(^1D)3s$	$^2P^\circ-^2D$	1/2	3/2	98%	7.80E−02	0.97	−3
81.031	$2s^22p^5$	$2s^22p^4(^1D)3d$	$^2P^\circ-^2S$	1/2	1/2	95%	8.32E−02	1.25	25
83.257	$2s^22p^5$	$2s^22p^4(^3P)3d$	$^2P^\circ-^2D$	3/2	3/2	68%	9.98E−02	1.10	9
99.460	$2s^22p^5$	$2s^22p^4(^3P)3s$	$^2P^\circ-^2P$	3/2	3/2	96%	1.00E−01	1.00	−1
77.718	$2s^22p^5$	$2s^22p^4(^1S)3d$	$^2P^\circ-^2D$	1/2	3/2	97%	1.01E−01	1.10	10
80.909	$2s^22p^5$	$2s^22p^4(^1D)3d$	$^2P^\circ-^2P$	1/2	3/2	90%	1.11E−01	1.11	11
80.698	$2s^22p^5$	$2s^22p^4(^1D)3d$	$^2P^\circ-^2S$	3/2	1/2	95%	1.35E−01	0.89	−11
83.128	$2s^22p^5$	$2s^22p^4(^3P)3d$	$^2P^\circ-^2D$	3/2	5/2	86%	1.80E−01	2.16	116
80.449	$2s^22p^5$	$2s^22p^4(^1D)3d$	$^2P^\circ-^2D$	3/2	5/2	77%	1.90E−01	1.76	76
83.611	$2s^22p^5$	$2s^22p^4(^3P)3d$	$^2P^\circ-^2D$	1/2	3/2	68%	1.99E−01	0.81	−19
83.358	$2s^22p^5$	$2s^22p^4(^3P)3d$	$^2P^\circ-^2P$	1/2	3/2	68%	2.03E−01	1.20	20
80.577	$2s^22p^5$	$2s^22p^4(^1D)3d$	$^2P^\circ-^2P$	3/2	3/2	90%	2.67E−01	1.09	9
80.821	$2s^22p^5$	$2s^22p^4(^1D)3d$	$^2P^\circ-^2P$	1/2	1/2	85%	2.73E−01	0.96	−4
80.725	$2s^22p^5$	$2s^22p^4(^1D)3d$	$^2P^\circ-^2D$	1/2	3/2	91%	3.68E−01	1.14	14

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6. Si VI

$Z=14$

F I isoelectronic sequence

Ground state $1s^2 2s^2 2p^5\ ^2P^\circ_{3/2}$

Ionization energy 1 655 590 cm^{-1} (205.27 eV)

Data are tabulated for 66 transitions in the range from 66 to 151 Å. Because of the breakdown of LS coupling for F-like ions we mainly selected transition probabilities calculated in intermediate coupling. Mean values of MCHF[1] and CIV3[2] results are given for the transition arrays $2s^2 2p^5 - 2s^2 2p^4 3s$, $2s^2 2p^5 - 2s^2 2p^4 3d$, and $2s 2p^6 - 2s^2 2p^4 3p$. Data for the other 11 transitions $2s^2 2p^5 - 2s^2 2p^4 nl (n=4,5)$ and $2s 2p^6 - 2s 2p^5 3s$ are taken from the Opacity Project (OP).[3] OP provides, however, only multiplet values. These have been decomposed into fine-structure components assuming LS coupling, as indicated by the notation LS in the reference column.

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Si VI

λ Ritz (Å)	E_i (cm^{-1})	E_k (cm^{-1})	Configurations	Terms	$J_i - J_k$	$g_i - g_k$	A_{ki} (10^8 s^{-1})	f_{ik}	S (a.u.)	log $g_i f$	Acc.	Ref.
66.772?	0	1 497 630?	$2s^2 2p^5 - 2s^2 2p^4(^3P)5d$	$^2P^\circ - ^2D$	3/2–5/2	4–6	6.77E+01	6.79E−03	5.97E−03	−1.566	D	3,LS
71.181?	0	1 404 870?	$2s^2 2p^5 - 2s^2 2p^4(^3P)4d$	$^2P^\circ - ^2D$	3/2–5/2	4–6	1.75E+03	1.99E−01	1.87E−01	−0.099	D	3,LS
71.273	0	1 403 050	$2s^2 2p^5 - 2s^2 2p^4(^3P)4d$	$^2P^\circ - ^2P$	3/2–3/2	4–4	7.20E+02	5.48E−02	5.14E−02	−0.659	D	3,LS
71.302	0	1 402 490	$2s^2 2p^5 - 2s^2 2p^4(^3P)4d$	$^2P^\circ - ^2P$	3/2–1/2	4–2	2.89E+02	1.10E−02	1.03E−02	−1.357	D	3,LS
71.533	5 090	1 403 050	$2s^2 2p^5 - 2s^2 2p^4(^3P)4d$	$^2P^\circ - ^2P$	1/2–3/2	2–4	1.42E+02	2.18E−02	1.03E−02	−1.361	D	3,LS
71.561	5 090	1 402 490	$2s^2 2p^5 - 2s^2 2p^4(^3P)4d$	$^2P^\circ - ^2P$	1/2–1/2	2–2	5.69E+02	4.37E−02	2.06E−02	−1.058	D	3,LS
72.896?	0	1 371 820?	$2s^2 2p^5 - 2s^2 2p^4(^1D)4s$	$^2P^\circ - ^2D$	3/2–5/2	4–6	8.79E+01	1.05E−02	1.01E−02	−1.377	D	3,LS
75.194	0	1 329 900	$2s^2 2p^5 - 2s^2 2p^4(^3P)4s$	$^2P^\circ - ^2P$	3/2–3/2	4–4	2.32E+02	1.97E−02	1.95E−02	−1.103	D	3,LS
75.483	5 090	1 329 900	$2s^2 2p^5 - 2s^2 2p^4(^3P)4s$	$^2P^\circ - ^2P$	1/2–3/2	2–4	4.61E+01	7.87E−03	3.91E−03	−1.803	D	3,LS
77.412	0	1 291 790	$2s^2 2p^5 - 2s^2 2p^4(^1S)3d$	$^2P^\circ - ^2D$	3/2–3/2	4–4	7.92E+01	7.12E−03	7.26E−03	−1.546	B	1,2
77.429	0	1 291 510	$2s^2 2p^5 - 2s^2 2p^4(^1S)3d$	$^2P^\circ - ^2D$	3/2–5/2	4–6	5.21E+02	7.02E−02	7.16E−02	−0.552	B	1,2
77.718	5 090	1 291 790	$2s^2 2p^5 - 2s^2 2p^4(^1S)3d$	$^2P^\circ - ^2D$	1/2–3/2	2–4	5.86E+02	1.06E−01	5.43E−02	−0.673	B	1,2
80.395	0	1 243 860	$2s^2 2p^5 - 2s^2 2p^4(^1D)3d$	$^2P^\circ - ^2D$	3/2–3/2	4–4	3.81E+02	3.69E−02	3.91E−02	−0.830	B	1,2
80.449	0	1 243 020	$2s^2 2p^5 - 2s^2 2p^4(^1D)3d$	$^2P^\circ - ^2D$	3/2–5/2	4–6	1.81E+03	2.63E−01	2.78E−01	0.022	D	1,2
80.490	0	1 242 390	$2s^2 2p^5 - 2s^2 2p^4(^1D)3d$	$^2P^\circ - ^2P$	3/2–1/2	4–2	8.83E+02	4.29E−02	4.55E−02	−0.765	C	1,2
80.503	0	1 242 186	$2s^2 2p^5 - 2s^2 2p^4(^1D)3d$	$^2P^\circ - ^2F$	3/2–5/2	4–6	3.52E+02	5.13E−02	5.44E−02	−0.687	C	1,2
80.577	0	1 241 050	$2s^2 2p^5 - 2s^2 2p^4(^1D)3d$	$^2P^\circ - ^2P$	3/2–3/2	4–4	2.86E+03	2.79E−01	2.96E−01	0.047	B	1,2
80.698	0	1 239 190	$2s^2 2p^5 - 2s^2 2p^4(^1D)3d$	$^2P^\circ - ^2S$	3/2–1/2	4–2	2.61E+03	1.27E−01	1.35E−01	−0.293	B	1,2
80.725	5 090	1 243 860	$2s^2 2p^5 - 2s^2 2p^4(^1D)3d$	$^2P^\circ - ^2D$	1/2–3/2	2–4	2.01E+03	3.94E−01	2.09E−01	−0.104	B	1,2
80.821	5 090	1 242 390	$2s^2 2p^5 - 2s^2 2p^4(^1D)3d$	$^2P^\circ - ^2P$	1/2–1/2	2–2	2.73E+03	2.67E−01	1.42E−01	−0.272	A	1,2
80.909	5 090	1 241 050	$2s^2 2p^5 - 2s^2 2p^4(^1D)3d$	$^2P^\circ - ^2P$	1/2–3/2	2–4	5.98E+02	1.17E−01	6.25E−02	−0.630	B	1,2
81.031	5 090	1 239 190	$2s^2 2p^5 - 2s^2 2p^4(^1D)3d$	$^2P^\circ - ^2S$	1/2–1/2	2–2	9.52E+02	9.37E−02	5.00E−02	−0.727	C	1,2
83.005	0	1 204 740	$2s^2 2p^5 - 2s^2 2p^4(^3P)3d$	$^2P^\circ - ^2P$	3/2–3/2	4–4	1.30E+02	1.35E−02	1.47E−02	−1.269	B	1,2
83.128	0	1 202 960	$2s^2 2p^5 - 2s^2 2p^4(^3P)3d$	$^2P^\circ - ^2D$	3/2–5/2	4–6	1.83E+03	2.85E−01	3.12E−01	0.056	D	1,2
83.257	0	1 201 100	$2s^2 2p^5 - 2s^2 2p^4(^3P)3d$	$^2P^\circ - ^2D$	3/2–3/2	4–4	1.01E+03	1.05E−01	1.15E−01	−0.378	B	1,2
83.284	0	1 200 710	$2s^2 2p^5 - 2s^2 2p^4(^3P)3d$	$^2P^\circ - ^2P$	3/2–1/2	4–2	3.00E+02	1.56E−02	1.71E−02	−1.205	A	1,2
83.358	5 090	1 204 740	$2s^2 2p^5 - 2s^2 2p^4(^3P)3d$	$^2P^\circ - ^2P$	1/2–3/2	2–4	1.07E+03	2.24E−01	1.23E−01	−0.349	A	1,2
83.532	0	1 197 151	$2s^2 2p^5 - 2s^2 2p^4(^3P)3d$	$^2P^\circ - ^2F$	3/2–5/2	4–6	1.63E+02	2.56E−02	2.82E−02	−0.989	D	1,2
83.611	5 090	1 201 100	$2s^2 2p^5 - 2s^2 2p^4(^3P)3d$	$^2P^\circ - ^2D$	1/2–3/2	2–4	8.55E+02	1.79E−01	9.87E−02	−0.446	B	1,2
83.613	0	1 195 984	$2s^2 2p^5 - 2s^2 2p^4(^3P)3d$	$^2P^\circ - ^4P$	3/2–3/2	4–4	2.11E+01	2.21E−03	2.43E−03	−2.054	D	1,2
83.639	5 090	1 200 710	$2s^2 2p^5 - 2s^2 2p^4(^3P)3d$	$^2P^\circ - ^2P$	1/2–1/2	2–2	4.20E+02	4.40E−02	2.43E−02	−1.055	B	1,2
83.689	0	1 194 899	$2s^2 2p^5 - 2s^2 2p^4(^3P)3d$	$^2P^\circ - ^4P$	3/2–1/2	4–2	1.44E+01	7.57E−04	8.34E−04	−2.519	B	1,2
83.729	0	1 194 327	$2s^2 2p^5 - 2s^2 2p^4(^3P)3d$	$^2P^\circ - ^4F$	3/2–3/2	4–4	9.27E+00	9.75E−04	1.07E−03	−2.409	D	1,2
83.807	0	1 193 223	$2s^2 2p^5 - 2s^2 2p^4(^3P)3d$	$^2P^\circ - ^4F$	3/2–5/2	4–6	2.81E+01	4.43E−03	4.89E−03	−1.751	D	1,2
83.971	5 090	1 195 984	$2s^2 2p^5 - 2s^2 2p^4(^3P)3d$	$^2P^\circ - ^4P$	1/2–3/2	2–4	3.06E+00	6.47E−04	3.58E−04	−2.888	E	1,2
84.047	5 090	1 194 899	$2s^2 2p^5 - 2s^2 2p^4(^3P)3d$	$^2P^\circ - ^4P$	1/2–1/2	2–2	8.48E−02	8.99E−06	4.97E−06	−4.745	C	1,2
84.088	5 090	1 194 327	$2s^2 2p^5 - 2s^2 2p^4(^3P)3d$	$^2P^\circ - ^4F$	1/2–3/2	2–4	1.95E+01	4.14E−03	2.29E−03	−2.082	C	1,2
84.538	0	1 182 894	$2s^2 2p^5 - 2s^2 2p^4(^3P)3d$	$^2P^\circ - ^4D$	3/2–1/2	4–2	7.32E−01	3.92E−05	4.36E−05	−3.805	C	1,2
84.580	0	1 182 311	$2s^2 2p^5 - 2s^2 2p^4(^3P)3d$	$^2P^\circ - ^4D$	3/2–3/2	4–4	1.19E+00	1.28E−04	1.42E−04	−3.291	C	1,2

Si VI—Continued

λ Ritz (Å)	E_i (cm^{-1})	E_k (cm^{-1})	Configurations	Terms	J_i–J_k	g_i–g_k	A_{ki} (10^8 s^{-1})	f_{ik}	S (a.u.)	log $g_i f$	Acc.	Ref.
84.627	0	1 181 649	$2s^22p^5$–$2s^22p^4(^3P)3d$	$^2P^\circ$–^4D	3/2–5/2	4–6	1.48E−01	2.39E−05	2.66E−05	−4.020	D	1,2
84.904	5 090	1 182 894	$2s^22p^5$–$2s^22p^4(^3P)3d$	$^2P^\circ$–^4D	1/2–1/2	2–2	1.75E+00	1.90E−04	1.06E−04	−3.421	C	1,2
84.946	5 090	1 182 311	$2s^22p^5$–$2s^22p^4(^3P)3d$	$^2P^\circ$–^4D	1/2–3/2	2–4	2.47E−01	5.34E−05	2.98E−05	−3.972	D	1,2
91.370	0	1 094 449	$2s^22p^5$–$2s^22p^4(^1S)3s$	$^2P^\circ$–^2S	3/2–1/2	4–2	1.85E+02	1.16E−02	1.39E−02	−1.335	B	1,2
91.797	5 090	1 094 449	$2s^22p^5$–$2s^22p^4(^1S)3s$	$^2P^\circ$–^2S	1/2–1/2	2–2	1.17E+02	1.48E−02	8.95E−03	−1.529	B	1,2
96.018	0	1 041 472	$2s^22p^5$–$2s^22p^4(^1D)3s$	$^2P^\circ$–^2D	3/2–3/2	4–4	2.98E+01	4.12E−03	5.21E−03	−1.783	B	1,2
96.023	0	1 041 416	$2s^22p^5$–$2s^22p^4(^1D)3s$	$^2P^\circ$–^2D	3/2–5/2	4–6	3.04E+02	6.29E−02	7.96E−02	−0.599	A	1,2
96.490	5 090	1 041 472	$2s^22p^5$–$2s^22p^4(^1D)3s$	$^2P^\circ$–^2D	1/2–3/2	2–4	2.75E+02	7.68E−02	4.88E−02	−0.814	A	1,2
99.096	0	1 009 118	$2s^22p^5$–$2s^22p^4(^3P)3s$	$^2P^\circ$–^2P	3/2–1/2	4–2	2.81E+02	2.07E−02	2.70E−02	−1.082	A	1,2
99.460	0	1 005 430	$2s^22p^5$–$2s^22p^4(^3P)3s$	$^2P^\circ$–^2P	3/2–3/2	4–4	6.73E+02	9.98E−02	1.31E−01	−0.399	A	1,2
99.599	5 090	1 009 118	$2s^22p^5$–$2s^22p^4(^3P)3s$	$^2P^\circ$–^2P	1/2–1/2	2–2	5.14E+02	7.64E−02	5.01E−02	−0.816	A	1,2
99.966	5 090	1 005 430	$2s^22p^5$–$2s^22p^4(^3P)3s$	$^2P^\circ$–^2P	1/2–3/2	2–4	1.09E+02	3.28E−02	2.16E−02	−1.184	A	1,2
100.455	0	995 470	$2s^22p^5$–$2s^22p^4(^3P)3s$	$^2P^\circ$–^4P	3/2–1/2	4–2	9.22E−02	6.97E−06	9.22E−06	−4.555	B	1,2
100.640	0	993 640	$2s^22p^5$–$2s^22p^4(^3P)3s$	$^2P^\circ$–^4P	3/2–3/2	4–4	1.10E+01	1.67E−03	2.21E−03	−2.176	B	1,2
100.957	0	990 516	$2s^22p^5$–$2s^22p^4(^3P)3s$	$^2P^\circ$–^4P	3/2–5/2	4–6	7.34E−01	1.68E−04	2.24E−04	−3.172	B	1,2
100.971	5 090	995 470	$2s^22p^5$–$2s^22p^4(^3P)3s$	$^2P^\circ$–^4P	1/2–1/2	2–2	2.59E+00	3.96E−04	2.63E−04	−3.101	B	1,2
101.158	5 090	993 640	$2s^22p^5$–$2s^22p^4(^3P)3s$	$^2P^\circ$–^4P	1/2–3/2	2–4	9.31E−01	2.86E−04	1.90E−04	−3.243	B	1,2
102.845	406 497	1 378 830	$2s2p^6$–$2s2p^5(^3P^\circ)3s$	^2S–$^2P^\circ$	1/2–1/2	2–2	3.70E+02	5.87E−02	3.98E−02	−0.930	D	3,LS
103.163	406 497	1 375 840	$2s2p^6$–$2s2p^5(^3P^\circ)3s$	^2S–$^2P^\circ$	1/2–3/2	2–4	3.67E+02	1.17E−01	7.95E−02	−0.631	D	3,LS
134.447	406 497	1 150 282	$2s2p^6$–$2s^22p^4(^1D)3p$	^2S–$^2P^\circ$	1/2–1/2	2–2	8.01E+00	2.17E−03	1.92E−03	−2.362	B	1,2
134.879	406 497	1 147 901	$2s2p^6$–$2s^22p^4(^1D)3p$	^2S–$^2P^\circ$	1/2–3/2	2–4	7.47E+00	4.08E−03	3.62E−03	−2.089	B	1,2
137.441	406 497	1 134 081	$2s2p^6$–$2s^22p^4(^1D)3p$	^2S–$^2D^\circ$	1/2–3/2	2–4	4.89E−02	2.77E−05	2.51E−05	−4.257	C	1,2
145.842	406 497	1 092 171	$2s2p^6$–$2s^22p^4(^3P)3p$	^2S–$^2P^\circ$	1/2–3/2	2–4	1.85E+00	1.18E−03	1.13E−03	−2.628	D	1,2
147.818	406 497	1 083 003	$2s2p^6$–$2s^22p^4(^3P)3p$	^2S–$^4D^\circ$	1/2–1/2	2–2	1.96E−02	6.41E−06	6.24E−06	−4.892	D	1,2
147.991	406 497	1 082 215	$2s2p^6$–$2s^22p^4(^3P)3p$	^2S–$^4D^\circ$	1/2–3/2	2–4	7.46E−03	4.90E−06	4.77E−06	−5.009	C	1,2
150.459	406 497	1 071 129	$2s2p^6$–$2s^22p^4(^3P)3p$	^2S–$^4P^\circ$	1/2–1/2	2–2	4.91E−03	1.67E−06	1.65E−06	−5.478	C	1,2
150.748	406 497	1 069 854	$2s2p^6$–$2s^22p^4(^3P)3p$	^2S–$^4P^\circ$	1/2–3/2	2–4	9.40E−03	6.41E−06	6.36E−06	−4.892	C	1,2

7. Si VII

$Z=14$

O I isoelectronic sequence

Ground state $1s^2 2s^2 2p^4\ {}^3P_2$

Ionization energy 1 988 000 cm^{-1} (246.5 eV)

Data are tabulated for 129 transitions in the range from 54 to 151 Å. Transition probabilities for the $2s^2 2p^4 - 2s^2 2p^3 3s$, $2s^2 2p^4 - 2s^2 2p^3 3d$, and $2s 2p^5 - 2s 2p^4(^4P)3s$ arrays are taken from MCHF calculations.[1] The other results are taken from the Opacity Project (OP).[2] OP provides, however, only multiplet values. These have been decomposed into fine-structure components assuming LS coupling, as indicated by the notation LS in the reference column.

References

[1]G. Tachiev and C. Froese Fischer, http://www.vuse.vanderbilt.edu/~cff/mchf_collection/ (downloaded 22 June, 2002). See also G. Tachiev and C. Froese Fischer, Astron. Astrophys. **385**, 716 (2002).
[2]http://legacy.gsfc.nasa.gov/topbase/ (downloaded 1 August, 1995).

Si VII

λ Ritz (Å)	E_i (cm^{-1})	E_k (cm^{-1})	Configurations	Terms	J_i–J_k	g_i–g_k	A_{ki} ($10^8\ s^{-1}$)	f_{ik}	S (a.u.)	log $g_i f$	Acc.	Ref.
54.462	0.0	1 836 140	$2s^2 2p^4 - 2s^2 2p^3(^2D^\circ)5d$	$^3P - ^3P^\circ$	2–2	5–5	4.30E+02	1.91E−02	1.71E−02	−1.020	D	2,LS
54.522	0.0	1 834 120	$2s^2 2p^4 - 2s^2 2p^3(^2D^\circ)5d$	$^3P - ^3D^\circ$	2–3	5–7	1.11E+01	6.90E−04	6.19E−04	−2.462	E	2,LS
54.582	4 030	1 836 140	$2s^2 2p^4 - 2s^2 2p^3(^2D^\circ)5d$	$^3P - ^3P^\circ$	1–2	3–5	1.42E+02	1.06E−02	5.71E−03	−1.498	D	2,LS
55.828	46 569.8	1 837 780	$2s^2 2p^4 - 2s^2 2p^3(^2P^\circ)5s$	$^1D - ^1P^\circ$	2–1	5–3	1.10E+01	3.08E−04	2.83E−04	−2.812	E	2,LS
56.528	0.0	1 769 040	$2s^2 2p^4 - 2s^2 2p^3(^4S^\circ)5d$	$^3P - ^3D^\circ$	2–3	5–7	1.15E+03	7.72E−02	7.18E−02	−0.413	D	2,LS
57.325	0.0	1 744 440	$2s^2 2p^4 - 2s^2 2p^3(^2P^\circ)4d$	$^3P - ^3D^\circ$	2–3	5–7	8.93E+02	6.16E−02	5.81E−02	−0.511	D	2,LS
57.434	0.0	1 741 130	$2s^2 2p^4 - 2s^2 2p^3(^2P^\circ)4d$	$^3P - ^3P^\circ$	2–2	5–5	3.94E+02	1.95E−02	1.84E−02	−1.011	D	2,LS
57.523	99 341	1 837 780	$2s^2 2p^4 - 2s^2 2p^3(^2P^\circ)5s$	$^1S - ^1P^\circ$	0–1	1–3	1.70E+01	2.53E−03	4.79E−04	−2.597	D	2,LS
57.567	4 030	1 741 130	$2s^2 2p^4 - 2s^2 2p^3(^2P^\circ)4d$	$^3P - ^3P^\circ$	1–2	3–5	1.30E+02	1.08E−02	6.14E−03	−1.489	D	2,LS
58.388	0.0	1 712 680	$2s^2 2p^4 - 2s^2 2p^3(^2D^\circ)4d$	$^3P - ^3S^\circ$	2–1	5–3	1.35E+03	4.13E−02	3.97E−02	−0.685	D	2,LS
58.445	0.0	1 711 010	$2s^2 2p^4 - 2s^2 2p^3(^2D^\circ)4d$	$^3P - ^3P^\circ$	2–2	5–5	1.21E+03	6.18E−02	5.95E−02	−0.510	D	2,LS
58.526	4 030	1 712 680	$2s^2 2p^4 - 2s^2 2p^3(^2D^\circ)4d$	$^3P - ^3S^\circ$	1–1	3–3	8.02E+02	4.12E−02	2.38E−02	−0.908	D	2,LS
58.578	5 565	1 712 680	$2s^2 2p^4 - 2s^2 2p^3(^2D^\circ)4d$	$^3P - ^3S^\circ$	0–1	1–3	2.66E+02	4.11E−02	7.93E−03	−1.386	D	2,LS
58.579	0.0	1 707 090	$2s^2 2p^4 - 2s^2 2p^3(^2D^\circ)4d$	$^3P - ^3D^\circ$	2–2	5–5	2.10E+02	1.08E−02	1.04E−02	−1.268	D	2,LS
58.579	0.0	1 707 090	$2s^2 2p^4 - 2s^2 2p^3(^2D^\circ)4d$	$^3P - ^3D^\circ$	2–3	5–7	8.37E+02	6.03E−02	5.81E−02	−0.521	D	2,LS
58.583	4 030	1 711 010	$2s^2 2p^4 - 2s^2 2p^3(^2D^\circ)4d$	$^3P - ^3P^\circ$	1–2	3–5	3.99E+02	3.42E−02	1.98E−02	−0.989	D	2,LS
58.718	4 030	1 707 090	$2s^2 2p^4 - 2s^2 2p^3(^2D^\circ)4d$	$^3P - ^3D^\circ$	1–2	3–5	6.23E+02	5.37E−02	3.11E−02	−0.793	D	2,LS
58.782	46 569.8	1 747 770	$2s^2 2p^4 - 2s^2 2p^3(^2P^\circ)4d$	$^1D - ^1F^\circ$	2–3	5–7	1.34E+03	9.73E−02	9.42E−02	−0.313	D	2,LS
59.884	0.0	1 669 900	$2s^2 2p^4 - 2s^2 2p^3(^2P^\circ)4s$	$^3P - ^3P^\circ$	2–2	5–5	1.16E+02	6.24E−03	6.15E−03	−1.506	D	2,LS
59.966?	46 569.8	1 714 180?	$2s^2 2p^4 - 2s^2 2p^3(^2D^\circ)4d$	$^1D - ^1F^\circ$	2–3	5–7	1.56E+03	1.18E−01	1.17E−01	−0.229	C	2,LS
60.029	4 030	1 669 900	$2s^2 2p^4 - 2s^2 2p^3(^2P^\circ)4s$	$^3P - ^3P^\circ$	1–2	3–5	3.84E+01	3.46E−03	2.05E−03	−1.984	D	2,LS
60.837	0.0	1 643 740	$2s^2 2p^4 - 2s^2 2p^3(^4S^\circ)4d$	$^3P - ^3D^\circ$	2–3	5–7	1.26E+03	9.82E−02	9.83E−02	−0.309	D	2,LS
61.306	0.0	1 631 160	$2s^2 2p^4 - 2s^2 2p^3(^2D^\circ)4s$	$^3P - ^3D^\circ$	2–3	5–7	2.74E+02	2.16E−02	2.18E−02	−0.967	D	2,LS
61.522	46 569.8	1 672 010	$2s^2 2p^4 - 2s^2 2p^3(^2P^\circ)4s$	$^1D - ^1P^\circ$	2–1	5–3	4.35E+02	1.48E−02	1.50E−02	−1.131	D	2,LS
62.940	46 569.8	1 635 390	$2s^2 2p^4 - 2s^2 2p^3(^2D^\circ)4s$	$^1D - ^1D^\circ$	2–2	5–5	4.58E+02	2.72E−02	2.82E−02	−0.866	D	2,LS
63.586	99 341	1 672 010	$2s^2 2p^4 - 2s^2 2p^3(^2P^\circ)4s$	$^1S - ^1P^\circ$	0–1	1–3	1.88E+02	3.42E−02	7.16E−03	−1.466	D	2,LS
65.595	363 170	1 887 680	$2s 2p^5 - 2s 2p^4(^4P)4s$	$^3P^\circ - ^3P$	2–2	5–5	1.41E+02	9.08E−03	9.80E−03	−1.343	D	2,LS
65.751	366 786	1 887 680	$2s 2p^5 - 2s 2p^4(^4P)4s$	$^3P^\circ - ^3P$	1–2	3–5	4.66E+01	5.03E−03	3.27E−03	−1.821	D	2,LS
67.858	0.0	1 473 670	$2s^2 2p^4 - 2s^2 2p^3(^2P^\circ)3d$	$^3P - ^1F^\circ$	2–3	5–7	7.72E+00	7.47E−04	8.34E−04	−2.428	D	1
68.025	0.0	1 470 050	$2s^2 2p^4 - 2s^2 2p^3(^2P^\circ)3d$	$^3P - ^1D^\circ$	2–2	5–5	1.16E+02	8.06E−03	9.03E−03	−1.395	C	1
68.148	0.0	1 467 390	$2s^2 2p^4 - 2s^2 2p^3(^2P^\circ)3d$	$^3P - ^3D^\circ$	2–3	5–7	2.18E+03	2.12E−01	2.38E−01	0.026	B	1
68.190	0.0	1 466 490	$2s^2 2p^4 - 2s^2 2p^3(^2P^\circ)3d$	$^3P - ^3D^\circ$	2–2	5–5	4.36E+02	3.04E−02	3.41E−02	−0.818	B	1
68.212	4 030	1 470 050	$2s^2 2p^4 - 2s^2 2p^3(^2P^\circ)3d$	$^3P - ^1D^\circ$	1–2	3–5	3.81E+02	4.43E−02	2.99E−02	−0.876	B	1
68.378	4 030	1 466 490	$2s^2 2p^4 - 2s^2 2p^3(^2P^\circ)3d$	$^3P - ^3D^\circ$	1–2	3–5	1.82E+03	2.13E−01	1.44E−01	−0.194	B	1
68.406	0.0	1 461 860	$2s^2 2p^4 - 2s^2 2p^3(^2P^\circ)3d$	$^3P - ^3P^\circ$	2–2	5–5	4.06E+02	2.85E−02	3.21E−02	−0.847	B	1
68.453	0.0	1 460 860	$2s^2 2p^4 - 2s^2 2p^3(^2P^\circ)3d$	$^3P - ^3P^\circ$	2–1	5–3	2.05E+02	8.65E−03	9.75E−03	−1.364	C	1
68.595	4 030	1 461 860	$2s^2 2p^4 - 2s^2 2p^3(^2P^\circ)3d$	$^3P - ^3P^\circ$	1–2	3–5	1.07E+02	1.25E−02	8.48E−03	−1.425	B	1
68.642	4 030	1 460 860	$2s^2 2p^4 - 2s^2 2p^3(^2P^\circ)3d$	$^3P - ^3P^\circ$	1–1	3–3	4.42E+02	3.12E−02	2.12E−02	−1.029	B	1
68.669	4 030	1 460 290	$2s^2 2p^4 - 2s^2 2p^3(^2P^\circ)3d$	$^3P - ^3P^\circ$	1–0	3–1	1.36E+03	3.21E−02	2.18E−02	−1.017	B	1
68.715	5 565	1 460 860	$2s^2 2p^4 - 2s^2 2p^3(^2P^\circ)3d$	$^3P - ^3P^\circ$	0–1	1–3	4.44E+02	9.43E−02	2.13E−02	−1.026	B	1
69.087	0.0	1 447 440	$2s^2 2p^4 - 2s^2 2p^3(^2D^\circ)3d$	$^3P - ^1F^\circ$	2–3	5–7	8.58E+01	8.59E−03	9.77E−03	−1.367	C	1

Si VII—Continued

λ Ritz (Å)	E_i (cm^{-1})	E_k (cm^{-1})	Configurations	Terms	J_i–J_k	g_i–g_k	A_{ki} (10^8 s^{-1})	f_{ik}	S (a.u.)	log $g_i f$	Acc.	Ref.
69.385	0.0	1 441 230	$2s^22p^4$–$2s^22p^3(^2D^\circ)3d$	^3P–$^3S^\circ$	2–1	5–3	2.73E+03	1.18E−01	1.35E−01	−0.229	B	1
69.580	4 030	1 441 230	$2s^22p^4$–$2s^22p^3(^2D^\circ)3d$	^3P–$^3S^\circ$	1–1	3–3	1.81E+03	1.31E−01	9.03E−02	−0.404	B	1
69.602	0.0	1 436 750	$2s^22p^4$–$2s^22p^3(^2D^\circ)3d$	^3P–$^3P^\circ$	2–1	5–3	2.41E+03	1.05E−01	1.20E−01	−0.281	B	1
69.622?	0.0	1 436 330?	$2s^22p^4$–$2s^22p^3(^2D^\circ)3d$	^3P–$^1D^\circ$	2–2	5–5	1.15E+02	8.35E−03	9.57E−03	−1.379	C	1
69.654	5 565	1 441 230	$2s^22p^4$–$2s^22p^3(^2D^\circ)3d$	^3P–$^3S^\circ$	0–1	1–3	6.32E+02	1.38E−01	3.16E−02	−0.860	B	1
69.664	0.0	1 435 460	$2s^22p^4$–$2s^22p^3(^2D^\circ)3d$	^3P–$^3P^\circ$	2–2	5–5	4.14E+03	3.01E−01	3.46E−01	0.178	B	1
69.797	4 030	1 436 750	$2s^22p^4$–$2s^22p^3(^2D^\circ)3d$	^3P–$^3P^\circ$	1–1	3–3	1.04E+03	7.56E−02	5.21E−02	−0.644	B	1
69.818?	4 030	1 436 330?	$2s^22p^4$–$2s^22p^3(^2D^\circ)3d$	^3P–$^1D^\circ$	1–2	3–5	2.22E+01	2.71E−03	1.87E−03	−2.090	C	1
69.860	4 030	1 435 460	$2s^22p^4$–$2s^22p^3(^2D^\circ)3d$	^3P–$^3P^\circ$	1–2	3–5	1.05E+03	1.28E−01	8.82E−02	−0.416	B	1
69.872	5 565	1 436 750	$2s^22p^4$–$2s^22p^3(^2D^\circ)3d$	^3P–$^3P^\circ$	0–1	1–3	1.29E+03	2.83E−01	6.50E−02	−0.549	B	1
69.967	0.0	1 429 240	$2s^22p^4$–$2s^22p^3(^2D^\circ)3d$	^3P–$^1P^\circ$	2–1	5–3	1.37E+02	6.02E−03	6.93E−03	−1.521	C	1
70.024	0.0	1 428 090	$2s^22p^4$–$2s^22p^3(^2D^\circ)3d$	^3P–$^3D^\circ$	2–2	5–5	5.32E+02	3.91E−02	4.51E−02	−0.709	B	1
70.027	0.0	1 428 020	$2s^22p^4$–$2s^22p^3(^2D^\circ)3d$	^3P–$^3D^\circ$	2–3	5–7	3.17E+03	3.26E−01	3.76E−01	0.212	B	1
70.072	46 569.8	1 473 670	$2s^22p^4$–$2s^22p^3(^2P^\circ)3d$	^1D–$^1F^\circ$	2–3	5–7	4.29E+03	4.42E−01	5.10E−01	0.344	B	1
70.124	0.0	1 426 050	$2s^22p^4$–$2s^22p^3(^2D^\circ)3d$	^3P–$^3F^\circ$	2–2	5–5	3.04E+00	2.24E−04	2.59E−04	−2.950	D	1
70.165	4 030	1 429 240	$2s^22p^4$–$2s^22p^3(^2D^\circ)3d$	^3P–$^1P^\circ$	1–1	3–3	3.71E+02	2.74E−02	1.90E−02	−1.086	B	1
70.222	4 030	1 428 090	$2s^22p^4$–$2s^22p^3(^2D^\circ)3d$	^3P–$^3D^\circ$	1–2	3–5	2.26E+03	2.78E−01	1.93E−01	−0.079	B	1
70.241	5 565	1 429 240	$2s^22p^4$–$2s^22p^3(^2D^\circ)3d$	^3P–$^1P^\circ$	0–1	1–3	1.42E+02	3.14E−02	7.26E−03	−1.503	B	1
70.250	46 569.8	1 470 050	$2s^22p^4$–$2s^22p^3(^2P^\circ)3d$	^1D–$^1D^\circ$	2–2	5–5	2.90E+03	2.14E−01	2.48E−01	0.030	B	1
70.322	4 030	1 426 050	$2s^22p^4$–$2s^22p^3(^2D^\circ)3d$	^3P–$^3F^\circ$	1–2	3–5	7.50E+00	9.27E−04	6.44E−04	−2.556	D	1
70.382	46 569.8	1 467 390	$2s^22p^4$–$2s^22p^3(^2P^\circ)3d$	^1D–$^3D^\circ$	2–3	5–7	3.39E+01	3.53E−03	4.09E−03	−1.754	C	1
70.426	46 569.8	1 466 490	$2s^22p^4$–$2s^22p^3(^2P^\circ)3d$	^1D–$^3D^\circ$	2–2	5–5	5.49E+02	4.08E−02	4.73E−02	−0.690	B	1
70.657	46 569.8	1 461 860	$2s^22p^4$–$2s^22p^3(^2P^\circ)3d$	^1D–$^3P^\circ$	2–2	5–5	2.84E−01	2.12E−05	2.47E−05	−3.974	E	1
70.707	46 569.8	1 460 860	$2s^22p^4$–$2s^22p^3(^2P^\circ)3d$	^1D–$^3P^\circ$	2–1	5–3	1.69E+01	7.61E−04	8.86E−04	−2.420	D	1
71.384	46 569.8	1 447 440	$2s^22p^4$–$2s^22p^3(^2D^\circ)3d$	^1D–$^1F^\circ$	2–3	5–7	4.10E+03	4.38E−01	5.15E−01	0.340	B	1
71.702	46 569.8	1 441 230	$2s^22p^4$–$2s^22p^3(^2D^\circ)3d$	^1D–$^3S^\circ$	2–1	5–3	2.41E+00	1.11E−04	1.32E−04	−3.254	D	1
71.933	46 569.8	1 436 750	$2s^22p^4$–$2s^22p^3(^2D^\circ)3d$	^1D–$^3P^\circ$	2–1	5–3	7.82E+01	3.64E−03	4.31E−03	−1.740	C	1
71.955?	46 569.8	1 436 330?	$2s^22p^4$–$2s^22p^3(^2D^\circ)3d$	^1D–$^1D^\circ$	2–2	5–5	2.30E+03	1.78E−01	2.11E−01	−0.050	B	1
72.000	46 569.8	1 435 460	$2s^22p^4$–$2s^22p^3(^2D^\circ)3d$	^1D–$^3P^\circ$	2–2	5–5	4.51E+01	3.50E−03	4.15E−03	−1.757	C	1
72.324	46 569.8	1 429 240	$2s^22p^4$–$2s^22p^3(^2D^\circ)3d$	^1D–$^1P^\circ$	2–1	5–3	2.00E+03	9.40E−02	1.12E−01	−0.328	B	1
72.384	46 569.8	1 428 090	$2s^22p^4$–$2s^22p^3(^2D^\circ)3d$	^1D–$^3D^\circ$	2–2	5–5	1.29E+00	1.01E−04	1.21E−04	−3.296	D	1
72.388	46 569.8	1 428 020	$2s^22p^4$–$2s^22p^3(^2D^\circ)3d$	^1D–$^3D^\circ$	2–3	5–7	2.46E+00	2.70E−04	3.22E−04	−2.869	D	1
72.491	46 569.8	1 426 050	$2s^22p^4$–$2s^22p^3(^2D^\circ)3d$	^1D–$^3F^\circ$	2–2	5–5	1.46E+00	1.15E−04	1.37E−04	−3.240	D	1
73.123	0.0	1 367 560	$2s^22p^4$–$2s^22p^3(^4S^\circ)3d$	^3P–$^3D^\circ$	2–3	5–7	2.14E+03	2.40E−01	2.89E−01	0.079	B	1
73.134	0.0	1 367 360	$2s^22p^4$–$2s^22p^3(^4S^\circ)3d$	^3P–$^3D^\circ$	2–1	5–3	6.17E+01	2.97E−03	3.57E−03	−1.829	C	1
73.134	0.0	1 367 360	$2s^22p^4$–$2s^22p^3(^4S^\circ)3d$	^3P–$^3D^\circ$	2–2	5–5	5.53E+02	4.43E−02	5.33E−02	−0.655	B	1
73.350	4 030	1 367 360	$2s^22p^4$–$2s^22p^3(^4S^\circ)3d$	^3P–$^3D^\circ$	1–1	3–3	8.75E+02	7.06E−02	5.11E−02	−0.674	B	1
73.350	4 030	1 367 360	$2s^22p^4$–$2s^22p^3(^4S^\circ)3d$	^3P–$^3D^\circ$	1–2	3–5	1.52E+03	2.05E−01	1.48E−01	−0.211	B	1
73.432	5 565	1 367 360	$2s^22p^4$–$2s^22p^3(^4S^\circ)3d$	^3P–$^3D^\circ$	0–1	1–3	1.14E+03	2.75E−01	6.66E−02	−0.560	B	1
73.447	99 341	1 460 860	$2s^22p^4$–$2s^22p^3(^2P^\circ)3d$	^1S–$^3P^\circ$	0–1	1–3	1.65E+01	3.99E−03	9.65E−04	−2.399	C	1
74.522	99 341	1 441 230	$2s^22p^4$–$2s^22p^3(^2D^\circ)3d$	^1S–$^3S^\circ$	0–1	1–3	1.49E+00	3.72E−04	9.13E−05	−3.429	D	1
74.771	99 341	1 436 750	$2s^22p^4$–$2s^22p^3(^2D^\circ)3d$	^1S–$^3P^\circ$	0–1	1–3	1.53E+00	3.84E−04	9.45E−05	−3.416	D	1
75.194	99 341	1 429 240	$2s^22p^4$–$2s^22p^3(^2D^\circ)3d$	^1S–$^1P^\circ$	0–1	1–3	3.23E+02	8.22E−02	2.04E−02	−1.085	B	1
75.701	46 569.8	1 367 560	$2s^22p^4$–$2s^22p^3(^4S^\circ)3d$	^1D–$^3D^\circ$	2–3	5–7	1.80E+00	2.17E−04	2.70E−04	−2.965	D	1
75.712	46 569.8	1 367 360	$2s^22p^4$–$2s^22p^3(^4S^\circ)3d$	^1D–$^3D^\circ$	2–2	5–5	1.04E+00	8.93E−05	1.11E−04	−3.350	E	1
75.712	46 569.8	1 367 360	$2s^22p^4$–$2s^22p^3(^4S^\circ)3d$	^1D–$^3D^\circ$	2–1	5–3	3.99E−01	2.06E−05	2.57E−05	−3.987	E	1
76.919	363 170	1 663 240	$2s2p^5$–$2s2p^4(^2S)3s$	$^3P^\circ$–^3S	2–1	5–3	3.03E+02	1.61E−02	2.04E−02	−1.094	D	2,LS
77.133	366 786	1 663 240	$2s2p^5$–$2s2p^4(^2S)3s$	$^3P^\circ$–^3S	1–1	3–3	1.81E+02	1.61E−02	1.23E−02	−1.316	D	2,LS
77.251	368 761	1 663 240	$2s2p^5$–$2s2p^4(^2S)3s$	$^3P^\circ$–^3S	0–1	1–3	6.00E+01	1.61E−02	4.10E−03	−1.793	D	2,LS
78.917	5 565	1 272 720	$2s^22p^4$–$2s^22p^3(^2P^\circ)3s$	^3P–$^1P^\circ$	0–1	1–3	2.83E−01	7.94E−05	2.06E−05	−4.100	E	1
79.237	0.0	1 262 040	$2s^22p^4$–$2s^22p^3(^2P^\circ)3s$	^3P–$^3P^\circ$	2–2	5–5	2.77E+02	2.61E−02	3.40E−02	−0.885	B	1
79.264	0.0	1 261 610	$2s^22p^4$–$2s^22p^3(^2P^\circ)3s$	^3P–$^3P^\circ$	2–1	5–3	1.47E+02	8.32E−03	1.09E−02	−1.381	C	1
79.491	4 030	1 262 040	$2s^22p^4$–$2s^22p^3(^2P^\circ)3s$	^3P–$^3P^\circ$	1–2	3–5	1.43E+02	2.26E−02	1.78E−02	−1.169	B	1
79.518	4 030	1 261 610	$2s^22p^4$–$2s^22p^3(^2P^\circ)3s$	^3P–$^3P^\circ$	1–1	3–3	9.39E+01	8.91E−03	6.99E−03	−1.573	C	1
79.523?	4 030	1 261 530?	$2s^22p^4$–$2s^22p^3(^2P^\circ)3s$	^3P–$^3P^\circ$	1–0	3–1	4.10E+02	1.30E−02	1.02E−02	−1.410	B	1
79.615	5 565	1 261 610	$2s^22p^4$–$2s^22p^3(^2P^\circ)3s$	^3P–$^3P^\circ$	0–1	1–3	1.69E+02	4.83E−02	1.27E−02	−1.316	B	1
80.913	0.0	1 235 890	$2s^22p^4$–$2s^22p^3(^2D^\circ)3s$	^3P–$^1D^\circ$	2–2	5–5	1.18E+01	1.16E−03	1.54E−03	−2.238	C	1
81.178	4 030	1 235 890	$2s^22p^4$–$2s^22p^3(^2D^\circ)3s$	^3P–$^1D^\circ$	1–2	3–5	1.83E+00	3.01E−04	2.42E−04	−3.044	D	1
81.449	363 170	1 590 930	$2s2p^5$–$2s2p^4(^2D)3s$	$^3P^\circ$–^3D	2–3	5–7	5.12E+02	7.13E−02	9.56E−02	−0.448	D	2,LS
81.556	46 569.8	1 272 720	$2s^22p^4$–$2s^22p^3(^2P^\circ)3s$	^1D–$^1P^\circ$	2–1	5–3	5.24E+02	3.13E−02	4.21E−02	−0.805	B	1
81.623	0.0	1 225 150	$2s^22p^4$–$2s^22p^3(^2D^\circ)3s$	^3P–$^3D^\circ$	2–1	5–3	1.71E+01	1.03E−03	1.38E−03	−2.290	C	1

Si VII—Continued

λ Ritz (Å)	E_i (cm^{-1})	E_k (cm^{-1})	Configurations	Terms	J_i–J_k	g_i–g_k	A_{ki} (10^8 s^{-1})	f_{ik}	S (a.u.)	log $g_i f$	Acc.	Ref.
81.623	0.0	1 225 150	$2s^22p^4$–$2s^22p^3(^2D^\circ)3s$	^3P–$^3D^\circ$	2–2	5–5	1.41E+02	1.41E−02	1.90E−02	−1.151	B	1
81.623	0.0	1 225 150	$2s^22p^4$–$2s^22p^3(^2D^\circ)3s$	^3P–$^3D^\circ$	2–3	5–7	4.24E+02	5.93E−02	7.96E−02	−0.528	B	1
81.892	4 030	1 225 150	$2s^22p^4$–$2s^22p^3(^2D^\circ)3s$	^3P–$^3D^\circ$	1–2	3–5	2.82E+02	4.73E−02	3.83E−02	−0.848	B	1
81.892	4 030	1 225 150	$2s^22p^4$–$2s^22p^3(^2D^\circ)3s$	^3P–$^3D^\circ$	1–1	3–3	1.96E+02	1.97E−02	1.59E−02	−1.229	B	1
81.995	5 565	1 225 150	$2s^22p^4$–$2s^22p^3(^2D^\circ)3s$	^3P–$^3D^\circ$	0–1	1–3	2.06E+02	6.22E−02	1.68E−02	−1.206	B	1
82.273	46 569.8	1 262 040	$2s^22p^4$–$2s^22p^3(^2P^\circ)3s$	^1D–$^3P^\circ$	2–2	5–5	1.93E+01	1.96E−03	2.65E−03	−2.009	C	1
82.302	46 569.8	1 261 610	$2s^22p^4$–$2s^22p^3(^2P^\circ)3s$	^1D–$^3P^\circ$	2–1	5–3	1.50E+00	9.12E−05	1.24E−04	−3.341	E	1
84.082	46 569.8	1 235 890	$2s^22p^4$–$2s^22p^3(^2D^\circ)3s$	^1D–$^1D^\circ$	2–2	5–5	1.07E+03	1.13E−01	1.57E−01	−0.248	B	1
84.848	46 569.8	1 225 150	$2s^22p^4$–$2s^22p^3(^2D^\circ)3s$	^1D–$^3D^\circ$	2–3	5–7	1.25E+00	1.89E−04	2.64E−04	−3.025	D	1
84.848	46 569.8	1 225 150	$2s^22p^4$–$2s^22p^3(^2D^\circ)3s$	^1D–$^3D^\circ$	2–1	5–3	2.22E+00	1.44E−04	2.01E−04	−3.143	D	1
85.224	99 341	1 272 720	$2s^22p^4$–$2s^22p^3(^2P^\circ)3s$	^1S–$^1P^\circ$	0–1	1–3	5.01E+02	1.64E−01	4.59E−02	−0.786	B	1
85.290	0.0	1 172 470	$2s^22p^4$–$2s^22p^3(^4S^\circ)3s$	^3P–$^3S^\circ$	2–1	5–3	7.57E+02	4.95E−02	6.95E−02	−0.606	B	1
85.584	4 030	1 172 470	$2s^22p^4$–$2s^22p^3(^4S^\circ)3s$	^3P–$^3S^\circ$	1–1	3–3	4.31E+02	4.73E−02	4.00E−02	−0.848	B	1
85.697	5 565	1 172 470	$2s^22p^4$–$2s^22p^3(^4S^\circ)3s$	^3P–$^3S^\circ$	0–1	1–3	1.43E+02	4.73E−02	1.33E−02	−1.325	B	1
86.039	99 341	1 261 610	$2s^22p^4$–$2s^22p^3(^2P^\circ)3s$	^1S–$^3P^\circ$	0–1	1–3	3.14E−02	1.05E−05	2.96E−06	−4.981	E	1
87.742	363 170	1 502 880	$2s2p^5$–$2s2p^4(^4P)3s$	$^3P^\circ$–^3P	2–1	5–3	3.55E+02	2.46E−02	3.55E−02	−0.910	D	2,LS
87.901	366 786	1 504 430	$2s2p^5$–$2s2p^4(^4P)3s$	$^3P^\circ$–^3P	1–0	3–1	8.50E+02	3.28E−02	2.85E−02	−1.007	D	2,LS
88.005	363 170	1 499 470	$2s2p^5$–$2s2p^4(^4P)3s$	$^3P^\circ$–^3P	2–2	5–5	6.34E+02	7.36E−02	1.07E−01	−0.434	D	2,LS
88.021	366 786	1 502 880	$2s2p^5$–$2s2p^4(^4P)3s$	$^3P^\circ$–^3P	1–1	3–3	2.11E+02	2.45E−02	2.13E−02	−1.134	D	2,LS
88.174	368 761	1 502 880	$2s2p^5$–$2s2p^4(^4P)3s$	$^3P^\circ$–^3P	0–1	1–3	2.80E+02	9.80E−02	2.85E−02	−1.009	D	2,LS
88.286	366 786	1 499 470	$2s2p^5$–$2s2p^4(^4P)3s$	$^3P^\circ$–^3P	1–2	3–5	2.10E+02	4.08E−02	3.56E−02	−0.912	D	2,LS
88.818	46 569.8	1 172 470	$2s^22p^4$–$2s^22p^3(^4S^\circ)3s$	^1D–$^3S^\circ$	2–1	5–3	6.58E−01	4.67E−05	6.82E−05	−3.632	E	1
88.825	99 341	1 225 150	$2s^22p^4$–$2s^22p^3(^2D^\circ)3s$	^1S–$^3D^\circ$	0–1	1–3	7.68E−01	2.72E−04	7.97E−05	−3.565	D	1
101.141	849 057	1 837 780	$2p^6$–$2s^22p^3(^2P^\circ)5s$	^1S–$^1P^\circ$	0–1	1–3	5.85E−01	2.69E−04	8.96E−05	−3.570	E	2,LS
121.514	849 057	1 672 010	$2p^6$–$2s^22p^3(^2P^\circ)4s$	^1S–$^1P^\circ$	0–1	1–3	5.78E−01	3.84E−04	1.54E−04	−3.416	E	2,LS
150.937	1 225 150	1 887 680	$2s^22p^3(^2D^\circ)3s$–$2s2p^4(^4P)4s$	$^3D^\circ$–^3P	2–2	5–5	7.94E−01	2.71E−04	6.73E−04	−2.868	E	2,LS
150.937	1 225 150	1 887 680	$2s^22p^3(^2D^\circ)3s$–$2s2p^4(^4P)4s$	$^3D^\circ$–^3P	3–2	7–5	4.43E+00	1.08E−03	3.76E−03	−2.121	D	2,LS

8. Si VIII

$Z=14$

N I isoelectronic sequence

Ground state $1s^2 2s^2 2p^3\ {}^4S^\circ_{3/2}$

Ionization energy 2 448 200 cm^{-1} (303.54 eV)

Data are tabulated for 147 transitions in the range from 50 to 161 Å. Transition probabilities for the $2s^2 2p^3 - 2s^2 2p^2 3s$, $2s^2 2p^3 - 2s^2 2p^2 3d$, $2s 2p^4 - 2s 2p^3 (^5S^\circ) 3s$, $2p^5 - 2s^2 2p^2 3s$, and $2p^5 - 2s^2 2p^2 3d$ arrays are taken from MCHF calculations.[1] The other results are taken from the Opacity Project (OP).[2] OP provides, however, only multiplet values. These have been decomposed into fine-structure components assuming LS coupling, as indicated by the notation LS in the reference column.

References

[1]G. Tachiev and C. Froese Fischer, http://www.vuse.vanderbilt.edu/~cff/mchf_collection/ (downloaded 22 June, 2002). See also G. Tachiev and C. Froese Fischer, Astron. Astrophys. **385**, 716 (2002).
[2]http://legacy.gsfc.nasa.gov/topbase/ (downloaded 1 August, 1995).

Si VIII

λ Ritz (Å)	E_i (cm^{-1})	E_k (cm^{-1})	Configurations	Terms	J_i–J_k	g_i–g_k	A_{ki} (10^8 s^{-1})	f_{ik}	S (a.u.)	log $g_i f$	Acc.	Ref.
49.987?	0.0	2 000 520?	$2s^2 2p^3 - 2s^2 2p^2 (^3P) 4d$	$^4S^\circ - ^4P$	3/2–3/2	4–4	2.80E+03	1.05E−01	6.91E−02	−0.377	C	2,LS
50.019	0.0	1 999 240	$2s^2 2p^3 - 2s^2 2p^2 (^3P) 4d$	$^4S^\circ - ^4P$	3/2–5/2	4–6	2.79E+03	1.57E−01	1.03E−01	−0.202	C	2,LS
51.559?	69 168.1	2 008 700?	$2s^2 2p^3 - 2s^2 2p^2 (^3P) 4d$	$^2D^\circ - ^2D$	3/2–5/2	4–6	5.24E+01	3.13E−03	2.13E−03	−1.902	D	2,LS
51.566?	69 420.5	2 008 700?	$2s^2 2p^3 - 2s^2 2p^2 (^3P) 4d$	$^2D^\circ - ^2D$	5/2–5/2	6–6	7.33E+02	2.92E−02	2.97E−02	−0.756	D	2,LS
51.718?	69 420.5	2 002 980?	$2s^2 2p^3 - 2s^2 2p^2 (^3P) 4d$	$^2D^\circ - ^2F$	5/2–7/2	6–8	1.89E+03	1.01E−01	1.03E−01	−0.218	C	2,LS
51.819?	69 168.1	1 998 960?	$2s^2 2p^3 - 2s^2 2p^2 (^3P) 4d$	$^2D^\circ - ^2F$	3/2–5/2	4–6	1.76E+03	1.06E−01	7.23E−02	−0.373	C	2,LS
51.826?	69 420.5	1 998 960?	$2s^2 2p^3 - 2s^2 2p^2 (^3P) 4d$	$^2D^\circ - ^2F$	5/2–5/2	6–6	1.25E+02	5.04E−03	5.16E−03	−1.519	D	2,LS
52.554?	105 890	2 008 700?	$2s^2 2p^3 - 2s^2 2p^2 (^3P) 4d$	$^2P^\circ - ^2D$	3/2–5/2	4–6	1.71E+03	1.06E−01	7.34E−02	−0.373	C	2,LS
53.763?	69 168.1	1 929 190?	$2s^2 2p^3 - 2s^2 2p^2 (^3P) 4s$	$^2D^\circ - ^2P$	3/2–3/2	4–4	1.78E+01	7.73E−04	5.47E−04	−2.510	E	2,LS
53.770?	69 420.5	1 929 190?	$2s^2 2p^3 - 2s^2 2p^2 (^3P) 4s$	$^2D^\circ - ^2P$	5/2–3/2	6–4	1.61E+02	4.64E−03	4.93E−03	−1.555	D	2,LS
54.829?	105 348	1 929 190?	$2s^2 2p^3 - 2s^2 2p^2 (^3P) 4s$	$^2P^\circ - ^2P$	1/2–3/2	2–4	1.50E+01	1.35E−03	4.87E−04	−2.569	D	2,LS
54.846?	105 890	1 929 190?	$2s^2 2p^3 - 2s^2 2p^2 (^3P) 4s$	$^2P^\circ - ^2P$	3/2–3/2	4–4	7.50E+01	3.38E−03	2.44E−03	−1.869	D	2,LS
58.696?	0.0	1 703 690?	$2s^2 2p^3 - 2s^2 2p^2 (^1D) 3d$	$^4S^\circ - ^2S$	3/2–1/2	4–2	2.26E+00	5.82E−05	4.50E−05	−3.633	D	1
58.885?	0.0	1 698 230?	$2s^2 2p^3 - 2s 2p^2 (^5S^\circ) 3p$	$^4S^\circ - ^4P$	3/2–3/2	4–4	1.12E+03	5.84E−02	4.53E−02	−0.632	D	2,LS
58.885?	0.0	1 698 230?	$2s^2 2p^3 - 2s 2p^2 (^5S^\circ) 3p$	$^4S^\circ - ^4P$	3/2–1/2	4–2	1.12E+03	2.92E−02	2.26E−02	−0.933	D	2,LS
58.885?	0.0	1 698 230?	$2s^2 2p^3 - 2s^2 2p^2 (^5S^\circ) 3p$	$^4S^\circ - ^4P$	3/2–5/2	4–6	1.12E+03	8.76E−02	6.79E−02	−0.455	D	2,LS
58.888	0.0	1 698 150	$2s^2 2p^3 - 2s^2 2p^2 (^1D) 3d$	$^4S^\circ - ^2P$	3/2–3/2	4–4	1.83E+01	9.52E−04	7.38E−04	−2.419	C	1
58.942	0.0	1 696 590	$2s^2 2p^3 - 2s^2 2p^2 (^1D) 3d$	$^4S^\circ - ^2P$	3/2–1/2	4–2	3.86E+00	1.00E−04	7.79E−05	−3.396	C	1
59.257	0.0	1 687 560	$2s^2 2p^3 - 2s^2 2p^2 (^1D) 3d$	$^4S^\circ - ^2D$	3/2–5/2	4–6	3.48E+00	2.75E−04	2.14E−04	−2.959	D	1
59.314	0.0	1 685 950	$2s^2 2p^3 - 2s^2 2p^2 (^1D) 3d$	$^4S^\circ - ^2D$	3/2–3/2	4–4	9.17E−01	4.84E−05	3.78E−05	−3.713	D	1
59.354	0.0	1 684 810	$2s^2 2p^3 - 2s^2 2p^2 (^1D) 3d$	$^4S^\circ - ^2F$	3/2–5/2	4–6	1.12E+00	8.87E−05	6.93E−05	−3.450	D	1
60.223	0.0	1 660 490	$2s^2 2p^3 - 2s^2 2p^2 (^3P) 3d$	$^4S^\circ - ^2D$	3/2–5/2	4–6	2.96E−01	2.41E−05	1.91E−05	−4.016	D	1
60.266	0.0	1 659 320	$2s^2 2p^3 - 2s^2 2p^2 (^3P) 3d$	$^4S^\circ - ^2D$	3/2–3/2	4–4	1.10E−01	5.99E−06	4.75E−06	−4.621	D	1
60.989	0.0	1 639 640	$2s^2 2p^3 - 2s^2 2p^2 (^3P) 3d$	$^4S^\circ - ^4P$	3/2–1/2	4–2	8.72E+03	2.43E−01	1.95E−01	−0.012	B	1
61.019	0.0	1 638 830	$2s^2 2p^3 - 2s^2 2p^2 (^3P) 3d$	$^4S^\circ - ^4P$	3/2–3/2	4–4	8.55E+03	4.77E−01	3.84E−01	0.281	A	1
61.070	0.0	1 637 470	$2s^2 2p^3 - 2s^2 2p^2 (^3P) 3d$	$^4S^\circ - ^4P$	3/2–5/2	4–6	8.31E+03	6.97E−01	5.61E−01	0.445	A	1
61.198	0.0	1 634 040	$2s^2 2p^3 - 2s^2 2p^2 (^3P) 3d$	$^4S^\circ - ^2F$	3/2–5/2	4–6	2.34E+01	1.97E−03	1.59E−03	−2.104	C	1
61.388	69 168.1	1 698 150	$2s^2 2p^3 - 2s^2 2p^2 (^1D) 3d$	$^2D^\circ - ^2P$	3/2–3/2	4–4	6.49E+01	3.66E−03	2.96E−03	−1.834	E	1
61.398	69 420.5	1 698 150	$2s^2 2p^3 - 2s^2 2p^2 (^1D) 3d$	$^2D^\circ - ^2P$	5/2–3/2	6–4	1.31E+03	4.93E−02	5.97E−02	−0.529	B	1
61.447	69 168.1	1 696 590	$2s^2 2p^3 - 2s^2 2p^2 (^1D) 3d$	$^2D^\circ - ^2P$	3/2–1/2	4–2	1.97E+03	5.59E−02	4.52E−02	−0.651	B	1
61.539	0.0	1 624 990	$2s^2 2p^3 - 2s^2 2p^2 (^3P) 3d$	$^4S^\circ - ^2P$	3/2–3/2	4–4	1.07E+02	6.10E−03	4.94E−03	−1.613	D	1
61.790	69 168.1	1 687 560	$2s^2 2p^3 - 2s^2 2p^2 (^1D) 3d$	$^2D^\circ - ^2D$	3/2–5/2	4–6	2.24E+03	1.92E−01	1.56E−01	−0.115	D	1
61.799	69 420.5	1 687 560	$2s^2 2p^3 - 2s^2 2p^2 (^1D) 3d$	$^2D^\circ - ^2D$	5/2–5/2	6–6	1.43E+03	8.18E−02	9.99E−02	−0.309	E	1
61.851	69 168.1	1 685 950	$2s^2 2p^3 - 2s^2 2p^2 (^1D) 3d$	$^2D^\circ - ^2D$	3/2–3/2	4–4	3.82E+03	2.19E−01	1.78E−01	−0.058	B	1
61.861	69 420.5	1 685 950	$2s^2 2p^3 - 2s^2 2p^2 (^1D) 3d$	$^2D^\circ - ^2D$	5/2–3/2	6–4	4.65E+02	1.78E−02	2.17E−02	−0.972	C	1
61.895	69 168.1	1 684 810	$2s^2 2p^3 - 2s^2 2p^2 (^1D) 3d$	$^2D^\circ - ^2F$	3/2–5/2	4–6	6.17E+03	5.32E−01	4.33E−01	0.328	D	1
61.905	69 420.5	1 684 810	$2s^2 2p^3 - 2s^2 2p^2 (^1D) 3d$	$^2D^\circ - ^2F$	5/2–5/2	6–6	2.65E+03	1.52E−01	1.86E−01	−0.039	D	1
61.914	69 420.5	1 684 560	$2s^2 2p^3 - 2s^2 2p^2 (^1D) 3d$	$^2D^\circ - ^2F$	5/2–7/2	6–8	9.22E+03	7.07E−01	8.64E−01	0.627	A	1
62.565?	105 348	1 703 690?	$2s^2 2p^3 - 2s^2 2p^2 (^1D) 3d$	$^2P^\circ - ^2S$	1/2–1/2	2–2	1.21E+03	7.10E−02	2.93E−02	−0.848	C	1
62.586?	105 890	1 703 690?	$2s^2 2p^3 - 2s^2 2p^2 (^1D) 3d$	$^2P^\circ - ^2S$	3/2–1/2	4–2	2.97E+03	8.72E−02	7.18E−02	−0.458	A	1

Si VIII—Continued

λ Ritz (Å)	E_i (cm^{-1})	E_k (cm^{-1})	Configurations	Terms	J_i–J_k	g_i–g_k	A_{ki} (10^8 s^{-1})	f_{ik}	S (a.u.)	log $g_i f$	Acc.	Ref.
62.782	105 348	1 698 150	$2s^22p^3$–$2s^22p^2(^1D)3d$	$^2P^\circ$–^2P	1/2–3/2	2–4	6.20E+02	7.32E−02	3.03E−02	−0.834	A	1
62.804	105 890	1 698 150	$2s^22p^3$–$2s^22p^2(^1D)3d$	$^2P^\circ$–^2P	3/2–3/2	4–4	3.66E+03	2.17E−01	1.79E−01	−0.062	B	1
62.841	69 168.1	1 660 490	$2s^22p^3$–$2s^22p^2(^3P)3d$	$^2D^\circ$–^2D	3/2–5/2	4–6	8.67E+02	7.70E−02	6.37E−02	−0.512	E	1
62.844	105 348	1 696 590	$2s^22p^3$–$2s^22p^2(^1D)3d$	$^2P^\circ$–^2P	1/2–1/2	2–2	2.70E+03	1.60E−01	6.62E−02	−0.495	B	1
62.851	69 420.5	1 660 490	$2s^22p^3$–$2s^22p^2(^3P)3d$	$^2D^\circ$–^2D	5/2–5/2	6–6	2.46E+03	1.46E−01	1.81E−01	−0.059	B	1
62.865	105 890	1 696 590	$2s^22p^3$–$2s^22p^2(^1D)3d$	$^2P^\circ$–^2P	3/2–1/2	4–2	8.41E+02	2.49E−02	2.06E−02	−1.002	D	1
62.887	69 168.1	1 659 320	$2s^22p^3$–$2s^22p^2(^3P)3d$	$^2D^\circ$–^2D	3/2–3/2	4–4	1.68E+03	9.98E−02	8.27E−02	−0.399	D	1
62.897	69 420.5	1 659 320	$2s^22p^3$–$2s^22p^2(^3P)3d$	$^2D^\circ$–^2D	5/2–3/2	6–4	3.39E+02	1.34E−02	1.67E−02	−1.095	C	1
63.224	105 890	1 687 560	$2s^22p^3$–$2s^22p^2(^1D)3d$	$^2P^\circ$–^2D	3/2–5/2	4–6	3.67E+03	3.30E−01	2.75E−01	0.121	B	1
63.267	105 348	1 685 950	$2s^22p^3$–$2s^22p^2(^1D)3d$	$^2P^\circ$–^2D	1/2–3/2	2–4	2.39E+03	2.87E−01	1.20E−01	−0.241	C	1
63.289	105 890	1 685 950	$2s^22p^3$–$2s^22p^2(^1D)3d$	$^2P^\circ$–^2D	3/2–3/2	4–4	2.12E+02	1.27E−02	1.06E−02	−1.294	E	1
63.675	69 168.1	1 639 640	$2s^22p^3$–$2s^22p^2(^3P)3d$	$^2D^\circ$–^4P	3/2–1/2	4–2	1.08E+00	3.29E−05	2.76E−05	−3.881	D	1
63.708	69 168.1	1 638 830	$2s^22p^3$–$2s^22p^2(^3P)3d$	$^2D^\circ$–^4P	3/2–3/2	4–4	5.15E−02	3.13E−06	2.63E−06	−4.902	D	1
63.718	69 420.5	1 638 830	$2s^22p^3$–$2s^22p^2(^3P)3d$	$^2D^\circ$–^4P	5/2–3/2	6–4	5.60E+00	2.27E−04	2.86E−04	−2.865	C	1
63.732	69 420.5	1 638 490	$2s^22p^3$–$2s^22p^2(^3P)3d$	$^2D^\circ$–^2F	5/2–7/2	6–8	1.81E+03	1.47E−01	1.85E−01	−0.054	B	1
63.763	69 168.1	1 637 470	$2s^22p^3$–$2s^22p^2(^3P)3d$	$^2D^\circ$–^4P	3/2–5/2	4–6	1.13E+00	1.03E−04	8.68E−05	−3.383	C	1
63.773	69 420.5	1 637 470	$2s^22p^3$–$2s^22p^2(^3P)3d$	$^2D^\circ$–^4P	5/2–5/2	6–6	4.63E+00	2.83E−04	3.56E−04	−2.771	C	1
63.879	69 168.1	1 634 640	$2s^22p^3$–$2s^22p^2(^3P)3d$	$^2D^\circ$–^4D	3/2–1/2	4–2	1.04E+02	3.17E−03	2.67E−03	−1.896	C	1
63.903	69 168.1	1 634 040	$2s^22p^3$–$2s^22p^2(^3P)3d$	$^2D^\circ$–^2F	3/2–5/2	4–6	1.65E+03	1.51E−01	1.27E−01	−0.219	B	1
63.913	69 420.5	1 634 040	$2s^22p^3$–$2s^22p^2(^3P)3d$	$^2D^\circ$–^2F	5/2–5/2	6–6	1.36E+02	8.34E−03	1.05E−02	−1.301	B	1
63.930	69 168.1	1 633 370	$2s^22p^3$–$2s^22p^2(^3P)3d$	$^2D^\circ$–^4D	3/2–3/2	4–4	1.29E+02	7.93E−03	6.68E−03	−1.499	C	1
63.941	69 420.5	1 633 370	$2s^22p^3$–$2s^22p^2(^3P)3d$	$^2D^\circ$–^4D	5/2–3/2	6–4	1.42E+02	5.81E−03	7.34E−03	−1.458	C	1
64.275	69 168.1	1 624 990	$2s^22p^3$–$2s^22p^2(^3P)3d$	$^2D^\circ$–^2P	3/2–3/2	4–4	1.91E+02	1.19E−02	1.00E−02	−1.324	D	1
64.285	69 420.5	1 624 990	$2s^22p^3$–$2s^22p^2(^3P)3d$	$^2D^\circ$–^2P	5/2–3/2	6–4	3.90E+02	1.61E−02	2.04E−02	−1.015	D	1
64.325	105 890	1 660 490	$2s^22p^3$–$2s^22p^2(^3P)3d$	$^2P^\circ$–^2D	3/2–5/2	4–6	2.48E+03	2.31E−01	1.96E−01	−0.035	C	1
64.351	105 348	1 659 320	$2s^22p^3$–$2s^22p^2(^3P)3d$	$^2P^\circ$–^2D	1/2–3/2	2–4	2.50E+03	3.10E−01	1.31E−01	−0.207	A	1
64.374	105 890	1 659 320	$2s^22p^3$–$2s^22p^2(^3P)3d$	$^2P^\circ$–^2D	3/2–3/2	4–4	8.06E+02	5.01E−02	4.24E−02	−0.698	D	1
65.177	105 348	1 639 640	$2s^22p^3$–$2s^22p^2(^3P)3d$	$^2P^\circ$–^4P	1/2–1/2	2–2	1.82E−01	1.16E−05	4.96E−06	−4.636	D	1
65.200	105 890	1 639 640	$2s^22p^3$–$2s^22p^2(^3P)3d$	$^2P^\circ$–^4P	3/2–1/2	4–2	6.76E−01	2.15E−05	1.85E−05	−4.065	D	1
65.211	105 348	1 638 830	$2s^22p^3$–$2s^22p^2(^3P)3d$	$^2P^\circ$–^4P	1/2–3/2	2–4	1.18E+00	1.50E−04	6.45E−05	−3.522	C	1
65.234	105 890	1 638 830	$2s^22p^3$–$2s^22p^2(^3P)3d$	$^2P^\circ$–^4P	3/2–3/2	4–4	6.34E−01	4.04E−05	3.47E−05	−3.791	D	1
65.292	105 890	1 637 470	$2s^22p^3$–$2s^22p^2(^3P)3d$	$^2P^\circ$–^4P	3/2–5/2	4–6	2.39E+00	2.29E−04	1.97E−04	−3.038	C	1
65.390	105 348	1 634 640	$2s^22p^3$–$2s^22p^2(^3P)3d$	$^2P^\circ$–^4D	1/2–1/2	2–2	3.09E+02	1.98E−02	8.52E−03	−1.403	B	1
65.413	105 890	1 634 640	$2s^22p^3$–$2s^22p^2(^3P)3d$	$^2P^\circ$–^4D	3/2–1/2	4–2	1.68E+02	5.37E−03	4.63E−03	−1.668	C	1
65.444	105 348	1 633 370	$2s^22p^3$–$2s^22p^2(^3P)3d$	$^2P^\circ$–^4D	1/2–3/2	2–4	1.34E+02	1.72E−02	7.40E−03	−1.464	B	1
65.467	105 890	1 633 370	$2s^22p^3$–$2s^22p^2(^3P)3d$	$^2P^\circ$–^4D	3/2–3/2	4–4	4.87E+02	3.13E−02	2.70E−02	−0.902	B	1
65.805	105 348	1 624 990	$2s^22p^3$–$2s^22p^2(^3P)3d$	$^2P^\circ$–^2P	1/2–3/2	2–4	2.73E+02	3.55E−02	1.54E−02	−1.149	D	1
65.828	105 890	1 624 990	$2s^22p^3$–$2s^22p^2(^3P)3d$	$^2P^\circ$–^2P	3/2–3/2	4–4	1.08E+03	7.03E−02	6.10E−02	−0.551	D	1
67.156	312 670	1 801 730	$2s2p^4$–$2s2p^3(^5S^\circ)3d$	^4P–$^4D^\circ$	5/2–3/2	6–4	1.68E+02	7.57E−03	1.00E−02	−1.343	D	2,LS
67.156	312 670	1 801 730	$2s2p^4$–$2s2p^3(^5S^\circ)3d$	^4P–$^4D^\circ$	5/2–7/2	6–8	3.36E+03	3.03E−01	4.02E−01	0.260	C	2,LS
67.156	312 670	1 801 730	$2s2p^4$–$2s2p^3(^5S^\circ)3d$	^4P–$^4D^\circ$	5/2–5/2	6–6	1.01E+03	6.81E−02	9.03E−02	−0.389	D	2,LS
67.198	0.0	1 488 150	$2s^22p^3$–$2s^22p^2(^1D)3s$	$^4S^\circ$–^2D	3/2–3/2	4–4	1.15E−01	7.80E−06	6.91E−06	−4.506	D	1
67.263	0.0	1 486 710	$2s^22p^3$–$2s^22p^2(^1D)3s$	$^4S^\circ$–^2D	3/2–5/2	4–6	5.87E−01	5.97E−05	5.29E−05	−3.622	D	1
67.318	316 250	1 801 730	$2s2p^4$–$2s2p^3(^5S^\circ)3d$	^4P–$^4D^\circ$	3/2–5/2	4–6	2.34E+03	2.38E−01	2.11E−01	−0.021	C	2,LS
67.318	316 250	1 801 730	$2s2p^4$–$2s2p^3(^5S^\circ)3d$	^4P–$^4D^\circ$	3/2–1/2	4–2	5.56E+02	1.89E−02	1.68E−02	−1.121	D	2,LS
67.318	316 250	1 801 730	$2s2p^4$–$2s2p^3(^5S^\circ)3d$	^4P–$^4D^\circ$	3/2–3/2	4–4	1.78E+03	1.21E−01	1.07E−01	−0.315	C	2,LS
67.404	318 140	1 801 730	$2s2p^4$–$2s2p^3(^5S^\circ)3d$	^4P–$^4D^\circ$	1/2–1/2	2–2	2.78E+03	1.89E−01	8.39E−02	−0.423	C	2,LS
67.404	318 140	1 801 730	$2s2p^4$–$2s2p^3(^5S^\circ)3d$	^4P–$^4D^\circ$	1/2–3/2	2–4	1.39E+03	1.89E−01	8.39E−02	−0.423	C	2,LS
68.781	0.0	1 453 900	$2s^22p^3$–$2s^22p^2(^3P)3s$	$^4S^\circ$–^2P	3/2–3/2	4–4	4.17E−01	2.96E−05	2.68E−05	−3.927	D	1
68.966	0.0	1 449 990	$2s^22p^3$–$2s^22p^2(^3P)3s$	$^4S^\circ$–^2P	3/2–1/2	4–2	4.92E−01	1.76E−05	1.59E−05	−4.154	D	1
69.632	0.0	1 436 120	$2s^22p^3$–$2s^22p^2(^3P)3s$	$^4S^\circ$–^4P	3/2–5/2	4–6	5.49E+02	5.98E−02	5.49E−02	−0.621	A	1
69.790	0.0	1 432 870	$2s^22p^3$–$2s^22p^2(^3P)3s$	$^4S^\circ$–^4P	3/2–3/2	4–4	5.42E+02	3.96E−02	3.64E−02	−0.801	A	1
69.905	0.0	1 430 510	$2s^22p^3$–$2s^22p^2(^3P)3s$	$^4S^\circ$–^4P	3/2–1/2	4–2	5.37E+02	1.97E−02	1.81E−02	−1.104	A	1
70.473	69 168.1	1 488 150	$2s^22p^3$–$2s^22p^2(^1D)3s$	$^2D^\circ$–^2D	3/2–3/2	4–4	6.39E+02	4.76E−02	4.42E−02	−0.720	B	1
70.486	69 420.5	1 488 150	$2s^22p^3$–$2s^22p^2(^1D)3s$	$^2D^\circ$–^2D	5/2–3/2	6–4	3.77E+01	1.87E−03	2.61E−03	−1.949	E	1
70.545	69 168.1	1 486 710	$2s^22p^3$–$2s^22p^2(^1D)3s$	$^2D^\circ$–^2D	3/2–5/2	4–6	8.22E+01	9.20E−03	8.54E−03	−1.434	D	1
70.557	69 420.5	1 486 710	$2s^22p^3$–$2s^22p^2(^1D)3s$	$^2D^\circ$–^2D	5/2–5/2	6–6	6.95E+02	5.19E−02	7.23E−02	−0.507	A	1
72.216	69 168.1	1 453 900	$2s^22p^3$–$2s^22p^2(^3P)3s$	$^2D^\circ$–^2P	3/2–3/2	4–4	2.17E+01	1.69E−03	1.61E−03	−2.169	E	1
72.229	69 420.5	1 453 900	$2s^22p^3$–$2s^22p^2(^3P)3s$	$^2D^\circ$–^2P	5/2–3/2	6–4	8.88E+02	4.63E−02	6.60E−02	−0.556	B	1
72.317	105 348	1 488 150	$2s^22p^3$–$2s^22p^2(^1D)3s$	$^2P^\circ$–^2D	1/2–3/2	2–4	1.96E+02	3.08E−02	1.47E−02	−1.211	C	1
72.345	105 890	1 488 150	$2s^22p^3$–$2s^22p^2(^1D)3s$	$^2P^\circ$–^2D	3/2–3/2	4–4	1.40E+02	1.10E−02	1.05E−02	−1.358	D	1
72.421	105 890	1 486 710	$2s^22p^3$–$2s^22p^2(^1D)3s$	$^2P^\circ$–^2D	3/2–5/2	4–6	2.38E+02	2.80E−02	2.67E−02	−0.950	C	1

Si VIII—Continued

λ Ritz (Å)	E_i (cm^{-1})	E_k (cm^{-1})	Configurations	Terms	J_i–J_k	g_i–g_k	A_{ki} (10^8 s^{-1})	f_{ik}	S (a.u.)	log $g_i f$	Acc.	Ref.
72.421	69 168.1	1 449 990	$2s^22p^3$–$2s^22p^2(^3P)3s$	$^2D^\circ$–^2P	3/2–1/2	4–2	1.06E+03	4.16E−02	3.97E−02	−0.779	B	1
73.155	69 168.1	1 436 120	$2s^22p^3$–$2s^22p^2(^3P)3s$	$^2D^\circ$–^4P	3/2–5/2	4–6	9.63E−02	1.16E−05	1.12E−05	−4.334	D	1
73.169	69 420.5	1 436 120	$2s^22p^3$–$2s^22p^2(^3P)3s$	$^2D^\circ$–^4P	5/2–5/2	6–6	1.95E+00	1.56E−04	2.26E−04	−3.028	C	1
73.330	69 168.1	1 432 870	$2s^22p^3$–$2s^22p^2(^3P)3s$	$^2D^\circ$–^4P	3/2–3/2	4–4	1.07E+00	8.63E−05	8.33E−05	−3.462	D	1
73.343	69 420.5	1 432 870	$2s^22p^3$–$2s^22p^2(^3P)3s$	$^2D^\circ$–^4P	5/2–3/2	6–4	3.22E+00	1.73E−04	2.51E−04	−2.984	C	1
73.457	69 168.1	1 430 510	$2s^22p^3$–$2s^22p^2(^3P)3s$	$^2D^\circ$–^4P	3/2–1/2	4–2	3.44E+00	1.39E−04	1.35E−04	−3.254	C	1
74.154	105 348	1 453 900	$2s^22p^3$–$2s^22p^2(^3P)3s$	$^2P^\circ$–^2P	1/2–3/2	2–4	1.44E+02	2.37E−02	1.16E−02	−1.324	C	1
74.183	105 890	1 453 900	$2s^22p^3$–$2s^22p^2(^3P)3s$	$^2P^\circ$–^2P	3/2–3/2	4–4	5.95E+02	4.91E−02	4.80E−02	−0.707	A	1
74.369	105 348	1 449 990	$2s^22p^3$–$2s^22p^2(^3P)3s$	$^2P^\circ$–^2P	1/2–1/2	2–2	4.45E+02	3.69E−02	1.81E−02	−1.132	B	1
74.399	105 890	1 449 990	$2s^22p^3$–$2s^22p^2(^3P)3s$	$^2P^\circ$–^2P	3/2–1/2	4–2	1.50E+02	6.21E−03	6.09E−03	−1.605	E	1
75.175	105 890	1 436 120	$2s^22p^3$–$2s^22p^2(^3P)3s$	$^2P^\circ$–^4P	3/2–5/2	4–6	2.31E−03	2.93E−07	2.90E−07	−5.931	D	1
75.328	105 348	1 432 870	$2s^22p^3$–$2s^22p^2(^3P)3s$	$^2P^\circ$–^4P	1/2–3/2	2–4	2.02E−01	3.43E−05	1.70E−05	−4.163	D	1
75.359	105 890	1 432 870	$2s^22p^3$–$2s^22p^2(^3P)3s$	$^2P^\circ$–^4P	3/2–3/2	4–4	1.08E+00	9.21E−05	9.14E−05	−3.434	D	1
75.462	105 348	1 430 510	$2s^22p^3$–$2s^22p^2(^3P)3s$	$^2P^\circ$–^4P	1/2–1/2	2–2	3.47E−01	2.97E−05	1.47E−05	−4.227	D	1
75.493	105 890	1 430 510	$2s^22p^3$–$2s^22p^2(^3P)3s$	$^2P^\circ$–^4P	3/2–1/2	4–2	6.89E−01	2.94E−05	2.93E−05	−3.929	D	1
75.988	312 670	1 628 660	$2s^22p^4$–$2s2p^3(^5S^\circ)3s$	^4P–$^4S^\circ$	5/2–3/2	6–4	6.05E+02	3.49E−02	5.24E−02	−0.679	A	1
76.196	316 250	1 628 660	$2s^22p^4$–$2s2p^3(^5S^\circ)3s$	^4P–$^4S^\circ$	3/2–3/2	4–4	3.91E+02	3.41E−02	3.42E−02	−0.866	A	1
76.306	318 140	1 628 660	$2s^22p^4$–$2s2p^3(^5S^\circ)3s$	^4P–$^4S^\circ$	1/2–3/2	2–4	1.94E+02	3.38E−02	1.70E−02	−1.170	A	1
83.452	430 360	1 628 660	$2s^22p^4$–$2s2p^3(^5S^\circ)3s$	^2D–$^4S^\circ$	5/2–3/2	6–4	1.70E−02	1.18E−06	1.95E−06	−5.149	D	1
83.454	430 390	1 628 660	$2s^22p^4$–$2s2p^3(^5S^\circ)3s$	^2D–$^4S^\circ$	3/2–3/2	4–4	1.46E−03	1.52E−07	1.67E−07	−6.216	D	1
84.140?	820 200	2 008 700?	$2p^5$–$2s^22p^2(^3P)4d$	$^2P^\circ$–^2D	3/2–5/2	4–6	2.40E−02	3.82E−06	4.23E−06	−4.816	E	2,LS
88.966	504 630	1 628 660	$2s2p^4$–$2s2p^3(^5S^\circ)3s$	^2S–$^4S^\circ$	1/2–3/2	2–4	1.23E−01	2.92E−05	1.71E−05	−4.233	D	1
90.172?	820 200	1 929 190?	$2p^5$–$2s^22p^2(^3P)4s$	$^2P^\circ$–^2P	3/2–3/2	4–4	4.64E−01	5.65E−05	6.71E−05	−3.646	E	2,LS
90.640?	825 930	1 929 190?	$2p^5$–$2s^22p^2(^3P)4s$	$^2P^\circ$–^2P	1/2–3/2	2–4	9.13E−02	2.25E−05	1.34E−05	−4.347	E	2,LS
91.253	532 800	1 628 660	$2s2p^4$–$2s2p^3(^5S^\circ)3s$	^2P–$^4S^\circ$	1/2–3/2	2–4	2.04E−03	5.10E−07	3.06E−07	−5.992	D	1
113.187?	820 200	1 703 690?	$2p^5$–$2s^22p^2(^1D)3d$	$^2P^\circ$–^2S	3/2–1/2	4–2	9.48E−02	9.10E−06	1.36E−05	−4.439	B	1
113.902	820 200	1 698 150	$2p^5$–$2s^22p^2(^1D)3d$	$^2P^\circ$–^2P	3/2–3/2	4–4	1.23E−01	2.39E−05	3.58E−05	−4.020	C	1
113.926?	825 930	1 703 690?	$2p^5$–$2s^22p^2(^1D)3d$	$^2P^\circ$–^2S	1/2–1/2	2–2	4.61E−02	8.97E−06	6.73E−06	−4.746	B	1
114.104	820 200	1 696 590	$2p^5$–$2s^22p^2(^1D)3d$	$^2P^\circ$–^2P	3/2–1/2	4–2	4.09E−02	3.99E−06	5.99E−06	−4.797	D	1
114.650	825 930	1 698 150	$2p^5$–$2s^22p^2(^1D)3d$	$^2P^\circ$–^2P	1/2–3/2	2–4	1.98E−02	7.80E−06	5.89E−06	−4.807	D	1
114.855	825 930	1 696 590	$2p^5$–$2s^22p^2(^1D)3d$	$^2P^\circ$–^2P	1/2–1/2	2–2	9.22E−02	1.82E−05	1.38E−05	−4.438	C	1
119.007	820 200	1 660 490	$2p^5$–$2s^22p^2(^3P)3d$	$^2P^\circ$–^2D	3/2–5/2	4–6	3.82E−02	1.22E−05	1.90E−05	−4.313	D	1
119.172	820 200	1 659 320	$2p^5$–$2s^22p^2(^3P)3d$	$^2P^\circ$–^2D	3/2–3/2	4–4	3.49E−03	7.42E−07	1.16E−06	−5.528	D	1
119.992	825 930	1 659 320	$2p^5$–$2s^22p^2(^3P)3d$	$^2P^\circ$–^2D	1/2–3/2	2–4	3.27E−02	1.41E−05	1.12E−05	−4.549	D	1
122.784	820 200	1 634 640	$2p^5$–$2s^22p^2(^3P)3d$	$^2P^\circ$–^4D	3/2–1/2	4–2	4.13E−03	4.67E−07	7.55E−07	−5.729	D	1
122.976	820 200	1 633 370	$2p^5$–$2s^22p^2(^3P)3d$	$^2P^\circ$–^4D	3/2–3/2	4–4	1.28E−02	2.90E−06	4.70E−06	−4.935	D	1
123.654	825 930	1 634 640	$2p^5$–$2s^22p^2(^3P)3d$	$^2P^\circ$–^4D	1/2–1/2	2–2	7.77E−03	1.78E−06	1.45E−06	−5.448	D	1
123.848	825 930	1 633 370	$2p^5$–$2s^22p^2(^3P)3d$	$^2P^\circ$–^4D	1/2–3/2	2–4	1.32E−03	6.05E−07	4.93E−07	−5.917	D	1
149.712	820 200	1 488 150	$2p^5$–$2s^22p^2(^1D)3s$	$^2P^\circ$–^2D	3/2–3/2	4–4	3.83E−04	1.29E−07	2.54E−07	−6.289	D	1
150.035	820 200	1 486 710	$2p^5$–$2s^22p^2(^1D)3s$	$^2P^\circ$–^2D	3/2–5/2	4–6	2.14E−03	1.09E−06	2.14E−06	−5.363	C	1
151.007	825 930	1 488 150	$2p^5$–$2s^22p^2(^1D)3s$	$^2P^\circ$–^2D	1/2–3/2	2–4	1.77E−03	1.21E−06	1.20E−06	−5.617	C	1
157.803	820 200	1 453 900	$2p^5$–$2s^22p^2(^3P)3s$	$^2P^\circ$–^2P	3/2–3/2	4–4	1.43E−03	5.33E−07	1.11E−06	−5.671	D	1
158.783	820 200	1 449 990	$2p^5$–$2s^22p^2(^3P)3s$	$^2P^\circ$–^2P	3/2–1/2	4–2	6.66E−04	1.26E−07	2.63E−07	−6.298	D	1
159.243	825 930	1 453 900	$2p^5$–$2s^22p^2(^3P)3s$	$^2P^\circ$–^2P	1/2–3/2	2–4	2.83E−04	2.16E−07	2.26E−07	−6.366	D	1
160.241	825 930	1 449 990	$2p^5$–$2s^22p^2(^3P)3s$	$^2P^\circ$–^2P	1/2–1/2	2–2	1.44E−03	5.54E−07	5.84E−07	−5.956	D	1

9. Si IX

$Z=14$ C I isoelectronic sequence

Ground state $1s^2 2s^2 2p^2\ {}^3P_0$

Ionization energy 2 832 000 cm^{-1} (351.12 eV)

Data are tabulated for 144 transitions in the range from 44 to 125 Å. Transition probabilities for the $2s^2 2p^2 - 2s^2 2p 3s$, $2s^2 2p^2 - 2s^2 2p 3d$, $2p^4 - 2s^2 2p 3s$, and $2p^4 - 2s^2 2p 3d$ arrays are the mean values of the MCHF and CIV3 calculations.[1,2] Values for the $2s 2p^3 - 2s 2p^2 3s$, $2s 2p^3 - 2s 2p^2 3d$, $2s^2 2p^2 - 2s 2p^2 3p$, and $2s^2 2p^2 - 2s^2 2p 4d$ transitions are taken from the Opacity Project (OP).[3] OP provides, however, only multiplet values. These have been decomposed into fine-structure components assuming LS coupling, as indicated by the notation LS in the reference column.

References

[1]G. Tachiev and C. Froese Fischer, http://www.vuse.vanderbilt.edu/~cff/mchf_collection/ (downloaded 22 June, 2002). See also G. Tachiev and C. Froese Fischer, Can. J. Phys. **79**, 955 (2001).
[2]K. M. Aggarwal, Astrophys. J., Suppl. Ser. **118**, 589 (1998).
[3]http://legacy.gsfc.nasa.gov/topbase/ (downloaded 1 August, 1995).

Si IX

λ Ritz (Å)	E_i (cm^{-1})	E_k (cm^{-1})	Configurations	Terms	J_i–J_k	g_i–g_k	A_{ki} (10^8 s^{-1})	f_{ik}	S (a.u.)	log $g_i f$	Acc.	Ref.
44.215?	2 545.0	2 264 220?	$2s^2 2p^2 - 2s^2 2p 4d$	$^3P - ^3D^\circ$	1–2	3–5	2.85E+03	1.39E−01	6.07E−02	−0.380	C	3,LS
44.249?	6 414	2 266 350?	$2s^2 2p^2 - 2s^2 2p 4d$	$^3P - ^3D^\circ$	2–3	5–7	3.80E+03	1.56E−01	1.14E−01	−0.108	C	3,LS
44.291?	6 414	2 264 220?	$2s^2 2p^2 - 2s^2 2p 4d$	$^3P - ^3D^\circ$	2–2	5–5	9.45E+02	2.78E−02	2.03E−02	−0.857	C	3,LS
51.113	52 925.9	2 009 370	$2s^2 2p^2 - 2s 2p^2(^2D) 3p$	$^1D - ^1D^\circ$	2–2	5–5	3.32E+03	1.30E−01	1.09E−01	−0.187	C	3,LS
51.362	52 925.9	1 999 890	$2s^2 2p^2 - 2s 2p^2(^2D) 3p$	$^1D - ^1F^\circ$	2–3	5–7	2.85E+03	1.58E−01	1.34E−01	−0.102	C	3,LS
52.669?	292 232	2 190 870?	$2s 2p^3 - 2s 2p^2(^2P) 3d$	$^3D^\circ - ^3F$	3–3	7–7	2.29E+02	9.51E−03	1.15E−02	−1.177	C	3,LS
52.669?	292 232	2 190 870?	$2s 2p^3 - 2s 2p^2(^2P) 3d$	$^3D^\circ - ^3F$	3–2	7–5	9.02E+00	2.68E−04	3.25E−04	−2.727	D	3,LS
52.669?	292 232	2 190 870?	$2s 2p^3 - 2s 2p^2(^2P) 3d$	$^3D^\circ - ^3F$	3–4	7–9	2.06E+03	1.10E−01	1.34E−01	−0.114	C	3,LS
52.671?	292 296	2 190 870?	$2s 2p^3 - 2s 2p^2(^2P) 3d$	$^3D^\circ - ^3F$	2–3	5–7	1.82E+03	1.06E−01	9.19E−02	−0.276	C	3,LS
52.671?	292 296	2 190 870?	$2s 2p^3 - 2s 2p^2(^2P) 3d$	$^3D^\circ - ^3F$	2–2	5–5	3.20E+02	1.33E−02	1.15E−02	−1.177	C	3,LS
52.675?	292 441	2 190 870?	$2s 2p^3 - 2s 2p^2(^2P) 3d$	$^3D^\circ - ^3F$	1–2	3–5	1.72E+03	1.19E−01	6.19E−02	−0.447	C	3,LS
52.810	2 545.0	1 896 130	$2s^2 2p^2 - 2s 2p^2(^4P) 3p$	$^3P - ^3D^\circ$	1–2	3–5	1.68E+03	1.17E−01	6.10E−02	−0.455	C	3,LS
52.838	6 414	1 898 990	$2s^2 2p^2 - 2s 2p^2(^4P) 3p$	$^3P - ^3D^\circ$	2–3	5–7	2.24E+03	1.31E−01	1.14E−01	−0.184	C	3,LS
52.918	6 414	1 896 130	$2s^2 2p^2 - 2s 2p^2(^4P) 3p$	$^3P - ^3D^\circ$	2–2	5–5	5.57E+02	2.34E−02	2.04E−02	−0.932	C	3,LS
53.806	0	1 858 540	$2s^2 2p^2 - 2s 2p^2(^4P) 3p$	$^3P - ^3S^\circ$	0–1	1–3	2.93E+02	3.81E−02	6.75E−03	−1.419	D	3,LS
53.879	2 545.0	1 858 540	$2s^2 2p^2 - 2s 2p^2(^4P) 3p$	$^3P - ^3S^\circ$	1–1	3–3	8.73E+02	3.80E−02	2.02E−02	−0.943	C	3,LS
53.992	6 414	1 858 540	$2s^2 2p^2 - 2s 2p^2(^4P) 3p$	$^3P - ^3S^\circ$	2–1	5–3	1.45E+03	3.79E−02	3.37E−02	−0.722	C	3,LS
54.390	0	1 838 560	$2s^2 2p^2 - 2s^2 2p 3d$	$^3P - ^1P^\circ$	0–1	1–3	2.13E+01	2.84E−03	5.09E−04	−2.547	C	1,2
54.466	2 545.0	1 838 560	$2s^2 2p^2 - 2s^2 2p 3d$	$^3P - ^1P^\circ$	1–1	3–3	1.26E+01	5.60E−04	3.01E−04	−2.775	C	1,2
54.581	6 414	1 838 560	$2s^2 2p^2 - 2s^2 2p 3d$	$^3P - ^1P^\circ$	2–1	5–3	4.71E−01	1.26E−05	1.13E−05	−4.200	D	1,2
54.604	6 414	1 837 780	$2s^2 2p^2 - 2s^2 2p 3d$	$^3P - ^1F^\circ$	2–3	5–7	1.12E+00	7.00E−05	6.29E−05	−3.456	E	1,2
54.841	150 770+x	1 974 220+x	$2s 2p^3 - 2s 2p^2(^4P) 3d$	$^5S^\circ - ^5P$	2–1	5–3	1.21E+04	3.27E−01	2.95E−01	0.214	C	3,LS
54.870	150 770+x	1 973 260+x	$2s 2p^3 - 2s 2p^2(^4P) 3d$	$^5S^\circ - ^5P$	2–2	5–5	1.21E+04	5.45E−01	4.92E−01	0.435	C	3,LS
54.907	150 770+x	1 972 030+x	$2s 2p^3 - 2s 2p^2(^4P) 3d$	$^5S^\circ - ^5P$	2–3	5–7	1.20E+04	7.62E−01	6.89E−01	0.581	C	3,LS
55.039	0	1 816 900	$2s^2 2p^2 - 2s^2 2p 3d$	$^3P - ^3P^\circ$	0–1	1–3	5.37E+02	7.32E−02	1.33E−02	−1.136	A	1,2
55.094	2 545.0	1 817 630	$2s^2 2p^2 - 2s^2 2p 3d$	$^3P - ^3P^\circ$	1–0	3–1	6.29E+03	9.54E−02	5.19E−02	−0.543	A	1,2
55.116	2 545.0	1 816 900	$2s^2 2p^2 - 2s^2 2p 3d$	$^3P - ^3P^\circ$	1–1	3–3	3.18E+03	1.45E−01	7.89E−02	−0.362	A	1,2
55.234	6 414	1 816 900	$2s^2 2p^2 - 2s^2 2p 3d$	$^3P - ^3P^\circ$	2–1	5–3	2.89E+03	7.93E−02	7.21E−02	−0.402	A	1,2
55.272	6 414	1 815 650	$2s^2 2p^2 - 2s^2 2p 3d$	$^3P - ^3P^\circ$	2–2	5–5	7.01E+03	3.21E−01	2.92E−01	0.205	A	1,2
55.305	0	1 808 160	$2s^2 2p^2 - 2s^2 2p 3d$	$^3P - ^3D^\circ$	0–1	1–3	7.71E+03	1.06E+00	1.93E−01	0.026	A	1,2
55.356	2 545.0	1 809 040	$2s^2 2p^2 - 2s^2 2p 3d$	$^3P - ^3D^\circ$	1–2	3–5	9.66E+03	7.40E−01	4.04E−01	0.346	A	1,2
55.383	2 545.0	1 808 160	$2s^2 2p^2 - 2s^2 2p 3d$	$^3P - ^3D^\circ$	1–1	3–3	3.03E+03	1.39E−01	7.63E−02	−0.379	A	1,2
55.401	6 414	1 811 430	$2s^2 2p^2 - 2s^2 2p 3d$	$^3P - ^3D^\circ$	2–3	5–7	1.10E+04	7.06E−01	6.43E−01	0.547	A	1,2
55.475	6 414	1 809 040	$2s^2 2p^2 - 2s^2 2p 3d$	$^3P - ^3D^\circ$	2–2	5–5	3.56E+02	1.64E−02	1.50E−02	−1.085	C	1,2
55.502	6 414	1 808 160	$2s^2 2p^2 - 2s^2 2p 3d$	$^3P - ^3D^\circ$	2–1	5–3	1.23E+01	3.40E−04	3.10E−04	−2.770	C	1,2
55.510	292 232	2 093 700	$2s 2p^3 - 2s 2p^2(^2D) 3d$	$^3D^\circ - ^3D$	3–3	7–7	5.48E+03	2.53E−01	3.24E−01	0.248	C	3,LS
55.510	292 232	2 093 700	$2s 2p^3 - 2s 2p^2(^2D) 3d$	$^3D^\circ - ^3D$	3–2	7–5	9.64E+02	3.18E−02	4.07E−02	−0.652	C	3,LS
55.512	292 296	2 093 700	$2s 2p^3 - 2s 2p^2(^2D) 3d$	$^3D^\circ - ^3D$	2–1	5–3	1.54E+03	4.28E−02	3.91E−02	−0.670	C	3,LS
55.512	292 296	2 093 700	$2s 2p^3 - 2s 2p^2(^2D) 3d$	$^3D^\circ - ^3D$	2–3	5–7	6.88E+02	4.45E−02	4.07E−02	−0.653	C	3,LS
55.512	292 296	2 093 700	$2s 2p^3 - 2s 2p^2(^2D) 3d$	$^3D^\circ - ^3D$	2–2	5–5	4.31E+03	1.99E−01	1.82E−01	−0.002	C	3,LS
55.517	292 441	2 093 700	$2s 2p^3 - 2s 2p^2(^2D) 3d$	$^3D^\circ - ^3D$	1–2	3–5	9.26E+02	7.13E−02	3.91E−02	−0.670	C	3,LS

Si IX—Continued

λ Ritz (Å)	E_i (cm^{-1})	E_k (cm^{-1})	Configurations	Terms	J_i–J_k	g_i–g_k	A_{ki} (10^8 s^{-1})	f_{ik}	S (a.u.)	log $g_i f$	Acc.	Ref.
55.517	292 441	2 093 700	$2s2p^3$–$2s2p^2(^2D)3d$	$^3D^\circ$–^3D	1–1	3–3	4.63E+03	2.14E−01	1.17E−01	−0.192	C	3,LS
55.779	292 232	2 085 020	$2s2p^3$–$2s2p^2(^2D)3d$	$^3D^\circ$–^3F	3–3	7–7	1.08E+03	5.03E−02	6.47E−02	−0.453	C	3,LS
55.779	292 232	2 085 020	$2s2p^3$–$2s2p^2(^2D)3d$	$^3D^\circ$–^3F	3–4	7–9	9.69E+03	5.81E−01	7.47E−01	0.609	C	3,LS
55.779	292 232	2 085 020	$2s2p^3$–$2s2p^2(^2D)3d$	$^3D^\circ$–^3F	3–2	7–5	4.26E+01	1.42E−03	1.83E−03	−2.003	D	3,LS
55.781	292 296	2 085 020	$2s2p^3$–$2s2p^2(^2D)3d$	$^3D^\circ$–^3F	2–2	5–5	1.51E+03	7.04E−02	6.46E−02	−0.453	C	3,LS
55.781	292 296	2 085 020	$2s2p^3$–$2s2p^2(^2D)3d$	$^3D^\circ$–^3F	2–3	5–7	8.61E+03	5.62E−01	5.16E−01	0.449	C	3,LS
55.786	292 441	2 085 020	$2s2p^3$–$2s2p^2(^2D)3d$	$^3D^\circ$–^3F	1–2	3–5	8.13E+03	6.32E−01	3.48E−01	0.278	C	3,LS
55.819	2 545.0	1 794 050+x	$2s^22p^2$–$2s^22p3d$	^3P–$^1D^\circ$	1–2	3–5	1.88E+02	1.46E−02	8.05E−03	−1.359	C	1,2
55.940	6 414	1 794 050+x	$2s^22p^2$–$2s^22p3d$	^3P–$^1D^\circ$	2–2	5–5	2.07E+01	9.73E−04	8.96E−04	−2.313	C	1,2
56.003	52 925.9	1 838 560	$2s^22p^2$–$2s^22p3d$	^1D–$^1P^\circ$	2–1	5–3	3.85E+02	1.09E−02	1.00E−02	−1.266	C	1,2
56.027	52 925.9	1 837 780	$2s^22p^2$–$2s^22p3d$	^1D–$^1F^\circ$	2–3	5–7	1.35E+04	8.86E−01	8.17E−01	0.647	A	1,2
56.690	52 925.9	1 816 900	$2s^22p^2$–$2s^22p3d$	^1D–$^3P^\circ$	2–1	5–3	6.62E+00	1.91E−04	1.79E−04	−3.019	C	1,2
56.730	52 925.9	1 815 650	$2s^22p^2$–$2s^22p3d$	^1D–$^3P^\circ$	2–2	5–5	9.54E+01	4.60E−03	4.30E−03	−1.638	C	1,2
56.867	52 925.9	1 811 430	$2s^22p^2$–$2s^22p3d$	^1D–$^3D^\circ$	2–3	5–7	1.04E−01	7.06E−06	6.61E−06	−4.452	D	1,2
56.944	52 925.9	1 809 040	$2s^22p^2$–$2s^22p3d$	^1D–$^3D^\circ$	2–2	5–5	3.28E+01	1.59E−03	1.49E−03	−2.099	C	1,2
56.972	52 925.9	1 808 160	$2s^22p^2$–$2s^22p3d$	^1D–$^3D^\circ$	2–1	5–3	4.97E+00	1.45E−04	1.36E−04	−3.139	C	1,2
57.153	344 009	2 093 700	$2s2p^3$–$2s2p^2(^2D)3d$	$^3P^\circ$–^3D	1–1	3–3	1.35E+03	6.61E−02	3.73E−02	−0.703	C	3,LS
57.153	344 009	2 093 700	$2s2p^3$–$2s2p^2(^2D)3d$	$^3P^\circ$–^3D	1–2	3–5	2.43E+03	1.98E−01	1.12E−01	−0.226	C	3,LS
57.155	344 075	2 093 700	$2s2p^3$–$2s2p^2(^2D)3d$	$^3P^\circ$–^3D	0–1	1–3	1.80E+03	2.65E−01	4.99E−02	−0.577	C	3,LS
57.157	344 118	2 093 700	$2s2p^3$–$2s2p^2(^2D)3d$	$^3P^\circ$–^3D	2–1	5–3	9.02E+01	2.65E−03	2.49E−03	−1.878	D	3,LS
57.157	344 118	2 093 700	$2s2p^3$–$2s2p^2(^2D)3d$	$^3P^\circ$–^3D	2–2	5–5	8.11E+02	3.97E−02	3.74E−02	−0.702	C	3,LS
57.157	344 118	2 093 700	$2s2p^3$–$2s2p^2(^2D)3d$	$^3P^\circ$–^3D	2–3	5–7	3.24E+03	2.22E−01	2.09E−01	0.045	C	3,LS
57.434	52 925.9	1 794 050+x	$2s^22p^2$–$2s^22p3d$	^1D–$^1D^\circ$	2–2	5–5	2.78E+03	1.38E−01	1.30E−01	−0.162	C	1
57.778	107 799	1 838 560	$2s^22p^2$–$2s^22p3d$	^1S–$^1P^\circ$	0–1	1–3	8.03E+03	1.21E+00	2.29E−01	0.081	B	1,2
58.158?	292 232	2 011 690?	$2s2p^3$–$2s2p^2(^4P)3d$	$^3D^\circ$–^3D	3–2	7–5	3.29E+02	1.19E−02	1.60E−02	−1.079	C	3,LS
58.158?	292 232	2 011 690?	$2s2p^3$–$2s2p^2(^4P)3d$	$^3D^\circ$–^3D	3–3	7–7	1.87E+03	9.49E−02	1.27E−01	−0.178	C	3,LS
58.160?	292 296	2 011 690?	$2s2p^3$–$2s2p^2(^4P)3d$	$^3D^\circ$–^3D	2–3	5–7	2.35E+02	1.67E−02	1.60E−02	−1.078	C	3,LS
58.160?	292 296	2 011 690?	$2s2p^3$–$2s2p^2(^4P)3d$	$^3D^\circ$–^3D	2–2	5–5	1.47E+03	7.43E−02	7.11E−02	−0.430	C	3,LS
58.165?	292 441	2 011 690?	$2s2p^3$–$2s2p^2(^4P)3d$	$^3D^\circ$–^3D	1–2	3–5	3.16E+02	2.67E−02	1.53E−02	−1.096	C	3,LS
58.510	107 799	1 816 900	$2s^22p^2$–$2s^22p3d$	^1S–$^3P^\circ$	0–1	1–3	5.90E+00	9.08E−04	1.75E−04	−3.042	C	1,2
58.811	107 799	1 808 160	$2s^22p^2$–$2s^22p3d$	^1S–$^3D^\circ$	0–1	1–3	1.93E+01	3.01E−03	5.82E−04	−2.522	C	1,2
58.906	292 232	1 989 850+x	$2s2p^3$–$2s2p^2(^4P)3d$	$^3D^\circ$–^3F	3–4	7–9	4.07E+03	2.72E−01	3.69E−01	0.280	C	3,LS
59.002	292 232	1 987 100+x	$2s2p^3$–$2s2p^2(^4P)3d$	$^3D^\circ$–^3F	3–3	7–7	4.50E+02	2.35E−02	3.20E−02	−0.784	C	3,LS
59.004	292 296	1 987 100+x	$2s2p^3$–$2s2p^2(^4P)3d$	$^3D^\circ$–^3F	2–3	5–7	3.60E+03	2.63E−01	2.55E−01	0.119	C	3,LS
59.070	292 232	1 985 150+x	$2s2p^3$–$2s2p^2(^4P)3d$	$^3D^\circ$–^3F	3–2	7–5	1.77E+01	6.63E−04	9.03E−04	−2.333	D	3,LS
59.072	292 296	1 985 150+x	$2s2p^3$–$2s2p^2(^4P)3d$	$^3D^\circ$–^3F	2–2	5–5	6.29E+02	3.29E−02	3.20E−02	−0.784	C	3,LS
59.077	292 441	1 985 150+x	$2s2p^3$–$2s2p^2(^4P)3d$	$^3D^\circ$–^3F	1–2	3–5	3.38E+03	2.95E−01	1.72E−01	−0.053	C	3,LS
59.462	292 232	1 973 980+x	$2s2p^3$–$2s2p^2(^4P)3d$	$^3D^\circ$–^3P	3–2	7–5	4.54E+02	1.72E−02	2.36E−02	−0.919	C	3,LS
59.464	292 296	1 973 980+x	$2s2p^3$–$2s2p^2(^4P)3d$	$^3D^\circ$–^3P	2–2	5–5	8.09E+01	4.29E−03	4.20E−03	−1.669	D	3,LS
59.469	292 441	1 973 980+x	$2s2p^3$–$2s2p^2(^4P)3d$	$^3D^\circ$–^3P	1–2	3–5	5.40E+00	4.77E−04	2.80E−04	−2.844	D	3,LS
59.964?	344 009	2 011 690?	$2s2p^3$–$2s2p^2(^4P)3d$	$^3P^\circ$–^3D	1–2	3–5	2.95E+03	2.65E−01	1.57E−01	−0.100	C	3,LS
59.967?	344 118	2 011 690?	$2s2p^3$–$2s2p^2(^4P)3d$	$^3P^\circ$–^3D	2–3	5–7	3.92E+03	2.96E−01	2.92E−01	0.170	C	3,LS
59.967?	344 118	2 011 690?	$2s2p^3$–$2s2p^2(^4P)3d$	$^3P^\circ$–^3D	2–2	5–5	9.81E+02	5.29E−02	5.22E−02	−0.578	C	3,LS
60.944	0	1 640 850	$2s^22p^2$–$2s^22p3s$	^3P–$^1P^\circ$	0–1	1–3	5.21E+00	8.70E−04	1.75E−04	−3.061	C	1,2
60.989	150 770+x	1 790 410+x	$2s2p^3$–$2s2p^2(^4P)3s$	$^5S^\circ$–^5P	2–3	5–7	9.21E+02	7.19E−02	7.22E−02	−0.444	C	3,LS
61.039	2 545.0	1 640 850	$2s^22p^2$–$2s^22p3s$	^3P–$^1P^\circ$	1–1	3–3	8.79E+00	4.91E−04	2.96E−04	−2.832	C	1,2
61.109	150 770+x	1 787 190+x	$2s2p^3$–$2s2p^2(^4P)3s$	$^5S^\circ$–^5P	2–2	5–5	9.16E+02	5.13E−02	5.16E−02	−0.591	C	3,LS
61.183	6 414	1 640 850	$2s^22p^2$–$2s^22p3s$	^3P–$^1P^\circ$	2–1	5–3	2.11E+00	7.12E−05	7.17E−05	−3.449	D	1,2
61.190	150 770+x	1 785 020+x	$2s2p^3$–$2s2p^2(^4P)3s$	$^5S^\circ$–^5P	2–1	5–3	9.12E+02	3.07E−02	3.09E−02	−0.814	C	3,LS
61.351	344 009	1 973 980+x	$2s2p^3$–$2s2p^2(^4P)3d$	$^3P^\circ$–^3P	1–2	3–5	7.01E+02	6.59E−02	3.99E−02	−0.704	C	3,LS
61.355	344 118	1 973 980+x	$2s2p^3$–$2s2p^2(^4P)3d$	$^3P^\circ$–^3P	2–2	5–5	2.11E+03	1.19E−01	1.20E−01	−0.225	C	3,LS
61.502	2 545.0	1 628 500	$2s^22p^2$–$2s^22p3s$	^3P–$^3P^\circ$	1–2	3–5	2.94E+02	2.78E−02	1.69E−02	−1.079	A	1,2
61.543	292 232	1 917 100	$2s2p^3$–$2s2p^2(^2D)3s$	$^3D^\circ$–^3D	3–3	7–7	1.14E+03	6.45E−02	9.15E−02	−0.345	C	3,LS
61.543	292 232	1 917 100	$2s2p^3$–$2s2p^2(^2D)3s$	$^3D^\circ$–^3D	3–2	7–5	2.00E+02	8.09E−03	1.15E−02	−1.247	C	3,LS
61.546	292 296	1 917 100	$2s2p^3$–$2s2p^2(^2D)3s$	$^3D^\circ$–^3D	2–1	5–3	3.20E+02	1.09E−02	1.10E−02	−1.264	C	3,LS
61.546	292 296	1 917 100	$2s2p^3$–$2s2p^2(^2D)3s$	$^3D^\circ$–^3D	2–3	5–7	1.42E+02	1.13E−02	1.15E−02	−1.248	C	3,LS
61.546	292 296	1 917 100	$2s2p^3$–$2s2p^2(^2D)3s$	$^3D^\circ$–^3D	2–2	5–5	8.89E+02	5.05E−02	5.12E−02	−0.598	C	3,LS
61.551	292 441	1 917 100	$2s2p^3$–$2s2p^2(^2D)3s$	$^3D^\circ$–^3D	1–1	3–3	9.60E+02	5.45E−02	3.31E−02	−0.786	C	3,LS
61.551	292 441	1 917 100	$2s2p^3$–$2s2p^2(^2D)3s$	$^3D^\circ$–^3D	1–2	3–5	1.92E+02	1.82E−02	1.11E−02	−1.263	C	3,LS
61.600	0	1 623 380	$2s^22p^2$–$2s^22p3s$	^3P–$^3P^\circ$	0–1	1–3	3.82E+02	6.52E−02	1.32E−02	−1.186	A	1,2
61.649	6 414	1 628 500	$2s^22p^2$–$2s^22p3s$	^3P–$^3P^\circ$	2–2	5–5	8.75E+02	4.99E−02	5.06E−02	−0.603	A	1,2
61.697	2 545.0	1 623 380	$2s^22p^2$–$2s^22p3s$	^3P–$^3P^\circ$	1–1	3–3	2.81E+02	1.60E−02	9.76E−03	−1.318	B	1,2

Si IX—Continued

λ Ritz (Å)	E_i (cm^{-1})	E_k (cm^{-1})	Configurations	Terms	J_i–J_k	g_i–g_k	A_{ki} (10^8 s^{-1})	f_{ik}	S (a.u.)	log $g_i f$	Acc.	Ref.
61.844	6 414	1 623 380	$2s^22p^2$–$2s^22p3s$	^{3}P–^{3}P°	2–1	5–3	4.86E+02	1.67E−02	1.70E−02	−1.078	A	1,2
62.975	52 925.9	1 640 850	$2s^22p^2$–$2s^22p3s$	^{1}D–^{1}P°	2–1	5–3	1.41E+03	5.04E−02	5.22E−02	−0.599	A	1,2
63.469	52 925.9	1 628 500	$2s^22p^2$–$2s^22p3s$	^{1}D–^{3}P°	2–2	5–5	3.64E+00	2.20E−04	2.29E−04	−2.959	C	1,2
63.569	344 009	1 917 100	$2s2p^3$–$2s2p^2(^2\mathrm{D})3s$	^{3}P°–^{3}D	1–1	3–3	2.01E+02	1.22E−02	7.66E−03	−1.437	D	3,LS
63.569	344 009	1 917 100	$2s2p^3$–$2s2p^2(^2\mathrm{D})3s$	^{3}P°–^{3}D	1–2	3–5	3.64E+02	3.67E−02	2.30E−02	−0.958	C	3,LS
63.572	344 075	1 917 100	$2s2p^3$–$2s2p^2(^2\mathrm{D})3s$	^{3}P°–^{3}D	0–1	1–3	2.69E+02	4.89E−02	1.02E−02	−1.311	C	3,LS
63.574	344 118	1 917 100	$2s2p^3$–$2s2p^2(^2\mathrm{D})3s$	^{3}P°–^{3}D	2–3	5–7	4.85E+02	4.11E−02	4.30E−02	−0.687	C	3,LS
63.574	344 118	1 917 100	$2s2p^3$–$2s2p^2(^2\mathrm{D})3s$	^{3}P°–^{3}D	2–2	5–5	1.21E+02	7.33E−03	7.67E−03	−1.436	D	3,LS
63.574	344 118	1 917 100	$2s2p^3$–$2s2p^2(^2\mathrm{D})3s$	^{3}P°–^{3}D	2–1	5–3	1.35E+01	4.89E−04	5.12E−04	−2.612	D	3,LS
63.676	52 925.9	1 623 380	$2s^22p^2$–$2s^22p3s$	^{1}D–^{3}P°	2–1	5–3	2.63E+01	9.59E−04	1.01E−03	−2.319	C	1,2
65.229	107 799	1 640 850	$2s^22p^2$–$2s^22p3s$	^{1}S–^{1}P°	0–1	1–3	4.22E+02	8.08E−02	1.73E−02	−1.093	A	1,2
65.486	446 942	1 973 980+x	$2s2p^3$–$2s2p^2(^4\mathrm{P})3d$	^{3}S°–^{3}P	1–2	3–5	4.89E+02	5.24E−02	3.39E−02	−0.804	C	3,LS
65.981	107 799	1 623 380	$2s^22p^2$–$2s^22p3s$	^{1}S–^{3}P°	0–1	1–3	6.11E+00	1.20E−03	2.60E−04	−2.922	C	1,2
85.983	674 764	1 837 780	$2p^4$–$2s^22p3d$	^{3}P–^{1}F°	2–3	5–7	2.78E−03	4.31E−07	6.10E−07	−5.667	E	1,2
87.555	674 764	1 816 900	$2p^4$–$2s^22p3d$	^{3}P–^{3}P°	2–1	5–3	1.34E−01	9.22E−06	1.33E−05	−4.336	D	1,2
87.651	674 764	1 815 650	$2p^4$–$2s^22p3d$	^{3}P–^{3}P°	2–2	5–5	2.52E−01	2.90E−05	4.19E−05	−3.838	D	1,2
87.848	679 300	1 817 630	$2p^4$–$2s^22p3d$	^{3}P–^{3}P°	1–0	3–1	3.31E−01	1.28E−05	1.11E−05	−4.416	D	1,2
87.904	679 300	1 816 900	$2p^4$–$2s^22p3d$	^{3}P–^{3}P°	1–1	3–3	9.01E−02	1.04E−05	9.06E−06	−4.504	D	1,2
87.977	674 764	1 811 430	$2p^4$–$2s^22p3d$	^{3}P–^{3}D°	2–3	5–7	1.98E−02	3.22E−06	4.66E−06	−4.794	C	1,2
88.001	679 300	1 815 650	$2p^4$–$2s^22p3d$	^{3}P–^{3}P°	1–2	3–5	6.88E−02	1.33E−05	1.16E−05	−4.399	C	1,2
88.042	681 079	1 816 900	$2p^4$–$2s^22p3d$	^{3}P–^{3}P°	0–1	1–3	1.06E−01	3.68E−05	1.07E−05	−4.434	C	1,2
88.162	674 764	1 809 040	$2p^4$–$2s^22p3d$	^{3}P–^{3}D°	2–2	5–5	4.02E−02	4.69E−06	6.80E−06	−4.630	C	1,2
88.230	674 764	1 808 160	$2p^4$–$2s^22p3d$	^{3}P–^{3}D°	2–1	5–3	7.53E−03	5.27E−07	7.66E−07	−5.579	D	1,2
88.516	679 300	1 809 040	$2p^4$–$2s^22p3d$	^{3}P–^{3}D°	1–2	3–5	1.18E−03	2.30E−07	2.01E−07	−6.161	E	1
89.343	674 764	1 794 050+x	$2p^4$–$2s^22p3d$	^{3}P–^{1}D°	2–2	5–5	6.78E−03	8.11E−07	1.19E−06	−5.392	E	1
89.361	719 502	1 838 560	$2p^4$–$2s^22p3d$	^{1}D–^{1}P°	2–1	5–3	1.51E−02	1.09E−06	1.60E−06	−5.265	D	1
89.423	719 502	1 837 780	$2p^4$–$2s^22p3d$	^{1}D–^{1}F°	2–3	5–7	1.19E−01	1.99E−05	2.94E−05	−4.001	E	1,2
91.229	719 502	1 815 650	$2p^4$–$2s^22p3d$	^{1}D–^{3}P°	2–2	5–5	3.44E−03	4.29E−07	6.44E−07	−5.669	E	1,2
91.782	719 502	1 809 040	$2p^4$–$2s^22p3d$	^{1}D–^{3}D°	2–2	5–5	4.71E−03	5.94E−07	8.98E−07	−5.527	E	1,2
93.062	719 502	1 794 050+x	$2p^4$–$2s^22p3d$	^{1}D–^{1}D°	2–2	5–5	2.79E−01	3.63E−05	5.56E−05	−3.741	D	1
98.148	819 689	1 838 560	$2p^4$–$2s^22p3d$	^{1}S–^{1}P°	0–1	1–3	4.24E−01	1.84E−04	5.93E−05	−3.736	D	1,2
101.166	819 689	1 808 160	$2p^4$–$2s^22p3d$	^{1}S–^{3}D°	0–1	1–3	1.48E−03	6.82E−07	2.27E−07	−6.166	E	1,2
104.192	681 079	1 640 850	$2p^4$–$2s^22p3s$	^{3}P–^{1}P°	0–1	1–3	8.39E−04	4.10E−07	1.41E−07	−6.388	E	1,2
104.851	674 764	1 628 500	$2p^4$–$2s^22p3s$	^{3}P–^{3}P°	2–2	5–5	1.74E−02	2.86E−06	4.94E−06	−4.844	C	1,2
105.352	679 300	1 628 500	$2p^4$–$2s^22p3s$	^{3}P–^{3}P°	1–2	3–5	5.90E−03	1.64E−06	1.70E−06	−5.309	C	1,2
105.417	674 764	1 623 380	$2p^4$–$2s^22p3s$	^{3}P–^{3}P°	2–1	5–3	8.52E−03	8.52E−07	1.48E−06	−5.371	C	1,2
105.923	679 300	1 623 380	$2p^4$–$2s^22p3s$	^{3}P–^{3}P°	1–1	3–3	4.98E−03	8.37E−07	8.76E−07	−5.600	D	1,2
106.123	681 079	1 623 380	$2p^4$–$2s^22p3s$	^{3}P–^{3}P°	0–1	1–3	6.48E−03	3.28E−06	1.15E−06	−5.484	D	1,2
108.537	719 502	1 640 850	$2p^4$–$2s^22p3d$	^{1}D–^{1}P°	2–1	5–3	1.84E−03	1.95E−07	3.48E−07	−6.012	D	1,2
121.779	819 689	1 640 850	$2p^4$–$2s^22p3s$	^{1}S–^{1}P°	0–1	1–3	5.18E−03	3.46E−06	1.39E−06	−5.462	D	1,2
124.426	819 689	1 623 380	$2p^4$–$2s^22p3s$	^{1}S–^{3}P°	0–1	1–3	3.11E−04	2.16E−07	8.86E−08	−6.665	E	1,2

10. Si x

$Z=14$

B I isoelectronic sequence

Ground state $1s^2 2s^2 2p\ ^2P^\circ_{1/2}$

Ionization energy 3 237 300 cm^{-1} (401.37 eV)

Data are tabulated for 143 transitions in the range from 34 to 170 Å. Transition probabilities for the $2s^2 2p - 2s^2 3d$, $2s2p^2 - 2s2p3s$, and $2p^3 - 2s^2 3d$ arrays are taken from MCHF[1] calculations. The other results are taken from the Opacity Project (OP).[2] OP provides, however, only multiplet values. These have been decomposed into fine-structure components assuming LS coupling, as indicated by the notation LS in the reference column.

References

[1]G. Tachiev and C. Froese Fischer, http://www.vuse.vanderbilt.edu/~cff/mchf_collection/ (downloaded 22 June, 2002). See also G. Tachiev and C. Froese Fischer, J. Phys. B **33**, 2419 (2000).
[2]http://legacy.gsfc.nasa.gov/topbase/ (downloaded 1 August, 1995).

Si x

λ Ritz (Å)	E_i (cm^{-1})	E_k (cm^{-1})	Configurations	Terms	J_i–J_k	g_i–g_k	A_{ki} (10^8 s^{-1})	f_{ik}	S (a.u.)	log $g_i f$	Acc.	Ref.
34.238?	6 990.6	2 927 720?	$2s^2 2p - 2s^2 6d$	$^2P^\circ - ^2D$	3/2–5/2	4–6	8.19E+02	2.16E−02	9.74E−03	−1.063	B	2,LS
35.932	6 990.6	2 790 020	$2s^2 2p - 2s^2 5d$	$^2P^\circ - ^2D$	3/2–5/2	4–6	1.56E+03	4.53E−02	2.14E−02	−0.742	B	2,LS
39.443	0.0	2 535 310	$2s^2 2p - 2s^2 4d$	$^2P^\circ - ^2D$	1/2–3/2	2–4	2.74E+03	1.28E−01	3.32E−02	−0.592	B	2,LS
39.552	6 990.6	2 535 310	$2s^2 2p - 2s^2 4d$	$^2P^\circ - ^2D$	3/2–3/2	4–4	5.46E+02	1.28E−02	6.67E−03	−1.291	B	2,LS
39.552	6 990.6	2 535 310	$2s^2 2p - 2s^2 4d$	$^2P^\circ - ^2D$	3/2–5/2	4–6	3.27E+03	1.15E−01	5.99E−02	−0.337	B	2,LS
42.512?	575 450	2 927 720?	$2p^3 - 2s^2 6d$	$^2D^\circ - ^2D$	5/2–5/2	6–6	2.33E−01	6.32E−06	5.31E−06	−4.421	E	2,LS
43.853?	647 390	2 927 720?	$2p^3 - 2s^2 6d$	$^2P^\circ - ^2D$	3/2–5/2	4–6	3.40E−02	1.47E−06	8.49E−07	−5.231	E	2,LS
44.518	0.0	2 246 300	$2s^2 2p - 2s2p(^1P^\circ)3p$	$^2P^\circ - ^2S$	1/2–1/2	2–2	2.62E+02	7.78E−03	2.28E−03	−1.808	C	2,LS
44.657	6 990.6	2 246 300	$2s^2 2p - 2s2p(^1P^\circ)3p$	$^2P^\circ - ^2S$	3/2–1/2	4–2	5.19E+02	7.76E−03	4.56E−03	−1.508	C	2,LS
46.672	647 390	2 790 020	$2p^3 - 2s^2 5d$	$^2P^\circ - ^2D$	3/2–5/2	4–6	6.70E−01	3.28E−05	2.02E−05	−3.882	D	2,LS
46.891	0.0	2 132 600	$2s^2 2p - 2s2p(^3P^\circ)3p$	$^2P^\circ - ^2S$	1/2–1/2	2–2	1.44E+03	4.74E−02	1.46E−02	−1.023	B	2,LS
47.045	6 990.6	2 132 600	$2s^2 2p - 2s2p(^3P^\circ)3p$	$^2P^\circ - ^2S$	3/2–1/2	4–2	2.85E+03	4.73E−02	2.93E−02	−0.723	B	2,LS
47.489?	0.0	2 105 750?	$2s^2 2p - 2s2p(^3P^\circ)3p$	$^2P^\circ - ^2D$	1/2–3/2	2–4	3.49E+03	2.36E−01	7.38E−02	−0.326	B	2,LS
47.545	6 990.6	2 110 260	$2s^2 2p - 2s2p(^3P^\circ)3p$	$^2P^\circ - ^2D$	3/2–5/2	4–6	4.17E+03	2.12E−01	1.33E−01	−0.072	B	2,LS
47.647?	6 990.6	2 105 750?	$2s^2 2p - 2s2p(^3P^\circ)3p$	$^2P^\circ - ^2D$	3/2–3/2	4–4	6.91E+02	2.35E−02	1.47E−02	−1.027	B	2,LS
48.385	0.0	2 066 750	$2s^2 2p - 2s2p(^3P^\circ)3p$	$^2P^\circ - ^2P$	1/2–3/2	2–4	6.27E+02	4.40E−02	1.40E−02	−1.056	B	2,LS
48.436	0.0	2 064 590	$2s^2 2p - 2s2p(^3P^\circ)3p$	$^2P^\circ - ^2P$	1/2–1/2	2–2	2.50E+03	8.79E−02	2.80E−02	−0.755	B	2,LS
48.549	6 990.6	2 066 750	$2s^2 2p - 2s2p(^3P^\circ)3p$	$^2P^\circ - ^2P$	3/2–3/2	4–4	3.11E+03	1.10E−01	7.03E−02	−0.357	B	2,LS
48.600	6 990.6	2 064 590	$2s^2 2p - 2s2p(^3P^\circ)3p$	$^2P^\circ - ^2P$	3/2–1/2	4–2	1.24E+03	2.19E−02	1.40E−02	−1.057	B	2,LS
49.418?	287 850	2 311 390?	$2s2p^2 - 2s2p(^1P^\circ)3d$	$^2D - ^2D^\circ$	3/2–5/2	4–6	7.76E+01	4.26E−03	2.77E−03	−1.769	C	2,LS
49.419?	287 880	2 311 390?	$2s2p^2 - 2s2p(^1P^\circ)3d$	$^2D - ^2D^\circ$	5/2–5/2	6–6	1.08E+03	3.97E−02	3.88E−02	−0.623	B	2,LS
49.439?	287 850	2 310 530?	$2s2p^2 - 2s2p(^1P^\circ)3d$	$^2D - ^2D^\circ$	3/2–3/2	4–4	1.05E+03	3.83E−02	2.49E−02	−0.815	B	2,LS
49.440?	287 880	2 310 530?	$2s2p^2 - 2s2p(^1P^\circ)3d$	$^2D - ^2D^\circ$	5/2–3/2	6–4	1.16E+02	2.84E−03	2.77E−03	−1.769	C	2,LS
49.701?	287 850	2 299 900?	$2s2p^2 - 2s2p(^1P^\circ)3d$	$^2D - ^2F^\circ$	3/2–5/2	4–6	7.31E+03	4.06E−01	2.66E−01	0.211	B	2,LS
49.701?	287 880	2 299 900?	$2s2p^2 - 2s2p(^1P^\circ)3d$	$^2D - ^2F^\circ$	5/2–7/2	6–8	7.82E+03	3.86E−01	3.79E−01	0.365	B	2,LS
49.701?	287 880	2 299 900?	$2s2p^2 - 2s2p(^1P^\circ)3d$	$^2D - ^2F^\circ$	5/2–5/2	6–6	5.21E+02	1.93E−02	1.90E−02	−0.936	B	2,LS
49.973	161 010+x	2 162 100+x	$2s2p^2 - 2s2p(^3P^\circ)3d$	$^4P - ^4P^\circ$	1/2–3/2	2–4	3.38E+03	2.53E−01	8.33E−02	−0.296	B	2,LS
50.035	163 490+x	2 162 100+x	$2s2p^2 - 2s2p(^3P^\circ)3d$	$^4P - ^4P^\circ$	3/2–3/2	4–4	1.08E+03	4.04E−02	2.66E−02	−0.792	B	2,LS
50.064	163 490+x	2 160 920+x	$2s2p^2 - 2s2p(^3P^\circ)3d$	$^4P - ^4P^\circ$	3/2–5/2	4–6	2.41E+03	1.36E−01	8.97E−02	−0.264	B	2,LS
50.124	167 060+x	2 162 100+x	$2s2p^2 - 2s2p(^3P^\circ)3d$	$^4P - ^4P^\circ$	5/2–3/2	6–4	3.62E+03	9.08E−02	8.99E−02	−0.264	B	2,LS
50.154	167 060+x	2 160 920+x	$2s2p^2 - 2s2p(^3P^\circ)3d$	$^4P - ^4P^\circ$	5/2–5/2	6–6	5.62E+03	2.12E−01	2.10E−01	0.104	B	2,LS
50.254	161 010+x	2 150 900+x	$2s2p^2 - 2s2p(^3P^\circ)3d$	$^4P - ^4D^\circ$	1/2–1/2	2–2	1.26E+04	4.76E−01	1.58E−01	−0.021	B	2,LS
50.254	161 010+x	2 150 900+x	$2s2p^2 - 2s2p(^3P^\circ)3d$	$^4P - ^4D^\circ$	1/2–3/2	2–4	6.29E+03	4.76E−01	1.58E−01	−0.021	B	2,LS
50.305	163 490+x	2 151 360+x	$2s2p^2 - 2s2p(^3P^\circ)3d$	$^4P - ^4D^\circ$	3/2–5/2	4–6	1.05E+04	6.00E−01	3.98E−01	0.380	B	2,LS
50.317	163 490+x	2 150 900+x	$2s2p^2 - 2s2p(^3P^\circ)3d$	$^4P - ^4D^\circ$	3/2–3/2	4–4	8.01E+03	3.04E−01	2.01E−01	0.085	B	2,LS
50.317	163 490+x	2 150 900+x	$2s2p^2 - 2s2p(^3P^\circ)3d$	$^4P - ^4D^\circ$	3/2–1/2	4–2	2.51E+03	4.76E−02	3.15E−02	−0.720	B	2,LS
50.333	167 060+x	2 153 830+x	$2s2p^2 - 2s2p(^3P^\circ)3d$	$^4P - ^4D^\circ$	5/2–7/2	6–8	1.50E+04	7.61E−01	7.57E−01	0.660	B	2,LS
50.396	167 060+x	2 151 360+x	$2s2p^2 - 2s2p(^3P^\circ)3d$	$^4P - ^4D^\circ$	5/2–5/2	6–6	4.49E+03	1.71E−01	1.70E−01	0.011	B	2,LS
50.407	167 060+x	2 150 900+x	$2s2p^2 - 2s2p(^3P^\circ)3d$	$^4P - ^4D^\circ$	5/2–3/2	6–4	7.48E+02	1.90E−02	1.89E−02	−0.943	B	2,LS
50.524?	0.0	1 979 260?	$2s^2 2p - 2s^2 3d$	$^2P^\circ - ^2D$	1/2–3/2	2–4	8.15E+03	6.24E−01	2.08E−01	0.096	A	1
50.691	6 990.6	1 979 730	$2s^2 2p - 2s^2 3d$	$^2P^\circ - ^2D$	3/2–5/2	4–6	9.70E+03	5.60E−01	3.74E−01	0.350	A	1
50.703?	6 990.6	1 979 260?	$2s^2 2p - 2s^2 3d$	$^2P^\circ - ^2D$	3/2–3/2	4–4	1.62E+03	6.24E−02	4.17E−02	−0.603	A	1
51.024	575 430	2 535 310	$2p^3 - 2s^2 4d$	$^2D^\circ - ^2D$	3/2–5/2	4–6	2.36E−01	1.38E−05	9.27E−06	−4.258	D	2,LS

Si x—Continued

λ Ritz (Å)	E_i (cm^{-1})	E_k (cm^{-1})	Configurations	Terms	J_i–J_k	g_i–g_k	A_{ki} (10^8 s^{-1})	f_{ik}	S (a.u.)	log $g_i f$	Acc.	Ref.
51.024	575 450	2 535 310	$2p^3$–$2s^24d$	$^2D^\circ$–^2D	5/2–3/2	6–4	3.52E−01	9.17E−06	9.24E−06	−4.259	E	2,LS
51.024	575 450	2 535 310	$2p^3$–$2s^24d$	$^2D^\circ$–^2D	5/2–5/2	6–6	3.28E+00	1.28E−04	1.29E−04	−3.115	C	2,LS
51.024	575 430	2 535 310	$2p^3$–$2s^24d$	$^2D^\circ$–^2D	3/2–3/2	4–4	3.18E+00	1.24E−04	8.33E−05	−3.305	C	2,LS
51.635?	509 330+x	2 446 000+x?	$2p^3$–$2p^2(^3P)3d$	$^4S^\circ$–^4P	3/2–3/2	4–4	1.40E+04	5.58E−01	3.79E−01	0.349	B	2,LS
51.676?	509 330+x	2 444 460+x?	$2p^3$–$2p^2(^3P)3d$	$^4S^\circ$–^4P	3/2–5/2	4–6	1.39E+04	8.36E−01	5.69E−01	0.524	B	2,LS
52.070?	390 040	2 310 530?	$2s2p^2$–$2s2p(^1P^\circ)3d$	^2P–$^2D^\circ$	1/2–3/2	2–4	8.93E+03	7.26E−01	2.49E−01	0.162	B	2,LS
52.155?	394 030	2 311 390?	$2s2p^2$–$2s2p(^1P^\circ)3d$	^2P–$^2D^\circ$	3/2–5/2	4–6	1.07E+04	6.52E−01	4.48E−01	0.416	B	2,LS
52.178?	394 030	2 310 530?	$2s2p^2$–$2s2p(^1P^\circ)3d$	^2P–$^2D^\circ$	3/2–3/2	4–4	1.77E+03	7.24E−02	4.98E−02	−0.538	B	2,LS
52.248?	287 850	2 201 790?	$2s2p^2$–$2s2p(^3P^\circ)3d$	^2D–$^2P^\circ$	3/2–1/2	4–2	1.61E+02	3.30E−03	2.27E−03	−1.879	C	2,LS
52.319?	287 850	2 199 210?	$2s2p^2$–$2s2p(^3P^\circ)3d$	^2D–$^2P^\circ$	3/2–3/2	4–4	1.61E+01	6.59E−04	4.54E−04	−2.579	C	2,LS
52.320?	287 880	2 199 210?	$2s2p^2$–$2s2p(^3P^\circ)3d$	^2D–$^2P^\circ$	5/2–3/2	6–4	1.44E+02	3.95E−03	4.08E−03	−1.625	C	2,LS
52.485	287 880	2 193 190	$2s2p^2$–$2s2p(^3P^\circ)3d$	^2D–$^2F^\circ$	5/2–7/2	6–8	9.88E+03	5.44E−01	5.64E−01	0.514	B	2,LS
52.611	287 850	2 188 590	$2s2p^2$–$2s2p(^3P^\circ)3d$	^2D–$^2F^\circ$	3/2–5/2	4–6	9.16E+03	5.70E−01	3.95E−01	0.358	B	2,LS
52.612	287 880	2 188 590	$2s2p^2$–$2s2p(^3P^\circ)3d$	^2D–$^2F^\circ$	5/2–5/2	6–6	6.56E+02	2.72E−02	2.83E−02	−0.787	B	2,LS
52.951	646 760	2 535 310	$2p^3$–$2s^24d$	$^2P^\circ$–^2D	1/2–3/2	2–4	7.53E+00	6.33E−04	2.21E−04	−2.898	C	2,LS
52.968	647 390	2 535 310	$2p^3$–$2s^24d$	$^2P^\circ$–^2D	3/2–5/2	4–6	9.03E+00	5.70E−04	3.98E−04	−2.642	C	2,LS
52.968	647 390	2 535 310	$2p^3$–$2s^24d$	$^2P^\circ$–^2D	3/2–3/2	4–4	1.51E+00	6.33E−05	4.42E−05	−3.597	D	2,LS
53.462	287 850	2 158 330	$2s2p^2$–$2s2p(^1P^\circ)3s$	^2D–$^2P^\circ$	3/2–3/2	4–4	9.10E+01	3.90E−03	2.75E−03	−1.807	C	2,LS
53.463	287 880	2 158 330	$2s2p^2$–$2s2p(^1P^\circ)3s$	^2D–$^2P^\circ$	5/2–3/2	6–4	8.19E+02	2.34E−02	2.47E−02	−0.853	B	2,LS
53.572	287 850	2 154 480	$2s2p^2$–$2s2p(^3P^\circ)3d$	^2D–$^2D^\circ$	3/2–5/2	4–6	2.70E+02	1.74E−02	1.23E−02	−1.157	B	2,LS
53.573	287 880	2 154 480	$2s2p^2$–$2s2p(^3P^\circ)3d$	^2D–$^2D^\circ$	5/2–5/2	6–6	3.79E+03	1.63E−01	1.73E−01	−0.010	B	2,LS
53.595	287 850	2 153 700	$2s2p^2$–$2s2p(^3P^\circ)3d$	^2D–$^2D^\circ$	3/2–3/2	4–4	3.65E+03	1.57E−01	1.11E−01	−0.202	B	2,LS
53.596	287 880	2 153 700	$2s2p^2$–$2s2p(^3P^\circ)3d$	^2D–$^2D^\circ$	5/2–3/2	6–4	4.04E+02	1.16E−02	1.23E−02	−1.157	B	2,LS
54.464	163 490+x	1 999 580+x	$2s2p^2$–$2s2p(^3P^\circ)3s$	^4P–$^4P^\circ$	3/2–5/2	4–6	5.95E+02	3.97E−02	2.85E−02	−0.799	A	1
54.522	161 010+x	1 995 140+x	$2s2p^2$–$2s2p(^3P^\circ)3s$	^4P–$^4P^\circ$	1/2–3/2	2–4	8.12E+02	7.24E−02	2.60E−02	−0.839	A	1
54.522?	367 670	2 201 790?	$2s2p^2$–$2s2p(^3P^\circ)3d$	^2S–$^2P^\circ$	1/2–1/2	2–2	5.90E+03	2.63E−01	9.44E−02	−0.279	B	2,LS
54.570	167 060+x	1 999 580+x	$2s2p^2$–$2s2p(^3P^\circ)3s$	^4P–$^4P^\circ$	5/2–5/2	6–6	1.39E+03	6.18E−02	6.66E−02	−0.431	A	1
54.591	161 010+x	1 992 830+x	$2s2p^2$–$2s2p(^3P^\circ)3s$	^4P–$^4P^\circ$	1/2–1/2	2–2	3.22E+02	1.44E−02	5.17E−03	−1.541	A	1
54.596	163 490+x	1 995 140+x	$2s2p^2$–$2s2p(^3P^\circ)3s$	^4P–$^4P^\circ$	3/2–3/2	4–4	2.59E+02	1.16E−02	8.32E−03	−1.335	A	1
54.599?	367 670	2 199 210?	$2s2p^2$–$2s2p(^3P^\circ)3d$	^2S–$^2P^\circ$	1/2–3/2	2–4	5.87E+03	5.25E−01	1.89E−01	0.021	B	2,LS
54.665	163 490+x	1 992 830+x	$2s2p^2$–$2s2p(^3P^\circ)3s$	^4P–$^4P^\circ$	3/2–1/2	4–2	1.61E+03	3.60E−02	2.59E−02	−0.842	A	1
54.702	167 060+x	1 995 140+x	$2s2p^2$–$2s2p(^3P^\circ)3s$	^4P–$^4P^\circ$	5/2–3/2	6–4	8.74E+02	2.62E−02	2.83E−02	−0.804	A	1
55.195?	390 040	2 201 790?	$2s2p^2$–$2s2p(^3P^\circ)3d$	^2P–$^2P^\circ$	1/2–1/2	2–2	6.53E+02	2.98E−02	1.08E−02	−1.225	B	2,LS
55.274?	390 040	2 199 210?	$2s2p^2$–$2s2p(^3P^\circ)3d$	^2P–$^2P^\circ$	1/2–3/2	2–4	1.63E+02	1.49E−02	5.42E−03	−1.526	B	2,LS
55.317?	394 030	2 201 790?	$2s2p^2$–$2s2p(^3P^\circ)3d$	^2P–$^2P^\circ$	3/2–1/2	4–2	3.24E+02	7.43E−03	5.41E−03	−1.527	C	2,LS
55.396?	394 030	2 199 210?	$2s2p^2$–$2s2p(^3P^\circ)3d$	^2P–$^2P^\circ$	3/2–3/2	4–4	8.06E+02	3.71E−02	2.71E−02	−0.829	B	2,LS
55.845	367 670	2 158 330	$2s2p^2$–$2s2p(^1P^\circ)3s$	^2S–$^2P^\circ$	1/2–3/2	2–4	6.49E+02	6.07E−02	2.23E−02	−0.916	B	2,LS
56.552	390 040	2 158 330	$2s2p^2$–$2s2p(^1P^\circ)3s$	^2P–$^2P^\circ$	1/2–3/2	2–4	2.09E+02	2.00E−02	7.45E−03	−1.398	B	2,LS
56.680	394 030	2 158 330	$2s2p^2$–$2s2p(^1P^\circ)3s$	^2P–$^2P^\circ$	3/2–3/2	4–4	1.04E+03	5.00E−02	3.73E−02	−0.699	B	2,LS
56.700	390 040	2 153 700	$2s2p^2$–$2s2p(^3P^\circ)3d$	^2P–$^2D^\circ$	1/2–3/2	2–4	9.87E+02	9.51E−02	3.55E−02	−0.721	B	2,LS
56.804	394 030	2 154 480	$2s2p^2$–$2s2p(^3P^\circ)3d$	^2P–$^2D^\circ$	3/2–5/2	4–6	1.18E+03	8.54E−02	6.39E−02	−0.466	B	2,LS
56.829	394 030	2 153 700	$2s2p^2$–$2s2p(^3P^\circ)3d$	^2P–$^2D^\circ$	3/2–3/2	4–4	1.96E+02	9.49E−03	7.10E−03	−1.421	C	2,LS
57.208?	287 850	2 035 860?	$2s2p^2$–$2s2p(^3P^\circ)3s$	^2D–$^2P^\circ$	3/2–3/2	4–4	1.06E+02	5.22E−03	3.93E−03	−1.680	C	2,LS
57.209?	287 880	2 035 860?	$2s2p^2$–$2s2p(^3P^\circ)3s$	^2D–$^2P^\circ$	5/2–3/2	6–4	9.57E+02	3.13E−02	3.54E−02	−0.726	B	2,LS
57.365?	287 850	2 031 060?	$2s2p^2$–$2s2p(^3P^\circ)3s$	^2D–$^2P^\circ$	3/2–1/2	4–2	1.05E+03	2.60E−02	1.96E−02	−0.983	B	2,LS
58.420?	287 850	1 999 580+x	$2s2p^2$–$2s2p(^3P^\circ)3s$	^2D–$^4P^\circ$	3/2–5/2	4–6	6.97E−02	5.35E−06	4.12E−06	−4.670	D	1
58.421?	287 880	1 999 580+x	$2s2p^2$–$2s2p(^3P^\circ)3s$	^2D–$^4P^\circ$	5/2–5/2	6–6	1.19E+00	6.08E−05	7.01E−05	−3.438	C	1
58.572?	287 850	1 995 140+x	$2s2p^2$–$2s2p(^3P^\circ)3s$	^2D–$^4P^\circ$	3/2–3/2	4–4	7.19E−01	3.70E−05	2.85E−05	−3.830	C	1
58.573?	287 880	1 995 140+x	$2s2p^2$–$2s2p(^3P^\circ)3s$	^2D–$^4P^\circ$	5/2–3/2	6–4	1.30E+00	4.47E−05	5.17E−05	−3.571	C	1
58.652?	287 850	1 992 830+x	$2s2p^2$–$2s2p(^3P^\circ)3s$	^2D–$^4P^\circ$	3/2–1/2	4–2	7.35E−01	1.89E−05	1.46E−05	−4.121	C	1
59.945?	367 670	2 035 860?	$2s2p^2$–$2s2p(^3P^\circ)3s$	^2S–$^2P^\circ$	1/2–3/2	2–4	3.44E+02	3.71E−02	1.46E−02	−1.130	B	2,LS
60.118?	367 670	2 031 060?	$2s2p^2$–$2s2p(^3P^\circ)3s$	^2S–$^2P^\circ$	1/2–1/2	2–2	3.41E+02	1.85E−02	7.32E−03	−1.432	B	2,LS
60.760?	390 040	2 035 860?	$2s2p^2$–$2s2p(^3P^\circ)3s$	^2P–$^2P^\circ$	1/2–3/2	2–4	1.44E+01	1.59E−03	6.36E−04	−2.498	C	2,LS
60.908?	394 030	2 035 860?	$2s2p^2$–$2s2p(^3P^\circ)3s$	^2P–$^2P^\circ$	3/2–3/2	4–4	7.16E+01	3.98E−03	3.19E−03	−1.798	C	2,LS
60.938?	390 040	2 031 060?	$2s2p^2$–$2s2p(^3P^\circ)3s$	^2P–$^2P^\circ$	1/2–1/2	2–2	5.71E+01	3.18E−03	1.28E−03	−2.197	C	2,LS
61.086?	394 030	2 031 060?	$2s2p^2$–$2s2p(^3P^\circ)3s$	^2P–$^2P^\circ$	3/2–1/2	4–2	2.84E+01	7.93E−04	6.38E−04	−2.499	C	2,LS
61.445?	367 670	1 995 140+x	$2s2p^2$–$2s2p(^3P^\circ)3s$	^2S–$^4P^\circ$	1/2–3/2	2–4	2.41E−01	2.73E−05	1.10E−05	−4.263	C	1
61.532?	367 670	1 992 830+x	$2s2p^2$–$2s2p(^3P^\circ)3s$	^2S–$^4P^\circ$	1/2–1/2	2–2	6.64E−02	3.77E−06	1.53E−06	−5.123	D	1
62.284?	394 030	1 999 580+x	$2s2p^2$–$2s2p(^3P^\circ)3s$	^2P–$^4P^\circ$	3/2–5/2	4–6	3.01E−02	2.62E−06	2.15E−06	−4.979	D	1
62.301?	390 040	1 995 140+x	$2s2p^2$–$2s2p(^3P^\circ)3s$	^2P–$^4P^\circ$	1/2–3/2	2–4	3.68E−02	4.28E−06	1.75E−06	−5.068	D	1
62.391?	390 040	1 992 830+x	$2s2p^2$–$2s2p(^3P^\circ)3s$	^2P–$^4P^\circ$	1/2–1/2	2–2	3.09E−02	1.80E−06	7.41E−07	−5.443	D	1
62.518	646 760	2 246 300	$2s2p(^1P^\circ)3p$	$^2P^\circ$–^2S	1/2–1/2	2–2	1.84E+00	1.08E−04	4.45E−05	−3.666	C	2,LS

Si x—Continued

λ Ritz (Å)	E_i (cm^{-1})	E_k (cm^{-1})	Configurations	Terms	J_i–J_k	g_i–g_k	A_{ki} (10^8 s^{-1})	f_{ik}	S (a.u.)	log $g_i f$	Acc.	Ref.
62.543	647 390	2 246 300	$2p^3$–$2s2p(^1P^\circ)3p$	$^2P^\circ$–^2S	3/2–1/2	4–2	3.68E+00	1.08E−04	8.90E−05	−3.365	C	2,LS
62.547?	394 030	1 992 830+x	$2s2p^2$–$2s2p(^3P^\circ)3s$	^2P–$^4P^\circ$	3/2–1/2	4–2	5.09E−02	1.49E−06	1.23E−06	−5.224	D	1
65.154	575 430	2 110 260	$2p^3$–$2s2p(^3P^\circ)3p$	$^2D^\circ$–^2D	3/2–5/2	4–6	3.01E+00	2.87E−04	2.46E−04	−2.940	C	2,LS
65.155	575 450	2 110 260	$2p^3$–$2s2p(^3P^\circ)3p$	$^2D^\circ$–^2D	5/2–5/2	6–6	4.21E+01	2.68E−03	3.45E−03	−1.794	C	2,LS
65.346?	575 430	2 105 750?	$2p^3$–$2s2p(^3P^\circ)3p$	$^2D^\circ$–^2D	3/2–3/2	4–4	4.02E+01	2.57E−03	2.21E−03	−1.988	C	2,LS
65.347?	575 450	2 105 750?	$2p^3$–$2s2p(^3P^\circ)3p$	$^2D^\circ$–^2D	5/2–3/2	6–4	4.48E+00	1.91E−04	2.47E−04	−2.941	C	2,LS
67.055	575 430	2 066 750	$2p^3$–$2s2p(^3P^\circ)3p$	$^2D^\circ$–^2P	3/2–3/2	4–4	7.14E+00	4.81E−04	4.25E−04	−2.716	C	2,LS
67.056	575 450	2 066 750	$2p^3$–$2s2p(^3P^\circ)3p$	$^2D^\circ$–^2P	5/2–3/2	6–4	6.43E+01	2.89E−03	3.83E−03	−1.761	C	2,LS
67.152	575 430	2 064 590	$2p^3$–$2s2p(^3P^\circ)3p$	$^2D^\circ$–^2P	3/2–1/2	4–2	7.10E+01	2.40E−03	2.12E−03	−2.018	C	2,LS
67.302	646 760	2 132 600	$2p^3$–$2s2p(^3P^\circ)3p$	$^2P^\circ$–^2S	1/2–1/2	2–2	7.23E+01	4.91E−03	2.18E−03	−2.008	C	2,LS
67.331	647 390	2 132 600	$2p^3$–$2s2p(^3P^\circ)3p$	$^2P^\circ$–^2S	3/2–1/2	4–2	1.45E+02	4.91E−03	4.35E−03	−1.707	C	2,LS
68.359	647 390	2 110 260	$2p^3$–$2s2p(^3P^\circ)3p$	$^2P^\circ$–^2D	3/2–5/2	4–6	2.65E+01	2.78E−03	2.50E−03	−1.954	C	2,LS
68.541?	646 760	2 105 750?	$2p^3$–$2s2p(^3P^\circ)3p$	$^2P^\circ$–^2D	1/2–3/2	2–4	2.19E+01	3.08E−03	1.39E−03	−2.210	C	2,LS
68.570?	647 390	2 105 750?	$2p^3$–$2s2p(^3P^\circ)3p$	$^2P^\circ$–^2D	3/2–3/2	4–4	4.37E+00	3.08E−04	2.78E−04	−2.909	C	2,LS
70.423	646 760	2 066 750	$2p^3$–$2s2p(^3P^\circ)3p$	$^2P^\circ$–^2P	1/2–3/2	2–4	9.15E−02	1.36E−05	6.31E−06	−4.565	D	2,LS
70.454	647 390	2 066 750	$2p^3$–$2s2p(^3P^\circ)3p$	$^2P^\circ$–^2P	3/2–3/2	4–4	4.57E−01	3.40E−05	3.15E−05	−3.866	D	2,LS
70.530	646 760	2 064 590	$2p^3$–$2s2p(^3P^\circ)3p$	$^2P^\circ$–^2P	1/2–1/2	2–2	3.65E−01	2.72E−05	1.26E−05	−4.264	D	2,LS
70.562	647 390	2 064 590	$2p^3$–$2s2p(^3P^\circ)3p$	$^2P^\circ$–^2P	3/2–1/2	4–2	1.82E−01	6.79E−06	6.31E−06	−4.566	E	2,LS
71.210	575 430	1 979 730	$2p^3$–$2s^23d$	$^2D^\circ$–^2D	3/2–5/2	4–6	7.66E−02	8.74E−06	8.19E−06	−4.457	D	1
71.211	575 450	1 979 730	$2p^3$–$2s^23d$	$^2D^\circ$–^2D	5/2–5/2	6–6	5.92E−01	4.50E−05	6.33E−05	−3.568	C	1
71.234?	575 430	1 979 260?	$2p^3$–$2s^23d$	$^2D^\circ$–^2D	3/2–3/2	4–4	6.23E−01	4.74E−05	4.45E−05	−3.722	C	1
71.235?	575 450	1 979 260?	$2p^3$–$2s^23d$	$^2D^\circ$–^2D	5/2–3/2	6–4	5.19E−02	2.63E−06	3.71E−06	−4.801	D	1
75.047?	646 760	1 979 260?	$2p^3$–$2s^23d$	$^2P^\circ$–^2D	1/2–3/2	2–4	1.31E−02	2.22E−06	1.10E−06	−5.353	D	1
75.056	647 390	1 979 730	$2p^3$–$2s^23d$	$^2P^\circ$–^2D	3/2–5/2	4–6	4.48E−02	5.67E−06	5.61E−06	−4.644	D	1
75.082?	647 390	1 979 260?	$2p^3$–$2s^23d$	$^2P^\circ$–^2D	3/2–3/2	4–4	9.70E−04	8.19E−08	8.10E−08	−6.484	E	1
112.125?	2 035 860	2 927 720?	$2s2p(^3P^\circ)3s$–$2s^26d$	$^2P^\circ$–^2D	3/2–5/2	4–6	5.45E+00	1.54E−03	2.27E−03	−2.210	C	2,LS
129.973?	2 158 330	2 927 720?	$2s2p(^1P^\circ)3s$–$2s^26d$	$^2P^\circ$–^2D	3/2–5/2	4–6	4.87E−01	1.85E−04	3.17E−04	−3.131	C	2,LS
132.598	2 035 860	2 790 020	$2s2p(^3P^\circ)3s$–$2s^25d$	$^2P^\circ$–^2D	3/2–5/2	4–6	1.07E+01	4.23E−03	7.39E−03	−1.772	C	2,LS
137.266?	2 199 210	2 927 720?	$2s2p(^3P^\circ)3d$–$2s^26d$	$^2P^\circ$–^2D	3/2–5/2	4–6	2.88E−03	1.22E−06	2.21E−06	−5.312	E	2,LS
157.154	2 153 700	2 790 020	$2s2p(^3P^\circ)3d$–$2s^25d$	$^2D^\circ$–^2D	3/2–5/2	4–6	1.37E−02	7.63E−06	1.58E−05	−4.515	E	2,LS
157.347	2 154 480	2 790 020	$2s2p(^3P^\circ)3d$–$2s^25d$	$^2D^\circ$–^2D	5/2–5/2	6–6	1.92E−01	7.12E−05	2.21E−04	−3.369	D	2,LS
158.305	2 158 330	2 790 020	$2s2p(^1P^\circ)3s$–$2s^25d$	$^2P^\circ$–^2D	3/2–5/2	4–6	1.77E−02	1.00E−05	2.09E−05	−4.398	D	2,LS
159.281?	2 299 900	2 927 720?	$2s2p(^1P^\circ)3d$–$2s^26d$	$^2F^\circ$–^2D	5/2–5/2	6–6	3.97E−03	1.51E−06	4.75E−06	−5.043	E	2,LS
159.281?	2 299 900	2 927 720?	$2s2p(^1P^\circ)3d$–$2s^26d$	$^2F^\circ$–^2D	7/2–5/2	8–6	7.92E−02	2.26E−05	9.48E−05	−3.743	D	2,LS
162.025?	2 310 530	2 927 720?	$2s2p(^1P^\circ)3d$–$2s^26d$	$^2D^\circ$–^2D	3/2–5/2	4–6	2.49E−03	1.47E−06	3.14E−06	−5.231	E	2,LS
162.251?	2 311 390	2 927 720?	$2s2p(^1P^\circ)3d$–$2s^26d$	$^2D^\circ$–^2D	5/2–5/2	6–6	3.47E−02	1.37E−05	4.39E−05	−4.085	D	2,LS
167.552	2 193 190	2 790 020	$2s2p(^3P^\circ)3d$–$2s^25d$	$^2F^\circ$–^2D	7/2–5/2	8–6	8.71E−03	2.75E−06	1.21E−05	−4.658	E	2,LS
169.259	2 199 210	2 790 020	$2s2p(^3P^\circ)3d$–$2s^25d$	$^2P^\circ$–^2D	3/2–5/2	4–6	3.29E−01	2.12E−04	4.73E−04	−3.072	C	2,LS

11. Si XI

$Z=14$

Be I isoelectronic sequence

Ground state $1s^2 2s^2\ {}^1S_0$

Ionization energy 3 842 100 cm^{-1} (476.36 eV)

Data are tabulated for 147 transitions in the range from 31 to 164 Å. Transition probabilities for the $2s2p-2s3s$, $2s2p-2s3d$, $2s2p-2p3p$, $2p^2-2p3s$, and $2p^2-2s3d$ arrays are taken from calculations with the many body-perturbation theory (MBPT) by Safronova *et al.*[1] The mean values of MBPT and CIV3 results[1,2] are given for singlets. The other results are taken from the Opacity Project (OP).[3] OP provides, however, only multiplet values. These have been decomposed into fine-structure components assuming LS coupling, as indicated by the notation LS in the reference column.

For the transition probability of the $2s^2\ {}^1S_0-2s3p\ {}^1P^\circ_1$ transition (43.763 Å) we have tabulated the mean value of several advanced calculations.[1,2,4,5] For the $2s^2\ {}^1S_0-2s3p\ {}^3P^\circ_1$ intercombination line (43.760 Å) we give the mean of the results of three advanced calculations[1,5,6] and an experimental value from beam foil spectroscopy.[7] In this experiment the lifetimes of the $2s3p\ {}^3P^\circ_{0,1,2}$ levels and the mean wavelength of the $2p^2\ {}^3P-2s3p\ {}^3P^\circ$ transitions were measured. The mean energy of the $2s3p\ {}^3P^\circ$ term was established as 2 285 210 cm^{-1} from this wavelength (54.45 Å) as well as the mean energy of the $2p^2\ {}^3P$ term (448 664 cm^{-1}). The $2s3p\ {}^3P^\circ$ term is not included in the NIST Atomic Spectra Database because the previous spectral compilation was done before 1994. Ten transitions involving levels of the $2s3p\ {}^3P^\circ$ term are included in the present table.

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Si XI

λ Ritz (Å)	E_i (cm^{-1})	E_k (cm^{-1})	Configurations	Terms	J_i-J_k	g_i-g_k	A_{ki} ($10^8\ s^{-1}$)	f_{ik}	S (a.u.)	log $g_i f$	Acc.	Ref.
31.926	172 144	3 304 400	$2s2p-2s5d$	$^3P^\circ-{}^3D$	1–2	3–5	1.42E+03	3.62E−02	1.14E−02	−0.964	C	3,LS
31.979	177 318	3 304 400	$2s2p-2s5d$	$^3P^\circ-{}^3D$	2–3	5–7	1.88E+03	4.04E−02	2.13E−02	−0.695	C	3,LS
31.979	177 318	3 304 400	$2s2p-2s5d$	$^3P^\circ-{}^3D$	2–2	5–5	4.71E+02	7.22E−03	3.80E−03	−1.442	D	3,LS
33.153?	495 201	3 511 520?	$2p^2-2p5d$	$^1D-{}^1F^\circ$	2–3	5–7	3.53E+03	8.14E−02	4.44E−02	−0.390	C	3,LS
33.165?	172 144	3 187 370?	$2s2p-2p4p$	$^3P^\circ-{}^3P$	1–2	3–5	4.00E+02	1.10E−02	3.60E−03	−1.481	D	3,LS
33.222?	177 318	3 187 370?	$2s2p-2p4p$	$^3P^\circ-{}^3P$	2–2	5–5	1.19E+03	1.97E−02	1.08E−02	−1.007	C	3,LS
33.298?	177 318	3 180 500?	$2s2p-2p4p$	$^3P^\circ-{}^3D$	2–3	5–7	1.27E+03	2.95E−02	1.62E−02	−0.831	C	3,LS
33.515?	0	2 983 740?	$2s^2-2s4p$	$^1S-{}^1P^\circ$	0–1	1–3	3.03E+03	1.53E−01	1.69E−02	−0.815	C	3,LS
33.573	329 679	3 308 260	$2s2p-2s5d$	$^1P^\circ-{}^1D$	1–2	3–5	1.65E+03	4.64E−02	1.54E−02	−0.856	C	3,LS
34.910?	329 679	3 194 190?	$2s2p-2p4p$	$^1P^\circ-{}^1D$	1–2	3–5	1.87E+03	5.69E−02	1.96E−02	−0.768	C	3,LS
35.353	169 802	2 998 380	$2s2p-2s4d$	$^3P^\circ-{}^3D$	0–1	1–3	2.37E+03	1.33E−01	1.55E−02	−0.876	C	3,LS
35.383	172 144	2 998 380	$2s2p-2s4d$	$^3P^\circ-{}^3D$	1–1	3–3	1.76E+03	3.31E−02	1.16E−02	−1.003	C	3,LS
35.383	172 144	2 998 380	$2s2p-2s4d$	$^3P^\circ-{}^3D$	1–2	3–5	3.18E+03	9.94E−02	3.47E−02	−0.525	C	3,LS
35.446	177 318	2 998 510	$2s2p-2s4d$	$^3P^\circ-{}^3D$	2–3	5–7	4.21E+03	1.11E−01	6.48E−02	−0.256	C	3,LS
35.448	177 318	2 998 380	$2s2p-2s4d$	$^3P^\circ-{}^3D$	2–1	5–3	1.17E+02	1.32E−03	7.70E−04	−2.180	E	3,LS
35.448	177 318	2 998 380	$2s2p-2s4d$	$^3P^\circ-{}^3D$	2–2	5–5	1.05E+03	1.98E−02	1.16E−02	−1.004	C	3,LS
36.252?	446 494	3 204 950?	$2p^2-2p4d$	$^3P-{}^3P^\circ$	1–2	3–5	7.58E+02	2.49E−02	8.92E−03	−1.127	D	3,LS
36.311?	450 965	3 204 950?	$2p^2-2p4d$	$^3P-{}^3P^\circ$	2–2	5–5	2.27E+03	4.48E−02	2.68E−02	−0.650	C	3,LS
36.335	450 965	3 203 130	$2p^2-2p4d$	$^3P-{}^3D^\circ$	2–3	5–7	5.74E+03	1.59E−01	9.51E−02	−0.100	C	3,LS
36.772	495 201	3 214 660	$2p^2-2p4d$	$^1D-{}^1F^\circ$	2–3	5–7	7.33E+03	2.08E−01	1.26E−01	0.017	B	3,LS
37.060?	495 201	3 193 530?	$2p^2-2p4d$	$^1D-{}^1D^\circ$	2–2	5–5	1.90E+03	3.91E−02	2.39E−02	−0.709	C	3,LS
37.340	329 679	3 007 770	$2s2p-2s4d$	$^1P^\circ-{}^1D$	1–2	3–5	3.30E+03	1.15E−01	4.24E−02	−0.462	C	3,LS
39.090	0	2 558 230	$2s^2-2p3d$	$^1S-{}^3P^\circ$	0–1	1–3	7.52E−01	5.17E−05	6.65E−06	−4.287	E	1
40.184?	495 201	2 983 740?	$2p^2-2s4p$	$^1D-{}^1P^\circ$	2–1	5–3	1.03E+01	1.50E−04	9.92E−05	−3.125	E	3,LS
40.472?	0	2 470 820?	$2s^2-2p3s$	$^1S-{}^1P^\circ$	0–1	1–3	2.97E+02	2.19E−02	2.92E−03	−1.660	C	1,2
42.106?	608 758	2 983 740?	$2p^2-2s4p$	$^1S-{}^1P^\circ$	0–1	1–3	1.39E+02	1.11E−02	1.54E−03	−1.955	D	3,LS

Si XI—Continued

λ Ritz (Å)	E_i (cm^{-1})	E_k (cm^{-1})	Configurations	Terms	J_i–J_k	g_i–g_k	A_{ki} (10^8 s^{-1})	f_{ik}	S (a.u.)	log $g_i f$	Acc.	Ref.
42.368	172 144	2 532 420	$2s2p-2p3p$	$^3P^\circ-{}^1D$	1–2	3–5	6.79E+00	3.05E−04	1.27E−04	−3.039	D	1
42.461	177 318	2 532 420	$2s2p-2p3p$	$^3P^\circ-{}^1D$	2–2	5–5	1.07E+01	2.89E−04	2.02E−04	−2.840	D	1
42.729	169 802	2 510 130	$2s2p-2p3p$	$^3P^\circ-{}^3P$	0–1	1–3	7.42E+02	6.09E−02	8.57E−03	−1.215	C	1
42.731	172 144	2 512 380	$2s2p-2p3p$	$^3P^\circ-{}^3P$	1–2	3–5	7.05E+02	3.22E−02	1.36E−02	−1.016	B	1
42.772	172 144	2 510 130	$2s2p-2p3p$	$^3P^\circ-{}^3P$	1–1	3–3	5.03E+02	1.38E−02	5.83E−03	−1.383	C	1
42.825	177 318	2 512 380	$2s2p-2p3p$	$^3P^\circ-{}^3P$	2–2	5–5	2.62E+03	7.22E−02	5.09E−02	−0.443	B	1
42.826?	172 144	2 507 170?	$2s2p-2p3p$	$^3P^\circ-{}^3P$	1–0	3–1	3.36E+03	3.08E−02	1.30E−02	−1.035	B	1
42.867	177 318	2 510 130	$2s2p-2p3p$	$^3P^\circ-{}^3P$	2–1	5–3	2.10E+03	3.47E−02	2.45E−02	−0.760	B	1
42.907	169 802	2 500 420	$2s2p-2p3p$	$^3P^\circ-{}^3S$	0–1	1–3	5.81E+02	4.81E−02	6.79E−03	−1.318	C	1
42.950	172 144	2 500 420	$2s2p-2p3p$	$^3P^\circ-{}^3S$	1–1	3–3	1.42E+03	3.91E−02	1.66E−02	−0.930	B	1
43.046	177 318	2 500 420	$2s2p-2p3p$	$^3P^\circ-{}^3S$	2–1	5–3	1.02E+03	1.69E−02	1.20E−02	−1.072	B	1
43.290	177 318	2 487 320	$2s2p-2p3p$	$^3P^\circ-{}^3D$	2–3	5–7	1.88E+03	7.40E−02	5.27E−02	−0.432	B	1
43.760	0	2 285 210	$2s^2-2s3p$	$^1S-{}^3P^\circ$	0–1	1–3	3.24E+02	2.79E−02	4.02E−03	−1.554	C	1,5,6,7
43.763	0	2 285 040	$2s^2-2s3p$	$^1S-{}^1P^\circ$	0–1	1–3	6.33E+03	5.45E−01	7.86E−02	−0.263	A	1,2,4,5
45.398	329 679	2 532 420	$2s2p-2p3p$	$^1P^\circ-{}^1D$	1–2	3–5	5.14E+03	2.65E−01	1.19E−01	−0.100	A	1,2
45.680	172 144	2 361 290	$2s2p-2s3d$	$^3P^\circ-{}^1D$	1–2	3–5	1.10E+00	5.75E−05	2.60E−05	−3.763	D	1
45.788	177 318	2 361 290	$2s2p-2s3d$	$^3P^\circ-{}^1D$	2–2	5–5	1.09E−01	3.42E−06	2.58E−06	−4.767	E	1
45.815	329 679	2 512 380	$2s2p-2p3p$	$^1P^\circ-{}^3P$	1–2	3–5	3.49E+01	1.83E−03	8.29E−04	−2.260	C	1
45.862	329 679	2 510 130	$2s2p-2p3p$	$^1P^\circ-{}^3P$	1–1	3–3	3.59E+00	1.13E−04	5.13E−05	−3.469	D	1
45.924?	329 679	2 507 170?	$2s2p-2p3p$	$^1P^\circ-{}^3P$	1–0	3–1	5.27E+00	5.55E−05	2.52E−05	−3.778	D	1
46.067	329 679	2 500 420	$2s2p-2p3p$	$^1P^\circ-{}^3S$	1–1	3–3	4.66E+01	1.48E−03	6.75E−04	−2.352	C	1
46.298	172 144	2 332 050	$2s2p-2s3d$	$^3P^\circ-{}^3D$	1–2	3–5	1.01E+04	5.39E−01	2.46E−01	0.209	B	1
46.399	177 318	2 332 520	$2s2p-2s3d$	$^3P^\circ-{}^3D$	2–3	5–7	1.33E+04	6.02E−01	4.60E−01	0.479	B	1
46.409	177 318	2 332 050	$2s2p-2s3d$	$^3P^\circ-{}^3D$	2–2	5–5	3.34E+03	1.08E−01	8.24E−02	−0.268	B	1
46.905	450 965	2 582 930	$2p^2-2p3d$	$^3P-{}^1F^\circ$	2–3	5–7	1.13E+01	5.24E−04	4.04E−04	−2.582	D	1
47.291	443 670	2 558 230	$2p^2-2p3d$	$^3P-{}^3P^\circ$	0–1	1–3	1.18E+03	1.19E−01	1.85E−02	−0.926	B	1
47.354	446 494	2 558 230	$2p^2-2p3d$	$^3P-{}^3P^\circ$	1–1	3–3	3.84E+03	1.29E−01	6.04E−02	−0.412	B	1
47.387	446 494	2 556 770	$2p^2-2p3d$	$^3P-{}^3P^\circ$	1–2	3–5	1.05E+02	5.90E−03	2.76E−03	−1.752	C	1
47.455	450 965	2 558 230	$2p^2-2p3d$	$^3P-{}^3P^\circ$	2–1	5–3	3.99E+03	8.08E−02	6.31E−02	−0.394	B	1
47.488	450 965	2 556 770	$2p^2-2p3d$	$^3P-{}^3P^\circ$	2–2	5–5	9.16E+03	3.10E−01	2.42E−01	0.190	B	1
47.605	446 494	2 547 100	$2p^2-2p3d$	$^3P-{}^3D^\circ$	1–2	3–5	1.44E+04	8.13E−01	3.82E−01	0.387	B	1
47.653	450 965	2 549 470	$2p^2-2p3d$	$^3P-{}^3D^\circ$	2–3	5–7	1.65E+04	7.85E−01	6.16E−01	0.594	B	1
47.707	450 965	2 547 100	$2p^2-2p3d$	$^3P-{}^3D^\circ$	2–2	5–5	1.39E+03	4.75E−02	3.73E−02	−0.624	B	1
47.899	495 201	2 582 930	$2p^2-2p3d$	$^1D-{}^1F^\circ$	2–3	5–7	2.04E+04	9.83E−01	7.75E−01	0.692	A	1,2
48.111	446 494	2 525 040	$2p^2-2p3d$	$^3P-{}^1D^\circ$	1–2	3–5	1.22E+02	7.04E−03	3.34E−03	−1.675	C	1
48.214	450 965	2 525 040	$2p^2-2p3d$	$^3P-{}^1D^\circ$	2–2	5–5	3.05E+01	1.06E−03	8.44E−04	−2.274	C	1
48.317	172 144	2 241 810	$2s2p-2s3s$	$^3P^\circ-{}^1S$	1–0	3–1	9.69E−02	1.13E−06	5.39E−07	−5.470	E	1
48.472	495 201	2 558 230	$2p^2-2p3d$	$^1D-{}^3P^\circ$	2–1	5–3	9.34E+00	1.97E−04	1.57E−04	−3.006	D	1
48.507	495 201	2 556 770	$2p^2-2p3d$	$^1D-{}^3P^\circ$	2–2	5–5	1.17E+02	4.14E−03	3.30E−03	−1.684	C	1
48.679	495 201	2 549 470	$2p^2-2p3d$	$^1D-{}^3D^\circ$	2–3	5–7	4.98E+00	2.48E−04	1.98E−04	−2.907	D	1
48.735	495 201	2 547 100	$2p^2-2p3d$	$^1D-{}^3D^\circ$	2–2	5–5	6.20E+00	2.21E−04	1.77E−04	−2.957	D	1
48.998	169 802	2 210 700	$2s2p-2s3s$	$^3P^\circ-{}^3S$	0–1	1–3	3.02E+02	3.26E−02	5.25E−03	−1.487	C	1
49.054	172 144	2 210 700	$2s2p-2s3s$	$^3P^\circ-{}^3S$	1–1	3–3	9.06E+02	3.27E−02	1.58E−02	−1.008	B	1
49.179	177 318	2 210 700	$2s2p-2s3s$	$^3P^\circ-{}^3S$	2–1	5–3	1.52E+03	3.30E−02	2.67E−02	−0.783	B	1
49.222	329 679	2 361 290	$2s2p-2s3d$	$^1P^\circ-{}^1D$	1–2	3–5	8.79E+03	5.32E−01	2.59E−01	0.203	A	1,2
49.265	495 201	2 525 040	$2p^2-2p3d$	$^1D-{}^1D^\circ$	2–2	5–5	5.17E+03	1.88E−01	1.53E−01	−0.027	C	1,2
49.330?	443 670	2 470 820?	$2p^2-2p3s$	$^3P-{}^1P^\circ$	0–1	1–3	2.37E+00	2.59E−04	4.21E−05	−3.587	D	1
49.399?	446 494	2 470 820?	$2p^2-2p3s$	$^3P-{}^1P^\circ$	1–1	3–3	4.26E+00	1.56E−04	7.60E−05	−3.331	D	1
49.509?	450 965	2 470 820?	$2p^2-2p3s$	$^3P-{}^1P^\circ$	2–1	5–3	4.60E−02	1.01E−06	8.26E−07	−5.295	E	1
49.941	329 679	2 332 050	$2s2p-2s3d$	$^1P^\circ-{}^3D$	1–2	3–5	1.40E+00	8.71E−05	4.29E−05	−3.583	D	1
50.410?	446 494	2 430 220?	$2p^2-2p3s$	$^3P-{}^3P^\circ$	1–2	3–5	5.47E+02	3.47E−02	1.73E−02	−0.982	B	1
50.524?	450 965	2 430 220?	$2p^2-2p3s$	$^3P-{}^3P^\circ$	2–2	5–5	1.58E+03	6.04E−02	5.03E−02	−0.520	B	1
50.617?	495 201	2 470 820?	$2p^2-2p3s$	$^1D-{}^1P^\circ$	2–1	5–3	1.62E+03	3.73E−02	3.11E−02	−0.729	A	1,2
51.296	608 758	2 558 230	$2p^2-2p3d$	$^1S-{}^3P^\circ$	0–1	1–3	7.71E+00	9.12E−04	1.54E−04	−3.040	D	1
51.679?	495 201	2 430 220?	$2p^2-2p3s$	$^1D-{}^3P^\circ$	2–2	5–5	5.88E+00	2.36E−04	2.00E−04	−2.929	D	1
52.298	329 679	2 241 810	$2s2p-2s3s$	$^1P^\circ-{}^1S$	1–0	3–1	8.85E+02	1.21E−02	6.25E−03	−1.440	A	1,2
53.163	329 679	2 210 700	$2s2p-2s3s$	$^1P^\circ-{}^3S$	1–1	3–3	3.55E−01	1.50E−05	7.90E−06	−4.346	E	1
53.704?	608 758	2 470 820?	$2p^2-2p3s$	$^1S-{}^1P^\circ$	0–1	1–3	6.43E+02	8.34E−02	1.48E−02	−1.079	A	1,2
54.302	443 670	2 285 210	$2p^2-2s3p$	$^3P-{}^3P^\circ$	0–1	1–3	1.07E+01	1.42E−03	2.54E−04	−2.847	C	1
54.307	443 670	2 285 040	$2p^2-2s3p$	$^3P-{}^1P^\circ$	0–1	1–3	5.58E−01	7.40E−05	1.32E−05	−4.131	D	1
54.386	446 494	2 285 210	$2p^2-2s3p$	$^3P-{}^3P^\circ$	1–1	3–3	7.10E+00	3.15E−04	1.69E−04	−3.025	C	1
54.386	446 494	2 285 210	$2p^2-2s3p$	$^3P-{}^3P^\circ$	1–2	3–5	9.25E+00	6.83E−04	3.67E−04	−2.688	C	1
54.386	446 494	2 285 210	$2p^2-2s3p$	$^3P-{}^3P^\circ$	1–0	3–1	3.17E+01	4.68E−04	2.52E−04	−2.852	C	1
54.391	446 494	2 285 040	$2p^2-2s3p$	$^3P-{}^1P^\circ$	1–1	3–3	6.64E−01	2.95E−05	1.58E−05	−4.054	D	1

Si XI—Continued

λ Ritz (Å)	E_i (cm^{-1})	E_k (cm^{-1})	Configurations	Terms	J_i–J_k	g_i–g_k	A_{ki} (10^8 s^{-1})	f_{ik}	S (a.u.)	log $g_i f$	Acc.	Ref.
54.518	450 965	2 285 210	$2p^2$–$2s3p$	^{3}P–^{3}P°	2–2	5–5	2.52E+01	1.12E−03	1.01E−03	−2.251	C	1
54.518	450 965	2 285 210	$2p^2$–$2s3p$	^{3}P–^{3}P°	2–1	5–3	1.01E+01	2.69E−04	2.42E−04	−2.871	C	1
54.523	450 965	2 285 040	$2p^2$–$2s3p$	^{3}P–^{1}P°	2–1	5–3	5.37E+00	1.44E−04	1.29E−04	−3.144	D	1
55.866	495 201	2 285 210	$2p^2$–$2s3p$	^{1}D–^{3}P°	2–2	5–5	5.86E−02	2.74E−06	2.52E−06	−4.863	E	1
55.866	495 201	2 285 210	$2p^2$–$2s3p$	^{1}D–^{3}P°	2–1	5–3	2.50E+01	7.02E−04	6.46E−04	−2.455	D	1
55.871	495 201	2 285 040	$2p^2$–$2s3p$	^{1}D–^{1}P°	2–1	5–3	3.34E+02	9.36E−03	8.61E−03	−1.330	A	1,2
59.650	608 758	2 285 210	$2p^2$–$2s3p$	^{1}S–^{3}P°	0–1	1–3	3.51E−01	5.62E−05	1.10E−05	−4.250	D	1
59.656	608 758	2 285 040	$2p^2$–$2s3p$	^{1}S–^{1}P°	0–1	1–3	1.22E+01	1.95E−03	3.82E−04	−2.711	D	1,2
86.939?	2 361 290	3 511 520?	$2s3d$–$2p5d$	^{1}D–^{1}F°	2–3	5–7	2.10E+01	3.33E−03	4.77E−03	−1.779	D	3,LS
97.731	2 285 040	3 308 260	$2s3p$–$2s5d$	^{1}P°–^{1}D	1–2	3–5	4.86E+02	1.16E−01	1.12E−01	−0.458	B	3,LS
100.578?	2 210 700	3 204 950?	$2s3s$–$2p4d$	^{3}S–^{3}P°	1–2	3–5	1.92E+01	4.86E−03	4.83E−03	−1.836	D	3,LS
102.135?	2 532 420	3 511 520?	$2p3p$–$2p5d$	^{1}D–^{1}F°	2–3	5–7	4.61E+02	1.01E−01	1.70E−01	−0.297	B	3,LS
114.393?	2 430 220?	3 304 400	$2p3s$–$2s5d$	^{3}P°–^{3}D	2–3	5–7	8.12E−01	2.23E−04	4.20E−04	−2.953	E	3,LS
114.393?	2 430 220?	3 304 400	$2p3s$–$2s5d$	^{3}P°–^{3}D	2–2	5–5	2.03E−01	3.98E−05	7.49E−05	−3.701	E	3,LS
114.561?	2 332 050	3 204 950?	$2s3d$–$2p4d$	^{3}D–^{3}P°	2–2	5–5	6.91E−01	1.36E−04	2.57E−04	−3.167	E	3,LS
114.622?	2 332 520	3 204 950?	$2s3d$–$2p4d$	^{3}D–^{3}P°	3–2	7–5	3.85E+00	5.42E−04	1.43E−03	−2.421	D	3,LS
114.800	2 332 050	3 203 130	$2s3d$–$2p4d$	^{3}D–^{3}D°	2–3	5–7	2.91E−01	8.06E−05	1.52E−04	−3.395	E	3,LS
114.862	2 332 520	3 203 130	$2s3d$–$2p4d$	^{3}D–^{3}D°	3–3	7–7	2.32E+00	4.59E−04	1.22E−03	−2.493	D	3,LS
117.182	2 361 290	3 214 660	$2s3d$–$2p4d$	^{1}D–^{1}F°	2–3	5–7	7.70E+00	2.22E−03	4.28E−03	−1.955	D	3,LS
119.412?	2 470 820?	3 308 260	$2p3s$–$2s5d$	^{1}P°–^{1}D	1–2	3–5	3.23E+01	1.15E−02	1.36E−02	−1.462	C	3,LS
120.158?	2 361 290	3 193 530?	$2s3d$–$2p4d$	^{1}D–^{1}D°	2–2	5–5	7.39E+00	1.60E−03	3.17E−03	−2.097	D	3,LS
127.678	2 525 040	3 308 260	$2p3d$–$2s5d$	^{1}D°–^{1}D	2–2	5–5	2.16E−01	5.27E−05	1.11E−04	−3.579	E	3,LS
132.048	2 547 100	3 304 400	$2p3d$–$2s5d$	^{3}D°–^{3}D	2–2	5–5	1.22E−01	3.20E−05	6.96E−05	−3.796	E	3,LS
132.048	2 547 100	3 304 400	$2p3d$–$2s5d$	^{3}D°–^{3}D	2–3	5–7	1.96E−02	7.17E−06	1.56E−05	−4.446	E	3,LS
132.074?	2 430 220?	3 187 370?	$2p3s$–$2p4p$	^{3}P°–^{3}P	2–2	5–5	2.93E+02	7.65E−02	1.66E−01	−0.417	B	3,LS
132.463	2 549 470	3 304 400	$2p3d$–$2s5d$	^{3}D°–^{3}D	3–3	7–7	1.55E−01	4.07E−05	1.24E−04	−3.545	E	3,LS
132.463	2 549 470	3 304 400	$2p3d$–$2s5d$	^{3}D°–^{3}D	3–2	7–5	2.71E−02	5.10E−06	1.56E−05	−4.447	E	3,LS
133.284?	2 430 220?	3 180 500?	$2p3s$–$2p4p$	^{3}P°–^{3}D	2–3	5–7	4.24E+02	1.58E−01	3.47E−01	−0.102	B	3,LS
133.756	2 556 770	3 304 400	$2p3d$–$2s5d$	^{3}P°–^{3}D	2–2	5–5	1.57E+00	4.20E−04	9.25E−04	−2.678	E	3,LS
133.756	2 556 770	3 304 400	$2p3d$–$2s5d$	^{3}P°–^{3}D	2–3	5–7	6.26E+00	2.35E−03	5.17E−03	−1.930	D	3,LS
134.018	2 558 230	3 304 400	$2p3d$–$2s5d$	^{3}P°–^{3}D	1–2	3–5	4.68E+00	2.10E−03	2.78E−03	−2.201	D	3,LS
134.784?	2 241 810	2 983 740?	$2s3s$–$2s4p$	^{1}S–^{1}P°	0–1	1–3	3.99E+02	3.26E−01	1.45E−01	−0.487	B	3,LS
137.868	2 582 930	3 308 260	$2p3d$–$2s5d$	^{1}F°–^{1}D	3–2	7–5	2.01E−01	4.09E−05	1.30E−04	−3.543	E	3,LS
138.242?	2 470 820?	3 194 190?	$2p3s$–$2p4p$	^{1}P°–^{1}D	1–2	3–5	3.54E+02	1.69E−01	2.31E−01	−0.295	B	3,LS
139.348?	2 487 320	3 204 950?	$2p3p$–$2p4d$	^{3}D–^{3}P°	3–2	7–5	2.84E+01	5.90E−03	1.90E−02	−1.384	C	3,LS
139.702	2 487 320	3 203 130	$2p3p$–$2p4d$	^{3}D–^{3}D°	3–3	7–7	2.25E+02	6.58E−02	2.12E−01	−0.337	B	3,LS
141.939?	2 500 420	3 204 950?	$2p3p$–$2p4d$	^{3}S–^{3}P°	1–2	3–5	5.64E+02	2.84E−01	3.98E−01	−0.070	B	3,LS
143.922?	2 510 130	3 204 950?	$2p3p$–$2p4d$	^{3}P–^{3}P°	1–2	3–5	9.89E+01	5.12E−02	7.28E−02	−0.814	C	3,LS
144.390?	2 512 380	3 204 950?	$2p3p$–$2p4d$	^{3}P–^{3}P°	2–2	5–5	2.94E+02	9.19E−02	2.18E−01	−0.338	B	3,LS
144.770	2 512 380	3 203 130	$2p3p$–$2p4d$	^{3}P–^{3}D°	2–3	5–7	7.75E+02	3.41E−01	8.13E−01	0.232	B	3,LS
146.576	2 532 420	3 214 660	$2p3p$–$2p4d$	^{1}D–^{1}F°	2–3	5–7	9.36E+02	4.22E−01	1.02E+00	0.324	B	3,LS
147.564	2 332 050	3 009 720	$2s3d$–$2s4f$	^{3}D–^{3}F°	2–3	5–7	1.89E+03	8.65E−01	2.10E+00	0.636	B	3,LS
147.564	2 332 050	3 009 720	$2s3d$–$2s4f$	^{3}D–^{3}F°	2–2	5–5	3.31E+02	1.08E−01	2.62E−01	−0.268	B	3,LS
147.667	2 332 520	3 009 720	$2s3d$–$2s4f$	^{3}D–^{3}F°	3–3	7–7	2.37E+02	7.74E−02	2.63E−01	−0.266	B	3,LS
147.667	2 332 520	3 009 720	$2s3d$–$2s4f$	^{3}D–^{3}F°	3–2	7–5	9.34E+00	2.18E−03	7.42E−03	−1.816	D	3,LS
147.667	2 332 520	3 009 720	$2s3d$–$2s4f$	^{3}D–^{3}F°	3–4	7–9	2.13E+03	8.93E−01	3.04E+00	0.796	B	3,LS
149.443?	2 525 040	3 194 190?	$2p3d$–$2p4p$	^{1}D°–^{1}D	2–2	5–5	7.23E−01	2.42E−04	5.95E−04	−2.917	E	3,LS
151.261?	2 532 420	3 193 530?	$2p3p$–$2p4d$	^{1}D–^{1}D°	2–2	5–5	2.75E+02	9.43E−02	2.35E−01	−0.327	B	3,LS
156.184?	2 547 100	3 187 370?	$2p3d$–$2p4p$	^{3}D°–^{3}P	2–2	5–5	8.83E+00	3.23E−03	8.30E−03	−1.792	D	3,LS
156.764?	2 549 470	3 187 370?	$2p3d$–$2p4p$	^{3}D°–^{3}P	3–2	7–5	4.90E+01	1.29E−02	4.66E−02	−1.044	C	3,LS
157.878?	2 547 100	3 180 500?	$2p3d$–$2p4p$	^{3}D°–^{3}D	2–3	5–7	1.33E+00	6.97E−04	1.81E−03	−2.458	D	3,LS
158.471?	2 549 470	3 180 500?	$2p3d$–$2p4p$	^{3}D°–^{3}D	3–3	7–7	1.05E+01	3.96E−03	1.45E−02	−1.557	C	3,LS
158.579?	2 556 770	3 187 370?	$2p3d$–$2p4p$	^{3}P°–^{3}P	2–2	5–5	4.03E+00	1.52E−03	3.97E−03	−2.119	D	3,LS
158.947?	2 558 230	3 187 370?	$2p3d$–$2p4p$	^{3}P°–^{3}P	1–2	3–5	1.33E+00	8.42E−04	1.32E−03	−2.598	D	3,LS
160.326?	2 556 770	3 180 500?	$2p3d$–$2p4p$	^{3}P°–^{3}D	2–3	5–7	2.37E+01	1.28E−02	3.38E−02	−1.194	C	3,LS
160.655?	2 361 290	2 983 740?	$2s3d$–$2s4p$	^{1}D–^{1}P°	2–1	5–3	9.22E+01	2.14E−02	5.66E−02	−0.971	C	3,LS
163.597?	2 582 930	3 194 190?	$2p3d$–$2p4p$	^{1}F°–^{1}D	3–2	7–5	7.33E+01	2.10E−02	7.92E−02	−0.833	C	3,LS

12. Si XII

$Z=14$

Li I isoelectronic sequence

Ground state $1s^2 2s\ ^2S_{1/2}$

Ionization energy 4 221 670 cm^{-1} (523.42 eV)

Data are tabulated for 93 transitions in the range from 25 to 151 Å. Transition probabilities for the $2s-np$ $(n=3-5)$, $2p-ns$ $(n=3-5)$, and $2p-nd$ $(n=3-5)$ arrays are taken from the fully relativistic calculations of Zhang *et al.*[1] based on a Dirac–Fock–Slater central potential. The other results are taken from the Opacity Project (OP).[2] OP provides, however, only multiplet values. These have been decomposed into fine-structure components assuming LS coupling, as indicated by the notation LS in the reference column. Level values with square brackets are from precise calculations as discussed in the Introduction.

References

[1]H. L. Zhang, D. H. Sampson, and C. J. Fontes, At. Data Nucl. Data Tables **44**, 31 (1990).
[2]http://legacy.gsfc.nasa.gov/topbase/ (downloaded 1 August, 1995).

Si XII

λ Ritz (Å)	E_i (cm^{-1})	E_k (cm^{-1})	Configurations	Terms	J_i-J_k	g_i-g_k	A_{ki} ($10^8\ s^{-1}$)	f_{ik}	S (a.u.)	log $g_i f$	Acc.	Ref.
25.658	0	[3 897 350]	$1s^2 2s-1s^2 7p$	$^2S-^2P^\circ$	1/2–3/2	2–4	3.88E+02	7.66E−03	1.29E−03	−1.815	B	2,LS
25.660	0	[3 897 150]	$1s^2 2s-1s^2 7p$	$^2S-^2P^\circ$	1/2–1/2	2–2	3.88E+02	3.83E−03	6.47E−04	−2.116	B	2,LS
26.078	192 062	4 026 700	$1s^2 2p-1s^2 9d$	$^2P^\circ-^2D$	1/2–3/2	2–4	2.65E+02	5.40E−03	9.27E−04	−1.967	B	2,LS
26.134	200 238	4 026 700	$1s^2 2p-1s^2 9d$	$^2P^\circ-^2D$	3/2–5/2	4–6	3.16E+02	4.85E−03	1.67E−03	−1.712	B	2,LS
26.134	200 238	4 026 700	$1s^2 2p-1s^2 9d$	$^2P^\circ-^2D$	3/2–3/2	4–4	5.26E+01	5.39E−04	1.86E−04	−2.666	B	2,LS
26.436	192 062	[3 974 800]	$1s^2 2p-1s^2 8d$	$^2P^\circ-^2D$	1/2–3/2	2–4	3.82E+02	8.01E−03	1.39E−03	−1.795	B	2,LS
26.456	0	[3 779 800]	$1s^2 2s-1s^2 6p$	$^2S-^2P^\circ$	1/2–3/2	2–4	6.15E+02	1.29E−02	2.25E−03	−1.588	B	2,LS
26.459	0	[3 779 500]	$1s^2 2s-1s^2 6p$	$^2S-^2P^\circ$	1/2–1/2	2–2	6.15E+02	6.45E−03	1.12E−03	−1.889	B	2,LS
26.493	200 238	3 974 800	$1s^2 2p-1s^2 8d$	$^2P^\circ-^2D$	3/2–3/2	4–4	7.59E+01	7.99E−04	2.79E−04	−2.495	B	2,LS
26.493	200 238	[3 974 800]	$1s^2 2p-1s^2 8d$	$^2P^\circ-^2D$	3/2–5/2	4–6	4.56E+02	7.19E−03	2.51E−03	−1.541	B	2,LS
26.975	192 062	3 899 150	$1s^2 2p-1s^2 7d$	$^2P^\circ-^2D$	1/2–3/2	2–4	5.82E+02	1.27E−02	2.26E−03	−1.595	B	2,LS
27.035	200 238	3 899 150	$1s^2 2p-1s^2 7d$	$^2P^\circ-^2D$	3/2–3/2	4–4	1.16E+02	1.27E−03	4.52E−04	−2.294	B	2,LS
27.035	200 238	3 899 150	$1s^2 2p-1s^2 7d$	$^2P^\circ-^2D$	3/2–5/2	4–6	6.94E+02	1.14E−02	4.06E−03	−1.341	B	2,LS
27.850	192 062	3 782 700	$1s^2 2p-1s^2 6d$	$^2P^\circ-^2D$	1/2–3/2	2–4	9.55E+02	2.22E−02	4.07E−03	−1.353	B	2,LS
27.897	0	[3 584 650]	$1s^2 2s-1s^2 5p$	$^2S-^2P^\circ$	1/2–3/2	2–4	1.06E+03	2.48E−02	4.56E−03	−1.305	A	1
27.901	0	[3 584 150]	$1s^2 2s-1s^2 5p$	$^2S-^2P^\circ$	1/2–1/2	2–2	1.07E+03	1.25E−02	2.30E−03	−1.602	A	1
27.914	200 238	3 782 700	$1s^2 2p-1s^2 6d$	$^2P^\circ-^2D$	3/2–3/2	4–4	1.90E+02	2.22E−03	8.16E−04	−2.052	B	2,LS
27.914	200 238	3 782 700	$1s^2 2p-1s^2 6d$	$^2P^\circ-^2D$	3/2–5/2	4–6	1.14E+03	2.00E−02	7.35E−03	−1.097	B	2,LS
29.439	192 062	3 588 900	$1s^2 2p-1s^2 5d$	$^2P^\circ-^2D$	1/2–3/2	2–4	1.77E+03	4.59E−02	8.90E−03	−1.037	A	1
29.509	200 238	3 589 050	$1s^2 2p-1s^2 5d$	$^2P^\circ-^2D$	3/2–5/2	4–6	2.11E+03	4.13E−02	1.61E−02	−0.782	A	1
29.510	200 238	3 588 900	$1s^2 2p-1s^2 5d$	$^2P^\circ-^2D$	3/2–3/2	4–4	3.52E+02	4.60E−03	1.79E−03	−1.735	A	1
29.574	192 062	3 573 450	$1s^2 2p-1s^2 5s$	$^2P^\circ-^2S$	1/2–1/2	2–2	1.30E+02	1.70E−03	3.31E−04	−2.469	B	2,LS
29.645	200 238	3 573 450	$1s^2 2p-1s^2 5s$	$^2P^\circ-^2S$	3/2–1/2	4–2	2.58E+02	1.70E−03	6.64E−04	−2.167	B	2,LS
31.012	0	3 224 550	$1s^2 2s-1s^2 4p$	$^2S-^2P^\circ$	1/2–3/2	2–4	2.05E+03	5.91E−02	1.21E−02	−0.927	A	1
31.023	0	3 223 450	$1s^2 2s-1s^2 4p$	$^2S-^2P^\circ$	1/2–1/2	2–2	2.07E+03	2.98E−02	6.09E−03	−1.225	A	1
32.888	192 062	3 232 700	$1s^2 2p-1s^2 4d$	$^2P^\circ-^2D$	1/2–3/2	2–4	3.80E+03	1.23E−01	2.67E−02	−0.608	A	1
32.973	200 238	3 233 000	$1s^2 2p-1s^2 4d$	$^2P^\circ-^2D$	3/2–5/2	4–6	4.54E+03	1.11E−01	4.82E−02	−0.352	A	1
32.977	200 238	3 232 700	$1s^2 2p-1s^2 4d$	$^2P^\circ-^2D$	3/2–3/2	4–4	7.55E+02	1.23E−02	5.34E−03	−1.308	A	1
33.222	192 062	3 202 100	$1s^2 2p-1s^2 4s$	$^2P^\circ-^2S$	1/2–1/2	2–2	2.54E+02	4.20E−03	9.19E−04	−2.076	A	1
33.313	200 238	3 202 100	$1s^2 2p-1s^2 4s$	$^2P^\circ-^2S$	3/2–1/2	4–2	5.17E+02	4.30E−03	1.89E−03	−1.764	A	1
40.911	0	2 444 330	$1s^2 2s-1s^2 3p$	$^2S-^2P^\circ$	1/2–3/2	2–4	4.51E+03	2.26E−01	6.10E−02	−0.344	A	1
40.951	0	2 441 940	$1s^2 2s-1s^2 3p$	$^2S-^2P^\circ$	1/2–1/2	2–2	4.55E+03	1.15E−01	3.09E−02	−0.640	A	1
44.019	192 062	[2 463 790]	$1s^2 2p-1s^2 3d$	$^2P^\circ-^2D$	1/2–3/2	2–4	1.12E+04	6.49E−01	1.88E−01	0.113	A	1
44.165	200 238	[2 464 480]	$1s^2 2p-1s^2 3d$	$^2P^\circ-^2D$	3/2–5/2	4–6	1.34E+04	5.87E−01	3.41E−01	0.370	A	1
44.178	200 238	[2 463 790]	$1s^2 2p-1s^2 3d$	$^2P^\circ-^2D$	3/2–3/2	4–4	2.23E+03	6.51E−02	3.79E−02	−0.584	A	1
45.521	192 062	2 388 870	$1s^2 2p-1s^2 3s$	$^2P^\circ-^2S$	1/2–1/2	2–2	6.41E+02	1.99E−02	5.96E−03	−1.400	A	1
45.691	200 238	2 388 870	$1s^2 2p-1s^2 3s$	$^2P^\circ-^2S$	3/2–1/2	4–2	1.30E+03	2.04E−02	1.23E−02	−1.088	A	1
63.101	2 441 940	4 026 700	$1s^2 3p-1s^2 9d$	$^2P^\circ-^2D$	1/2–3/2	2–4	9.38E+01	1.12E−02	4.65E−03	−1.650	B	2,LS
63.196	2 444 330	4 026 700	$1s^2 3p-1s^2 9d$	$^2P^\circ-^2D$	3/2–5/2	4–6	1.13E+02	1.01E−02	8.41E−03	−1.394	B	2,LS
63.196	2 444 330	4 026 700	$1s^2 3p-1s^2 9d$	$^2P^\circ-^2D$	3/2–3/2	4–4	1.87E+01	1.12E−03	9.32E−04	−2.349	B	2,LS
65.238	2 441 940	[3 974 800]	$1s^2 3p-1s^2 8d$	$^2P^\circ-^2D$	1/2–3/2	2–4	1.36E+02	1.74E−02	7.47E−03	−1.458	B	2,LS

Si XII—Continued

λ Ritz (Å)	E_i (cm^{-1})	E_k (cm^{-1})	Configurations	Terms	J_i–J_k	g_i–g_k	A_{ki} (10^8 s^{-1})	f_{ik}	S (a.u.)	log $g_i f$	Acc.	Ref.
65.339	2 444 330	[3 974 800]	$1s^23p$–$1s^28d$	$^2P^\circ$–^2D	3/2–5/2	4–6	1.63E+02	1.56E−02	1.34E−02	−1.205	B	2,LS
65.339	2 444 330	[3 974 800]	$1s^23p$–$1s^28d$	$^2P^\circ$–^2D	3/2–3/2	4–4	2.70E+01	1.73E−03	1.49E−03	−2.160	B	2,LS
66.292	2 388 870	[3 897 350]	$1s^23s$–$1s^27p$	^2S–$^2P^\circ$	1/2–3/2	2–4	1.21E+02	1.60E−02	6.98E−03	−1.495	B	2,LS
66.301	2 388 870	[3 897 150]	$1s^23s$–$1s^27p$	^2S–$^2P^\circ$	1/2–1/2	2–2	1.21E+02	7.99E−03	3.49E−03	−1.796	B	2,LS
68.624	2 441 940	3 899 150	$1s^23p$–$1s^27d$	$^2P^\circ$–^2D	1/2–3/2	2–4	2.06E+02	2.91E−02	1.32E−02	−1.235	B	2,LS
68.737	2 444 330	3 899 150	$1s^23p$–$1s^27d$	$^2P^\circ$–^2D	3/2–5/2	4–6	2.46E+02	2.61E−02	2.36E−02	−0.981	B	2,LS
68.737	2 444 330	3 899 150	$1s^23p$–$1s^27d$	$^2P^\circ$–^2D	3/2–3/2	4–4	4.09E+01	2.90E−03	2.63E−03	−1.936	B	2,LS
69.756	[2 463 790]	[3 897 350]	$1s^23d$–$1s^27p$	^2D–$^2P^\circ$	3/2–3/2	4–4	1.15E+00	8.37E−05	7.69E−05	−3.475	B	2,LS
69.766	[2 463 790]	[3 897 150]	$1s^23d$–$1s^27p$	^2D–$^2P^\circ$	3/2–1/2	4–2	1.15E+01	4.19E−04	3.85E−04	−2.776	B	2,LS
69.790	[2 464 480]	[3 897 350]	$1s^23d$–$1s^27p$	^2D–$^2P^\circ$	5/2–3/2	6–4	1.03E+01	5.02E−04	6.92E−04	−2.521	B	2,LS
71.894	2 388 870	[3 779 800]	$1s^23s$–$1s^26p$	^2S–$^2P^\circ$	1/2–3/2	2–4	1.91E+02	2.96E−02	1.40E−02	−1.228	B	2,LS
71.910	2 388 870	[3 779 500]	$1s^23s$–$1s^26p$	^2S–$^2P^\circ$	1/2–1/2	2–2	1.91E+02	1.48E−02	7.01E−03	−1.529	B	2,LS
74.585	2 441 940	3 782 700	$1s^23p$–$1s^26d$	$^2P^\circ$–^2D	1/2–3/2	2–4	3.35E+02	5.58E−02	2.74E−02	−0.952	B	2,LS
74.718	2 444 330	3 782 700	$1s^23p$–$1s^26d$	$^2P^\circ$–^2D	3/2–5/2	4–6	4.00E+02	5.02E−02	4.94E−02	−0.697	B	2,LS
74.718	2 444 330	3 782 700	$1s^23p$–$1s^26d$	$^2P^\circ$–^2D	3/2–3/2	4–4	6.66E+01	5.57E−03	5.48E−03	−1.652	B	2,LS
75.987	[2 463 790]	[3 779 800]	$1s^23d$–$1s^26p$	^2D–$^2P^\circ$	3/2–3/2	4–4	1.93E+00	1.67E−04	1.67E−04	−3.175	B	2,LS
76.005	[2 463 790]	[3 779 500]	$1s^23d$–$1s^26p$	^2D–$^2P^\circ$	3/2–1/2	4–2	1.93E+01	8.34E−04	8.35E−04	−2.477	B	2,LS
76.027	[2 464 480]	[3 779 800]	$1s^23d$–$1s^26p$	^2D–$^2P^\circ$	5/2–3/2	6–4	1.73E+01	1.00E−03	1.50E−03	−2.222	B	2,LS
83.627	2 388 870	[3 584 650]	$1s^23s$–$1s^25p$	^2S–$^2P^\circ$	1/2–3/2	2–4	3.22E+02	6.76E−02	3.72E−02	−0.869	B	2,LS
83.662	2 388 870	[3 584 150]	$1s^23s$–$1s^25p$	^2S–$^2P^\circ$	1/2–1/2	2–2	3.22E+02	3.38E−02	1.86E−02	−1.170	B	2,LS
87.187	2 441 940	3 588 900	$1s^23p$–$1s^25d$	$^2P^\circ$–^2D	1/2–3/2	2–4	6.01E+02	1.37E−01	7.87E−02	−0.562	B	2,LS
87.358	2 444 330	3 589 050	$1s^23p$–$1s^25d$	$^2P^\circ$–^2D	3/2–5/2	4–6	7.17E+02	1.23E−01	1.42E−01	−0.308	B	2,LS
87.369	2 444 330	3 588 900	$1s^23p$–$1s^25d$	$^2P^\circ$–^2D	3/2–3/2	4–4	1.19E+02	1.36E−02	1.57E−02	−1.264	B	2,LS
88.377	2 441 940	3 573 450	$1s^23p$–$1s^25s$	$^2P^\circ$–^2S	1/2–1/2	2–2	8.71E+01	1.02E−02	5.94E−03	−1.690	B	2,LS
88.565	2 444 330	3 573 450	$1s^23p$–$1s^25s$	$^2P^\circ$–^2S	3/2–1/2	4–2	1.74E+02	1.02E−02	1.19E−02	−1.389	B	2,LS
89.217	[2 463 790]	[3 584 650]	$1s^23d$–$1s^25p$	^2D–$^2P^\circ$	3/2–3/2	4–4	3.70E+00	4.42E−04	5.19E−04	−2.753	B	2,LS
89.257	[2 463 790]	[3 584 150]	$1s^23d$–$1s^25p$	^2D–$^2P^\circ$	3/2–1/2	4–2	3.70E+01	2.21E−03	2.60E−03	−2.054	B	2,LS
89.272	[2 464 480]	[3 584 650]	$1s^23d$–$1s^25p$	^2D–$^2P^\circ$	5/2–3/2	6–4	3.33E+01	2.65E−03	4.67E−03	−1.799	B	2,LS
119.663	2 388 870	3 224 550	$1s^23s$–$1s^24p$	^2S–$^2P^\circ$	1/2–3/2	2–4	5.75E+02	2.47E−01	1.95E−01	−0.306	B	2,LS
119.821	2 888 870	3 223 450	$1s^23s$–$1s^24p$	^2S–$^2P^\circ$	1/2–1/2	2–2	5.76E+02	1.24E−01	9.78E−02	−0.606	B	2,LS
124.494	3 223 450	4 026 700	$1s^24p$–$1s^29d$	$^2P^\circ$–^2D	1/2–3/2	2–4	4.30E+01	2.00E−02	1.64E−02	−1.398	B	2,LS
124.665	3 224 550	4 026 700	$1s^24p$–$1s^29d$	$^2P^\circ$–^2D	3/2–5/2	4–6	5.15E+01	1.80E−02	2.96E−02	−1.143	B	2,LS
124.665	3 224 550	4 026 700	$1s^24p$–$1s^29d$	$^2P^\circ$–^2D	3/2–3/2	4–4	8.58E+00	2.00E−03	3.28E−03	−2.097	B	2,LS
126.461	2 441 940	3 232 700	$1s^23p$–$1s^24d$	$^2P^\circ$–^2D	1/2–3/2	2–4	1.22E+03	5.84E−01	4.86E−01	0.067	B	2,LS
126.796	2 444 330	3 233 000	$1s^23p$–$1s^24d$	$^2P^\circ$–^2D	3/2–5/2	4–6	1.45E+03	5.24E−01	8.75E−01	0.321	B	2,LS
126.844	2 444 330	3 232 700	$1s^23p$–$1s^24d$	$^2P^\circ$–^2D	3/2–3/2	4–4	2.41E+02	5.82E−02	9.72E−02	−0.633	B	2,LS
131.447	[2 463 790]	3 224 550	$1s^23d$–$1s^24p$	^2D–$^2P^\circ$	3/2–3/2	4–4	8.61E+00	2.23E−03	3.86E−03	−2.050	B	2,LS
131.551	2 441 940	3 202 100	$1s^23p$–$1s^24s$	$^2P^\circ$–^2S	1/2–1/2	2–2	1.83E+02	4.75E−02	4.11E−02	−1.022	B	2,LS
131.567	[2 464 480]	3 224 550	$1s^23d$–$1s^24p$	^2D–$^2P^\circ$	5/2–3/2	6–4	7.75E+01	1.34E−02	3.48E−02	−1.095	B	2,LS
131.638	[2 463 790]	3 223 450	$1s^23d$–$1s^24p$	^2D–$^2P^\circ$	3/2–1/2	4–2	8.62E+01	1.12E−02	1.94E−02	−1.349	B	2,LS
131.966	2 444 330	3 202 100	$1s^23p$–$1s^24s$	$^2P^\circ$–^2S	3/2–1/2	4–2	3.62E+02	4.73E−02	8.22E−02	−0.723	B	2,LS
133.094	3 223 450	[3 974 800]	$1s^24p$–$1s^28d$	$^2P^\circ$–^2D	1/2–3/2	2–4	6.19E+01	3.29E−02	2.88E−02	−1.182	B	2,LS
133.289	3 224 550	[3 974 800]	$1s^24p$–$1s^28d$	$^2P^\circ$–^2D	3/2–3/2	4–4	1.24E+01	3.29E−03	5.78E−03	−1.881	B	2,LS
133.289	3 224 550	[3 974 800]	$1s^24p$–$1s^28d$	$^2P^\circ$–^2D	3/2–5/2	4–6	7.41E+01	2.96E−02	5.20E−02	−0.927	B	2,LS
143.833	3 202 100	[3 897 350]	$1s^24s$–$1s^27p$	^2S–$^2P^\circ$	1/2–3/2	2–4	5.45E+01	3.38E−02	3.20E−02	−1.170	B	2,LS
143.875	3 202 100	[3 897 150]	$1s^24s$–$1s^27p$	^2S–$^2P^\circ$	1/2–1/2	2–2	5.45E+01	1.69E−02	1.60E−02	−1.471	B	2,LS
147.995	3 223 450	3 899 150	$1s^24p$–$1s^27d$	$^2P^\circ$–^2D	1/2–3/2	2–4	9.32E+01	6.12E−02	5.96E−02	−0.912	B	2,LS
148.236	3 224 550	3 899 150	$1s^24p$–$1s^27d$	$^2P^\circ$–^2D	3/2–3/2	4–4	1.86E+01	6.11E−03	1.19E−02	−1.612	B	2,LS
148.236	3 224 550	3 899 150	$1s^24p$–$1s^27d$	$^2P^\circ$–^2D	3/2–5/2	4–6	1.11E+02	5.50E−02	1.07E−01	−0.658	B	2,LS
150.455	3 232 700	[3 897 350]	$1s^24d$–$1s^27p$	^2D–$^2P^\circ$	3/2–3/2	4–4	1.30E+00	4.42E−04	8.76E−04	−2.753	B	2,LS
150.500	3 232 700	[3 897 150]	$1s^24d$–$1s^27p$	^2D–$^2P^\circ$	3/2–1/2	4–2	1.30E+01	2.21E−03	4.38E−03	−2.054	B	2,LS
150.523	3 233 000	[3 897 350]	$1s^24d$–$1s^27p$	^2D–$^2P^\circ$	5/2–3/2	6–4	1.17E+01	2.65E−03	7.88E−03	−1.799	B	2,LS