The Electronic Spectrum and Energy Levels of the Deuterium Molecule

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Beginning in the 1930s, G. H. Dieke and his students carried out an extensive program of measuring the optical spectrum of molecular hydrogen and its isotopes. Parts of the work were published but the project was interrupted by Dieke's death in 1965, with much of the latest and most accurate work unpublished. This paper gives the 27 488 lines of molecular deuterium, measured by Dieke, arranges the 8243 assigned lines into band systems, and derives rotational–vibrational energy levels for over 50 electronic states. It also derives energy levels from published vacuum ultraviolet spectra of D_2.

Key words: band systems; deuterium; Dieke; energy levels; spectra; wavelengths.

Contents

1. Introduction

Among the many spectroscopic accomplishments of G. H. Dieke, an extensive body of work on hydrogen and its

isotopes (H, D, and T) stands out. Beginning in the 1930s, Dieke and his co-workers published well over a dozen papers giving measurements of spectra and their interpretations.[1-12] A review in 1958 presented energy levels of the H_2 isotope and summarized progress on the systematic measurement of the spectra of all six isotopic species (H_2, D_2, T_2, HD, HT, and DT).[1] Unfortunately, this project was inter-

rupted in 1965 by Dieke's death, with much work unfinished and little of it published. The major exception is a book giving the latest measurements on the H_2 isotope, *The Hydrogen Molecule Wavelength Tables of G. H. Dieke*, edited by H. M. Crosswhite and published in 1972.[2]

The present paper presents data on the D_2 isotope. Six papers published by Dieke in the 1930s present measurements and interpretations of several band systems.[3-8] More recent publications present infrared data[9-11] and measurements on one of the singlet systems.[12] An unpublished working list of 27 488 measured lines with 8243 assignments had been compiled from the latest work. This list forms the basis of the present review. From it, we have assembled tables of lines for all assigned band systems, including several never published before. From these measured lines, we derive a table of energy levels. Energy levels are presented rather than molecular constants because for hydrogen and its isotopes relatively few rotational levels are populated and perturbations between electronic states are large; it would require nearly as many constants as lines to accurately reproduce most of the data. In addition, we collect published energy levels for those excited singlets which have been measured by vacuum ultraviolet spectroscopy[13-18] and make comparisons to the present energy levels wherever possible. We also make comparisons to those few *ab initio* calculations with accuracy approaching that of experiment.[19-22]

Four developments since 1958 have made major improvements in our knowledge of the D_2 energy levels. First, there was the recognition[23-31] that several of the $^1\Sigma_g^+$ potential curves possess double minima due to avoided crossings between the one-electron electron excited states with $^1\Sigma_g^+$ symmetry and the ionic state, also of $^1\Sigma_g^+$ symmetry, which dissociates to $H^+ + H^-$ and is sometimes described by the

configuration $(2p\sigma_u)^2$. Levels which lie within these potential wells explain many previously observed but uninterpreted band fragments.[8] Second, careful vacuum ultraviolet measurements of the Lyman bands[13,15] determined the absolute energies of the B $^1\Sigma_u^+$ state with respect to the ground state to an accuracy of about 0.1 cm^{-1}, close to the relative accuracy ($\sim$0.05 cm^{-1}) of the spectroscopic measurements in the visible spectrum. Third, direct experimental determination of the triplet energy levels with respect to the singlets was made for the first time by anticrossing spectroscopy.[32-35] And fourth, the relative energies of the two nonintercombining sets of triplets (gerade and ungerade) were determined by infrared[10,11] and anticrossing[35,36] spectroscopy.

2. Notation

Several different notations have been in common use for the electronic states of hydrogen. The most economical is that of Dieke in which, for example, $(s\sigma)\Sigma_g^+$ states are denoted by upper case letter "A" for singlets and by lower case "a" for triplets. A $(p\sigma)\Sigma_u^+$ state is indicated by B or b, a $(p\pi)\Pi_u$ state by C or c, a $(d\sigma)\Sigma_g^+$ state by D or d, etc., with the principal quantum number of the excited electron included as a prefix. The traditional system[37] uses letter names followed by a symmetry designation with the ground state being X $^1\Sigma_g^+$, the first excited singlet being B $^1\Sigma_u^+$, etc. The united atom orbital of the outermost electron is a useful descriptor, so we sometimes include it with the symmetry designation, e.g., B(2p) $^1\Sigma_u^+$. These notations are related to each other in Fig. 1.
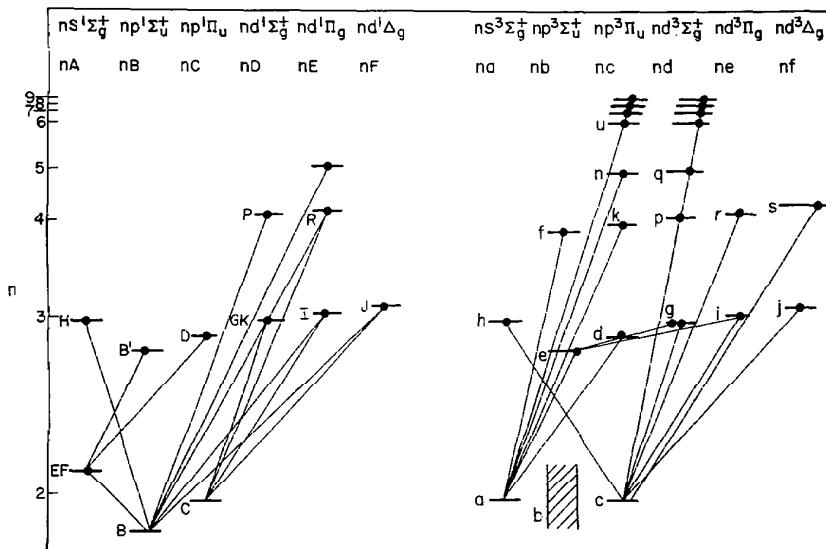

FIG. 1. Diagram of band systems observed in emission by Dieke and co-workers. The relationship between Dieke's notation for the electronic states and the traditional notation is also shown.

3. Dieke's Measurements

Appendix C contains the 27 488 measured line positions and intensities of the D_2 spectrum which had been collected on a magnetic tape at the time of Dieke's death. They span the range from 32 383.24 to 8388.97 cm^{-1}. Appendix C also contains the infrared lines and intensities from Gloersen's thesis,[10] which span the range 6071.33–3597.70 cm^{-1}.

The apparatus and general experimental conditions are described by Ref. 1. Details are available from one of the authors (HMC).

"The main spectrograph used was a 21-ft. Paschen with a 1200-groove/mm grating having a first-order dispersion of 1.25 Å/mm and a resolution limit of about 0.1 cm^{-1}. In most exposures the widths of the lines themselves limited the attainable accuracy, which was a few hundredths of a cm^{-1}. This spectrograph was used in the second order below 5000 Å and in the first order between 5000 and 9000 Å. Above this, to the photographic limit near 12000 Å, exposures were taken on a 21-ft. Wadsworth spectrograph. With this spectrograph the limiting resolution was approximately 0.2 cm^{-1}, with a corresponding deterioration in accuracy. These photographic wavelength measurements were calibrated by lines from an iron–neon hollow-cathode discharge tube. Small residual corrections for individual plates were made when called for by comparison with D_2 interferometric measurements."[1]

For the infrared measurements, Gloersen used a vacuum Ebert spectrograph with a focal length of 2 m, capable of resolving power of 700 000. Resolution, however, was limited by the widths of the lines. Wave number errors in this region should not exceed a few times 0.01 cm^{-1}.

Measurement conditions included (1) a low-temperature (77 K), low-pressure (0.1–0.2 Torr) electrodeless discharge of low to medium power for minimum line broadening; (2) a high-power microwave discharge at 1 Torr for maximum light intensity; and (3) a high-power electrodeless discharge with 80–200 Torr of helium to suppress high vibrational quantum states.

Most of Dieke's assignments remain unchanged, but obvious errors have been corrected, about 50 obvious reassignments have been made, and of 200 tentative assignments by Dieke, about 100 have been confirmed and 100 have been dropped.

Column 1 of Appendix C gives the multiplicity and symmetry. All lines are assigned to either a singlet-to-singlet or a triplet-to-triplet transition, indicated, respectively, by S or T. The reflection (Krönig) symmetry of the upper level is given next as + or − . Then, the nuclear inversion symmetry is given by o or p, where ortho levels have total nuclear spin, $I_T = I_1 + I_2 = 0$ or 2, and para levels have $I_T = 1$. Table 1 summarizes the relationships among these symmetry designations.

Column 2 gives the electronic state assignments, with the upper level listed on the left. We use Dieke's notation, except that no lowercase letters are printed, so singlets and triplets are distinguished in column 1. Several state notations deviate from Dieke's: his 2A and 2K states have been reas-

Table 1. Relationship of the symmetry of the nuclear spin wavefunction (ortho-para) to the rotational quantum number N and the symmetries of the electronic wavefunction (inversion at the center of symmetry g-u. and reflection in a plane through the nuclei ±).

Electronic wavefunction		Rotational quantum number N	
Reflection at the center of symmetry	Reflection in a plane through the nuclei[a]	even	odd
g	+	o	p
g	−	p	o
u	+	p	o
u	−	o	p

[a] These + or − symbols are given as superscripts to the state designations in Appendices A and B. They correspond to the e and f designations, respectively, of J. M. Brown, J. T. Hougen, K.-P. Huber, J. W. C. Johns, I. Kopp, H. Lefebvre-Brion, A. J. Merer, D. A. Ramsay, J. Rostas, and R. N. Zare, J. Mol. Spectrosc. 55, 500 (1975).

signed as the double-minimum EF state. His 3D and 3K states have been reassigned as the GK state. These reassignments are discussed in Sec. 6. Several fragmentary $^1\Sigma_g^+$ states are arbitrarily called WW, WX, WY, and WZ. And lastly, a number of transitions from fragmentary states identified by Dieke as $^3\Pi_g$ are indicated by e–2c.

Column 3 gives the vibrational level assignment, with the upper state listed first.

Column 4 gives the rotational assignment as P, Q, or R branch followed by the rotational quantum number N'' of the lower state.

Column 5 gives the wave number of the line. An asterisk indicates a blend, which means two or more unresolved transitions are assigned to the same wave number. There are 598 double blends, 31 triple blends, and 1 quadruple blend.

Column 6 gives the air wavelength of the line, in units of Å, except for Gloersen's measurements in the IR (16 470–27 795 Å) which are given as the vacuum wavelength.

Columns 7–10 give intensity values I_1–I_4 as listed by Dieke. Descriptive notations are given after some intensity values: R indicates a red shaded line, V a violet shaded line, D a diffuse line, and B or BB a broad or very broad line, often with a flat top due to overexposure. There is no reliable record of the measurement conditions leading to the different intensity values and the different scales which are used. Several comments were made by Dieke and Cunningham,[12] however, which apply to Appendix C:

"The intensities given in the tables are of different kinds, as one consistent system of quantitative intensities for the whole spectrum is not available.

"The intensity values with three significant figures are quantitative or semi-quantitative measurements of various

Table 2. Intensity data used to derive the uniform scale I_5.

$\nu(cm^{-1})$	$\lambda(\text{\AA})$	i	Number of Lines	Number of I_i	Min I_i	Max I_i	$\langle I_i \rangle$	σ_i	Min I_5	Max I_5
32383.24-24990.55	3087.123-4000.386	1	2998	2469	0	10	2.66	2.50	14	74
24989.79-22212.33	4000.506-4500.744	1	3198	1833	120	500	212	64	8	98
22211.61-18176.85	4500.892-5499.979	2	5063	4098	0	10	4.05	3.11	10	59
18176.31-15378.01	5500.145-6500.977	2	4472	2464	101	433	235	67	0	74
15377.72-14286.60	6501.035-6997.640	2	1557	1273	0	10	5.43	3.23	5	51
14281.67-12496.65	7000.050-7999.943	2	3375	2687	37	900	305	201	10	74
12495.38-11010.44	8000.754-9079.800	2	3055	2476	32	895	212	163	13	93
11010.02-10148.92	9080.140-9850.560	1	1332	930	17	505	113	79	12	104
10148.28-9859.52	9851.188-10139.700	3	240	213	17	205	73	40	9	80
9858.19-8388.97	10141.070-11917.150	1	1273	1116	25	450	127	77	10	93
6071.33-5001.78	16470.86-19992.900	1	1011	1010	190	520	318	37	-21	112
4998.39-3597.70	20006.450-27795.500	1	577	577	100	415	248	33	-37	106

degrees of reliability. The one- and two-digit figures from 0 to 10 are based on rough eye estimates made from the appearance on the photographic plate and are used where the more accurate values are not yet available.

"For D_2 the intensity values are obtained from uncalibrated plates and are not corrected for the changes of emulsion characteristics or the response of the spectrograph with wavelength. The values in the tables are the Seidel function $S = \log(1 - T)/T$, multiplied by 100 and corrected for different plates by an additive constant to make different exposures roughly compatible. The S values are with good approximation proportional to the log I values, but the proportionality constant is not necessarily one and may vary from plate to plate.

"The use of three digits should not be taken to imply high accuracy. In order to obtain weak lines, the plates have to be hypersensitized and developed to a high, and often irregular, fog level, conditions not conducive to accurate intensity measurements. With all these shortcomings, however, these intensity values are vastly superior to the usual eye estimates, and they were of great help in the analysis."[17]

For Gloersen's data in the infrared, "intensities are on an absolute scale. The antilogarithms of the tabulated values are in units of ergs per second per 100 cm² per steradian per Å."[10]

In order to facilitate comparison of intensities which are listed with different scales, we have constructed a uniform

intensity scale I_5. To construct it, we first selected wavelength regions over which one of the intensity scales I_1–I_4 displays no large discontinuities as a function of wavelength, and contains values for most of the lines. Table 2 gives these ranges, the chosen intensity column I_i, and some statistics. The uniform scale I_5 is defined

$$I_5 = 30 + (I_i - \langle I_i \rangle) \frac{15}{\sigma_i}, \tag{1}$$

so that almost all I_5 values lie between 0 and 100, with a mean of 30 and a standard deviation of 15 in every wavelength region. Although this procedure is not precise, it gives a convenient and uniform scale. Its main flaw is that Eq. (1) does not represent the varying degrees of skewness in the different regions. With the large uncertainties in the intensity data, however, we do not believe a more precise analysis is warranted.

4. Band Systems

As in previous Appendix C are organized by band system in Appendix A. The electronic transitions are illustrated in Fig. 1.

Columns 1 gives the rotational quantum number N'' of the lower state.

Columns 2 identifies both the upper and lower levels as ... ...

Column 3 gives the observed wave number of the P-branch transition, with an asterisk if the line is blended. Unobserved lines are indicated by a dash. Lines which do not exist are left blank.

Column 4 gives the intensity I_5. These intensities cannot be meaningfully compared for different spectral regions because of the different methods used to measure intensities, the unknown source condition, and the inevitable errors of intensity measurements, especially the eye estimates. Within a band, however, the I_5 values generally display the expected ortho–para 2:1 intensity alternation and a weakening for higher rotational levels. Occasional I_5 values which break the trend are often due to blends, assigned or unassigned. They may also be due to misassignments, but we have not attempted reassignments based on intensity measurements alone.

Column 5 gives the difference between the observed wave number and the wave number calculated from the energy levels in Appendix B, in units of 0.01 cm^{-1}. There are 4 singlet and 59 triplet lines for which this column is blank. For these lines, neither the upper nor the lower energy level can be derived, so no wave number can be calculated.

The remaining columns give comparable information for the Q branch (if it exists) and the R branch.

All singlet band systems are listed first, then the triplets, in the same order as in Tables 6a and 6b. For transitions involving one lambda doubled level, the (+) or (−) symmetry is given at the top of each column. If both states are lambda doubled, the symmetry of the second state is given in the heading.

Although some of these band systems have been published before, the lines here extend many of them to higher N and v. For the important and extensive 3d–2c, 3e–2c, and 3f–2c systems, this is the first published report.

5. Energy Levels

Appendix B presents the energy levels derived from the band systems in Appendix A. A number of singlet levels which cannot be derived from Dieke's measurements are derived from published vacuum ultraviolet (VUV) spectra.[15–18] For comparison purposes, dissociation and ionization energies are listed in Table 3.

Energy levels are given in units of cm^{-1} with the zero of energy taken as $v = 0$, $N = 0$ of the X $^1\Sigma_g^+$ state (1A). Appendix B first gives the rotational quantum number N and ortho or para symmetry, and then for each vibrational level gives the energy followed by the number of lines (#) in Appendix A which originate or terminate on that level. Levels available only from VUV measurements are indicated by a reference to the authors: BH for Bredohl and Herzberg's emission measurements,[15] DH for Dabrowski and Herzberg's absorption measurements,[16] TT for Takezawa and Tanaka's absorption measurements,[17] and LL for emission measurements by Larzillière, Launay, and Roncin.[18] Fine and hyperfine structures are unresolved optically and so are omitted from the tables. Dieke[1] does report resolving the 0.2 cm^{-1} pseudodoublet structure of the 2c state, however, and accurate fine and hyperfine measurements have been made

Table 3. Dissociation and ionization energies of D_2 in units of cm^{-1}. The X $^1\Sigma_g^+$, $v = 0$, $N = 0$ level is the zero of energy.

$D_2 \rightarrow D(1s) + D(1s)$	36748.9 ±0.3[a,b]
$D_2 \rightarrow D(1s) + D(2s,2p)$	119030.4 ± 0.4[b]
$D_2 \rightarrow D(1s) + D(3s,3p,3d)$	134267.4 ± 0.4[b,d]
$D_2 \rightarrow D(1s) + D^+$	146457.5 ± 0.4
$D_2 \rightarrow D_2^+(X\ ^2\Sigma_g^+,\ v=0, N=0)$	124746.6 ± 0.6[c]
$D \rightarrow D(2s)$	82281.33[d]
$D \rightarrow D(3s)$	97518.74[d]
$D \rightarrow D^+$	109708.61[d]

[a] R. J. LeRoy and M. G. Barwell, 53, 1983 (1975).

[b] G. Herzberg, J. Mol. Spectrosc. 33, 147 (1970).

[c] S. Takezawa and Y. Tanaka, J. Mol. Spectrosc. 54, 379 (1975).

[d] J. D. Garcia and J. E. Mack, J. Opt. Soc. Am. 55, 654 (1965).

by molecular beam, double resonance, and anticrossing methods.[35]

Singlet states are listed with Σ_g^+ states first, then $p\Sigma_u^+$, $p\Pi_u$, $d\Pi_g$, and $d\Delta_g$. For the triplets, $d\Sigma_g^+$ states follow $p\Pi_u$ states. The Π^+, Π^-, Δ^+, and Δ^- levels are listed separately to distinguish the relatively unperturbed (−) levels from the (+) levels which are strongly perturbed by Σ^+ levels. This arrangement has the minor disadvantage that the two members of each Λ doublet appear in different lists.

The sequence of operations for deriving the energy levels (Fig. 2) established several levels as intermediate reference levels and used combination differences to derive the remaining levels:

Levels of the ground state are taken from Table 5 of Bredohl and Herzberg's[15] VUV emission measurements of the Lyman bands (B $^1\Sigma_u^+ \rightarrow$ X $^1\Sigma_g^+$) with Herzberg's correction to the two bound levels of $v = 21$ as reported by LeRoy and Barwell.[38] These energy levels agree reasonably well with Stoicheff's[39] Raman measurements for $v = 0$ and $v = 1$, with the differences being ≤0.05 cm^{-1} except for $N = 4$–6 of $v = 0$, for which the difference reaches 0.14 cm^{-1}. They also agree with Wolniewicz's nonadiabatic calculations. Any error in the X $^1\Sigma$ energy levels affects only those levels in Appendix B which are derived from VUV measurements; those derived from Dieke's data are totally unaffected.

Levels of the 2B state are taken from four different sources, three reporting VUV measurements, and Dieke's
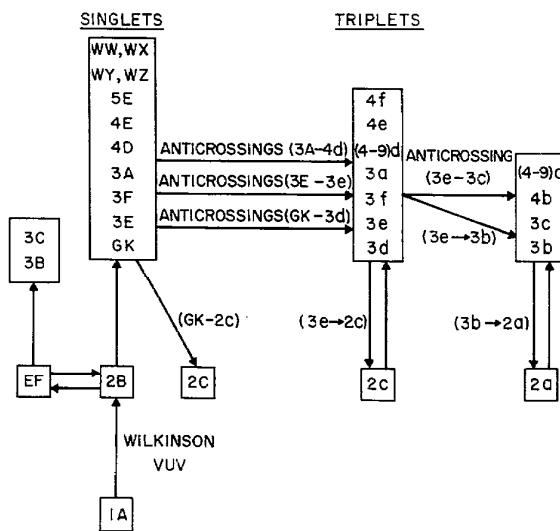
FIG. 2. Schematic diagram of the sequences by which energy levels were derived.

present measurements in the near UV, visible, and IR. Wherever possible, Dieke's data have been used because of the better wave number dispersion in that region of the spectrum.

Derivation of the 2B excitation energy with respect to the ground state requires a VUV measurement; that of Wilkinson[13] is chosen for this reference. The measurement was made in emission, providing spectra in the lithium fluoride region of the VUV where good wavelength standards were available. Because ortho and para levels do not intercombine, we choose two 2B reference levels in this work, $v = 2$, $N = 0$ (para) at 92 498.80 cm^{-1} and $v = 2$, $N = 1$ (ortho) at 92 517.15 cm^{-1}. All other excited levels are given with respect to these two. Levels in $v = 2$ are chosen because Wilkinson's[13] energy intervals between them and the neighboring $v = 1$ and 3 levels agree best with the more precise intervals obtained from Dieke's data. Table 7 shows that this choice of reference energy is supported by Bredohl and Herzberg's[15] independent data. The remainder of the 2B energy levels up to $v = 10$ were derived by combination differences from Dieke's measurements, first to determine the $N = 0$ and 1 levels, and then going up each rotational ladder.

Once the 2B energy levels were determined, it was straightforward to derive the higher singlet energy levels, and come back down to the 2C levels (see Fig. 2).

Deriving many of the triplet levels was more difficult than for the singlets because the triplet band systems are nearly diagonal, that is, Δv is near 0. This is because both the lower and upper triplet states are Rydberg, whereas the 2B state is largely ionic and so has a potential curve which differs greatly from the Rydberg upper singlet states. (In addition there are two groups of triplet states with very few transitions between them. It was only in 1957 that Gloersen[10] found infrared transitions linking the two sets. An anticrossing now provides a further link.[36])

A number of singlet–triplet anticrossings are available to determine the energy of a triplet level as an intermediate

reference. We chose one to provide the reference triplet level, but as we see in Sec. 7, the others confirm the validity of this choice. Thus, the 3E$^-$, $v = 1$, $N = 1 \rightarrow 3$e$^-$, $v = 1$, $N = 1$ anticrossing locates the 3e$^-$, $v = 1$, $N = 1$ ortho triplet level with respect to the singlets, and from that level and one optical transition, the 2c$^-$, $v = 1$, $N = 2$ ortho level was located. The remaining levels of the 2c state were then derived by using combination differences and the one assumption that lambda doubling is negligible for $v = 1$, $N = 1$ of the 2c state. Higher triplet levels of this one set were straightforward to derive. Infrared transitions then located $v = 0$, 1, and 2 of the 3b state and from them levels of the 2a state were derived and then levels of the b and c states (see Fig. 2).

Predissociation is apparent in a number of cases above 119 030.4 cm^{-1}, the dissociation energy to D(1s) + D(2s, 2p). Most levels of + symmetry predissociate before they can radiate whereas − states do not predissociate. The only + states above this limit which do radiate are those with principal quantum number of 4 or higher where the predissociation rate is slower. The measurements of Takezawa and Tanaka[17] are taken in absorption and so are not sensitive to predissociation of the upper levels.

A recent analysis of the 3E$^-$ and 3F$^-$ energy levels by Quadrelli and Dressler[40] was based on preliminary results of this work. We have examined the two energy levels (3E$^-$, $v = 0$, $N = 12$ and 3E$^-$, $v = 3$, $N = 8$) which deviated from their fit and find lines which produce excellent agreement with Quadrelli and Dressler's predictions. Many similar extensions of these tables should be possible with the data presented here. Caution is in order, however, as Dieke points out[1]: the spectrum is so dense that a line can be found at almost any predicted position. It is imperative to make use of redundancies and intensities to confirm assignments.

6. $^1\Sigma_g^+$ States

For many years, beginning with Richardson's[41] work in the 1920s, the spectrum of H_2 (and later D_2) contained a number of bands which could not be explained with singly excited electron descriptions which worked so well for most other states. Therefore they were called "doubly excited states" even though no electron configuration could be assigned. Davidson[23] first showed in 1961 that the ionic $^1\Sigma_g^+$ state with a $(2p\sigma_u)^2$ configuration and a H$^+$ + H$^-$ dissociation limit undergoes a series of avoided crossings with the Rydberg $^1\Sigma_g^+$ states and leads to a series of double minimum states. This was demonstrated quantitatively for the lowest such state EF $^1\Sigma_g^+$ by Boye[24] in 1968 and by Kolos and Wolniewicz[25] in 1969. The next higher double minimum state GK $^1\Sigma_g^+$ was calculated by Glover and Weinhold[26] in 1977 and by Wicke[27] in 1978. An impressive quantitative description has been obtained most recently in a series of papers by Wolniewicz, Dressler, Gallusser, and Quadrelli.[28-31] They fit essentially all experimental data with the EF, GK, and the HH $^1\Sigma_g^+$ states (where HH is the next higher double minimum state for which the inner minimum corresponds to 3A in Dieke's notation).

Experimental data for these states of D_2 come entirely from work of Dieke and co-workers. Because several nota-

tions have been used through the years, Table 5 relates them to the latest and preferred notation. The name EF derives from the E(2s) $^1\Sigma_g^+$ + F(2p)^2 $^1\Sigma_g^+$ notation of Herzberg. The name GK derives from the G(3d) $^1\Sigma_g^+$ + 3 ^{1}K notation, although it is ironic that none of the levels formerly assigned to 3 ^{1}K are now assigned to the GK state. The notations X and Y were used in Dieke's unpublished data and by Dressler et al.[29] when referring to that data.

The levels of several states call for special comment. Both 3A and 3a have unassigned $v = 0$ and $v = 1$ levels; this is most likely because their levels are highly perturbed.

A number of fragmentary bands were identified by Dieke, but still defy assignment. We arbitrarily call them

WW, WX, WY, and WZ. Combination differences prove that the lower state is 2B and give its vibrational assignment. The upper states must therefore be $^1\Sigma_g^+$, $^1\Pi_g$, or $^1\Delta_g$, but since all $^1\Pi_g$ and $^1\Delta_g$ states are known in the energy regions of the observed levels, these states must be $^1\Sigma_g^+$. They are probably levels of the double minimum states for which the theory is still insufficiently accurate.

Three fragmentary states were reported by Dieke and Lewis.[8] Their 3 ^{1}K$_0$ fragment is the present WY state, although several line assignments have been changed. The 3 ^{1}K$_1$ and 3 ^{1}M fragments of Dieke and Lewis[8] appear to be spurious; Dieke does not include them in his later unpublished data.

Table 4. Observed anticrossings in D_2 and the energy level separations ΔE (at zero magnetic field) derived from them. Comparison to the ΔE values from Appendix B shows good agreement. All energies are in cm^{-1}.

Electronic State	v	N	Sym	E (Appendix B)	Ref.	ΔE (AC)	ΔE (Appendix B)	$\Delta(\Delta E)$
r(4d) $^3\Pi_g^+$	0	2	o	117951.63	33	1.33	1.34	−0.01
H(3s) $^1\Sigma_g^+$	3	2	o	117950.29				
I(3d) $^1\Pi_g^-$	1	1	o	113845.48	32	0.21	0.21	0.00
i(3d) $^3I_g^-$	1	1	o	113845.27				
I(3d) $^1\Pi_g^-$	1	2	p	113893.93	32	0.31	0.30	0.01
i(3d) $^3\Pi_g^-$	1	2	p	113893.63				
I(3d) $^1\Pi_g^-$	1	4	p	114064.50	32	0.53	0.56	−0.03
i(3d) $^3\Pi_g^-$	1	4	p	114063.94				
I(3d) $^1\Pi_g^-$	1	5	o	114186.97	32	0.59	0.60	−0.01
i(3d) $^3\Pi_g^-$	1	5	o	114186.37				
GK $^1\Sigma_g^+$	1	0	o	112066.78	34	1.79	1.76	0.03
g(3d) $^3\Sigma_g^+$	0	0	o	112065.02				
g(3d) $^3\Sigma_g^+$	0	1	p	112079.49	34	3.89	3.90	−0.01
GK $^1\Sigma_g^+$	1	1	p	112075.59				
g(3d) $^3\Sigma_g^+$	0	2	o	112109.33	34	10.17	10.13	0.04
GK $^1\Sigma_g^+$	1	2	o	112099.20				
i(3d) $^3\Pi_g^-$	3	1	p	116692.82	36	0.90	0.95	−0.05
d(3p) $^3\Pi_u^+$	3	1	p	116691.87				

Table 5. Comparisons of different notations for the $^1\Sigma_g^+$ states of D_2.

Current Notation	Dieke & Cunningham[12]	Dieke (unpublished)	Dieke & Lewis[8]	Dressler et al.[29]	Dressler & Wolniewicz[31]
EF0	2A0			100	
EF3	2A1			103	
EF6	2A2			106	
EF7	2K1			107	
EF9	2A3			109	
EF10	2K3			110	
EF11	2K4			111	
EF12	2A4			112	
EF13	2K5			113	
EF14	2K6			114	
EF15	2A5			115	
EF16	2K7			116	
EF17	2K8			117	
EF18	2A6			118	
EF19	2K9			119	
EF20	2K10			120	
EF21	2A7			121	
EF22	2K11			122	
EF29		X		129	
EF32		X		132	
GK0	2K13			200	
GK1		3D0	3d $^1\Sigma(v=0)$	201=G0	
GK2		X		202	
GK3		3D1	3d $^1\Sigma(v=1)$	203=G1	
GK4		Y		204	
GK5		3D2	3d $^1\Sigma(v=2)$	205=G2	
GK6		X		206	
GK7		3D3	3d $^1\Sigma(v=3)$	207=G3	
GK8		X		208	
GK9		X		209	
3A0					$\overline{HH}0$
3A1					$\overline{HH}1$
3A2		Y			$\overline{HH}2$
3A3		3D4			$\overline{HH}3$
3A4					$\overline{HH}4$
WW		X			
WX		X			
WY			3^1K_0		
WZ					
Spurious			3^1M		
Spurious			3^1K_1		

Table 6 a. Statistics of differences Δ between observed emission
lines in Appendix A and calculated values from the energy levels
of Appendix B, in units of 0.01 cm⁻¹. Singlets

SINGLETS	NOT-BLENDED				BLENDED				ALL LINES			
	# Lines	Min Δ	Max Δ	Mean Δ ± Std. Dev.	# Lines	Min Δ	Max Δ	Mean Δ ± Std. Dev.	# Lines	Min Δ	Max Δ	Mean Δ ± Std. Dev.
EF-2B	1264	−25	26	1.2±5.6	256	−30	25	1.3±8.6	1520	−30	26	1.2±6.2
EF-2C	21	−10	13	1.3±4.8	7	−18	18	0.1±11.3	28	−18	18	1.0±6.8
3A-2B	152	−18	16	−0.4±4.8	31	−12	19	1.8±7.0	183	−18	19	0.0±5.3
3A-2C	43	−13	9	−0.3±5.6	16	−12	9	−1.3±6.0	59	−13	9	−0.5±5.7
GK-2B	648	−19	31	0.0±5.5	131	−18	29	0.1±7.4	779	−19	31	0.0±5.9
GK-2C	180	−18	14	−0.2±4.4	36	−15	13	−2.3±6.5	216	−18	14	−0.6±4.9
4D-2B	56	−16	14	0.6±5.6	4	0	31	8.3±15.2	60	−16	31	1.2±6.7
4D-2C	16	−3	9	3.6±3.7	10	−2	12	5.7±4.3	26	−3	12	4.4±4.0
WW-2B	2	−2	1	−0.5±2.1	3	−11	16	−0.3±14.4	5	−11	16	−0.4±10.2
WW-2C	2	−3	4	0.5±4.9	0	−	−	−	2	−3	4	0.5±4.9
WX-2B	7	−9	8	0.9±5.5	6	−7	10	0.5±6.9	13	−9	10	0.7±5.9
WY-2B	5	−2	3	−0.2±2.0	2	0	4	2.0±2.8	7	−2	4	0.4±2.3
WZ-2B	18	−8	6	−0.2±4.1	2	8	13	10.5±3.5	20	−8	13	0.9±5.2
3B-EF	234	−11	17	0.2±3.4	29	−20	15	−0.3±8.4	263	−20	17	0.1±4.2
3C-EF	149	−25	20	−0.2±4.9	10	−13	10	0.0±7.4	159	−25	20	−0.2±5.0
3E-2B	608	−22	23	0.0±4.8	93	−18	27	0.0±7.8	701	−22	27	0.0±5.3
3E-2C	217	−28	19	0.4±4.8	68	−18	23	1.4±7.9	285	−28	23	0.7±5.7
4E-2B	221	−25	19	0.2±5.6	25	−11	9	−2.6±5.8	246	−25	19	−0.1±5.7
4E-2C	52	−16	17	4.2±6.7	25	−14	23	4.7±8.6	77	−16	23	4.4±7.3
5E-2B	8	−10	10	0.5±7.0	0	-	-	-	8	−10	10	0.5±7.0
3F-2B	201	−23	15	−0.7±5.5	23	−24	9	−5.4±9.4	224	−24	15	−1.2±6.1
3F-2C	189	−19	17	−0.8±5.4	52	−19	18	0.9±8.1	241	−19	18	−0.4±6.1
ALL LINES	4293	−28	31	0.4±5.3	829	−30	31	0.6±8.1	5122	−30	31	0.4±5.8

Table 6b. Statistics of differences Δ between observed emission
lines in Appendix A and calculated values from the energy levels
of Appendix B, in units of 0.01 cm^{-1}. Triplets

TRIPLETS	NOT-BLENDED				BLENDED				ALL LINES			
	# Lines	Min Δ	Max Δ	Mean Δ $\pm$ Std. Dev	# Lines	Min Δ	Max Δ	Mean Δ $\pm$ Std. Dev	# Lines	Min Δ	Max Δ	Mean Δ $\pm$ Std. Dev
2a-2c	6	−9	15	2.0±9.1	0	−	−	−	6	−9	15	2.0±9.1
3a-2c	32	−7	5	0.2±2.7	8	−8	7	1.4±4.8	40	−8	7	0.2±3.2
3b-2a	732	−23	26	0.0±3.7	139	−27	25	0.6±6.4	871	−27	26	0.1±4.2
4b-2a	58	−10	21	0.3±5.0	15	−8	9	1.1±4.5	73	−10	21	0.5±4.9
2c-2a	4	−23	24	−2.3±19.9	0	−	−	−	4	−23	24	−2.3±19.9
3c-2a	547	−21	37	0.1+3.9	107	−22	28	−0.1±6.5	654	−22	37	0.1±4.4
4c-2a	232	−21	21	−1.4±4.4	21	−15	16	−0.7±7.5	253	−21	21	−1.4±4.7
5c-2a	96	−18	18	−0.8±4.9	12	−16	19	2.8±9.8	108	−18	19	−0.4±5.7
6c-2a	33	−13	10	−0.7±4.4	3	−26	14	0.3±22.8	36	−26	14	−0.6±6.9
7c-2a	9	0	0	0±0	0	−	−	−	9	0	0	0±0
8c-2a	4	0	0	0±0	0	−	−	−	4	0	0	0±0
9c-2a	5	0	0	0±0	0	−	−	−	5	0	0	0±0
3d-2c	144	−19	22	−0.1±5.5	25	−29	15	−2.0±9.0	169	−29	22	−0.4±6.1
3d-3b	30	−26	19	−0.8±8.8	2	−1	3	1.0±2.8	32	−26	19	−0.7±8.5
4d-2c	77	−18	20	0.2±6.5	10	−12	9	−0.6±5.6	87	−18	20	0.1±6.4
4d-3b	12	−7	12	1.8±5.9	0	−	−	−	12	−7	12	1.8±5.9
5d-2c	11	−1	1	0.0±0.4	2	0	9	4.5±6.4	13	−1	9	0.7±2.5
6d-2c	4	0	0	0±0	2	0	0	0±0	6	0	0	0±0
7d-2c	4	0	0	0±0	1	0	0	0	5	0	0	0±0
8d-2c	6	0	0	0±0	0	−	−	−	6	0	0	0±0
9d-2c	5	0	0	0±0	0	−	−	−	5	0	0	0±0
3e-2c	209	−21	23	−0.1±5.9	49	−32	17	−2.3±7.7	258	−32	23	−0.5±6.3
3e-3b	44	−11	21	1.0±6.5	2	-1	5	2.0±4.2	46	−11	21	1.0±6.3
4e-2c	30	−7	7	−0.2±4.0	7	−3	8	2.0±4.5	37	−7	8	0.2±4.2
4e-3b	4	−7	16	4.0±12.2	1	−9	−9	−9.0	5	−9	16	1.4±12.1
3f-2c	241	−16	23	0.0±4.9	39	−32	17	−0.8±9.4	280	−32	23	−0.1±5.7
3f-3b	8	−22	18	1.5±11.3	0	−	−	−	8	−22	18	1.5±11.3
4f-2c	6	0	2	0.8±1.0	4	−10	4	−4.0±6.1	10	−10	4	−1.1±4.4
ALL LINES	2593	−26	37	−0.1±4.7	449	−32	28	−0.1±7.2	3042	−32	37	−0.1±5.1

7. Accuracy of the Energy Levels

We now present arguments which lead to a ± 0.05 cm^{-1} estimate of the one standard deviation uncertainty of the energy levels in Appendix B, relative to the 2B, $v = 2$, $N = 1$ and 2 levels. The absolute energies of the 2B, $v = 2$, $N = 1$ and 2 reference levels are based on vacuum ultraviolet measurements from the literature, estimated by those authors to be accurate to about ± 0.4 cm^{-1}.

7.1. Ability of the Energy Levels to Reproduce the Observed Wave Numbers

An important measure of the quality of the energy levels in Appendix B is their ability to reproduce the observed wave numbers of Appendix A. For this comparison we call the wave number difference between two energy levels the calculated value and examine the distribution of the observed minus calculated (O–C) values. The spread of the (O–C) values indicates the precision of the measurements, and their mean value for any band system indicates the size of a systematic error in an entire state's energy levels. These approximate indicators would not be necessary if a least-squares[42–44] procedure had been used to derive the energy levels, but such an approach was unfeasible for this extensive data set.

The distributions of (O–C) values are given in Tables 6a and 6b and Figs. 3 and 4. There are 5126 lines assigned as singlet-to-singlet transitions, 831 of them blended and 4295 not blended. For 4 of them neither of the energy levels could be derived so there are no (O–C) values (each of these 4 lines involves levels with high rotational quantum numbers). The values of (O–C) range from -0.30 to $+0.31$ cm^{-1} (the tables express O–C in units of 0.01 cm^{-1} which we call Δ), but only 24 lie outside the range -0.22 to $+0.22$ and 84% lie between -0.07 and $+0.07$ cm^{-1}. The mean (O–C) for all singlets is 0.004 ± 0.058 cm^{-1}.

There are 3117 lines assigned as triplet-to-triplet transitions, 463 of them blended and 2654 not blended. For 75 of them, neither of the energy levels could be derived. Of these 75 lines, 31 are the band fragments assigned as e–2c, 6 are assigned as the 4–4 band of 3f–2c, and the remainder involve high rotational quantum numbers. The values of (O–C) for
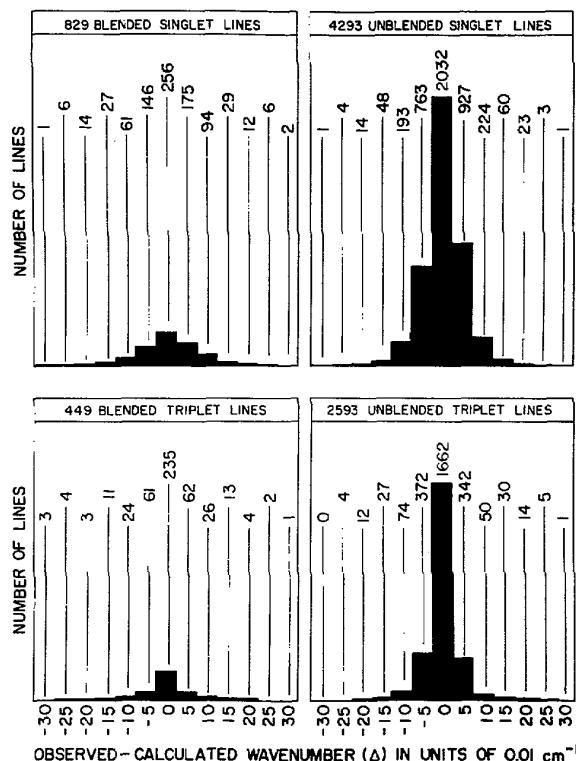

OBSERVED – CALCULATED WAVENUMBER (Δ) IN UNITS OF 0.01 cm^{-1}

FIG. 3. Distributions of the numbers of lines with Δ in the 0.05 cm^{-1} interval centered on the value on the horizontal axis (except for the one value for unblended triplets in the interval marked 30, which corresponds to $\Delta = 37$).

the triplets range from -0.32 to $+0.37$ cm^{-1} with only 20 outside the range -0.22 to $+0.22$ cm^{-1} and 90% between -0.07 and $+0.07$ cm^{-1}. The mean (O–C) value for all triplets is -0.001 ± 0.051 cm^{-1}.

The distributions of (O–C) values as a function of wave number are shown in Fig. 4. The precision of the measurements appears to be roughly uniform from the infrared to the ultraviolet.
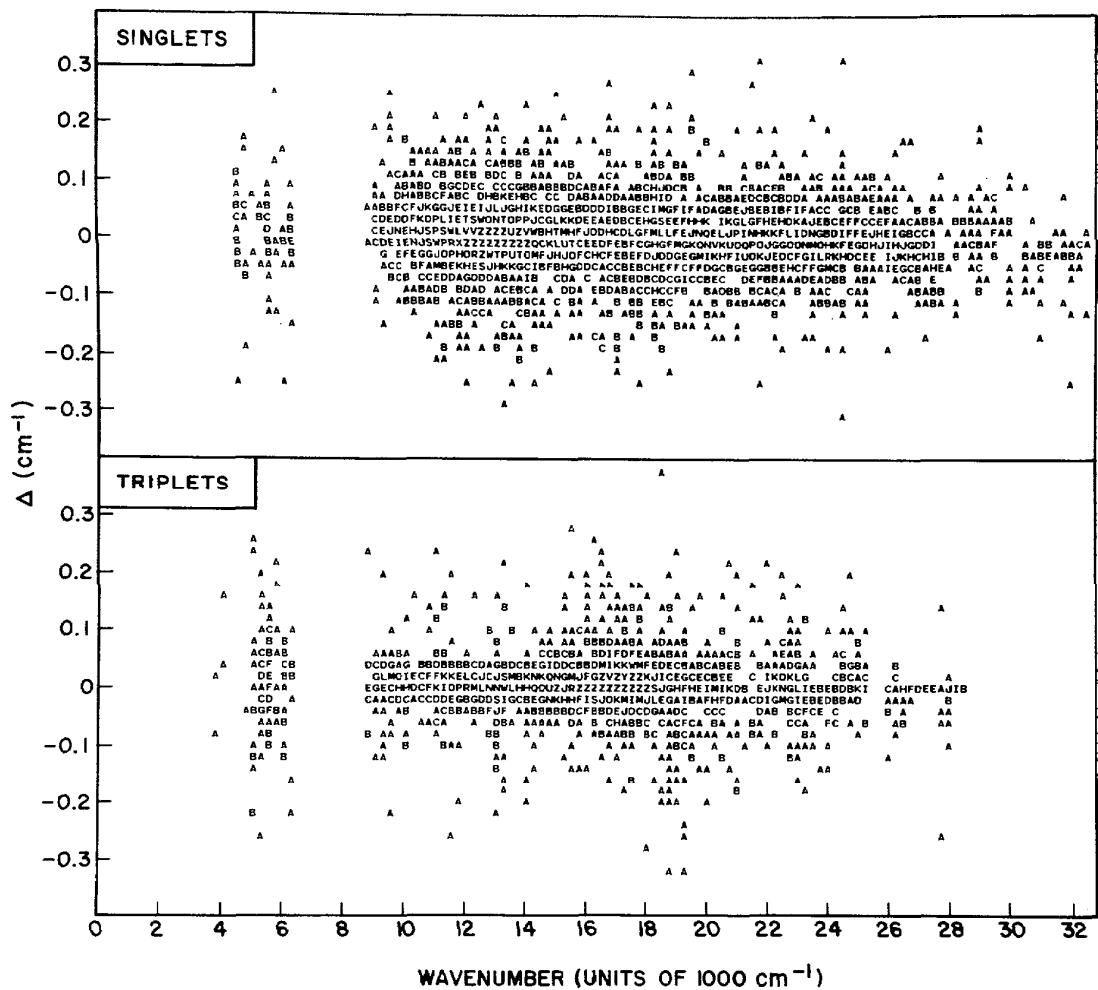
FIG. 4. Distributions of the observed minus calculated wave numbers as a function of the wave number. A single value is represented by the letter A, two overlapping values by B, etc., and 26 or more overlapping values by Z.

7.2. Anticrossings

Although one anticrossing was used in Sec. 5 to locate the triplets with respect to the singlets, other anticrossings were examined to verify that this was a reasonable choice. We can consider these other anticrossings to be checks on the relative singlet–triplet energies, and on the relative energies of the two sets of nonintercombining triplets. They also serve to indicate the accuracy of several "typical" energy levels.

Table 4 lists the known anticrossings in D_2. The level called G $^1\Sigma, v = 4$ in the literature[33] has been reassigned[30] as $H(3s)$ $^1\Sigma_g^+$ and the levels called G $^1\Sigma, v = 0$ in the literature[34] are now called GK $^1\Sigma_g^+$, $v = 1$. Table 4 compares the zero field separation (ΔE) of each pair of levels, as derived from anticrossing measurements, to the separation derived from Appendix B. The difference of these two values is called $\Delta (\Delta E)$ which is, by definition, zero for the pair of levels used to determine the triplet energies. For the other seven singlet–triplet anticrossings, $\Delta (\Delta E)$ lies between -0.03 and 0.04, which confirms the accuracy of the triplets with respect to the singlets. The one triplet–triplet anticrossing has the larger $\Delta (\Delta E)$ value of -0.05, probably because the $i(3d)^3 \Pi_g^+$, $v = 3, N = 1$ energy level was derived from a single spectral line measurement, in error presumably by about 0.05 cm^{-1}.

7.3. Comparison to Vacuum Ultraviolet Measurements of Singlet Energy Levels

Several workers in addition to Wilkinson[13] have measured singlet–singlet spectra of D_2 in the vacuum ultraviolet.[14–18] Comparisons of the present energy levels to energy levels derived from their work provide further checks on the absolute and relative accuracy of Appendix B. It turns out that the relative accuracy (and probably also the absolute accuracy) of the energy levels in Appendix B is as good or better than that of the levels derived from any of the VUV experiments.

Tables 7–10 provide comparisons between energy levels derivable from both Dieke's measurements and each of the VUV measurements. No energy levels were derived from those VUV lines which were reported as blended; these levels are indicated by an asterisk (*). Energy levels were calculated from the reported VUV wave numbers and subtracted from the value in Appendix B. The difference is given for each v and N in units of 0.01 cm^{-1}. The average of the differences is

given below each column. Unusually large differences probably result from misassignments in the VUV spectrum; they are given in parentheses and have been omitted from the averaging. The averages for each vibrational level for each author are themselves averaged and collected in Table 11, along with their standard deviations.

Wilkinson's data[13] for the 2B state differ least from Dieke's since they were used for reference. Bredohl and Herzberg's data[15] agree nearly as well in average absolute energy (-0.02 cm^{-1}) and show very little scatter ($\pm 0.04 \text{ cm}^{-1}$). Some of this scatter must even be due to Dieke's measurements. This excellent agreement between two entirely independent measurements is another confirmation of the accuracy which can be expected for Appendix B.

Bredohl and Herzberg's data[15] for the 2C state shows slightly larger absolute and relative differences than for the 2B state. This can be attributed to the difference in spectral regions of the two transitions; the 2B emission spectrum lies in the 60 000–90 000 cm^{-1} region whereas the 2C emission spectrum lies in the 80 000–98 000 cm^{-1} region where the wave number dispersion is not as high and the wavelength reference lines are presumably known less accurately.

The measurements of Dabrowski and Herzberg,[16] Takezawa and Tanaka,[17] and Monfils[14] are all in absorption from $v'' = 0$, not in emission as are Bredohl and Herzberg's.[15] They can be expected, therefore, to be somewhat less accurate because they lie further into the VUV. Furthermore only one or two lines are available to determine each energy level, not as many as the 26 emission lines available for some energy levels of the 2B state. For three electronic states, Dabrowski and Herzberg's levels[16] are low by about 0.3 cm^{-1}, Takezawa and Tanaka's[17] are low by about 0.12 cm^{-1}, and Monfils's[14] are low by about 1.2 cm^{-1}.

With the accuracy estimates of Table 11 as a guide, we use levels from Bredohl and Herzberg in Appendix B, for those levels not derivable from Dieke's measurements. Dabrowski and Herzberg's levels were used when neither Dieke's nor Bredohl and Herzberg's provided the information. For the nB and nC states with $n \geqslant 4$, Takezawa and Tanaka's measurements are more extensive and more accurate than those of Monfils and so were used in Appendix B. The data from these VUV measurements are given without correction in Appendix B. The user might obtain more accurate information by adding 0.30 cm^{-1} to Dabrowski and Herzberg's values and 0.12 cm^{-1} to Takezawa and Tanaka's values.

Table 7.   Differences between the present energy levels of the $B(2p)^1\Sigma_u^+$ state and previous literature values, expressed as the present value minus the literature value, in units of 0.01 cm^{-1}. BH stands for Bredohl and Herzberg, DH for Dabrowski and Herzberg, W for Wilkinson, TT for Takezawa and Tanaka, and (in Tables 8 and 10) M for Monfils. The average difference for each vibration is given at the bottom of each column, and the average of averages is given in Table 11.

| 2B | $v=0$ | | | $v=1$ | | | $v=2$ | | | $v=3$ | | $v=4$ | |
N	BH	W	TT	BH	W	TT	BH	W	TT	BH	W	BH	W
0	4	*		3	−1		1	1		−3	13	−2	21
1	3	−4	21	2	1	(3600)	−2	3	−5	−1	9	−6	9
2	5	−12		5	−5		−1	−2		1	3	−3	13
3	1	−13		−2	1		−2	−16		−2	6	−7	(44)
4	4	−18		4	1		7	5		−9	4	−3	9
5	5	−11		7	4		3	7		1	4	−6	7.
AV-BH	4			3			1			−2		−5	
AV-W		−12			0			0			7		12
AV-TT			21						−5				

| 2B | $v=5$ | | $v=6$ | | $v=7$ | | $v=8$ | | $v=9$ | | $v=10$ | |
N	BH	DH	BH	DH	BH	DH	BH	DH	BH	DH	BH	DH
0	2	44	−3	29	1	-	−6	24	−4	24	−14	13
1	−4	22	−5	29	−3	27	−1	35	−7	36	−8	24
2	1	1	−1	20	0	14	−5	15	−7	28	−10	27
3	0	23	−2	21	−3	57	0	15	−6	29	−11	31
4	−4	16	−2	23	−7	43	−11	15	−5	27	−12	25
5	7	52	0	41	−2	49	3	14	−8	33	−9	23
AV-BH	0		−2		−2		−3		−6		−11	
AV-DH		26		27		38		20		30		24

Table 8. Comparison of the present energy levels of the $B'(3p)^1\Sigma_u^+$ state to previous literature values (present−previous) in units of 0.01 cm^{-1}.

| 3B | $v=0$ | | $v=1$ | | $v=2$ | | $v=3$ | | $v=4$ | | $v=5$ | | $v=6$ | |
N	DH	M	DH	M	DH	M	DH	M	DH	M	DH	M	DH	M
0	20	83	4	93	8	106	-	156	51	10	17	158	-	157
1	32	205	12	142	1	69	56	80	64	132	65	146	41	70
2	19	29	8	109	14	105	34	124	59	191	28	149	50	44
3	7	34	18	55	14	148	29	38	68	156	24	88	47	202
4	42	59	31	124	8	(372)	32	69	-	144	23	76		
5	46	188	21	81	18	(654)	28	144	66	(279)	45	64		
6	27	161	21	53	22	(1038)	42	(344)						
7		14	27	40										
8		3		(300)										
AV-DH	28		18		12		37		62		34		46	
AV-M		86		87		107		102		127		114		118

Table 9. Comparison of the present energy levels of the
C(2p)$^1\Pi_u$ state to previous values (present—
previous) in units of 0.01 cm^{-1}.

2C$^+$	$v=0$		$v=1$		$v=2$		$v=3$		$v=4$	
N	BH	DH	BH	DH	BH	DH	BH	DH	BH	DH
1	−20	10	−4	*	−12	39	−12	11	−8	*
2	−8	14	−3	*	−5	22	−1	21	1	41
3	−14	26	0	35	−16	17	−16	13	−11	41
4	−11	35	3	42	−8	36	−14	24	−10	*
5	−25	35	−9	35	−12	32				
6		36	−2	*						
AV-BH	−16		−3		−11		−11		−7	
AV-DH		26		37		29		17		41

2C$^-$	$v=0$			$v=1$			$v=2$			$v=3$		$v=4$	
N	BH	DH	TT	BH	DH	TT	BH	DH	TT	BH	DH	BH	DH
1	−6	20	8	−3	32	41	−9	29	18	−11	*	−12	*
2	−16	12	13	−6	30	35	−14	38	23	−11	*	−20	*
3	−46	37		−1	13		−3	27		−9	18	−8	4
4	−13	36		−8	27		−9	24		−14	20	−10	(142)
5	−25	36		9	39		−7	*		1	22	−8	31
6	−18	34			37		3	37		2			−12
7	(−73)	(57)											46
AV-BH	−21			−2			−7			−7		−12	
AV-DH		29			30			31			20		17
AV-TT			11			38			21				

Table 10. Comparison of the present energy levels of the D(3p)$^1\Pi_u$ state to previous literature values (present−previous) in units of 0.01 cm^{-1}.

3C$^+$ N	v=0 M	v=1 M	v=2 M	v=3 M
1	56	212	236	220
2	74	216	50	68
3	202	197	183	226
4	104		157	154
5	157			
AV-M	119	208	157	167

3C$^-$ N	v=0 M	v=0 TT	v=1 M	v=1 TT	v=2 M	v=2 TT	v=3 M	v=4 M
1	99	−47	131	−8	269	21	164	158
2	126	26	106	−2	119	30	90	24
3	−11		103		146		(388)	206
4	−24		140		140		100	130
5	(318)		128		311			
6	(254)		175		−1			
7	(20)							
8	(365)							
AV-M	48		131		164		118	130
AV-TT		−11		−5		26		

Table 11. Summary of average values from Tables 7-10, of the difference between present energy levels (Appendix B) and those derived from vacuum ultraviolet measurements, in units of 0.01 cm^{-1}, and the standard deviation.

State	W	BH	DH	TT	M
2B	1±9	−2±4	28±6	8±18	
3B			34±17		106±15
2C		−10±6	28±8	23±14	
3C				3±20	138±44

7.4. Ab initio Calculations

Most ab initio computations of D_2 energy levels are far less accurate than experimental measurements. Several computations, however, consider nonadiabatic and relativistic effects and so are capable of experimental accuracy.

Kolos and Wolniewicz[19] calculated the adiabatic (diagonal) corrections to the Born–Oppenheimer potential of the 2B state, and estimated that the relativistic and nonadiabatic

corrections to T_∞ would be less than 1 cm^{-1}. Their result, $T_\infty = 90\ 634.9$ cm^{-1} lies 1.3 cm^{-1} above our value in Appendix B, and 1.1 cm^{-1} above Wilkinson's value.[13] (Our 2B, $v = 0$, $N = 0$ value differs from Wilkinson's because we choose his $v = 2$ value as reference and derive $v = 0$ from the present spectra.) This comparison serves as another test of Wilkinson's VUV data. Kolos and Wolniewicz concluded that although the discrepancy is meaningful, the calculation and experiment agree within 1 cm^{-1}.

Kolos and Rychlewski[20] calculated the Born–Oppenheimer energy of the 2a state, with adiabatic corrections, and estimated the nonadiabatic and relativistic corrections. They obtained $T_\infty = 95\ 348.6$ cm^{-1}, in agreement with the Appendix B value of 95 348.22 cm^{-1}.

More recently, Bishop and Cheung[21] directly calculated the full 2a nonadiabatic wave function for H_2, with relativistic and radiative corrections (but they did not report the calculations for D_2). Their result for T_∞ of H_2 differs from the Kolos and Rychlewski H_2 result[20] by only 1.5 cm^{-1}, and the experimental value lies beween these two calculations. This agreement for H_2 suggests that the corresponding D_2 calculation would be comparably close to the Appendix B value.

The ~1 cm^{-1} agreement between calculations of T_∞ for the 2B and 2a states with the values for $v = 0$, $N = 0$ in Appendix B strengthens our confidence in the overall accuracy of Appendix B. It verifies that the VUV measurements are more accurate than 1 cm^{-1} and that the accumulated errors in deriving energy levels by the sequence in Fig. 2 are not excessive.

8. Future Work

The set of energy levels in Appendix B is the most extensive and accurate now available for D_2. It can be used to test ab initio and multichannel quantum defect theory[45] calculations, to derive molecular constants, to analyze perturbations, and to examine breakdown of the Born–Oppenheimer approximation.

Additional energy levels with higher principal quantum number may soon be determined by multiphoton spectroscopy from the ground state[46,47] and from molecular beams of the metastable 2c state.[48] These methods may also extend vibrational and rotational series and fill in gaps such as $v = 0$ and $v = 1$ of the 3A and 3a states.

A first study has been reported of extension to higher angular momentum states. By means of Fourier transform infrared spectroscopy, Herzberg and Jungen[49] recently observed the 5g–4f transition. Many of the lines in their related 4f–3d spectrum of H_2 appear as unassigned lines in Dieke's measurements,[2] so we can expect that Appendix C of this work could be used to confirm similar measurements on D_2.

9. Acknowledgments

10. References

[1]G. H. Dieke, J. Mol. Spectrosc. **2**, 494 (1958).

[2]*The Hydrogen Molecule Wavelength Tables of Gerhard Heinrich Dieke,* edited by H. M. Crosswhite (Wiley, New York, 1972).

[3]G. H. Dieke and R. W. Blue, Phys. Rev. **47**, 261 (1935).

[4]G. H. Dieke, Phys. Rev. **47**, 661 (1935).

[5]G. H. Dieke, Phys. Rev. **48**, 606 (1935).

[6]G. H. Dieke, Phys. Rev. **48**, 610 (1935).

[7]G. H. Dieke, Phys. Rev. **50**, 797 (1936).

[8]G. H. Dieke and M. N. Lewis, Phys. Rev. **52**, 100 (1937).

[9]S. P. S. Porto and G. H. Dieke, J. Opt. Soc. Am. **45**, 447 (1955).

[10]P. Gloersen, "High Resolution Spectroscopy in the Near Infrared. The Spectrum of H_2 and D_2," Ph.D. thesis (The Johns Hopkins University, 1957).

[11]P. Gloersen and G. H. Dieke, J. Mol. Spectrosc. **16**, 191 (1965).

[12]G. H. Dieke and S. P. Cunningham, J. Mol. Spectrosc. **18**, 288 (1965).

[13]P. G. Wilkinson, Can. J. Phys. **46**, 1225 (1968).

[14]A. Monfils, J. Mol. Spectrosc. **25**, 513 (1968).

[15]H. Bredohl and G. Herzberg, Can. J. Phys. **51**, 867 (1973).

[16]I. Dabrowski and G. Herzberg, Can. J. Phys. **52**, 1110 (1974).

[17]S. Takezawa and Y. Tanaka, J. Mol. Spectrosc. **54**, 379 (1975).

[18]M. Larzillière, F. Launay, and J.-Y. Roncin, J. Phys. (Paris) **41**, 1431 (1980).

[19]W. Kolos and L. Wolniewicz, Can. J. Phys. **53**, 2189 (1975).

[20]W. Kolos and J. Rychlewski, Chem. Phys. Lett. **59**, 183 (1978).

[21]D. M. Bishop and L. M. Cheung, Chem. Phys. Lett. **79**, 130 (1981).

[22]L. Wolniewicz, J. Chem. Phys. **78**, 6173 (1983).

[23]E. R. Davidson, J. Chem. Phys. **33**, 1577 (1960); J. Chem. Phys. **35**, 1189 (1961).

[24]R. J. Boye, J. Mol. Spectrosc. **26**, 36 (1968).

[25]W. Kolos and L. Wolniewicz, J. Chem. Phys. **50**, 3228 (1969).

[26]R. M. Glover and F. Weinhold, J. Chem. Phys. **66**, 303 (1977).

[27]B. G. Wicke, J. Chem. Phys. **68**, 337 (1978).

[28]L. Wolniewicz and K. Dressler, J. Mol. Spectrosc. **67**, 416 (1977).

[29]K. Dressler, R. Gallusser, P. Quadrelli, and L. Wolniewicz, J. Mol. Spectrosc. **75**, 205 (1979).

[30]L. Wolniewicz and K. Dressler, J. Mol. Spectrosc. **77**, 286 (1979).

[31]K. Dressler and L. Wolniewicz, J. Mol. Spectrosc. **86**, 534 (1981).

[32]R. Jost, M. Lombardi, J. Derouard, R. S. Freund, T. A. Miller, and B. R. Zegarski, Chem. Phys. Lett. **37**, 507 (1976).

[33]T. A. Miller, R. S. Freund, and B. R. Zegarski, J. Chem. Phys. **64**, 1842 (1976).

[34]T. A. Miller, B. R. Zegarski, and R. S. Freund, J. Mol. Spectrosc. **69**, 199 (1978).

[35]T. A. Miller and R. S. Freund, Adv. Magn. Reson. **9**, 49 (1977).

[36]R. S. Freund, T. A. Miller, and B. R. Zegarski, J. Chem. Phys. **64**, 4069 (1976).

[37]K. P. Huber and G. Herzberg, *Molecular Spectra and Molecular Structure IV. Constants of Diatomic Molecules* (Van Nostrand Reinhold, New York, 1979).

[38]R. J. LeRoy and M. G. Barwell, Can. J. Phys. **53**, 1983 (1975).

[39]B. P. Stoicheff, Can. J. Phys. **35**, 730 (1957).

[40]P. Quadrelli and K. Dressler, J. Mol. Spectrosc. **86**, 316 (1981).

[41]O. W. Richardson, *Molecular Hydrogen and its Spectrum* (Yale University, New Haven, CT, 1934).

[42]N. Åslund, Ark. Fys. **30**, 377 (1965); J. Mol. Spectrosc. **50**, 424 (1974).

[43]R. N. Zare, A. L. Schmeltekopf, W. J. Harrop, and D. L. Albritton, J. Mol. Spectrosc. **46**, 37 (1973).

[44]D. L. Albritton, W. J. Harrop, A. L. Schmeltekopf, R. N. Zare, and E. L. Crow, J. Mol. Spectrosc. **46**, 67 (1973).

[45]Ch. Jungen and O. Atabek, J. Chem. Phys. **56**, 5584 (1977).

[46]M. Rothschild, H. Egger, R. T. Hawkins, J. Bokor, H. Pummer, and C. K. Rhodes, Phys. Rev. A **23**, 206 (1981).

[47]E. E. Marinero, C. T. Rettner, and R. N. Zare, Phys. Rev. Lett. **48**, 1323 (1982).

[48]E. E. Eyler and F. M. Pipkin, J. Chem. Phys. **77**, 5315 (1982).

[49]G. Herzberg and Ch. Jungen, J. Chem. Phys. **77**, 5876 (1982).

Appendix A. Band Systems of D_2 Observed in Emission by Dieke

EF-2B   EF $^1\Sigma_g^+$ — B(2p) $^1\Sigma_u^+$ Continued

N"	SYM	P-BRANCH	I5	O-C	R-BRANCH	I5	O-C
				0- 4 BAND			
0	p	---			---		
1	o				5249.78	57	-5
2	p	5151.30	57	-6	5310.82	61	-10
3	o	5163.77	63	-3	5386.25	64	-3
4	p	5190.98	58	2	5475.71	58	25
5	o	5232.86	64	0	5578.19	57	-13
6	p	5289.22	57	3	---		
7	o	5359.84	59	-12	---		
				0- 5 BAND			
0	p	---			4333.19	28	6
1	o	4284.37	32	6	4380.37	37	5
2	p	4282.56*	40	-25	4442.32	32	-5
3	o	4296.64	43	0	4519.17	45	0
4	p	4325.77	36	4	4610.41	36	4
5	o	4369.96	44	9	4715.40	48	9
6	p	4429.19	38	16	---		
				3- 0 BAND			
0	p	10496.49	78	1	10546.87	67	1
1	o	10487.83	74	2	10588.38	94	2
2	p	10490.27	90	3	10640.57	86	1
3	o	10503.87*	74	-1	10703.18	99	1
4	p	10528.64	82	5	10776.00	74	3
5	o	10564.31	64	1	10859.06	91	3
6	p	10611.32	69	1	10951.69	57	0
7	o	10669.06	63	7	11053.77	33	7
8	p	10737.43	61	7	11164.91	22	6
9	o	10816.25*	52	8	11284.83	30	10
10	p	10905.36*	43	8	11413.21*	32	-3
11	o	11004.32*	28	-8	---		

EF-2B   EF $^1\Sigma_g^+$ — B(2p) $^1\Sigma_u^+$

N"	SYM	P-BRANCH	I5	O-C	R-BRANCH	I5	O-C
				0- 0 BAND			
0	p	8808.26	46	1	8860.05	44	1
1	o	8800.99	46	0	8904.27-	62	-1
2	p	8806.15	57	-1	8960.56	60	1
3	o	8823.88	51	1	9028.67	67	3
4	p	8854.08	62	2	9108.39	64	2
5	o	8896.74	57	2	9199.48	64	-4
6	p	8951.78	65	-2	9301.66	52	4
7	o	9018.99	59	0	9414.61	56	4
8	p	9098.28	63	7	9538.01	45	6
9	o	9189.34	51	1	9671.56	45	0
10	p	9292.16*	64	3	9814.82	28	-2
11	o	9406.00*	34	11	9967.39	35	9
12	p	9530.87*	39	0	---		
				0- 1 BAND			
2	p	---			---		
3	o	---			---		
4	p	---			---		
5	o	---			---		
6	p	---			8491.40	24	5
7	o	---			8619.82	24	-1
8	p	---			---		
9	o	---			8907.89	38	-2
10	p	---			---		
				0- 3 BAND			
0	p	6040.34	63	-3	---		
1	o	6036.84	65	-5	---		
2	p	6047.76	75	-1	---		
3	o				---		

EF-2B EF $^1\Sigma_g^+$ — B(2p) $^1\Sigma_u^+$ *Continued*

N"	SYM	P-BRANCH	I5	O-C	R-BRANCH	I5	O-C
					3- 6 BAND		
0	P	5119.77	51	3	5211.68	60	6
1	O	5117.81	51	3	5270.52	55	-1
2	P	5130.26	62	4	5343.22	61	7
3	O	5157.01	53	2	---		
4	P	5198.02	71	9	5528.36	58	-1
5	O	5252.73	45	1	---		
					3- 7 BAND		
0	P	---			4330.18	25	8
1	O	4282.56*	40	12	4375.50	40	6
2	P	4296.27	48	11	4435.12	37	-7
3	O	4324.60	39	-2	4509.13	48	4
4	P	4367.65	47	3	---		
5	O				4698.03	44	-3
					6- 0 BAND		
0	P	12088.48	91	0	12137.32	77	0
1	O	12078.29	89	2	12175.65*	92	-4
2	P	12077.62	93	5	12223.21	83	2
3	O	12086.52	88	1	12279.47	89	4
4	P	12104.87	91	2	12340.79	68	-1
5	O	12129.13	75	0	12418.46	74	4
6	P	12170.73	68	3	12499.61	50	4
7	O	12216.96	61	-1	12588.25	50	-4
8	P	12271.91	61	4	12682.57	29	0
9	O	12333.87*	43	-2	12783.02	25	-1
10	P	12403.53		-3	12887.61	38	4
11	O	12478.80*	47	7	---		
					6- 1 BAND		
0	P	11146.86	53	-3	11194.99	44	2
1	O	11138.09	47	0	11234.11	60	-1
2	P	11139.57	57	-1	11283.03	59	2
3	O	11151.28	45	1	11341.43	61	-1
4	P	11173.08*	54	2	11405.57	56	3
5	O	11201.37	33	3	11486.65	57	2
6	P	11247.55	37	5	11571.84	44	3
7	O	11298.81	27	2	11665.07	42	6
8	P	11359.31*	32	10	11764.40	29	-1
9	O	11427.07	21	0	11870.46		1
10	P	11503.00	23	13	11980.78		-3
11	O	11581.94	36	4	---		

EF-2B EF $^1\Sigma_g^+$ — B(2p) $^1\Sigma_u^+$ *Continued*

N"	SYM	P-BRANCH	I5	O-C	R-BRANCH	I5	O-C
					3- 1 BAND		
0	P	---			9604.56	0	5
1	O	9554.89	46	0	9646.82	48	5
2	P	9547.67	45	4	9700.45		7
3	O	9552.26	56	3	9765.21	45	5
4	P	9568.66	50	2	9840.71	25	-2
5	O	9596.87	39	7	9927.28	43	4
6	P	9636.61	50	8	10023.96	35	6
7	O	9688.14	43	3	10130.55	52	5
8	P	9750.95*	36	7	10246.72		5
9	O	9824.73	36	3	10372.11	18	4
10	P	9909.40	27	5	10506.45		3
11	O	10004.60	35	1	---		
12	P	10107.59	27	2	---		
					3- 2 BAND		
0	P	---			8681.57	22	-8
1	O	8626.53	15	-11	8724.56	21	4
2	P	8633.13	19	3	8779.46*	45	7
3	O	8652.01	15	6	8846.23	38	20
4	P	8683.23	18	9	8924.10	25	6
5	O	---			9013.56		-2
6	P	8782.07	19	3	9113.77	45	-2
7	O	---					
					3- 5 BAND		
0	P	---			6064.44	69	4
1	O	5969.64	62	1	---		
2	P	5980.76	70	4	---		
3	O	6005.73	65	-1	---		
4	P	6044.50	72	10	---		
5	O						

EF-2B EF $^1\Sigma_g^+$ − B(2p) $^1\Sigma_u^+$ *Continued*

N'	SYM	P-BRANCH	I5	O-C	R-BRANCH	I5	O-C
				6- 8 BAND			
0	P	---			---		
1	Q	---			---		
2	P	5053.86	49	-5	5198.81	53	-2
3	Q	5065.70	43	5	5267.53	60	2
4	P	---			---		
5	Q	5129.71	65	6	5443.35	65	13
6	P	5177.86	53	4	---		
				6- 9 BAND			
0	P	4252.02	32	0	---		
1	Q	4250.99	35	1	---		
2	P	4263.90	46	-5	4339.27	37	4
3	Q	4290.85	36	-2	4395.72	30	-18
4	P	4331.38	43	-4	4465.75	44	-6
5	Q				---		
				7- 1 BAND			
0	P	---			---		
1	Q	---			---		
2	P	---			---		
3	Q	11333.28	25	3	11465.09	18	0
4	P	11278.51	16	-14	11446.96	18	-5
5	Q	11215.02		15	11419.06	21	-1
6	P				11376.06	17	-9
				7- 2 BAND			
0	P	---			---		
1	Q	---			---		
2	P	---			---		
3	Q	10416.50	24	-5	10543.92	18	-8
4	P	10365.06	20	7	10527.89	28	1
5	Q	10304.74*	49	-2	10502.36	43	-2
6	P	10230.89*	24	-5	10462.53*	38	4
7	O						

EF-2B EF $^1\Sigma_g^+$ − B(2p) $^1\Sigma_u^+$ *Continued*

N"	SYM	P-BRANCH	I5	O-C	R-BRANCH	I5	O-C
				6- 2 BAND			
0	P	10224.63	69	-1	10272.10	52	-1
1	Q	10217.09	64	-1	10311.88	71	3
2	P	10220.46	73	3	10362.04	63	2
3	Q	10234.62	65	4	10422.30	72	1
4	P	10259.42	68	2	10488.91	36	6
5	Q	10291.28	27	5	10573.03	59	6
6	P	10341.46	53	3	10661.74	45	4
7	Q	10397.19	33	5	10758.96	41	2
8	P	10462.53*	38	2	10862.78	23	4
9	Q	10535.71*	31	4	10973.71	26	6
10	P						
11	O	10617.35	18	9	---		
				6- 3 BAND			
0	P	9320.58	39	0	9367.68*	36	17
1	Q	9314.19	38	2	9407.80	42	1
2	P	9319.37	66	19	9459.11	41	2
3	Q	9335.61	43	-1	9521.06	45	2
4	P	9363.12*	54	4	9589.86	42	-1
5	Q	9398.16	49	2	9676.73	35	8
6	P	9452.01	45	12	9768.63	28	2
7	Q	9511.80	36	2	9869.47	27	7
8	P	9581.59	41	7	9977.54	21	16
9	O				---		
				6- 7 BAND			
0	P	5875.56	61	0	5962.79	65	2
1	Q	5872.85	59	-5	6017.80	60	-2
2	P	5883.49	68	0	---		
3	Q	5907.11	69	-14	---		
4	P	5943.93	65	5	---		
5	O				---		

EF-2B   EF $^1\Sigma_g^+$ - B(2p) $^1\Sigma_u^+$ *Continued*

N"	SYM	P-BRANCH	I5	O-C	R-BRANCH	I5	O-C
			9- 2 BAND				
0	P	11679.81	20	2	11723.87	22	3
1	Q	---			11756.76	32	-1
2	P	11668.82	23	2	11795.53	32	0
3	Q	11665.38	28	-1	11836.64*	59	6
4	P	11668.09*	42	0	11867.32	44	4
5	Q	11673.72*	46	3	11858.14		1
6	P	11669.74*	51	8	---		
7	Q	11626.57	47	-2	---		
			9- 3 BAND				
0	P	10775.53*	73	0	10819.20	57	-4
1	Q	10765.92*	73	2	10852.70	78	-1
2	P	10764.10	82	0	10892.62	58	2
3	Q	10769.06	59	5	10935.33	53	0
4	P	10777.40	58	3	10968.23	20	-7
5	Q	10776.48	51	9	---		
			9- 4 BAND				
0	P	9888.97	34	-1	9932.13	28	1
1	Q	9880.36	42	-1	9966.13	52	-3
2	P	9880.11	50	-2	10007.04	41	-3
3	Q	9887.11	36	0	10051.35	54	-1
4	P	9897.90	43	-4	10086.29	31	-1
5	Q	9900.05*	36	2	---		
			9- 5 BAND				
0	P	9019.48	33	-1	9062.14	29	0
1	Q	9011.85	34	-3	9096.69	40	4
2	P	9012.99	45	2	9138.51*	31	-1
3	Q	9021.87	39	-1	9184.22	50	2
4	P	9034.80	56	-15	9221.09	36	2
5	Q	9039.90	41	3	---		

EF-2B   EF $^1\Sigma_g^+$ - B(2p) $^1\Sigma_u^+$ *Continued*

N"	SYM	P-BRANCH	I5	O-C	R-BRANCH	I5	O-C
			7- 3 BAND				
0	P	---			---		
1	Q	---			---		
2	P	---			---		
3	Q	9517.61	32	3	9626.71	29	8
4	P	9468.68	29	1	9603.33	27	-7
5	Q	9411.61	19	-6	9566.17	32	0
6	P	9341.45		4	---		
7	Q	---			---		
			9- 0 BAND				
0	P	13543.42	50	-1	13589.04	48	-1
1	Q	13530.00	74	0	13620.62	50	-1
2	P	13522.50	50	1	13656.70	50	0
3	Q	13520.04	50	-16	13693.74	2	-1
4	P	13518.98	48	1	13719.21	50	0
5	Q	13507.57	39		13703.57	33	-1
6	P	13455.87			---		
7	Q	---			---		
			9- 1 BAND				
0	P	12601.83	74	-1	12646.68	65	-2
1	Q	12589.81	74	-1	12679.01	74	-1
2	P	12584.47		-1	12716.47*	74	-5
3	Q	12584.74*	74	-4	12755.70	74	-1
4	P	12587.37*	74	2	12783.97	57	0
5	Q	12579.79*	59	2	12771.82	49	3
6	P	12532.63	51	-3	12867.02	17	3
7	Q	12593.95	39	-2	12921.46*	37	1
8	P	12615.64	17	-1	---		
9	Q	---			---		
10	P	12693.21	14	-18	13061.04	16	17
11	Q	---			---		

EF-2B $EF\ ^1\Sigma_g^+ - B(2p)\ ^1\Sigma_u^+$ Continued

N"	SYM	P-BRANCH	I5	O-C	R-BRANCH	I5	O-C
		10- 3 BAND					
0	P	11125.05	25	-3	11149.89*	23	-6
1	O	11096.60	22	-1	11146.49*	31	-2
2	P	11057.90	27	0	11133.47	25	-7
3	O	11010.02*		-3	11114.02	31	-2
4	P	10956.11*	60	3	11100.10	30	-6
5	O	10908.40	53	-3	11120.28	33	3
6	P	10895.59	62	10	---		
7	O				---		
		10- 5 BAND					
0	P	9369.07*	68	5	9392.90	23	5
1	O	9342.79	50	26	9390.41	22	-4
2	P	9306.79	29	2	9379.40	23	-6
3	O	---			9363.12*	54	21
4	P	9213.67	27	1	9353.05	22	2
5	O				9377.83*	93	0
		11- 0 BAND					
0	P				14534.05		-1
		11- 1 BAND					
0	P	13563.26*	48	-2	13591.73		2
1	O	13534.85	48	2	13591.46		-1
2	P	13496.93	54	0	13580.44*	50	0
3	O	13448.73	46	13	13558.04*	48	2
4	P	13389.66	52	0	13523.72	48	-4
5	O	13319.55	38	-1	13477.99	26	4
6	P	13238.84	31	2	---		
7	O				---		
		11- 2 BAND					
0	P	12640.85*	59	-18	12668.86	52	-1
1	O	12613.82	56	-2	12669.21	59	-1
2	P	12577.78*	65	7	12659.48*	56	3
3	O	12531.96		5	12638.89	54	0
4	P	12476.04*	76	4	12607.02*	49	-5
5	O	12409.44	55	-1	12564.29	40	0
6	P	12332.70	58	-5	---		
7	O				---		

EF-2B $EF\ ^1\Sigma_g^+ - B(2p)\ ^1\Sigma_u^+$ Continued

N"	SYM	P-BRANCH	I5	O-C	R-BRANCH	I5	O-C
		9- 9 BAND					
0	P	5707.12	48	15	---		
1	O	5702.46	65	-25	---		
2	P	5708.86	64	-1	5829.41	49	0
3	O	---			5880.10	45	0
4	P	---			---		
5	O	5745.72	61	1	---		
		10- 0 BAND					
0	P	13892.94		-4	---		
1	O	---			---		
2	P	13816.26*	49	-3	13897.56*	52	-8
3	O	13760.98*	51	2	13872.45		2
4	P	13697.84		-1	13851.01	35	-6
5	O	---			13862.03	47	1
6	P	13614.32	50	2	---		
7	O				---		
		10- 1 BAND					
0	P	12951.38	23	-1	12972.79	20	-3
1	O	12920.53	18	0	12957.57*	25	1
2	P	12878.29	26	1	12934.26	22	-16
3	O	12825.93*	62	2	12915.83	47	0
4	P	12766.04	36	-1	12930.25	55	2
5	O	12711.62	56	1	---		
6	P	12691.09		-1	---		
7	O						
		10- 2 BAND					
0	P	12029.15	58	1	12054.54	46	-1
1	O	11999.53	54	-1	12050.56	59	-1
2	P	11959.12	61	-3	12036.39	54	-8
3	O	11908.99*		-4	12015.22	58	-7
4	P	11852.39	60	-1	11999.13*	58	-1
5	O	11801.51	54	-1	12016.59	31	2
6	P	11785.04	43	1	---		
7	O				---		

EF-2B EF $^1\Sigma_g^+$ – B(2p) $^1\Sigma_u^+$ Continued

N"	SYM	P-BRANCH	I5	0-C	R-BRANCH	I5	0-C
				12- 2 BAND			
0	P	13014.87	56	1	13050.14*	55	0
1	O	12995.15*	64	2	13065.41	64	-1
2	P	12974.00*	56	2	13078.36	55	-1
3	O	12950.95	60	4	13087.52	59	3
4	P	12924.65	50	5	13090.05	51	7
5	O	12892.42	50	6	13082.09	51	6
6	P	12850.53	50	4	13056.38*	47	8
7	O	12791.82	25	8	---		
				12- 3 BAND			
0	P	12110.81	67	1	12145.51	59	-3
1	O	12092.22	65	2	12161.34	67	0
2	P	12072.74	72	1	12175.23*	64	-19
3	O	12051.92*	63	-1	12186.26	60	2
4	P	12028.31	62	3	12191.00	35	0
5	O	11999.13*	53	-14	12185.76	32	5
6	P	11961.05	37	10	12163.20	26	1
7	O	11906.37	20	-1	---		
				12- 4 BAND			
0	P	11224.26	45	1	11258.46	37	4
1	O	11206.67	40	0	11274.80	57	1
2	P	11188.75*	53	-1	11289.89	61	0
3	O	11169.95	31	2	11302.27	57	0
4	P	11148.86	38	1	11309.05	34	5
5	O	11122.78	27	5	11306.30	37	2
6					11286.76*	18	9
				12- 5 BAND			
0	P	10354.75	48	1	10388.47	35	3
1	O	10338.13	44	1	10405.28	50	0
2	P	10321.64	57	4	10421.36	40	2
3	O	10304.74*	49	4	10435.15	41	4
4	P	10285.96	38	10	10443.80	23	3
5	O	10262.62	23	5	10443.38	20	9
6	P	10230.89*	24	8	---		

EF-2B EF $^1\Sigma_g^+$ – B(2p) $^1\Sigma_u^+$ Continued

N"	SYM	P-BRANCH	I5	0-C	R-BRANCH	I5	0-C
				11- 3 BAND			
0	P	11736.79	32	-18	11764.21	30	-4
1	O	11710.90	33	-1	11765.14	46	-2
2	P	11676.54	46	-1	11756.55	32	13
3	O	11633.11	35	18	11737.64	36	1
4	P	11579.67	38	-1	11708.08	32	-1
5	O	11516.32	25	-4	11668.09*	42	12
6	P	11443.28	23	7	---		
				11- 4 BAND			
0	P	10850.22	44	-20	10877.16	33	3
1	O	10825.34	42	-4	10878.60	45	-1
2	P	10792.54*	57	-4	10871.10*	39	21
3	O	10751.04	39	11	10853.63	40	-4
4	P	10700.21	46	-1	10826.09*	35	0
5	O	10639.81		-1	10788.55	26	1
6	P	10570.15	28	-3	---		
				12- 0 BAND			
0	P	14878.75	51	5	14915.39	47	4
1	O	14856.30	51	0	14929.27	51	3
2	P	14831.16	51	4	14939.54	47	2
3	O	14802.85	51	1	14944.67	47	4
4	P	14770.09	51	4	14941.91	37	0
5	O	14730.32	47	6	14927.40*	37	-8
6	P	14679.79	47	3	---		
7	O	14611.54	28	-3	---		
				12- 1 BAND			
0	P	13937.11	61	0	13973.05	53	5
1	O	13916.13	61	-1	13987.65*	64	0
2	P	13893.12	74	1	13999.38	55	4
3	O	13867.63	59	3	14006.65*	61	3
4	P	13838.31	62	5	14006.65*	61	-2
5	O	13802.49	48	2	13995.75	46	6
6	P	13756.58	48	2	13966.46*	15	5
7	O	13693.43		4	---		

EF-2B EF $^1\Sigma_g^+$ – B(2p) $^1\Sigma_u^+$ Continued

N"	SYM	P-BRANCH	I5	O-C	R-BRANCH	I5	O-C
			13- 4 BAND				
0	P				11698.39*	38	-1
1	O	11669.97	40	-1	11703.66	32	-7
2	P	11646.59	36	-6	11703.94	23	-4
3	O	11617.66		-4	11700.76	18	13
4	P	11583.99	29	-3	---		
5	O	11547.21	28	0	---		
			13- 5 BAND				
0	P				10828.39	49	-3
1	O	10800.49*	59	2	10834.19	70	-3
2	P	10778.10	58	0	10835.42	57	-1
3	O	10750.54	76	0	10833.52	66	5
4	P	---			---		
5	O	10684.33	67	11	---		
			13- 6 BAND				
0	P				9981.42	27	-2
1	O	9947.72	31	3	---		
2	P	9926.36	17	11	9983.07*	24	10
3	O	9900.05*	36	-1	---		
4	P	9870.06		2	---		
5	O	9837.80	24	5	---		
			13- 7 BAND				
0	P				9138.51*	31	-6
1	O	---		-4	9145.25	22	-1
2	P	---		-3	9148.24	21	0
3	O	9090.87	19	13	9148.94	23	3
4	P	9065.95	25	6	---		
5	O	9037.80	23		---		
	9007.50	25					
			14- 1 BAND				
0	P				14941.54	37	0
1	O	14911.16	51	3	14945.25	42	-6
2	P	14884.64	42	-2	14941.06	42	13
3	O	14850.71	47	-6	14928.44	33	3
4	P	14809.24	47	5	---		
5	O	14760.04*	47	-1	14879.55*	47	4
6	P	14703.44*	51	-10	---		
7	O	14640.40	37	2	---		

EF-2B EF $^1\Sigma_g^+$ – B(2p) $^1\Sigma_u^+$ Continued

N"	SYM	P-BRANCH	I5	O-C	R-BRANCH	I5	O-C
			12- 6 BAND				
0	P	---			---		
1	O	---			---		
2	P	9471.19	29	9	9584.63	20	2
			13- 0 BAND				
0	P				15355.32	28	-1
1	O	15324.46	37	3	15358.19	37	-1
2	P	15296.25	47	-3	15353.58	28	-3
3	O	15260.05*	42	-1	15343.04	37	5
4	P	15216.90	37	-3	---		
			13- 1 BAND				
0	P				14412.93	5	-5
1	O	14382.86	14	2	14416.59*	51	0
2	P	14356.10	33	0	14413.43	33	0
3	O	14322.07		2	14405.02*	42	4
4	P	14281.67		-2	---		
5	O	14236.68		6	---		
			13- 2 BAND				
0	P				13490.10	34	-2
1	O	13460.61	45	2	13494.32	45	-2
2	P	13435.10	40	-1	13492.43	30	-1
3	O	13402.89	46	-3	13485.90		5
4	P	13365.00	37		---		
5	O	13322.93*	62	-3	---		
			13- 3 BAND				
0	P				12585.46	50	-6
1	O	12556.51	55	-2	12590.23	59	-5
2	P	12532.11*	60	-7	12589.50	56	-1
3	O	12501.64	62	-3	12584.74*	74	14
4	P	12465.96	68	-6	---		
5	O	12426.67	69	3	---		

EF-2B   EF $^1\Sigma_g^+$ – B(2p) $^1\Sigma_u^+$ Continued

N"	SYM	P-BRANCH	I5	O-C	R-BRANCH	I5	O-C
				14- 6 BAND			
0	P	10476.04	52	6	10503.70		10
1	O	10454.86	47	5	10510.16	46	0
2	P	10428.75	55	-1	10511.14*	41	6
3	O	10397.58	41	4	—		
4	P	10361.22	47	4	10496.13	40	4
5	O	10319.75	31	2	10480.69	35	5
6	P	10273.80	28	5	—		
7	O				—		
				14- 7 BAND			
0	P	—			—		
1	O	—			—		
2	P	9594.68	21	-2	9673.89	22	-9
3	O	—			9675.91	21	17
4	P	—			—		
5	O	9530.87*	39	0	—		
				15- 0 BAND			
0	P				16364.99		-8
				15- 1 BAND			
0	P	15390.76*	50	-16	15422.69*	32	-3
1	O	15365.84	47	0	15429.30*	34	2
2	P	15334.73	51	-1	15429.30*	34	-5
3	O	15297.58	47	-3	15422.69*	32	1
4	P	15254.16*	51	-16	15408.86	27	18
5	O	15204.59	37	11	15387.09		12
6	P	15147.97	33	13	—		
7	O				—		
				15- 2 BAND			
0	P	14468.77*	51	10	14499.87	47	1
1	O	14444.86	51	1	14507.02	51	-1
2	P	14415.64*	51	3	14508.37	51	
3	O	—			14503.54	51	-1
4	P	14380.98		6	14492.17	42	18
5	O	14340.71	47	5	14473.46	42	15
6	P	14294.53	23	16	—		
7	O	14241.91		14	—		

EF-2B   EF $^1\Sigma_g^+$ – B(2p) $^1\Sigma_u^+$ Continued

N"	SYM	P-BRANCH	I5	O-C	R-BRANCH	I5	O-C
				14- 2 BAND			
0	P	13988.88	50	0	14018.69	43	-1
1	O	13963.66	50	-1	14022.81*	74	-25
2	P	13931.60	56	-4	14019.95	46	-1
3	O	13892.53	49	3	14009.29	29	-1
4	P	13846.42*	50	3	13991.12	33	7
5	O	13793.45	37	2	13965.90	30	5
6	P	13734.31	39	0	—		
				14- 3 BAND			
0	P	13084.83	36	1	13114.15*	45	7
1	O	13060.75	36	1	13118.96*	48	-4
2	P	13030.34	49	-5	13117.00	46	-1
3	O	12993.50	37	-2	13108.06	48	3
4	P	12950.11	47	4	13092.06	36	-1
5	O	12900.34	30	0	13069.53	48	0
6	P	12844.86	32	9	—		
				14- 4 BAND			
0	P	12198.25	63	-2	12227.00	58	4
1	O	12175.23*	64	2	12232.41		-4
2	P	12146.33	69	-9	12231.49	58	1
3	O	12111.50	63	-2	12224.05	60	-1
4	P	12070.65	62	1	12210.10*	51	3
5	O	12023.82	47	2	12190.09	43	-1
6	P	11971.71	47	-3	—		
				14- 5 BAND			
0	P	11328.76	30	0	11356.93*	46	-5
1	O	11306.69	0	3	11362.92*	50	-2
2	P	11279.34	0	8	11362.92*	50	-1
3	O	11246.31	24	2	11356.93*	46	3
4	P	11207.75	26	10	11344.87	29	3
5	O	11163.69	18	5	11327.13	31	2
6	P	11114.74	22	11	—		

EF-2B   EF $^1\Sigma_g^+$ – B(2p) $^1\Sigma_u^+$ Continued

N"	SYM	P-BRANCH	I5	O-C	R-BRANCH	I5	O-C
15- 7 BAND							
0	p	10119.62	48	3	10148.28*	68	-3
1	o	10100.65	47	0	10157.95*	31	0
2	p	10078.67*	65	0	10164.17	23	1
3	o	10053.59	50	0	10166.62	26	1
4	p	10025.15	50	1	10164.76	13	0
5	o	9992.91	29	5	10157.95*	31	16
6	p	9956.33	31	13			
7	o						
16- 1 BAND							
0	p	15877.52*	35	-2	15908.33	9	-4
1	o	15851.43	18	-6	15913.25	33	17
2	p	15818.52	27	-2	15910.92	28	0
3	o	15779.20	21	2	15902.20	37	-3
4	p	15733.88	26	1	15887.36	33	3
5	o	15683.15	21	2	15866.59	25	0
6	p	15627.48		2		22	
7	o						
16- 2 BAND							
0	p	14955.28	37	-1	14985.47	9	-4
1	o	14930.48	9	-2	14990.83	33	0
2	p	14899.42	33	1	14989.94	28	1
3	o	14862.55	28	6	14983.11	37	1
4	p	14820.24	37	3	14970.69	33	5
5	o	14773.09	37	7	14952.98	33	5
6	p	14721.40		1			
7	o						
16- 3 BAND							
0	p	14051.22*	42	-1	14080.81	34	-1
1	o	14027.53*	42	-4	14086.79	44	0
2	p	13998.18	48	2	14087.00	38	2
3	o	13963.53		2	14081.87	23	0
4	p	13923.92	43	3	14071.67*		1
5	o	13879.94	27	1	14056.64	21	3
6	p	13832.00*	31	15			
7	o						

EF-2B   EF $^1\Sigma_g^+$ – B(2p) $^1\Sigma_u^+$ Continued

N"	SYM	P-BRANCH	I5	O-C	R-BRANCH	I5	O-C
15- 3 BAND							
0	p	13564.59	30	-2	13595.30*		4
1	o	13541.87	24	-5	13603.10*	48	13
2	p	13514.37*	40	1	13605.24*	46	-19
3	o	13481.91	20	-3	13602.37	21	7
4	p	13444.32	18	-2			
5	o	13401.34	25	6	13577.05	27	6
6	p	13352.37	16	14			
7	o						
15- 4 BAND							
0	p	12678.04	53	-2	12708.14	47	0
1	o	12656.38*	53	-1	12716.47*	74	5
2	p	12630.35	58	-4	12719.90*	51	0
3	o	12599.92	52	-2	12718.29	53	4
4	p	12564.88*	55	-3	12711.12	28	1
5	o	12524.86	42	12	12697.55*	51	-1
6	p	12479.27	54	7			
7	o						
15- 5 BAND							
0	p	11808.55	46	0	11838.15	31	-1
1	o	11787.84	44	0	11846.89	42	-2
2	p	11763.23	56	0	11851.26*	35	9
3	o	11734.70	38	-1	11851.26*	35	9
4	p	11702.00	40	8	11845.82	14	4
5	o	11664.67	39	9	11834.68	15	1
6	p	11622.21	36	12			
7	o						
15- 6 BAND							
0	p	10955.81	49	4	10984.97	37	-1
1	o	10936.00	47	1	10994.15	53	2
2	p	10912.75	63	2	10999.51	43	1
3	o	10886.00	47	4	11000.66*	56	-1
4	p	10855.48	56	3	10997.20	35	17
5	o	10820.78	39	11	10988.22*	54	12
6	p	10781.35	39	14			
7	o						

EF-2B   EF $^1\Sigma_g^+$ − B(2p) $^1\Sigma_u^+$ *Continued*

17- 2 BAND

N"	SYM	P-BRANCH	I5	O-C	R-BRANCH	I5	O-C
0	P				15493.19		-3
1	Q	15463.52	24	1	15497.44		-4
2	P	15438.20	23	-3	15494.63		4
3	Q	15406.03	33	8	15484.81		3
4	P	15367.23	37	9	15468.22		2
5	Q	15321.98	5	3	---		
6	P	15270.61		-4	---		
7	Q	15213.79	33		---		

17- 3 BAND

N"	SYM	P-BRANCH	I5	O-C	R-BRANCH	I5	O-C
0	P	14559.44	51	-1	14588.54	47	-8
1	Q	14535.25	51	-3	14593.37		-5
2	P	14504.77	51	-4	14591.69*	51	3
3	Q	14468.15	47	-2	14583.55	51	2
4	P	14425.61	47	4	14569.24	42	2
5	Q	14377.50	23	-1	14549.03	51	-2
6	P	14324.43	23	14	---		
7	Q				---		

17- 4 BAND

N"	SYM	P-BRANCH	I5	O-C	R-BRANCH	I5	O-C
0	P	13672.94*	48	4	13701.37	21	-13
1	Q	13649.74	39	-1	13706.88	50	-1
2	P	13620.93		9	13706.19	18	6
3	Q	13586.20		3	13699.74	68	8
4	P	13546.16	21	2	13687.28	22	6
5	Q	13501.01	12	6	---		
6	P	13451.31	22	5	---		
7	Q				---		

17- 5 BAND

N"	SYM	P-BRANCH	I5	O-C	R-BRANCH	I5	O-C
0	P	12803.38	47	-1	12831.51*	50	-1
1	Q	12781.17	46	-3	12837.32	45	-4
2	P	12753.66	53	-2	12837.63	48	5
3	Q	12720.94	47	0	12832.45	35	5
4	P	12683.23	49	8	12822.03	35	4
5	Q	12640.85*	59	6	12806.74		11
6	P	12594.23	36	8	---		
7	Q				---		

EF-2B   EF $^1\Sigma_g^+$ − B(2p) $^1\Sigma_u^+$ *Continued*

16- 4 BAND

N"	SYM	P-BRANCH	I5	O-C	R-BRANCH	I5	O-C
0	P	13164.64	47	-4	13193.74	35	-5
1	Q	13142.00		-4	13200.22	26	0
2	P	13114.15*	45	1	13201.49	32	2
3	Q	13081.52*	32	4	13197.86	24	-2
4	P	13044.50	36	7	13189.69	26	3
5	Q	13003.46*	51	-1	13177.20		2
6	P	12958.81*	34		---		
7	Q				---		

16- 5 BAND

N"	SYM	P-BRANCH	I5	O-C	R-BRANCH	I5	O-C
0	P	12295.14	61	-3	12323.78	54	-3
1	Q	12273.46	60	-3	12330.72*	68	1
2	P	12247.08*	67	5	12332.94		-2
3	Q	12216.30	59	2	12330.72*	68	0
4	P	12181.40*	91	-7	12324.47	53	4
5	Q	12143.27	48	4	12314.28	39	9
6	P				---		

16- 7 BAND

N"	SYM	P-BRANCH	I5	O-C	R-BRANCH	I5	O-C
0	P	10606.22	51	1	10633.96	43	0
1	Q	10586.29	49	-1	10641.76	58	1
2	P	10562.49	58	2	10645.77	53	4
3	Q	10535.18	44	2	10646.19	55	3
4	P	10504.73	30	4	10643.36	39	5
5	Q	10471.53	35	2	10637.46	39	5
6	P	10435.87	35	5	---		
7	Q				---		

17- 1 BAND

N"	SYM	P-BRANCH	I5	O-C	R-BRANCH	I5	O-C
0	P	16385.82*	46	6	16419.82		9
1	Q	16359.04*		-16	16415.77		19
2	P	16325.28		9	16403.83		-8
3	Q	16283.95	17	11	16385.11		22
4	P	16235.42		-13	16359.04*		1
5	Q	16180.84	14	15	---		
6	P	16119.99		9	---		
7	Q				---		

EF-2B EF $^1\Sigma_g^+$ − B(2p) $^1\Sigma_u^+$ *Continued*

N"	SYM	P-BRANCH	I5	O-C	R-BRANCH	I5	O-C
				18- 2 BAND			
0	P	15963.75	24	-3	15993.71		3
1	O	15938.64	21	-3	15998.34	23	1
2	P	15906.89	28	-2	15995.98		0
3	O	15868.56	24	2	15986.61	21	4
4	P	15823.70*	29	2	15970.01		1
5	O	15772.41	19	3	15946.26	21	-2
6	P	15714.83		9	---		
7	O				---		
				18- 3 BAND			
0	P	15059.72	33	0	15089.04	28	-4
1	O	15035.74	33	0	15094.26	37	-1
2	P	15005.66	42	0	15093.05	37	0
3	O	14969.55	37	-1	15085.32*	37	0
4	P	14927.40*	37	4	15071.01	28	-1
5	O	14879.32	33	3	15050.00	23	4
6	P	14825.34	33	14	---		
7	O				---		
				18- 4 BAND			
0	P	14173.16	37	-1	14201.99		3
1	O	14150.26*	41	5	14207.69		-3
2	P	14121.68	37	-1	14207.49*		-3
3	O	14087.53	46	-3	14201.24		-1
4	P	14047.98	36	5	14189.00	21	-2
5	O	14002.82*	52	7	14170.57	18	4
6	P	13952.14	33	-3	---		
7	O				---		
				18- 5 BAND			
0	P	13303.65	28	-1	13331.97	22	-1
1	O	13281.66		0	13338.19	36	-2
2	P	13254.55	35	2	13338.95	29	-2
3	O	13222.33		0	13334.16		-1
4	P	13184.99	28	5	13323.79	30	0
5	O	13142.50*	55	-9	13307.67	28	13
6	P	13095.20	21	14	---		
7	O				---		

EF-2B EF $^1\Sigma_g^+$ − B(2p) $^1\Sigma_u^+$ *Continued*

N"	SYM	P-BRANCH	I5	O-C	R-BRANCH	I5	O-C
				17- 6 BAND			
0	P	11950.64	54	3	11978.31	54	-3
1	O	11929.34	50	-1	11984.56	37	-2
2	P	11903.17	59	-1	11985.76	48	3
3	O	11872.22	47	3	11981.90*	30	0
4	P	11836.64*	59	-4	11973.24	22	0
5	O	11796.92	31	4	11960.20		4
6	P	11753.32	31	5	---		
7	O				---		
				17- 7 BAND			
0	P	11114.44	18	1	11141.67	17	0
1	O	11094.01	17	0	11148.39	23	-1
2	P	11069.13	26	1	11150.48*	23	9
3	O	11039.86	18	4	11147.89	23	5
4	P	11006.43	35	6	11140.92	23	5
5	O	10969.09	27	2	11129.89	23	4
6	P				---		
				17- 8 BAND			
0	P	10294.61	35	3	10321.46	30	-2
1	O	10274.97	33	-5	10328.53	43	-2
2	P	10251.26	46	-2	10331.39	33	-1
3	O	10223.63	35	-2	10330.05	38	1
4	P	10192.19	35	5	10324.70	26	0
5	O	10157.20	21	3	10315.68	26	6
6	P	10119.14	47	6	---		
7	O				---		
				18- 1 BAND			
0	P				---		
1	O				---		
2	P	16826.04	17	0	---		
3	O						

EF-2B   EF $^1\Sigma_g^+$ — B(2p) $^1\Sigma_u^+$ Continued

N"	SYM	P-BRANCH	I5	O-C	R-BRANCH	I5	O-C
				19- 2 BAND			
0	P	16455.62	11	2	16485.35		4
1	O	16430.35	14	5	16489.71	21	5
2	P	16398.29	21	5	16487.07	12	6
3	O	16359.58*	32	1	16477.51	19	3
4	P	16314.65	34	6	16461.02		-4
5	O	16263.46		2	16437.84	24	0
6	P	16206.36	13	6	16407.91		8
7	O	16143.35		8			
				19- 3 BAND			
0	P	15551.63		9	---		
1	O	15527.41		4	---		
2	P				---		
3	O				---		
4	P	15418.29	24	2	---		
5	O	15370.37		2	---		
				19- 4 BAND			
0	P	14664.99	51	0	14693.65	47	6
1	O	14641.86	51	2	14699.05	51	0
2	P	14612.99	51	-3	14698.59*	47	4
3	O	14578.62	47	3	14692.23	51	-3
4	P	14538.90*		6	14680.16*	47	8
5	O	14493.89*	51	8	14662.08	42	-1
6	P	14443.78	37	5	---		
				19- 5 BAND			
0	P	13795.47	20	-1	---		
1	O	13773.44*	54	15	---		
2	P	13745.88	25	2	---		
3	O	13713.35	20	-1	---		
4	P	13675.89		4	---		
5	O	13633.69		4	---		
7	O	13586.77		15	---		

EF-2B   EF $^1\Sigma_g^+$ — B(2p) $^1\Sigma_u^+$ Continued

N"	SYM	P-BRANCH	I5	O-C	R-BRANCH	I5	O-C
				18- 6 BAND			
0	P	12450.91	57		12478.80*	47	0
1	O	12429.83	56	3	12485.46	61	3
2	P	12404.05	63	2	12487.18	52	6
3	O	12373.60	56	2	12483.71	57	2
4	P	12338.49	58	2	12475.08	37	4
5	O	12298.69	42	1	12461.12*	41	5
7	O	12254.24	42	6	12442.30	25	0
				18- 7 BAND			
0	P	11614.71	25	1	11642.19	21	6
1	O	11594.48	31	1	11649.35	21	10
2	P	11569.99	23	2	11651.81	18	3
3	O	11541.20	21	-1	---		
4	P	11508.16	17	0	11630.87	25	11
5	O	11470.87		0	---		
7	O	11429.32		15	---		
				18- 8 BAND			
0	P	10794.88	42	3	10821.91	34	-3
1	O	10775.53*	73	5	10829.43*	52	3
2	P	10752.18	52	5	10832.75	41	-4
3	O	10725.00	44	-4	10831.84	49	5
4	P	10693.94	47	-1	10826.47	35	-3
5	O	10658.99	34	2	10816.60	36	7
6	P	10620.07	35	8	---		
7	O	10577.33	25	0	---		
				18- 9 BAND			
0	P	9991.18	35	2	---		
1	O	9972.54	30	-1	10025.74*	47	3
2	P	9950.47	41	4	10029.99*	41	13
3	O	9924.85	26	-1	10029.99*	41	-10
4	P	9895.69	30	-1	10026.28	33	-1
5	O	9862.94	27	0	10018.30	29	0
7	O	9826.70	27	3	---		

EF-2B EF $^1\Sigma_g^+$ – B(2p) $^1\Sigma_u^+$ Continued

N"	SYM	P-BRANCH	I5	O-C	R-BRANCH	I5	O-C
			19-10 BAND				
0	p	9695.27	27	-1	9721.59	16	10
1	o	9677.34	25	0	9729.45	26	2
2	p	9656.04	31	-2	9733.98	23	-7
3	o	9631.64	28	-2	9735.24	25	-6
4	p	9604.17	31	-5	9733.04	22	-11
5	o	9573.79	29	-11	9727.54	24	7
6	p	9540.61	32	7	---		
			20- 3 BAND				
0	p	16045.20	33	-3	16073.91		-2
1	o	16020.58		-1	16077.86		-1
2	p	15989.27	19		16075.03		7
3	o	15951.38		-9	16065.35		2
4	p	15907.37		0	---		
5	o	15857.50*	19	4	---		
			20- 4 BAND				
0	p	15158.65	33	-3	15186.77	37	-4
1	o	15135.07	33	1	15191.24*	37	-8
2	p	15105.25	37	-4	15189.41	33	-2
3	o	15069.48	33	1	15181.36	37	0
4	p	15027.91	37	-3	15167.30	28	1
5	o	14980.92	28	0	---		
6	p	14928.94	33	1	---		
			20- 5 BAND				
0	p	14289.15	23	-2	14316.79	9	-4
1	o	---			14321.82		
2	p	14238.08		-5	14320.93	5	5
3	o	---			14314.31	23	11
4	p	14165.05	30	0	---		
5	o	14120.74	23	2	---		
6	p	14071.85	22	3			

EF-2B EF $^1\Sigma_g^+$ – B(2p) $^1\Sigma_u^+$ Continued

N"	SYM	P-BRANCH	I5	O-C	R-BRANCH	I5	O-C
			19- 6 BAND				
0	p	12942.77	37	7	12970.48	30	5
1	o	12921.46*	37	2	12976.84*	50	8
2	p	12895.41*	62	5	12978.19	34	4
3	o	12864.67	43	6	12974.62	40	2
4	p	12829.38	42	0	12966.14	28	4
5	o	12789.76	31	2	12952.65	29	2
6	p	12745.76	27	2	12933.98	33	-15
			19- 7 BAND				
0	p	12106.56	55	4	12133.79*	44	3
1	o	12086.14*	38	4	12140.58*	56	0
2	p	12061.34	59	1	12142.82	45	1
3	o	12032.26	48	2	12140.58*	56	4
4	p	11999.13*	58	6	12133.79*	44	6
5	o	11962.05		12	12122.31	28	-1
6	p	11920.75	31	2	---		
			19- 8 BAND				
0	p	11286.76*	18	9	11313.53	32	-4
1	o	11267.05	19	-6	11320.77	23	4
2	p	11243.52	17	6	11323.82	22	0
3	o	11216.05	31	-2	11322.75	24	5
4	p	11184.93	27	9	11317.46	22	6
5	o	11149.89*	23	-14	11308.15	22	
6	p	11111.59	16	4	---		
			19- 9 BAND				
0	p	10483.03	42	5	10509.49	28	4
1	o	10464.22	40	4	10517.08	40	0
2	p	10441.80	50	4	10520.99*	43	10
3	o	10415.85	37	-1	10520.99*	43	-1
4	p	10386.58	39	-3	10517.34	30	-1
5	o	10353.99	25	-1	10509.83	30	-3
6	p	10318.17	27	-6	---		

EF-2B   EF $^1\Sigma_g^+$ − B(2p) $^1\Sigma_u^+$ *Continued*

20-10 BAND

N"	SYM	P-BRANCH	I5	O-C	R-BRANCH	I5	O-C
0	P	10189.01	29	-5	10214.61	23	-10
1	O	10170.48	26	-8	10221.66	35	-4
2	P	10148.28*	68	-5	10224.88	36	-5
3	O	10122.43	45	-11	10224.32	35	-8
4	P	10093.24	52	-8	---		
5	O	10060.88	29	-13	10212.56	21	-11
7	O	10025.74*	47	0	---		

21- 2 BAND

N"	SYM	P-BRANCH	I5	O-C	R-BRANCH	I5	O-C
0	P	17441.29	22	5	17470.12	34	-14
1	O	17415.19	38	-6	17473.37	19	8
2	P	17381.62*		-25	17468.77	18	19
3	O	17341.20*			17455.96	28	-8
5	O	17293.02		-13	17435.72		-14

21- 3 BAND

N"	SYM	P-BRANCH	I5	O-C	R-BRANCH	I5	O-C
0	P	16537.17	11	-1	16565.63*	20	
1	O	16512.24*	15	-8	16569.14*		
2	P	16480.64		2	16565.63*	20	
3	O	16442.21		5	---		
5	O	16396.85		2	---		

21- 5 BAND

N"	SYM	P-BRANCH	I5	O-C	R-BRANCH	I5	O-C
0	P	14781.08	47	-4	14808.64	42	8
1	O	14758.25	51	1	14813.16	42	-1
2	P	14729.49*	51	0	14811.58	37	3
3	O	14695.11*	51	18	14803.69	47	1
4	P	14654.66*	51	25	14789.66	37	
6	P	14608.56	42	11	---		

EF-2B   EF $^1\Sigma_g^+$ − B(2p) $^1\Sigma_u^+$ *Continued*

20- 6 BAND

N"	SYM	P-BRANCH	I5	O-C	R-BRANCH	I5	O-C
0	P	13436.49	24	10	13463.74*	27	9
1	O	13414.78	41	12	13469.12*		9
2	P	13387.70*	24	7	13469.12*		9
3	O	---			13463.74*	27	4
4	P	13318.52	26	4	13453.26	21	5
5	O	13276.60*	57	-25	13437.84	30	1
6	P	13230.92		-2	---		
7	O	13205.39*	55		---		

20- 7 BAND

N"	SYM	P-BRANCH	I5	O-C	R-BRANCH	I5	O-C
0	P	12600.22	43	1	12627.01	32	3
1	O	12579.33	42	1	12632.87	47	2
2	P	12553.58	50	1	12633.71	36	2
3	O	12523.13	39	1	12629.65	41	1
4	P	12488.18	58		12620.86	30	2
5	O	12449.00	37	-4	12607.56	28	4
7	O	12405.92	30	-1	---		

20- 8 BAND

N"	SYM	P-BRANCH	I5	O-C	R-BRANCH	I5	O-C
0	P	11780.34	35	-2	11806.77	26	-2
1	O	11760.29	32	-4	11813.02	31	2
2	P	11735.78	41	5	11814.68	26	-2
3	O	11706.96*	59	1	11811.83	25	3
4	P	11673.97	37	3	11804.69	27	2
5	O	11637.14	23	0	---		
7	O	11596.73	24	-2	---		

20- 9 BAND

N"	SYM	P-BRANCH	I5	O-C	R-BRANCH	I5	O-C
0	P	10976.69	30	2	11002.68	23	1
1	O	10957.37	36	-3	11009.32	34	-8
2	P	10934.02	37	-1	11011.85*	22	-8
3	O	10906.72	31	-2	11010.02*		-14
4	P	10875.69	35	-2	11004.32*	28	-6
5	O	10841.11	27	0	10995.00	27	
7	O	10803.37	30	-6	---		

EF-2B EF $^1\Sigma_g^+$ − B(2p) $^1\Sigma_u^+$ Continued

N"	SYM	P-BRANCH	I5	O-C	R-BRANCH	I5	O-C
				21-10 BAND			
0	P	10680.94	43	-7	10706.36	34	-8
1	Q	10662.29	38	0	10713.00	43	-6
2	P	10639.61	45	-8	10715.48	35	-14
3	Q	10613.07	34	-16	10713.80	39	-6
4	P	10582.71	36	-7	10707.92	30	-3
5	Q				10697.95	32	-5
				22- 5 BAND			
0	P	15263.40	33	-4	15290.92	28	3
1	Q	15240.60	37	3	15295.62	51	12
2	P	15211.83*	42	1	15293.91*	33	5
3	Q	15177.22	28	0	15286.01	33	2
4	P	15136.82	33	8	---		
5	Q				---		
				22- 6 BAND			
0	P	14410.74	28	8	14437.74	23	3
1	Q	14388.72	23	0	14442.76	37	4
2	P	14361.35	33	3	---		
3	Q	---			---		
4	P	14290.15	14	-12	14435.26*	51	-23
5	Q				---		
				22- 7 BAND			
0	P	13574.48	23	0	13606.58	21	4
1	Q	13553.35*	42	-3	13606.69		2
2	P	13527.13	20	-13	13601.38	39	-5
3	Q	13496.17	16	7	---		
4	P	13460.04	22	8	---		
5	Q				---		
				22- 8 BAND			
0	P	12754.63	35	0	12780.85	28	0
1	Q	12734.38	17	-1	12786.69	37	0
2	P	12709.44		2	12787.65	28	-3
3	Q	12679.88*	36	-5	12783.63	38	4
4	P	12645.75	36	2	---		
5	Q	12607.02*	49	8	---		
6	P						

EF-2B EF $^1\Sigma_g^+$ − B(2p) $^1\Sigma_u^+$ Continued

N"	SYM	P-BRANCH	I5	O-C	R-BRANCH	I5	O-C
				21- 6 BAND			
0	P	13928.39	17	5	---		
1	Q	13906.38	20	-1	13960.41	17	2
2	P	13879.03	22	4	13959.67	15	-5
3	Q	13846.42*	50	24	13953.27	16	11
4	P	13807.81	48	-13	---		
5	Q				---		
				21- 7 BAND			
0	P	13092.14		-2	13118.79		8
1	Q	13071.09*	50	4	13124.23*	51	2
2	P	13044.95	35	2	13119.12		-8
3	Q	13013.90	25	9	13108.60		2
4	P	12977.64	30	1	---		7
5	Q	12936.90*	36	17	---		
6	P	12891.32	20	6	---		
7	Q						
				21- 8 BAND			
0	P	12272.30	48	-1	12298.51	40	-1
1	Q	12252.04	47	-2	12304.38	51	2
2	P	12227.10	60	1	12305.31	37	-8
3	Q	12197.55	45	-9	12301.30	40	4
4	P	12163.43	48	3	12292.46	30	0
5	Q	12124.87	30	4	---		
6	P						
				21- 9 BAND			
0	P	---		-11	11494.26	17	-14
1	Q	11449.02	18	5	11500.63	17	-4
2	P	11425.44	67	2	11502.46		0
3	Q	11397.45*	16	-4	11499.55	19	-1
4	P	11365.13	16	-4	11492.26*		1
5	Q				---		

EF-2B EF $^1\Sigma_g^+$ – B(2p) $^1\Sigma_u^+$ *Continued*

N"	SYM	P-BRANCH	I5	O-C	R-BRANCH	I5	O-C
29- 4 BAND							
0	P	19350.13	20	1	---		
1	Q						
2	P	19323.95*	25	5	---		
29- 5 BAND							
0	P	18480.72	49	11	18505.73*	44	6
1	Q	18455.44	44	9	18506.21*	54	3
2	P	18422.43	49	-7	18499.36	49	-4
3	Q	18382.73	44	-3	18486.45	49	2
4	P	18337.10	59	-8	18472.60	49	6
5	Q	18291.26	44	-8	18433.59	59	-8
29- 6 BAND							
0	P	17627.75	24	-8	17652.53*	36	4
1	Q				17653.31	9	-9
2	P	---			17647.49	5	6
3	Q	---			17635.94	9	-1
4	P	17533.89*	43	-12	17623.80	17	1
29- 7 BAND							
0	P				16815.77*	43	-5
1	Q	---			16817.27*	15	5
2	P	---			16812.23		2
3	Q	---			16801.93		6
4	P	---			16791.55*	42	13
5	Q	16619.65		3	16756.80*	46	-9
29- 8 BAND							
0	P	15971.75		-5	15997.33*	38	-4
1	Q	15949.22		5	15993.25		3
2	P	15920.00		-10	15983.87		-16
3	Q	15885.53		6	15975.28		3
4	P	15846.20		3	---		
5	Q	15807.76		4	---		

EF-2B EF $^1\Sigma_g^+$ – B(2p) $^1\Sigma_u^+$ *Continued*

N"	SYM	P-BRANCH	I5	O-C	R-BRANCH	I5	O-C
22- 9 BAND							
0	P	11950.94	35	0	11976.73	26	0
1	Q	11931.48	36	2	11983.00	34	0
2	P	11907.72	44	0	11984.71		-4
3	Q	11879.68	31	-4	11981.90*	48	1
4	P	11847.46	34	-4	---		
5	Q	---			---		
22-10 BAND							
0	P	11144.59	15	-3	11188.75*	53	-2
1	Q	11121.99	16	-3	11195.34	18	-5
2	P	---			11198.05*	27	14
3	Q	---			11196.13	17	-6
29- 0 BAND							
0	P	23004.55	45	-2	23032.57	41	-1
1	Q	22973.53	31	0	23030.14	50	0
2	P	---			23017.54	39	-4
3	Q	22880.89	19	-1	22995.94	45	1
4	P	22821.39*	28	2	22970.67*	38	-1
5	Q	22759.06		3	---		
29- 2 BAND							
0	P	21140.71	39	-2	21167.38	30	1
1	Q	21112.34	30	-2	21166.27	44	-3
2	P	21074.87	30	-1	21156.40	39	1
3	Q	21029.04*	54	7	21138.78	45	-3
4	P	20975.92	25	0	21118.79	49	4
5	Q	20921.06	30	-7	---		
29- 3 BAND							
0	P	20236.64		-3	20262.79		2
1	Q	20209.47		4	20262.25	15	1
2	P	20173.62		-1	20253.46		-2
3	Q	20129.83*		-16	20237.54	15	-2
4	P	20079.58	30	-2	20219.76	10	-1
5	Q	20028.00	30	-4	---		

EF-2B   EF ¹Σg⁺ — B(2p) ¹Σu⁺   Continued

N"	SYM	P-BRANCH	I5	O-C	R-BRANCH	I5	O-C
		29- 9 BAND					
0	P	15168.16		5	15193.67	28	-1
1	O	15146.38*	28	14	15190.19	23	-10
2	P	15118.40	28	0	15182.37*	42	4
3	O	15085.32*	37	6	15175.02	28	-2
4	P	15047.87	28	-7	---		
5	O	15011.67	23	-2	---		
		29-10 BAND					
0	P	14380.47*	33	-3	---		
1	O	14359.26	19	-14	---		
2	P	---			---		
		32- 0 BAND					
0	P	24214.14		5	24252.61*		-30
1	O	24187.33		-4	24252.61*		-3
2	P	24154.82		3	24245.66*		11
3	O	---			---		
4	P	---			---		
5	O	24071.06		9	---		
		32- 1 BAND					
0	P	23272.54	38	4	23311.19	37	-13
1	O	23247.22*	21	3	23312.48	28	2
2	P	---			---		
3	O	23180.71	23	-1	---		
4	P	23139.12*	44	-6	---		
5	O	---			---		
		32- 2 BAND					
0	P	22350.07	35	-18	---		
1	O	---			---		
		32- 3 BAND					
0	P	21446.25	39	6	---		
1	O	21423.27	10	0	---		
2	P	21396.30	20	-10	---		
3	O	21365.06	15	1	---		
4	P	21329.21	20	1	---		

EF-2B   EF ¹Σg⁺ — B(2p) ¹Σu⁺   Continued

N"	SYM	P-BRANCH	I5	O-C	R-BRANCH	I5	O-C
		32- 4 BAND					
0	P	20559.64	35	0	---		
1	O	---			---		
2	P	20512.32		-11	---		
3	O	---			---		
		32- 5 BAND					
0	P	19690.13	35	0	19719.68	35	17
1	O	---			19728.86*	49	-9
2	P	19645.15	44	-12	---		
3	O	---			---		
4	P	19586.94	39	16	---		
		32- 6 BAND					
0	P	18837.44*	59	9	18866.47*	59	14
1	O	18817.39*	59	5	---		
2	P	18794.63*	59	-14	---		
3	O	18769.21*	54	14	---		
4	P	18740.30*	59	-1	---		
		32- 7 BAND					
0	P	18001.30*	27	13	18029.64	11	-2
1	O	---			18039.90		-9
2	P	17960.73		2	18051.42	19	-5
3	O	17936.69*	26	-1	---		
		32- 8 BAND					
0	P	---			---		
1	O	---			17228.29*	37	1
2	P	17142.88		1	---		
3	O	---			---		
4	P	17095.90	10	13	---		
		32- 9 BAND					
0	P	16377.62	11	-1	16425.37	34	2
1	O	16360.05	21	-3	16432.02		9
2	P	---			---		
3	O	---			---		

EF-2C$^{\pm}$ EF $^1\Sigma_g^+$ − C(2p) $^1\Pi_u^{\pm}$

N"	SYM	P-BRANCH	I5	O-C	SYM	Q-BRANCH	I5	O-C	SYM	R-BRANCH	I5	O-C
		2C+				2C−				2C+		

29− 0 BAND

N"	SYM	P-BRANCH	I5	O-C	SYM	Q-BRANCH	I5	O-C	SYM	R-BRANCH	I5	O-C
1	O	---			P	---			O	---		
2	P	---			O	---			P	---		
3	O	---			P	14132.13	17	−1	O	14167.65*	32	−2
4	P	---			O	14047.34*	17	−5	P	14097.41	29	5
5	O	---			P	13948.54	15	3	O	---		

29− 1 BAND

N"	SYM	P-BRANCH	I5	O-C	SYM	Q-BRANCH	I5	O-C	SYM	R-BRANCH	I5	O-C
1	O	12572.34	25	−3	P	12581.00	28	3	O	12597.95	28	1
2	P	12521.05*	47	18	O	12539.07	33	−2	P	12564.88*	55	−4
3	O	12448.75	36	4	P	12477.34	32	O	O	12512.70	38	6
4	P	12357.02	20	3	O	12397.08	40	−1	P	12446.82	45	5
5	O	12247.08*	67	7	P	12303.82	33	2	O	---		

29− 2 BAND

N"	SYM	P-BRANCH	I5	O-C	SYM	Q-BRANCH	I5	O-C	SYM	R-BRANCH	I5	O-C
1	O	10979.80	19	1	P	10988.22*	54	−18	O	---		
2	P	---			O	10948.84		13	P	---		
3	O	10861.74	24	−1	P	---			O	---		

29− 3 BAND

N"	SYM	P-BRANCH	I5	O-C	SYM	Q-BRANCH	I5	O-C	SYM	R-BRANCH	I5	O-C
1	O	---			P	9462.54	25	7	O	---		
2	P	9406.87	52	−2	O	---			P	9450.89	20	−5
3	O	---			P	---			O	9406.00*	34	5

32− 3 BAND

N"	SYM	P-BRANCH	I5	O-C	SYM	Q-BRANCH	I5	O-C	SYM	R-BRANCH	I5	O-C
1	O	---			P	---			O	10702.17	24	−10

3A–2B   H(3s) $^1\Sigma_g^+$ – B(2p) $^1\Sigma_u^+$ Continued

N"	SYM	P-BRANCH	I5	O-C	R-BRANCH	I5	O-C
		2– 5 BAND					
0	P	21244.28	25	-5	---		
1	O	21235.61	25	-1	---		
2	P	21234.76	35	4	---		
3	P	21234.07*	35	10	---		
4	O	21234.07*	35	7	---		
5	P	21228.00	10	10	---		
6	P				---		
		2– 6 BAND					
0	P	---			---		
1	O	---			---		
2	P	20384.22	15	0	20465.65		3
3	P	20385.22	15	0	20498.85*		9
4	O	---			---		
		2– 7 BAND					
0	P	19555.39	25	2	19596.09	25	0
1	O	19548.43	30	0	19629.45	44	-1
2	P	19550.17	44	1	19663.40	54	-2
3	P	19552.82	44	-3	---		
4	O	---			---		
5	P	19556.16*	39	-2	---		
6	P	---					
		2– 8 BAND					
0	P	---			---		
1	O	---			---		
2	P	18732.31	30	-1	18809.59	44	0
3	P	18736.54		-14	---		
4	O	---			---		
		2– 9 BAND					
0	P	17931.84	29	1	17971.85*	16	7
1	O	17926.43	21	-8	18005.97	26	7
2	P	17930.63		1	18041.51†	34	1
3	P	17936.43		-4	18079.23	16	8
4	O	---			---		

3A–2B   H(3s) $^1\Sigma_g^+$ – B(2p) $^1\Sigma_u^+$

N"	SYM	P-BRANCH	I5	O-C	R-BRANCH	I5	O-C
		2– 0 BAND					
0	P	25768.28	56	-1	25812.82	68	-3
1	O	25753.75		-5	25842.37	74	1
2	P	25744.24		0	25868.74	50	-5
3	P	25732.06		-5	25892.93	26	16
4	O	25718.01		-18	---		
5	P	25695.55		-4	---		
		2– 1 BAND					
0	P	24826.73	49	3	24870.54	30	4
1	O	24813.63	44	1	24900.74	27	-3
2	P	24806.23	51	0	24928.55	22	-6
3	P	24796.86	33	-1	24954.68	24	-8
4	O	---			---		
5	P	24767.71	27	-9	---		
		2– 2 BAND					
0	P	23904.45	57	0	23947.61	35	-3
1	O	23892.61	45	-2	23978.52	43	0
2	P	23887.09	43	-1	24007.60	43	2
3	P	23880.16	26	-2	24035.56		-7
4	O	---			---		
		2– 3 BAND					
0	P	---			23043.04	21	0
1	O	---			23074.48	36	2
2	P	22985.83	24	-2	23104.68	53	-1
3	P	22976.48	23	6	---		
4	O	---			---		
		2– 4 BAND					
0	P	22113.86		2	22219.15	17	-1
1	O	22104.19		2	22250.53*		12
2	P	22099.29	20	9	---		
3	P	22096.88*	54	-11	---		
4	O	22088.09		3	---		
5	P	---					

3A-2B   H(3s) $^1\Sigma_g^+$ — B(2p) $^1\Sigma_u^+$ Continued

N". SYM	P-BRANCH	I5	O-C	R-BRANCH	I5	O-C
			3- 3 BAND			
0 P						
1 P						
2 P	24483.03	28	2	24557.10	13	0
3 P				24600.04	18	4
			3- 4 BAND			
0 P	23596.44	52	-2	23619.64	64	2
1 O	23567.88	40	1	23642.50	54	3
2 P	23556.50	51	0	23671.55	39	-2
3 O	23551.60	31	-1	23716.00	33	-3
4 P	23562.64*	45	1	23766.78*	45	-3
5 P	23580.55	22	3	23806.03	23	-3
6 O				23863.38	17	-1
7				23945.99		-2
			3- 5 BAND			
0 P				22749.67	49	3
1 O				22773.04	46	2
2 P				22803.08	32	6
3 O				22848.92	29	5
4 P	---					
5 O	---			22943.11	20	4
6 P	---			23003.28*	26	5
			3- 6 BAND			
0 P	21874.20	15	3	21920.21	20	-3
1 O	----			21951.18*	20	1
2 P						
			3- 7 BAND			
0 P	21038.02	35	3	21059.86*	39	7
1 O	21012.16	30	3	21084.16	35	0
2 P	21004.81	35	3	21115.88*	39	5
3 O	21005.30	35	4	---		
4 P	21022.82*	44	-2	---		
5 O						

3A-2B   H(3s) $^1\Sigma_g^+$ — B(2p) $^1\Sigma_u^+$ Continued

N". SYM	P-BRANCH	I5	O-C	R-BRANCH	I5	O-C
			2-10 BAND			
0 P						1
1 O	17144.11	65	-11	17218.30		
2 P						
3 O	17144.80*	12	-12			
4 P	17152.24	12	-3			
5 O				17327.30*	41	0
			2-11 BAND			
0 P	16372.30		6	16446.39*	56	8
1 O						
			3- 0 BAND			
0 P	27250.88	74	-3	27276.48*	62	-7
1 O	27217.43	68	-7	27296.94	68	-4
2 P	27198.82	74	-4	27321.14	68	-6
3 O	27184.48	44	-7	27358.38	74	-1
4 P	27183.74*	56	-7	27399.68	68	-4
5 O	27188.03	50	-4	27427.21	38	-5
6 P				27470.83	38	-9
			3- 1 BAND			
0 P	26309.29	74	-3	26334.17	74	-3
1 O	26277.30	50	-2	26355.36	74	-3
2 P				26380.98	74	-4
3 O				26420.35	74	-3
4 P	26249.22	68	-6	26464.47	68	-1
5 O	26251.99*	68	-3	26495.49	56	2
6 P	26260.28	50	0	26543.12	50	-1
7 O	26256.33	26	-1	26614.63*	50	-2
			3- 2 BAND			
0 P	---			25411.34	68	0
1 O	25341.74	14	2	25433.15	68	-1
2 P	25332.60	32	1	25460.04	68	-1
3 O	25338.38	38	2	25501.24	68	-1
4 P	25350.27*	26	10	25547.84	44	5
5 O	---			25581.85	44	4
6 P				25633.07	38	5
7 O				25708.59		1

3A-2C±   **H(3s) ¹Σg⁺ — C(2p) ¹Πu±**

N"	SYM	P-BRANCH (2C+)	I5	0-C	SYM	Q-BRANCH (2C-)	I5	0-C	SYM	R-BRANCH (2C+)	I5	0-C
						2- 0 BAND						
1	P	16996.58*	48	6	P	17021.60*	38	-7	O	17070.54*	15	-5
2	O	---			O	17009.49		6	P	---		
3	P	---			P	---			O	---		
4	O	16788.92	37	2	O	16944.24*	52	3	O	17064.56	31	7
5	P	16699.49		7	P	---			P	17033.83*	11	-9
6	O				O				P			
						2- 1 BAND						
1	P	15336.14*	51	5	P	15361.15	23	-9	O	15410.06		-10
2	O	---			O	15351.34	23	3	P	---		
3	P	15261.02	19	9	P	15328.52	23	-3	O	15409.55*		9
4	O	---			O	15293.91*	33	0	P	---		
						2- 2 BAND						
1	O	13743.50	74	-1	P	13768.67	43	0	O	13817.61	38	3
2	P	13710.76	48	4	O	13760.98*	51	5	P	13825.70	34	-1
3	O	13573.97		0	P	13741.47	50	-3	O	13822.51	18	1
4	P	---			O	13711.18		-3	P	---		
5	O	---			P	13663.07	19	-8				
						2- 3 BAND						
1	O	12217.70	25	5	P	12237.22	25	4	O	12291.75	25	3
2	P	12187.11*	48	-5	O	12221.01	34	-1	P	12302.06		-9
3	O	---			P	---			O	12302.71	25	-6
						3- 2 BAND						
1	O	---			P	15232.24	33	-13	O	15288.07*	37	-5
2	P	15174.36	9	-6	O	15215.47	5	-8	P	---		
3	O	15128.59	23	0	P	15193.80		-11	O	---		
4	P	---			O	15155.72		9	P	---		
5	O				P							
						3- 3 BAND						
1	O	13700.27	30	0	P	13691.86	45	6	O	13746.37	26	-4
2	P	13550.93	42	7	O	13673.38*	48	-5	P	---		
3	O	13508.84*		-2	P	13660.73*		2	O	---		
4	P				O				P			
						3- 4 BAND						
1	O	12241.59	42	-3	P	12246.29	57	3	O	12287.65	55	-4
2	P	---			O	12233.82	54	5	P	12293.58	49	2
3	O	---			P	12218.60	35	-3	O	---		
4	P	---			O	12210.10*	60	-1	P	---		
5	O	---			P	12199.42*	60	-12				
6					O	12169.29	25	2				
7					P	12149.09	26	0				

3A-2B   **H(3s) ¹Σg⁺ — B(2p) ¹Σu⁺   Continued**

N"	SYM	P-BRANCH	I5	0-C	R-BRANCH	I5	0-C
				3- 8 BAND			
0	P	20218.21	10		20239.60	15	0
1	O	---		7	20264.23	10	2
2	P	20186.95		1	20296.77		-7
3	O	---			---		
4	P	20208.66*		5	20404.28		-1
5	O						
				3- 9 BAND			
0	P	19414.48	44	3	19435.49	44	1
1	O	---			19460.53*	49	1
2	P	19385.25	25	1	19493.89	39	-2
3	O	---			19544.80	44	3
4	P	19410.35*	35	-3	19653.86	49	3
5	O						
				3-10 BAND			
0	P	---			18647.45	44	-7
1	O	---			18672.91	54	0
2	P	---			18707.02	49	-5
3	O	18599.42	49	-12	18759.01	54	-6
4	P	18604.60	30	-8	18819.79	44	-9
5	O	18627.94*	44	-5	18871.38*	49	-6
				3-11 BAND			
0	P	17854.92*	28	6	17875.30*	30	19
1	O	---			17900.99	25	6
2	P	---			17935.83	17	5
3	O	17835.91		10	17988.86	23	6
4	P	---			18051.08	9	7
				3-12 BAND			
0	P	17098.69	12	-2	17118.66	12	2
1	O	---			17144.80*	16	6
2	P	---			17180.41		6

GK-2B GK $^1\Sigma_g^+$ – B(2p) $^1\Sigma_u^+$ *Continued*

N"	SYM	P-BRANCH	I5	O-C	R·BRANCH	I5	O-C
				0– 5 BAND			
0	P				16584.26*	21	5
1	O	16556.77*		27	16588.93*	49	6
2	P				16586.67*	47	11
3	O	16505.13		-6	16576.58	9	-7
4	P	16469.98		6	---		
5	O	16427.51		11	---		
				0– 6 BAND			
0	P				15731.04		1
1	O	15703.75		3	15736.14	22	5
2	P	15682.06		2	15734.79	28	8
3	O	15654.70		1	15726.23		8
4	P	15621.26	22	9	---		
5	O	15580.97	30	4	---		
				0– 7 BAND			
0	P				---		
1	O	---			---		
2	P				---		
3	O	14820.66	5	3	---		
4	P	---			---		
5	O	14750.62	28	0	---		
				0– 8 BAND			
0	P				---		
1	O	14027.53*	42	-18	14080.04	16	-2
2	P				---		
3	O	---			---		
4	P	13936.49	18	10	---		
5	O				---		
				0– 9 BAND			
0	P				---		
1	O	---			---		
2	P	13201.10	15	1	---		

GK-2B GK $^1\Sigma_g^+$ – B(2p) $^1\Sigma_u^+$

N"	SYM	P-BRANCH	I5	O-C	R-BRANCH	I5	O-C
				0– 0 BAND			
0	P	21080.55	30	9	21111.14	25	2
1	O	21052.06*	54	-1	21112.84	35	1
2	P	21014.74	35	3	21104.80	30	6
3	O	20968.11	35	5	21086.24	35	7
4	P	20911.71	30	12	---		
5	O						
				0– 1 BAND			
0	P				20168.82		5
				0– 2 BAND			
0	P	19216.67	44	5	19245.93	35	2
1	O	19190.89	44	-1	19248.99	49	0
2	P	19157.56	49	-1	19243.78*		21
3	O	19116.21	44	8	19229.32*	59	29
4	P	19066.14*	54	0	19204.87	35	-1
				0– 3 BAND			
0	P	18312.64	54	8	18341.37	49	6
1	O	18288.02*	49	5	18344.98*	59	5
2	P	18256.37*		5	18340.69*	54	5
3	O	18217.21	54	6	18305.85	49	-5
4	P	18169.91	35	9	18288.02*	49	-5
5	O	18114.19	28	2	---		
6	P	18063.41	34	10	---		
				0– 4 BAND			
0	P	17426.03	27	2	17454.25	19	6
1	O	17402.45	22	1	17458.41	31	3
2	P	17372.37	34	2	17455.00	41	-11
3	O	17335.22	24	7	17443.79	29	-2
4	P	17290.23*	54	-16	---		
5	O	17237.66	21	3	---		
6	P						

GK-2B   GK ¹Σg⁺ – B(2p) ¹Σu⁺   Continued

N"	SYM	P-BRANCH	I5	O-C	R-BRANCH	I5	O-C
				1 – 2 BAND			
0	p				19576.76*	44	-3
1	o	19549.62*	49	-1	19582.04	59	-1
2	p	19521.78	39	0	19589.43	59	0
3	o	19490.63	44	0	19602.36*	59	2
4	p	19462.02	39	5	19622.64	54	0
5	o	19439.47	39	0	19651.19*	59	4
6	p	19424.98	25	0	19688.43	49	4
7	o	19419.61	30	0	19734.78*	59	3
8	p				19789.89*	44	-1
9	o	19438.29*	54	-5	19853.80	39	3
10	p				19926.04	30	-10
11	o	19497.41		-1	20006.02*	35	1
				1 – 3 BAND			
0	p				18672.16*	44	-3
1	o	18645.61	44	4	18677.99*	59	0
2	p	18618.87	44	2	18686.45	54	-3
3	o	18589.40	44	2	18701.11	59	0
4	p	18562.92	59	-7	18723.61	54	-1
5	o	18543.24	44	9	18754.87	59	4
6	p	18532.09	49	20	18795.27	49	-4
7	o	18530.17	39	10	18845.29	54	6
8	p						
9	o	18557.41	25	6	18972.87	44	5
				1 – 4 BAND			
0	p	17758.99	11	-3	17791.42*	26	-2
1	o				17800.95	25	0
2	p	17705.43	13	2	17817.12	30	-2
3	o				17841.66	28	4
4	p	17663.71	6	-1	17875.30*	30	-10
5	o				17918.80	19	3
6	p				17972.11	21	-9

GK-2B   GK ¹Σg⁺ – B(2p) ¹Σu⁺   Continued

N"	SYM	P-BRANCH	I5	O-C	R-BRANCH	I5	O-C
				1 – 0 BAND			
0	p				21442.00	54	0
1	o	21413.45	54	-2	21445.88	59	-1
2	p	21382.95	54	0	21450.57	59	-1
3	o	21347.80*	59	3	21459.49	59	-1
4	p	21313.88	54	-2	21474.50	59	-3
5	o	21284.92	54	0	21496.91	59	1
6	p	21262.86	44	-2	21526.28	30	31
7	o	21248.87*	44	-1	21564.00*	44	-2
8	p	21243.67	35	0	21609.67	15	-4
9	o	21247.71	30	1	21663.22	39	2
10	p	21261.08	25	7	21724.44	20	5
11	o	21283.72	20	0	21792.35	35	8
12	p	21315.60	15	8	21866.03	20	4
13	o	21355.82	20	3	21944.42	20	0
				1 – 1 BAND			
0	p	20471.88	20	0	20499.68	30	3
1	o	20442.81	20	4	20504.29	54	-1
2	p	20409.77	35	1	20510.44*	54	-4
3	o	20378.67	10	1	20521.49	59	0
4	p	20353.11	15	-2	20539.29	59	0
5	o	20335.08*		-1	20564.82	59	1
6	p	20325.65*		-3	20598.56	54	5
7	o	20335.08*		16	20640.83	54	-1
8	p				20691.52	44	1
9	o	20354.13	10	-6	20750.49	49	-2
10	p				20817.52	44	-2
11	o	20382.99		-4	20891.58*	49	-4
12	p	20418.65		-4	20969.11*	39	-4
13	o	20455.76		0	21044.52	25	13

GK-2B GK $^1\Sigma_g^+$ – B(2p) $^1\Sigma_u^+$ Continued

N"	SYM	P-BRANCH	I5	O-C	R-BRANCH	I5	O-C
2- 0 BAND							
0	P	22491.94	75	3	22526.11	52	3
1	Q	22467.03	55	0	22535.19	78	2
2	P	22437.05*	60	0	22538.81	44	-1
3	Q	22402.14*	45	0	22536.12	32	-4
4	P				---		
2- 1 BAND							
0	P	21550.27	25	-5	21583.71	25	-2
1	Q	21526.84	25	-1	21593.64	15	6
2	P	21498.98	49	-6	21598.83	15	9
3	Q	21466.87	44	-3	21598.29	15	4
4	P	21429.73	44	-6	---		
5							
2- 2 BAND							
0	P	20628.10*	54	3	20660.89	35	2
1	Q	20605.86	44	0	20671.31	49	-2
2	P	20579.90	49	-1	20677.50	54	-15
3	Q	20550.21	44	0	20678.98	44	-4
4	P	20516.10	39	-3	---		
5							
2- 3 BAND							
0	P	19724.00	25	-1	19767.25	30	-2
1	Q	19702.91	20	-2	19774.75	25	3
2	P	19678.67	30	1	19777.63*	59	-14
3	Q	19651.19*	59	-4	---		
4	P	19619.77	10	-4	---		
5							
2- 4 BAND							
0	P	18837.44*	59	-2	18869.15	54	0
1	Q	18817.39*	59	-1	18880.66	59	-6
2	P	18794.63*	59	-6	18889.18	54	-1
3	Q	18769.21*	54	-2	18893.73	54	-7
4	P	18740.30*	59	-8	---		
5							

GK-2B GK $^1\Sigma_g^+$ – B(2p) $^1\Sigma_u^+$ Continued

N"	SYM	P-BRANCH	I5	O-C	R-BRANCH	I5	O-C
2- 5 BAND							
0	P	17967.88	13	-7	18011.12	28	-9
1	Q	17948.80	15	-5	18020.59	16	-5
2	P	17927.52	23	-1	18026.55	17	-9
3	Q	17903.95*	48	-5	---		
4	P	17877.40	24	1	---		
5							
2- 6 BAND							
0	P	---			17158.46	46	3
1	Q	---			---		
2	P	---			---		
3	Q	17055.28		3	---		
4	P	17030.79		-13			
5							
2- 7 BAND							
0	P	16279.03		4	16322.24	20	-1
1	Q	16261.66		0	---		
2	P	16242.97		0	---		
3	Q	---			---		
4	P						
5		16200.59	14	-2			
2- 8 BAND							
0	P	15459.13		-1	15502.28		-12
1	Q	15442.67		0	15514.41		-5
2	P	15425.14*		1	15524.22		-2
3	Q	---			---		
4	P						
5		15386.29	14	-9			
2- 9 BAND							
0	P	14655.47	23	2	---		
1					---		
3- 0 BAND							
0	P	22854.25	72	3	22886.21	67	2
1	Q	22827.14	64	0	22892.86	95	-3
2	P	22794.82	79	5	22896.86	83	-5
3	Q	22760.23	48	0	22901.04*	79	6
4	P	22726.49	45	-3	22915.23	31	-5
5	Q	22703.59	21	-4	22940.47	49	-3
6	P	22692.82		4	---		
7	Q						

GK-2B   GK $^1\Sigma_g^+$ − B(2p) $^1\Sigma_u^+$ Continued

N"	SYM	P-BRANCH	I5	O-C	R-BRANCH	I5	O-C
		3- 5 BAND					
0	P				18359.38	54	0
1	O	18330.27	54	1	18368.93	59	0
2	P	18309.00*	49	4	18378.72	59	-1
3	O				18391.59	59	-1
4	P	18262.11	49	2	18417.15	44	-1
5	O	18242.42*	54	9	18456.37	54	6
		3- 6 BAND					
0	P				17516.28*	42	13
1	O	---			17526.94†	31	6
2	P	---			17541.11	26	3
3	O	---			17568.53	30	4
4	P	---			17609.83	19	-1
5	O	---					
		3- 7 BAND					
0	P				16679.92*	35	-5
1	O	16621.79*	34	2	16691.50	---	-4
2	P	16600.67	31	-2			
3	O						
		3- 8 BAND					
0	P				15849.22*	57	-2
1	O	15821.42*	47	-3	15860.11	---	-1
2	P	---					
3	O	15782.85		0	15889.23*	56	5
4	P	15764.82		2	---		
		3- 9 BAND					
0	P				15056.37	5	-6
1	O	15017.73	9	-3	---		
		4- 0 BAND					
0	P				23751.01	27	-1
1	O	23703.64	29	19	23763.48	29	-4
2	P	23679.71	---	-19	---		
3	O	23652.85	30	-3			
4	P	23626.80	34	-4			

GK-2B   GK $^1\Sigma_g^+$ − B(2p) $^1\Sigma_u^+$ Continued

N"	SYM	P-BRANCH	I5	O-C	R-BRANCH	I5	O-C
		3- 1 BAND					
0	P				21951.18*	20	-12
1	O	21912.62		-1	21956.74*	39	-1
2	P	21886.80		-16	21963.11	---	2
3	O	21856.71		-5	---		
4	P	21825.13	15	14	---		
5	O	21794.77		4			
		3- 2 BAND					
0	P				21020.99	49	-1
1	O	20990.37	49	-1	21029.04*	54	-1
2	P	20966.00*	59	3	21035.74	54	0
3	O	20937.62	54	-1	21043.96	54	0
4	P	20908.32	44	2	21063.39	39	4
5	O	20881.07	49	0	21095.06	54	1
6	P	20865.73	15	0	---		
7	O	20863.46	39	-5	---		
		3- 3 BAND					
0	P				20116.34	20	-4
1	O	20086.31	54	-1	20122.99	44	0
2	P	20063.03	49	-1	20132.79	30	-2
3	O	20036.37	54	-6	20142.72*	44	1
4	P	20009.26	44	-2	20164.29	---	-8
5	O	19984.73	49	-11	20198.74	20	-1
6	P	19972.53	15		20249.81	10	0
		3- 4 BAND					
0	P				19229.32*	59	6
1	O	19199.74	44	-3	19238.41	59	-3
2	P	19177.40*	59	-11	19247.24	54	-4
3	O	19152.37	44	-4	19258.69	54	-5
4	P	19127.32	30	0	19282.35	30	-2
5	O	19105.25	35	-7	19319.26	44	-4

GK-2B GK $^1\Sigma_g^+$ − B(2p) $^1\Sigma_u^+$ Continued

N"	SYM	P-BRANCH	I5	O-C	R-BRANCH	I5	O-C
4- 1 BAND							
0	P	22761.78	46	-8	22796.66*	52	6
1	O	22739.71	55	-1	22809.39*	65	-2
2	P	22714.82	63	-5	22823.31	41	-3
3	O	22691.62	32	2	---		
4	P				---		
4- 2 BAND							
0	P	---			---		
1	O	---			21887.36		20
2	P				21902.38	35	3
3	O	21795.75*	54	-1	---		
4	P	21774.95	15	4	---		
4- 3 BAND							
0	P	20935.54	44	-1	20969.11*	39	-3
1	O	20915.80*	54	0	20983.08	44	-1
2	P	20894.47	54	-2	20999.45	39	3
3	O	20875.90	49	-3	---		
4	P				---		
4- 4 BAND							
0	P	20048.97	49	-3	20081.99	44	-3
1	O	20030.27	49	0	20096.50	54	-5
2	P	20010.49*	54	-3	20113.89		0
3	O	19993.92	49	-1	---		
4	P						
4- 5 BAND							
0	P	19179.50	39	-1	19212.23	10	19
1	O	19161.65	25	-7	19227.06	15	2
2	P	19143.35	30	-1	---		
3	O						
4- 6 BAND							
0	P	18326.78*	59	7	18358.88	49	2
1	O	18309.90	54	3	18374.30	59	4
2	P	18292.90	59	4	18393.53	49	4
3	O	18279.97	49	2	---		
4	P						

GK-2B GK $^1\Sigma_g^+$ − B(2p) $^1\Sigma_u^+$ Continued

N"	SYM	P-BRANCH	I5	O-C	R-BRANCH	I5	O-C
4- 7 BAND							
0	P	17490.55		2	17522.19	10	0
1	O				17538.17	21	9
2	P				17558.19	5	4
3	O	17458.85	26	5	---		
4	P	17447.53*	20	-5	---		
4- 8 BAND							
0	P	16670.52*		-16	16701.84	17	-16
1	O	16655.36		-18	---		
2	P				16739.16		0
4- 9 BAND							
0	P				15914.38		-16
1	O	15039.22		-4	---		
2	P	15831.14		-6	---		
3	O						
4	P						
4-10 BAND							
0	P	15079.35	14	-3	---		
1	O				---		
2	P	15053.51		-5	---		
3	O				---		
5- O BAND							
0	P	24420.79	28	7	24450.53	30	1
1	O	24391.46	22	-1	24454.03	55	5
2	P	24355.87	27	1	24455.06	47	-3
3	O	24318.40	16	-1	24463.14	57	-3
4	P	24288.56*	29	-3	24504.19	34	-2
5	O	24292.48	21	-3	24528.28	13	0
6	P	24280.61		3	24559.21	16	4
7	O	24276.59*		1	24570.68*	17	
8	P	24254.38		8	---		
9	O						

GK-2B   GK ¹Σg⁺ – B(2p) ¹Σu⁺   *Continued*

N"	SYM	P-BRANCH	I5	O-C	R-BRANCH	I5	O-C
			5- 6 BAND				
0	P				19070.35*	44	-8
1	O	19044.02	25	4	19085.09	54	3
2	P	19021.50		6	19103.27	54	12
3	O	18995.97		13			
			5- 7 BAND				
0	P	18207.70*	59	-10	18233.80	54	4
1	O	18186.11	54	-1	18241.09*	59	3
2	P	18161.81	39	3	18249.75	59	3
3	O	18139.16	30	1	18269.10	59	1
4	P	18127.60	31	-2	18324.91	44	-1
5	O				18367.31*	39	-2
6	P				18455.76	49	-4
7	O						
			5- 8 BAND				
0	P	17367.10	20	-1	17413.54	23	-3
1	O	17343.99	37	5	17421.21	32	0
2	P	17322.90	20	-8	17430.70	30	-3
3	O	17313.43		4	17451.26	32	1
4	P	17341.20*		0	17508.67	11	-6
5	O						
6	P						
			5- 9 BAND				
0	P	16584.26*	21	0	16609.40*	59	-5
1	O				16617.46	37	-6
2	P	16542.31		7	16649.45		-10
3	O				16708.49	6	-3
4	P						
			5-10 BAND				
0	P				15821.42*	47	-7
1	O						
2	P	15756.49		-5			
3	O						
4	P				15972.31		-17
5	O						

GK-2B   GK ¹Σg⁺ – B(2p) ¹Σu⁺   *Continued*

N"	SYM	P-BRANCH	I5	O-C	R-BRANCH	I5	O-C
			5- 1 BAND				
0	P	23479.13	52	0	23508.16	53	-1
1	O	23451.26	43	-3	23512.32*	85	-7
2	P	23417.84	49	-1	23514.87	68	-4
3	O	23383.29	23	2	23523.11	56	-5
4	P	23356.83	20	3	23568.91	26	-1
5	O	23364.66		6			
6	P						
7	O				23647.35	22	-9
			5- 2 BAND				
0	P	22556.90	49	2	22585.31	45	0
1	O	22530.29	42	-1	22590.14	81	0
2	P	22498.72	58	0	22593.92	60	0
3	O	22466.49	35	1	22605.04	50	1
4	P				22652.22	26	-1
5	O	22454.67	51	6			
			5- 3 BAND				
0	P	21627.44	51	7	21686.06	15	-2
1	O				21690.92	15	-7
2	P				21704.77		-1
3	O				21753.27		2
			5- 4 BAND				
0	P	20766.24	49	-3	20793.59	44	0
1	O	20741.84	44	0	20799.48	54	-5
2	P	20713.42	49	-8	20805.44	49	-2
3	O	20685.46	35	-4	20820.76	54	-5
4	P	20667.31	35	-8	20871.23	35	-2
5	O						
			5- 5 BAND				
0	P	19896.74	54	-2	19923.60	49	-1
1	O	19873.27	49	-2	19930.00	59	-2
2	P	19846.34	54	0	19936.91	54	0
3	O	19820.24	44	-3	19953.62	59	-3
4	P	19804.44	49	4	20006.02*	35	0
5	O						

GK-2B   GK $^1\Sigma_g^+$ – B(2p) $^1\Sigma_u^+$ Continued

N"	SYM	P-BRANCH	I5	O-C	R-BRANCH	I5	O-C
		5-11 BAND					
0	P	15024.77*	51	10	---		
1	O	---			15057.98	9	5
2	P	---			---		
3	O	---			15093.60	51	2
4	P	14965.92	28	21	---		
		6- 0 BAND					
0	P	25190.84	26	7	---		
1	O	25166.20	20	-3	---		
2	P	25137.63	44	2	---		
3	O	25102.22	32	-1	---		
4	P	25065.49	38	0	---		
		6- 1 BAND					
0	P	---			---		
1	O	24226.10		5	---		
2	P	---			---		
3	O	24133.72		2	---		
		6- 2 BAND					
0	P	23326.82	37	-11	23360.05	40	-2
1	O	23305.03	50	-3	23371.92	60	3
2	P	23280.46	73	-1	23377.73	34	-1
3	O	23250.31	38	3	23382.92	33	
4	P	23220.04	36	0	---		
		6- 3 BAND					
0	P	22422.93	39	6	---		
1	O	---			---		
2	P	22379.24	45	2	---		

GK-2B   GK $^1\Sigma_g^+$ – B(2p) $^1\Sigma_u^+$ Continued

N"	SYM	P-BRANCH	I5	O-C	R-BRANCH	I5	O-C
		6- 4 BAND					
0	P	21536.28		-4	---		
1	O	21516.63		3	---		
2	P	21495.21	44	-4	---		
3	O	21469.24	35	-6	---		
4	P	21444.25	44	-4	---		
		6- 5 BAND					
0	P	20666.84	39	3	20698.32	35	-5
1	O	20648.08	39	3	20711.77	44	0
2	P	20628.10*	54	1	20720.73	39	2
3	O	20604.07	39	0	20730.55	44	0
4	P	20581.33		3	20737.60	35	0
5	O	20556.42	35	2	---		
		6- 6 BAND					
0	P	19814.11	54	8	19845.18	44	-1
1	O	19796.21	54	1	19859.01	54	2
2	P	19777.63*	59	4	19868.91	44	5
3	O	19755.38*	49	6	19880.04	49	-1
4	P	19734.78*	59	-5	19888.85	35	0
		6- 7 BAND					
0	P	---			19008.58	25	6
1	O	---			---		
2	P	---			---		
3	O	---			---		
4	P	---			---		
5	O	18904.61*	49	9	---		
		6- 8 BAND					
0	P	18141.77*	33	-10	18188.34*	49	1
1	O	18125.73	39	4	18202.98	59	2
2	P	18106.77	29	-1	18214.53	49	0
3	O	18090.30	33	1	18228.19	54	4
4	P	18072.76	19	-2	18240.27*	49	-4

GK-2B   GK ¹Σg⁺ – B(2p) ¹Σu⁺   Continued

N"	SYM	P-BRANCH	I5	O-C	R-BRANCH	I5	O-C
				6- 9 BAND			
0	P	---			17399.25*	33	-2
1	O	17354.28*	36	-3	17411.47	21	-13
2	P	17338.95	21	1	17426.43	21	-2
3	O	17324.00*	49	1	17440.19*	64	9
4	P	17306.56*	27	-1	---		
5	O	17292.07*			---		
6	P	17276.70	25	-5			
				6-10 BAND			
0	P	---			16611.67	13	1
1	O	---			16624.78*	44	2
2	P	---			16640.73	24	-2
3	O				---		
4	P				---		
5	O						
				6-11 BAND			
0	P	16522.25*	46	-12	---		
1	O	16509.66	21	-1	15839.74		6
				7- 0 BAND			
0	P	25904.06	20	0	25932.02	56	-1
1	O	25872.96	32	-2	25927.68	68	-1
2	P	25829.55	50	0	25930.06	68	-3
3	O	25793.39	50	-2	25959.42	74	-5
4	P	25784.87	68	-2	---		
5	O	---			---		
				7- 1 BAND			
0	P	24932.73*	30	-7	24989.79*	0	1
1	O	24891.56	22	2	24986.07	68	-1
2	P	24858.20	23	3	24989.79*	0	-12
3	O	24853.15	36	5	25021.43	68	-3
4	P	---			---		
5	O	---			---		

GK-2B   GK ¹Σg⁺ – B(2p) ¹Σu⁺   Continued

N"	SYM	P-BRANCH	I5	O-C	R-BRANCH	I5	O-C
				7- 2 BAND			
0	P				24066.79	38	-3
1	O	24040.20	22	-2	24063.80	55	-3
2	P	24011.71	20	-10	24068.93	30	1
3	O	23972.44	30	3	---		
4	P	23941.50	28	2	24102.30	---	-3
				7- 3 BAND			
0	P	---			23159.78	93	1
1	O	---			23166.00	62	1
2	P	23108.71		-17	---		
				7- 4 BAND			
0	P	22249.63	15	2	22275.12	28	2
1	O	22223.31	23	-4	22273.19	54	-3
2	P	22187.17	20	-2	22280.45	30	1
3	O	22160.49		-1	---		
4	P				---		
				7- 5 BAND			
0	P	---			21405.17	39	5
1	O	---			21403.71	44	0
2	P	---			21411.93	35	2
3	O	21295.23	15	-4	21449.99	35	4
4	P	21300.76	35	6	---		
5	O				---		
				7- 6 BAND			
0	P	---			20551.93	44	-1
1	O	---			20550.96	54	3
2	P	---			20560.06	49	0
3	O				20599.47	44	2
				7- 7 BAND			
0	P	19691.14	49	0	19715.31	49	4
1	O	19667.63	30	2	19714.77	59	2
2	P	19635.48	10	1	19724.73	54	1
3	O	19614.13		-2	19765.39	49	0
4	P	19623.89		-3	---		
5	O						

GK-2B   GK $^1\Sigma_g^+$ - B(2p) $^1\Sigma_u^+$ *Continued*

N"	SYM	P-BRANCH	I5	O-C	R-BRANCH	I5	O-C
		8-2 BAND					
0	P	24696.98	18	2	24727.90	18	-5
1	O	24673.00	--	6	24735.28	23	0
2	P	24643.93	29	7	24738.41	32	11
3	O	24610.91*	20	5	---		
4	P				---		
		8-3 BAND					
0	P	23792.87*	41	-3	23823.25	28	-10
1	O	23769.98	38	-3	23831.17	38	-15
2	P	23742.56	55	-5	23835.28	26	-9
3	O	23711.79	37	-9	---		
4	P				---		
		8-4 BAND					
0	P	22906.34	41	-1	22936.24	32	1
1	O	22884.46	39	-2	22944.62		-5
2	P	22858.62	48	-2	22949.78	32	-6
3	O	22829.88	30	0	---		
4	P				---		
		8-5 BAND					
0	P	22036.75		-9	22066.24		-1
1	O	22016.09		16	22075.24		8
2	P	21991.55*	25	7	22081.36*	20	7
3	O	21964.69	15	4	---		
4	P				---		
		8-6 BAND					
0	P	21184.12	30	6	21213.03	20	-4
1	O	21164.10	35	2	21222.33	25	-5
2	P	21140.98	39	0	21229.41	15	-3
3	O	21115.88*	39	-2	---		
4	P				---		
		8-7 BAND					
0	P	20347.92	10	4	20376.49		9
1	O	---			20386.09	15	-11
2	P	20306.94	15	2	20394.18		8
3	O	20283.54		1	---		
4	P				---		

GK-2B   GK $^1\Sigma_g^+$ - B(2p) $^1\Sigma_u^+$ *Continued*

N"	SYM	P-BRANCH	I5	O-C	R-BRANCH	I5	O-C
		7-8 BAND					
0	P	18871.38*	49	9	18894.94*	54	-14
1	O	---			18894.94*	54	4
2	P	---			18905.66	49	-7
3	O	18797.94	25	-4	18947.56	54	1
4	P				---		
		7-9 BAND					
0	P	18067.66*	21	6	18091.00	42	4
1	O	18045.70	25	1	18091.20	33	-1
2	P	18015.94	26	-3	18102.82	30	-2
3	O	17997.74	15		18145.83		-2
4	P						
		7-10 BAND					
0	P	---			17302.94		-6
1	O	---			17303.56		-4
2	P	17230.24*	32	1	17315.92	27	-4
3	O				17360.10	24	-5
		7-11 BAND					
0	P	---			16530.73		14
1	O	---			16531.71	20	9
2	P	16460.12		16	16589.96		8
3	O						
		7-12 BAND					
0	P	---			15774.17	25	5
1	O	---			15775.42	26	-5
2	P	---			15835.55		-1
3	O						
		8-0 BAND					
0	P	26560.84	38	4	26593.13*	56	-3
1	O	26534.08	38	-3	26599.16	44	4
2	P	26500.99	44	-1	---		
3	O				---		
		8-1 BAND					
0	P	25619.23	32	2	25657.51	14	-2
1	O	25593.97	38	4	25659.26		-3
2	P	25562.95	44	-4	---		
3	O	25527.54	38	-1	---		
4	P						

GK-2B   GK ¹Σg⁺ − B(2p) ¹Σu⁺   Continued

N"	SYM	P-BRANCH	I5	O-C	R-BRANCH	I5	O-C
				9- 4 BAND			
0	P				23521.00*	68	-8
1	O	23491.57	65	-5	23527.07	79	-5
2	P	23469.31	42	-2	23526.45	62	-1
3	O	23441.08	40	-1	23521.00*	68	-5
4	P	23406.48*	26	-2	23512.32*	85	12
5	O	23367.65	21	-7			
6	P	23325.86					
				9- 5 BAND			
0	P				22651.14	39	4
1	O	22622.12*	45	1	22657.61*	66	0
2	P	22600.77	26	-1	22657.93	48	2
3	O	22573.99	28	6	22653.95*	45	6
4	P	22541.23	18	-4	22646.91	24	-6
5	O	22504.60	18	8			
6	P	22465.85					
				9- 6 BAND			
0	P	---			---		
1	O	---			21804.77		-6
2	P	---			---		
				9- 7 BAND			
0	P	21723.53	20	10			
1	O	21692.42		-10	21798.19	15	-3
				9- 8 BAND			
0	P	20933.12	35	-3	20961.30	35	5
1	O	20913.68	30	9	20968.67	44	2
2	P	20889.43	35	6	20970.74	39	2
3	O	20860.14	20	-1	20969.32	44	-1
0	P	20113.35	10	5	20141.07	10	1
1	O	20094.53	39	-7	20148.84	30	4
2	P	20071.55	44	-2	20151.65	25	-8
3	O	20043.94	30	-4	20151.54		5
4	P	20013.58	39	-5	20149.55	15	-13
6	P	19982.07	25	-8			

GK-2B   GK ¹Σg⁺ − B(2p) ¹Σu⁺   Continued

N"	SYM	P-BRANCH	I5	O-C	R-BRANCH	I5	O-C
				8- 8 BAND			
0	P				19556.16*	39	-5
1	O	19528.07	49	4	19566.34	49	-1
2	P	19509.70	44	-5	19575.06	39	-5
3	O	19489.09	54	1	---		
4	P	19467.37*	54	1	---		
				8- 9 BAND			
0	P	---			---		
1	O	---			18762.70		4
2	P	---			---		
3	O	18687.43	44	5			
				8-10 BAND			
0	P	17936.69*	26	-4	17963.99	19	-14
1	O	17919.88	22	-10	17974.94	29	-11
2	P	17901.58	30	-10	17985.25	20	-9
3	O	17882.81	24	-14	---		
				8-11 BAND			
0	P	17164.84	44	9	17203.04		-3
1	O						
				8-12 BAND			
0	P	16408.58		-2	16435.36	13	11
1	O						
				9- 2 BAND			
0	P	---			25312.81	44	1
1	O	---			25317.75	56	2
2	P	---			25314.91	50	-1
3	O	25143.47	14	9	25306.28	62	1
4	P				25293.16	50	-2
5	O						
				9- 3 BAND			
0	P	---			24408.12*	27	-8
1	O	24354.87	20	1	24413.68	23	1
2	P	24325.13	12	7	24412.04	11	5
3	O	24288.56*	29	6	---		
4	P	24247.02		-4	---		
5	O						

GK-2C± GK $^1\Sigma_g^+$ — C(2p) $^1\Pi_u^\pm$

N"	SYM	P-BRANCH (2C+)	I5	O-C	SYM	Q-BRANCH (2C-)	I5	O-C	SYM	R-BRANCH (2C+)	I5	O-C
						0- 0 BAND						
1	O	---			P	12319.89*	59	-5	O	---		
2	P	---			O	12279.93	42	3	P	---		
3	O	12257.58	20	-7	P	---			O	12257.92	22	3
4	P	---			O	---			P	---		
5	O	11982.23*	64	-7	P	11923.84	26	-2	O	---		
6	P	---			O	---			P	---		
7	O	11708.52	28	1					O	---		
						0- 1 BAND						
1	P	---			A	---			P	---		
2	O	---			O	10621.73		-5	O	10603.00	15	14
3	D	---			P	---			D	---		
						0- 2 BAND						
1	O	---			A	---			O	---		
2	P	9008.97	21	-2	O	---			P	---		
3	O	---			P	---			O	9015.88	33	-2
						1- 0 BAND						
1	O	12641.68	39	-2	P	12650.80	42	-2	O	12674.12	34	0
2	P	12588.51	32	-2	O	12612.97	54	1	P	12656.19	51	3
3	O	12519.49	26	0	P	12565.15	49	-1	O	12601.23	56	1
4	P	12440.62	29	4	O	12510.93	51	2	P	12601.23	51	2
5	O	12355.60*	29	-3	P	12452.38	56	3	O	12567.32	54	1
6	P	---			O	12390.65	29	2	P	12550.21	47	8
7	O	---			P	12326.49	40	-1	O	12490.39	60	-4
8	P	---			O	12260.54	32		P	12448.63	39	0
9	O	---			P	12192.82	55	-5	O	12402.31	31	-1
10	P	---			O	12124.27	37	-4	P	12355.60*	29	-3
11	O	---			P	12053.70	19	0	O	12305.61	30	1
						1- 1 BAND						
1	O	---			P	10990.38	15	-1	O	11013.71	15	2
2	P	---			O	10954.85	21	1	P	---		
3	O	10864.44*	28	-2	P	---			O	10976.27	56	8

GK-2B GK $^1\Sigma_g^+$ — B(2p) $^1\Sigma_u^+$ *Continued*

N"	SYM	P-BRANCH	I5	O-C	R-BRANCH	I5	O-C
		9- 9 BAND					
0	P	---			19336.97	49	3
1	O	19309.49	49	-12	19345.15	59	4
2	P	19291.67	44	0	19348.82	49	2
3	O	19269.84	54	1	19349.79	59	0
4	P	19243.78*		1	19349.47	49	0
5	O	19215.38	54	-2	---		
6	P	19186.06	44	-6	---		
		9-10 BAND					
0	P	---			---		
1	O	18504.78	39	-5	---		
2	P	18484.13	49	0	---		
3	O	18459.53	44	-4	---		
4	P	18432.91	44	-10	---		
5	O	---			---		

GK-2C±   GK $^1\Sigma_g^+$ − C(2p) $^1\Pi_u^\pm$ *Continued*

N"	SYM	P-BRANCH	I5	O-C	SYM	Q-BRANCH	I5	O-C	SYM	R-BRANCH	I5	O-C
		2C+				2C-				2C+		

2- 0 BAND

N"	SYM	P-BRANCH	I5	O-C	SYM	Q-BRANCH	I5	O-C	SYM	R-BRANCH	I5	O-C
1	O	13720.13	24	-1	P	13734.84	21	-6	O	13763.34	20	-6
2	P	---			O	13702.21	26	-3	P	13744.34	23	-6
3	O	---			P	13653.45		7	O	---		
4	P	13528.90		8	O	13587.52	24	-8	P	---		
5	O	13432.26	22	-3	P	---			O	---		

2- 1 BAND

N"	SYM	P-BRANCH	I5	O-C	SYM	Q-BRANCH	I5	O-C	SYM	R-BRANCH	I5	O-C
1	O	12059.74	33	3	P	12074.50	35	3	O	12103.00*	37	3
2	P	12014.35	26	-2	O	12044.11	42	-1	P	12086.14*	38	-2
3	O	11953.79	29	5	P	11998.59	32	1	O	12052.88	31	3
4	P	11878.23	22	O	O	11937.28	29	-2	P	---		
5	O	11787.24	20	2	P	---			O	---		

2- 2 BAND

N"	SYM	P-BRANCH	I5	O-C	SYM	Q-BRANCH	I5	O-C	SYM	R-BRANCH	I5	O-C
1	O	10467.23	18	10	P	10481.90	18	O	O	---		
2	P	10424.03*	25	8	O	10453.74	21	O	P	---		
3	O	10366.78	25	O	P	---			O	---		

3- 0 BAND

N"	SYM	P-BRANCH	I5	O-C	SYM	Q-BRANCH	I5	O-C	SYM	R-BRANCH	I5	O-C
1	O	14082.44	16	-1	P	14095.10	22	9	O	14121.11	19	-1
2	P	14032.71	14	-1	O	---			P	---		
3	O	13966.46*	15	-3	P	14011.44	17	-3	O	---		

3- 1 BAND

N"	SYM	P-BRANCH	I5	O-C	SYM	Q-BRANCH	I5	O-C	SYM	R-BRANCH	I5	O-C
1	O	12422.03	44	1	P	12434.60	51	2	O	12460.69	57	O
2	P	12374.49		1	O	12401.83	63	-1	P	12444.20	54	-5
3	O	12311.53	36	7	P	12356.66	54	-1	O	12417.84*	61	5
4	P	---			O	12302.23	59	-1	P	12391.36	32	-1
5	O	12152.18*	48	2	P	12248.36	27	-4	O	12366.15		1
6	P	12069.01	24	-13	O	12196.41	39	2	P	---		

3- 2 BAND

N"	SYM	P-BRANCH	I5	O-C	SYM	Q-BRANCH	I5	O-C	SYM	R-BRANCH	I5	O-C
1	O	10829.43*	52	-1	P	10842.05	30	4	O	---		
2	P	---			O	10811.46	25	O	P	---		
3	O	10724.41	30	-9	P	10769.64	23	2	O	---		
4	P	---			O	10719.54	26	O	P	---		
5	O	---			P	10671.23	23	4	O	---		

3- 3 BAND

N"	SYM	P-BRANCH	I5	O-C	SYM	Q-BRANCH	I5	O-C	SYM	R-BRANCH	I5	O-C
1	O	---			P	9316.02	41	-6	O	---		
2	P	9260.46	35	-4	O	---			P	---		

4- 0 BAND

N"	SYM	P-BRANCH	I5	O-C	SYM	Q-BRANCH	I5	O-C	SYM	R-BRANCH	I5	O-C
1	O	---			P	14947.68	9	-9	O	---		
2	P	14885.40	9	-8	O	---			P	14969.05	9	-5
3	O	14824.62	37	2	P	14878.09	5	1	O	---		
4	P	14753.52	28	O	O	---			P	---		

4- 1 BAND

N"	SYM	P-BRANCH	I5	O-C	SYM	Q-BRANCH	I5	O-C	SYM	R-BRANCH	I5	O-C
1	O	13271.26	40	1	P	13287.36	32	2	O	13318.83	30	3
2	P	13227.23		-1	O	13259.94	37	-1	P	13310.85	48	-1
3	O	13169.65*	36	8	P	13223.32	33	4	O	---		
4	P	13102.98	49	5	O	---			P	---		

4- 2 BAND

N"	SYM	P-BRANCH	I5	O-C	SYM	Q-BRANCH	I5	O-C	SYM	R-BRANCH	I5	O-C
1	O	11678.68	30	1	P	11694.80*	35	3	O	11726.25	27	3
2	P	11636.85	22	3	O	11669.49		-8	P	11720.35*	79	-9
3	O	11582.57	23	-4	P	11636.25	33	2	O	---		

4- 3 BAND

N"	SYM	P-BRANCH	I5	O-C	SYM	Q-BRANCH	I5	O-C	SYM	R-BRANCH	I5	O-C
1	O	---			P	---			O	10200.41		5
2	P	---			O	10145.83	24	1	P	---		

GK-2C±   GK $^1\Sigma_g^+$ − C(2p) $^1\Pi_u^\pm$ *Continued*

N"	SYM	P-BRANCH 2C+	I5	O-C	SYM	Q-BRANCH 2C-	I5	O-C	SYM	R-BRANCH 2C+	I5	O-C
						5- 1 BAND						
1	O	---			P	13998.84	26	-7	O	14021.73	18	-5
2	P	---			O	13962.98	25	5	P	---		
3	O	---			P	---			O	---		
4	P	---			O	13864.30	21	-1	P	13980.15	17	-10
5	O	13714.23	27	O	P	13837.31	26	3	O	---		
6	P	---			O	13784.11	15	-8	P	13924.72*	49	O
						5- 2 BAND						
1	O	12395.94	45	O	P	12406.32	40	-2	O	12429.19	56	-1
2	P	12348.39	28	O	O	12372.54	61	-1	P	12412.02	53	1
3	O	12285.57*	66	-2	P	12327.80	51	O	O	12392.85*	79	-5
4	P	---			O	12281.62	54	1	P	---		
5	O	---			P	12260.08	26	1	O	---		
6	P	---			O	---			P	---		
7	O	---			P	12165.88	21	-4	O	---		
						5- 3 BAND						
1	O	---			P	10880.23	21	-18	O	10903.40	66	6
2	P	10824.79	26	-4	O	10848.76	25	-4	P	10888.58*	35	13
3	O	---			P	---			O	10873.15	24	-2
						6- 1 BAND						
1	O	14758.46*	47	-11	P	14773.64		-3	O	---		
2	P	14713.55		-2	O	14744.71*	47	3	P	---		
3	O	14654.34*		4	P	14698.59*	47	-6	O	---		
4	P	---			O	14641.22	28	1	P	---		
5	O	14491.13	28	O	P	---			O	---		
						6- 2 BAND						
1	O	13166.03	28	4	P	13180.99*	49	-11	O	13210.98*	45	3
2	P	13123.19	27	4	O	13154.28*	52	-2	P	13195.83	15	2
3	O	13067.19*	62	-15	P	13111.63	38	3	O	13169.65*	36	-15
4	P	---			O	13058.53	47	2	P	---		
5	O	---			P	12991.65	29	O	O	---		
						6- 3 BAND						
1	O	11640.19	28	6	P	11655.19	27	2	O	11685.11	23	2
2	P	11599.63*	69	4	O	11630.53*	40	-2	P	11672.29	28	4
3	O	11547.63	23	2	P	11591.09	22	-3	O	11650.01*	33	-6
4	P	---			O	11542.34	20	-5	P	---		
						7- 2 BAND						
1	O	---			P	---			O	13902.96	38	7
2	P	---			O	---			P	---		
3	O	13759.28	43	O	P	---			O	13889.17	21	-3
4	P	---			O	13777.88	40	-3	P	---		
						7- 3 BAND						
1.	O	12353.38	18	-4	P	12361.96	56	4	O	12377.03	59	O
2	P	12300.21	33	-13	O	12322.51	60	2	P	12363.49	55	4
3	O	12239.45	24	-10	P	12282.38	61	6	O	12369.42	57	-5
4	P	---			O	12261.75	46	-4	P	---		
						7- 4 BAND						
1	O	---			P	10901.76	20	2	O	10918.44	28	6
2	P	---			O	10864.44*	28	-2	P	---		

GK-2C± GK $^1\Sigma_g^+$ – C(2p) $^1\Pi_u^\pm$ *Continued*

N"	SYM	P-BRANCH	I5	O-C	SYM	Q-BRANCH	I5	O-C	SYM	R-BRANCH	I5	O-C
		2C+				2C-				2C+		
						8- 3 BAND						
1	O	13010.18	30	2	P	13023.07	24	2	O	13048.48	28	O
2	P	12967.45*	49	-2	O	12993.96	34	2	P	13032.81*	21	-2
3	O	12910.96	37	-4	P	12951.66	29	-4	O	---		
						9- 3 BAND						
1	O	13595.30*		-13	P	13607.94	46	4	O	13630.93	36	O
2	P	13552.22*	48	-10	O	13576.43	48	4	P	---		
3	O	13493.45	40	O	P	13528.35	45	3	O	13573.39	34	-2
4	P	---			O	13465.73	44	O	P	---		
5	O	---			P	13390.09	35	-10	O	---		

4D-2B P(4d) $^1\Sigma_g^+$ – B(2p) $^1\Sigma_u^+$

N"	SYM	P-BRANCH	I5	O-C	R-BRANCH	I5	O-C
				0- 0 BAND			
0	P				27068.51	62	1
1	O	---			27056.97	74	3
2	P	27009.42	50	-3	27050.73	68	-2
3	O	26958.81	44	-1	27052.35	74	O
4	P	26913.91	32	-16	27062.69	68	-1
5	O	26877.67	26	-10	27082.00	74	-3
6	P	---			27110.65	62	-2
7	O	---			27148.60	56	-1
8	P	---			27195.89	44	O
9	O	---			27252.12	38	-1
10	P	---			27317.47		1
11	O	---			27391.06	50	-2
				0- 1 BAND			
0	P				26126.15	62	O
1	O	---			26115.34	74	-1
2	P	26069.30	50	3	26110.54	68	-3
3	O	26020.69	50	-12	26114.32	74	-2
4	P	25976.88	38	5	26127.45	62	-1
5	O	25946.04	38	6	26150.19	62	-5
6	P	25923.23	20	-3	26182.83	50	-5
7	O	---			26225.42	56	1
				0- 2 BAND			
0	P				25203.35	26	6
1	O	---			25193.16	56	6
2	P	25148.29*	50	1	25189.63	44	5
3	O	25101.58	26	-10	25195.29	56	8
4	P	---			25210.89	44	12
5	O	---			25236.61	50	3
6	P	---			25272.85	20	8

4D-2B   P(4d) $^1\Sigma_g^+$ − B(2p) $^1\Sigma_u^+$ *Continued*

N"	SYM	P-BRANCH	I5	O-C	R-BRANCH	I5	O-C
			O- 3 BAND				
O	P				24298.70	16	1
1	O	---			24289.05*	29	1
2	P	24245.66*		31	24286.79	35	14
3	O	24200.49		6	24294.02	31	6
4	P	---			24311.78	18	-1
5	O	---			24340.30	22	4
			O- 4 BAND				
O	P				23411.60	23	3
1	O	---			23402.46	34	-3
2	P	---			23401.11	25	-1
3	O	23316.51	18	5	23409.99	26	O
4	P	---			23429.77	22	-2
5	O	---			23460.83*	34	O
			O- 5 BAND				
O	P				22541.70		11
1	O	---			22533.05	20	7
2	P	---			---		
3	O	---			22542.78		-5
4	P	---			22564.53		-3
5	O	---			22597.88		4
			O- 7 BAND				
O	P				---		
1	O	---			---		
2	P	---			---		
3	O	---			20858.31	35	4
			O-11 BAND				
O	P				---		
1	O	---			17660.91	10	2

4D-2C±   P(4d) $^1\Sigma_g^+$ − C(2p) $^1\Pi_u^\pm$

SYM	P-BRANCH	I5	O-C	SYM	Q-BRANCH	I5	O-C	SYM	R-BRANCH	I5	O-C
	2C+				2C-				2C+		
					O- O BAND						
1	O	---			P	18277.39	44	7	O	18285.26*	59	9
2	P	18215.08		5	O	18224.13*	59	12	P	18256.37*		4
3	O	---			P	18165.37	23	6	O	18224.13*	59	6
4	P	---			O	18103.84	24	5	P	18189.44	54	6
5	O	17948.47	13	-1	P	18040.61	12	8	O	18152.78	40	4
6	P	17854.92*	28	4	O	---			P	18114.47	30	-3
7	O	17760.71	20	1	P	17910.87	O	3	O	18075.05	35	5
					O- 1 BAND						
1	O	---			P	---			O	16624.78*	44	4
2	P	16556.77*		-2	O	---			P	---		
3	O	---			P	16510.60*	67	9	O	16569.14*		10
4	P	---			O	16453.50*	74	1	P	16538.78		-1
					O- 2 BAND						
1	O	---			P	---			O	---		
2	P	14966.46	37	9	O	---			P	---		
3	O	14888.53	19	-2	P	---			O	---		
4	P	---			O	14870.85		6	P	---		

WX-2B

WX $^1\Sigma_g^+$ — B(2p) $^1\Sigma_u^+$

N"	SYM	P-BRANCH	I5	O-C	R-BRANCH	I5	O-C
		— 2 BAND					
0	P	17818.22	37	8	---		
1	O	17791.42*	26	3	---		
2	P	17750.20	33	0	---		
3	P	17695.45*	30	10	---		
		— 3 BAND					
0	P	16914.07	37	-1	16937.53*	36	-3
1	O	16888.39*		-7	16919.80*	30	-6
2	P	16848.97	35	2	---		
3	P	16796.37	38	0	---		
		— 4 BAND					
0	P	16027.59	18	6	---		
1	O				---		
		— 5 BAND					
0	P	15157.93	5	-9	---		
1	O				---		
		— 7 BAND					
0	P	13469.12*		6	---		
1	O				---		

WW-2C

WW $^1\Sigma_g^+$ — C(2p) $^1\Pi_u$

N"	SYM	P-BRANCH	I5	O-C	R-BRANCH	I5	O-C
		— 0 BAND					
6	P	11852.19		4	10536.03	15	-3
		— 1 BAND					
4	P	---					

WW-2B

WW $^1\Sigma_g^+$ — B(2p) $^1\Sigma_u^+$

N"	SYM	P-BRANCH	I5	O-C	R-BRANCH	I5	O-C
		— 0 BAND					
4	P	---			21059.86*	39	-11
		— 3 BAND					
4	P	---			18309.00*	49	-6
		— 4 BAND					
4	P	---			17427.07	25	1
		— 5 BAND					
4	P	---			16561.81		-2
5	O	---			---		
6	P	16380.79*	45	16	---		

WY-2B

WY $^1\Sigma_g^+$ — B(2p) $^1\Sigma_u^+$

N"	SYM	P-BRANCH	I5	O-C	R-BRANCH	I5	O-C
		— 0 BAND					
0	P	---			21258.75	10	0
1	O	---			21279.95	35	0
2	P	---			21265.56*	30	0
3	O	---			---		
4	P	---			---		
		— 1 BAND					
0	P	---			---		
1	O	21199.68	35	-2	---		
2	P	21128.86	25	-2	---		
		— 2 BAND					
0	P	20259.56*	15	4	---		
1	O	---			---		
2	P	---			---		
3	O	---			---		
4	P	19276.98	10	3	---		

WZ-2B   WZ $^1\Sigma_g^+ \to$ B(2p) $^1\Sigma_u^+$ *Continued*

N"	SYM	P-BRANCH	I5	0-C	R-BRANCH	I5	0-C
				− 6 BAND			
0	P	---					
1	O	---					
2	P	---					
3	O	20604.86	35	4	20718.41	35	5
4	P	---			---		
				− 7 BAND			
0	P	---					
1	O	---			---		
2	P	---					
3	O	19772.47	30	2	19883.03	35	1
4	P	---			---		
				− 8 BAND			
0	P	---					
1	O	---			---		
2	P	---					
3	O	18956.22	44	−6	19064.00	44	−3
4	P	---			---		
				− 9 BAND			
0	P	---					
1	O	---			---		
2	P	---					
3	O	18156.01	22	−6	18261.14	39	4
4	P	---			---		
				−10 BAND			
0	P	---					
1	O	---			---		
2	P				17474.18	44	−8

WZ-2B   WZ $^1\Sigma_g^+ \to$ B(2p) $^1\Sigma_u^+$

N"	SYM	P-BRANCH	I5	0-C	R-BRANCH	I5	0-C
				− 0 BAND			
0	P	---					
1	O	---			---		
2	P	---					
3	O	25951.69	38	−2	26088.36	44	−3
4	P	---			---		
				− 1 BAND			
0	P	---					
1	O	---			---		
2	P				25148.29*	50	8
				− 2 BAND			
0	P	---					
1	O	---			---		
2	P	---					
3	O	24099.78		0	24227.23	23	1
4	P	---			---		
				− 3 BAND			
0	P	---					
1	O	---			---		
2	P	---					
3	O	23200.77	52	−3	23324.29	43	0
4	P	---			---		
				− 4 BAND			
0	P	---					
1	O	---			---		
2	P	---					
3	O	22318.93*	83	13	22438.82	23	6
4	P	---			---		
				− 5 BAND			
0	P	---					
1	O	---			---		
2	P	---					
3	O	21453.57	39	0	21570.26		5
4	P	---			---		

3B-EF   B'(3p) $^1\Sigma_u^+$ – EF $^1\Sigma_g^+$

N"	SYM	P-BRANCH	I5	O-C	R-BRANCH	I5	O-C
0–0 BAND							
0	O	---			11380.39*	73	-14
1	P	---			11400.97*	55	5
2	O	11284.54	53	2	11415.35	59	-1
3	P	11241.34	37	-2	11423.79	47	0
4	O	11192.87	40	1	11426.23	51	0
5	P	11139.28	28	-1	11422.69	32	0
6	O	11080.87*	33	0	11413.21*	32	0
7	P	11017.78	27	-1	11397.45*	67	0
8	O	10950.37	33	1	---		
0–3 BAND							
0	O	9635.38	33	0	9692.33	33	-1
1	P	9600.41	41	-3	9714.09	31	-1
2	O	9561.32	37	-3	9731.25	39	1
3	P	9518.30	46	-3	9743.81	34	3
4	O	9471.68	35	-1	9751.67	37	-3
5	P	9421.28	45	2	9755.26	36	17
6	O	9367.68*	36	-4	9753.62		2
7	P	9311.21	39	0	---		
8	O				---		
1–0 BAND							
0	O	12687.40	27	0	12744.33	34	-1
1	P	12648.32	43	1	12761.94	31	-1
2	O	12602.36	37	-3	12772.26	48	0
3	P	12549.76	41	-1	12775.25	31	0
4	O	12490.74	40	-1	12770.95	35	0
5	P	12425.55	38	6	12759.40	22	-2
6	O	12354.48	27	-4	12740.69	24	10
7	P	12277.85	25	1	12714.91	18	0
8	O	12195.88	22	0	12682.20	19	-1
9	P	12108.93	21	9	---		
10	O				---		

3B-EF   B'(3p) $^1\Sigma_u^+$ – EF $^1\Sigma_g^+$ *Continued*

N"	SYM	P-BRANCH	I5	O-C	R-BRANCH	I5	O-C
1–3 BAND							
0	O	11000.66*	56	8	11055.91*	33	-20
1	P	10964.17	64	-6	11075.13	29	0
2	O	10922.35	57	-3	11088.17	33	0
3	P	10875.21	71	-3	11095.25*	30	1
4	O	10823.13	47	-2	11096.40	32	-2
5	P	10765.92*	73	-6	11091.81	24	-1
6	O	10704.46	39	1	11081.05		-3
7	P	---			11064.87	21	-4
8	O	10568.97	21	-7	11043.03	21	-3
9	P	10495.66	27	-3	---		
10	O				---		
1–6 BAND							
0	O	9410.18*	54	6	9464.16	43	
1	P	9376.91	52	1	9484.70	41	
2	O	9339.77	45	2	9500.95*	64	
3	P	9298.99	54	1	9512.63	46	
4	O	---			9520.17	53	
5	P	---			9527.02	38	
6	O	9156.56	41	2	9521.71	47	
7	P				---		
2–0 BAND							
0	O	13973.43*	60	-12	14029.43	18	-1
1	P	13933.44	27	1	14044.97	16	-2
2	O	13885.48	31	5	14052.27	19	1
3	P	13829.78	35	0	14051.22*	42	-19
4	O	13766.88	24	-3	14042.71	15	-3
5	P	13697.33	28	5	14026.80	15	-10
6	O	13621.99		-1	---		
7	P				---		

3B-EF   B'(3p) $^1\Sigma_u^+$ – EF $^1\Sigma_g^+$ Continued

N"	SYM	P-BRANCH	I5	O-C	R-BRANCH	I5	O-C
		3- 9 BAND					
0	O				10494.17	39	-
1	P	10446.97	28	2	10511.14*	41	-1
2	O	10417.00	41	0	10524.57	36	-1
3	P	---			10535.71*	31	-2
4	O	10353.35	40	2	10548.04	32	4
5	P	10336.49	28	-1	10573.97	23	-1
		4- 6 BAND					
0	O	13009.12	33	0	13058.84	38	2
1	P	12971.60*	56	-1	13070.84	48	-1
2	O	12925.89	33	-2	13074.24	50	-2
3	P	12872.45	49	5	13069.03	36	-10
4	O	12814.84	24	-1	13055.66	45	1
5	P	12742.06	26	-2	---		
6	O						
		4- 9 BAND					
0	O	11557.38	46	-1	11603.86	56	-1
1	P	11526.69	59	0	11619.11	52	-1
2	O	11492.39	55	-1	11629.34	59	0
3	P	11458.09	54	-2	11635.64	46	2
4	O	11436.43	32	0	11641.38	46	2
5	P						
		5- 3 BAND					
0	O	---			15654.14		5
1	P	---			---		
2	O	---			15657.99		0
3	P	15509.05		-2	---		
		5- 6 BAND					
0	O	14013.73	21	-2	14062.11	24	2
1	P	13974.87	31	-1	14071.36	21	0
2	O	13926.40	27	-4	14070.67		1
3	P	13868.76	36	-4	---		
4	O	---					

3B-EF   B'(3p) $^1\Sigma_u^+$ – EF $^1\Sigma_g^+$ Continued

N"	SYM	P-BRANCH	I5	O-C	R-BRANCH	I5	O-C
		2- 3 BAND					
0	O	12286.73	47	0	12341.23	58	0
1	P	12249.34	61	-1	12358.14	52	-3
2	O	12205.39*	55	-3	12368.16*	66	-2
3	P	12155.22	60	-3	12371.38	49	-2
4	O	12099.31	41	0	12368.16*	66	-5
5	P	12037.76*	45	-1	12359.32*	37	2
6	O	11971.96	29	-3	12346.16	36	2
7	P	11903.73	25	-2	---		
		2- 6 BAND					
0	O	10696.27	43	0	10749.25	48	2
1	P	10662.02	60	0	10767.73	43	2
2	O	10622.78	49	-1	10780.86	53	1
3	P	10578.99	55	0	10788.81	39	4
4	O	10534.51*	35	1	10791.95	42	0
5	P	10478.35	41	-3	10794.53	27	4
6	O	10424.03*	25	1	10786.76	26	1
7	P	10369.24	23	0	---		
		3- 3 BAND					
0	O	13489.12	27	-2	13541.15	43	2
1	P	13449.22	38	-3	13553.35*	42	1
2	O	13400.58	26	-1	13556.80	48	-1
3	P	13343.85	28	-3	13551.82	42	-1
4	O	13279.84*	33	10	13538.53	44	-2
5	P	---			13517.22		0
6	O	13129.85		0	---		
		3- 6 BAND					
0	O	11898.68	47	0	11949.14	55	1
1	P	11861.90	61	-2	11962.90	53	-2
2	O	11817.95	57	-1	11969.48*	61	0
3	P	11767.63	60	1	11969.18	51	-2
4	O	11714.93	48	-2	11962.28	53	-1
5	P	11648.70	56		---		

3B-EF B'(3p) $^1\Sigma_u^+$ – EF $^1\Sigma_g^+$ Continued

N"	SYM	P-BRANCH	I5	O-C	R-BRANCH	I5	O-C
5-9 BAND							
0	O				12607.14	34	0
1	P	12562.04	33	2	12619.65	48	2
2	O	12529.96	48	0	12625.75	31	1
3	P	12492.94	44	1	12626.55	40	1
4	O	12454.49	58	-2	12625.54	---	
5	P	12427.37	34	2			
5-10 BAND							
0	O	---			---		
1	P	---			---		
2	O	---			---		
3	P	---			---		
4	O	---			---		
5	P	---			---		
6	O	12282.65	39	0	---		
5-11 BAND							
0	O				11645.83	35	13
1	P	11617.58	50	7	11713.29	32	0
2	O	---			---		
5-12 BAND							
0	O				11271.87	30	0
1	P	11235.73	24	1	11293.34	28	1
2	O	11221.33	33	0	11317.12	37	-1
3	P	11210.12	26	1	11343.70	27	-2
4	O	11203.58	30	-2	11374.61	30	-1
5	P	11204.65	23	0	---		
5-13 BAND							
0	O				10826.09*	35	-5
1	P	10795.78	28	4	10888.21	31	4
2	O	10792.54*	57	15			
5-14 BAND							
0	O				10297.96	27	11
1	P	10267.24		6	---		
2	O	10263.62		-5	---		
3	P	10281.84	21	3	---		
4	O	10303.55		-3	---		
5	P	10333.31		-6	---		
6	O	---					

3B-EF B'(3p) $^1\Sigma_u^+$ – EF $^1\Sigma_g^+$ Continued

N"	SYM	P-BRANCH	I5	O-C	R-BRANCH	I5	O-C
5-15 BAND							
0	O	---			---		
1	P	---			9875.44	19	-4
2	O	---			---		
5-16 BAND							
0	O						
6-9 BAND							
0	O				9331.49	26	5
6-10 BAND							
0	O				13478.82	39	0
1	P	13436.85	25	1	---		
2	O	13401.66	33	2	13483.01	44	2
3	P	13358.68	25	0	---		
4	O	---			13458.22	40	2
6-11 BAND							
0	O				13129.24	16	-3
1	P	13107.75		-9	---		
2	O	---			13189.18	19	1
3	P	13133.00	52	-5	---		
4	O				13279.53	26	4
6-12 BAND							
0	O				12517.52	18	14
1	P	12489.18	27	-1	12570.51	23	-3
2	O	12509.44	20	-1	---		
3	P	12110.63	39	9	12143.52	37	-3
4	O	12093.01	46	0	12174.32	45	-4
5	P	12049.84	28	-2	12207.30	32	1
6	O	---			---		
6-13 BAND							
0	O				11697.84	39	2
1	P	11670.59	32	3	11719.12	33	2
2	O	11664.12	56	5	11745.43	38	1
3	P	11661.77	42	0	---		

3B-EF B'(3p) $^1\Sigma_u^+$ − EF $^1\Sigma_g^+$ *Continued*

N"	SYM	P-BRANCH	I5	O-C	R-BRANCH	I5	O-C
				6-14 BAND			
0	O				11169.52	19	-1
1	P	11141.97	19	-3	---		
2	O	11135.39	22	4	11216.75	24	5
3	P	11134.26	19	-1	---		
4	O	11139.03	25	-3	---		
5	P	---			---		
6	O	11166.02	23	-2	---		
				6-15 BAND			
0	O				10689.72	27	-2
1	P	10660.71	24	-11	10709.36	24	0
2	O	10651.43	35	5	10732.74	30	1
3	P	---			---		
4	O	10644.78	38	-1	10791.23	23	0

3C±-EF D(3p) $^1\Pi_u^\pm$ − EF $^1\Sigma_g^+$

N"	SYM	P-BRANCH 3C+	I5	O-C	SYM	Q-BRANCH 3C-	I5	O-C	SYM	R-BRANCH 3C+	I5	O-C
								O- O BAND				
0	O				O				O	13761.55	49	2
1	P				P	13728.86	74	-3	P	13789.96	45	1
2	O	13665.54	46	2	O	13724.51	74	3	O	13816.26*	49	3
3	P	13630.37	45	-2	P	13717.82		3	P	13840.13	40	10
4	O	13593.77	48	2	O	13708.99	48	-4	O	13861.14		-3
5	P	13555.62	46	9	P	13698.03		1	P	---		
6	O	13515.77	48	6	O	13685.05	40	6	O	---		
7	P	---			P	13670.10	30	0	P	---		
8	O	---			O	13653.24	27	0	O	---		
9	P	---			P	13634.62		0	P	---		
10	O	---			O	13614.00	50	0	O	---		
11	P	---			P	---			P	---		
12	O	---			O	13569.08	19	0	O	---		
								O- 3 BAND				
0	O				O				O	12073.29	25	-3
1	P				P	12042.11	21	4	P	12103.00*	37	-13
2	O	11981.42	24	-2	O	12040.37	27	-3	O	12132.13	23	-2
3	P	11950.38	26	0	P	12037.76*	45	-2	P	12159.90	55	-12
4	O	11919.20	23	-2	O	12034.40	22	-10	O	---		
5	P	11887.87	26	-6	P	12030.41	18	-1	P	---		
6	O	11856.18	21	-2	O	12025.42	20	-6	O	---		
								O- 6 BAND				
0	O				O				O	---		
1	P				P	10451.67		6	P	---		
2	O	---			O	10453.09	20	2	O	---		
3	P	---			P	10455.14		-1	P	---		
4	O	---			O	10458.39	20	15	O	---		
								1- O BAND				
0	O				O				O	---		
1	P				P	15329.98		0	P	---		
2	O	---			O	15323.30	37	0	O	---		
3	P	---			P	15313.36	33	-3	P	---		
4	O	---			O	15300.09	33	-2	O	---		
5	P	---			P	15283.65	28	-2	P	---		
6	O	---			O	15264.14	14	0	O	---		

3C$^\pm$-EF   D(3p) $^1\Pi_u^\pm$ − EF $^1\Sigma_g^+$ *Continued*

N"	SYM	P-BRANCH	I5	O-C	SYM	O-BRANCH	I5	O-C	SYM	R-BRANCH	I5	O-C
		3C+				3C−				3C+		
						1- 3 BAND						
0	O				O				O	13675.47	48	2
1	P				P	13643.15	48	-1	P	13704.95	48	-2
2	O	13583.54	48	-3	O	13639.20	50	-2	O	13733.05	52	0
3	P	13552.22*	48	0	P	13633.31	50	-7	P	---		
4	O	---			O	13625.60	50	2	O	---		
5	P	---			P	13616.09	40	2	P	---		
6	O	---			O	13604.60	45	-3	O	---		
						1- 6 BAND						
0	O				O				O	12083.48	36	3
1	P				P	12052.71	31	1	P	12114.51	31	0
2	O	11996.20	21	-4	O	12051.92*	63	3	O	12145.71	42	-1
3	P	11969.48*	61	-11	P	12050.84*	52	9	P	---		
4	O	11943.87	23	1	O	12049.31	30	-1	O	---		
5	P	---			P	12051.27	23	1	P	---		
6	O	---			O	12045.26	26	2	O	---		
						2- 3 BAND						
0	O				O				O	15209.88	42	-2
1	P				P	15178.53	37	-2	P	15235.65	37	0
2	O	15117.99	37	-3	O	15172.46	47	2	O	15258.54	42	2
3	P	15082.84	33	-6	P	15163.34	37	3	P	15278.31	28	0
4	O	15045.55	37	-4	O	15151.20	37	-5	O	---		
5	P	15006.21	33	-1	P	15136.49	23	4	P	---		
6	O	---			O	15117.66	33	2	O	---		
						2- 6 BAND						
0	O				O				O	13617.91	48	1
1	P				P	13588.10	48	1	P	13645.20	48	1
2	O	13530.49	50	-20	O	13585.10	48	-1	O	13671.18*	50	-1
3	P	13500.27	46	0	P	13580.67		-1	P	13695.69		1
4	O	13469.36	52	3	O	13575.00	48	1	O	---		
5	P	13441.41	44	0	P	13571.64	41	0	P	---		
6	O	---			O	13558.24		-1	O	---		
						2- 9 BAND						
0	O				O				O	12162.93	35	-2
1	P				P	12136.36	35	0	P	12193.45	30	-1
2	O	12085.83	26	6	O	12140.19	43	0	O	12226.27		0
3	P	12066.80	23	4	P	12147.16	31	-1	P	12262.15	25	-2
4	O	12055.06*	77	2	O	12160.73	33	3	O	---		
5	P	12063.08*	29	10	P	---			P	---		
						3- 6 BAND						
0	O				O				O	---		
1	P				P	15059.28	33	1	P	15116.08	33	1
2	O	15002.56	37	-1	O	15054.19	47	-5	O	15140.06	33	0
3	P	14971.13	33	-2	P	15046.62	37	-1	P	---		
4	O	14938.19	37	-1	O	15036.84	42	5	O	---		
						3- 9 BAND						
0	O				O				O	13634.85	48	2
1	P				P	13607.56	50	2	P	13664.37	48	3
2	O	13557.68	48	3	O	13609.30	50	-2	O	13695.16		2
3	P	13537.67	46	3	P	13613.14	50	2	P	---		
4	O	13523.93	48	2	O	13622.46	48	-4	O	---		
						3-10 BAND						
0	O				O				O	13285.26	20	-2
1	P				P	---			P	13333.67	20	4
2	O	---			O	---			O	---		
3	P	13296.75	22	5	P	---			P	---		
4	O	13345.22	31	2	O	---			O	---		
5	P	13396.72	31	0	P	---			P	---		
						3-12 BAND						
0	O				O				O	12299.54	27	-2
1	P				P	12281.20	35	-4	P	12338.05	25	1
2	O	12248.91	38	-11	O	12300.76	43	7	O	12386.46	36	-5
3	P	12254.78	23	-4	P	12330.28	23	-2	P	---		
4	O	12273.00	18	0	O	---			O	---		

3C±-EF   D(3p) $^1\Pi_u^\pm$ − EF $^1\Sigma_g^+$

Continued

N"	SYM	Q-BRANCH	I5	O-C

3C-

4- 9 BAND

N"	SYM	Q-BRANCH	I5	O-C
1	P	15015.92	33	-1
2	O	15015.55	37	0
3	P	---		
4	O	15021.35	23	-8

4-11 BAND

N"	SYM	Q-BRANCH	I5	O-C
1	P	14070.85	30	-7
2	O	14103.08	40	-2
3	P	14152.32	26	20
4	O	14219.17		5

4-12 BAND

N"	SYM	Q-BRANCH	I5	O-C
1	P	13689.57		-6

4-13 BAND

N"	SYM	Q-BRANCH	I5	O-C
1	P	13249.67	32	2
2	O	13277.97	39	-1

4-15 BAND

N"	SYM	Q-BRANCH	I5	O-C
1	P	12240.01	29	10
2	O	12265.34	49	5
3	P	12303.16	30	5

4-16 BAND

N"	SYM	Q-BRANCH	I5	O-C
·1	P	11754.29	23	3
2	O	11781.46	30	-3
3	P	11821.29	29	-25
4	O	11874.93	21	2

3E±-2B   I(3d) $^1\Pi_g^\pm$ − B(2p) $^1\Sigma_u^+$

N"	SYM	P-BRANCH	I5	O-C	SYM	Q-BRANCH	I5	O-C	SYM	R-BRANCH	I5	O-C
		3E+				3E-				3E+		
						O- O BAND						
0	P				P				P	21710.14	35	O
1	O				O	21671.65*	54	-3	O	21769.66	35	-1
2	P	21651.07	39	-2	P	21681.03	54	1	P	21839.90	15	1
3	O	21671.65*	54	10	O	21695.89	54	O	O	21917.11	15	6
4	P	21703.20	49	-1	P	21717.15	49	3	P	21999.06		-12
5	O	21742.47	54	O	O	21745.53		2	O	22086.68		-6
6	P	21787.51	49	-2	P	21781.54	39	-1	P	22176.49		10
7	O	21839.03	49	1	O	21825.73*	49	3	O	22264.38		6
8	P	21893.74	39	-2	P	21878.22	25	-4	P	22370.01	26	-11
9	O	21948.07	35	9	O	21939.31	35	5	O	---		
10	P	22021.34*	15	-10	P	22009.08	15	9	P	---		
11	O	22086.01*	30	O	O	22087.42	20	5	O	---		

3E±-2B   I(3d) ¹Πg± — B(2p) ¹Σu+   *Continued*

N"	SYM	P-BRANCH 3E+	I5	O-C	SYM	Q-BRANCH 3E-	I5	O-C	SYM	R-BRANCH 3E+	I5	O-C
						O- 1 BAND						
0	P				P				P	20767.99*	54	20
1	O				O	20730.11	59	2	O	20828.04	49	-4
2	P	20710.93	49	2	P	20740.83	59	-1	P	20899.69	35	-2
3	O	20733.54	59	0	O	20757.86	59	-2	O	20979.00	35	-4
4	P	20767.99*	54	2	P	20781.95	54	7	P	21063.92	25	-2
5	O	20810.69*	54	1	O	20813.72*	54	0	O	21154.94	15	-1
6	P	20859.75	54	1	P	20853.81	54	5	P	21248.87*	44	27
7	O	20915.80*	54	-2	O	20902.48	49	-2	O	21341.09	20	-3
8	P	20975.51	39	-7	P	20960.06	39	-2	P	21451.96	20	2
9	O	21035.37	44	5	O	21026.63	44	3	O	---		
10	P	21114.69	16	7	P	21102.15	39	-2	P	---		
11	O	---			O	21186.62	44	-6	O	---		
12	P	---			P	21277.10	15	0	P	---		
13	O	---			O	21381.77	39	0	O	---		
						O- 2 BAND						
0	P				P				P	19844.94	39	1
1	O				O	19807.87	54	3	O	19905.79	39	-4
2	P	19789.89*	44	-3	P	19819.83	49	-2	P	19978.69	20	-3
3	O	19814.41	54	0	O	19838.73	59	-2	O	20059.89	20	-2
4	P	19851.30	44	2	P	19865.23	44	4	P	20147.31		6
5	O	19897.10	59	8	O	19900.06*	54	0	O	20241.27		-2
6	P	19949.62	44	-1	P	19943.64	39	-1	P	---		
7	O	20009.76	49	1	O	19996.37	44	-6	O	---		
8	P	20073.91	25	-2	P	20058.45	30	2	P	---		
9	O	20138.58		-4	O	20129.83*		-7	O	---		
10	P	20223.32		10	P	20210.69		-8	P	---		
						O- 3 BAND						
0	P				P				P	18940.28	35	-5
1	O				O	18903.82*	54	4	O	19001.78	44	1
2	P	18887.00	39	1	P	18916.93	49	1	P	---		
3	O	18913.16	49	0	O	18937.48*	59	-2	O	19158.61	30	-5
4	P	18952.24	44	-6	P	18966.19	49	-2	P	---		
5	O	19000.70	49	0	O	19003.75	49	1	O	---		
6	P	19056.52	44	-2	P	19050.56	44	0	P	---		
7	O	19120.27	44	6	O	19106.93	44	4	O	---		
8	P	---			P	19173.09	35	2	P	---		
						O- 4 BAND						
0	P				P				P	---		
1	O				O	18017.22	23	-1	O	18115.20	15	-2
2	P	18001.30*	27	-16	P	18031.38	22	-1	P	18190.25		-1
3	O	18029.15	19	-4	O	18053.49	28	-4	O	18274.70*	59	1
4	P	18070.29	16	-1	P	18084.09*	55	-12	P	---		
5	O	18121.18	21	-9	O	18124.28		-3	O	---		
6	P	---			P	18173.99	O	-3	P	---		
						O- 5 BAND						
0	P				P				P	---		
1	O				O	17147.72	34	O	O	17245.73		2
2	P	---			P	---			P	17321.76		5
3	O	---			O	17186.42*	25	5	O	---		
						O- 6 BAND						
0	P				P				P	---		
1	O				O	---			O	---		
2	P	---			P	---			P	---		
3	O	---			O	16335.87		O	O	---		
						O- 7 BAND						
0	P				P				P	---		
1	O				O	15458.74		-2	O	---		
2	P	---			P	---			P	---		
3	O	---			O	---			O	---		
4	P	---			P	---			P	---		
5	O	15581.57		7	O	---			O	---		

3E±-2B   I(3d) $^1\Pi^{\pm}_g$ − B(2p) $^1\Sigma^+_u$ *Continued*

N"	SYM	P-BRANCH 3E+	I5	O-C	SYM	Q-BRANCH 3E-	I5	O-C	SYM	R-BRANCH 3E+	I5	O-C

1- 0 BAND

N"	SYM	P-BRANCH	I5	O-C	SYM	Q-BRANCH	I5	O-C	SYM	R-BRANCH	I5	O-C
0	P				P				P	23221.65	70	2
1	O				O	23192.20	86	3	O	23266.78	88	4
2	P	23162.61*	70	3	P	23201.26	86	-3	O	23319.19	58	0
3	O	23168.66	98	4	O	23215.40*	90	0	O	23371.23	44	0
4	P	23182.51	83	0	P	23235.16	49	-2	P	23439.96	25	-3
5	O	23196.66	74	1	O	23260.97*	73	1	O	23509.08	26	-3
6	P	23228.34	43	0	P	23293.30	34	-1	P	23578.22	30	-2
7	O	23261.40		1	O	23332.51	34	2	O	23658.16	23	-2
8	P	23295.58		-3	P	23378.96	25	-3	P	23755.06*	29	-5
9	O	23341.87	22	3	O	23432.80	30	4	O	---		
10	P	23406.48*	26	5	P	---			P	---		

1- 1 BAND

N"	SYM	P-BRANCH	I5	O-C	SYM	Q-BRANCH	I5	O-C	SYM	R-BRANCH	I5	O-C
0	P				P				P	---		
1	O				O	22250.53*		-5	O	---		
2	P	22222.44	27	4	P	---			P	---		
3	O	22230.64	26	3	O	22277.35		-4	O	22433.24	17	2
4	P	22247.30	15	3	P	---			P	---		
5	O	---			O	---			O	22577.33		1
6	P	22300.57		2	P	---			P	22650.49*	47	4

1- 2 BAND

N"	SYM	P-BRANCH	I5	O-C	SYM	Q-BRANCH	I5	O-C	SYM	R-BRANCH	I5	O-C
0	P				P				P	21356.43	49	1
1	O				O	21328.29	59	-4	O	21402.90*	49	0
2	P	21301.40	49	-1	P	21340.11	54	-1	P	21457.97	44	-5
3	O	21311.50	59	2	O	21358.27	59	1	O	21514.06	15	-3
4	P	21330.61	54	3	P	21383.28	54	3	P	---		
5	O	21351.22	54	2	O	21415.49	54	-2	O	---		
6	P	21390.42	54	-2	P	21455.45	49	4	P	---		
7	O	---			O	21503.21	15	-1	O	---		
8	P	---			P	21559.18*	10	2	P	---		
9	O	---			O	21623.32		-8	O	---		

1- 3 BAND

N"	SYM	P-BRANCH	I5	O-C	SYM	Q-BRANCH	I5	O-C	SYM	R-BRANCH	I5	O-C
0	P				P				P	20451.79	10	-3
1	O				O	20424.29	44	2	O	20498.85*		1
2	P	20398.48	10	0	P	20437.19	30	0	O	20555.06	39	-3
3	O	20410.25	39	2	O	20457.06*	49	5	O	20612.86	44	2
4	P	20431.60	0	0	P	20484.24*	30	-3	P	---		
5	O	20454.91	25	3	O	20519.19	54	0	O	---		
6	P	20497.36		1	P	20562.29	44	-3	P	---		
7	O	---			O	20613.60*	59	-8	O	---		
8	P	---			P	20673.82	35	2	P	---		
9	O	---			O	20742.42	44	1	O	---		

1- 4 BAND

N"	SYM	P-BRANCH	I5	O-C	SYM	Q-BRANCH	I5	O-C	SYM	R-BRANCH	I5	O-C
0	P				P				P	19564.72	39	2
1	O				O	19537.71	59	-1	O	19612.27	49	-2
2	P	19512.91	39	-4	P	19551.65	54	-1	P	19669.56	49	0
3	O	19526.23	54	-3	O	19573.01	59	-3	O	19728.86*	49	-1
4	P	19549.62*	49	2	P	19602.36*	59	9	P	---		
5	O	19575.43	44	-2	O	19639.72	54	-4	O	---		
6	P	19620.79	39	-2	P	19685.78	44	0	P	---		
7	O	---			O	19740.64*	44	-1	O	---		

1- 5 BAND

N"	SYM	P-BRANCH	I5	O-C	SYM	Q-BRANCH	I5	O-C	SYM	R-BRANCH	I5	O-C
0	P				P				P	18694.70	54	-2
1	O				O	18668.20	59	-1	O	18742.75	54	-3
2	P	18644.36	49	-4	P	18683.14	54	3	P	18801.03	44	2
3	O	18659.14	54	4	O	18705.90	59	2	O	18861.71	49	0
4	P	18684.37	49	0	P	18737.02	49	-2	P	---		
5	O	18712.48	54	2	O	18776.82	59	5	O	---		
6	P	18760.70*	54	5	P	18825.64	44	2	P	---		
7	O	---			O	18883.60	54	6	O	---		
8	P	---			P	18950.97	39	-7	P	---		
9	O	---			O	19027.51	44	0	O	---		

	3E±-2B				I(3d) ¹Π± − B(2p) ¹Σ		*Continued*				

N"	SYM	P-BRANCH	I5	O-C	SYM	Q-BRANCH	I5	O-C	SYM	R-BRANCH	I5	O-C
		3E+				3E-				3E+		

1- 6 BAND

N"	SYM	P-BRANCH	I5	O-C	SYM	Q-BRANCH	I5	O-C	SYM	R-BRANCH	I5	O-C
0	P				P				P	---		
1	O				O	17815.47	28	4	O	17889.91*	29	-9
2	P	---			P	17831.28	25	2	P	---		
3	O	17808.64	19	4	O	17855.40	32	2	O	---		
4	P	17835.62	14	O	P	17888.22	24	-7	P	---		
5	O	---			O	17930.28	28	-2	O	---		

2- 0 BAND

N"	SYM	P-BRANCH	I5	O-C	SYM	Q-BRANCH	I5	O-C	SYM	R-BRANCH	I5	O-C
0	P				P				P	24665.31	39	1
1	O				O	24636.10	61	-3	O	24706.53	50	O
2	P	24606.17	35	-8	P	24644.59	53	-3	P	24752.28	37	1
3	O	24608.40	54	-1	O	24657.59	64	O	O	24798.32	42	4
4	P	24615.62	43	3	P	24675.44	44	-5	P	---		
5	O	24623.72	49	2	O	24698.54*	45	-3	O	---		
6	P	---			P	24727.09	27	-7	P	---		
7	O	---			O	24761.54	27	-1	O	---		
8	P	---			P	24802.06	20	-11	P	---		
9	O	---			O	24848.86	25	3	O	---		
10	P	---			P	---			P	---		
11	O	---			O	24961.95	18	4	O	---		

2- 1 BAND

N"	SYM	P-BRANCH	I5	O-C	SYM	Q-BRANCH	I5	O-C	SYM	R-BRANCH	I5	O-C
0	P				P				P	23723.00	65	5
1	O				O	23694.50	81	-4	O	23764.93	83	-1
2	P	23666.03	62	-4	P	23704.42	78	-2	P	23812.07	58	-2
3	O	23670.37	88	-3	O	23719.55	76	-3	O	23860.23	46	-4
4	P	23680.33	79	-2	P	23740.23	44	-2	P	23917.36	17	-4
5	O	23691.89	71	-2	O	23766.78	45	O	O	---		
6	P	23713.24	23	4	P	23799.33	29	-4	P	---		
7	O	---			O	23838.29	31	-6	O	---		
8	P	---			P	23884.10	26	11	P	---		
9	O	---			O	23936.16	21	-1	O	---		
10	P	---			P	---			P	---		
11	O	---			O	24061.18	24	-4	O	---		

2- 2 BAND

N"	SYM	P-BRANCH	I5	O-C	SYM	Q-BRANCH	I5	O-C	SYM	R-BRANCH	I5	O-C
0	P				P				P	22800.08	44	-1
1	O				O	22772.29	52	O	O	22842.69	63	O
2	P	22745.15*	45	7	P	22783.45	54	O	P	22891.09	44	-1
3	O	22751.27	68	O	O	22800.48	51	3	O	22941.13	37	-1
4	P	22763.74	38	8	P	22823.58	27	2	P	---		
5	O	22778.25	40	O	O	22853.12	25	O	O	---		
6	P	---			P	22889.25	21	-1	P	---		
7	O	---			O	22932.28	26	O	O	---		
8	P	---			P	---			P	---		
9	O	---			O	23039.46		-1	O	---		

2- 3 BAND

N"	SYM	P-BRANCH	I5	O-C	SYM	Q-BRANCH	I5	O-C	SYM	R-BRANCH	I5	O-C
0	P				P				P	21895.41		-8
1	O				O	21868.23	20	O	O	21938.69	15	6
2	P	21842.17	15	2	P	21880.53*	20	1	P	21988.22	20	5
3	O	21850.00	25	-2	O	21899.11	35	-9	O	---		
4	P	21864.65	25	-3	P	---			P	---		
5	O	21881.95	35	2	O	21956.74*	39	-6	O	---		
6	P	---			P	---			P	---		
7	O	---			O	22042.80		6	O	---		
8	P	---			P	22096.88*	54	-10	P	---		

2- 4 BAND

N"	SYM	P-BRANCH	I5	O-C	SYM	Q-BRANCH	I5	O-C	SYM	R-BRANCH	I5	O-C
0	P				P				P	21008.36	44	-1
1	O				O	20981.65	54	-3	O	21052.06*	54	-2
2	P	20956.61	49	-1	P	20994.98	54	-1	P	21102.66	39	2
3	O	20966.00*	59	-5	O	21015.22	54	-1	O	21155.90	44	-2
4	P	20982.65	49	-3	P	21042.58	49	O	P	---		
5	O	21002.47	54	-3	O	21077.34	54	-3	O	---		
6	P	---			P	21119.61	49	-2	P	---		
7	O	---			O	21169.62	44	-9	O	---		
8	P	---			P	21227.66	35	4	P	---		

3E±-2B   I(3d) $^1\Pi_g^\pm$ — B(2p) $^1\Sigma_u^+$ *Continued*

N"	SYM	P-BRANCH	I5	O-C	SYM	Q-BRANCH	I5	O-C	SYM	R-BRANCH	I5	O-C
		3E+				3E-				3E+		
						2- 5 BAND						
0	P				P				P	20138.36	10	-3
1	O				O	20112.17	35	O	O	20182.57	15	O
2	P	20088.06	49	-1	P	20126.44	20	O	P	20234.12		3
3	O	20098.88	54	-1	O	20148.11	39	4	O	20288.76	15	O
4	P	20117.44	20	-1	P	20177.35	20	O	P	---		
5	O	20139.56	30	5	O	20214.42	20	4	O	---		
6	P	---			P	20259.56*	15	9	P	---		
7	O	---			O	20312.67		7	O	---		
						2- 6 BAND						
0	P				P				P	19285.07	39	-14
1	O				O	19259.44	54	5	O	19329.81	54	2
2	P	19236.25	49	3	P	19274.61	54	2	P	19382.27		3
3	O	19248.42	54	3	O	19297.61	59	4	O	19438.29*	54	3
4	P	19268.73	49	3	P	19328.65	49	5	P	---		
5	O	19293.04	44	O	O	19367.88	54	-3	O	---		
6	P	---			P	19415.54	39	-2	P	---		
7	O	---			O	19471.74	44	2	O	---		
						2- 7 BAND						
0	P				P				P	---		
1	O				O	18423.24	59	3	O	18493.63	44	2
2	P	---			P	18439.31	54	6	P	18546.80	54	-10
3	O	18414.35	59	2	O	18463.52	59	1	O			
4	P	18436.36	54	3	P	18496.25	49	2	P	---		
5	O	18462.75	59	2	O	18537.58	54	-2	O	---		
6	P	---			P	18587.83	44	8	P	---		
7	O	---			O	18646.76	49	5	O	---		
						2- 8 BAND						
0	P				P				P	---		
1	O				O	17603.39	28	3	O	17673.76	22	O
2	P	17581.87	10	-2	P	17620.19	26	-7	P	17727.87	19	-4
3	O	17596.53	25	4	O	17645.71	31	4	O	---		
4	P	---			P	17680.02	21	-4	P	---		
5	O	---			O	17723.31	27	-6	O	---		
6	P	---			P	17775.82	23	-3	P	---		
7	O	---			O	17837.53	17	O	O	---		
						2- 9 BAND						
0	P				P				P	---		
1	O				O	16799.71		4	O	16869.96		-11
2	P	---			P	16817.27*	15	-6	P	---		
3	O	16794.86		7	O	16844.07	33	10	O	---		
4	P	---			P	---			P	---		
5	O	---			O	16925.09	35	-5	O	---		
						2-10 BAND						
0	P				P				P	---		
1	O				O	---			O	---		
2	P	---			P	---			P	---		
3	O	---			O	16058.18	17	-9	O	---		
4	P	---			P	16095.57		-8	P	---		
5	O	---			O	16142.67*	45	-8	O	---		
6	P	---			P	---			P	---		
7	O	---			O	16266.34		-18	O	---		
						2-11 BAND						
0	P				P				P	---		
1	O				O	15240.16	33	8	O	---		
2	P	---			P	15259.19	5	-1	P	---		
3	O	---			O	15288.07*	37	7	O	---		
4	P	---			P	15326.87	28	9	P	---		
5	O	---			O	15375.75	37	6	O	---		

3E±-2B				I(3d) $^1\Pi^{\pm}_g$ − B(2p) $^1\Sigma^+_u$				*Continued*			

N"	SYM	P-BRANCH	I5	O-C	SYM	Q-BRANCH	I5	O-C	SYM	R-BRANCH	I5	O-C
		3E+				3E-				3E+		
					2-12 BAND							
0	P				P				P	---		
1	O				O	14483.78*	19	-15	O	---		
2	P	---			P	14503.97		20	P	---		
3	O	---			O	14533.66	14	-2	O	---		
					3- 0 BAND							
0	P				P				P	26033.51	50	-6
1	O				O	26000.40	62	1	O	26071.71	56	1
2	P	25974.51	44	-1	P	26007.95	56	-1	P	26114.78	44	-2
3	O	25973.59	56	1	O	26019.39	62	0	O	26161.09	38	2
4	P	25978.14	14	2	P	26035.01	50	-5	P	---		
5	O	25986.47	38	-2	O	26055.05	50	-4	O	---		
6	P	---			P	26079.72	38	-4	P	---		
7	O	---			O	26109.28	32	-4	O	---		
					3- 1 BAND							
0	P				P				P	25091.23	56	1
1	O				O	25058.77	74	-3	O	25130.11	62	0
2	P	25034.33	56	-1	P	25067.76	68	-2	P	---		
3	O	25035.52*	62	-5	O	25081.35	74	-3	O	---		
4	P	---			P	25099.84	62	2	P	---		
5	O	---			O	25123.29	62	-1	O	---		
6	P	---			P	25152.00	38	3	P	---		
7	O	---			O	25186.09	38	-3	O	---		
8	P	---			P	25225.80	14	-1	P	---		
					3- 2 BAND							
0	P				P				P	24168.36	27	0
1	O				O	24136.45		-10	O	24207.90	33	4
2	P	24113.30		-5	P	24146.77	32	-2	P	---		
3	O	24116.44		0	O	24162.25	50	0	O	---		
4	P	---			P	24183.15	31	2	P	---		
5	O	---			O	24209.65	30	1	O	---		
6	P	---			P	24241.89*	53	3	P	---		
7	O	---			O	24279.98	12	-7	O	---		
8	P	---			P	24324.10	22	-6	P	---		
					3- 3 BAND							
0	P				P				P	23263.72	47	-4
1	O				O	23232.50	74	1	O	23303.79	65	-1
2	P	23210.44	52	2	P	23243.86	70	0	P	---		
3	O	23215.40*	90	21	O	23260.97*	73	-3	O	---		
4	P	---			P	23284.10	41	-5	P	---		
5	O	---			O	23313.29	32	-3	O	---		
6	P	---			P	23348.73	23	-4	P	---		
7	O	---			O	23390.58	25	7	O	---		
8	P	---			P	23438.91	20	11	P	---		
					3- 4 BAND							
0	P				P				P	---		
1	O				O	22345.94	32	0	O	22417.24	23	-1
2	P	22324.85	17	-4	P	22358.37	22	4	P	---		
3	O	22331.15	26	-7	O	22377.05	21	2	O	---		
4	P	---			P	22402.14*	45	-1	P	---		
5	O	---			O	22433.83		-6	O	---		
6	P	---			P	22472.25*	21	2	P	---		
7	O	---			O	22517.43		-5	O	---		
8	P	---			P	22569.43	30	-1	P	---		

$3E^{\pm}-2B$ $I(3d)\ ^1\Pi_g^{\pm} - B(2p)\ ^1\Sigma_u^+$ *Continued*

N"	SYM	P-BRANCH $3E+$	I5	O-C	SYM	Q-BRANCH $3E-$	I5	O-C	SYM	R-BRANCH $3E+$	I5	O-C
						3- 5 BAND						
0	P				P				P	21506.73		7
1	O				O	21476.41	49	-2	O	---		
2	P	21456.36	39	2	P	21489.78	44	0	P	---		
3	O	21464.05	49	-1	O	21509.88	25	1	O	---		
4	P	---			P	21536.94	20	2	P	---		
5	U	---			O	21570.99	35	9	O	---		
6	P	---			P	21612.10		3	P	---		
7	O	---			O	21660.47		10	O	---		
8	P	---			P	21716.01		-3	P	---		
						3- 6 BAND						
0	P				P				P	20653.47	35	-1
1	O				O	20623.72	54	7	O	20695.00	39	4
2	P	20604.53	39	4	P	20637.94	49	1	P	---		
3	O	20613.60*	59	4	O	20659.42	54	5	O	---		
4	P	---			P	20688.19	44	2	P	---		
5	O	---			O	20724.45	54	2	O	---		
6	P	---			P	20767.99*	54	-17	P	---		
7	O	---			O	20819.52	44	3	O	---		
						3- 7 BAND						
0	P				P				P	19816.83	35	2
1	O				O	19787.52	59	5	O	19858.85		7
2	P	19769.17	44	2	P	19802.61	54	2	P	---		
3	O	19779.53	59	3	O	19825.32	59	1	O	---		
4	P	---			P	19855.82	49	2	P	---		
5	O	---			O	19894.12	54	0	O	---		
6	P	---			P	19940.34	35	-1	P	---		
7	O	---			O	19994.47	35	-1	O	---		
						3- 8 BAND						
0	P				P				P	18996.60	49	-2
1	O				O	18967.67	59	5	O	19038.92	54	-1
2	P	18950.07	44	-9	P	18983.56	59	-4	P	---		
3	O	18961.72	49	6	O	19007.51	59	4	O	---		
4	P	---			P	19039.58	54	-5	P	---		
5	O	---			O	---			O	---		
6	P	---			P	19128.44	44	-1	P	---		
7	O	---			O	19185.28	44	-2	O	---		
8	P	---			P	---			P	---		
9	O	---			O	19323.95*	25		O	---		
10	P	---			P	19405.76	15		P	---		
						3- 9 BAND						
0	P				P				P	18192.51	39	1
1	O				O	18163.98	33	5	O	18235.24	49	0
2	P	18147.26	25	3	P	18180.67	54	0	P	---		
3	O	18160.00	32	4	O	18205.81	59	4	O	---		
4	P	---			P	18239.38	49	-4	P	---		
5	O	---			O	18281.59	49	-7	O	---		
6	P	---			P	18332.24*	59	-18	P	---		
7	O	---			O	18391.95	54	-3	O	---		
						3-10 BAND						
0	P				P				P	---		
1	O				O	17376.34	28	2	O	17447.53*	20	-10
2	P	17360.28	13	-11	P	---			P	---		
3	O	17374.28		2	O	17420.00	29	-7	O	---		
4	P	---			P	---			P	---		
5	O	---			O	17499.19*	38	-8	O	---		
						3-11 BAND						
0	P				P				P	---		
1	O				O	---			O	16675.72	7	7
2	P	16589.19		9	P	---			P	---		
3	O	---			O	16649.77		-3	O	---		

$3E^{\pm}\text{-}2B$ $I(3d)\ {}^1\Pi_g^{\pm} - B(2p)\ {}^1\Sigma_u^{+}$ *Continued*

N"	SYM	P-BRANCH 3E+	I5	O-C	SYM	Q-BRANCH 3E-	I5	O-C	SYM	R-BRANCH 3E+	I5	O-C
						4- O BAND						
O	P				P				P	---		
1	O				O	27278.46	38	-4	O	---		
2	P	27254.87	56	-4	P	27284.74*	56	-11	P	---		
3	O	27240.43	56	-2	O	27294.40	44	-2	O	---		
4	P	---			P	27307.46	38	-4	P	---		
5	O	---			O	27324.24	32	5	O	---		
6	P	---			P	27344.81	14	O	P	---		
						4- 1 BAND						
O	P				P				P	26371.60	56	-1
1	O				O	26336.88	68	-3	O	26396.97	56	-1
2	P	26314.68	68	-5	P	26344.63*	68	-4	P	---		
3	O	26302.42	68	-2	O	26356.38	68	-3	O	---		
4	P	---			P	26372.27	62	1	P	---		
5	O	---			O	26392.44	56	4	O	---		
6	P	---			P	26417.19	50	17	P	---		
7	O	---			O	26446.24	38	1	O	---		
						4- 2 BAND						
O	P				P				P	25448.76	50	1
1	O				O	25414.69	74	3	O	25474.73	62	O
2	P	25393.77	62	3	P	25423.67	68	-1	P	---		
3	O	25383.35	68	4	O	25437.30	74	2	O	---		
4	P	---			P	25455.59	62	2	P	---		
5	O	---			O	25478.74	62	O	O	---		
6	P	---			P	25506.92	44	1	P	---		
7	O	---			O	25540.16	38	O	O	---		
8	P	---			P	25578.72	14	O	P	---		
9	O	---			O	25622.86	20	O	O	---		
						4- 3 BAND						
O	P				P				P	24544.06	19	-9
1	O				O	24510.64	17	4	O	24570.68*	17	1
2	P	---			P	24520.84	15	9	P	---		
3	O	---			O	24536.03	19	O	O	---		
						4- 4 BAND						
O	P				P				P	23657.09	53	6
1	O				O	23624.00	70	-5	O	23684.11	61	-1
2	P	23605.26	52	-2	P	23635.21	60	-1	P	---		
3	O	23598.07	59	-2	O	23652.02	57	-4	O	---		
4	P	---			P	23674.57	33	-2	P	---		
5	O	....			O	23702.89	37	-10	O	---		
6	P	---			P	23737.21	24	-7	P	---		
7	O	---			O	23777.53	23	-6	O	---		
8	P	---			P	23823.96	20	-4	P	---		
9	O	---			O	23876.66		O	O	---		
						4- 5 BAND						
O	P				P				P	22787.06	29	1
1	O				O	22754.58	42	4	O	22814.59	39	-2
2	P	22736.77	39	4	P	22766.58*		-9	P	---		
3	O	22730.96	41	3	O	22784.91	38	1	O	---		
4	P	---			P	22809.39*	65	3	P	---		
5	O	---			O	22840.08	20	8	O	---		
6	P	---			P	22877.08*		-4	P	---		
7	O	---			O	22920.54		6	O	---		
8	P	---			P	22970.67*	38	7	P	---		
						4- 6 BAND						
O	P				P				P	---		
1	O				O	---			O	21961.83	15	O
2	P	---			P	---			P	---		
3	O	21880.53*	20	10	O	21934.42		2	O	---		
4	P	---			P	---			P	---		
5	O	---			O	21993.51		-2	O	---		

3E±-2B   I(3d) $^1\Pi_g^\pm$ − B(2p) $^1\Sigma_u^+$ *Continued*

N"	SYM	P-BRANCH	I5	O-C	SYM	Q-BRANCH	I5	O-C	SYM	R-BRANCH	I5	O-C
		3E+				3E-				3E+		
						4- 7 BAND						
O	P				P				P	21097.25	35	5
1	O				O	21065.64	49	6	O	21125.66	35	1
2	P	21049.57	39	3	P	21079.55	49	7	P	---		
3	O	21046.41	39	4	O	21100.40*	49	6	O	---		
4	P	---			P	21128.26	39	2	P	---		
5	O	---			O	21163.20	44	-2	O	---		
6	P	---			P	21205.32	30	-8	P	---		
7	O	---			O	21254.59	30	O	O	---		
						4- 8 BAND						
O	P				P				P	---		
1	O				O	20245.78	20	5	O	20305.82		2
2	P	20230.54	10	-1	P	20260.48	15	-1	P	---		
3	O	20228.59	10	6	O	20282.53*	25	3	O	---		
4	P	---			P	20312.02		-5	P	---		
5	O	---			O	20348.95	10	-4	O	---		
6	P	---			P	20393.47		-3	P	---		
7	O	---			O	20445.33		-8	O	---		
						4- 9 BAND						
O	P				P				P	---		
1	O				O	19442.08	54	4	O	19502.12	44	1
2	P	19427.62	39	O	P	19457.57	49	1	P	---		
3	O	19426.86	44	3	O	19480.80	54	O	O	---		
4	P	---			P	19511.85	44	-1	P	---		
5	O	---			O	19550.70	44	-6	O	---		
6	P	---			P	19597.40	30	-7	P	---		
7	O	---			O	19652.00	35	-9	O	---		
						4-10 BAND						
O	P				P				P	18684.85	44	-8
1	O				O	18654.42	54	-1	O	---		
2	P	18640.72		-6	P	18670.68	54	-4	P	---		
3	O	18641.05	44	-8	O	---			O	---		
4	P	---			P	18727.59	49	-7	P	---		
5	O	---			O	18768.28	49	-9	O	---		
6	P	---			P	18817.39*		2	P	---		
7	O	---			O	18874.41	44	1	O	---		
						4-11 BAND						
O	P				P				P	---		
1	O				O	17882.54	27	9	O	17942.49	18	-3
2	P	---			P	17899.49	24	6	P	---		
3	O	17870.97*	26	11	O	17924.92	30	9	O	---		
						4-12 BAND						
O	P				P				P	---		
1	O				O	---			O	17186.42*	25	5
2	P	---			P	---			P	---		
3	O	17116.53		-1	O	17170.53*	51	2	O	---		
						5- O BAND						
O	P				P				P	---		
1	O				O	28456.97		-4	O	---		
						5- 1 BAND						
O	P				P				P	---		
1	O				O	27515.37*	44	-5	O	---		
2	P	---			P	27521.72	44	-9	P	---		
3	O	---			O	27531.50	44	-5	O	---		
4	P	---			P	27544.61	50	-10	P	---		
5	O	---			O	27561.75*	38	11	O	---		

3E±-2B   I(3d) $^1\Pi_g^\pm$ − B(2p) $^1\Sigma_u^+$ *Continued*

N"	SYM	Q-BRANCH	I5	O-C

3E-

5- 2 BAND

1	O	26593.13*	56	-4
2	P	26600.76	56	-6
3	O	26612.38	68	-4
4	P	26628.03	68	1
5	O	26647.97*	62	-1
6	P	26672.43	50	-2
7	O	26701.77	44	-2

5- 3 BAND

1	O	25689.10	62	-1
2	P	25697.86		-3
3	O	25711.14		-3
4	P	25729.03		-1
5	O	25751.70*		4
6	P	25779.37	38	1
7	O	25812.27	32	2
8	P	25850.11	32	O

5- 5 BAND

1	O	23933.05	51	O
2	P	23943.84*	46	3
3	O	23960.06*	42	2
4	P	---		
5	O	24009.31	20	7

5- 6 BAND

1	O	23080.33	49	6
2	P	23092.01	44	5
3	O	23109.60	40	6
4	P	23133.17		11
5	O	23162.61*	70	-16
6	P	23198.76*	37	1

5- 7 BAND

1	O	22244.12		3
2	P	22256.70	44	8
3	O	22275.52		4
4	P	---		
5	O	22332.38	30	-8

5- 8 BAND

1	O	21424.27	39	3
2	P	21437.56	35	-7
3	O	21457.63	44	-1
4	P	21484.48	35	-4
5	O	21518.24		1
6	P	21559.18*	10	14
7	O	21606.95		-9

5- 9 BAND

1	O	20620.58	44	3
2	P	20634.71	39	1
3	O	20655.94*	39	O
4	P	20684.34	35	3
5	O	20720.01	39	1
6	P	20763.06	25	5
7	O	20813.72*	54	O

N"	SYM	Q-BRANCH	I5	O-C

3E-

5-10 BAND

1	O	19832.92	49	-2
2	P	19847.80	39	-6
3	O	19870.17	44	-7
4	P	19900.06*	54	-5
5	O	19937.54	35	-7
6	P	19982.78	15	-13
7	O	20035.87	15	-16

5-11 BAND

1	O	---		
2	P	---		
3	O	19100.03	54	6
4	P	19131.36	44	12
5	O	19170.74	54	19

5-12 BAND

1	O	18304.88	54	7
2	P	18321.26	44	12
3	O	18345.68*	49	3
4	P	18378.08	49	-22
5	O	18419.52	49	23
6	P	---		
7	O	18526.76	44	15
8	P	18591.50	54	O

6- 3 BAND

| 1 | O | 26737.06 | 38 | 6 |

6- 6 BAND

| 1 | O | 24128.26 | | 10 |

6- 7 BAND

| 1 | O | 23291.99 | | 1 |

6- 8 BAND

| 1 | O | 22472.25* | 21 | 12 |

6-12 BAND

| 1 | O | 19352.81 | 25 | 11 |

$$3E^+\text{-}2C^\pm \qquad I(3d)\ {}^1\Pi_g^+ - C(2p)\ {}^1\Pi_u^\pm$$

N"	SYM	P-BRANCH 2C+	I5	O-C	SYM	Q-BRANCH 2C-	I5	O-C	SYM	R-BRANCH 2C+	I5	O-C
						O- O BAND						
1	O				P	12918.97*	51	1	O	12997.92	49	2
2	P	12856.68	47	1	O	12936.90*	36	16	P	13045.47	36	O
3	O	12843.30	53	3	O	12954.47	31	2	O	13088.76	50	-1
4	P	12829.94	42	5	O	12968.44*	52	-5	P	13125.88		2
5	O	12813.17	48	-1	P	12977.00		-1	O	13157.44*	53	-1
6	P	12791.37	30	1	O	12980.74	45	-2	P	13180.22	21	O
7	O	12765.40	29	-1	P	12976.55	46.	-1	O	13190.80*	61	9
8	P	---			O	12960.89		6	P	---		
9	O	12687.16	21	5	P	12953.14	12	-16	O	---		
10	P	12652.68		-3	O	---			P	---		
						1- 1 BAND						
1	O				P	12770.04	46	2	O	12834.60	53	6
2	P	12709.92	49	O	O	12775.71	24	2	P	12866.54	49	1
3	O	12685.40*	59	9	P	---			O	12887.99	53	7
4	P	12658.64	50	4	O	---			P	12916.11	45	3
5	O	12622.32	51	3	P	12773.07	22	-4	O	---		
6	P	---			O	12764.92	18	-8	P	---		
						1- 3 BAND						
1	O				P	9651.64		12	O	---		
2	P	---			O	---			P	---		
3	O	9578.62	19	O	P	---			O	---		
						2- O BAND						
1	O				P	---			O	---		
2	P	15811.78		-5	O	---			P	---		
						2- 2 BAND						
1	O				P	12621.14	41	2	O	12681.74	52	-1
2	P	12563.19	48	2	O	12625.09*	28	-1	P	12709.17*	61	-2
3	O	12538.09*	55	-5	P	12625.09*	28	11	O	12727.98	55	-3
4	P	12509.17	50	O	O	---			P	12746.20	20	-2
						2- 3 BAND						
1	O				P	11095.25*	30	6	O	11155.91	19	2
2	P	---			O	---			P	11185.64	22	1
3	O	11018.36	23	-5	P	---			O	11208.26	21	-2
						3- O BAND						
1	O				P	---			O	17299.91	21	-2
2	P	---			O	---			P	---		
3	O	17145.35		5	P	---			O	---		
						3- 1 BAND						
1	O				P	---			O	---		
2	P	15521.81		-5	O	---			P	---		
						3- 2 BAND						
1	O				P	13989.40	21	1	O	14046.92	23	O
2	P	---			O	13990.31	19	4	P	14071.67*	23	-5
3	O	13903.32	39	1	P	13987.65*	64	14	O	---		
						3- 3 BAND						
1	O				P	12463.47*	47	1	O	12521.05*	47	-1
2	P	12407.91	57	3	O	12466.52	32	O	P	---		
3	O	12383.56	64	-2	P	12467.11		8	O	12571.20	48	13
4	P	---			O	12463.47*	47	8	P	---		

3E⁺-2C±   I(3d) ¹Πg⁺ — C(2p) ¹Πu±   *Continued*

N"	SYM	P-BRANCH 2C+	I5	O-C	SYM	Q-BRANCH 2C-	I5	O-C	SYM	R-BRANCH 2C+	I5	O-C
						3- 4 BAND						
1	O				P	11003.33	23	5	O	---		
						4- 0 BAND						
1	O				P	18522.83*	44	5	O	---		
2	P	---			O	18505.73*	44	9	P	---		
3	O	---			P	---			O	---		
4	P	---			O	---			P	---		
5	O	---			P	18394.82	35	O	O	---		
						4- 1 BAND						
1	O				P	---			O	---		
2	P	---			O	16847.56		4	P	---		
3	O	16757.26*	43	12	P	---			O	---		
						4- 2 BAND						
1	O				P	---			O	---		
2	P	15211.83*	42	O	O	---			P	---		
3	O	15170.17	28	-1	P	---			O	---		
						4- 3 BAND						
1	O				P	13743.89	74	4	O	13787.94	27	1
2	P	13688.17	26	-10	O	13733.44	52	5	P	---		
3	O	13650.45	29	O	P	---			O	---		
						4- 4 BAND						
1	O				P	12283.71		4	O	12329.29	62	1
2	P	---			O	12275.40	34	4	P	---		

3E⁻-2C±   I(3d) ¹Πg⁻ — C(2p) ¹Πu±

N"	SYM	P-BRANCH 2C-	I5	O-C	SYM	Q-BRANCH 2C+	I5	O-C	SYM	R-BRANCH 2C-	I5	O-C
						0- 0 BAND						
1	P				O	12899.94	51	3	P	12948.86	48	-3
2	O	12838.78	52	3	P	12886.59	25	-1	O	12961.06*	57	-2
3	P	12795.56	48	-2	O	12867.61	18	O	P	12968.44*	52	8
4	O	12747.32	52	-1	P	12843.74*	23	-6	O	12971.60*	56	7
5	P	12695.00	47	5	O	12816.22	16	O	P	12971.06	47	3
6	O	12639.52	40	-1	P	12785.40*	67	2	O	12967.45*	49	1
7	P	12581.69	28	-3	O	12752.07	18	-2	P	12961.06*	57	O
8	O	12522.18	25	-3	P	12717.16	20	-4	O	12952.12	31	1
9	P	12461.50	25	6	O	12678.43	33	4	P	12940.95	26	10
10	O	12400.44	24	4	P	12640.25	20	-1	O	12927.68	24	-28
11	P	---			O	12600.66	22	O	P	---		
						1- 1 BAND						
1	P				O	12760.00	53	3	P	12808.75	45	2
2	O	12701.12	53	O	P	12748.61	28	-2	O	12822.50	58	3
3	P	12661.06	49	1	O	12732.28	48	19	P	12831.67*	52	5
4	O	12616.55	54	1	P	12711.28		1	O	12836.69	54	1
5	P	12568.28	47	-2	O	12686.50*	39	-10	P	12838.06	46	-2
6	O	12516.91	47	6	P	12658.84		2	O	12836.21*	48	11
7	P	12463.07	37	-7	O	---			P	12831.51*		6
8	O	12407.41	39	2	P	---			O	12823.97	28	-3
9	P	---			O	---			P	---		
10	O	---			P	---			O	12802.04	26	
						1- 3 BAND						
1	P				O	9641.51*	66	-2	P	9690.30		7

	$3E^--2C^\pm$				$I(3d)\ {}^1\Pi_g^- - C(2p)\ {}^1\Pi_u^\pm$			*Continued*			
N"	SYM	P-BRANCH	I5	O-C	SYM	Q-BRANCH	I5	O-C	SYM	R-BRANCH	I5	O-C
		2C-				2C+				2C-		

2- 2 BAND

N"	SYM	P-BRANCH	I5	O-C	SYM	Q-BRANCH	I5	O-C	SYM	R-BRANCH	I5	O-C
1	P				O	12611.36	53	1	P	12659.48*	56	-1
2	O	12554.70	53	O	P	---			O	12674.29	57	1
3	P	12517.32	50	-1	O	12587.37*	74	5	P	12684.88	51	O
4	O	12476.04*	76	1	P	---			O	12691.54*	54	-5
5	P	12431.38	54	-2	O	---			P	12694.55*	49	-17
6	O	12383.75	57	-10	P	---			O	12694.55*	49	O
7	P	12333.87*	43	O	O	---			P	12691.54*	54	3

2- 3 BAND

N"	SYM	P-BRANCH	I5	O-C	SYM	Q-BRANCH	I5	O-C	SYM	R-BRANCH	I5	O-C
1	P				O	11085.48	19	-1	P	---		
2	O	11030.98	23	3	P	11077.94	20	-4	O	11150.48*	23	-5
3	P	10996.84	27	-1	O	11067.57	16	-2	P	11164.39*	17	-1
4	O	10959.88	30	-3	P	---			O	---		
5	P	10920.60	30	3	O	---			P	11183.87	17	-2
6	O	---			P	---			O	11190.13	17	-3

3- O BAND

N"	SYM	P-BRANCH	I5	O-C	SYM	Q-BRANCH	I5	O-C	SYM	R-BRANCH	I5	O-C
1	P				O	17228.61*	47	-1	P	17275.80	33	-3
2	O	17167.42*	39	-4	P	---			U	---		
3	P	---			O	---			P	---		
4	O	17070.76*	44	-7	P	---			O	---		
5	P	17012.90		1	O	---			P	---		
6	O	16949.04		-7	P	---			O	---		

3- 1 BAND

N"	SYM	P-BRANCH	I5	O-C	SYM	Q-BRANCH	I5	O-C	SYM	R-BRANCH	I5	O-C
1	P				O	---			P	---		
2	O	---			P	---			O	---		
3	P	---			O	---			P	---		
4	O	---			P	---			O	---		
5	P	---			O	15480.79		6	P	---		

3- 2 BAND

N"	SYM	P-BRANCH	I5	O-C	SYM	Q-BRANCH	I5	O-C	SYM	R-BRANCH	I5	O-C
1	P				O	13975.66	30	5	P	14022.81*	74	-2
2	O	13918.98	30	2	P	13964.92	19	4	O	14036.10	27	2
3	P	13880.52*	44	-15	O	13949.12	21	-4	P	14044.41	21	-4
4	O	13837.86		3	P	13928.70	15	6	O	14048.13		2
5	P	13790.96	27	-1	O	13904.45	23	2	P	14047.34*	17	2
6	O	13740.47	74	10	P	---			O	---		

3- 3 BAND

N"	SYM	P-BRANCH	I5	O-C	SYM	Q-BRANCH	I5	O-C	SYM	R-BRANCH	I5	O-C
1	P				O	12449.77	61	2	P	12496.88*	57	-2
2	O	12395.29*	74	8	P	12441.32	36	O	O	12512.35	54	2
3	P	12360.17	58	-2	O	12429.37		-2	P	12523.96	48	-1
4	O	12321.70	63	-1	P	12417.84*	61	-13	O	12532.11*	60	12
5	P	12280.37*	90	23	O	---			P	12536.48	37	-1
6	O	12235.98	57	O	P	---			O	12538.09*	55	16

3- 4 BAND

N"	SYM	P-BRANCH	I5	O-C	SYM	Q-BRANCH	I5	O-C	SYM	R-BRANCH	I5	O-C
1	P				O	---			P	11036.79	17	7
2	O	10937.20	32	2	P	---			O	11054.34	23	4
3	P	10905.36*	43	-3	O	---			P	---		
4	O	10871.10*	39	-1	P	---			O	11081.40		1
5	P	10834.91*	92	3	O	---			P	---		
6	O	10797.06	29	-4	P	---			O	---		

4- O BAND

N"	SYM	P-BRANCH	I5	O-C	SYM	Q-BRANCH	I5	O-C	SYM	R-BRANCH	I5	O-C
1	P				O	---			P	---		
2	O	18445.53	39	-4	P	---			O	18559.60		-1
3	P	---			O	---			P	18558.76	44	2
4	O	18345.68*	49	-18	P	---			O	---		
5	P	18285.26*	59	-7	O	---			P	---		

3E⁻-2C±   I(3d) $^1\Pi_g^-$ — C(2p) $^1\Pi_u^\pm$ *Continued*

N"	SYM	P-BRANCH	I5	O-C	SYM	Q-BRANCH	I5	O-C	SYM	R-BRANCH	I5	O-C
		2C-				2C+				2C-		

4- 1 BAND

N"	SYM	P-BRANCH	I5	O-C	SYM	Q-BRANCH	I5	O-C	SYM	R-BRANCH	I5	O-C
1	P				O	16846.28	32	-2	P	---		
2	O	---			P	---			O	---		
3	P	---			O	---			P	---'		
4	O	---			P	16783.58		-1	O	---		
5	P	---			O	---			P	16889.60		2
6	O	---			P	---			O	16872.97		-7

4- 2 BAND

N"	SYM	P-BRANCH	I5	O-C	SYM	Q-BRANCH	I5	O-C	SYM	R-BRANCH	I5	O-C
1	P				O	---			P	---		
2	O	15197.11	23	4	P	15241.81	28	4	O	15311.11	33	0
3	P	15157.53	9	-3	O	15224.13	9	-2	P	---		
4	O	15112.91	23	5	P	---			O	15317.20	28	-1
5	P	---			O	---			P	15312.43		6
6	O	---			P	---			O	15302.54	37	11

4- 3 BAND

N"	SYM	P-BRANCH	I5	O-C	SYM	Q-BRANCH	I5	O-C	SYM	R-BRANCH	I5	O-C
1	P				O	13727.80	45	-6	P	13773.78	26	-1
2	O	13673.38*	45	6	P	---			O	13787.35	31	-1
3	P	13637.08	33	0	O	13704.40	27	-2	P	13796.39	22	-2
4	O	13596.70*	44	-4	P	---			O	13801.02	25	-7
5	P	13552.58		0	O	---			P	13801.52	18	-2
6	O	13505.11	36	3	P	---			O	13798.02	15	-2

4- 4 BAND

N"	SYM	P-BRANCH	I5	O-C	SYM	Q-BRANCH	I5	O-C	SYM	R-BRANCH	I5	O-C
1	P				O	12269.18	57	-3	P	12313.62	50	1
2	O	12215.32	57	3	P	12257.16	32	-5	O	---		
3	P	12182.23	58	-5	O	---			P	12341.68	56	7
4	O	12146.16	64	2	P	---			O	12350.47	57	-2
5	P	12107.36	45	4	O	---			P	12356.22*	66	-6
6	O	12066.19	48	-1	P	---			O	12359.13	39	-3
7	P	12022.96	28	-2	O	---			P	12359.32*	37	-3

5- 0 BAND

N"	SYM	P-BRANCH	I5	O-C	SYM	Q-BRANCH	I5	O-C	SYM	R-BRANCH	I5	O-C
1	P				O	---			P	---		
2	O	---			P	---			O	---		
3	P	---			O	---			P	---		
4	O	---			P	---			O	---		
5	P	---			O	19564.04	15	-10	P	---		
6	O	---			P	---			O	---		
7	P	19310.47	20	-5	O	---			P	---		

5- 1 BAND

N"	SYM	P-BRANCH	I5	O-C	SYM	Q-BRANCH	I5	O-C	SYM	R-BRANCH	I5	O-C
1	P				O	---			P	---		
2	O	---			P	---			O	---		
3	P	17921.84	9	9	O	---			P	18076.43	11	4

5- 2 BAND

N"	SYM	P-BRANCH	I5	O-C	SYM	Q-BRANCH	I5	O-C	SYM	R-BRANCH	I5	O-C
1	P				O	---			P	---		
2	O	---			P	---			O	---		
3	P	16334.63		-7	O	16399.24	13	-5	P	---		

5- 3 BAND

N"	SYM	P-BRANCH	I5	O-C	SYM	Q-BRANCH	I5	O-C	SYM	R-BRANCH	I5	O-C
1	P				O	14906.38	33	1	P	14950.96	9	3
2	O	14851.73	37	-10	P	14895.39	5	4	O	14962.51	9	1
3	P	14814.23	14	1	O	14879.55*	47	-1	P	14968.82		-4
4	O	14771.83	37	-5	P	---			O	---		
5	P	14725.04*	51	1	O	---			P	---		
6	O	14674.36	23	4	P	---			O	---		

5- 4 BAND

N"	SYM	P-BRANCH	I5	O-C	SYM	Q-BRANCH	I5	O-C	SYM	R-BRANCH	I5	O-C
1	P				O	---			P	13490.78	23	3
2	O	13393.83	38	3	P	---			O	13504.49	27	2
3	P	13359.33	38	-9	O	---			P	13514.17		11
4	O	13321.29	44	1	P	---			O	13519.70		-3
5	P	13279.84*	33	7	O	---			P	---		
6	O	13235.48*	48	4	P	---			O	---		

	3E$^-$-2C$^\pm$			I(3d) $^1\Pi_g^-$ — C(2p) $^1\Pi_u^\pm$			*Continued*		

N"	SYM	P-BRANCH	I5	O-C	SYM	Q-BRANCH	I5	O-C	SYM	R-BRANCH	I5	O-C
		2C-				2C+				2C-		
						5- 5 BAND						
1	P				O	12050.84*	52	16	P	12095.65	40	5
2	O	12000.84	50	14	P	---			O	---		

	4E$^\pm$-2B			R(4d) $^1\Pi_g^\pm$ — B(2p) $^1\Sigma_u^+$					

N"	SYM	P-BRANCH	I5	O-C	SYM	Q-BRANCH	I5	O-C	SYM	R-BRANCH	I5	O-C
		4E+				4E-				4E+		
						O- O BAND						
0	P				P				P	27237.08	56	3
1	O				O	27181.91	68	-2	O	27284.74*	56	O
2	P	27177.98	56	-2	P	27179.30	56	-2	P	---		
3	O	27186.65	68	3	O	27177.02	68	-1	O	---		
4	P	27198.62		O	P	27175.55	62	-2	P	---		
5	O	27207.46	62	-2	O	27183.74*	56	-11	O	27511.49	32	-3
6	P	27228.62	62	7	P	27209.24		5	P	---		
7	O	27263.74	44	-6	O	27276.48*	62	O	O	---		
						O- 1 BAND						
0	P				P				P	---		
1	O				O	26240.30	62	-4	O	26343.14	56	-1
2	P	---			P				P	26395.10		-2
3	O	26248.58	68	-3	O	26238.98	62	-4	O	26443.97*	56	-8
4	P	26263.39*	50	1	P	---			P	---		
5	O	26275.71	50	2	O	26251.99*	68	-7	O	26579.80	20	7
6	P	26300.69	32	-7	P	26281.35	20	-5	P	---		
7	O	26340.63	56	3	O	---			O	---		
						O- 2 BAND						
0	P				P				P	---		
1	O				O	25318.15*	44	6	O	---		
2	P	---			P	25318.15*	44	O	P	---		
3	O	25329.50	50	2	O	25319.90	50	1	O	---		
4	P	---			P	---			P	---		
5	O	25362.11	32	8	O	---			O	---		
6	P	---			P	---			P	---		
7	O	25434.54	20	1	O	---			O	---		
						O- 4 BAND						
0	P				P				P	---		
1	O				O	23527.49	21	1	O	---		
2	P	---			P	23529.72	30	3	P	---		
3	O	---			O	23534.66	23	-1	O	---		
4	P	---			P	23542.68	19	2	P	---		
5	O	---			O	23562.64*	45	-1	O	---		

4E±-2B   R(4d) $^1\Pi_g^\pm$ − B(2p) $^1\Sigma_u^+$ Continued

Column 1 — 4E-

O- 5 BAND

N"	SYM	Q-BRANCH	I5	O-C
1	O	---		
2	P	---		
3	O	22667.57		6
4	P	---		
5	O	22699.77	38	11

O- 6 BAND

N"	SYM	Q-BRANCH	I5	O-C
1	O	---		
2	P	---		
3	O	---		
4	P	---		
5	O	21853.17	15	-2

O- 7 BAND

N"	SYM	Q-BRANCH	I5	O-C
1	O	---		
2	P	---		
3	O	---		
4	P	---		
5	O	21022.82*	44	-6

O- 8 BAND

N"	SYM	Q-BRANCH	I5	O-C
1	O	---		
2	P	---		
3	O	---		
4	P	---		
5	O	20208.66*		1

O- 9 BAND

N"	SYM	Q-BRANCH	I5	O-C
1	O	---		
2	P	---		
3	O	---		
4	P	---		
5	O	19410.35*	35	-7

O-10 BAND

N"	SYM	Q-BRANCH	I5	O-C
1	O	---		
2	P	---		
3	O	---		
4	P	---		
5	O	18627.94*	44	-9

O-11 BAND

N"	SYM	Q-BRANCH	I5	O-C
1	O	17785.97		9

O-12 BAND

N"	SYM	Q-BRANCH	I5	O-C
1	O	17029.75		2

1- 0 BAND

N"	SYM	Q-BRANCH	I5	O-C
1	O	28731.25	68	1
2	P	28728.57	68	-5
3	O	28730.88	74	0
4	P	28740.09	62	-4
5	O	28756.98	56	-7
6	P	28782.10	50	-5
7	O	28815.59	44	-3
8	P	28857.07	20	0

Column 2 — 4E-

1- 2 BAND

N"	SYM	Q-BRANCH	I5	O-C
1	O	26867.37*	62	-3
2	P	26867.37*	62	-8
3	O	26873.75	62	1
4	P	26888.18	56	-2
5	O	26911.59	50	-1
6	P	26944.27	38	2
7	O	26986.32	32	-3

1- 3 BAND

N"	SYM	Q-BRANCH	I5	O-C
1	O	25963.34	56	0
2	P	25964.50	56	-2
3	O	25972.51	62	2
4	P	25989.20	44	-2
5	O	26015.30	44	2
6	P	26051.17	32	1
7	O	26096.86	20	5

1- 4 BAND

N"	SYM	Q-BRANCH	I5	O-C
1	O	25076.82	32	3
2	P	25079.02	44	3
3	O	25088.53	38	1
4	P	25107.30	20	8
5	O	25135.83	20	-2
6	P	25174.66		4

1- 5 BAND

N"	SYM	Q-BRANCH	I5	O-C
1	O	24207.27*	24	-1
2	P	24210.50	16	6
3	O	24221.51	25	15
4	P	24241.89*	53	-10
5	O	24272.92	10	6

1- 6 BAND

N"	SYM	Q-BRANCH	I5	O-C
1	O	23354.44*	29	-6
2	P	23358.61	23	2
3	O	---		
4	P	---		
5	O	23426.44		5

1- 7 BAND

N"	SYM	Q-BRANCH	I5	O-C
1	O	22518.30		-2
2	P	22523.25	18	0
3	O	22536.77		-3

1- 8 BAND

N"	SYM	Q-BRANCH	I5	O-C
1	O	21698.49*	49	2
2	P	21704.18	10	-8
3	O	21718.97	10	1

2- 0 BAND

N"	SYM	Q-BRANCH	I5	O-C
1	O	30210.13*	62	-9
2	P	30210.13*	62	9
3	O	30213.24	62	-2
4	P	30221.48	50	-4
5	O	30235.79	56	-7
6	P	30256.90	32	-1
7	O	30284.91	32	-3

Column 3 — 4E-

2- 1 BAND

N"	SYM	Q-BRANCH	I5	O-C
1	O	29268.65	62	2
2	P	29269.94	56	8
3	O	29275.24	62	-1
4	P	29286.26	50	-2
5	O	29304.08	56	1
6	P	29329.14	32	2
7	O	29361.73	32	-1

2- 2 BAND

N"	SYM	Q-BRANCH	I5	O-C
1	O	28346.40	62	2
2	P	28348.87	56	0
3	O	28356.15	62	3
4	P	28369.63	50	4
5	O	28390.49	50	8
6	P	28419.04	26	3
7	O	28455.65	26	-2

2- 3 BAND

N"	SYM	Q-BRANCH	I5	O-C
1	O	27442.36		4

2- 4 BAND

N"	SYM	Q-BRANCH	I5	O-C
1	O	26555.76	56	-1
2	P	26560.39	50	-2
3	O	26570.89	56	-1
4	P	26588.60	32	-1
5	O	26614.63*	50	-3
6	P	26649.31	32	-7
7	O	26693.06	26	-4

2- 5 BAND

N"	SYM	Q-BRANCH	I5	O-C
1	O	25686.30	44	4
2	P	25691.81		-5
3	O	25703.78		4
4	P	25723.43		5
5	O	25751.70*		3
6	P	25789.25	20	3
7	O	25836.10	14	11

2- 6 BAND

N"	SYM	Q-BRANCH	I5	O-C
1	O	24833.52	33	4

2- 7 BAND

N"	SYM	Q-BRANCH	I5	O-C
1	O	23997.28	32	-2
2	P	---		
3	O	24019.18	27	0
4	P	---		
5	O	24074.92		3

2- 9 BAND

N"	SYM	Q-BRANCH	I5	O-C
1	O	22373.76	55	0
2	P	---		
3	O	22399.66		2

4E±-2B   R(4d) $^1\Pi_g^\pm$ – B(2p) $^1\Sigma_u^+$ *Continued*

4E-

3- 0 BAND

N"	SYM	Q-BRANCH	I5	O-C
1	O	31618.26	44	7
2	P	31619.52	44	1
3	O	31623.21	44	-11
4	P	31630.69	26	-25
5	O	31642.97	32	-1
6	P	31660.28	14	-12

3- 1 BAND

N"	SYM	Q-BRANCH	I5	O-C
1	O	30676.55	62	-5
2	P	30679.31	56	-2
3	O	30685.27	62	-4
4	P	30695.60	56	-10
5	O	30711.12	56	-7
6	P	30732.61	44	0
7	O	30759.88	44	-17

3- 2 BAND

N"	SYM	Q-BRANCH	I5	O-C
1	O	29754.27		-8
2	P	29758.24		-10
3	O	29766.19		1
4	P	29778.96		-5
5	O	29797.47		-6

3- 3 BAND

N"	SYM	Q-BRANCH	I5	O-C
1	O	28850.33	62	4
2	P	28855.51	56	10
3	O	28864.99	62	6
4	P	28879.96	56	-7
5	O	28901.21	50	0
6	P	28929.44	38	3
7	O	28964.52	32	8

3- 4 BAND

N"	SYM	Q-BRANCH	I5	O-C
1	O	27963.73	50	-1
2	P	27969.92	26	4
3	O	27980.94	50	-2
4	P	27997.93	38	-10
5	O	28021.66	50	-12
6	P	28052.85	20	-2
7	O	28091.49	20	8

3- 5 BAND

N"	SYM	Q-BRANCH	I5	O-C
1	O	27094.15	50	-8
2	P	27101.36	44	3
3	O	27113.82	44	2
4	P	27132.72*	50	-8
5	O	27158.77	26	-2

3- 6 BAND

N"	SYM	Q-BRANCH	I5	O-C
1	O	---		
2	P	26249.65	50	17
3	O	26263.39*	50	9
4	P	26284.03	44	-2
5	O	26312.33	38	1

3- 7 BAND

N"	SYM	Q-BRANCH	I5	O-C
1	O	25405.35	44	8
2	P	25414.14	20	0
3	O	25429.34	32	10

4E-

3- 9 BAND

N"	SYM	Q-BRANCH	I5	O-C
1	O	---		
2	P	---		
3	O	23809.76	26	6

3-10 BAND

N"	SYM	Q-BRANCH	I5	O-C
1	O	---		
2	P	---		
3	O	23024.02	23	2

3-12 BAND

N"	SYM	Q-BRANCH	I5	O-C
1	O	21465.92	20	-7
2	P	---		
3	O	21499.47	35	6

4- 1 BAND

N"	SYM	Q-BRANCH	I5	O-C
1	O	32011.44	44	-1
2	P	32014.89	38	-5
3	O	32021.14	44	-2
4	P	32029.87	38	-1
5	O	32043.60	38	-1

4- 2 BAND

N"	SYM	Q-BRANCH	I5	O-C
1	O	31089.18	50	-2
2	P	31093.93	50	-2
3	O	31102.00	56	-3
4	P	31113.18	50	-1
5	O	31129.96	50	1
6	P	---		
7	O	31178.38	32	-2

4- 4 BAND

N"	SYM	Q-BRANCH	I5	O-C
1	O	29298.58	56	-1
2	P	29305.50	56	1
3	O	29316.79	62	-2
4	P	29332.20	44	-1
5	O	29354.21	44	1
6	P	---		
7	O	29415.86	26	3

4- 5 BAND

N"	SYM	Q-BRANCH	I5	O-C
1	O	28429.11	50	3
2	P	28436.99	50	5
3	O	28449.65	62	0
4	P	28467.00	44	2
5	O	28491.21	56	0
6	P	---		
7	O	28558.71	26	-1

4- 6 BAND

N"	SYM	Q-BRANCH	I5	O-C
1	O	27576.26		-4
2	P	---		
3	O	27599.23	26	8

4- 7 BAND

N"	SYM	Q-BRANCH	I5	O-C
1	O	26740.18	50	6
2	P	26749.75	44	0
3	O	26765.10	50	1
4	P	26785.77	38	-9

4E-

4- 8 BAND

N"	SYM	Q-BRANCH	I5	O-C
1	O	25920.37	44	10
2	P	---		
3	O	25947.32	50	7

5- 2 BAND

N"	SYM	Q-BRANCH	I5	O-C
1	O	32343.04	44	1
2	P	32350.94	26	-12
3	O	32358.52	38	0

5- 3 BAND

N"	SYM	Q-BRANCH	I5	O-C
1	O	31438.95	20	-2
2	P	31448.10	38	-3
3	O	31457.27	50	0

5- 4 BAND

N"	SYM	Q-BRANCH	I5	O-C
1	O	30552.39	26	-3
2	P	30562.64	26	4
3	O	30573.22	38	-8

5- 5 BAND

N"	SYM	Q-BRANCH	I5	O-C
1	O	29682.94		3
2	P	29694.17		12
3	O	29706.24		10

5- 6 BAND

N"	SYM	Q-BRANCH	I5	O-C
1	O	28830.31	38	18
2	P	28842.39	50	19

6- 4 BAND

N"	SYM	Q-BRANCH	I5	O-C
1	O	31724.77	32	-7
2	P	31731.00	20	-3
3	O	31740.49	32	-3
4	P	---		
5	O	31769.80	14	-5

6- 5 BAND

N"	SYM	Q-BRANCH	I5	O-C
1	O	30855.32	38	-1
2	P	30862.43	32	-5
3	O	30873.33	44	-3
4	P	30888.08	32	-3
5	O	30906.84	26	-2

6- 7 BAND

N"	SYM	Q-BRANCH	I5	O-C
1	O	29166.45	56	8
2	P	29175.36	50	7
3	O	29188.85	56	5
4	O	29207.02	44	3
5	O	29230.10	44	2
6	P	29258.06	20	0
7	O	29291.13	14	0

$4E^{\pm}$-2B

$$R(4d)\ ^1\Pi_g^{\pm} - B(2p)\ ^1\Sigma_u^+$$

Continued

N"	SYM	Q-BRANCH	I5	O-C

4E-

7- 6 BAND

N"	SYM	Q-BRANCH	I5	O-C
1	O	---		
2	P	---		
3	O	31088.10	32	O

7- 8 BAND

N"	SYM	Q-BRANCH	I5	O-C
1	O	---		
2	P	---		
3	O	29436.22	32	2

7- 9 BAND

N"	SYM	Q-BRANCH	I5	O-C
1	O	---		
2	P	---		
3	O	28634.42	26	-8

7-10 BAND

N"	SYM	Q-BRANCH	I5	O-C
1	O	---		
2	P	---		
3	O	27848.76		-4

$4E^+$-2C$^+$ $R(4d)\ ^1\Pi_g^+ - C(2p)\ ^1\Pi_u^+$

N"	SYM	P-BRANCH	I5	O-C	SYM	Q-BRANCH	I5	O-C	SYM	R-BRANCH	I5	O-C
		2C+				2C-				2C+		

O- O BAND

N"	SYM	P-BRANCH	I5	O-C	SYM	Q-BRANCH	I5	O-C	SYM	R-BRANCH	I5	O-C
1	O				P	---			O	18513.04	59	7
2	P	---			O	---			P	---		
3	O	18358.38*	49	4	P	---			O	---		
4	P	18325.38	35	8	O	---			P	---		

O- 3 BAND

N"	SYM	P-BRANCH	I5	O-C	SYM	Q-BRANCH	I5	O-C	SYM	R-BRANCH	I5	O-C
1	O				P	---			O	---		
2	P	---			O	---			P	---		
3	O	13596.70*	44	8	P	---			O	---		

$4E^-$-2C$^{\pm}$ $R(4d)\ ^1\Pi_g^- - C(2p)\ ^1\Pi_u^{\pm}$

N"	SYM	P-BRANCH	I5	O-C	SYM	Q-BRANCH	I5	O-C	SYM	R-BRANCH	I5	O-C
		2C-				2C+				2C-		

O- O BAND

N"	SYM	P-BRANCH	I5	O-C	SYM	Q-BRANCH	I5	O-C	SYM	R-BRANCH	I5	O-C
1	P				O	18410.24	49	8	P	18447.10	49	-9
2	O	---			P	---			O	18442.27	59	5
3	P	---			O	---			P	18426.70	49	-11
4	O	---			P	---			O	18409.90	39	3
5	P	---			O	---			P	18398.65	39	-2

O- 1 BAND

N"	SYM	P-BRANCH	I5	O-C	SYM	Q-BRANCH	I5	O-C	SYM	R-BRANCH	I5	O-C
1	P				O	16749.71*	31	-2	P	---		

$4E^- - 2C^{\pm}$ $R(4d)\ {}^1\Pi_g^- - C(2p)\ {}^1\Pi_u^{\pm}$ *Continued*

N"	SYM	P-BRANCH 2C-	I5	O-C	SYM	Q-BRANCH 2C+	I5	O-C	SYM	R-BRANCH 2C-	I5	O-C
						1- 1 BAND						
1	P				O	18299.04	49	O	P	18336.20	54	14
2	O	18240.27*	49	8	P	18275.99	44	3	O	18338.04	44	9
3	P	18188.34*	49	-4	O	---			P	18336.66	49	9
4	O	18132.09	21	7	P	18216.31	35	9	O	18332.82	54	5
5	P	18073.29	6	4	O	18182.78	35	9	P	18326.78*	59	-14
6	O	18013.11*	24	17	P	---			O	---		
7	P	---			O	---			P	---		
8	O	17890.36		-16	P	---			O	---		
						1- 2 BAND						
1	P				O	---			P	---		
2	O	---			P	---			O	---		
3	P	---			O	---			P	16749.71*	31	19
4	O	---			P	---			O	---		
5	P	16496.07	46	3	O	---			P	16749.71*	31	O
						1- 3 BAND						
1	P				O	---			P	---		
2	O	---			P	---			O	---		
3	P	---			O	---			P	15229.00	5	-4
4	O	---			P	---			O	---		
5	P	---			O	---			P	15238.89		1
						2- 1 BAND						
1	P				O	19778.07	10	5	P	---		
2	O	---			P	---			O	---		
3	P	---			O	19730.12	15	17	P	---		
4	O	---			P	---			O	19811.58*	49	O
						2- 2 BAND						
1	P				O	18185.51*	49	7	P	18225.05	49	14
2	O	18128.86	26	7	P	---			O	18230.04	54	9
3	P	18082.73*	32	-2	O	18142.99	8	O	P	18231.03*	59	12
4	O	18031.79	23	9	P	---			O	18229.00	49	12
5	P	17977.48	20	5	O	---			P	18224.57	39	10
6	O	17921.17	11	3	P	---			O	18218.00	44	6
						3- 1 BAND						
1	P				O	21186.06	30	7	P	---		
2	O	---			P	21166.78	15	-7	O	---		
						3- 3 BAND						
1	P				O	18067.66*	21	11	P	---		
2	O	18013.11*	24	10	P	18052.76		-11	O	18116.36	32	10
3	P	17971.85*	16	11	O	---			P	18119.89*	32	4
4	O	17925.70	19	6	P	---			O	18119.89*	32	1
5	P	17876.04	3	2	O	---			P	18117.36*	49	23
6	O	17823.93*	26	6	P	---			O	---		
						4- 4 BAND						
1	P				O	---			P	17983.96	9	8
2	O	17889.91*	29	8	P	---			O	17994.17	26	9
3	P	17852.63	13	8	O	---			P	17999.31	22	8
4	O	17810.95	22	6	P	---			O	---		
5	P	17764.89	8	-5	O	---			P	---		
6	O	17717.44	9	3	P	---			O	---		
						5- 1 BAND						
1	P				O	---			P	---		
2	O	---			P	---			O	---		
3	P	23671.98	23	-1	O	---			P	---		
						5- 2 BAND						
1	P				O	22182.05	15	-4	P	---		
2	O	---			P	22169.16*	49	1	O	---		

4E⁻-2C±		R(4d) $^1\Pi_g^-$ — C(2p) $^1\Pi_u^\pm$			*Continued*	

N"	SYM	P-BRANCH 2C-	I5	O-C	SYM	Q-BRANCH 2C+	I5	O-C	SYM	R-BRANCH 2C-	I5	O-C
						5- 4 BAND						
1	P				O	---			P	19241.05	35	6
2	O	---			P	---			O	---		
3	P	19109.72	25	6	O	---			P	---		
4	O	19067.48	30	10	P	---			O	---		
						6- 0 BAND						
1	P				O	26607.49*	50	-3	P	26648.56*	20	3
2	O	---			P	---			O	26647.97*	62	-10

5E⁻-2B	
(5d) $^1\Pi_g^-$ — B(2p) $^1\Sigma_u^+$	

N"	SYM	Q-BRANCH 5E-	I5	O-C
		O- 0 BAND		
1	O	29717.91		3
		O- 1 BAND		
1	O	28776.21	50	-8
		O- 2 BAND		
1	O	27854.05	44	1
2	P	27945.66		4
		O- 3 BAND		
1	O	---		
2	P	27042.66	26	-3
		O- 5 BAND		
1	O	25194.02	14	10
		O-10 BAND		
1	O	21093.71	30	-10
		O-12 BAND		
1	O	19565.75	15	7

3F±-2B		J(3d) $^1\Delta_g^\pm$ — B(2p) $^1\Sigma_u^+$				

N"	SYM	P-BRANCH 3F+	I5	O-C	SYM	Q-BRANCH 3F-	I5	O-C	SYM	R-BRANCH 3F+	I5	O-C
						O- 0 BAND						
1	O				O				O	22109.46	25	-4
2	P	22011.43	15	5	P	22069.76	15	5	P	22172.37	15	-1
3	O	22011.43	15	5	O	22111.28	20	4	O	22248.92	12	1
4	P	22035.69	39	-1	P	22165.15	30	5	P	---		
5	O	22074.37	20	4	O	22230.36		8	O	---		
6	P	22126.73	15	O	P	22306.11	21	-2	P	---		
7	O	22188.82	20	4	O	22391.78	33	6	O	---		
8	P	---			P	22486.83	25	O	P	---		
9	O	22362.52	15	2	O	---			O	---		

3F±-2B   J(3d) ¹Δ±_g − B(2p) ¹Σ⁺_u   *Continued*

N"	SYM	P-BRANCH 3F+	I5	O-C	SYM	Q-BRANCH 3F-	I5	O-C	SYM	R-BRANCH 3F+	I5	O-C
						O- 1 BAND						
1	O				O				O	21167.88	30	-3
2	P				P	21129.43*	35	-10	P	21232.14	20	-6
3	O	21073.38	30	1	O	21173.20	44	-3	O	21310.92	39	2
4	P	21100.40*	49	-6	P	21229.81	35	-5	P	21402.90*	49	-24
5	O	21142.53	39	-1	O	21298.42	39	-7	O	21504.68		-3
6	P	21198.91	35	-3	P	21378.27	30	-7	P	21634.88		O
7	O	21265.56*	30	-2	O	21468.54	39	2	O	21755.63		-1
						O- 2 BAND						
1	O				O				O	---		
2	P				P	---			P	---		
3	O	---			O	---			O	20391.76		-1
4	P	---			P	---			P	---		
5	O	20228.89		1	O	---			O	---		
						O- 4 BAND						
1	O				O				O	18455.07	25	2
2	P				P	---			P	18522.83*	44	8
3	O	---			O	18468.83	35	-5	O	---		
4	P	---			P	---			P	---		
5	O	18453.07	20	-6	O	18609.07	10	-1	O	---		
6	P	---			P	18698.69*	20	9	P	---		
7	O	---			O	18799.81	44	-7	O	---		
8	P	---			P	18912.39	10	11	P	---		
						O- 5 BAND						
1	O				O				O	---		
2	P				P	17551.59	10	6	P	---		
3	O	---			O	---			O	---		
4	P	---			P	---			P	---		
5	O	---			O	17746.09		O	O	---		
						O- 6 BAND						
1	O				O				O	16732.79	9	3
2	P				P	16699.72		4	P	---		
3	O	---			O	---			O	---		
4	P	---			P	16818.28		7	P	---		
5	O	---			O	16899.53		-9	O	---		
						O- 7 BAND						
1	O				O	---			O	---		
2	P				P	---			P	---		
3	O	---			O	---			O	---		
4	P	---			P	---			P	---		
5	O	---			O	16069.23		-8	O	---		
						O- 8 BAND						
1	O				O				O	---		
2	P				P	---			P	---		
3	O	---			O	---			O	---		
4	P	---			P	15169.71	19	4	P	---		
5	O	---			O	15255.04		-4	O	---		
						O-10 BAND						
1	O				O				O	13485.40	42	-3
2	P				P	---			P	13558.04*	48	-21
3	O	---			O	13511.93	48	1	O	13649.53		-6
4	P	---			P	---			P	---		
5	O	13518.39	25	-12	O	13674.38		-8	O	---		
						1- O BAND						
1	O				O				O	23695.73	34	1
2	P				P	23656.49	33	4	P	---		
3	O	23597.60	34	O	O	---			O	23814.24	23	O
4	P	---			P	23737.89	25	-5	P	23902.36		2
5	O	---			O	23794.17	23	-4	O	---		
6	P	23690.67	23	-2	P	---			P	---		

3F±-2B   **J(3d) $^1\Delta_i^{\pm}$ — B(2p) $^1\Sigma_u^+$**   *Continued*

N"	SYM	P-BRANCH 3F+	I5	O-C	SYM	Q-BRANCH 3F-	I5	O-C	SYM	R-BRANCH 3F+	I5	O-C
						1- 1 BAND						
1	U				O				O	---		
2	P				P	---			P	22805.98		2
3	O	---			O	---			O	22876.19	34	-4
4	P	22674.20	25	-2	P	---			P	---		
5	O	22707.92		5	O	22862.49		7	O	---		
						1- 2 BAND						
1	O				O				O	---		
2	P				P	21795.18	15	-10	P	---		
3	O	---			O	21834.69	20	-2	O	---		
4	P	---			P	21886.06	15	5	P	---		
5	O	---			O	21948.78	20	2	O	---		
6	P	---			P	---			P	---		
7	O	---			O	22105.21		-2	O	---		
						1- 3 BAND						
1	O				O				O	---		
2	P				P	20892.40	25	5	P	---		
3	O	---			O	20933.42	35	-4	O	---		
4	P	---			P	---			P	---		
5	O	---			O	21052.41	30	-3	O	---		
6	P	---			P	---			P	---		
7	O	---			O	21215.72	25	3	O	---		
						1- 4 BAND						
1	O				O				O	---		
2	P				P	---			P	---		
3	O	---			O	20049.42	20	-7	O	---		
4	P	---			P	---			P	---		
5	O	---			O	20172.93		-8	O	---		
						1- 5 BAND						
1	O				O				O	---		
2	P				P	---			P	---		
3	O	---			O	19182.31	15	-2	O	---		
4	P	---			P	---			P	---		
5	O	---			O	19310.06	15	4	O	---		
						2- 0 BAND						
1	O				O				O	25218.34	14	-3
2	P				P	---			P	---		
3	O	25120.35	14	10	O	25208.94	32	5	O	25327.94	26	-1
4	P	25133.10	38	-1	P	---			P	---		
5	O	25153.49	32	12	O	25294.86	14	-4	O	---		
6	P	25185.25	14	0	P	25350.27*	26	-6	P	---		
						2- 1 BAND						
1	O				O				O	24276.59*		-19
2	P				P	24239.20	14	-2	P	24329.60	16	-1
3	O	24182.12	41	-12	O	24270.85	23	-3	O	24389.95	18	1
4	P	24197.85	16	-2	P	24312.34	15	-2	P	24461.64	13	-2
5	O	---			O	---			O	---		
6	P	---			P	24422.58	28	4	P	---		
						2- 2 BAND						
1	O				O				O	23354.44*	29	-9
2	P				P	23318.19		-4	P	23408.52	21	-10
3	O	23263.07	27	-4	O	23351.70		-5	O	---		
4	P	23281.17	28	-1	P	23395.76		9	P	---		
5	O	23308.01	23	9	O	23449.46	20	1	O	23631.12		7
6	P	23347.29		-6	P	23512.32*	85	-11	P	---		
7	O	---			O	23584.34		-5	O	---		

3F±-2B   J(3d) $^1\Delta_g^\pm - B(2p)\ ^1\Sigma_u^+$ *Continued*

N"	SYM	P-BRANCH 3F+	I5	O-C	SYM	Q-BRANCH 3F-	I5	O-C	SYM	R-BRANCH 3F+	I5	O-C
						2- 3 BAND						
1	O				O				O	22450.51*		4
2	P				P	22415.37	14	7	P	22505.65	19	-4
3	O	---			O	22450.51*		1	O	---		
4	P	22382.27*	33	7	P	22496.65		-4	P	---		
5	O	22411.65	28	5	O	---			O	---		
6	P	---			P	22619.29*		-5	P	---		
7	O	---			O	22694.91		6	O			
						2- 4 BAND						
1	O				O				O	21564.00*	44	8
2	P				P	---			P	---		
3	O	---			O	---			O	21685.55		-4
4	P	---			P	---			P	21764.03		4
5	O	21532.08		-9	O	21673.73	15	3	O	---		
6	P	21577.79		7	P	---			P	---		
						2- 5 BAND						
1	O				O				O	20694.30	25	-11
2	P				P	---			P	---		
3	O	---			O	20699.37	25	O	O	---		
4	P	---			P	20749.43	20	-3	P	---		
5	O	20669.24	35	6	O	20810.69*	54	-2	O	---		
						2- 6 BAND						
1	O				O				O	19841.51	30	-12
2	P				P	---			P	---		
3	O	---			O	---			O	---		
4	P	---			P	---			P	---		
5	O	19022.71	25	O	O	---			O	---		
6	P	19873.60	15	-5	P	---			P	---		
						2- 7 BAND						
1	O				O				O	---		
2	P				P	---			P	---		
3	O	---			O	---			O	---		
4	P	---			P	---			P	---		
5	O	---			O	---			O	19315.46	30	-7
						2- 8 BAND						
1	O				O				O	18185.51*	49	-9
2	P	18108.26		-7	P	---			P	---		
3	O				O	---			O	---		
						2- 9 BAND						
1	O				O				O	---		
2	P				P	---			P	---		
3	O	17306.56*	27	-7	O	17395.34	24	7	O	---		
4	P	---			P	17451.91	22	-5	P	---		
						2-10 BAND						
1	O				O				O	16594.21		-9
2	P				P	---			P	---		
3	O	16520.81		-12	O	---			O	---		
4	P	---			P	---			P	---		
5	O	---			O	16738.89*		-19	O	---		
6	P	---			P	16822.69	42	-20	P	---		
7	O	16733.52		-23	O	---			O	---		

3F±-2B J(3d) ¹Δ±_g − B(2p) ¹Σ+_u *Continued*

$3F^{\pm}\text{-}2B \qquad J(3d)\ {}^1\Delta_g^{\pm} - B(2p)\ {}^1\Sigma_u^+ \qquad \textit{Continued}$

N"	SYM	P-BRANCH	I5	O-C	SYM	Q-BRANCH	I5	O-C	SYM	R-BRANCH	I5	O-C
		3F+				3F-				3F+		
						3- 0 BAND						
1	O				O				O	---		
2	P				P	26639.70	20	-4	P	26722.55	20	O
3	O	---			O	26663.45	44	O	O	26773.19	20	-7
						3- 1 BAND						
1	O				O				O	25737.47		-4
2	P				P	25699.52		-4	P	25782.33	38	-4
3	O	25642.96		-1	O	25725.40		-4	O	25835.22	44	-3
4	P	25650.66		3	P	25759.51		O	P	25895.38	44	-1
5	O	25666.89	26	O	O	25802.44	62	7	O	---		
6	P	25691.21		2	P	---			P	---		
						3- 2 BAND						
1	O				O				O	24815.34	19	8
2	P				P	24778.56	18	-1	P	---		
3	O	---			O	---			O	---		
4	P	---			P	24842.83	19	1	P	---		
5	O	24753.24	22	1	O	---			O	---		
						3- 3 BAND						
1	O				O				O	23911.13	16	-7
2	P				P	---			P	23958.43		-2
3	O	23822.52	23	-7	O	23905.05	19	-1	O	---		
4	P	---			P	23943.84*	46	O	P	---		
5	O	23856.90		-1	O	---			O	---		
						3- 4 BAND						
1	O				O				O	23024.80	21	15
2	P				P	22990.20		9	P	---		
3	O	22938.60		-2	O	23021.07	21	-2	O	23130.87		-3
4	P	---			P	---			P	---		
5	O	22977.42		-6	O	23112.89		-7	O	---		
						3- 5 BAND						
1	O				O				O	22155.11		-3
2	P				P	22121.58		2	P	---		
3	O	22071.46	20	O	O	22153.97	10	4	O	22263.83	25	9
4	P	22087.75		2	P	---			P	---		
5	O	22114.58		9	O	---			O	---		
						3- 6 BAND						
1	O				O				O	21302.39	15	3
2	P				P	---			P	---		
3	O	21220.91	15	-5	O	21303.45	25	2	O	---		
4	P	---			P	21347.80*	59	-6	P	---		
5	O	21268.04	25	2	O	---			O	---		
						3- 7 BAND						
1	O				O				O	---		
2	P				P	---			P	---		
3	O	---			O	---			O	20579.17		-1
						3- 8 BAND						
1	O				O				O	---		
2	P				P	---			P	---		
3	O	---			O	---			O	---		
4	P	---			P	---			P	---		
5	O	19623.49	15	1	O	---			O	---		
6	P	---			P	---			P	---		
7	O	19710.40	15	7	O	---			O	---		

3F±-2B   J(3d) $^1\Delta_g^\pm$ − B(2p) $^1\Sigma_u^+$ *Continued*

N"	SYM	P-BRANCH 3F+	I5	O-C	SYM	Q-BRANCH 3F-	I5	O-C	SYM	R-BRANCH 3F+	I5	O-C
						3- 9 BAND						
1	O				O				O	---		
2	P				P	---			P	18895.20		-6
3	O	---			O	---			O	---		
4	P	---			P	---			P	---		
5	O	---			O	---			O	19108.57	15	-7
						4- 1 BAND						
1	O				O				O	27136.00	20	-8
2	P				P	---			P	---		
3	O	27041.52	20	-2	O	27117.93	38	-4	O	27218.67	44	-5
						4- 2 BAND						
1	O				O				O	26213.84	44	1
2	P				P	26177.26	38	-1	P	26253.35	38	O
3	O	26122.42	38	1	O	26198.84	50	O	O	26299.56	44	-3
4	P	---			P	---			P	---		
5	O	26136.70	32	O	O	---			O	---		
						4- 3 BAND						
1	O				O				O	---		
2	P				P	---			P	---		
3	O	---			O	25297.59	26	O	O	---		
						4- 5 BAND						
1	O				O				O	23553.76		5
2	P				P	---			P	---		
3	O	---			O	23546.50	22	4	O	---		
4	P	---			P	---			P	---		
5	O	23498.06		10	O	---			O	---		
						4- 6 BAND						
1	O				O				O	22700.93	22	O
2	P				P	---			P	22744.54	25	5
3	O	---			O	22695.95		-1	O	22796.66*	52	-5
4	P	---			P	---			P	---		
5	O	22651.50	25	1	O	---			O	---		
						4- 7 BAND						
1	O				O				O	---		
2	P				P	21833.09		2	P	---		
3	O	---			O	21861.91	15	1	O	21962.63		-2

3F+-2C±   J(3d) $^1\Delta_g^+$ − C(2p) $^1\Pi_u^\pm$

N"	SYM	P-BRANCH 2C+	I5	O-C	SYM	Q-BRANCH 2C-	I5	O-C	SYM	R-BRANCH 2C+	I5	O-C
						0- 0 BAND						
1	O				P				O	13337.72	62	-1
2	P				O	13276.60*	57	3	P	13377.89	50	-7
3	O	13183.17	59	7	P	13286.90	50	-4	O	13420.64	49	1
4	P	13162.38	49	O	O	13300.36	54	1	P	13465.05	36	-1
5	O	13145.05	52	1	P	13316.19	43	-2	O	13507.23	37	2
6	P	13130.56	34	O	O	13330.53	45	1	P	---		
7	O	13115.21	53	4	P	---			O	13605.24*	46	1
8	P	13118.96*	48	-2	O	13375.30	27	-5	P	---		
9	O	13101.58	25	-5	P	13333.29	24	O	O	---		

3F⁺-2C± $J(3d)\ ^1\Delta_g^+ - C(2p)\ ^1\Pi_u^{\pm}$ *Continued*

N"	SYM	P-BRANCH	I5	O-C	SYM	Q-BRANCH	I5	O-C	SYM	R-BRANCH	I5	O-C
		2C+				2C-				2C+		
						O- 1 BAND						
1	O				P				O	11677.23	26	-7
2	P				O	11618.46	23	1	P	11719.77	26	5
3	O	11528.24	26	17	P	11632.07	22	-7	O	11765.57	25	-3
4	P	11511.78	19	-1	O	11650.01*	33	-4	P	11814.50	20	3
5	O	11500.03	21	6	P	11671.51*	46	1	O	11862.20		6
6	P	11492.26*		2	O	11692.35	21	-4	P	11928.05	33	-13
						O- 2 BAND						
1	O				P				O	---		
2	P				O	---			P	10129.31	35	1
3	O	9941.16	29	5	P	---			O	---		
4	P	---			O	10067.32	24	-3	P	---		
						1- 1 BAND						
1	O				P				O	13263.58	65	6
2	P				O	13204.72*	69	5	P	13293.45	46	-3
3	O	13114.42	51	13	P	13205.89	56	-1	O	13331.01	52	8
4	P	13085.55	33	O	O	13215.42	57	4	P	13378.50	43	7
5	O	---			P	13235.48*	48	2	O	---		
6	P	13056.38*	47	18	O	---			P	---		
						1- 3 BAND						
1	O				P				O	---		
2	P				O	---			P	---		
3	O	10007.68	19	8	P	---			O	---		
						2- 1 BAND						
1	O				P				O	14786.04	51	13
2	P				O	14727.33*	51	1	P	14817.14*	42	1
3	O	14636.92	33	-2	P	14729.49*	51	-6	O	14844.73	33	9
4	P	14609.17	47	-3	O	14729.11	42	2	P	14872.97		-2
5	O	14579.06	42	5	P	14729.99	28	-3	O	14902.11		-3
6	P	14550.86*	37	10	O	---			P	---		
						2- 2 BAND						
1	O				P				O	13193.51	68	-8
2	P				O	13136.84	65	-10	P	13226.73	55	2
3	O	13049.84		-14	P	13142.50*	55	O	O	13257.67	56	-1
4	P	13026.69	51	O	O	13146.42	59	3	P	13290.48	46	O
5	O	13002.72	55	1	P	13152.77	50	-4	O	---		
6	P	---			O	13161.77*	49	-1	P	---		
						2- 3 BAND						
1	O				P				O	11667.56*	57	-17
2	P				O	11613.09	33	-10	P	11703.08	28	-7
3	O	11530.08	30	-17	P	11622.02	35	O	O	11737.95	23	O
4	P	11515.97	23	-5	O	11630.26	35	-1	P	---		
5	O	---			P	11641.96	26	-2	O	---		
						3- O BAND						
1	O				P				O	17907.34*	26	1
2	P				O	---			P	17928.11	29	-2
3	O	---			P	---			O	17945.13*	51	15
						3- 2 BAND						
1	O				P				O	14654.34*		2
2	P				O	14597.67	47	O	P	14679.44	42	-3
3	O	14510.66	33	-5	P	14595.21	42	-5	O	14703.02	47	3
4	P	---			O	14591.69*	51	-1	P	---		
5	O	14448.01	28	-1	P	---			O	---		
						3- 3 BAND						
1	O				P				O	13128.47	73	1
2	P				O	13073.91	63	-1	P	13155.89	56	-2
3	O	12990.94	50	-4	P	13074.70	58	-8	O	---		
4	P	12968.89	45	11	O	13075.56	61	-2	P	13213.53	45	-1

$3F^+-2C^\pm$ $J(3d)\ ^1\Delta_g^+ - C(2p)\ ^1\Pi_u^\pm$ *Continued*

N"	SYM	P-BRANCH 2C+	I5	O-C	SYM	Q-BRANCH 2C-	I5	O-C	SYM	R-BRANCH 2C+	I5	O-C
						3- 4 BAND						
1	O				P				O	11669.74*	51	-7
2	P				O	11615.85*	54	-4	P	11694.80*	35	-11
3	O	11533.33		O	P	11619.86	43	-12	O	---		
4	P	---			O	11625.00	37	2	P	---		
						4- 4 BAND						
1	O				P				O	13068.37	65	-1
2	P				O	13014.49	60	3	P	---		
3	O	---			P	---			O	---		
4	P	12902.66	46	-2	O	---			P	---		

$3F^--2C^\pm$ $J(3d)\ ^1\Delta_g^- - C(2p)\ ^1\Pi_u^\pm$

N"	SYM	P-BRANCH 2C-	I5	O-C	SYM	Q-BRANCH 2C+	I5	O-C	SYM	R-BRANCH 2C-	I5	O-C
						O- O BAND						
1	P				O				P	13337.49	58	-9
2	O				P	13275.23	52	-6	O	13376.40	56	-3
3	P	13184.23	33	-4	O	13282.94	57	-2	P	13416.30	44	-4
4	O	13162.67	52	-1	P	13291.77	48	-1	O	13456.30	44	0
5	P	13142.90	51	-3	O	13300.97	52	-2	P	13495.52	39	-9
6	O	13124.23*	51	-7	P	13309.92	44	-4	O	13533.53	30	7
7	P	13106.23	28	-7	O	13318.17	45	6	P	13569.62	21	-1
8	O	13088.28	33	5	P	13325.79	30	2	O	---		
9	P	13070.13	33	12	O	13329.82	32	0	P	---		
						O- 1 BAND						
1	P				O				P	11677.16	25	1
2	O				P	11616.98	26	-7	O	11718.30	21	-1
3	P	11529.63*	32	16	O	11627.97	23	4	P	11761.64	18	10
4	O	11512.37	21	-1	P	11641.10	27	-9	O	---		
5	P	11498.17	18	-5	O	11655.90	24	-2	P	11850.97	21	7
6	O	11486.18	17	1	P	11671.51*	46	-13	O	11895.44*	41	11
7	P	11475.77*	37	-19	O	---			P	---		
8	O	11466.59	17	-3	P	---			O	---		
						O- 2 BAND						
2	O				P	---			O	---		
3	P	---			O	---			P	---		
4	O	---			P	---			O	---		
5	P	---			O	---			P	---		
6	O	---			P	---			O	---		
7	P	9912.87*	80	3	O	---			P	---		
						1- 1 BAND						
1	P				O				P	13263.95	58	6
2	O				P	13203.89*	64	10	O	13298.93	60	1
3	P	13116.30	48	9	O	13208.51*	71	-3	P	13334.43	50	5
4	O	13092.99	55	0	P	13214.10	53	7	O	13369.89	49	-4
5	P	13071.09*	50	3	O	13219.85	54	0	P	13404.70	48	4
6	O	13050.14*	55	4	P	---			O	13438.15	32	4
7	P	13029.68	31	-4	O	---			P	---		
8	O	13009.36	35	-4	P	---			O	---		

$$3F^--2C^\pm \qquad J(3d)\ ^1\Delta_g^- - C(2p)\ ^1\Pi_u^\pm \qquad \textit{Continued}$$

N"	SYM	P-BRANCH 2C-	I5	O-C	SYM	Q-BRANCH 2C+	I5	O-C	SYM	R-BRANCH 2C-	I5	O-C
						1- 3 BAND						
1	P				O	---			P	---		
2	O	---			P	---			O	---		
3	P	---			O	---			P	---		
4	O	---			P	---			O	---		
5	P	9983.07*	24	5	O	---			P	---		
						2- 0 BAND						
1	P				O	---			P	---		
2	O	---			P	---			O	---		
3	P	---			O	---			P	---		
4	O	---			P	---			O	---		
5	P	---			O	16365.56		-5	P	---		
6	O	---			P	---			O	---		
7	P	---			O	16339.86		-19	P	---		
						2- 1 BAND						
1	P				O				P	14786.90	47	6
2	O				P	14726.73	42	-1	O	14816.06*	51	10
3	P	14639.16	28	0	O	14725.61	47	3	P	14844.01	23	3
4	O	14610.04	37	1	P	14723.70	37	1	O	14870.63	23	1
5	P	14580.69	33	-3	O	14720.55	37	1	P	---		
6	O	14550.86*	37	7	P	---			O	---		
						2- 2 BAND						
1	P				O				P	13194.28*	65	1
2	O				P	13136.36	57	4	O	13225.58	63	0
3	P	13052.13	47	2	O	13138.58	65	-4	P	13256.97	51	-2
4	O	13027.35	55	2	P	13141.16	55	-2	O	13287.95	49	3
5	P	13003.46*	51	-5	O	13144.22	56	-2	P	13317.72	22	-17
6	O	12980.17	50	-1	P	---			O	13346.61	36	-5
7	P	12957.10	34	6	O	---			P	---		
						2- 3 BAND						
1	P				O				P	11668.45*	41	11
2	O				P	11612.80	32	4	O	11701.83	36	0
3	P	11531.61	23	-2	O	11618.84	43	-5	P	11736.48	24	-3
4	O	11511.17	30	-4	P	11630.53*	40	2	O	---		
5	P	11492.68	24	0	O	---			P	---		
6	O	11475.77*	37	-2	P	---			O	---		

		3F⁻-2C±				J(3d) $^1\Delta_g^-$ – C(2p) $^1\Pi_u^\pm$				Continued		
N"	SYM	P-BRANCH	I5	O-C	SYM	Q-BRANCH	I5	O-C	SYM	R-BRANCH	I5	O-C
		2C-				2C+				2C-		
						3- O BAND						
1	P				O				P	---		
2	O				P	---			O	---		
3	P	---			O	---			P	---		
4	O	---			P	---			O	---		
5	P	17672.49	32	-9	O	---			P	---		
						3- 1 BAND						
1	P				O				P	16246.99*	65	-19
2	O				P	16187.13*	45	5	O	---		
3	P	16099.41		-9	O	---			P	16291.21	46	2
4	O	16064.68*	36	9	P	---			O	---		
5	P	---			O	16159.77		-3	P	---		
						3- 2 BAND						
1	P				O				P	14654.66*	51	5
2	O				P	14596.63	42	-3	O	14680.16*	47	2
3	P	14512.41	19	-4	O	---			P	---		
4	O	---			P	---			O	14727.18		O
						3- 3 BAND						
1	P				O				P	---		
2	O				P	13073.13	57	3	O	13156.43	63	4
3	P	12991.95	39	-2	O	13073.47	64	2	P	13183.64	53	-2
4	O	12965.79	53	2	P	13077.63	53	-3	O	13210.98*	45	-8
						3- 4 BAND						
1	P				O				P	11668.45*	41	-5
2	O				P	11612.09	30	-1	O	11698.39*	38	3
3	P	11537.07	32	-10	O	11615.85*	54	5	P	11728.86	22	O
4	O	11515.22	32	5	P	11619.50	32	-9	O	---		
5	P	---			O	---			P	---		
6	O	11476.26*	86	9	P	---			O	---		
						4- 4 BAND						
1	P				O				P	13067.19*	62	-1
2	O				P	13010.81	53	1	O	13090.89	62	O
3	P	12935.85	36	-2	O	13008.37	65	4	P	---		

2a-2c± $\quad$ a(2s) $^3\Sigma_g^+$ − c(2p) $^3\Pi_u^\pm$

N"	SYM	P-BRANCH 2C+	I5	O-C	SYM	Q-BRANCH 2C-	I5	O-C	SYM	R-BRANCH 2C+	I5	O-C
					3- 0 BAND							
1	O	5371.56	49	-1	P	---			O	---		
2	P	---			O	---			P	---		
3	O	5309.95	63	9	P	---			O	---		
					4- 1 BAND							
1	O	---			P	---			O	---		
2	P	---			O	---			P	---		
3	O	---			P	---			O	5444.36	56	-6
					4- 2 BAND							
1	O	---			P	---			O	---		
2	P	---			O	---			P	---		
3	O	3627.82	52	4	P	3714.84	35	15	O	---		
					5- 3 BAND							
1	O	---			P	---			O	---		
2	P	---			O	---			P	---		
3	O	3617.53	36	-9	P	---			O	---		

3a-2c± $\quad$ h(3s) $^3\Sigma_u^+$ − c(2p) $^3\Pi_u^\pm$

N"	SYM	P-BRANCH 2C+	I5	O-C	SYM	Q-BRANCH 2C-	I5	O-C	SYM	R-BRANCH 2C+	I5	O-C
					2- 2 BAND							
1	O	16903.62	35	0	P	16933.10	36	-1	O	16991.82	45	-3
2	P	16876.07		2	O	16934.91		4	P	17022.59	45	0
3	O	---			P	16937.53*	36	6	O	---		
4	P	16824.29	26	-5	O	16940.64		-2	P	---		
5	O	16799.99	34	3	P	---			O	---		
					3- 3 BAND							
1	O	16861.16	42	0	P	16888.69*		-1	O	16943.73	39	3
2	P	16833.66	36	2	O	16888.69*		1	P	16970.85	40	5
3	O	16806.34	40	-3	P	16888.62	50	1	O	16997.39	40	-4
4	P	16779.23	30	-7	O	16888.39*		1	P	---		
5	O	16752.47	32	4	P	---			O	---		
					4- 4 BAND							
1	O	16815.77*	43	0	P	16842.09	37	0	O	16894.55	35	-1
2	P	---			O	16841.53	46	1	P	16919.80*	30	-8
3	O	16761.98*	46	5	P	16840.56	38	0	O	---		
4	P	16734.96	34	0	O	16839.17*	54	7	P	16967.82	23	2
5	O	16707.91	36	0	P	16837.23	28	-1	O	---		
6	P	16680.86	26	0	O	---			P	---		
					4- 5 BAND							
1	O	15374.88	42	-5	P	15401.25		O	O	---		
2	P	---			O	15402.50	28	O	P	---		
3	O	---			P	15404.38	25	O	O	---		
4	P	---			O	15406.84	34	O	P	---		

3b-2a   e(3p) ³Σu⁺ — a(2s) ³Σg⁺   Continued

N"	SYM	P-BRANCH	I5	O-C	R-BRANCH	I5	O-C
				0- 4 BAND			
0	O	---			---		
1	P	---			---		
2	O	---			4872.24	32	-4
3	P	---			---		
4	O	4670.39	29	26			
				1- 0 BAND			
0	O	13103.86	56	-1	13163.42	62	0
1	P	13062.65	71	-1	13181.55	59	-1
2	O	13014.06	64	0	13191.82	71	9
3	P	12958.25	74	-5	13194.28*	65	1
4	O	12895.41*	62	-1	13188.69	61	-1
5	P	12825.93*	62	-2	13175.35	51	-2
6	O	12749.93*	51	-5	13154.28*	52	-1
7	P	12667.77	51	-4	13125.60	36	-3
8	O	12579.79*	59	-5	13089.40	31	-4
9	P	12486.25	29	-4	13045.94	21	-4
10	O	12387.49	40	-5	12995.36	56	-5
11	P	12283.83	92	-4	12937.93*	52	-2
12	O	12175.65*	29	-6	12873.70	22	-5
13	P	12063.08*	21	16	12803.05	17	
14	O	11946.56	21	0	---		
15	P	11826.33	28	0	12643.47	29	-2
16	O	11702.80	23		12554.99	23	0
17	P	11576.35	25		12461.12*	41	-3

3b-2a   e(3p) ³Σu⁺ — a(2s) ³Σg⁺

N"	SYM	P-BRANCH	I5	O-C	R-BRANCH	I5	O-C
				0- 0 BAND			
0	O	11615.56	73		11676.18	79	1
1	P	11575.42	92	0	11696.42	76	1
2	O	11528.92	80	1	11709.84	86	2
3	P	11476.26*	86		11716.42	74	0
4	O	11417.68	70	0	11716.16	79	1
5	P	11353.39	69	-1	11709.10	66	-1
6	O	11283.69	54	-2	11695.29	53	1
7	P	11208.81	45	1	11674.85	55	1
8	O	11129.07	36	1	11647.90	37	2
9	P	11044.77	35	-3	11614.61		2
10	O	10956.11*	60	-2	11575.13	32	2
11	P	10863.61	46	-1	11529.63*	35	2
12	O	10767.38	32	1	11478.34	25	-2
13	P	10667.75	38	-2	11421.52	32	-2
14	O	10564.82	48		11359.31*	23	3
15	P	---			11292.05	23	0
16	O	---			11219.86	16	0
17	P	---			11143.03	27	
18	O	---			11061.71	28	
19	P	---			10886.83	23	
20	O	---			10793.50		
21	P	---					
				0- 1 BAND			
0	O	9801.83	39	0	9861.25	63	-2
1	P	9764.01	58	0	9882.69	56	-1
2	O	9720.99	55	0	9898.43	80	-1
3	P	9672.98	65	2	9908.49	64	0
4	O	9620.15	58	-1	9912.87*	80	-1
5	P	9562.74	66	0	9911.55	59	0
6	O	9500.95*	64	0	9904.63	66	0
7	P	9435.16	64	1	9892.14	41	6
8	O	9365.50	50	2	9874.27	47	2
9	P	9292.16*	64	3	9851.00	36	4
10	O	---		-6	9822.65	39	3
11	P	---			9789.24	36	1
12	O	---			9750.95*	43	1
13	P	---			9708.08	31	0
14	O	---			9660.76	37	0
15	P	---			9609.11	27	0
16	O	---			9553.40	34	-2
17	P	---			9493.80	28	2
18	O	---			9430.50	31	2
19	P	---			9363.60*	65	

3b-2a e(3p) $^3\Sigma_u^+$ − a(2s)$^3\Sigma_g^+$ *Continued*

N"	SYM	P-BRANCH	I5	O-C	R-BRANCH	I5	O-C
2- 0 BAND							
0	O				14583.13	51	-1
1	P	14524.66	51	2	14599.12	51	-3
2	O	14482.40	51	2	14604.21	51	-3
3	P	14431.65	51	-2	14604.40	51	-3
4	O	14372.71	51	3	14593.61	51	-5
5	P	14305.69	42		14574.05		-3
6	O	14230.90		-1	14545.76	51	-1
7	P	14148.66	42	1	14508.77	37	-3
8	O	14059.28	34	1	14463.47*	51	6
9	P	---			---		
10	O	13860.22	21	-6	---		
11	P	13751.08	23	-20	---		
12	O	---			---		
13	P	13387.70*	24	-2	---		
14	O	13255.29	21	-2	---		
15	P	13117.75	15	0	---		
16	O						
2- 1 BAND							
0	O				12768.23	71	-1
1	P	12710.89	62	-2	12785.40*	67	-2
2	O	12670.95	74	-3	12794.83	74	-1
3	P	12623.72	73	-1	12796.47	65	-2
4	O	12569.37	74	-1	12790.37-	72	
5	P	12508.11	68	-4	12776.53	55	-1
6	O	12440.22	80	-1	12755.06	56	0
7	P	12365.98	67	3	12726.13	38	-2
8	O	12285.57	66	-2	12689.71	36	5
9	P	12199.42	60	1	12646.13	37	-2
10	O	12107.73	46	-1	12595.48	27	1
11	P	12010.84	30	0	12538.09*	55	-1
12	O	11908.99*		-1	---		9
13	P	---			---		
14	O	---			---		
15	P	---			12244.28	25	0

3b-2a e(3p) $^3\Sigma_u^+$ − a(2s)$^3\Sigma_g^+$ *Continued*

N"	SYM	P-BRANCH	I5	O-C	R-BRANCH	I5	O-C
1- 2 BAND							
0	O				9602.73	62	2
1	P	9545.47	71	0	9623.15	59	1
2	O	9508.86	67	1	9638.02	68	3
3	P	9467.15	73	2	9647.27	64	1
4	O	9420.48	68	2	9650.92	68	0
5	P	9369.07*	71	3	9648.98	62	3
6	O	9313.15	67	4	9641.51*	66	3
7	P	9252.91	68	2	9628.56	56	3
8	O	9188.63	64	19	9610.26	61	4
9	P	9120.74*	66	3	9586.72	49	2
10	O	9048.97	56	3	9558.06	54	2
11	P	8974.09	54	2	---		
12	O	8896.20	36	-1	9486.04	49	0
13	P	8815.48	34	0	9442.99	37	5
14	O	8732.34	20	5	9395.50	42	0
15	P	8646.81		23	9343.82	35	-3
16	O	8559.70			9287.92	36	-23
1- 4 BAND							
0	O	---			---		
1	P	---			---		
2	O	---			---		
3	P	---			---		
4	O	---			---		
5	P	6068.73	53	1	---		
6	O				---		
1- 5 BAND							
0	O	---			---		
1	P	---			---		
2	O	4649.22	35	-23	---		
3	P	4615.76	43	-5	---		
4	O						

3b-2a $e(3p)\ ^3\Sigma_u^+ - a(2s)\ ^3\Sigma_g^+$ *Continued*

N"	SYM	P-BRANCH	I5	O-C	R-BRANCH	I5	O-C
				3–1 BAND			
0	O	14063.82	53	–	14120.06	58	0
1	P	14022.81*	74	1	14135.10	56	-2
2	O	13973.43*	60	0	14141.34	65	0
3	P	13915.89	74	1	14138.72	55	-2
4	O	13850.40	56	0	14127.32	58	0
5	P	13777.19	58	0	14107.18	48	1
6	O	13696.59		0	14078.38	48	-3
7	P	13608.84*		-2	14041.04	28	1
8	O	13514.37*	40	1	13995.32	30	0
9	P	13413.34	28	1	13941.41	18	1
10	O				13879.46	22	0
				3–2 BAND			
0	O	12319.14	72	0	12374.24	79	-1
1	P	12280.37*	90	-2	12390.44	76	-1
2	O	12234.44	82	0	12398.93	90	-2
3	P	12181.40*	91	0	12399.73	74	-1
4	O	12121.51	75	-3	12392.85*	79	1
5	P	12055.06*	77	0	12378.31	65	-2
6	O	11982.23*	64	0	12356.22*	66	0
7	P	11903.36	63	3	12326.67	47	0
8	O	11818.69	42	0	12289.79	43	0
9	P	11728.51	40	0	12245.73	29	0
10	O				12194.64	30	0
11	P	–			12136.71	33	-2
12		–			12072.16	31	-2
				3–3 BAND			
0	O	10642.09	26	-12	10695.97	35	-1
1	P	10605.48	45	-1	10713.27	31	-1
2	O	10562.83	39	-1	10723.99	36	-2
3	P	10514.23	41	0	10728.14	28	-1
4	O	10459.89	35	-1	10725.66	30	-1
5	P	10399.96	34	-1	–		
6	O						

3b-2a $e(3p)\ ^3\Sigma_u^+ - a(2s)\ ^3\Sigma_g^+$ *Continued*

N"	SYM	P-BRANCH	I5	O-C	R-BRANCH	I5	O-C
				2–2 BAND			
0	O	10966.20	56	–	11022.43	31	0
1	P	10928.58	84	-4	11040.76	31	1
2	O	10884.75	77	1	11052.45	35	-2
3	P	10834.91*	92	1	11057.50	31	0
4	O	10779.31	73	2	11055.91*	33	3
5	P	10718.08	79	0	11047.69	29	2
6	O	10651.63	54	4	11032.94	29	1
7	P	10580.09	49	3	11011.85*	22	13
8	O	10503.87*	74	-13	–		
9	P				–		
				2–3 BAND			
0	O	9289.10	58	3	9344.17	65	1
1	P	9253.65	71	0	9363.60*	65	2
2	O	9213.15	67	-1	9377.52	71	-1
3	P	9167.75	72	-2	9385.96*	71	6
4	O	9117.63	65	0	9388.73	71	2
5	P	9063.03	69	2	9385.96*	93	-1
6	O	9004.14	67	-1	9377.83*	59	5
7	P	8941.26	66	0	9364.29	62	-3
8	O	8874.56	57	-3	9345.40	52	-1
9	P	8804.40	55	1	9321.30	64	0
10	O	–			9292.16*	45	0
11	P	–			9258.01	65	2
12	O	–			9219.27	36	-9
13	P				9175.59	36	2
14	O				9127.59	48	2
				3–0 BAND			
0	O	15877.52*	35	-2	15934.95	40	-1
1	P	15834.19	44	-1	15948.83	38	-1
2	O	15781.36	39	1	15952.74	47	-2
3	P	15719.18	44	0	15946.66	37	-2
4	O	15647.90	34	-5	15930.61	41	1
5	P	15567.85	36	-1	15904.71	30	1
6	O	15479.28	22	-3	15868.98	33	4
7	P	15382.54	25	0	15823.70*	29	5
8	O	15277.92	28	-5	15768.99	21	1
9	P	15165.86	19	-1	15705.21	19	20
10	O				15631.99		-1

3b-2a   e(3p) $^3\Sigma_u^+$ – a(2s) $^3\Sigma_g^+$ *Continued*

N"	SYM	P-BRANCH	I5	0-C	R-BRANCH	I5	0-C
		4 – 2 BAND					
0	O	13603.10*	48	-1	13657.15	48	-1
1	P	13563.26*	48	-2	13671.18*	50	1
2	O	---			13676.45	50	0
3	P	---			13672.94*	48	-1
4	O	13458.95	74	3	13660.73*	48	1
5	P	13394.73	59	-1	13639.84	48	3
6	O	13322.93*	62	1	13610.25	48	-4
7	P	13243.74	50	1	13572.34	35	3
8	O	13157.44*	53	2	13525.03	35	0
9	P	13064.34	28	1	13471.70	24	3
10	O	12964.75	27	0	13409.85	24	0
		4 – 3 BAND					
0	O	11925.93	66	-1	11978.85	72	-2
1	P	11888.34	79	-2	11993.99	69	1
2	O	---			12001.49	78	-1
3	P	11791.73	80	-2	12001.34	70	1
4	O	11733.08	71	0	11993.54	59	1
5	P	11667.86	76	1	11978.13	56	-2
6	O	11596.26	61	-3	11955.20	34	2
7	P	11518.61	60	1	11924.84	33	3
8	O	11435.14	34	-4	11887.22	25	-1
9	P	11346.20	30	-2	11842.51	31	1
10	O	11252.15	21	-1	11791.31		1
		4 – 4 BAND					
0	O	10314.98	23	4	10383.01	23	1
1	P	10279.56	21	1	10392.70	30	-2
2	O	10238.01	18	0	10395.82	23	2
3	P	10190.57	24	0	10392.36	25	-1
4	O	10137.32	24	4	10382.36	20	-1
5	P	10078.67*	65	15	---		
6	O	---			---		

3b-2a   e(3p) $^3\Sigma_u^+$ – a(2s) $^3\Sigma_g^+$ *Continued*

N"	SYM	P-BRANCH	I5	0-C	R-BRANCH	I5	0-C
		3 – 4 BAND					
0	O	9030.99	62	2	9083.91	66	2
1	P	8996.68	68	2	9102.32	64	4
2	O	8957.31	65	2	9115.21	66	1
3	P	8913.07	65	2	9122.62	64	2
4	O	8864.09	65	1	9124.50	66	-1
5	P	8810.64	65	0	9120.74*	64	-1
6	O	8752.94	51	4	9111.83	65	3
7	P	8691.19	50	0	9097.39	63	5
8	O	---			9077.65	66	0
9	P	---			---		
10	O	---			9022.69	58	3
		3 – 6 BAND					
0	O	6003.21	52	-17	---		
1	P	5973.45	61	9	---		
2	O	5940.42	43	3	---		
3	P	5904.63	58	-2	---		
		3 – 7 BAND					
0	O	---			4656.56	49	-13
1	P	---			4676.05	47	5
2	O	---			4693.05	38	8
3	P	---			4707.58	30	3
		4 – 0 BAND					
0	O	---			17229.56	26	-1
1	P	---			17230.24*	32	-2
		4 – 1 BAND					
0	O	15347.75	51	-3	15402.95	49	0
1	P	15305.67	51	-2	15415.83	48	-1
2	O	15254.16*	51	1	15418.85	55	1
3	P	15193.36	51	-4	15411.95	47	1
4	O	15123.59*	51	0	15395.19	50	-1
5	P	15045.07	42	-1	15368.65	47	-2
6	O	14958.08	42	-6	15332.45	51	1
7	P	14862.89	47	1	15286.68	37	1
8	O	14760.04*	33	4	15231.60	37	4
9	P	14649.61			---		

3b-2a e(3p) $^3\Sigma_u^+$ — a(2s)$^3\Sigma_g^+$ *Continued*

N"	SYM	P-BRANCH	I5	O-C	R-BRANCH	I5	O-C
			5- 2 BAND				
0	O	14816.06*	51	-1	14869.06	51	-1
1	P	14775.21	51	0	14881.02*	51	-4
2	O	14725.04*	51	-1	14883.35	51	2
3	P	14665.85	51	5	14876.32	51	-2
4	O	14598.08	51	-5	14862.02	51	0
5	P	14524.31	47	9	14823.45	37	-1
6	O	14427.35	37	-1	14789.21	51	-4
7	P	14336.40	37	2	---		
8	O				---		
			5- 3 BAND				
0	O	13138.89	56	-1	13190.80*	61	0
1	P	13100.29	73	0	13203.89*	64	0
2	O	13053.47	63	2	13208.51*	71	10
3	P	12998.65	74	2	13204.72*	69	-2
4	O	12936.46	58	-1	13194.85		0
5	P	12869.14	57	-1	13161.77*	49	-1
6	O	12779.87	42	-5	13134.15	52	-3
7	P	12697.55*	51	-3	---		
8	O				---		
			5- 4 BAND				
0	O	11527.91	59	-1	11578.71	65	0
1	P	11491.48	70	0	11592.90	63	-1
2	O	11447.91	64	-1	11599.63*	69	-3
3	P	11397.45*	67	0	11599.17	59	-2
4	O	11340.67	57	1	11593.66	57	-1
5	P	11279.83	48	0	11565.96	43	-2
6	O	11198.05*	27	1	---		
7	P	11124.20	31	-4	---		
8	O				---		

3b-2a e(3p) $^3\Sigma_u^+$ — a(2s)$^3\Sigma_g^+$ *Continued*

N"	SYM	P-BRANCH	I5	O-C	R-BRANCH	I5	O-C
			4- 5 BAND				
0	O	8769.05	39	2	8819.80	50	2
1	P	8735.78	50	1	8837.09	51	0
2	O	8697.48	42	0	8848.96	62	2
3	P	8654.29	50	2	8855.26	57	-1
4	O	8606.36	37	0	8856.11	64	4
5	P	8553.91	38	0	---		
6	O	8497.23	27	0	8841.32	58	4
7	P	8436.45	24	3	---		
8	O				---		
			4- 7 BAND				
0	O	5869.36	45	1	---		
1	P	---			---		
2	O	5808.33	69	-5	---		
3	P	5773.66	57	3	---		
4	O				---		
			4- 8 BAND				
0	O	---			---		
1	P	---			---		
2	O	---			---		
3	P	---			4630.31	28	-15
4	O						
			5- 1 BAND				
0	O	16560.81*	41	7	16614.88	34	0
1	P	16517.58*	51	-4	16625.75*	37	2
2	O	16464.04*	48	0	16625.75*	37	-1
3	P	16400.33*	50	5	16615.41	38	8
4	O	16327.00	45	1	16596.53	38	3
5	P	16246.39	55	2	16552.26	47	-4
6	O	16141.75	34	3	16511.39	40	-1
7	P	16041.98		7	---		
8	O				---		

3b-2a   e(3p) $^3\Sigma_u^+$ − a(2s)$^3\Sigma_g^+$ *Continued*

N"	SYM	P-BRANCH	I5	O-C	R-BRANCH	I5	O-C
					6-3 BAND		
0	O	--			14328.07	51	1
1	P	---			--		
2	O	14188.08	55	-1	14329.70	47	3
3	P	14129.28	62	-2	--		
4	O	14061.40	53	O	--		
5	P	13984.64*	55	-2	--		
6	O	13899.30	44	-1	--		
7	P	13805.59	44	-3	--		
8	O	13703.95	46	4	--		
9	P						
					6-4 BAND		
0	O	12666.45	54	O	12715.96	59	-1
1	P	12628.72	70	-2	12727.52	58	-1
2	O	12582.57*	62	3	12730.25	65	-2
3	P	12528.11	71	-1	12724.13	56	
4	O	12465.61	71	1	12709.17*	61*	-1
5	P	12395.29*	74	-4	12685.40*	59*	-3
6	O	12317.46	59	4	12652.88	49	-1
7	P	12232.29	67	1	12611.72	32	-1
8	O	12140.58*	56	1	--		
9							
					6-5 BAND		
0	O	11120.54	21	O	11168.97	25	O
1	P	11084.99	26	3	11181.63	24	1
2	O	11042.06	24	5	11186.50	29	1
3	P	10991.83	58	1	11183.60	21	1
4	O	10934.69	45	1	11173.08*	54	2
5	P	10870.75	51	3	11154.47		O
6	O	10800.49*	59*	24	11128.28	19	2
7	P	10723.44	37	2	11094.52	18	-2
8					--		

3b-2a   e(3p) $^3\Sigma_u^+$ − a(2s)$^3\Sigma_g^+$ *Continued*

N"	SYM	P-BRANCH	I5	O-C	R-BRANCH	I5	O-C
					5-6 BAND		
0	O	8500.34	18	3	8548.99	23	O
1	P	8468.16	25	-2	8565.34	23	4
2	O	8430.98	19	-2	8576.34	31	4
3	P	8388.97	O	-8	8582.29	26	O
4	O	--			8585.24	27	-3
5	P	--			8568.16	21	-8
					5-8 BAND		
0	O	--			5774.40	51	8
1	P	5699.92	61	6	5792.65	49	-11
2	O	5668.94	52	-7	5807.92	65	-6
3	P	5635.41	58	-13	5820.33	63	3
4	O				5831.63	51	-13
					6-1 BAND		
0	O				17752.14	29	O
1	P	--			17760.37	26	O
2	O	--			17756.43	37	2
3	P	17598.69	23	1	17740.31	30	5
4	O				17712.02	30	1
5	P	--			17671.69	17	O
6	O	17361.93	23	5	17619.48	20	4
					6-2 BAND		
0	O	15954.53	36	-3	16006.33	45	O
1	P	15912.45	48	-2	16015.68	43	-2
2	O	15859.65	40	-4	16014.02	52	2
3	P	15796.46	47	-1	16001.29		2
4	O	15723.16	34	O	15977.48	37*	-5
5	P	15639.74	38	1	15942.82	37	-1
6	O	15546.77	24	-2	15897.29	36	1
7	P	15544.40	29	2	15341.02	29	O
8	O	15333.06	23	O	--		
9	P						

3b-2a   e(3p) $^3\Sigma_u^+$ − a(2s) $^3\Sigma_g^+$ *Continued*

N"	SYM	P-BRANCH	I5	O-C	R-BRANCH	I5	O-C
					7- 5 BAND		
0	O				12226.43	64	0
1	P	12179.24	59	1	12236.69	61	2
2	O	12142.43	70	1	12238.23	66	3
3	P	12097.07	65	1	12229.90	60	2
4	O	12043.56	68	3	12213.05	62	3
5	P	11980.97	62	0	12187.11*	48	-1
6	O	11910.89	63	3	12152.18*	48	2
7	P	11832.93	49	1	---		
8	O	11747.34	47	4	12057.16	26	0
					7- 6 BAND		
0	O				---		
1	P	---			---		
2	O	---			---		
3	P	10662.87	20	-3	10758.65	23	-3
4	O	10620.62	31	-7	---		
5	P	---			---		
6	O	10450.31	18	-3	---		
					7- 7 BAND		
0	O	9279.58	39	3	9324.68	44	3
1	P				9337.03	44	2
					8- 2 BAND		
0	O	17983.31	22	5	18032.46	20	3
1	P	17938.56	28	-1	18036.74		2
2	O	17880.71	22	0	18027.37		-1
3	P	17809.85	31	0	18004.53		3
4	O	17726.27	25	-2	---		
					8- 3 BAND		
0	O	16306.13	30	4	16354.21	35	5
1	P	16263.67	43	2	16359.58*	32	3
2	O	16209.11	42	0	16352.48*	40	4
3	P	16142.67*	45	-1	16332.95	32	5
4	O	16064.68*	36	5	16301.23*	34	0
5	P	15975.52	43	-1	16258.44		2
6	O	15876.55	33	-1	---		

3b-2a   e(3p) $^3\Sigma_u^+$ − a(2s) $^3\Sigma_g^+$ *Continued*

N"	SYM	P-BRANCH	I5	O-C	R-BRANCH	I5	O-C
					6- 6 BAND		
0	O				9686.26*	41	-1
1	P	9638.89	34	3	9699.96	39	-2
2	O	9605.43	47		9706.98		
3	P	9565.65	45	-1	9707.18	51	-4
4	O	9519.72	55	1	9700.77	50	-1
5	P	9467.84	46	0	9687.61	41	-2
6	O	9410.18*	54	-2	9667.77	46	1
7	P	9347.01	43	-2	---		
8	O	9278.49	48	-3	---		
					7- 2 BAND		
0	O				17063.80*	35	-3
1	P	17013.28	25	-3	17070.76*	44	3
2	O	16969.96	38	3	17065.72	38	1
3	P	16914.75	34	1	---		
4	O	16848.20	36	2	---		
5	P	16769.37	29	2	---		
6	O	16679.92*	35	5	---		
					7- 3 BAND		
0	O				15385.51	47	-1
1	P	15336.14*	51	0	15393.58	45	0
2	O	15295.01	51	0	15390.76*	50	-3
3	P	15243.14	51	0	15375.95	51	-1
4	O	15181.01	51	0	15350.47	51	-3
5	P	15107.67	51	-2	15313.84*	51	0
6	O	15024.77*	51	-3	15266.09	47	-1
7	P	14931.94	42	-4	15207.29	42	0
8	O	14829.51	42		---		
					7- 4 BAND		
0	O				13773.44*	54	-1
1	P	13725.15	50	1	13782.59	53	1
2	O	13686.21		1	13781.97	58	-1
3	P	13637.61	48	2	13770.43	53	-2
4	O	13579.82	50	-1	13749.30	74	-2
5	P				13718.06	52	-4
6	O	13435.46	55	-1	13676.73		
7	P	13350.10	45	1	---		
8	O	13256.14	44	-2	---		

3b-2a e(3p) $^3\Sigma_u^+$ — a(2s) $^3\Sigma_g^+$ *Continued*

N"	SYM	P-BRANCH	I5	O-C	R-BRANCH	I5	O-C
8-8 BAND							
0	O						
1	P	8894.92	32	-4	8937.68	42	0
2	O				8948.44*	48	2
3	P				8951.95		-8
4	O	8824.63	36	-4	8948.44*	48	-2
		8779.46*	45	-13	8938.02	52	-12
9-3 BAND							
0	O	17173.26	24	1	17219.55	41	5
1	P	17128.97	32	-2	17221.26	28	-1
2	O	17070.76*	44	-5	17208.74	42	4
3	P	16998.91	33		17181.71	33	-1
4	O	16913.44	26	1	17140.39		4
5	P	16814.66	24	1	17084.54		4
9-4 BAND							
0	O	15562.25	30	0	15607.41	41	0
1	P	15520.17	44	-1	15610.24	40	-1
2	O	15465.28	40	-2	15599.88	47	1
3	P	15397.70	45	-4	15576.21	39	4
4	O	15317.70	47	5	15539.18	44	-1
5	P	15225.34	47	2	15483.74	32	4
6	O	15120.78	37	3			
9-5 BAND							
0	O	14016.34	43	0	14060.43	47	2
1	P	13976.41	53	1	14064.35	45	-1
2	O	13924.72*	49	-1	14056.13	51	2
3	P	13861.27	55	-17	14035.68	44	4
4	O	13786.75	47	2	14002.82*	52	-5
5	P	13700.76	48	5	13957.82	32	4
6	O	13603.58	40	0	13900.25	34	-1
7	P	13495.40		0			
8	O						

3b-2a e(3p) $^3\Sigma_u^+$ — a(2s) $^3\Sigma_g^+$ *Continued*

N"	SYM	P-BRANCH	I5	O-C	R-BRANCH	I5	O-C
8-4 BAND							
0	O						
1	P	14695.11*	51	2	14742.06	51	-1
2	O	14654.85		1	14748.55	51	0
3	P	14603.55	51	-1	14743.63	51	-2
4	O	14541.50	51	0	14727.33*	51	-2
5	P	14468.77*	51	-6	14700.02	51	-3
6	O	14386.21	42	1	14662.66	51	4
8-5 BAND							
0	O						
1	P	13149.20	49	2	13195.10	53	3
2	O	13111.08	59	2	13202.65	51	1
3	P	13063.01	55	-2	13199.90	56	-3
4	O	13005.21	60	1	13186.85	49	1
5	P	12937.93*	52	2	13163.76	51	1
6	O	12861.63*	55	4	13131.71	27	1
7	P	12777.51	34	1			
8-6 BAND							
0	O						
1	P	11667.56*	57	6	11712.34	54	-1
2	O	11631.53	63	-1	11720.96	74	0
3	P	11586.66	57		11720.35*	79	0
4	O	11533.10	62	0	11710.48	44	0
5	P	11471.05	55	0	11691.65	40	3
6	O	11400.97*	55	-4	11664.84	40	0
7	P	11324.26	25	-10	11634.64	36	-4
8	O	11245.28	17	-10			-2
8-7 BAND							
0	O						
1	P	10249.43	24	-7	10293.31	21	-3
2	O	10215.63	23	-1	10302.94	21	-2
3	P	10173.90	20	-3	10304.46	30	1
4	O	10124.53	33	-3			
5	P	10067.80	27	0	10283.12	23	1
6	O	10004.05	24	1			

3b-2a e(3p) $^3\Sigma_u^+$ − a(2s) $^3\Sigma_g^+$ Continued

N"	SYM	P-BRANCH	I5	O-C	R-BRANCH	I5	O-C
					10- 4 BAND		
0	O	---			16344.24	33	3
1	P	16301.23*	34	5	16342.97*	36	12
2	O	16257.02	34	4	16326.06	35	2
3	P	---			---		
4	O	16124.14*	66	25	---		
					10- 5 BAND		
0	O	---			14797.18*	51	-3
1	P	14755.24	51	-3	14796.95		1
2	O	---			14782.28	51	2
3	P	---			---		
4	O	14587.64		5	---		
					10- 6 BAND		
0	O	13273.58	42	-1	13314.48	45	-1
1	P	13233.70	51	2	13315.26	44	0
2	O	13180.99*	49	3	13302.71	49	-3
3	P	13115.47		-2	13276.60*	57	-7
4	O	13037.29		-2	13237.02	43	1
5	P	12946.43	48	0	---		
					10- 7 BAND		
0	O	11855.59	34	0	11895.44*	41	-4
1	P	11817.79	54	1	11897.27	37	1
2	O	11768.24	46	1	11886.84	50	0
3	P	11706.96*	59	1	11863.96	32	2
4	O	11634.01	44	-1	11828.47	34	0
					10- 8 BAND		
0	O	---			10539.84	23	2
1	P	---			10542.71	35	-1
2	O	10419.01	20	4	10534.51*	17	9
3	P				10514.67		-1
					10- 9 BAND		
0	O				9247.91	34	2

3b-2a e(3p) $^3\Sigma_u^+$ − a(2s) $^3\Sigma_g^+$ Continued

N"	SYM	P-BRANCH	I5	O-C	R-BRANCH	I5	O-C
					9- 6 BAND		
0	O	12534.65	42		12577.78*	65	9
1	P	12496.88*	57	-1	12582.57	62	-9
2	O	12448.36	61	0	12576.57	54	-2
3	P	12389.32	67	0	12559.27	47	0
4	O	12319.89*	59	-2	12530.76	49	-1
5	P	12240.20	60	-2	12490.91	41	-5
6	O	12150.32	42	1	12439.65	42	-9
7	P	12050.45		-5	---		
8	O			-1	---		
					9- 7 BAND		
0	O	11116.71	18	5	11158.63	18	-5
1	P	11080.87*	33	-11	11164.39*	17	-27
2	O	11035.63	20	0	11160.68	18	-1
3	P	10980.82	35	2	11146.49*	31	-5
4	O	10916.60	30	-2	---		
5	P	10843.15	33	-1	---		
					9- 8 BAND		
0	O	9728.55	29	-1	9803.00	23	-2
1	P	9686.26*	41	-11	9810.08		-4
2	O	9635.73	37	-10	9808.28	31	1
3	P	9577.35	26	1	9797.29	26	1
4	O				9777.17	34	-9
					10- 3 BAND		
0	O	17865.81	31	2	17956.29	18	-1
1	P	17803.39	19	-2	17953.82	12	-3
2	O	17725.07	25	0	17934.82	23	-3
3	P	17630.89	18	4	17899.16	19	4
4	O	---			---		
5	P	---			---		

4b-2a   f(4p) $^3\Sigma_u^+$ – a(2s) $^3\Sigma_g^+$ *Continued*

N"	SYM	P-BRANCH	I5	O-C	R-BRANCH	I5	O-C
2– 0 BAND							
0	Q	---			23610.64	42	0
1	P				23628.33	35	-1
2	Q	23509.86	45	-2	23637.98	36	-2
3	P	23460.83*	34	-3	---		
4	Q	23404.40	30	-4	---		
2– 1 BAND							
0	Q	21737.60	39	0	21795.75*	54	1
1	P	21698.49*	49	1	21814.62	49	1
2	Q	21653.13	44	21	21826.62	54	2
3	P	21601.18	44	4	---		
4	Q				---		
2– 2 BAND							
0	Q	19992.93	44	0	20049.93	49	0
1	P	19956.08	54	1	20069.91	49	-3
2	Q	19913.96		3	20084.18*	54	-1
3	P	19866.66	54	0	---		
4	Q				---		
2– 3 BAND							
0	Q	18315.75	35	-1	18371.63	49	-3
1	P	18281.16	44	9	18392.71	44	-6
2	Q	18242.42*	54	-1	18409.28	49	1
3	P	18199.48	44		---		
4	Q				---		

4b-2a   f(4p) $^3\Sigma_u^+$ – a(2s) $^3\Sigma_g^+$

N"	SYM	P-BRANCH	I5	O-C	R-BRANCH	I5	O-C
0– 0 BAND							
0	Q	20512.41	54	0	20574.20	54	-2
1	P	20473.50	44	4	20596.84	54	-1
2	Q	20429.37	25	0	20613.60*	59	4
3	P	20379.99	49	-1	20625.41	49	0
4	Q	20326.77*	15	9	20631.17	54	3
5	P	20268.36	10	-2	20633.08	30	0
6	Q				---		
0– 1 BAND							
0	Q	18698.69*	20	1	18783.16	35	4
1	P	18662.01	39	-5	18802.15	49	-1
2	Q	---			18817.39*		-8
3	P	---					
4	Q	18576.67	44	-3			
1– 0 BAND							
0	Q	22064.65	25	1	22125.07	44	2
1	P	22024.27	49	-2	22144.89	44	1
2	Q	21977.41*	44	1	22157.81	49	-3
3	P	21924.26	39	-2	22163.90	44	2
4	Q	21865.05	15	-10	---		
5	P				---		
1– 1 BAND							
0	Q	20250.92	20	1	20310.14	30	-1
1	P	20212.89	44	0	20331.13	25	-4
2	Q	20169.47	25	-1	20346.49*	44	5
3	P	20120.94	39	-4	20355.93	15	-1
4	Q	20067.58	49	-2	---		
5	P	20010.49*	54	0	---		
1– 2 BAND							
0	Q	18506.21*	54	-3	18564.54	44	20
1	P	18470.47	39	-1	18586.51	39	1
2	Q	18430.47	35	-2	18604.06	49	3
3	P	18386.53*	44	3	18616.95*	44	0
4	Q	18338.88	25	14	---		
5	P				---		

$$2c^{\pm}\text{-}2a \qquad c\,(2p)\ {}^{3}\Pi_{u}^{\pm} - a\,(2s)\ {}^{3}\Sigma_{g}^{+}$$

N"	SYM	P-BRANCH 2C+	I5	O-C	SYM	Q-BRANCH 2C-	I5	O-C	SYM	R-BRANCH 2C+	I5	O-C
						3- O BAND						
O	O				O				O	4727.13	32	O
1	P				P	---			P	4748.34	25	-23
2	O	---			O	---			O	4763.94	22	24
3	P	---			P	---			P	---		
4	O	---			O	---			O	4775.04	29	-10

$$3c^{\pm}\text{-}2a \qquad d\,(3p)\ {}^{3}\Pi_{u}^{\pm} - a\,(2s)\ {}^{3}\Sigma_{g}^{+}$$

N"	SYM	P-BRANCH 3C+	I5	O-C	SYM	Q-BRANCH 3C-	I5	O-C	SYM	R-BRANCH 3C+	I5	O-C
						O- O BAND						
O	O				O				O	16695.89		2
1	P				P	16662.13	66	1	P	16721.97	62	-1
2	O	16595.12	62	1	O	16654.55	74	1	O	16744.14*	69	-1
3	P	16554.50	59	O	O	16643.19	67	1	P	16762.32	59	O
4	O	16510.60*	67	1	O	16628.11	71	-1	O	16776.36	63	O
5	P	16463.59	59	O	P	16609.40*	59	-1	P	16786.20	50	-2
6	O	16413.60	63	O	O	16587.12	61	1	O	16791.84	52	O
7	P	16360.81	52	O	P	16561.32	48	O	P	16793.19	41	O
8	O	16305.36	53	O	O	16532.14	49	O	O	16790.26	43	O
9	P	16247.42	43	1	P	16499.68	39	-2	P	16783.01	32	O
10	O	16187.13*	45	O	O	16464.04*	48	-2	O	16770.82	36	-6
11	P	16124.56		O	P	---			P	16755.94	13	O
12	O	16059.41	37	5	O	16383.74		O	O	---		
13	P	---			P	16339.38	32	O	P	---		
14	O	---			O	16292.33	36	O	O	---		
15	P	---			P	16242.75	30	-2	P	---		
16	O	---			O	16190.87	34	O	O	---		
17	P	---			P	16136.73	24	O	P	---		
18	O	---			O	16080.43*	58	-2	O	---		
19	P	---			P	16022.21	22		P	---		
20	O	---			O	15962.14	24		O	---		
						O- 1 BAND						
O	O				O				O	14881.02*	51	5
1	P				P	14848.38	51	-1	P	14908.27	51	2
2	O	14783.69	51	-2	O	14843.12	51	-2	O	14932.75	51	O
3	P	14746.55	47	-1	P	14835.24	51	O	P	14954.37	47	-1
4	O	14707.28	51	-1	O	14824.83	51	1	O	14973.04	47	-2
5	P	---			P	14811.88	42	2	P	14988.67	42	O
6	O	14622.94	47	1	O	14796.44	51	O	O	15001.15	42	-2
7	P	14578.11	42	2	P	14778.61	42	1	P	15010.48	23	1
8	O	14531.69	37	1	O	14758.46*	47	O	O	15016.65	37	7
9	P	14483.78*	19	-2	P	14736.12	37	3	P	15019.54	42	14
10	O	---			O	14711.53	51	1	O	---		
						O- 2 BAND						
O	O				O				O	---		
1	P				P	---			P	---		
2	O	---			O	13100.74	25	1	O	---		
						1- O BAND						
O	O				O				O	18308.37	59	-1
1	P				P	18274.70*	59	5	P	18332.24*	59	1
2	O	18207.70*	59	8	O	18265.28	59	37	O	18350.95	59	2
3	P	18164.76	42	1	P	18250.38	59	1	P	18364.08	59	1
4	O	18117.36*	49	-1	O	18231.03*	59	O	O	18369.49	59	3
5	P	18065.38	45	4	P	18207.01	59	-1	P	---		
6	O	18006.71	46	1	O	18178.38	59	-2	O	---		
7	P	---			P	18145.26	26	O	P	---		

$3c^{\pm}\text{-}2a$ $d(3p)\ ^3\Pi_u^{\pm} - a(2s)\ ^3\Sigma_g^+$ *Continued*

N"	SYM	P-BRANCH 3C+	I5	O-C	SYM	Q-BRANCH 3C-	I5	O-C	SYM	R-BRANCH 3C+	I5	O-C
						1- 1 BAND						
0	O				O				O	16493.46	69	-2
1	P				P	16460.87	66	-5	P	16518.48	64	-2
2	O	16396.21	63	-1	O	16453.50*	74	1	O	16539.53*	70	0
3	P	16356.82	61	1	P	16442.43	67	0	P	16556.12	63	-1
4	O	16314.06*	68	-1	O	16427.73	71	0	O	16566.17	65	1
5	P	16267.78	60	-1	P	16409.48	58	1	P	16586.67*	47	1
6	O	16216.04	62	1	O	16387.71	60	-2	O	16588.93*	49	0
7	P	16176.09	51	1	P	16362.53	46	1	P	16589.31	39	-1
8	O	16119.45	52	1	O	16334.09	46	2	O	16586.04	40	2
9	P	16062.63	41	-2	P	16302.39	35	-1	P	---		
10	O	16004.02	45	1	O	16267.60		4	O	---		
11	P	---			P	16229.90	32	1	P	---		
12	O	---			O	---			O	---		
13	P	---			P	16146.03	27	0	P	---		
14	O	---			O	16100.19	34	0	O	---		
						1- 2 BAND						
0	O				O				O	14747.65	51	-2
1	P				P	14716.26	51	1	P	14773.82	51	-1
2	O	14653.80	51	-1	O	14711.11	51	1	O	14797.18*	51	6
3	P	14617.81		-1	P	14703.44*	51	0	P	14817.14*	42	0
4	O	14579.59	51	0	O	14693.26	51	1	O	14831.68	51	0
5	P	14538.90*		-3	P	14680.60	51	1	P	14857.79	51	-1
6	O	14493.89*	51	1	O	14665.60		2	O	14866.77	47	-1
7	P	---			P	14648.18	47	0	P	14874.96	37	0
8	O	14413.92	33	1	O	14628.53	47	-1	O	14880.47	37	-2
9	P	14367.00	5	2	P	14606.74	37	1	P	---		
10	O	---			O	14582.86*	51	4	O	---		
11	P	---			P	14556.86	14	1	P	---		
						1- 3 BAND						
0	O				O				O	---		
1	P				P	13039.11	19	3	P	13096.65	19	-1
2	O	12978.71		-18	O	13036.18	23	0	O	13122.14	27	-6
3	P	12946.22		0	P	13031.83	18	1	P	13145.52	23	-2
4	O	12912.44	27	2	O	13026.07	21	-1	O	13164.52		1
5	P	---			P	13018.78	19	17	P	---		
6	O	---			O	13010.65		14	O	---		
						2- 0 BAND						
0	O				O				O	19857.31	39	2
1	P				P	19823.53	44	8	P	---		
2	O	19756.51	44	-2	O	19811.58*	49	0	O	19895.49	39	0
3	P	---			P	19793.91	39	0	P	---		
4	O	19661.93	39	0	O	19770.43	44	2	O	---		
						2- 1 BAND						
0	O				O				O	18042.40	56	1
1	P				P	18009.70	54	-2	P	18065.70	51	5
2	O	17945.13*	51	0	O	18000.19	62	1	O	18084.09*	55	0
3	P	17903.95*	48	-1	P	17985.99	54	2	P	18097.63	46	0
4	O	17858.63		0	O	17967.11	58	0	O	18106.17	49	1
5	P	17809.28	45	-1	P	17943.66	48	-2	P	18109.66*	42	3
6	O	17756.03	48	0	O	17915.73	47	-1	O	18107.89	36	-4
7	P	17699.04	35	-1	P	17883.38	34	-1	P	---		
8	O	17638.45	38	1	O	17846.80*	34	0	O	18089.06	28	-3
9	P	17574.42	26	1	P	17806.03	22	-1	P	18071.87	19	2
10	O	17507.13	28	3	O	17761.33*	28	3	O	---		
						2- 2 BAND						
0	O				O				O	16296.59	67	1
1	P				P	16265.05	65	0	P	16320.98	61	0
2	O	16202.75	62	3	O	16257.81	74	4	O	16341.71	66	3
3	P	---			P	16246.99*	65	1	P	16358.66	56	2
4	O	16124.14*	66	-1	O	16232.64	69	1	O	16371.69	58	1
5	P	16080.43*	58	0	P	16214.83	58	1	P	16380.79*	45	2
6	O	16033.89	60	1	O	16193.59	58	0	O	16385.82*	46	4
7	P	15984.68	47	-1	P	16169.06		3	P	16386.78	35	6
8	O	15932.92	51	1	O	16141.29	44	2	O	16383.63	40	7
9	P	15878.73	37	-1	P	16110.35	33	-2	P	16376.20	28	2
10	O	---			O	---			O	16364.45	31	0
11	P	---			P				P	16348.47		0

$3c^{\pm}$-2a $d(3p)\ ^3\Pi_u^{\pm} - a(2s)\ ^3\Sigma_g^+$ *Continued*

N"	SYM	P-BRANCH	I5	O-C	SYM	Q-BRANCH	I5	O-C	SYM	R-BRANCH	I5	O-C
		3C+				3C-				3C+		

2- 3 BAND

N"	SYM	P-BRANCH	I5	O-C	SYM	Q-BRANCH	I5	O-C	SYM	R-BRANCH	I5	O-C
0	O				O				O	14618.29		-2
1	P				P	14587.85	51	-3	P	14643.81	51	O
2	O	14527.79	51	-1	O	14582.86*	51	1	O	14666.75	51	-1
3	P	14493.36	51	-1	P	14575.37	51	-1	P	14687.02	51	-2
4	O	14457.00	51	2	O	14565.45	51	-1	O	14704.50	51	-1
5	P	14418.77	47	O	P	14553.15	51	-1	P	14719.08	51	-3
6	O	14378.81	47	O	O	14538.55		3	O	14730.70	51	-1
7	P	14337.25*	37	O	P	14521.57	47	-2	P	14739.27	47	-1
8	O	14294.10	23	-1	O	14502.45	42	-2	O	14744.71*	47	-5
9	P	14249.54		-5	P	14481.26	37	4	P	14747.00	37	-3
10	O	---			O	14457.93	37	-2	O	---		
11	P	---			P	---			P	---		
12	O	---			O	14405.02*	42	O	O	---		

2- 4 BAND

N"	SYM	P-BRANCH	I5	O-C	SYM	Q-BRANCH	I5	O-C	SYM	R-BRANCH	I5	O-C
0	O				O				O	13006.22	28	O
1	P				P	12976.84*	50	-4	P	13032.81*	21	O
2	O	12918.97*	51	-2	O	12974.00*	64	-4	O	13057.95	25	O
3	P	---			P	12969.83	24	O	P	13081.52*	32	3
4	O	12855.78	24	-2	O	12964.27	26	-1	O	13103.30		-3
5	P	12822.95	19	-2	P	12957.57*	25	21	P	---		
6	O	---			O	12949.16	19	-3	O	---		
7	P	---			P	12939.84	47	14	P	---		

3- 1 BAND

N"	SYM	P-BRANCH	I5	O-C	SYM	Q-BRANCH	I5	O-C	SYM	R-BRANCH	I5	O-C
0	O				O				O	19528.89	54	O
1	P				P	19496.31		1	P	19549.97	49	2
2	O	19431.63	44	O	O	19484.74	59	O	O	19565.05	49	O
3	P	19388.17	49	-9	O	19467.37*	54	-6	O	19574.01	39	-3
4	O	19339.59	54	O	O	19444.52	54	1	O	19576.76*	44	16
5	P	19285.68	44	-2	P	19416.02	39	-1	P	---		
6	O	---			O	19382.13	49	2	O	---		

3- 2 BAND

N"	SYM	P-BRANCH	I5	O-C	SYM	Q-BRANCH	I5	O-C	SYM	R-BRANCH	I5	O-C
0	O				O				O	17783.04*	56	-4
1	P				P	17751.60	55	-3	P	---		
2	O	17689.24	50	2	O	17742.31	64	-2	O	17822.59	58	-5
3	P	17649.27	49	O	P	17728.47	55	3	P	17835.04	48	-1
4	O	17605.11	56	O	O	17710.04	58	1	O	17842.03	52	-9
5	P	17556.84	47	O	P	17687.17	47	O	P	17842.68	39	1
6	O	17504.36	52	4	O	17659.90	27	-6	O	---		
7	P	---			P	17628.34	35	O	P	---		
8	O	---			O	17592.66	33	4	O	---		
9	P	---			P	17552.85	28	O	P	---		
10	O	---			O	17509.24	27	3	O	---		

3- 3 BAND

N"	SYM	P-BRANCH	I5	O-C	SYM	Q-BRANCH	I5	O-C	SYM	R-BRANCH	I5	O-C
0	O				O				O	16104.79	63	-2
1	P				P	16074.46	61	O	P	16128.08	58	-3
2	O	16014.32	57	2	O	16067.38	69	-3	O	16147.69	63	-3
3	P	15977.69*	57	2	P	16056.84	61	O	P	16163.45	54	O
4	O	15937.92	62	-2	O	16042.85	66	-1	O	16174.94	56	-1
5	P	15895.16	53	-2	P	16025.49	52	-2	P	16180.93*	49	-8
6	O	15849.22*	57	-3	O	16004.83	54	-6	O	---		
7	P	15799.13	44	-2	P	15980.88	41	-2	P	---		
8	O	15745.07	32	O	O	15953.77	40	-5	O	---		
9	P	---			P	15923.70	30	O	P	---		
10	O	---			O	15890.66	33	-2	O	---		
11	P	---			P	15854.81	27	O	P	---		
12	O	---			O	15816.30	26	O	U	---		
13	P	---			P	15775.28		O	P	---		
14	O	---			O	15731.72	28	O	O	---		

$3c^{\pm}$-2a   d(3p) $^3\Pi_u^{\pm}$ − a(2s) $^3\Sigma_g^+$ *Continued*

N"	SYM	P-BRANCH	I5	O-C	SYM	Q BRANCH	I5	O-C	SYM	R BRANCH	I5	O-C
		3C+				3C				3C+		

3- 4 BAND

N"	SYM	P-BRANCH	I5	O-C	SYM	Q BRANCH	I5	O-C	SYM	R BRANCH	I5	O-C
0	O				O				O	14492.76	51	4
1	P				P	14463.47*	51	1	P	14517.10	51	-1
2	O	14405.53	51	4	O	14458.60	51	0	O	14538.90*		-1
3	P	14372.13		1	P	14451.32		3	P	14557.93	51	3
4	O	14336.76	51	0	O	14441.70	51	2	O	14573.75	51	-2
5	P	14299.41	47	3	P	14429.70	51	4	P	---		
6	O	14259.90		-2	O	14415.64*	51	8	O	---		
7	P	14217.31		5	P	14399.03	17	2	P	---		
8	O	---			O	14380.47*	33	1	O	---		
9	P	---			P	-			P	---		
10	O	---			O	14337.29*	17	2	O	---		
11	P	---			P	14312.82		2	P	---		
12	O	---			O	14286.60		0	O	---		

3- 5 BAND

N"	SYM	P-BRANCH	I5	O-C	SYM	Q BRANCH	I5	O-C	SYM	R BRANCH	I5	O-C
0	O				O				O	12945.71	31	-1
1	P				P	12917.55	27	0	P	12971.21		1
2	O	12861.63*	55	-8	O	12914.83	46	1	O	12995.15*		2
3	P	12831.67*	52	8	P	12910.77	30	1	P	13017.34	26	-3
4	O	12800.48	25	2	O	12905.40		2	O	13037.47	47	0
5	P	12768.50		4	P	12898.80	21	1	P	13054.31		2
6	O	12735.33	18	2	O	12890.91	20	-1	O	---		
7	P	---			P	12881.83	14	1	P	---		
8	O	---			O	12871.65	15	3	O	---		

4- 2 BAND

N"	SYM	P-BRANCH	I5	O-C	SYM	Q BRANCH	I5	O-C	SYM	R BRANCH	I5	O-C
0	O				O				O	19208.98	59	1
1	P				P	19177.40*	59	1	P	19229.32*	59	-6
2	O	19115.12	54	1	O	19166.10	59	1	O	19244.04	59	-1
3	P	19073.36	54	-1	P	19149.24	59	2	P	19252.95	54	3
4	O	19026.51	59	-1	O	19126.85	59	0	O	19255.79	54	0
5	P	18974.73	54	2	P	19099.03	54	1	P	19252.38	44	-1
6	O	18917.99	54	0	O	19065.89		4	O	19241.76	44	1
7	P	18856.32	49	1	P	---			P	---		
8	O	18788.84	49	-4	O	---			O	---		

4- 3 BAND

N"	SYM	P-BRANCH	I5	O-C	SYM	Q BRANCH	I5	O-C	SYM	R BRANCH	I5	O-C
0	O				O				O	17530.70	57	0
1	P				P	17500.24	54	0	P	17552.22	51	1
2	O	17440.19*	64	0	O	17491.17	61	2	O	17569.14	55	1
3	P	17401.87*	56	10	P	17477.68	55	2	P	17581.33	46	1
4	O	17359.37	55	2	O	17459.68	58	0	O	17588.61*	50	-1
5	P	17313.07	45	2	P	17437.36	45	0	P	17590.73	36	0
6	O	17262.93	49	1	O	17410.75	46	3	O	17586.74	39	6
7	P	---			P	---			P	---		
8	O	17150.07*	49	-1	O	17345.15*	33	2	O	---		

3c±-2a   d(3p) $^3\Pi_u^\pm$ − a(2s) $^3\Sigma_g^+$ *Continued*

N"	SYM	P-BRANCH 3C+	I5	O-C	SYM	Q-BRANCH 3C-	I5	O-C	SYM	R-BRANCH 3C+	I5	O-C
						4- 4 BAND						
0	O				O				O	15918.60	58	−1
1	P				P	15889.23*	56	−1	P	15941.20	51	−1
2	O	15831.35	53	−3	O	15882.38	64	O	O	15960.29	57	−3
3	P	15796.22	50	O	P	15872.10	56	−1	P	15975.77	47	O
4	O	15758.13	57	−4	O	15858.52	60	2	O	15987.43	48	−1
5	P	15717.25	49	O	P	15841.55	46	−1	P	15994.97	36	4
6	O	15673.57	51	−2	O	15821.42*	47	−3	O	15997.33*	38	−2
7	P	15626.98	41	O	P	15798.09	33	O	P	---		
8	O	15576.71	40	−3	O	15771.77	33	−2	O	---		
9	P	---			P	15742.46	21	O	P	---		
10	O	---			O	15710.30	24	O	O	---		
11	P	---			P	15675.43		O	P	---		
12	O	---			O	15638.29	20	O	O	---		
						4- 5 BAND						
0	O				O				O	14371.64	51	3
1	P				P	14343.36	51	3	P	14395.30	51	O
2	O	14287.65	47	5	O	14338.61	51	1	O	14416.59*	51	5
3	P	14255.67		−2	P	14331.59	51	1	P	14435.26*	51	2
4	O	14221.90		3	O	14322.25	51	5	O	14451.18	51	4
5	P	14186.31	48	−2	P	14310.65		1	P	14464.00	47	−1
6	O	14149.01	51	3	O	14296.86	42	2	O	14472.76	47	2
7	P	14109.81	41	O	P	14280.99		7	P	---		
8	O	14067.91	40	3	O	14262.95		2	O	---		
						4- 6 BAND						
0	O				O				O	12888.88	33	−1
1	P				P	12861.63*	55	−2	P	12913.63	33	1
2	O	12808.07	29	−1	O	12859.08	46	O	O	12937.03		1
3	P	12779.30	28	−2	P	12855.20	30	−1	r	12958.81*	34	−6
4	O	12749.93*	51	16	O	12850.09	37	−1	O	---		
5	P	12719.45	24	−6	P	12843.74*	23	−8	P	12997.07	54	−12
6	O	12688.31*	31	−15	O	12836.21*	48	−11	O	13012.19		−3
7	P	12656.38*	53	−22	P	12827.65	16	−6	P	---		
8	O	---			O	12817.95	14	−4	O	---		

$3c^{\pm}\text{-}2a$ $d(3p)\ ^3\Pi_u^{\pm} - a(2s)\ ^3\Sigma_g^+$ *Continued*

N"	SYM	Q-BRANCH	I5	O-C
		3C-		
		5- 2 BAND		
1	P	20543.63	30	-1
2	O	20530.40	39	3
3	P	20510.44*	54	-14
4	O	20484.24*	30	-1
5	P	---		
6	O	20412.60		5
		5- 3 BAND		
1	P	18866.47*	59	O
2	O	18855.45	59	O
3	P	18838.97	59	-1
4	O	18817.09	59	1
5	P	18789.90	54	2
6	O	18757.31	54	-17
7	P	18719.95	39	-3
8	O	18677.56	44	8
		5- 4 BAND		
1	P	17255.48	51	1
2	O	17246.64	59	O
3	P	17233.44	51	1
4	O	17215.91	54	1
5	P	17194.13	43	5
6	O	17168.17	43	2
7	P	17138.13	29	4
8	O	17104.13	27	-1
9	P	17066.13	36	O
10	O	17024.33		O
		5- 5 BAND		
1	P	15709.53	49	-3
2	O	15702.86	57	O
3	P	15692.86	49	-4
4	O	15679.60	51	O
5	P	15663.17	39	1
6	O	15643.56	41	2
7	P	15620.92	27	O
8	O	15595.30	28	2
9	P	15566.89		2
10	O	15535.98		O
		5- 6 BAND		
1	P	14227.88		O
2	O	14223.33		-1
3	P	14216.52		-1
4	O	14207.49*		-1
5	P	14196.30		-4
6	O	14183.00	59	-2
7	P	14167.65*	32	-6
8	O	14150.26*	41	-8
9	P	14131.11	19	O
		5- 7 BAND		
1	P	12809.89	30	1
2	O	12807.42	42	-2
3	P	12803.84	30	4
4	O	12798.97	35	1
5	P	12793.01	23	-4
6	O	12785.93	25	-6
7	P	12777.86	18	1

N"	SYM	Q-BRANCH	I5	O-C
		3C-		
		5- 8 BAND		
1	P	11455.38	21	4
2	O	11454.81	18	-21
		6- 3 BAND		
1	P	20174.18		1
2	O	20161.19	15	2
3	P	20141.84		-1
4	O	---		
5	P	20084.18*	54	5
		6- 4 BAND		
1	P	18563.20		3
2	O	18552.43	59	3
3	P	18536.35	59	5
4	O	18514.93	59	-1
5	P	18488.37	49	4
6	O	18456.66	54	-1
7	P	18420.01	44	-2
		6- 5 BAND		
1	P	17017.26	48	O
2	O	17008.64	57	2
3	P	---		
4	O	16978.67	53	3
5	P	16957.41	40	O
6	O	16932.09	35	3
		6- 6 BAND		
1	P	15535.58	43	O
2	O	15529.11	50	1
3	P	15519.41	42	1
4	O	15506.51	45	-3
5	P	15490.54	31	-5
6	O	15471.52	32	-2
7	P	15449.67	32	2
8	O	15425.14*		O

N"	SYM	Q-BRANCH	I5	O-C
		3C-		
		6- 7 BAND		
1	P	14117.58	54	O
2	O	14113.21	62	1
3	P	14106.67	54	O
4	O	14098.00	57	O
5	P	14087.29		-1
6	O	14074.50	45	-1
7	P	14059.82	29	3
8	O	14043.17	24	2
9	P	14024.71	23	
10	O	14004.21	18	
		6- 8 BAND		
1	P	12763.01	31	-3
2	O	12760.73	41	-5
3	P	12757.35	30	-6
4	O	12752.89	34	-14
5	P	12747.99	26	-3
		7- 4 BAND		
1	P	19813.28	39	3
2	O	19800.60	49	3
3	P	19781.67	39	5
		7- 5 BAND		
1	P	18267.37	59	3
2	O	18256.86	59	7
3	P	18241.09*	59	O
4	O	18220.21	59	8
5	P	18194.22	49	4

$3c^{\pm}-2a$ $d(3p)\ ^3\Pi_u^{\pm} - a(2s)\ ^3\Sigma_g^+$ *Continued*

N"	SYM	Q-BRANCH	I5	O-C
		3C-		
		7- 6 BAND		
1	P	16785.67	44	1
2	O	16777.27	53	0
3	P	16764..72	44	0
4	O	16748.06	48	3
5	P	16727.50*	51	14
6	O	16702.99	15	-1
7	P	16674.21	19	0
		7- 7 BAND		
1	P	15367.65	47	-1
2	O	15361.39	51	2
3	P	15351.97	47	-2
4	O	15339.50	51	1
5	P	15324.06	37	-1
6	O	15305.98	37	1
7	P	15284.36	19	1
8	O	15260.05*	42	0
		7- 8 BAND		
1	P	14013.10	51	-2
2	O	14008.92	60	-3
3	P	14002.68		-5
4	O	13994.42	54	-10
5	P	13984.64*	55	-15
6	O	13972.01	44	0
		7- 9 BAND		
1	P	12722.08	29	-4
2	O	12719.90*	51	-10
3	P	12716.93	33	3
4	O	12712.89	32	-4
5	P	12707.80	21	-5

N"	SYM	Q-BRANCH	I5	O-C
		3C-		
		8- 5 BAND		
1	P	19460.53*	49	4
2	O	19448.09	44	1
3	P	19429.59	39	3
4	O	19404.88	44	6
5	P	19374.17	25	1
6	O	19337.74	44	13
		8- 6 BAND		
1	P	17978.82	35	1
2	O	17968.53	43	-3
3	P	17953.14	36	-5
4	O	17932.72	37	0
5	P	17907.34*	26	0
6	O	17877.05	30	-4
		8- 7 BAND		
1	P	16560.81*	41	0
2	O	16552.69	50	3
3	P	16540.43	40	-3
4	O	16524.22	42	4
5	P	16504.08	31	3
6	O	16479.98	42	-8
		8- 8 BAND		
1	P	15206.26	42	-1
2	O	15200.18	47	-6
3	P	15191.24*	37	4
4	O	15179.11	42	-10
5	P	15164.96	23	19
6	O	15146.38*	28	28

N"	SYM	Q-BRANCH	I5	O-C
		3C-		
		8- 9 BAND		
1	P	13915.24	49	-3
2	O	13911.27	56	-2
3	P	13905.36	49	-1
4	O	13897.56*	52	-6
5	P	13887.92	42	9
6	O	13876.40	40	2
7	P	13863.18	24	
8	O	13848.35	21	
9	P	13832.00*	31	
10	O	13813.69	22	
		8-10 BAND		
1	P	12688.31*	31	-2
2	O	12686.50*	39	8
3	P	12683.57	21	-12
4	O	12679.88*	34	4
5	P	12675.10	15	2
		9- 7 BAND		
1	P	17697.55	31	4
2	O	17687.51	41	3
		9- 8 BAND		
1	P	16342.97*	36	0
2	O	16335.07	43	1
3	P	16323.19	34	0
4	O	16307.35*	47	0
		9- 9 BAND		
1	P	15051.98*	37	1
2	O	15046.11	37	0
3	P	---		
4	O	15025.85	47	9
		9-10 BAND		
1	P	13825.03	46	0
2	O	13821.15	53	-9
3	P	13815.85	47	17
4	O	---		
5	P	13799.56	38	0
6	O	13788.85	38	
		10- 8 BAND		
1	P	17423.59*	43	-2
2	O	17413.84	38	-2
3	P	17399.25*	33	0
4	O	17379.72	35	-5
		10- 9 BAND		
1	P	16132.64	25	3
2	O	16124.94	38	3
3	P	16113.45	27	3
4	O	16098.18	33	0
5	P	16079.22	21	0

4c±-2a $k(4p) \ ^3\Pi_u^{\pm} - a(2s) \ ^3\Sigma_g^+$

N"	SYM	P-BRANCH	I5	O-C	SYM	Q BRANCH	I5	O-C	SYM	R BRANCH	I5	O-C
		4C+				4C				4C+		
						O- O BAND						
0	O				O				O	22353.21	81	1
1	P				P	22318.93*	81	1	P	22379.86	57	2
2	O	22252.43	72	-1	O	22310.81*	70	0	O	22402.73	56	2
3	P	22212.33	0	-3	P	22298.74	47	2	P	22421.66	30	2
4	O	22169.16*	49	1	O	22282.67	42	3	O	22436.41	25	1
5	P	22122.89	39	-2	P	22262.83	48	1	P	22446.72	48	-2
6	O	22073.64	35	0	O	22238.99	16	2	O	22452.89	19	9
7	P	22021.34*	15	1	P	22211.61	85	2	P	---		
8	O	21966.23	15	-9	O	22180.52	15	8	O	---		
9	P	---			P	22145.67	15	0	P	---		
10	O	---			O	22106.57	15	0	O	---		
						O- 1 BAND						
0	O				O				O	20538.27	35	-3
1	P				P	20505.18	30	1	P	20566.12	35	1
2	O	20441.05		1	O	---			O	20591.29	39	-2
3	P	---			P	20490.83		1	P	20613.91	44	21
4	O	20365.82		-3	O	20479.43		3	O	---		
5	P	---			P	20465.27		0	P	---		
6	O	---			O	20448.36		2	O	---		
7	P	---			P	20428.84		3	P	---		
8	O	---			O	20406.67		0	O	---		
						1- O BAND						
0	O				O				O	23944.93	50	2
1	P				P	23910.60	41	1	P	23969.43	31	-3
2	O	23844.12	44	-3	O	23900.37	44	1	O	23988.61	23	-7
3	P	23801.91	34	-7	P	23885.01	27	5	P	24003.92	19	-1
4	O	23755.06*	29	-6	O	23864.60	23	7	O	24013.44		-2
5	P	23705.17	26	-3	P	23839.34	20	6	P	---		
6	O	23650.70	23	0	O	23809.14		10	O	---		
7	P	---			P	23774.26		1	P	---		
8	O	---			O	23734.73	21	0	O	---		
						1- 1 BAND						
0	O				O				O	22130.01	54	0
1	P				P	22096.88*	54	0	P	22155.74	49	1
2	O	22032.74	49	-1	O	22088.96	59	0	O	22177.29	35	1
3	P	21994.04	49	0	P	22077.13	49	1	P	22196.00	44	1
4	O	21951.81	44	-1	O	22061.39	54	2	O	22210.16	54	0
5	P	21907.64	30	-1	P	22041.87	39	2	P	---		
6	O	21860.06	49	3	O	22018.59	44	2	O	---		
7	P	---			P	21991.55*	15	0	P	---		
8	O	---			O	21961.08	20	3	O	---		
						1- 2 BAND						
0	O				O				O	---		
1	P				P	20352.22	10	1	P	20411.06	10	0
2	O	20290.38		4	O	20346.49*	44	-6	O	20434.88		1
3	P	20255.06		1	P	20338.09	10	-4	P	20457.06*	49	6
4	O	20217.44	15	10	O	20326.77*	15	-12	O	20475.67		-1
5	P	20178.79		0	P	--			P	---		
6	O	20137.88		0	O	20296.48		-4	O	---		
						2- 1 BAND						
0	O				O				O	23657.44	56	0
1	P				P	23624.07	62	-4	P	23680.84	36	-6
2	O	---			O	23614.32	58	-2	O	23699.63	30	-7
3	P	23519.20	31	-1	P	23599.27	44	-5	P	---		
4	O	23474.09	36	-15	O	23579.42	33	-4	O	---		
5	P	---			P	23554.53	23	-5	P	---		
						2- 2 BAND						
0	O				O				O	21911.62	49	-1
1	P				P	21879.72	49	-2	P	21936.23	35	0
2	O	21817.79	44	2	O	21871.92	54	-1	O	21957.25		-4
3	P	21780.22	35	0	P	21860.34	54	1	P	21974.97		-2
4	O	21739.74	35	-2	O	21844.99	54	1	O	21987.63	20	-5
5	P	21696.85		7	P	21825.73*	49	1	P	---		
6	O	21649.83		-5	O	21802.94	35	-2	O	---		
7	P	---			P	21796.16		-2	P	---		
8	O	---			O	21765.66		-2	O	---		

$4c^{\pm}$-2a   k(4p) $^3\Pi_u^{\pm}$ — a(2s) $^3\Sigma_g^+$ *Continued*

N"	SYM	P-BRANCH	I5	O-C	SYM	Q-BRANCH	I5	O-C	SYM	R-BRANCH	I5	O-C
		4C+				4C-				4C+		

2- 3 BAND

N"	SYM	P-BRANCH	I5	O-C	SYM	Q-BRANCH	I5	O-C	SYM	R-BRANCH	I5	O-C
0	O				O				O	20233.38	15	2
1	P				P	20202.56	20	-1	P	20259.04		-2
2	O	20142.72*	44	-13	O	20197.00	39	-1	O	20282.53*	25	16
3	P	20108.61	35	-1	P	20188.71	15	-2	P	---		
4	O	20072.53	39	-6	O	20177.78	20	-3	O	20320.54		3

3- 2 BAND

N"	SYM	P-BRANCH	I5	O-C	SYM	Q-BRANCH	I5	O-C	SYM	R-BRANCH	I5	O-C
0	O				O				O	23376.33	68	-2
1	P				P	23344.52	64	-4	P	23398.63	41	-2
2	O	23282.49	62	O	O	23334.68	60	-3	O	---		
3	P	---			P	23319.94	36	-5	P	---		
4	O	23198.76*	37	-1	O	23300.46	40	-4	O	---		
5	P	---			P	23276.20		-1	P	---		
6	O	---			O	23247.22*	21	-8	O	---		

3- 3 BAND

N"	SYM	P-BRANCH	I5	O-C	SYM	Q-BRANCH	I5	O-C	SYM	R-BRANCH	I5	O-C
0	O				O				O	21698.05	44	-3
1	P				P	21667.38	44	-1	P	21721.47	30	-1
2	O	21607.56	39	-1	O	21659.80	49	1	O	21741.36	35	-2
3	P	---			P	21648.37	44	-2	P	21757.26	15	-2
4	O	21531.54	30	-6	O	21633.30	44	-3	O	---		
5	P	---			P	21614.54	20	-1	P	---		
6	O	---			O	21592.35	15	12	O	---		
7	P	---			P	21576.12		-2	P	---		

3- 4 BAND

N"	SYM	P-BRANCH	I5	O-C	SYM	Q-BRANCH	I5	O-C	SYM	R-BRANCH	I5	O-C
0	O				O				O	20085.99	54	O
1	P				P	20056.38	49	1	P	20110.48	10	O
2	O	19998.74	44	-2	O	20050.94	54	-4	O	---		
3	P	---			P	20042.85	49	1	P	---		
4	O	19930.41	49	-1	O	20032.15	49	O	O	---		
5	P	---			P	20018.72	39	-3	P	---		
6	O	---			O	20002.80	35	-10	O	---		

4- 3 BAND

N"	SYM	P-BRANCH	I5	O-C	SYM	Q-BRANCH	I5	O-C	SYM	R-BRANCH	I5	O-C
0	O				O				O	23101.60	80	-2
1	P				P	23071.07	60	1	P	23122.68	49	O
2	O	23011.07	65	-4	O	23061.40	55	-1	O	23139.12*	44	O
3	P	22972.18	47	-6	P	23046.98	33	O	P	23150.56	28	4
4	O	22929.30	44	-4	O	23027.91	30	-3	O	23156.99	28	5
5	P	22882.25	25	O	P	23004.09	22	-1	P	---		
6	O	22831.21		-3	O	22975.76		-5	O	---		

4- 4 BAND

N"	SYM	P-BRANCH	I5	O-C	SYM	Q-BRANCH	I5	O-C	SYM	R-BRANCH	I5	O-C
0	O				O				O	21489.49	49	-4
1	P				P	21460.02	49	-4	P	21511.64	25	-4
2	O	21402.30	44	O	O	21452.57	49	-3	O	21530.23	30	-8
3	P	21366.75	49	6	P	21441.42	44	-1	P	21544.96	15	-1
4	O	21328.17		1	O	21426.73	49	-3	O	21555.72		-4
5	P	21286.43	39	-2	P	21408.34	39	4	P	---		
6	O	21241.83	44	-8	O	21386.46	35	-2	O	---		
7	P	---			P	21360.93	39	18	P	---		

4- 5 BAND

N"	SYM	P-BRANCH	I5	O-C	SYM	Q-BRANCH	I5	O-C	SYM	R-BRANCH	I5	O-C
0	O				O				O	19942.50	54	-3
1	P				P	19914.13		-2	P	19965.70	49	-7
2	O	19858.51	44	-1	O	---			O	19986.50	49	-3
3	P	19826.13	44	-3	P	19900.85	49	-5	P	20004.44	35	O
4	O	19791.86	49	O	O	19890.46	54	O	O	20019.43	39	-3
5	P	19755.38*	49	-15	P	19877.29	39	-9	P	---		
6	O	19717.28	39	-2	O	19861.87	35	O	O	---		
7	P	---			P	19843.37	39	-21	P	---		

5- 4 BAND

N"	SYM	P-BRANCH	I5	O-C	SYM	Q-BRANCH	I5	O-C	SYM	R-BRANCH	I5	O-C
0	O				O				O	22833.04	58	-2
1	P				P	22803.86	61	-4	P	---		
2	O	22745.84	45	1	O	22794.38	59	-1	O	---		
3	P	22709.44	49	3	P	22780.17	31	-2	P	---		
4	O	22665.69	25	-2	O	22761.98	58	-7	O	---		
5	P	22619.29*		11	P	22738.33		-4	P	---		
6	O	---			O	22710.58		4	O	---		

4c±-2a   k(4p) $^3\Pi_u^\pm$ − a(2s) $^3\Sigma_g^+$ *Continued*

N"	SYM	P-BRANCH	I5	O-C	SYM	Q-BRANCH	I5	O-C	SYM	R-BRANCH	I5	O-C
		4C+				4C-				4C+		
						5- 5 BAND						
0	O				O				O	21286.03	39	-3
1	P				P	21257.91	39	-8	P	---		
2	O	21202.07	35	2	O	21250.54	49	-7	O	---		
3	P	21168.82	35	-6	P	21239.64	44	-2	P	---		
4	O	21129.43*	35	2	O	21225.86	10	11	O	---		
5	P	21088.24	30	-2	P	---			P	---		
						5- 6 BAND						
0	O				O				O	19803.30	49	-4
1	P				P	19776.27	49	-4	P	---		
2	O	19722.50	39	-3	O	19771.08	54	-1	O	---		
3	P	---			P	19763.28	49	-1	P	---		
4	O	19657.26	39	-5	O	19753.69	25	4	O	---		
5	P	19621.30	49	-14	P	19740.64*	44	1	P	---		
6	O	---			O	19725.33	39	-8	O	---		
						5- 7 BAND						
0	O				O				O	18384.25	54	-8
1	P				P	18358.38*	49	7	P	---		
2	O	18306.65	30	2	O	18355.20	44	1	O	---		
						6- 4 BAND						
0	O				O				O	---		
1	P				P	24088.96	33	-6	P	---		
2	O	---			O	24077.58	34	-6	O	---		
3	P	---			P	---			P	---		
4	O	---			O	24038.19	21	1	O	---		
						6- 5 BAND						
0	O				O				O	---		
1	P				P	22543.11	50	0	P	---		
2	O	---			O	22533.87	48	1	O	---		
3	P	---			P	---			P	---		
4	O	---			O	22501.92	21	4	O	---		
						6- 6 BAND						
0	O				O				O	---		
1	P				P	21061.42	35	-1	P	---		
2	O	---			O	21054.34	39	0	O	---		
3	P	---			P	---			P	---		
4	O	---			O	21029.67	44	-11	O	---		
						6- 7 BAND						
0	O				O				O	---		
1	P				P	19643.40	44	-3	P	---		
2	O	---			O	19638.42	54	-2	O	---		

5c±-2a $n(4p)\ ^3\Pi_u^{\pm} - a(2s)\ ^3\Sigma_g^+$

N"	SYM	P-BRANCH 5C+	I5	O-C	SYM	Q-BRANCH 5C-	I5	O-C	SYM	R-BRANCH 5C+	I5	O-C
						O- O BAND						
0	O				O				O	24930.15	31	3
1	P				P	24895.98	30	-1	P	24956.41	25	-7
2	O	24829.36	30	O	O	24887.70	41	1	O	24978.87	34	-1
3	P	24788.97	24	-3	P	24875.36	29	1	P	24997.14	20	-6
4	O	24746.23	28	-9	O	24859.00	30	4	O	25011.20	14	O
5	P	24698.54*	45	7	P	24838.64	29	4	P	---		
6	O	---			O	24814.27	24	5	O	---		
7	P	---			P	24786.06		O	P	---		
8	O	---			O	24754.33		O	O	---		
						O- 1 BAND						
0	O				O				O	23115.18	25	-4
1	P				P	23082.27	23	1	P	23142.75	24	O
2	O	23017.97	23	1	O	23076.29	24	O	O	23167.46		-2
3	P	22981.10	24	4	P	23067.41		O	P	23189.15		-11
4	O	22942.04	19	2	O	23055.63		-3	O	---		
5	P	22901.04*	79	12	P	23041.02		-3	P	---		
6	O	---			O	23023.51*	20	-4	O	---		
						1- O BAND						
0	O				O				O	---		
1	P				P	26480.97	38	O	P	---		
2	O	---			O	26470.48	44	-1	O	---		
3	P	---			P	26454.85	32	-3	P	---		
4	O	---			O	26434.14	38	O	O	---		
						1- 1 BAND						
0	O				O				O	24700.02	33	O
1	P				P	24667.21	29	-3	P	24724.86	27	-1
2	O	24602.77	35	1	O	24659.09	41	O	O	24745.76	28	-2
3	P	24563.22	23	4	P	24646.96	30	2	P	24762.48	21	-3
4	O	24520.32	25	O	O	24630.92	35	8	O	---		
5	P	24474.21	15	4	P	24610.91*	20	19	P	---		
6	O	24424.84	15	-6	O	---			O	---		
						1- 2 BAND						
0	O				O				O	22954.19	34	-2
1	P				P	22922.59	25	2	P	22980.15	28	-5
2	O	22860.37	25	2	O	22916.69	30	1	O	23003.28*	26	-9
3	P	22824.22	25	3	P	22907.95	20	O	P	23023.51*	20	-1
4	O	22785.85	20	1	O	22896.28	29	-8	O	23040.44		-11
5	P	22745.15*	45	-16	P	22881.68	23	-18	P	---		
6	O	22702.93		18	O	---			O	---		
						2- 1 BAND						
0	O				O				O	---		
1	P				P	26188.27	38	-6	P	---		
2	O	---			O	26178.07	50	-6	O	---		
3	P	---			P	26162.79	38	-4	P	---		
4	O	---			O	26142.54	44	-2	O	---		
5	P	---			P	26117.21	20	-9	P	---		
						2- 2 BAND						
0	O				O				O	24475.10	27	O
1	P				P	24443.63	23	-3	P	24498.58	20	2
2	O	24381.28	21	4	O	24435.75	33	3	O	24518.00	23	3
3	P	24342.54	20	-1	P	24423.85	22	1	P	24533.22	13	4
4	O	24300.42	21	-2	O	24408.12*	27	4	O	---		
5	P	24254.95	14	-2	P	24388.53	14	9	P	---		
6	O	---			O	24365.23	10	O	O	---		
						2- 3 BAND						
0	O				O				O	22796.81	47	-2
1	P				P	22766.58*		9	P	22821.39*	28	O
2	O	22706.29	31	-3	O	22760.82	31	2	O	22843.08	26	3
3	P	22670.82	22	-13	P	22752.27	26	3	P	22861.57	17	-1
4	O	22633.29	19	2	O	22740.89	24	-2	O	22877.08*		12
5	P	22593.32	20	1	P	---			P	---		
6	O	22551.14		-12	O	---			O	---		

5c±-2a $n(4p)\ ^3\Pi_u^{\pm} - a(2s)\ ^3\Sigma_g^+$ *Continued*

N"	SYM	Q-BRANCH	I5	O-C

5C-

3- 2 BAND

N"	SYM	Q-BRANCH	I5	O-C
1	P	25903.51	44	-7
2	O	25893.69	44	1
3	P	---		
4	O	25859.07	38	-5

3- 3 BAND

N"	SYM	Q-BRANCH	I5	O-C
1	P	24226.43	17	2
2	O	24218.75	22	-1
3	P	24207.27*	24	1
4	O	24192.01	16	6

3- 4 BAND

N"	SYM	Q-BRANCH	I5	O-C
1	P	22615.46	25	5
2	O	22609.96	23	1
3	P	22601.70	15	-1
4	O	22590.75		-2

6c±-2a $u(6p)\ ^3\Pi_u^{\pm} - a(2s)\ ^3\Sigma_g^+$

N"	SYM	P-BRANCH	I5	O-C	SYM	Q-BRANCH	I5	O-C	SYM	R-BRANCH	I5	O-C
		6C+				6C-				6C+		
						O- O BAND						
0	O				O				O	---		
1	P				P	26282.56	44	O	P	---		
2	O	---			O	26274.22	50	O	O	---		
3	P	---			P	26261.83	50	O	P	---		
4	O	---			O	26245.12	50	O	O	---		
5	P	---			P	26224.47	32	O	P	---		
						1- O BAND						
0	O				O				O	27896.76	38	-1
1	P				P	27862.09	38	-3	P	---		
2	O	27796.02	38	1	O	27851.52	44	-6	O	---		
3	P	---			P	27835.75	38	-10	P	---		
4	O	---			O	27814.76	44	-4	O	---		
5	P	---			P	27788.69	26	O	P	---		
6	O	---			O	27757.59	26	-2	O	---		
						1- 1 BAND						
0	O				O				O	---		
1	P				P	26048.42	50	3	P	---		
2	O	---			O	26040.20	56	2	O	---		
3	P	---			P	26027.89	50	-2	P	---		
4	O	---			O	26011.52	50	2	O	---		
5	P	---			P	25991.14	32	O	P	---		
6	O	---			O	25966.97	26	3	O	---		
						1- 2 BAND						
0	O				O				O	---		
1	P				P	24303.71		-1	P	---		
2	O	---			O	24297.82	15	5	O	---		
3	P	---			P	24289.05*	29	13	P	---		
4	O	---			O	24277.05		3	O	---		
						2- 1 BAND						
0	O				O				O	---		
1	P				P	27561.75*	38	-26	P	---		
2	O	---			O	27551.47	44	-6	O	---		
3	P	---			P	27535.88	32	-5	P	---		
4	O	---			O	27515.37*	44	14	O	---		

$6c^{\pm}$-2a

$u(6p)\ ^3\Pi_u^{\pm} - a(2s)\ ^3\Sigma_g^+$

Continued

N"	SYM	Q-BRANCH	I5	O-C
		6C-		
		2- 2 BAND		
1	P	25817.31	50	-3
2	O	25809.12	50	O
3	P	25796.89	44	-5
4	O	25780.62	38	-13
5	P	25760.33		O
6	O	25736.13		O
		2- 3 BAND		
1	P	24140.20		3
2	O	24134.26		6
3	P	24125.44		10

$7c^-$-2a

$(7p)\ ^3\Pi_u^- - a(2s)\ ^3\Sigma_g^+$

N"	SYM	Q-BRANCH	I5	O-C
		7C-		
		O- O BAND		
1	P	27115.66	20	O
2	O	27106.60	44	O
3	P	---		
4	O	27077.41	44	O
5	P	27056.22	44	O
		1- 1 BAND		
1	P	26880.23	32	O
2	O	26872.06	44	O
3	P	26859.65	26	O
4	O	26843.31	26	O
5	P	26822.90		O

$8c^-$-2a

$(8p)\ ^3\Pi_u^- - a(2s)\ ^3\Sigma_g^+$

N"	SYM	Q-BRANCH	I5	O-C
		8C-		
		O- O BAND		
1	P	27652.54	20	O
2	O	27644.16	44	O
3	P	27631.53	26	O
4	O	27614.68	38	O

$9c^-$-2a

$(9p)\ ^3\Pi_u^- - a(2s)\ ^3\Sigma_g^+$

N"	SYM	Q-BRANCH	I5	O-C
		9C-		
		O- O BAND		
1	P	28020.44	14	O
2	O	28011.71	14	O
3	P	27999.30	14	O
4	O	27982.40	14	O
5	P	27961.01	32	O

$3d$-$2c^{\pm}$ $g(3d)\ ^3\Sigma_u^+ - c(2p)\ ^3\Pi_u^{\pm}$

N"	SYM	P-BRANCH	I5	O-C	SYM	Q-BRANCH	I5	O-C	SYM	R-BRANCH	I5	O-C
		2C+				2C-				2C+		
					O- O BAND							
1	O	16849.33*	57	-6	P	16863.88		2	O	16893.72	54	2
2	P	16802.82	41	-2	O	16832.67	58	O	P	16881.06	51	-1
3	O	16741.46	40	-2	P	16789.82*	50	-2	O	16860.32	60	-6
4	P	16668.81	25	1	O	16739.26	58	1	P	16834.19	83	O
5	O	16588.93*	49	5	P	16683.60	43	4	O	16804.29	57	-4
6	P	---			O	16624.78*	44	-2	P	16771.58	46	-1
7	O	---			P	16563.80	32	-2	O	16736.62	49	-1
8	P	---			O	16501.27	39	1	P	16699.87	39	3
9	O	---			P	16437.74		-3	O	16661.48		-1
10	P	---			O	16373.51		1	P	16621.79*	34	O
11	O	---			P	---			O	16580.85	35	O
12	P	---			O	---			P	16539.53*	70	O
13	O	---			P	---			O	16495.51		
14	P	---			O	---			P	16451.15	23	
15	O	---			P	---			O	16406.24	29	
					O- 1 BAND							
1	O	15168.02	28	5	P	15182.37*	42	-7	O	15212.30	23	2
2	P	15123.59*	51	15	O	15153.28	28	-1	P	15201.67	23	O
3	O	15064.96	42	-12	P	15113.53	23	2	O	15183.97	23	-1
4	P	---			O	15066.96	28	-1	P	15161.79	28	-3
5	O	---			P	---			O	15137.02	23	8
6	P	---			O	---			P	15110.32		4
					1- O BAND							
1	O	---			P	18375.01	39	-19	O	18401.80	44	6
2	P	---			O	18340.69*	54	-2	P	18386.53*	44	-14
3	U	---			P	18295.41	39	-3	O	18363.76		O
4	P	18174.34	O	-6	O	18242.42*	54	-21	P	18334.83	44	-5
5	O	18092.10	8	-16	P	18184.23	39	-2	O	18301.30	44	-6
6	P	18005.08	15	2	O	18121.78	22	-5	P	---		
7	O	17914.45		-2	P	---			O	---		

	3d-2c±			g(3d) ³Σ_u⁺ − c(2p) ³Π_u±				*Continued*		
N"	SYM	P-BRANCH	I5	O-C	SYM	Q-BRANCH	I5	O-C	SYM	R-BRANCH	I5	O-C
		2C+				2C-				2C+		

1- 1 BAND

N"	SYM	P-BRANCH	I5	O-C	SYM	Q-BRANCH	I5	O-C	SYM	R-BRANCH	I5	O-C
1	O	16676.83	23	O	P	16693.77	49	-1	O	16720.32	53	O
2	P	16634.78	39	O	O	16661.30	58	-3	P	16707.26		-1
3	O	16573.13	39	1	P	16619.12	51	1	O	16687.35	61	-1
4	P	16502.17	30	14	O	16570.35	55	O	P	16662.54	55	3
5	O	16424.67	24	O	P	16517.11	45	3	O	16634.02	60	5
6	P	---			O	16460.71		5	P	16602.57	49	O
7	O	16260.27		17	P	16401.98	35	-3	O	16568.72	51	-1
8	P	---			O	16341.59	21	2	P	---		

1- 2 BAND

N"	SYM	P-BRANCH	I5	O-C	SYM	Q-BRANCH	I5	O-C	SYM	R-BRANCH	I5	O-C
1	O	---			P	---			O	15100.84	33	O
2	P	15017.25	19	1	O	---			P	15089.78	42	5
3	O	14958.61	23	-2	P	---			O	15072.86	37	-1
4	P	---			O	---			P	15051.98*	37	2
5	O	---			P	---			O	15028.37	37	6
6	P	---			O	---			P	15002.81	14	3

2- 1 BAND

N"	SYM	P-BRANCH	I5	O-C	SYM	Q-BRANCH	I5	O-C	SYM	R-BRANCH	I5	O-C
1	O	18100.78	23	O	P	18113.46	24	-8	O	18141.77*	33	3
2	P	18054.49	14	-5	O	18082.73*	32	-2	P	18129.57	20	-12
3	O	17994.51	20	-3	P	18041.51*	34	-2	O	18109.66*	42	8
4	P	17924.36	30	-9	O	17992.52	31	-5	P	18083.30	21	2
5	O	17846.80*	34	-29	P	17937.81	24	-4	O	18052.00	25	-2
6	P	17764.51	7	-1	O	17876.62	31	-9	P	18016.42	17	-10
7	O	---			P	17815.90	21	-6	O	---		

2- 2 BAND

N"	SYM	P-BRANCH	I5	O-C	SYM	Q-BRANCH	I5	O-C	SYM	R-BRANCH	I5	O-C
1	O	16481.30	44	O	P	16494.11	49	5	O	16522.25*	46	-1
2	P	16437.05	36	5	O	16465.28	52	O	P	16512.24*		9
3	O	16380.07	35	2	P	16427.02	46	-1	O	16495.05	56	-4
4	P	---			O	16382.16	50	3	P	16472.74	50	1
5	O	16241.44	21	1	P	16332.39	42	5	O	16446.39*	56	3
6	P	16164.95	60	22	O	16279.12	47	8	P	16416.80	48	7
7	O	16085.18		-3	P	16223.21	37	7	O	16384.56	50	6
8	P	---			O	16165.51		15	P	16350.17	39	O
9	O	---			P	16106.18	25	O	O	16314.06*	68	
10	P	---			O	16045.63	26		P	16276.66	31	
11	O	---			P	---			O	16237.71*	48	
12	P	---			O	---			P	16198.40		

3- 2 BAND

N"	SYM	P-BRANCH	I5	O-C	SYM	Q-BRANCH	I5	O-C	SYM	R-BRANCH	I5	O-C
1	O	---			P	17828.38	21	O	O	17858.98	54	2
2	P	---			O	17801.97	33	-1	P	17850.75	20	-2
3	O	17716.74	23	-1	P	17765.57		-8	O	17834.27	26	-1
4	P	17652.53*	36	1	O	17721.29*	40	-3	P	17811.29	19	-1
5	O	17580.68	19	6	P	17670.91	25	O	O	17783.04*	56	O

3- 3 BAND

N"	SYM	P-BRANCH	I5	O-C	SYM	Q-BRANCH	I5	O-C	SYM	R-BRANCH	I5	O-C
1	O	16255.06	39	O	P	16269.58	37	2	O	16300.16	40	2
2	P	16214.51		1	O	16245.13	46	1	P	16293.82	40	-13
3	O	16162.80	32	-1	P	16211.67	39	-9	O	16280.33	49	-1
4	P	16102.37	24	-8	O	16171.28	45	-1	P	16261.26	43	3
5	O	16035.42	20	8	P	16125.76	37	3	O	16237.71*	48	-5
6	P	---			O	16076.39	44	-7	P	16210.71	41	O
7	O	---			P	16024.02	31	O	O	16180.93*	49	O
8	P	---			O	---			P	16148.84	36	O
9	O	---			P	---			O	16115.32	37	O

4- 3 BAND

N"	SYM	P-BRANCH	I5	O-C	SYM	Q-BRANCH	I5	O-C	SYM	R-BRANCH	I5	O-C
1	O	---			P	---			O	17549.45	20	O
2	P	---			O	---			P	17545.10		14
3	O	---			P	---			O	17532.72	22	-7

4- 4 BAND

N"	SYM	P-BRANCH	I5	O-C	SYM	Q-BRANCH	I5	O-C	SYM	R-BRANCH	I5	O-C
1	O	---			P	---			O	16050.07	33	O
2	P	---			O	15997.03	41	O	P	16047.59	32	O
3	O	---			P	---			O	16038.11	41	O
4	P	---			O	---			P	16022.90	34	O
5	O	---			P	---			O	16003.20	37	O

3d-3b   g(3d) $^3\Sigma_g^+$ — e(3p) $^3\Sigma_u^+$

N"	SYM	P-BRANCH	I5	O-C	R-BRANCH	I5	O-C
					O- O BAND		
0	P				5082.12	63	3
1	O	---			5084.96	63	2
2	P	---			5079.48	59	1
3	O	4950.58	35	5	5069.46*	76	3
4	P	4892.03	35	5	5057.42	64	5
5	O	---			5045.07	77	10
6	P	---			5033.20	64	1
7	O	---			5022.42	67	15
8	P	---			---		
9	O	---			5004.86	58	13
10	P	---			4998.39	50	-4
11	O	---			4993.51	54	19
12	P	---			4990.87	41	-2
					O- 1 BAND		
0	P				---		
1	O	---			3597.70	43	1
					1- 1 BAND		
0	P				5105.07	49	-5
1	O	---			5105.69	62	-4
2	P	5027.40	41	-5	5099.91	60	-3
3	O	4976.55	46	-4	5090.79	73	-4
4	P	4919.55	43	-26	5080.26	63	-3
5	O	4860.24	53	-13	5069.46*	76	-1
6	P	4800.35	32	-4	5059.17	62	-4
7	O	---			5049.76	67	2
					2- 2 BAND		
0	P	---			---		
1	O	---			---		
2	P	---			---		
3	O	---			---		
4	P	---			---		
5	O	---			5082.47	99	-9
6	P	---			5074.38	99	-6
7	O	---			5067.03	99	3
8	P	---			5060.79	99	-13

4d-2c$^\pm$ p(4d) $^3\Sigma_g^+$ — c(2p) $^3\Pi_u^\pm$

N"	SYM	P-BRANCH 2C+	I5	O-C	SYM	Q-BRANCH 2C-	I5	O-C	SYM	R-BRANCH 2C+	I5	O-C
						O- O BAND						
1	O	22489.53	29	0	P	22498.08	52	-11	O	22508.19	66	-3
2	P	22437.05*	58	-12	O	22447.17	59	-2	P	22480.24	57	-1
3	O	22356.02		2	P	22389.02	35	0	O	22449.30	60	1
4	P	---			O	22328.14	28	-2	P	22416.47	36	3
5	O	---			P	22265.78	15	-3	O	22382.27*	33	0
6	P	---			O	22202.93	39	19	P	22346.95	14	2
7	O	---			P	22139.14		-2	O	22310.81*	79	-3
8	P	---			O	---			P	22273.80		0
9	O	---			P	---			O	22236.14		0
						O- 1 BAND						
1	O	---			P	---			O	20826.63	44	-17
2	P	---			O	20767.84		3	P	20800.93	15	8
3	O	---			P	20712.75	15	6	O	20772.96	35	7
4	P	---			O	20655.94*	39	6	P	20743.89	20	-18
5	O	---			P	---			O	20714.88	35	0

4d-2c$^{\pm}$ **p(4d) $^3\Sigma_g^+$ − c(2p) $^3\Pi_u^{\pm}$**   *Continued*

N"	SYM	P-BRANCH	I5	O-C	SYM	Q-BRANCH	I5	O-C	SYM	R-BRANCH	I5	O-C
		2C+				2C-				2C+		

1- 0 BAND

N"	SYM	P-BRANCH	I5	O-C	SYM	Q-BRANCH	I5	O-C	SYM	R-BRANCH	I5	O-C
1	O	---			P	---			O	24055.99	23	-5
2	P	---			O	---			P	24028.01		6
3	O	---			P	---			O	---		
4	P	---			O	---			P	23960.06*	42	-4

1- 1 BAND

N"	SYM	P-BRANCH	I5	O-C	SYM	Q-BRANCH	I5	O-C	SYM	R-BRANCH	I5	O-C
1	O	---			P	---			O	22374.67	80	5
2	P	---			O	22315.70	77	7	P	22348.52	71	-3
3	O	22227.42	O		P	22260.36	46	-3	O	22319.21	83	3
4	P	---			O	22202.19	49	2	P	22287.74	47	1
5	O	---			P	22142.35	25	5	O	22254.66	40	-1
6	P	---			O	22081.36*	20	O	P	22220.24	17	0
7	O	---			P	---			O	22184.74*	35	0
8	P	---			O	---			P	22148.30	15	0

1- 2 BAND

N"	SYM	P-BRANCH	I5	O-C	SYM	Q-BRANCH	I5	O-C	SYM	R-BRANCH	I5	O-C
1	O	---			P	---			O	20755.34	15	20
2	P	---			O	---			P	20731.01	30	0
3	O	---			P	---			O	20704.67	30	-2
4	P	---			O	---			P	---		
5	O	---			P	---			O	20649.14	25	13

2- 1 BAND

N"	SYM	P-BRANCH	I5	O-C	SYM	Q-BRANCH	I5	O-C	SYM	R-BRANCH	I5	O-C
1	O	---			P	---			O	23851.75	26	-2
2	P	---			O	23792.87*	41	9	P	23825.99	23	-14

2- 2 BAND

N"	SYM	P-BRANCH	I5	O-C	SYM	Q-BRANCH	I5	O-C	SYM	R-BRANCH	I5	O-C
1	O	---			P	---			O	22232.35	76	6
2	P	---			O	22175.47	49	16	P	22208.57	59	-2
3	O	22089.99	9		P	22123.48	35	1	O	22181.23	54	2
4	P	---			O	22068.31	35	6	P	22151.28	49	0
5	O	---			P	22010.88	25	-1	O	22119.45	54	0
6	P	---			O	---			P	22086.01*	30	0
7	O	---			P	---			O	22051.25	30	0

2- 3 BAND

N"	SYM	P-BRANCH	I5	O-C	SYM	Q-BRANCH	I5	O-C	SYM	R-BRANCH	I5	O-C
1	O	---			P	---			O	20673.29	15	-18
2	P	---			O	20618.48	20	3	P	20651.71	20	-6
3	O	---			P	20569.63	39	5	O	20627.18	30	-9
4	P	---			O	20518.21	10	-1	P	---		

3- 3 BAND

N"	SYM	P-BRANCH	I5	O-C	SYM	Q-BRANCH	I5	O-C	SYM	R-BRANCH	I5	O-C
1	O	---			P	---			O	22080.72	35	2
2	P	---			O	22025.65	49	-3	P	22059.64	44	2
3	O	---			P	21977.41*	44	-2	O	22034.40	49	-1
4	P	---			O	21925.36	39	0	P	22006.16	44	1
5	O	---			P	21870.64	20	-1	O	21975.63	44	0
6	P	---			O	---			P	21943.30	30	0
7	O	---			P	---			O	21909.41	20	0

4- 4 BAND

N"	SYM	P-BRANCH	I5	O-C	SYM	Q-BRANCH	I5	O-C	SYM	R-BRANCH	I5	O-C
1	O	---			P	---			O	21918.67	39	1
2	P	---			O	21865.61	44	-1	P	21900.50	35	0
3	O	---			P	---			O	21877.54	44	0
4	P	---			O	---			P	21851.19	30	0
5	O	---			P	---			O	21822.16	15	0
6	P	---			O	---			P	21790.92	35	0
7	O	---			P	---			O	21758.01	30	

4d-3b   p(4d) $^3\Sigma_g^+$ — e(3p) $^3\Sigma_u^+$

N"	SYM	R-BRANCH	I5	O-C
		O- O BAND		
0	P	10716.47	20	5
1	O	10699.39	28	-7
2	P	10678.64	15	-1
3	O	10658.46	31	12
		O- 1 BAND		
0	P	9228.16	29	5
1	O	9212.25	15	4
2	P	---		
3	O	9176.45	36	9
		1- 1 BAND		
0	P	---		
1	O	10760.02	27	-1
2	P	10741.16	22	-6
3	O	10722.61	24	-4
4	P	10705.52	24	1
		2- 2 BAND		
0	P	---		
1	O	10817.51	25	5

5d-2c$^\pm$ (5d) $^3\Sigma_g^+$ — c(2p) $^3\Pi_u^\pm$

N"	SYM	Q BRANCH	I5	O C	SYM	R-BRANCH	I5	O-C
		2C-				2C+		
		O- O BAND						
1	P	---			O	25068.65	56	1
2	O	25007.60	26	-1	P	25035.52*	62	9
3	P	24944.20	16	O	O	25001.93	56	O
4	O	---			P	24967.64	28	O
5	P	---			O	24932.73*	30	O
6	O	---			P	24897.21	20	O
7	P	---			O	24861.18	26	O
8	O	---			P	24824.52		O
9	P	---			O	24787.55		O
10	O	---			P	24750.14	20	O
11	P	---			O	24712.40		O

6d-2c$^\pm$ (6d) $^3\Sigma_g^+$ — c(2p) $^3\Pi_u^\pm$

N"	SYM	R-BRANCH	I5	O-C
		2C+		
		O- O BAND		
1	O	26443.97*	56	O
2	P	26409.54	44	O
3	O	26375.53	56	O
4	P	26341.18*	50	O
5	O	26306.39	56	O
6	P	26269.22	44	O

7d-2c$^\pm$ (7d) $^3\Sigma_g^+$ — c(2p) $^3\Pi_u^\pm$

N"	SYM	R-BRANCH	I5	O-C
		2C+		
		O- O BAND		
1	O	27269.50	56	O
2	P	27235.20	50	O
3	O	27201.35	62	O
4	P	27167.24	38	O
5	O	27132.72*	50	O

8d-2c$^\pm$ (8d) $^3\Sigma_g^+$ — c(2p) $^3\Pi_u^\pm$

N"	SYM	R-BRANCH	I5	O-C
		2C+		
		O- O BAND		
1	O	27802.15	38	O
2	P	27768.27	38	O
3	O	27734.85	44	O
4	P	27700.91	26	O
5	O	27666.58	38	O
6	P	27632.08	20	O

9d-2c$^\pm$ (9d) $^3\Sigma_g^+$ — c(2p) $^3\Pi_u^\pm$

N"	SYM	R-BRANCH	I5	O-C
		2C+		
		O- O BAND		
1	O	28166.84	32	O
2	P	28133.36	26	O
3	O	28099.99	26	O
4	P	28066.67	26	O
5	O	28033.26	20	O

$$3e^+\text{-}2c^{\pm} \qquad i(3d)\ {}^3\Pi_g^+ - c(2p)\ {}^3\Pi_u^{\pm}$$

N"	SYM	P-BRANCH 2C+	I5	O-C	SYM	Q-BRANCH 2C-	I5	O-C	SYM	R-BRANCH 2C+	I5	O-C
						O– O BAND						
1	O				P	17130.63*	50	2	O	17219.08	47	3
2	P	17069.58	47	-1	O	17157.86		-16	P	17274.20	41	1
3	O	17066.79	54	-4	P	17182.96	27	O	O	17324.00*	49	5
4	P	17061.90	46	-2	O	17202.85	42	3	P	17367.48	39	3
5	O	17052.41	46	-4	P	17216.83	36	1	O	17404.61	42	-3
6	P	17037.60	34	-3	O	17225.12	42	1	P	17436.07	32	-3
7	O	17017.76	46	1	P	17228.29*	37	-4	O	17462.48	36	3
8	P	16993.54	20	6	O	17227.08	39	O	P	17484.33	26	O
9	O	16965.77		-1	P	17222.28	36	2	O	---		
10	P	16935.20		-2	O	17214.20		O	P	---		
11	O	16902.38		-19	P	17203.48	28	O	O	---		
						O– 1 BAND						
1	O				P	---			O	15537.72		9
2	P	---			O	---			P	---		
3	O	15390.43	31	O	P	---			O	---		
4	P	15389.60		5	O	---			P	---		
5	O	15385.15		9	P	---			O	---		
						1– O BAND						
1	O				P	18672.16*	44	3	O	18750.25	39	-21
2	P	18611.13	44	2	O	---			P	18797.39	15	2
3	O	18598.23*	49	-1	P	---			O	18840.68	35	-10
4	P	18585.07	44	-3	O	---			P	18878.81	20	-16
5	O	18569.15	49	-13	P	18728.49	54	15	O	18911.16	39	-8
6	P	18549.05	39	-10	O	18731.70	39	-1	P	18937.48*	59	8
7	O	18524.43	44	8	P	---			O	18957.79	10	5
						1– 1 BAND						
1	O				P	16990.68*	55	-3	O	17069.05	55	1
2	P	16931.67	51	-4	O	---			P	17117.98	48	1
3	O	16921.84	60	O	P	17029.85	23	4	O	17164.38	53	O
4	P	16912.68	57	5	O	17047.37	40	O	P	17206.60	43	O
5	O	16901.88	53	-1	P	17061.17	38	O	O	17243.83	50	-2
6	P	16887.84	41	O	O	17070.54*		O	P	17276.10	36	1
7	O	16870.03	41	5	P	17075.52	33	-1	O	17303.37	43	O
8	P	16848.45	27	12	O	17076.15	39	-6	P	---		
9	O	16823.39	24	1	P	---			O	---		
						1– 2 BAND						
1	O				P	---			O	---		
2	P	---			O	---			P	---		
3	O	15307.37	51	2	P	---			O	---		
						2– 1 BAND						
1	O				P	---			O	---		
2	P	---			O	18425.10	44	-21	P	---		
						2– 2 BAND						
1	O				P	---			O	16864.81	51	-1
2	P	---			O	16807.86		2	P	16905.41	46	O
3	O	16722.58	58	-3	P	---			O	16944.24*	52	2
4	P	16707.19	58	3	O	16831.25	39	-1	P	16979.68*	54	12
5	O	16690.62	56	6	P	16839.17*	54	O	O	---		
6	P	---			O	---			P	---		
7	O	16671.86	43	O	P	---			O	17059.54	46	O
8	P	16650.50	43	O	O	---			P	---		
9	O	---			P	---			O	---		
10	P	16601.69			O	---			P	---		

$$3e^{+}\text{-}2c^{\pm} \qquad i(3d)\ ^3\Pi_g^{+} - c(2p)\ ^3\Pi_u^{\pm} \qquad \textit{Continued}$$

N"	SYM	P-BRANCH 2C+	I5	O-C	SYM	Q-BRANCH 2C-	I5	O-C	SYM	R-BRANCH 2C+	I5	O-C

3- 3 BAND

N"	SYM	P-BRANCH 2C+	I5	O-C	SYM	Q-BRANCH 2C-	I5	O-C	SYM	R-BRANCH 2C+	I5	O-C
1	O				P	---			O	16681.71	46	2
2	P	16562.42	43	1	O	16626.68	36	1	P	16719.67	40	0
3	O	16544.36	51	O	P	---			O	16756.80*	46	-13
4	P	16528.17	45	O	O	16647.85	25	-3	P	16791.55*	42	O
5	O	16511.92	50	-1	P	16656.05	26	O	O	---		
6	P	---			O	---			P	16849.79	24	15
7	O	16473.91	43	-3	P	---			O	---		
8	P	16450.63	28	-16	O	---			P	---		

4- 4 BAND

N"	SYM	P-BRANCH 2C+	I5	O-C	SYM	Q-BRANCH 2C-	I5	O-C	SYM	R-BRANCH 2C+	I5	O-C
1	O				P	---			O	---		
2	P	16352.48*	40	-2	O	---			P	16512.24*		-6
3	O	16345.66*	25	-2	P	---			O	---		
4	P	16327.40	42	2	O	---			P	---		
5	O	16307.35*	47	-2	P	---			O	---		
6	P	16285.65	35	-2	O	---			P	---		

$$3e^{-}\text{-}2c^{\pm} \qquad i(3d)\ ^3\Pi_g^{-} - c(2p)\ ^3\Pi_u^{\pm}$$

N"	SYM	P-BRANCH 2C-	I5	O-C	SYM	Q-BRANCH 2C+	I5	O-C	SYM	R-BRANCH 2C-	I5	O-C

0- 0 BAND

N"	SYM	P-BRANCH 2C-	I5	O-C	SYM	Q-BRANCH 2C+	I5	O-C	SYM	R-BRANCH 2C-	I5	O-C
1	P				O	17101.49	52	-1	P	17150.07*	49	4
2	O	17040.48	50	1	P	17089.09	32	8	O	17162.59	55	O
3	P	16997.78	45	O	O	17071.29	6	-11	P	17170.53*	51	-4
4	O	16950.27	49	O	P	17049.51		-2	O	17174.41	54	3
5	P	16898.91	42	1	O	17024.00	19	-1	P	17174.95	45	3
6	O	16844.46	47	-2	P	16995.76	49	3	O	17172.45	49	-1
7	P	16787.90	31	-6	O	16965.10	25	O	P	17167.42*	39	O
8	O	16729.74	32	1	P	16932.56	33	-1	O	17159.96	42	1
9	P	16670.52*		2	O	16898.78		13	P	17150.62*	39	17
10	O	16610.66		O	P	---			O	17138.70	37	4
11	P	16550.46		5	O	16826.98		-5	P	17125.07	28	-2
12	O	16490.15		2	P	16789.82*	50	-4	O	17109.51	41	O
13	P	16429.92		2	O	---			P	17092.18		O
14	O	16369.80		23	P	---			O	17072.89	36	

0- 1 BAND

N"	SYM	P-BRANCH 2C-	I5	O-C	SYM	Q-BRANCH 2C+	I5	O-C	SYM	R-BRANCH 2C-	I5	O-C
1	P				O	15420.07		-1	P	---		
2	O	---			P	15409.55*		-6	O	---		
3	P	---			O	15394.95		-5	P	---		
4	O	---			P	15377.01*	28	-15	O	---		
5	P	---			O	---			P	---		
6	O	---			P	15334.52	37	10	O	---		

1- 0 BAND

N"	SYM	P-BRANCH 2C-	I5	O-C	SYM	Q-BRANCH 2C+	I5	O-C	SYM	R-BRANCH 2C-	I5	O-C
1	P				O	18629.64	44	O	P	18677.99*	59	-1
2	O	18568.56	39	-5	P	18616.95*	44	-3	O	18689.74	44	O
3	P	18525.88	49	13	O	18598.23*	49	-32	P	18695.98	39	-8
4	O	18477.40	44	-2	P	18574.85	39	-17	O	18697.32	44	-7
5	P	18424.38	39	-1	O	---			P	18694.03	20	-11
6	O	18367.31*	39	-18	P	---			O	---		

1- 1 BAND

N"	SYM	P-BRANCH 2C-	I5	O-C	SYM	Q-BRANCH 2C+	I5	O-C	SYM	R-BRANCH 2C-	I5	O-C
1	P				O	16948.22	54	O	P	16996.58*	48	O
2	O	16889.23	51	O	P	16937.53*	36	-5	O	17010.36	57	O
3	P	16849.33*	57	-9	O	---			P	17019.71	50	-2
4	O	16805.15	53	1	P	---			O	17025.11	55	O
5	P	16757.26*	43	4	O	16879.68	21	5	P	17026.97	44	O
6	O	16706.33	46	1	P	16853.67	19	3	O	17025.71	48	3
7	P	16653.07	34	-1	O	16825.12	24	O	P	17021.60*	38	-3
8	O	16597.93	42	-3	P	16794.45	16	2	O	17014.87	47	3
9	P	16541.54	28	2	O	16761.98*	46	-3	P	17005.79	33	O
10	O	---			P	---			O	16994.53	37	-2
11	P	---			O	16738.89*		O	P	---		

3e⁻-2c±   i(3d) ³Πg⁻ − c(2p) ³Πu±   *Continued*

N"	SYM	P-BRANCH 2C-	I5	O-C	SYM	Q-BRANCH 2C+	I5	O-C	SYM	R-BRANCH 2C-	I5	O-C
						1- 2 BAND						
1	P	---			O	15328.74	37	O	P	15377.01*	28	-9
2	O	---			P	15320.07	19	3	O	15392.91	26	2
3	P	---			O	---			P	15405.22	27	-1
4	O	15194.64	42	-6	P	---			O	15414.67	31	0
5	P	---			O	---			P	15421.55		9
						2- 1 BAND						
1	P				O	---			P	18451.87	49	14
2	O	18344.98*	59	1	P	---			O	18464.46		11
3	P	18304.51	49	-6	O	---			P	18471.84	44	O
4	O	18259.12	54	-1	P	---			O	---		
5	P	18209.33	44	O	O	---			P	---		
						2- 2 BAND						
1	P				O	16784.48	51	O	P	16832.25	46	O
2	O	16727.50*	51	O	P	16775.19	34	O	O	16846.92	55	4
3	P	16690.07		O	O	---			P	16857.37	50	3
4	O	16648.67	52	-2	P	16744.14*	69	-7	O	16864.08		6
5	P	16603.86	43	4	O	16723.25	29	-7	P	16867.03	49	-6
6	O	16555.94		-6	P	---			O	---		
7	P	16505.95	32	6	O	16673.11	23	-4	P	---		
8	O	16454.18		17	P	---			O	16857.89		O
9	P	16400.33*	50	O	O	---			P	---		
10	O	16345.66*	25	2	P	---			O	---		
						2- 3 BAND						
1	P				O	15225.67	42	1	P	15273.38	33	-5
2	O	15170.64	33	O	P	15218.34	28	-3	O	15290.00	42	-2
3	P	15136.12	33	-6	O	15207.72	9	1	P	15303.47	37	2
4	O	15098.64	37	-2	P	---			O	15313.84*	51	-15
5	P	15058.68	28	4	O	---			P	---		
						3- 3 BAND						
1	P				O	16607.92	49	-2	P	---		
2	O	16552.94*	48	2	P	16599.70	30	-7	O	16669.93	53	-1
3	P	16517.58*	51	O	O	16587.64		1	P	16681.29	47	-1
4	O	16478.59*	51	1	P	---			O	16688.92	50	1
5	P	16436.51	41	2	O	16552.94*	48	-2	P	16693.01		O
6	O	---			P	16531.25		19	O	16694.04	42	1
7	P	16344.41		4	O	16506.60	16	-1	P	---		
8	O	16295.29	34	-1	P	16478.59*	51	O	O	16682.34	49	1
						4- 4 BAND						
1	P				O	16400.33*	50	-11	P	---		
2	O	16347.38	46	-2	P	---			O	16475.88	47	-2
3	P	16331.08		-2	O	---			P	---		
4	U	---			P	---			O	---		
5	P	16251.56	38	-2	O	---			P	---		
6	O	16209.26	43		P	---			O	---		

$$3e^{\pm}\text{-}3b \qquad i(3d)\ ^3\Pi_g^{\pm} - e(3p)\ ^3\Sigma_u^+$$

N"	SYM	P-BRANCH 3E+	I5	O-C	SYM	Q-BRANCH 3E-	I5	O-C	SYM	R-BRANCH 3E+	I5	O-C
						O- O BAND						
O	P				P				P	5348.78	54	-6
1	O				O	5292.74	68	O	O	---		
2	P	5267.96	58	-3	P	5287.43	66	2	P	---		
3	O	5275.88	71	O	O	5280.49	72	4	O	5532.95	99	-5
4	P	5285.11	67	1	P	5272.67	63	-4	P	---		
5	O	5293.16	73	7	O	5264.74	70	9	O	5645.34	63	6
6	P	5299.27	67	4	P	5257.31	61	-2	P	---		
7	O	5303.52	72	13	O	5250.85	67	11	O	---		
8	P	5306.55	58	3	P	5245.64	56	3	P	---		
9	O	---			O	5241.99	60	10	O	---		
10	P	---			P	5239.95	51	-10	P	---		
						1- 1 BAND						
O	P				P				P	---		
1	O				O	---			O	---		
2	P	5324.34	71	-4	P	5330.21	67	-4	P	5510.70	48	6
3	O	5325.30*	81	-1	O	5325.64	74	2	O	5567.84	62	-1
4	P	5330.51	71	O	P	5320.35	73	-8	P	---		
5	O	5337.39	79	O	O	5315.16	75	3	O	---		
6	P	5344.46	68	-2	P	---			P	5732.81	65	8
7	O	5351.06	74	7	O	5306.15	68	2	O	---		
8	P	5357.12	71	5	P	5303.13	61	-4	P	---		
9	O	5362.74	68	-3	O	5301.43	63	3	O	---		
						2- 2 BAND						
O	P				P				P	---		
1	O				O	5369.67	67	2	O	---		
2	P	---			P	5367.70	61	-9	P	---		
3	O	5326.02	52	-11	O	5365.13	71	-4	O	5547.69	59	-5
4	P	5325.30*	81	5	P	---			P	5597.86	48	21
5	O	5326.72	64	-4	O	---			O	---		

$$4e^+\text{-}2c^{\pm} \qquad r(4d)\ ^3\Pi_g^+ - c(2p)\ ^3\Pi_u^{\pm}$$

N"	SYM	P-BRANCH 2C+	I5	O-C	SYM	Q-BRANCH 2C-	I5	O-C	SYM	R-BRANCH 2C+	I5	O-C
						O- O BAND						
1	O				P	---			O	22735.99	49	-1
2	P	---			O	22674.98	39	1	P	22765.11		1
3	O	22583.79	30	1	P	22673.93	31	6	O	22791.21*	30	O
4	P	22552.76	31	-7	O	22670.08	30	O	P	22815.12	21	-6
5	O	22519.72		1	P	22664.54	19	-1	O	22837.08		1
6	P	22485.43	58	7	O	22657.61*	66	7	P	22857.11		6
7	O	22450.11	34	-7	P	22649.30	40	2	O	---		
8	P	22414.36	17	-7	O	---			P	---		

$$4e^-\text{-}2c^{\pm} \qquad r(4d)\ ^3\Pi_g^- - c(2p)\ ^3\Pi_u^{\pm}$$

N"	SYM	P-BRANCH 2C-	I5	O-C	SYM	Q-BRANCH 2C+	I5	O-C	SYM	R-BRANCH 2C-	I5	O-C
						O- O BAND						
1	P				O	22622.12*	45	-2	P	22650.49*	47	-3
2	O	22561.12	22	1	P	22589.53	25	3	O	22648.18	48	3
3	P	22498.27	51	O	O	---			P	22645.14	31	2
4	O	22435.81	23	-2	P	22524.11	44	3	O	22640.65*	40	-1
5	P	22373.42	23	-3	O	22490.26		-3	P	22634.67	17	O
6	O	22310.81*	79	5	P	22455.43	32	-5	O	22627.35	17	-4
7	P	22247.77		6	O	22419.98		-5	P	---		
8	O	22184.74*	35	8	P	---			O	---		

4e±-3b $r(4d)\ ^3\Pi_g^\pm - e(3p)\ ^3\Sigma_u^+$
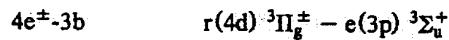
N"	SYM	P-BRANCH	I5	O-C	SYM	Q-BRANCH	I5	O-C	SYM	R-BRANCH	I5	O-C
		4E+				4E-				4E+		
						O- O BAND						
0	P				P				P	---		
1	D				O	10813.32	26	-6	O	10927.40	18	16
2	P	---			P'	---			P	10963.43	18	-7
3	O	---			O	10765.92*	73	-9	O	---		
4	P	---			P	---			P	11038.49		13

ne-2c $(nd)\ ^3\Pi_g - c(2p)\ ^3\Pi_u$
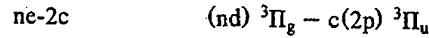
N"	SYM	P-BRANCH	I5	O-C	SYM	Q-BRANCH	I5	O-C	SYM	R-BRANCH	I5	O-C
		2C+				2C-				2C+		
						- O BAND						
1	P				O	---			P	---		
2	O	---			P	---			O	---		
3	P	---			O	---			P	25147.12	32	
4	O	---			P	25149.89	26		O	25141.32	56	
5	P	---			O	25143.74	14		P	25133.95	14	
6	O	---			P	25136.57	14		O	25126.12	14	
7	P	---			O	25127.93	20		P	---		
						- O BAND						
1	P				O	---			P	---		
2	O	---			P	26448.01	38		O	---		
3	P	---			O	26411.72	38		P	---		
4	O	---			P	26376.39	38		O	---		
5	P	26344.63*	68		O	26341.18*	50		P	---		
6	O	26308.63	50		P	26305.68	14		O	---		
7	P	26274.74	26		O	---			P	---		
						O BAND						
1	O				P	---			O	26509.14	38	
2	P	---			O	---			P	26502.94	44	
3	O	---			P	---			O	26497.47	44	
4	P	---			O	26494.92	44		P	26491.60	44	
5	O	---			P	26488.33	26		O	26484.88	32	
6	P	---			O	26481.84	44		P	26477.09	26	
						- O BAND						
1	O				P	26607.49*	50		O	---		
2	P'	---			O	---			P	---		
3	O	---			P	---			O	26616.04	44	
4	P	---			O	---			P	26638.95	32	
5	O	---			P	---			O	26661.36	14	
						- O BAND						
1	O				P'	---			O	26648.56*	20	
2	P	---			O	---			P	26647.97*	62	

$$3f^{+}\text{-}2c^{\pm} \qquad j(3d)\ ^{3}\Delta_{g}^{+} - c(2p)\ ^{3}\Pi_{u}^{\pm}$$

N"	SYM	P-BRANCH 2C+	I5	O-C	SYM	Q-BRANCH 2C-	I5	O-C	SYM	R-BRANCH 2C+	I5	O-C
						O- O BAND						
1	O				P				O	17534.57	60	2
2	P				O	17473.55	55	3	P	17576.35	47	2
3	O	17382.31	46	-2	P	17485.09	49	-1	O	17621.86	48	2
4	P	17364.05	45	-1	O	17500.73	52	2	P	17670.52	34	O
5	O	17350.29	51	-5	P	17519.91	41	2	O	17721.29*	40	2
6	O	17340.69	42	-1	O	17541.74	42	O	P	17772.81	22	-5
7	O	17334.37	47	-1	P	17565.12	33	3	O	17823.93*	26	-3
8	P	17330.24		O	O	17588.61*	50	2	P	17873.49		O
9	O	17327.30*	41	1	P	17611.42*	22	O	O	17920.57		O
10	P	17324.38	33	O	O	17632.58	24	O	P	---		
11	O	17320.94	36	-1	P	17651.52	13	O	O	---		
12	P	17316.21	27	-8	O	17667.66	13		P	---		
13	O	17309.93*	49		P	---			O	---		
14	P	---			O	17691.34			P	---		
15	O	---			P	---			O	---		
16	P	17279.31			O	---			P	---		
17	O	17264.05			P	---			O	---		
						1- O BAND						
1	O				P				O	19121.00	39	-10
2	P				O	19060.17	49	10	P	19155.71	15	O
3	O	18968.82	25	-6	P	19064.45	20	-3	O	19191.43	30	-7
4	P	18943.42	39	-2	O	19070.35*	44	-2	P	19228.05	25	-12
5	O	18919.97		-3	P	---			O	---		
6	P	18898.33	39	-2	O	---			P	---		
7	O	18878.15	44	-3	P	---			O	---		
						1- 1 BAND						
1	O				P				O	17439.67*	58	-1
2	P				O	17380.70	58	1	P	17476.33	51	2
3	O	17292.47	48	-1	P	17388.12	52	-3	O	17515.12	52	2
4	P	17271.10	46	3	O	17398.11	56	2	P	17555.82	39	2
5	O	17252.65	52	4	P	17410.37	45	O	O	17597.72	40	4
6	P	17237.02	44	-2	O	17424.37*	47	O	P	17640.13	30	-6
7	O	17223.81	49	O	P	17439.67*	58	4	O	17682.12	32	O
8	P	17212.43	39	O	O	---			P	17722.82	20	16
9	O	17202.20	45	7	P	---			O	17761.33*	28	O
10	P	17192.24	57	-16	O	17483.54	29	12	P	---		
11	O	---			P	---			O	---		
12	P	17171.36			O	---			P	---		
13	O	17159.26	31		P	---			O	---		
						2- 1 BAND						
1	O				P				O			
2	P				O	---			P	18992.83	44	-2
3	O	---			P	18904.61*	49	-8	P	19023.26	44	1
4	P	18787.64	39	3	O	18906.24	49	O	P	19053.39	25	1
5	O	18760.70*	54	-6	P	18907.85	39	-10	O	19082.84	25	O
6	P	18734.57	35	-5	O	18909.49	39	-4	P	---		
7	O	18708.91	39	-6	P	---			O	---		
						2- 2 BAND						
1	O				P				O	---		
2	P				O	---			P	17375.31	53	O
3	O	---			P	17290.23*	54	4	O	17408.75	55	-1
4	P	17177.06	46	O	O	17295.78	57	-2	P	17442.84	44	1
5	O	17155.14	52	4	P	17302.47	47	3	O	17477.15	45	-3
6	P	17134.86	43	3	O	17309.93*	49	7	P	17511.34		-7
7	O	17115.99	47	-4	P	17317.82	38	O	O	17544.69	34	O
8	P	17098.24	39	O	O	17325.55	42	O	P	---		
9	O	17081.06	52	2	P	17332.53	34	O	O	17575.15	21	2
10	P	17064.18	40	2	O	---			P	17594.80	26	2
11	O	---			P	17342.59		2	O	17611.42*	22	
12	P	---			O	17345.15*	33		P	17625.06	34	

3f⁺-2c±   j(3d) $^3\Delta_g^+$ − c(2p) $^3\Pi_u^\pm$ *Continued*

N"	SYM	P-BRANCH 2C+	I5	O-C	SYM	Q-BRANCH 2C-	I5	O-C	SYM	R-BRANCH 2C+	I5	O-C
						3- 3 BAND						
1	O				P				O	---		
2	P				O	---			P	17272.90	59	-11
3	O	---			P	---			O	---		
4	P	---			O	17192.80	58	O	P	---		
5	O	17056.85	49	O	P	17194.64	50	O	O	17357.75	44	6
6	P	17032.69	39	O	O	17196.36	48	-3	P	---		
7	O	17008.96	47	-1	P	17197.28	39	O	O	17405.91	41	O
8	P	16985.11	38	-1	O	---			P	---		
9	O	16958.43	44	2	P	---			O	---		
10	P	16928.37	40		O	---			P	---		

3f⁻-2c±   j(3d) $^3\Delta_g^+$ − c(2p) $^3\Pi_u^\pm$

N"	SYM	P-BRANCH 2C-	I5	O-C	SYM	Q-BRANCH 2C+	I5	O-C	SYM	R-BRANCH 2C-	I5	O-C
						O- O BAND						
1	P				O				P	17533.89*	43	1
2	O				P	17472.90	53	4	O	17573.36	53	O
3	P	17381.62*	38	-1	O	17482.19	58	2	P	17614.07	42	-1
4	O	17361.02	48	-2	P	17493.02	49	-2	O	17654.95	42	-4
5	P	17342.43		2	O	17504.64	52	2	P	17695.45*	30	-2
6	O	17325.10	46	1	P	17516.28*	42	O	O	17734.82	35	2
7	P	17308.53	38	2	O	17527.42	44	-2	P	17772.44	19	-1
8	O	17292.07*		O	P	17537.64	34	4	O	17807.86	22	3
9	P	17275.52		-1	O	17546.55	37	2	P	17840.86	12	-2
10	O	17258.50	36	-4	P	17553.85	29	1	O	17870.97*	26	-2
11	P	17240.85		1	O	17559.36	33	O	P	17898.07	14	-2
12	O	---			P	17562.84	36	-2	O	17922.15	20	O
13	P	---			O	17564.20	33	O	P	17942.69		O
14	O	17182.21	33	O	P	17563.35	23	O	O	17959.59		O
15	P	17160.60	21	O	O	17559.97	26	O	P	---		
						O- 1 BAND						
1	P				O				P	---		
2	O				P	---			O	---		
3	P	---			O	15805.85		8	P	---		
4	O	---			P	---			O	---		
5	P	---			O	15837.40		17	P	---		
						1- O BAND						
1	P				O				P	19120.71	35	-3
2	O				P	19059.70	39	-2	O	19154.14	35	-6
3	P	---			O	19063.08	39	7	P	19187.31	25	-12
4	O	18941.82	35	-6	P	19066.14*	54	-25	O	19219.56	25	-8
5	P	18915.71	20	-5	O	19069.21	35	-6	P	---		
6	O	18889.68	25	-6	P	19071.07	35	-7	O	19278.81		-11
7	P	18863.60	49	23	O	---			P	---		

$3\Gamma^--2c^{\pm}$ $j(3d)\ ^3\Delta_g^+ - c(2p)\ ^3\Pi_u^{\pm}$ *Continued*

N"	SYM	P-BRANCH	I5	O-C	SYM	Q-BRANCH	I5	O-C	SYM	R-BRANCH	I5	O-C
		2C-				2C+				2C-		

1- 1 BAND

N"	SYM	P-BRANCH	I5	O-C	SYM	Q-BRANCH	I5	O-C	SYM	R-BRANCH	I5	O-C
1	P				O				P	17439.33		1
2	O				P	17380.38	55	6	O	17474.84	57	2
3	P	17292.15	48	-1	O	17386.62	61	1	P	17511.15	46	5
4	O	17269.60	51	0	P	17394.03	52	1	O	17547.43	46	7
5	P	17248.61	43	2	O	17401.87*	56	-1	P	17583.19	33	3
6	O	17228.61*	47	4	P	17409.83	44	0	O	17617.76	40	1
7	P	17209.21	40	-6	O	17417.17	47	-2	P	17650.62	23	0
8	O	17190.05	44	2	P	17423.59*	43	17	O	17681.31	27	0
9	P	17170.53*	51	2	O	17428.53	40	5	P	17709.08	7	0
10	O	17150.62*	39	5	P	17431.73	31	0	O	---		
11	P	17130.01	28	0	O	17433.50	33	0	P	---		
12	O	---			P	17432.80	26		O	---		
13	P	---			O	17429.74	31		P	---		
14	O	---			P	17424.37*	47		O	---		

1- 2 BAND

N"	SYM	P-BRANCH	I5	O-C	SYM	Q-BRANCH	I5	O-C	SYM	R-BRANCH	I5	O-C
1	P				O				P	15819.88	18	4
2	O				P	15762.91		13	O	15857.50*	19	15
3	P	---			O	15772.16	24	4	P	15896.69		9
4	O	15659.18		2	P	15783.49		2	O	---		
5	P	---			O	---			P	15977.69*	57	4

2- 1 BAND

N"	SYM	P-BRANCH	I5	O-C	SYM	Q-BRANCH	I5	O-C	SYM	R-BRANCH	I5	O-C
1	P				O				P	18962.35	49	4
2	O				P	18903.31*	49	0	O	18992.13	44	2
3	P	18815.20	44	5	O	18903.82*	54	-8	P	19021.16	35	-6
4	O	18786.75	39	-14	P	18903.82*	54	-32	O	19049.01	35	-5
5	P	---			O	18903.31*	49	-27	P	19075.03	15	2
6	O	---			P	18901.58	35	-10	O	---		

2- 2 BAND

N"	SYM	P-BRANCH	I5	O-C	SYM	Q-BRANCH	I5	O-C	SYM	R-BRANCH	I5	O-C
1	P				O				P	17342.96	66	13
2	O				P	17285.91	60	14	O	17374.64	58	0
3	P	17200.68	51	3	O	17289.41	61	0	P	17406.74	47	2
4	O	17176.42	51	-3	P	17293.61	52	2	O	17438.58	48	-4
5	P	17153.20	43	0	O	17297.95	55	3	P	---		
6	O	17130.63*	50	3	P	17301.88		-1	O	17499.19*	38	11
7	P	17108.40	41	10	O	17305.25	47	0	P	17526.94*	31	-1
8	O	17086.11	46	0	P	17307.10	38	3	O	---		
9	P	17063.30	34	-8	O	---			P	---		
10	O	17033.83*	11	0	P	17306.75	31	0	O	---		

2 3 BAND

N"	SYM	P-BRANCH	I5	O-C	SYM	Q-BRANCH	I5	O-C	SYM	R-BRANCH	I5	O-C
1	P				O				P	15783.87	19	-14
2	O				P	15729.06	27	11	O	---		
3	P	---			O	15735.44	27	-3	P	---		
4	O	---			P	15743.51	22	-1	O	---		

3- 2 BAND

N"	SYM	P-BRANCH	I5	O-C	SYM	Q-BRANCH	I5	O-C	SYM	R-BRANCH	I5	O-C
1	P				O				P	---		
2	O				P	---			O	18829.66	49	-4

3- 3 BAND

N"	SYM	P-BRANCH	I5	O-C	SYM	Q-BRANCH	I5	O-C	SYM	R-BRANCH	I5	O-C
1	P				O				P	17244.41	66	2
2	O				P	17189.35	62	2	O	---		
3	P	17107.09	48	-5	O	17190.47	60	-6	P	17300.91	47	0
4	O	17081.51	51	3	P	17191.59	50	-1	O	17328.16	48	1
5	P	17056.12	42	2	O	---			P	17354.28*	36	4
6	O	17030.89	45	-1	P	---			O	17378.39	39	-1
7	P	17005.55	37	-5	O	17190.98	56	0	P	17400.39	28	0
8	O	16979.68*	54	1	P	17188.23	37	0	O	17419.65	32	-4
9	P	16952.89	45	0	O	17183.52	39	2	P	---		
10	O	16924.60	33	2	P	---			O	---		

3f⁻-2c±   j(3d) $^3\Delta_g^+ - $c(2p) $^3\Pi_u^\pm$ *Continued*

N"	SYM	P-BRANCH	I5	O-C	SYM	Q-BRANCH	I5	O-C	SYM	R-BRANCH	I5	O-C
		2C-				2C+				2C-		

3- 4 BAND

N"	SYM	P-BRANCH	I5	O-C	SYM	Q-BRANCH	I5	O-C	SYM	R-BRANCH	I5	O-C
1	P				O				P	---		
2	O				P	15692.04		8	O	---		
3	P	---			O	15695.85	30	0	P	---		
4	O	---			P	15700.81	21	0	O	---		

4- 4 BAND

N"	SYM	P-BRANCH	I5	O-C	SYM	Q-BRANCH	I5	O-C	SYM	R-BRANCH	I5	O-C
1	P				O				P	17144.17		4
2	O				P	17091.06	59	-2	O	17169.03	57	-8
3	P	17011.75	48	-1	O	17089.61	60	9	P	---		
4	O	16984.48	47	0	P	17087.35	47	-1	O	17215.19	46	0
5	P	16956.81	43	1	O	17084.00	56	0	P	17235.42	34	2
6	O	---			P	17078.99	42	-3	O	17253.14	37	
7	P	---			O	17072.15	46		P	17267.63	26	
8	O	16868.44	32		P	17063.80*	35		O	---		
9	P	---			O	---			P	17284.76	23	

5- 5 BAND

N"	SYM	P-BRANCH	I5	O-C	SYM	Q-BRANCH	I5	O-C	SYM	R-BRANCH	I5	O-C
1	P				O				P	17041.89	60	0
2	O				P	16990.68*	55		O	---		

3f±-3b   j(3d) $^3\Delta_g^\pm - $e(3p) $^3\Sigma_u^+$

N"	SYM	P-BRANCH	I5	O-C	SYM	Q-BRANCH	I5	O-C	SYM	R-BRANCH	I5	O-C
		3F+				3F-				3F+		

0- 0 BAND

N"	SYM	P-BRANCH	I5	O-C	SYM	Q-BRANCH	I5	O-C	SYM	R-BRANCH	I5	O-C
1	O				O				O	5725.82	76	3
2	P				P	---			P	5774.72	53	-1
3	O	5591.56	66	18	O	5691.23	43	1	O	---		
4	P	---			P	---			P	5893.73	64	3
5	O	5591.07	48	9	O	---			O	5961.92	50	1
6	P	---			P	---			P	6034.24	50	-22

4f⁻-2c±   (4d) $^3\Delta_g^- - $c(2p) $^3\Pi_u^\pm$

N"	SYM	P-BRANCH	I5	O-C	SYM	Q-BRANCH	I5	O-C	SYM	R-BRANCH	I5	O-C
		2C-				2C+				2C-		

0- 0 BAND

N"	SYM	P-BRANCH	I5	O-C	SYM	Q-BRANCH	I5	O-C	SYM	R-BRANCH	I5	O-C
1	P				O				P	22806.29	33	2
2	O				P	22745.15*	45	-10	O	22859.98	22	1
3	P	22653.95*	45	-7	O	22768.78	25	0	P	22912.30	30	2
4	O	22647.65	25	0	P	22791.21*	30	-3	O	---		
5	P	22640.65*	40	4	O	22811.68	21	0	P	---		

Appendix B. Energy Levels of D_2 Derived from the Band Systems of Appendix A and from Published Vacuum Ultraviolet Spectra

1A $X(1s)\ {}^1\Sigma_g^+$

N	SYM	V = 0	V = 1	V = 2	V = 3	V = 4	V = 5
0	O	0. BH	2993.60 BH	5868.46 BH	8625.71 BH	11267.80 BH	13795.72 BH
1	P	59.79 BH	3051.28 BH	5924.01 BH	8679.24 BH	11319.31 BH	13845.24 BH
2	O	179.01 BH	3166.28 BH	6034.87 BH	8786.11 BH	11422.22 BH	13944.08 BH
3	P	357.25 BH	3338.21 BH	6200.37 BH	8945.73 BH	11575.75 BH	14091.66 BH
4	O	593.64 BH	3566.22 BH	6420.27 BH	9157.42 BH	11779.47 BH	14287.52 BH
5	P	887.08 BH	3849.22 BH	6693.10 BH	9420.29 BH	12032.36 BH	14530.05 BH
6	O	1236.38 BH	4186.02 BH	7017.74 BH	9733.13 BH	12332.65 BH	14818.70 BH
7	P	1640.09 BH	---	7392.64 BH	10094.22 BH	12680.61 BH	15152.64 BH
8	O	2096.36 BH	---	7815.90 BH	10504.21 BH	13075.19 BH	15534.12 BH
9	P	2603.45 BH	---	---	---	---	---

N	SYM	V = 6	V = 7	V = 8	V = 9	V = 10	V = 11
0	O	16210.27 BH	18511.38 BH	20698.87 BH	22771.48 BH	24727.63 BH	26564.54 BH
1	P	16257.74 BH	18556.89 BH	20742.36 BH	22813.01 BH	24766.99 BH	26601.74 BH
2	O	16352.62 BH	18647.73 BH	20829.13 BH	22895.66 BH	24845.50 BH	26675.98 BH
3	P	16494.18 BH	18783.33 BH	20958.68 BH	23019.07 BH	24962.70 BH	26786.70 BH
4	O	16681.90 BH	18963.14 BH	21130.45 BH	23182.73 BH	25117.97 BH	26933.40 BH
5	P	16914.73 BH	19186.16 BH	21343.41 BH	23385.54 BH	25310.49 BH	27115.07 BH
6	O	17191.91 BH	19451.20 BH	21596.41 BH	23626.47 BH	25538.88 BH	27330.96 BH
7	P	---	19756.83 BH	21888.53 BH	23904.55 BH	25802.65 BH	27579.49 BH
8	O	---	20102.38 BH	22217.90 BH	---	---	---
9	P	---	---	22583.96 BH	---	---	---

N	SYM	V = 12	V = 13	V = 14	V = 15	V = 16	V = 17
0	O	28278.54 BH	29864.91 BH	31317.47 BH	32628.33 BH	33787.61 BH	34782.80 BH
1	P	28313.52 BH	29897.56 BH	31347.67 BH	32655.89 BH	33812.24 BH	34804.24 BH
2	O	28383.31 BH	29962.67 BH	31407.82 BH	32710.71 BH	33861.33 BH	34846.91 BH
3	P	28487.43 BH	30059.77 BH	31497.48 BH	32792.44 BH	33934.39 BH	34910.38 BH
4	O	28625.17 BH	30188.24 BH	31616.05 BH	32900.30 BH	34030.66 BH	34993.82 BH
5	P	28795.86 BH	30347.22 BH	31762.67 BH	33033.59 BH	34149.45 BH	35096.41 BH
6	O	28990.22 DH	30535.55 DH	31936.15 DH	33191.13 DH	34289.37 DH	35216.75 DH
7	P	29231.37 BH	30752.37 BH	32135.44 BH	33371.70 BH	34449.19 BH	35353.39 BH
8	O	---	30995.93 BH	32359.24 BH	33573.58 BH	34627.80 BH	---
9	P	---	31264.70 BH	---	---	---	---

N	SYM	V = 18	V = 19	V = 20	V = 21
0	O	35598.11 BH	36213.83 BH	36605.18 BH	36746.84 BH
1	P	35615.97 BH	36227.52 BH	36613.81 BH	36748.73 BH
2	O	35651.46 BH	36254.62 BH	36630.62 BH	---
3	P	35704.05 BH	36294.53 BH	36654.89 BH	---
4	O	35772.89 BH	36346.23 BH	36685.32 BH	---
5	P	35857.00 BH	36408.60 BH	36719.85 BH	---
6	O	35954.99 BH	36479.87 BH	---	---
7	P	36065.24 BH	---	---	---

$$EF = 2A+2K \qquad EF\ {}^1\Sigma_g^+$$

N	SYM	V = 0	#	V = 1	#	V = 2	#	V = 3	#	V = 4	#	V = 5	#
0	O	99461.58	7	---		---		101149.79	11	---		---	
1	P	99493.63	14	---		---		101180.45	24	---		---	
2	O	99557.59	17	---		---		101241.67	30	---		---	
3	P	99653.19	16	---		---		101333.20	28	---		---	
4	O	99780.07	16	---		---		101454.60	24	---		---	
5	P	99937.69	15	---		---		101605.29	19	---		---	
6	O	100125.53	13	---		---		101785.04	18	---		---	
7	P	100342.59	8	---		---		101992.66	10	---		---	
8	O	100588.28	7	---		---		102227.43	7	---		---	
9	P	100861.61	5	---		---		102488.45	5	---		---	
10	O	101161.65	4	---		---		102774.80	5	---		---	
11	P	101487.01	3	---		---		103085.52	4	---		---	
12	O	101836.91	3	---		---		---		---		---	

N	SYM	V = 6	#	V = 7	#	V = 8	#	V = 9	#	V = 10	#	V = 11	#
0	O	102741.79	13	---		---		104196.74	13	104546.29	7	105158.18	6
1	P	102770.91	28	---		---		104222.64	25	104553.35	8	105167.65	10
2	O	102829.00	33	---		---		104273.92	28	104567.72	11	105186.37	13
3	P	102915.83	30	103097.81	5	---		104349.34	24	104590.28	10	105213.16	10
4	O	103030.86	29	103136.45	6	---		104445.15	26	104623.86	13	105247.46	10
5	P	103170.10	17	103183.63	6	---		104548.53	17	104680.39	9	105288.32	8
6	O	103344.43	16	103233.95	5	---		104629.59	6	104788.03	10	105335.75	8
7	P	103540.57	10	---		---		104835.75	2	---		---	
8	O	103761.94	9	---		---		105018.38	2	---		---	
9	P	104006.17	7	---		---		---		---		---	
10	O	104273.08	6	---		---		105463.60	2	---		---	
11	P	104559.85	4	---		---		---		---		---	

N	SYM	V = 12	#	V = 13	#	V = 14	#	V = 15	#	V = 16	#	V = 17	#
0	O	105532.01	9	105977.74	9	106506.03	8	106985.82	8	107472.44	7	107980.66	8
1	P	105548.94	18	105988.92	19	106517.48	14	106998.66	18	107484.31	13	107992.02	15
2	O	105582.55	20	106011.49	21	106540.21	17	107024.18	18	107507.98	13	108014.63	16
3	P	105632.16	16	106046.25	15	106573.75	14	107062.17	15	107543.74	13	108048.40	16
4	O	105696.06	17	106094.42	15	106617.85	14	107112.12	16	107591.67	13	108093.35	16
5	P	105771.23	13	---		106672.30	12	107173.24	13	107651.89	12	108149.45	16
6	O	105853.49	12	---		106737.31	14	107244.77	14	107724.39	11	108216.83	13
7	P	105935.17	8	---		---		---		---		---	

N	SYM	V = 18	#	V = 19	#	V = 20	#	V = 21	#	V = 22	#	V = 23	#
0	O	108480.93	8	108972.75	9	109466.44	8	109958.39	7	110440.71	5	---	
1	P	108492.48	15	108984.11	16	109477.33	15	109969.06	15	110451.39	11	---	
2	O	108515.48	17	109006.81	15	109499.08	16	109990.44	16	110472.77	12	---	
3	P	108549.79	16	109040.82	15	109531.70	14	110022.39	16	110504.68	9	---	
4	O	108595.14	15	109086.05	16	109575.15	16	110064.61	15	110546.94	11	---	
5	P	108651.25	15	109142.31	16	109629.42	13	110117.11	9	110599.22	1	---	
6	O	108717.74	16	109209.30	15	109694.50	11	110179.83	2	---		---	
7	P	108794.87	2	109286.70	3	---		---		---		---	

N	SYM	V = 24	#	V = 25	#	V = 26	#	V = 27	#	V = 28	#	V = 29	#
0	O	---		---		---		---		---		113657.88	11
1	P	---		---		---		---		---		113666.17	19
2	O	---		---		---		---		---		113683.45	18
3	P	---		---		---		---		---		113710.22	20
4	O	---		---		---		---		---		113747.38	20
5	P	---		---		---		---		---		113800.00	19
6	O	---		---		---		---		---		113843.87	2

N	SYM	V = 30	#	V = 31	#	V = 32	#
0	O	---		---		114867.40	9
1	P	---		---		114880.01	8
2	O	---		---		114906.22	12
3	P	---		---		114945.28	8
4	O	---		---		114996.98	9

3A   H(3s) $^1\Sigma_g^+$

N	SYM	V = 0	#	V = 1	#	V = 2	#	V = 3	#
0	O	---		---		116421.60	13	117904.22	12
1	P	---		---		116446.44	18	117910.14	19
2	O	---		---		116495.67	30	117950.29	26
3	P	---		---		116561.43	23	118013.84	24
4	O	---		---		116644.20	17	118109.82	20
5	P	---		---		116736.56	8	118229.04	13
6	O	---		---		116809.13	1	118353.27	9
7	P	---		---		---		118511.89	6
8	O	---		---		---		118711.58	3

4D   P(4d) $^1\Sigma_g^+$

N	SYM	V = 0	#
0	O	---	
1	P	117702.09	14
2	O	117710.25	16
3	P	117743.39	10
4	O	117803.78	15
5	P	117892.02	11
6	O	118008.04	8
7	P	118151.64	5
8	O	118322.34	3
9	P	118519.49	1
10	O	118742.20	1
11	P	118989.74	1
12	O	119260.60	1

GK = 3D+3K   GK $^1\Sigma_g^+$

N	SYM	V = 0	#	V = 1	#	V = 2	#	V = 3	#	V = 4	#	V = 5	#
0	O	111733.77	6	112066.78	6	113145.22	12	113507.53	11	114356.76	11	115074.03	10
1	P	111744.71	16	112075.59	11	113159.67	17	113519.78	20	114372.54	20	115084.11	24
2	O	111766.14	17	112099.20	16	113188.48	24	113546.20	24	114404.31	28	115107.29	27
3	P	111797.38	12	112143.22	12	113231.46	20	113589.55	19	114456.16	24	115147.73	19
4	O	111837.60	17	112210.93	14	113287.59	20	113652.53	18	---		115214.60	23
5	P	111886.13	4	112303.85	11	---		113744.60	13	---		115333.48	16
6	O	111955.85	4	112422.61	11	---		113866.51	10	---		115454.31	5
7	P	---		112567.27	9	---		114021.77	1	---		115600.18	4
8	O	---		112737.77	11	---		---		---		115744.37	4
9	P	---		112933.29	7	---		---		---		---	
10	O	---		113153.24	9	---		---		---		---	
11	P	---		113396.64	7	---		---		---		---	
12	O	---		113661.83	6	---		---		---		---	
13	P	---		113947.10	2	---		---		---		---	
14	O	---		114250.46	2	---		---		---		---	

N	SYM	V = 6	#	V = 7	#	V = 8	#	V = 9	#
0	O	115844.08	10	116557.37	7	117214.11	13	117799.38	6
1	P	115858.87	19	116565.62	22	117226.75	21	117811.60	16
2	O	115889.04	23	116580.98	28	117252.43	26	117834.88	19
3	P	115931.53	19	116622.73	21	117292.11	20	117868.73	16
4	O	115991.50	22	116710.90	19	---		117914.84	15
5	P	116065.06	8	---		---		117974.43	11

WW $^1\Sigma_g^+$

N	SYM	V = 0	#
0	O	---	
1	P	---	
2	O	---	
3	P	---	
4	O	---	
5	P	111889.29	7

WX $^1\Sigma_g^+$

N	SYM	V = 0	#
0	O	110335.29	5
1	P	110345.20	2
2	O	110358.77	3
3	P	110376.60	3

WY = 3^1K_0 $^1\Sigma_g^+$

N	SYM	V = 0	#
0	O	---	
1	P	111892.34	3
2	O	111933.26	1
3	P	111958.20	3

WZ $^1\Sigma_g^+$

N	SYM	V = 0	#
0	O	---	
1	P	---	
2	O	---	
3	P	116781.03	20

2B   B(2p) $^1\Sigma_u^+$

N	SYM	V = 0	#	V = 1	#	V = 2	#	V = 3	#	V = 4	#	V = 5	#
0	P	90633.59	25	91575.94	22	92498.80	32	93403.40	27	94290.52	24	95160.50	29
1	O	90653.31	59	91594.90	62	92517.15	74	93421.21	70	94307.76	69	95177.27	73
2	P	90692.64	66	91632.82	71	92553.81	83	93456.74	76	94342.27	71	95210.82	67
3	O	90751.43	67	91689.44	74	92608.57	83	93509.82	67	94393.79	72	95260.95	73
4	P	90829.32	55	91764.56	61	92681.25	71	93580.23	54	94462.23	56	95327.46	53
5	O	90926.01	50	91857.80	57	92771.46	61	93667.78	50	94547.21	54	95410.20	56
6	P	91040.97	37	91968.76	41	92878.87	36	93771.96	30	94648.50	29	95508.66	23
7	O	91173.73	29	92096.93	32	93003.00	31	93892.54	24	94765.57	19	95622.68	13
8	P	91323.60	20	92241.78	14	93143.43	10	94020.79	8	94898.15	4	95751.55	3
9	O	91490.07	16	92402.73	11	93299.43	9	94180.42	4	95045.63	1	95895.32	1
10	P	91672.28	12	92579.10	9	93470.50	4	---		---		---	
11	O	91869.52	10	92770.21	7	93655.82	3	---		---		---	
12	P	92081.12	5	92977.95	5	---		---		---		---	
13	O	92306.04	3	93206.07	3	---		---		---		---	

N	SYM	V = 6	#	V = 7	#	V = 8	#	V = 9	#	V = 10	#	V = 11	#
0	P	96013.68	17	96850.35	21	97670.54	15	98474.66	10	99262.62	9	100035.03	BH
1	O	96030.05	56	96866.23	56	97686.08	42	98489.77	40	99277.38	23	100049.36	BH
2	P	96062.67	47	96898.01	52	97717.00	42	98519.93	35	99306.77	21	100078.06	BH
3	O	96111.45	53	96945.51	53	97763.35	42	98565.05	44	99350.75	28	100121.02	BH
4	P	96176.21	37	97008.58	34	97824.75	30	98624.96	25	99409.16	14	100178.03	BH
5	O	96256.67	35	97086.98	38	97901.21	25	98699.44	21	99481.83	20	100248.89	BH
6	P	96352.57	13	97180.38	13	97992.28	15	98788.31	9	99568.41	5	100333.52	BH
7	O	96463.56	8	97288.57	11	98097.75	9	98891.07	6	99668.76	6	100431.22	BH
8	P	---		---		98217.54	1	---		---		---	

N	SYM	V = 12		V = 13		V = 14		V = 15		V = 16		V = 17	
0	P	100791.50	BH	101532.49	BH	---		---		---		104345.00	DH
1	O	100805.51	BH	101546.15	BH	102271.58	BH	102981.79	BH	103677.02	BH	104357.43	DH
2	P	100833.49	BH	101573.57	BH	102298.24	BH	103007.89	BH	103702.39	BH	104382.47	DH
3	O	100875.34	BH	101614.46	BH	102338.05	BH	103046.96	BH	103740.38	BH	104420.36	DH
4	P	100930.97	BH	101668.94	BH	102390.99	BH	103096.65	BH	---		104474.81	DH
5	O	101000.15	BH	101736.41	BH	---		103156.15	BH	---		104526.90	DH
6	P	101083.11	BH	101817.47	BH	---		---		---		104601.39	DH
7	O	101178.18	BH	101910.38	BH	---		---		---		104686.53	DH
8	P	101287.40	BH	---		---		---		---		---	

N	SYM	V = 18		V = 19		V = 20		V = 21		V = 22		V = 23	
0	P	105011.23	DH	105662.97	DH	106300.62	DH	106924.10	DH	107533.69	DH	108129.76	DH
1	O	105023.45	DH	105676.46	DH	106311.87	DH	106935.00	DH	107544.65	DH	108140.33	DH
2	P	105047.51	DH	105695.73	DH	106335.75	DH	106957.38	DH	107566.74	DH	108161.76	DH
3	O	105083.73	DH	105732.08	DH	106369.73	DH	106991.07	DH	107599.91	DH	108193.82	DH
4	P	105131.85	DH	105779.45	DH	106415.84	DH	107034.32	DH	107643.80	DH	108236.26	DH
5	O	105191.79	DH	105838.19	DH	106473.02	DH	107091.49	DH	107698.62	DH	108289.28	DH
6	P	105263.31	DH	105907.86	DH	106541.46	DH	107157.85	DH	107764.50	DH	108352.79	DH
7	O	---		105988.86	DH	106621.09	DH	---		---		108426.50	DH

N	SYM	V = 24		V = 25		V = 26		V = 27		V = 28		V = 29	
0	P	108712.17	DH	109281.30	DH	109837.29	DH	110379.79	DH	110910.29	DH	111427.58	DH
1	O	108722.55	DH	109291.45	DH	109847.40	DH	110389.71	DH	110920.18	DH	111436.79	DH
2	P	108743.77	DH	109311.94	DH	109867.66	DH	110409.06	DH	110940.76	DH	111455.25	DH
3	O	108775.39	DH	109342.39	DH	109898.30	DH	110438.31	DH	110980.32	DH	111483.15	DH
4	P	108817.64	DH	109383.08	DH	109940.05	DH	---		111000.54	DH	111520.21	DH
5	O	108870.73	DH	109433.73	DH	110002.66	DH	110525.60	DH	111049.16	DH	111566.15	DH
6	P	108937.24	DH	109494.29	DH	110039.48	DH	110622.90	DH	111105.65	DH	111621.00	DH
7	O	108991.30	DH	109569.07	DH	---		---		111171.14	DH	111686.00	DH

N	SYM	V = 30		V = 31		V = 32		V = 33		V = 34		V = 35	
0	P	111932.41	DH	112424.55	DH	112904.16	DH	113371.64	DH	113826.34	DH	114268.82	DH
1	O	111940.79	DH	112433.38	DH	112912.65	DH	113379.85	DH	113834.37	DH	114276.64	DH
2	P	111958.17	DH	112451.00	DH	112929.64	DH	113396.80	DH	113850.42	DH	114292.80	DH
3	O	111985.16	DH	112477.63	DH	112955.12	DH	113422.07	DH	113874.80	DH	114316.76	DH
4	P	112020.86	DH	112512.83	DH	112989.14	DH	113456.05	DH	113907.14	DH	114349.56	DH
5	O	112065.71	DH	112556.96	DH	113031.50	DH	113498.20	DH	113947.50	DH	114392.06	DH
6	P	112181.26	DH	112610.07	DH	113082.77	DH	113550.61	DH	113995.79	DH	114455.64	DH
7	O	---		112673.20	DH	113141.38	DH	---		---		114481.16	DH

2B   B(2p) $^1\Sigma_u^+$ *Continued*

N	SYM	V = 36		V = 37		V = 38		V = 39		V = 40		V = 41	
0	P	114698.50	DH	115115.83	DH	115520.04	DH	115911.30	DH	116288.94	DH	116651.96	DH
1	O	114706.16	DH	115123.40	DH	115527.23	DH	115918.56	DH	116295.15	DH	116658.78	DH
2	P	114721.49	DH	115138.80	DH	115541.81	DH	115933.50	DH	116309.16	DH	116678.09	DH
3	O	114744.50	DH	115162.65	DH	115563.46	DH	---		116329.33	DH	116685.22	DH
4	P	114775.20	DH	115195.20	DH	115592.32	DH	115984.42	DH	116356.44	DH	116713.32	DH
5	O	114813.36	DH	---		115628.54	DH	116011.57	DH	116390.01	DH	116746.66	DH
6	P	114859.06	DH	---		---		---		116430.47	DH	---	

N	SYM	V = 42		V = 43		V = 44		V = 45		V = 46		V = 47	
0	P	116999.77	DH	117331.17	DH	117644.62	DH	117937.44	DH	118207.20	DH	118448.86	DH
1	O	117005.85	DH	117338.08	DH	117650.33	DH	117943.80	DH	118211.97	DH	118453.94	DH
2	P	117018.59	DH	117343.35	DH	117661.43	DH	117960.05	DH	118222.93	DH	118465.41	DH
3	O	117037.36	DH	117363.71	DH	117678.31	DH	117966.56	DH	118236.32	DH	118472.14	DH
4	P	117062.31	DH	117388.17	DH	117700.82	DH	117988.04	DH	118255.30	DH	118490.40	DH
5	O	117093.54	DH	117417.95	DH	117729.15	DH	118014.16	DH	118279.54	DH	118511.67	DH
6	P	---		117449.61	DH	---		---		---		---	

N	SYM	V = 48		V = 49		V = 50		V = 51	
0	P	118657.15	DH	---		118934.42	DH	---	
1	O	118660.30	DH	---		118936.43	DH	118989.64	DH
2	P	118667.99	DH	---		118940.34	DH	---	
3	O	118679.00	DH	---		118945.83	DH	---	

3B   B'(3p) $^1\Sigma_u^+$

N	SYM	V = 0	#	V = 1	#	V = 2	#	V = 3	#	V = 4	#	V = 5	#
0	P	110815.83	1	112181.03	3	113467.18	3	114669.59	3	115780.03	2	116784.66	5
1	O	110842.11	4	112205.90	6	113491.02	6	114690.92	6	115800.61	4	116803.68	14
2	P	110894.55	6	112255.58	6	113538.62	6	114733.79	5	115841.74	4	116842.27	7
3	O	110972.93	4	112329.84	6	113609.85	6	114798.48	6	115903.26	4	116899.66	11
4	P	111076.98	4	112428.44	5	113704.60	6	114885.03	6	115984.96	4	116975.88	5
5	O	111206.30	4	112551.02	5	113822.81	6	114993.15	4	116086.51	3	117070.68	4
6	P	111360.38	4	112697.11	6	113964.59	6	115122.51	3	---		---	
7	O	111538.64	4	112866.12	4	114131.18	4	---		---		---	
8	P	111740.04	1	113057.49	4	---		---		---		---	
9	O	---		113270.49	4	---		---		---		---	

N	SYM	V = 6	#	V = 7		V = 8		V = 9		V = 10		V = 11	
0	P	117659.48	5	118357.29	DH	118754.69	DH	118838.46	DH	118913.02	DH	118966.66	DH
1	O	117675.56	14	118370.99	DH	118761.27	DH	118842.80	DH	118916.24	DH	118969.96	DH
2	P	117708.02	5	118398.28	DH	118773.85	DH	118852.15	DH	118922.54	DH	118973.74	DH
3	O	117756.91	11	118438.75	DH	118790.94	DH	118863.48	DH	118931.93	DH	118980.24	DH
4	P	---		118491.93	DH	118811.52	DH	118880.97	DH	118944.21	DH	118988.93	DH
5	O	117903.35	6	118557.15	DH	118834.37	DH	---		118958.97	DH	119001.54	DH
6	P	---		118633.21	DH	---		---		---		---	
7	O	---		118719.57	DH	---		---		---		---	

N	SYM	V = 12		V = 13	
0	P	119003.58	DH	119026.49	DH
1	O	119005.11	DH	119027.79	DH
2	P	119008.39	DH	119034.49	DH
3	O	119013.16	DH	---	

| | | 4B | | B''(4p) $^1\Sigma_u^+$ | | |

N	SYM	V = 0	V = 1	V = 2	V = 3	V = 4	V = 5
0	P	117197.30 TT	118688.20 TT	120112.70 TT	121454.00 TT	122741.00 TT	123952.30 TT
1	O	117224.30 TT	118714.50 TT	120138.80 TT	121480.00 TT	122780.20 TT	123970.90 TT
2	P	117277.90 TT	118767.20 TT	120190.50 TT	121532.10 TT	122844.00 TT	124010.90 TT
3	O	117358.80 TT	118846.10 TT	120268.10 TT	121610.20 TT	122835.70 TT	124071.50 TT
4	P	117465.80 TT	118950.90 TT	120371.30 TT	121714.30 TT	122919.90 TT	124153.20 TT
5	O	117599.60 TT	119081.30 TT	120499.90 TT	121844.20 TT	123027.90 TT	124256.20 TT
6	P	117761.00 TT	119237.30 TT	---	---	123158.90 TT	124380.20 TT

N	SYM	V = 6	V = 7	V = 8	V = 9
0	P	125087.40 TT	126146.70 TT	127131.60 TT	128034.30 TT
1	O	125106.50 TT	126166.00 TT	127150.60 TT	128050.10 TT
2	P	125146.50 TT	126205.00 TT	127189.80 TT	128092.50 TT
3	O	125206.50 TT	126263.20 TT	127245.60 TT	128156.50 TT
4	P	125286.50 TT	126340.80 TT	127322.60 TT	---
5	O	125386.30 TT	126437.90 TT	127419.50 TT	---

| | | 5B | | B'''(5p) $^1\Sigma_u^+$ | | |

N	SYM	V = 0	V = 1	V = 2	V = 3	V = 4
0	P	120024.90 TT	121604.40 TT	123138.20 TT	124629.40 TT	126081.00 TT
1	O	120050.50 TT	121628.20 TT	123162.20 TT	124644.50 TT	126099.40 TT
2	P	120102.60 TT	121676.00 TT	123212.90 TT	124684.90 TT	126135.50 TT
3	O	120180.90 TT	121749.00 TT	123301.60 TT	124752.10 TT	126196.30 TT
4	P	120285.00 TT	121847.50 TT	123403.40 TT	124843.80 TT	---
5	O	---	121972.00 TT	---	---	---

| | | 6B | | (6p) $^1\Sigma_u^+$ | |

N	SYM	V = 0	V = 1	V = 2	V = 3
0	P	121488.00 TT	122988.20 TT	124386.90 TT	125729.10 TT
1	O	121513.50 TT	123009.20 TT	124411.30 TT	125752.50 TT
2	P	121564.60 TT	123056.50 TT	124461.80 TT	125801.40 TT
3	O	121641.40 TT	123130.90 TT	124536.50 TT	125874.60 TT
4	P	121735.60 TT	---	124636.10 TT	---

7B   (7p) $^1\Sigma_u^+$

N	SYM	V = 0	V = 1	V = 2
0	P	122405.60 TT	123962.60 TT	---
1	O	122426.40 TT	123991.70 TT	125540.90 TT
2	P	122470.90 TT	124030.80 TT	---
3	O	122540.60 TT	---	---

8B   (8p) $^1\Sigma_u^+$

N	SYM	V = 0	V = 1	V = 2
0	P	122958.90 TT	---	---
1	U	122980.40 TT	124573.80 TT	126092.90 TT
2	P	123014.30 TT	---	---

9B   (9p) $^1\Sigma_u^+$

N	SYM	V = 0	V = 1	V = 2
0	P	123386.80 TT	124930.70 TT	---
1	O	123392.50 TT	124945.80 TT	126450.70 TT
2	P	123431.10 TT	125014.60 TT	---
3	O	123474.60 TT	---	---

10B   (10p) $^1\Sigma_u^+$

N	SYM	V = 0	V = 1	V = 2
0	P	123648.80 TT	125195.30 TT	126708.40 TT
1	O	123639.90 TT	125213.90 TT	126721.90 TT
2	P	123675.00 TT	125249.50 TT	126758.40 TT
3	O	123703.80 TT	---	---

11B   (11p) $^1\Sigma_u^+$

N	SYM	V = 0	V = 1	V = 2
0	P	123854.80 TT	---	---
1	O	123836.20 TT	125405.80 TT	126931.30 TT
2	P	123872.50 TT	---	---
3	O	123897.20 TT	---	---

nB   (np) $^1\Sigma_u^+$

BAND	N	SYM	V = 0	V = 1	V = 2
12B	1	O	123981.90 TT	125554.40 TT	127069.20 TT
13B	1	O	124100.90 TT	125668.70 TT	127189.50 TT
14B	1	O	124178.30 TT	125770.10 TT	127281.70 TT
15B	1	O	---	125826.60 TT	127343.00 TT
16B	1	O	124316.20 TT	125892.40 TT	---
17B	1	O	124367.70 TT	125944.00 TT	127455.40 TT
18B	1	O	---	125987.30 TT	127499.30 TT
19B	1	O	124440.10 TT	---	---
20B	1	O	124472.30 TT	126050.20 TT	127561.00 TT
21B	1	O	124499.70 TT	126076.40 TT	127588.10 TT
22B	1	O	124518.60 TT	126092.90 TT	---
23B	1	O	124539.60 TT	126116.50 TT	127627.80 TT
24B	1	O	124555.10 TT	126135.00 TT	---

For values to n=46 see TT

∞	0	0	124746.60 TT	126324.30 TT	127836.20 TT

2C⁺   C(2p) $^1\Pi_u^+$

N	SYM	V = 0	#	V = 1	#	V = 2	#	V = 3	#	V = 4	#	V = 5	
1	O	99425.08	18	101085.51	24	102678.09	20	104203.95	26	105662.60	7	107059.64	BH
2	P	99487.06	16	101145.30	23	102735.72	24	104259.28	26	105720.28	5	107110.99	BH
3	O	99579.71	17	101234.74	28	102821.70	31	104341.43	28	105799.08	3	107187.82	BH
4	P	99702.64	14	101353.23	22	102935.74	6	104446.41	6	105904.48	2	107289.25	BH
5	O	99855.30	15	101500.37	18	103076.67	4	---		106035.70	BH	107415.10	BH
6	P	100037.14	10	101675.46	8	---		---		---		---	
7	O	100247.34	11	---		---		---		---		---	
8	P	100484.66	4	---		---		---		---		---	
9	O	100750.94	5	---		---		---		---		---	
10	P	101041.01	3	---		---		---		---		---	
11	O	101356.23	2	---		---		---		---		---	

N	SYM	V = 6	V = 7	V = 8	V = 9	V = 10	V = 11
1	O	108389.86 BH	109655.35 DH	110855.88 DH	111992.29 DH	113060.74 DH	114061.18 DH
2	P	108439.03 BH	109702.20 DH	110899.33 DH	112035.45 DH	113101.49 DH	114099.29 DH
3	O	108512.43 BH	109771.70 DH	110955.26 DH	112099.42 DH	---	114155.93 DH
4	P	108609.33 BH	109863.00 DH	111061.38 DH	112183.83 DH	113241.58 DH	114230.53 DH
5	O	108729.04 BH	109965.18 DH	111169.93 DH	112288.06 DH	113339.76 DH	114321.08 DH
6	P	---	110124.71 DH	111300.00 DH	112411.78 DH	113456.01 DH	114414.39 DH
7	O	---	110280.64 DH	111449.85 DH	112552.59 DH	---	114571.47 DH
8	P	---	---	111617.86 DH	---	---	---

N	SYM	V = 12	V = 13	V = 14	V = 15	V = 16	V = 17
1	O	114991.13 DH	115847.69 DH	116626.76 DH	117322.72 DH	117929.47 DH	118436.86 DH
2	P	115026.59 DH	115880.11 DH	---	117357.20 DH	117948.11 DH	118454.77 DH
3	O	---	115926.41 DH	116709.67 DH	---	117993.94 DH	118491.62 DH
4	P	115146.55 DH	116004.79 DH	116767.25 DH	117449.50 DH	118041.19 DH	118531.00 DH
5	O	115251.72 DH	116081.88 DH	116840.95 DH	117515.91 DH	---	118579.92 DH
6	P	---	---	116928.09 DH	117594.43 DH	---	118643.68 DH
7	O	115465.31 DH	---	117028.00 DH	---	---	---

N	SYM	V = 18
1	O	---
2	P	118846.94 DH
3	O	118872.94 DH
4	P	118903.05 DH
5	O	118943.57 DH

2C⁻   C(2p) $^1\Pi_u^-$

N	SYM	V = 0	#	V = 1	#	V = 2	#	V = 3	#	V = 4	#	V = 5	
1	P	99424.77	14	101085.20	15	102677.77	15	104203.70	16	105663.88	11	107059.03	BH
2	O	99486.24	16	101144.36	21	102734.74	22	104258.49	24	105716.52	14	107109.62	BH
3	P	99578.08	14	101232.88	25	102819.93	22	104340.41	24	105795.21	13	107185.03	BH
4	O	99699.99	14	101350.29	21	102932.99	20	104449.11	18	105899.71	11	107285.36	BH
5	P	99851.49	14	101496.20	17	103073.41	17	104584.24	14	106029.50	6	107409.79	BH
6	O	100031.99	9	101670.12	13	103240.73	9	104745.12	8	106184.00	7	107558.15	BH
7	P	100240.80	8	101871.14	4	103434.26	5	---		106362.80	3	107732.63	BH
8	O	100477.22	6	102098.83	5	---		---		---		---	
9	P	100740.42	6	---		---		---		---		---	
10	O	101028.93	3	---		---		---		---		---	
11	P	101342.94	1	---		---		---		---		---	

N	SYM	V = 6	V = 7	V = 8	V = 9·	V = 10	V = 11
1	P	108389.44 BH	109654.89 DH	110855.87 DH	111991.50 DH	113060.39 DH	114060.80 DH
2	O	108437.90 BH	109701.50 DH	110899.57 DH	112033.49 DH	113100.10 DH	114098.31 DH
3	P	108510.17 BH	109770.86 DH	110966.02 DH	112096.10 DH	113159.46 DH	114154.61 DH
4	O	108606.36 BH	109862.44 DH	111053.52 DH	112179.23 DH	113238.45 DH	114228.77 DH
5	P	---	109976.22 DH	111161.99 DH	112282.69 DH	113336.12 DH	114320.97 DH
6	O	---	110111.86 DH	111291.44 DH	112405.51 DH	113452.45 DH	114431.00 DH
7	P	---	110268.91 DH	111441.10 DH	---	113586.87 DH	---
8	O	---	110446.17 DH	---	---	---	---

2C⁻   C(2p) $^1\Pi_u^-$ *Continued*

N	SYM	V = 12		V = 14		V = 15		V = 16		V = 17		V = 18	
1	P	114991.65	DH	115847.74	DH	116627.22	DH	117323.63	DH	117930.27	DH	118437.28	DH
2	O	115025.88	DH	115880.34	DH	116657.15	DH	117350.73	DH	117954.19	DH	118457.66	DH
3	P	115078.61	DH	115929.13	DH	116702.03	DH	117391.37	DH	117990.11	DH	118486.50	DH
4	O	115148.22	DH	115993.85	DH	116761.54	DH	117445.01	DH	118037.24	DH	118527.86	DH
5	P	115234.58	DH	116073.92	DH	116834.85	DH	---		118095.43	DH	118576.92	DH
6	O	115337.19	DH	---		---		---		---		---	

3C⁺   D(3p) $^1\Pi_u^i$

N	SYM	V = 0	#	V = 1	#	V = 2	#	V = 3	#
1	O	113223.11	4	114825.24	4	116359.69	6	117831.57	6
2	P	113283.58	4	114885.42	4	116416.10	6	117886.98	8
3	O	113373.82	4	114974.72	3	116500.19	6	117969.06	7
4	P	113493.22	4	---		116611.51	6	118077.11	1
5	O	113641.24	3	---		---		---	

3C⁻   D(3p) $^1\Pi_u^-$

N	SYM	V = 0	#	V = 1	#	V = 2	#	V = 3	#	V = 4	#	V = 5	
1	P	113222.52	3	114823.61	3	116359.00	3	117830.18	3	119238.57	6	120585.09	LL
2	O	113282.07	3	114880.89	3	116414.11	3	117883.24	3	119289.47	5	---	
3	P	113370.98	3	114966.58	3	116496.51	3	117962.46	3	119365.28	3	120706.90	LL
4	O	113489.10	3	115080.18	3	116605.85	3	118067.65	2	119466.58	3	120803.77	LL
5	P	113635.71	2	115221.36	3	116741.74	2	---		---		---	
6	O	113810.52	2	115389.67	3	116902.68	2	---		---		---	
7	P	114012.69	1	---		---		---		---		---	
8	O	114241.52	1	---		---		---		---		---	
9	P	114496.23	1	---		---		---		---		---	
10	O	114775.65	1	---		---		---		---		---	
11	P	---		---		---		---		---		---	
12	O	115405.99	1	---		---		---		---		---	

N	SYM	V = 6		V = 7		V = 8		V = 9		V = 10		V = 11	
1	P	121870.46	LL	123095.84	LL	124261.64	LL	125367.96	LL	126415.01	LL	127402.63	LL
2	O	121917.30	LL	123140.70	LL	124304.54	LL	125408.79	LL	126453.82	LL	127439.44	LL
3	P	121981.37	LL	123207.79	LL	124368.57	LL	125469.95	LL	126512.00	LL	127494.57	LL
4	O	122080.38	LL	123296.73	LL	124453.63	LL	125551.65	LL	126589.24	LL	127567.85	LL

N	SYM	V = 12	
1	P	128330.03	LL
2	O	128375.03	LL

4C⁺   D'(4p) ¹Π$_u^+$

N	SYM	V = 0	V = 1	V = 2	V = 3	V = 4	V = 5
1	O	118190.30 TT	119775.70 TT	121295.80 TT	122739.40 TT	124153.50 TT	125486.90 TT
2	P	118251.20 TT	119832.00 TT	121348.10 TT	122775.10 TT	124208.60 TT	125537.40 TT
3	O	118341.50 TT	119917.90 TT	121425.80 TT	122932.90 TT	124290.60 TT	125613.80 TT
4	P	118462.00 TT	120031.20 TT	121529.60 TT	123046.30 TT	124397.00 TT	125712.00 TT
5	O	118611.20 TT	120170.80 TT	121655.60 TT	---	124528.90 TT	125835.10 TT
6	P	118787.70 TT	120336.50 TT	121806.20 TT	---	---	---

N	SYM	V = 6	V = 7	V = 8	V = 9	V = 10
1	O	126761.10 TT	127974.00 TT	129138.60 TT	130227.30 TT	131274.60 TT
2	P	126807.90 TT	128011.90 TT	129182.80 TT	130267.10 TT	131314.20 TT
3	O	126877.80 TT	128067.10 TT	129249.20 TT	130324.90 TT	131373.40 TT
4	P	126971.20 TT	128140.50 TT	129347.00 TT	---	---
5	O	127082.30 TT	---	129454.30 TT	---	---

4C⁻   D'(4p) ¹Π$_u^-$

N	SYM	V = 0	V = 1	V = 2	V = 3	V = 4	V = 5
1	P	118189.10 TT	119779.50 TT	121297.00 TT	122755.00 TT	124150.70 TT	125485.60 TT
2	O	118248.00 TT	119832.30 TT	121351.40 TT	122807.50 TT	124201.00 TT	125533.80 TT
3	P	118336.10 TT	119917.00 TT	121433.20 TT	122885.80 TT	124276.80 TT	125606.50 TT
4	O	118453.10 TT	120030.20 TT	121541.70 TT	122990.30 TT	124376.80 TT	125702.80 TT
5	P	118599.00 TT	120169.80 TT	121676.10 TT	123120.80 TT	124501.60 TT	---
6	O	---	120322.30 TT	---	---	---	---

N	SYM	V = 6	V = 7	V = 8	V = 9	V = 10
1	P	126760.90 TT	127977.60 TT	129137.20 TT	130229.00 TT	131273.50 TT
2	O	126807.40 TT	128022.10 TT	129179.90 TT	130270.60 TT	131312.60 TT
3	P	126876.90 TT	128088.90 TT	129244.10 TT	130330.50 TT	131370.90 TT
4	O	126969.20 TT	128176.90 TT	129328.80 TT	130411.80 TT	131448.50 TT
5	P	127083.80 TT	128293.90 TT	---	---	---

5C⁺   D''(5p) ¹Π$_u^+$

N	SYM	V = 0	V = 1	V = 2	V = 3	V = 4	V = 5
1	O	120528.80 TT	122109.90 TT	123625.80 TT	125079.50 TT	126470.00 TT	127806.10 TT
2	P	120592.20 TT	122170.00 TT	123683.00 TT	125133.00 TT	126521.80 TT	127851.10 TT
3	O	120687.00 TT	122259.60 TT	123767.80 TT	125213.30 TT	126597.00 TT	127921.80 TT
4	P	120812.40 TT	122378.40 TT	123880.20 TT	125451.20 TT	126697.10 TT	128015.50 TT
5	O	---	122524.50 TT	124019.50 TT	---	---	---

5C⁻   D''(5p) ¹Π$_u^-$

N	SYM	V = 0	V = 1	V = 2	V = 3	V = 4	V = 5
1	P	120526.40 TT	122108.00 TT	123624.90 TT	125079.00 TT	126471.40 TT	127804.60 TT
2	O	120586.10 TT	122164.50 TT	123679.20 TT	125128.90 TT	126521.80 TT	127853.10 TT
3	P	120672.90 TT	122249.10 TT	123760.70 TT	125209.20 TT	126596.40 TT	127924.60 TT
4	O	120789.60 TT	122361.50 TT	123868.90 TT	125313.40 TT	---	128021.20 TT
5	P	---	122503.30 TT	---	---	---	---

$6C^+$ $(6p)\ ^1\Pi_u^+$

N	SYM	V = 0	V = 1	V = 2	V = 3	V = 4
1	O	121813.20 TT	---	124903.00 TT	126353.00 TT	127739.30 TT
2	P	121872.50 TT	---	124960.80 TT	126409.90 TT	127793.00 TT
3	O	121968.00 TT	---	125038.90 TT	126494.30 TT	127873.30 TT

$6C^-$ $(6p)\ ^1\Pi_u^-$

N	SYM	V = 0	V = 1	V = 2	V = 3	V = 4
1	P	121808.70 TT	123386.20 TT	124900.20 TT	126350.60 TT	127737.40 TT
2	O	121867.90 TT	123442.90 TT	124954.60 TT	126402.90 TT	127787.60 TT
3	P	121954.20 TT	123527.40 TT	125036.10 TT	126481.40 TT	127863.80 TT
4	O	---	---	125143.60 TT	126584.50 TT	127961.90 TT

$7C^+\ (7p)\ ^1\Pi_u^+$ $8C^+\ (8p)\ ^1\Pi_u^+$ $9C^+\ (9p)\ ^1\Pi_u^+$

N	SYM	V = 0	V = 0	V = 0
1	O	122601.20 TT	123117.60 TT	123500.30 TT
2	P	122654.70 TT	123182.90 TT	123565.70 TT

nC^- $(np)\ ^1\Pi_u^-$

BAND	N	SYM	V = 0	V = 1	V = 2
7C-	1	P	122588.00 TT	124166.00 TT	125679.50 TT
7C-	2	O	122646.50 TT	124222.40 TT	125741.30 TT
8C-	1	P	123095.90 TT	124673.30 TT	126185.80 TT
8C-	2	O	123154.50 TT	124729.80 TT	126240.30 TT
9C-	1	P	123446.40 TT	125023.10 TT	126532.10 TT
9C-	2	O	123505.40 TT	---	126588.80 TT
10C-	1	P	123696.70 TT	125273.90 TT	126784.10 TT
10C-	2	O	123754.70 TT	125329.00 TT	126839.80 TT
11C-	1	P	123882.60 TT	125459.40 TT	126970.80 TT
11C-	2	O	123941.10 TT	125515.60 TT	127024.30 TT
12C-	1	P	124025.60 TT	125600.70 TT	127111.40 TT
12C-	2	O	124081.70 TT	---	127166.00 TT
13C-	1	P	124135.00 TT	125711.70 TT	127223.00 TT
13C-	2	O	124193.40 TT	---	127275.50 TT
14C-	1	P	124222.60 TT	---	127310.60 TT
14C-	2	O	---	125855.20 TT	127364.30 TT
15C-	1	P	---	125870.10 TT	127381.20 TT
15C-	2	O	---	125926.80 TT	127435.70 TT

nC⁻   (np) ¹Πᵤ⁻   *Continued*

BAND	N	SYM	V = 0		V = 1		V = 2	
16C-	1	P	124351.90	TT	125928.30	TT	---	
16C-	2	O	---		125985.20	TT	---	
17C-	1	P	124400.10	TT	125976.00	TT	127487.50	TT
17C-	2	O	---		126032.60	TT	--- .	
18C-	1	P	124440.50	TT	126017.00	TT	127527.90	TT
19C-	1	P	---		126051.10	TT	127562.40	TT
20C-	1	P	124503.80	TT	---		---	
21C-	1	P	124529.10	TT	126105.20	TT	---	
22C-	1	P	124551.00	TT	126127.00	TT	---	
23C-	1	P	124570.40	TT	---		---	
24C-	1	P	124587.10	TT	---		---	
∞	1	P	124776.0±0.6		126352.2±0.6		127863.4±0.4	
∞	2	O	124834 ±1		126409 ±1		127918 ±1	

3E⁺   I(3d) ¹Πg⁺

N	SYM	V = 0	#	V = 1	#	V = 2	#	V = 3	#	V = 4	#
1	P	112343.73	11	113855.22	14	115298.89	19	116667.16	26	117947.55	21
2	O	112422.98	14	113920.05	17	115359.84	25	116725.01	30	117991.88	32
3	P	112532.53	13	114011.83	14	115444.91	21	116807.44	5	---	
4	O	112668.48	14	114122.66	13	115549.71	16	116912.50	4	---	
5	P	112826.50	10	114269.31	9	115681.96	3	---		118246.31	1
6	O	113012.75	10	114435.12	4	---		---		---	
7	P	113217.36	7	114619.21	3	---		---		---	
8	O	113438.05	8	114831.91	2	---		---		---	
9	P	113693.72	7	115078.71	2	---		---		---	
10	O	113955.53	1	---		---		---		---	

3E⁻   I(3d) ¹Πg⁻

N	SYM	V = 0	#	V = 1	#	V = 2	#	V = 3	#	V = 4	#	V = 5	#
1	O	112324.99	9	113845.48	10	115289.44	16	116653.70	18	117931.81	18	119110.32	16
2	P	112373.66	8	113893.93	10	115337.26	16	116700.60	19	117977.49	18	119154.63	18
3	O	112447.32	10	113966.83	10	115409.02	19	116770.82	21	118045.85	21	119220.99	17
4	P	112546.44	8	114064.50	9	115504.81	14	116864.38	18	118136.82	16	119309.27	14
5	O	112671.52	8	114186.97	9	115624.58	14	116981.10	19	118250.20	15	119419.44	15
6	P	112822.52	8	114334.28	8	115768.13	11	117120.73	12	118385.78	14	119551.32	7
7	O	112999.43	7	114506.22	7	115935.28	12	117283.05	11	118543.16	12	119704.79	6
8	P	113201.86	7	114702.59	5	116125.77	5	117467.59	5	118722.15	4	119878.90	2
9	O	113429.33	6	114922.83	5	116338.90	3	---		118922.29	2	---	
10	P	113681.27	5	---		---		---		---		---	
11	O	113956.89	4	---		116831.43	2	---		---		---	
12	P	114255.05	1	---		---		---		---		---	
13	O	114587.84	1	---		---		---		---		---	

N	SYM	V = 6	#
1	O	120158.21	5

4E⁺   R(4d) ¹Π_g⁺

N	SYM	V = 0	#
1	P	117870.64	2
2	O	117938.05	8
3	P	118027.94	4
4	O	118133.49	4
5	P	118269.52	2
6	O	118437.53	5

5E⁻   (5d) ¹Π_g⁻

N	SYM	V = 0	#
1	O	120371.19	6
2	P	120499.43	2

4E⁻   R(4d) ¹Π_g⁻

N	SYM	V = 0	#	V = 1	#	V = 2	#	V = 3	#	V = 4	#	V = 5	#
1	O	117835.24	8	119384.55	10	120863.53	12	122271.50	11	123606.35	8	124860.18	6
2	P	117871.96	4	119421.26	11	120902.68	7	122312.15	11	123647.76	7	124904.87	9
3	O	117928.46	6	119482.31	9	120964.69	11	122374.75	13	123710.60	9	124967.09	5
4	P	118004.89	3	119569.45	11	121050.84	7	122460.26	9	123794.44	7	---	
5	O	118109.86	10	119683.06	9	121161.87	9	122568.99	9	123901.41	5	---	
6	P	118250.16	3	119823.12	7	121297.88	6	122701.37	5	---		---	
7	O	118450.21	1	119989.35	4	121458.67	6	122856.98	3	124181.40	3	---	
8	P	---		120180.67	1	---		---		---		---	

N	SYM	V = 6	#	V = 7	#
1	O	126032.60	4	---	
2	P	126073.30	4	---	
3	O	126134.31	4	127199.55	4
4	P	126215.57	2	---	
5	O	126317.06	3	---	
6	P	126438.44	1	---	
7	O	126579.70	1	---	

3F⁺   J(3d) ¹Δ_g⁺

N	SYM	V = 0	#	V = 1	#	V = 2	#	V = 3	#	V = 4	#
2	O	112762.81	14	114349.03	6	115871.68	24	117332.41	21	118730.98	8
3	P	112865.02	13	114438.78	5	115962.43	16	117415.19	14	118807.16	3
4	O	113000.34	16	114565.67	5	116079.38	17	117524.69	18	118908.16	7
5	P	113167.70	9	114731.66	5	116226.22	12	117659.95	3	---	
6	O	113362.51	8	---		116402.51	5	117808.08	2	---	
7	P	113603.64	3	---		---		---		---	
8	O	113852.57	5	---		---		---		---	
9	P	114073.71	1	---		---		---		---	

3F⁻   J(3d) ¹Δ_g⁻

N	SYM	V = 0	#	V = 1	#	V = 2	#	V = 3	#	V = 4	#
2	P	112762.35	10	114349.09	6	115872.04	12	117332.38	16	118731.08	5
3	O	112862.67	10	114443.28	7	115960.32	15	117414.88	14	118807.41	8
4	P	112994.42	10	114567.26	6	116076.92	14	117524.07	10	---	
5	O	113156.29	13	114720.22	9	116220.91	13	117660.17	6	---	
6	P	113347.10	10	114900.86	2	116391.30	7	---		---	
7	O	113565.45	8	115108.23	4	116587.39	4	---		---	
8	P	113810.43	5	---		---		---		---	
9	O	114080.76	1	---		---		---		---	

2a   a(2s) $^3\Sigma_g^+$

N	SYM	V = 0	#	V = 1	#	V = 2	#	V = 3	#	V = 4	#	V = 5	#
0	O	95348.22	15	97163.12	18	98908.93	18	100587.20	18	102199.29	13	103746.29	10
1	P	95381.84	32	97195.57	41	98940.24	41	100617.41	37	102228.41	32	103774.32	24
2	O	95418.98	41	97260.38	48	99002.79	51	100677.71	47	102286.52	39	103830.30	27
3	P	95549.32	34	97357.26	47	99096.25	44	100767.85	44	102373.40	33	103913.93	25
4	O	95682.54	36	97485.84	43	99220.32	45	100887.49	42	102488.67	37	104024.97	28
5	P	95848.05	27	97645.60	35	99374.46	37	101036.12	31	102631.92	27	104162.84	22
6	O	96045.30	21	97835.97	31	99558.12	34	101213.19	26	102802.52	23	104327.13	19
7	P	96273.46	16	98056.18	21	99770.54	19	101417.98	16	102999.87	15	104517.04	11
8	O	96531.78	15	98305.46	22	100010.99	18	101649.79	15	103223.13	9	104731.99	9
9	P	96819.24	10	98582.85	17	100278.52	14	101907.67	9	103471.01	3	104970.27	1
10	O	97134.91	11	98887.45	14	100572.27	9	102190.80	6	103744.25	4	105232.60	1
11	P	97477.69	7	99218.13	6	100891.15	4	102498.03	3	104040.04	2	---	
12	O	97846.43	6	99573.94	3	101234.13	3	102825.50	3	104355.20	2	---	
13	P	98239.95	5	99953.41	3	101600.11	3	103176.39	2	---		---	
14	O	98657.03	5	100355.60	3	101987.83	2	103547.20	2	---		---	
15	P	99096.65	6	100779.61	3	102396.29	2	---		---		---	
16	O	99557.02	5	101223.43	2	102823.86	2	---		---		---	
17	P	100037.34	4	101686.59	2	---		---		---		---	
18	U	100535.66	3	102166.89	2	---		---		---		---	

N	SYM	V = 6	#	V = 7	#	V = 8	#	V = 9	#	V = 10	#
0	O	105229.01	7	106648.02	5	108003.68	4	109295.61	1	---	
1	P	105256.00	19	106674.00	17	108028.54	11	109319.54	4	110546.48	2
2	O	105309.82	23	106725.72	15	108078.14	12	109367.09	4	110591.96	2
3	P	105390.30	20	106803.03	11	108152.29	13	109438.12	3	110659.80	2
4	O	105497.07	20	106905.61	11	108250.58	12	109532.17	4	110749.95	1
5	P	105629.66	17	107032.95	7	108372.23	4	109649.17	3	110861.92	2
6	O	105787.65	16	107184.68	6	108518.64	2	109788.36	1	---	
7	P	105970.25	8	107360.11	3	---		---		---	
8	O	106176.93	6	107558.92	2	---		---		---	
9	P	106406.03	1	---		---		---		---	

3a   h(3s) $^3\Sigma_g^+$

N	SYM	V = 0	#	V = 1	#	V = 2	#	V = 3	#	V = 4	#
0	O	---		---		115420.15	1	116936.51	1	118390.50	2
1	P	---		---		115449.64	2	116964.05	2	118416.82	2
2	O	---		---		115508.38	2	117019.05	3	118469.29	4
3	P	---		---		115596.18	3	117101.21	3	118547.66	4
4	O	---		---		115712.36	2	117210.11	3	118651.50	3
5	P	---		---		---		---		118780.50	3

3b   e(3p) $^3\Sigma_u^+$

N	SYM	V = 0	#	V = 1	#	V = 2	#	V = 3	#	V = 4	#	V = 5	#
0	P	106997.40	5	108485.71	5	109906.48	4	111259.38	6	112543.35	6	113756.31	5
1	O	107024.39	10	108511.64	10	109931.36	10	111283.18	11	112566.07	9	113778.00	12
2	P	107078.25	10	108563.38	13	109980.99	9	111330.69	12	112611.41	10	113821.30	12
3	O	107158.80	15	108640.78	14	110055.22	11	111401.72	12	112679.24	12	113886.12	12
4	P	107265.74	10	108743.51	11	110153.75	10	111496.00	11	112769.20	10	113972.59	10
5	O	107398.71	10	108871.24	11	110276.20	10	111613.16	11	112881.04	11	114082.34	10
6	P	107557.14	8	109023.41	10	110422.13	9	111752.77	8	113014.27	8	114197.90	9
7	O	107740.60	7	109199.60	9	110591.05	9	111914.32	8	113168.41	8	114347.37	7
8	P	107948.32	6	109399.07	8	110782.26	8	112097.21	7	113342.85	6	---	
9	O	108179.67	6	109621.21	8	110995.19	6	112300.78	7	113537.02	6	---	
10	P	108433.83	5	109865.22	6	111228.97	4	112524.25	3	113750.19	3	---	
11	O	108710.06	4	110130.31	5	111482.94	3	112766.91	4	113982.12	2	---	
12	P	109007.34	4	110415.60	4	111756.13	2	113027.88	1	---		---	
13	O	109324.78	3	110720.17	5	112044.75	2	113306.31	1	---		---	
14	P	109661.49	3	111043.05	5	112351.96	2	---		---		---	
15	O	110016.36	2	111383.33	4	112674.77	2	---		---		---	
16	P	110388.72	2	111740.14	4	113023.89	1	---		---		---	
17	O	110776.85	2	112112.01	4	---		---		---		---	
18	P	111180.37	2	112498.49	2	---		---		---		---	
19	O	111597.37	2	112897.62	1	---		---		---		---	

N	SYM	V = 6	#	V = 7	#	V = 8	#	V = 9	#	V = 10	#
0	P	114894.86	4	115953.55	5	116923.50	7	117790.66	5	118529.59	4
1	O	114915.26	10	115972.72	10	116941.36	13	117806.70	12	118543.50	11
2	P	114955.94	11	116010.99	10	116976.96	14	117838.66	12	118571.26	10
3	O	115016.79	10	116068.50	9	117030.17	14	117886.41	12	118612.56	11
4	P	115097.52	11	116143.81	6	117100.75	12	117949.57	12	118666.97	7
5	O	115197.85	11	116237.99	8	117188.72	11	118027.84	10	118734.08	3
6	P	115317.29	10	116349.96	7	117294.54	7	118120.62	7	---	
7	O	115455.41	10	116479.29	7	117422.31	2	118227.39	4	---	
8	P	115611.58	6	116625.27	1	---		---		---	
9	O	---		116789.15	1	---		---		---	

4b   f(4p) $^3\Sigma_u^+$

N	SYM	V = 0	#	V = 1	#	V = 2	#
0	P	115894.25	2	117446.48	3	118933.17	3
1	O	115922.44	3	117473.27	6	118958.86	8
2	P	115978.69	3	117526.74	6	119010.18	8
3	O	116062.54	4	117606.82	6	119086.98	8
4	P	116174.73	3	117713.20	6	---	
5	O	116313.68	2	117846.46	1	---	
6	P	116481.13	1	---		---	

2c$^+$ c(2p) $^3\Pi_u^+$

N	SYM	V = 0	#	V = 1	#	V = 2	#	V = 3	#	V = 4	#	V = 5	#
1	O	95215.63	23	96897.05	14	98516.53	11	100075.35	11	101574.73	5	103015.57	1
2	P	95276.65	27	96956.05	17	98573.59	15	100130.41	15	101627.78	7	103066.78	1
3	O	95367.85	30	97044.25	20	98658.74	16	100212.68	15	101707.36	6	---	
4	P	95488.92	33	97161.29	17	98771.84	13	100321.91	8	101812.70	7	---	
5	O	95639.35	31	97306.74	18	98912.40	13	100457.68	9	101943.59	5	---	
6	P	95818.74	25	97480.05	14	99079.84	7	100619.36	5	102099.64	4	---	
7	O	96026.24	17	97680.61	10	99273.55	9	100806.40	7	---		---	
8	P	96261.36	10	97907.81	6	99493.01	4	101018.21	5	---		---	
9	O	96522.91	8	98160.60	5	99737.20	3	101253.90	3	---		---	
10	P	96810.47	5	98438.07	2	100005.37	5	---		---		---	
11	O	97122.53	6	98694.17	2	---		---		---		---	
12	P	97458.70	4	---		---		---		---		---	
13	O	97817.38	3	---		---		---		---		---	
14	P	98198.00	2	---		---		---		---		---	
15	O	98598.99	2	---		---		---		---		---	

$$2c^- \qquad c(2p)\ ^3\Pi_u^-$$

N	SYM	V = 0	#	V = 1	#	V = 2	#	V = 3	#	V = 4	#	V = 5	#
1	P	95215.63	11	96897.05	8	98516.53	7	100075.35	5	101574.73	2	103015.57	2
2	O	95276.66	17	96956.04	14	98573.51	11	100130.37	9	101627.77	6	103066.79	1
3	P	95367.88	19	97044.21	16	98658.71	12	100212.60	10	101707.10	3	103143.28	1
4	O	95488.98	18	97161.26	15	98771.70	13	100321.73	12	101812.40	3	103244.66	1
5	P	95639.55	17	97306.72	12	98912.23	10	100457.41	9	101943.26	4	---	
6	O	95818.88	16	97480.05	10	99079.72	5	100618.98	5	---		---	
7	P	96026.51	11	97680.61	8	99273.43	5	100806.05	5	---		---	
8	O	96261.61	8	97907.77	6	99492.69	5	101017.71	4	---		---	
9	P	96523.43	7	98160.72	4	99737.00	4	101253.55	1	---		---	
10	O	96810.90	7	98438.51	3	100004.94	3	101512.82	1	---		---	
11	P	97123.47	6	98739.79	1	100257.58	1	---		---		---	
12	O	97459.43	4	---		---		---		---		---	
13	P	97818.66	3	---		---		---		---		---	
14	O	98199.37	5	---		---		---		---		---	
15	P	98600.75	1	---		---		---		---		---	

$$3c^+ \qquad d(3p)\ ^3\Pi_u^+$$

N	SYM	V = 0	#	V = 1	#	V = 2	#	V = 3	#	V = 4	#
1	O	112044.09	4	113656.60	7	115205.51	10	116692.01	10	118117.90	10
2	P	112103.82	4	113714.07	8	115261.22	6	116745.52	9	118169.62	10
3	O	112193.13	4	113799.91	8	115344.47	10	116825.43	10	118246.84	10
4	P	112311.64	3	113913.39	7	115454.89	8	116931.30	10	118349.17	10
5	O	112458.90	4	114052.00	7	115592.00	7	117062.44	9	118476.11	9
6	P	112634.27	4	114232.26	3	115755.23	6	117217.13	5	118626.85	9
7	O	112837.14	4	114424.90	4	115943.90	6	117394.86	1	118799.87	9
8	P	113066.65	4	114645.50	4	116157.26	5	---		---	
9	O	113322.04	3	114891.48	3	116394.55	4	---		---	
10	P	113602.25	3	---		116654.70	3	---		---	
11	O	113905.79	2	---		116936.72	1	---		---	
12	P	114233.63	1	---		117239.62	1	---		---	

$$3c^- \qquad d(3p)\ ^3\Pi_u^-$$

N	SYM	V = 0	#	V = 1	#	V = 2	#	V = 3	#	V = 4	#	V = 5	#
1	P	112043.96	2	113656.49	4	115205.29	5	116691.87	5	118117.65	5	119483.88	7
2	O	112103.52	3	113713.89	4	115260.56	5	116745.12	5	118168.90	5	119533.16	7
3	P	112192.50	2	113799.69	4	115343.23	5	116824.69	5	118245.51	5	119606.83	6
4	O	112310.66	2	113913.57	4	115452.95	5	116930.35	5	118347.17	5	119704.57	6
5	P	112457.46	2	114055.07	4	115589.28	4	117061.63	5	118473.48	5	119826.00	5
6	O	112632.41	2	114223.70	4	115751.71	4	117218.08	5	118623.97	5	119970.67	6
7	P	112834.78	2	114418.72	3	115939.57	4	117398.88	4	118797.96	3	120137.96	5
8	O	113063.92	2	114639.53	2	116152.26	3	117603.61	4	118994.92	4	120327.27	4
9	P	113318.94	2	114885.25	2	116388.89	3	117831.37	2	119213.47	1	120537.14	3
10	O	113598.97	2	115155.05	2	116648.75	2	118081.48	3	119454.55	1	120768.58	2
11	P	---		115448.02	2	---		118352.84	2	119715.47	1	---	
12	O	114230.17	1	---		117230.52	1	118641.80	2	119993.49	1	---	
13	P	114579.33	1	116099.44	1	---		118951.67	1	---		---	
14	O	114949.36	1	116455.79	1	---		119278.92	1	---		---	
15	P	115339.42	1	---		---		---		---		---	
16	O	115747.89	1	---		---		---		---		---	
17	P	116174.07	1	---		---		---		---		---	
18	O	116616.11	1	---		---		---		---		---	

N	SYM	V = 6	#	V = 7	#	V = 8	#	V = 9	#	V = 10	#
1	P	120791.58	6	122041.66	6	123234.81	6	124371.51	4	125452.15	2
2	O	120838.92	6	122087.09	6	123278.38	6	124413.20	4	125492.00	2
3	P	120909.70	5	122155.02	6	123343.49	6	124475.48	2	125551.54	2
4	O	121003.61	5	122245.10	5	123429.79	6	124557.93	2	125630.35	2
5	P	121120.25	6	122357.02	5	123537.00	6	124661.48	1	125728.39	1
6	O	121259.19	4	122490.65	3	123664.74	5	---		---	
7	P	121419.90	3	122644.46	2	---		---		---	
8	O	121602.07	2	122818.97	1	---		---		---	

$$4c^+ \qquad k(4p)\ ^3\Pi_u^+$$

N	SYM	V = 0	#	V = 1	#	V = 2	#	V = 3	#	V = 4	#	V = 5	#
1	O	117701.42	4	119293.13	5	120820.56	5	122285.28	6	123688.82	6	125032.35	8
2	P	117761.68	3	119351.30	6	120876.47	6	122338.89	3	123740.09	6	125082.81	2
3	O	117851.69	4	119437.66	6	120960.08	6	122419.09	4	123816.83	6	125154.38	3
4	P	117970.96	3	119553.25	6	121071.24	2	122525.13	1	123918.37	6	125251.10	3
5	O	118118.94	2	119696.00	6	121208.00	3	---		124044.43	6	---	
6	P	118294.79	2	---		---		---		---		---	
7	O	118498.10	2	---		---		---		---		---	

$$4c^- \qquad k(4p)\ ^3\Pi_u^-$$

N	SYM	V = 0	#	V = 1	#	V = 2	#	V = 3	#	V = 4	#	V = 5	#
1	P	117700.76	2	119292.45	3	120819.98	3	122284.80	3	123688.47	3	125032.31	4
2	O	117759.79	1	119349.34	3	120874.72	3	122337.50	3	123739.12	2	125080.91	4
3	P	117848.08	2	119434.38	3	120956.58	3	122416.24	3	123814.83	3	125153.59	3
4	O	117965.24	2	119547.21	3	121065.30	3	122520.82	3	123915.43	3	125250.72	3
5	P	118110.87	2	119687.45	2	121200.18	2	122650.67	3	124040.22	3	125370.29	2
6	O	118284.31	2	119854.54	3	121361.08	1	122805.42	3	124189.00	3	125513.06	2
7	P	118485.05	2	120047.73	2	121566.72	1	122994.12	1	124360.62	2	---	
8	O	118712.22	2	120266.51	2	121776.67	1	---		---		---	
9	P	118964.91	1	-		---		---		---		---	
10	O	119241.48	1	---		---		---		---		---	

N	SYM	V = 6	#
1	P	126317.43	4
2	O	126364.16	4
3	P	---	
4	O	126526.85	3

$$5c^+ \qquad n(5p)\ ^3\Pi_u^+$$

N	SYM	V = 0	#	V = 1	#	V = 2	#
1	O	120278.34	4	121863.14	4	123384.03	4
2	P	120338.32	4	121920.44	4	123438.80	4
3	O	120427.86	4	122006.16	4	123520.76	4
4	P	120546.52	4	122119.77	4	123629.43	4
5	O	120693.74	1	122260.87	3	123764.45	2

$$5c^- \qquad n(5p)\ ^3\Pi_u^-$$

N	SYM	V = 0	#	V = 1	#	V = 2	#	V = 3	#
1	P	120277.83	2	121862.81	3	123383.90	3	124843.82	3
2	O	120336.67	2	121919.47	3	123438.51	3	124896.47	3
3	P	120424.67	2	122004.20	3	123520.09	3	124975.11	2
4	O	120541.50	2	122116.68	3	123628.40	3	125079.44	3
5	P	120686.65	2	122256.32	2	123762.90	2	---	
6	O	120859.52	2	---		123923.35	1	---	
7	P	121059.52	1	---		---		---	
8	O	121286.11	1	---		---		---	

6c⁺			u(6p) ³Π_u⁺	
N SYM	V = 0	#	V = 1	#
1 O	---		123244.99	2

6c⁻			u(6p) ³Π_u⁻			
N SYM	V = 0	#	V = 1	#	V = 2	#
1 P	121664.40	1	123243.96	3	124757.58	3
2 O	121723.20	1	123300.56	3	124811.91	3
3 P	121811.15	1	123385.17	3	124893.19	3
4 O	121927.66	1	123497.34	3	125001.07	2
5 P	122072.52	1	123636.74	2	125134.79	1
6 O	---		123802.91	2	125294.25	1

7c⁻			(7p) ³Π_u⁻	
N SYM	V = 0	#	V. = 1	#
1 P	122497.50	1	124075.80	1
2 O	122555.58	1	124132.44	1
3 P	---		124216.91	1
4 O	122759.95	1	124329.15	1
5 P	122904.27	1	124468.50	1

8c⁻		(8p) ³Π_ı	
N SYM	V = 0	#	
1 P	123034.38	1	
2 O	123093.14	1	
3 P	123180.85	1	
4 O	123297.22	1	

9c⁻		(9p) ³Π_u⁻	
N SYM	V = 0	#	
1 P	123402.28	1	
2 O	123460.69	1	
3 P	123548.62	1	
4 O	123664.94	1	
5 P	123809.06	1	

3d			g(3d) ³Σ_g⁺							
N SYM	V = 0	#	V = 1	#	V = 2	#	V = 3	#	V = 4	#
0 O	112065.02	2	113573.88	1	114997.83	2	116330.41	1	---	
1 P	112079.49	5	113590.83	6	115010.59	4	116344.91	3	---	
2 O	112109.33	9	113617.37	9	115038.79	6	116375.49	6	117624.80	3
3 P	112157.72	7	113663.32	9	115085.74	5	116424.36	6	117675.37	2
4 O	112228.23	6	113731.61	9	115153.83	6	116493.02	6	117745.47	2
5 P	112323.11	4	113823.80	8	115244.57	6	116583.14	4	117835.60	1
6 O	112443.68	4	113940.71	8	115358.76	6	116695.44	3	117946.79	1
7 P	112590.33	4	114082.62	4	115496.57	5	116830.07	2	---	
8 O	112762.87	3	114249.34	3	115658.05	3	116987.33	1	---	
9 P	112961.20	2	---		115843.18	3	117167.05	1	---	
10 O	113184.40	3	---		---		117369.22	1	---	
11 P	113432.26	2	---		---		---		---	
12 O	113703.38	2	---		---		---		---	
13 P	113998.23	2	---		---		---		---	

4d			p(4d) ³Σ_g⁺							
N SYM	V = 0	#	V = 1	#	V = 2	#	V = 3	#	V = 4	#
0 O	117705.16	1	---		---		---		---	
1 P	117713.82	4	---		---		---		---	
2 O	117723.85	7	119271.67	6	120748.82	8	122156.05	2	123493.39	2
3 P	117756.90	5	119304.60	5	120782.18	5	122190.03	2	123528.28	1
4 O	117817.14	6	119363.43	4	120839.95	4	122247.09	2	123584.90	1
5 P	117905.36	3	119449.02	4	120923.12	2	122328.06	2	123663.89	1
6 O	118021.62	3	119561.41	3	121031.85	1	122433.31	1	123765.75	1
7 P	118165.67	2	119700.29	1	121165.85	1	122562.66	1	123890.56	1
8 O	118337.08	1	119865.35	1	121324.80	1	122715.81	1	---	
9 P	118535.16	1	120056.11	1	---		---		---	
10 O	118759.05	1	---		---		---		---	

5d   (5d) $^3\Sigma_g^+$

N	SYM	V = 0	#
0	O	---	
1	P	---	
2	U	120284.27	2
3	P	120312.08	2
4	O	120369.78	1
5	P	120456.56	1
6	O	120572.08	1
7	P	120716.95	1
8	O	120887.42	1
9	P	121085.88	1
10	O	121310.46	1
11	P	121560.61	1
12	O	121834.93	1

6d   (6d) $^3\Sigma_g^+$

N	SYM	V = 0	#
0	O	---	
1	P	---	
2	O	121659.60	1
3	P	121686.19	1
4	O	121743.38	1
5	P	121830.10	1
6	O	121945.74	1
7	P	122087.96	1

7d   (7d) $^3\Sigma_g^+$

N	SYM	V = 0	#
0	O	---	
1	P	---	
2	O	122485.13	1
3	P	122511.85	1
4	O	122569.20	1
5	P	122656.16	1
6	O	122772.07	1

8d   (8d) $^3\Sigma_g^+$

N	SYM	V = 0	#
0	O	---	
1	P	---	
2	O	123017.78	1
3	P	123044.92	1
4	O	123102.70	1
5	P	123189.83	1
6	O	123305.93	1
7	P	123450.82	1

9d   (9d) $^3\Sigma_g^+$

N	SYM	V = 0	#
0	O	---	
1	P	---	
2	O	123382.47	3
3	P	123410.01	3
4	O	123467.84	5
5	P	123555.59	5
6	O	123672.61	5

3e+   i(3d) $^3\Pi_g^+$

N	SYM	V = 0	#	V = 1	#	V = 2	#	V = 3	#	V = 4	#
1	P	112346.24	4	113887.76	5	---		116692.82	1	117980.28	1
2	O	112434.68	6	113966.09	6	115381.35	5	116757.04	3	118053.04	1
3	P	112550.84	5	114074.02	7	115479.00	3	116850.08	2	118140.08	2
4	O	112691.80	6	114208.63	7	115602.96	5	116969.61	3	118250.96	1
5	P	112856.37	4	114367.89	7	115751.40	3	117113.46	2	118385.31	1
6	O	113043.99	5	114550.59	7	115945.41	1	117280.34	1	---	
7	P	113254.84	4	114756.14	6	116143.51	1	117469.00	2	---	
8	O	113488.69	3	114983.98	5	116333.09	1	---		---	
9	P	113745.69	3	---		---		---		---	
10	O	114025.10	2	---		---		---		---	
11	P	114326.95	1	---		---		---		---	

3e−   i(3d) $^3\Pi_g^-$

N	SYM	V = 0	#	V = 1	#	V = 2	#	V = 3	#	V = 4	#
1	O	112317.13	4	113845.27	5	115301.01	6	116683.29	2	117975.17	2
2	P	112365.66	5	113893.63	9	115348.78	9	116730.18	2	118038.20	1
3	O	112439.25	5	113966.40	8	115420.39	8	116800.31	3	118103.67	1
4	P	112538.45	5	114063.94	7	115516.05	7	116893.90	2	118194.84	1
5	O	112663.36	4	114186.37	7	115635.72	4	117010.64	2	---	
6	P	112814.47	5	114333.69	5	115779.32	2	117150.42	3	---	
7	O	112991.34	4	114505.73	4	115946.70	2	117313.01	3	---	
8	P	113193.93	4	114702.24	4	116137.33	1	117496.80	1	---	
9	O	113421.56	4	114922.61	3	116350.58	2	117700.04	1	---	
10	P	113673.88	3	115166.51	1	---		---		---	
11	O	113949.56	3	115433.06	2	---		---		---	
12	P	114248.56	3	---		---		---		---	
13	O	114568.94	2	---		---		---		---	
14	P	114910.84	1	---		---		---		---	

4e⁺   r(4d) ³Π_g⁺

N	SYM	V = 0	#
1	P	---	
2	O	117951.63	4
3	P	118041.75	4
4	O	118159.06	3
5	P	118304.10	4
6	O	118476.42	3
7	P	118675.79	3

4e⁻   r(4d) ³Π_g⁻

N	SYM	V = 0	#
1	O	117837.77	3
2	P	117866.15	3
3	O	117924.81	3
4	P	118013.00	3
5	O	118129.64	3
6	P	118274.22	3
7	O	118446.27	3

3f⁺   j(3d) ³Δ_g⁺

N	SYM	V = 0	#	V = 1	#	V = 2	#	V = 3	#
2	O	112750.18	5	114336.73	6	---		---	
3	P	112852.98	4	114432.36	6	115948.90	6	117403.42	1
4	O	112989.69	4	114559.35	6	116067.50	6	117514.53	2
5	P	113159.44	4	114717.09	5	116214.07	6	117652.05	2
6	O	113360.62	4	114904.42	4	116389.58	6	117815.37	3
7	P	113591.60	4	115120.24	3	116591.25	3	118003.33	2
8	O	113850.20	3	115362.73	2	116818.24	3	118212.31	2
9	P	114134.85	3	115630.47	2	117069.53	2	---	
10	O	114443.48	3	115921.93	2	117312.33	1	---	
11	P	114774.99	2	---		117600.15	2	---	

3f⁻   j(3d) ³Δ_g⁻

N	SYM	V = 0	#	V = 1	#	V = 2	#	V = 3	#	V = 4	#	V = 5	#
2	P	112749.51	3	114336.37	7	115859.36	8	117319.74	4	118718.86	3	120057.46	2
3	O	112850.02	5	114430.86	9	115948.15	7	117403.21	4	118796.88	3	---	
4	P	112981.96	3	114555.31	8	116065.43	6	117513.51	4	118900.06	2	---	
5	O	113143.97	4	114708.62	6	116210.32	5	117649.88	2	119027.59	2	---	
6	P	113335.02	3	114889.88	6	116381.73	4	117811.65	2	119178.66	2	---	
7	O	113553.68	3	115097.80	4	116578.80	3	117997.38	3	---		---	
8	P	113798.96	3	115331.23	3	116800.38	3	118206.44	3	---		---	
9	O	114069.44	3	115589.08	3	117038.77	1	118437.40	3	---		---	
10	P	114364.31	3	115869.80	3	117312.12	1	---		---		---	
11	O	114681.89	2	116127.67	1	---		---		---		---	
12	P	115021.56	2	---		---		---		---		---	
13	O	115381.58	3	---		---		---		---		---	
14	P	115761.35	3	---		---		---		---		---	
15	O	116158.96	2	---		---		---		---		---	

4f⁻   (4d) ³Δ_g⁻

N	SYM	V = 0	#
2	P	118021.90	3
3	O	118136.63	3
4	P	118280.16	3
5	O	118451.03	1

Appendix C. Lines of the D₂ Emission Spectrum, Measured and Assigned by G. H. Dieke and Co-Workers

This list has been deposited with the Physics Auxiliary Publication Service.[a] It consists of about 600 pages of measured lines arranged in order of increasing wavelength with assignments indicated.

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[a] See AIP document no. PAPS JPCRD-14-0235-627 for 627 pages of measured lines of molecular deuterium arranged in order of increasing wavelength. Order of PAPS number and journal reference from American Institute of Physics, Physics Auxiliary Publication Service, 335 East 45th Street, New York, NY 10017. The price is $1.50 for each microfiche (98 pages) or $5.00 for photocopies of up to 30 pages, and $0.15 for each additional page over 30 pages. Airmail additional. Make checks payable to the American Institute of Physics.