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The Cu II Spectrum

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Abstract: New wavelength measurements in the vacuum ultraviolet (VUV), ultraviolet and visible spectral regions have been combined with available literature data to refine and extend the description of the spectrum of singly ionized copper (Cu II). In the VUV region, we measured 401 lines using a concave grating spectrograph and photographic plates. In the UV and visible regions, we measured 276 lines using a Fourier-transform spectrometer. These new measurements were combined with previously unpublished data from the thesis of Ross, with accurate VUV grating measurements of Kaufman and Ward, and with less accurate older measurements of Shenstone to construct a comprehensive list of ≈2440 observed lines, from which we derived a revised set of 379 optimized energy levels, complemented with 89 additional levels obtained using series formulas. Among the 379 experimental levels, 29 are new. Intensities of all lines observed in different experiments have been reduced to the same uniform scale by using newly calculated transition probabilities (*A*-values). We combined our calculations with published measured and calculated *A*-values to provide a set of 555 critically evaluated transition probabilities with estimated uncertainties, 162 of which are less than 20%.

Keywords: atomic spectra; singly ionized copper; energy levels; wavelengths; Ritz standards; transition probabilities; critical compilation

1. Introduction

The spectrum of singly ionized copper, belonging to the Ni isoelectronic sequence, has a long history of research. The most significant contributions to the analysis were made by Shenstone [1] in 1936 and by Ross [2] in 1969. Interest in this spectrum was mainly due to the fact that it has a large number of sharp distinct lines in the vacuum ultraviolet (VUV) region, as well as an equally large number of lines in the ultraviolet (UV), visible, and infrared (IR) regions, from which accurate wavelengths of the VUV lines can be established using the Ritz combination principle, thus providing a large set of lines usable as secondary VUV wavelength standards. This spectrum is also of considerable interest for astrophysics. Lines of Cu II were observed in the spectra of nebulae by Thackeray [3], Aller et al. [4], McKenna et al. [5], and by Wallerstein et al. [6], and also in interstellar H I clouds, as well as in Ap, Be, and Bp stars (Jaschek, and Jaschek [7], Danezis and Theodossiou [8]) and in the Sun (Samain [9]). Cu^+ was successfully used as an active lasing medium in various hollow cathodes. Continuous-wave or pulsed lasing has been reported for 28 lines of Cu II in a wide range from UV to IR (McNeil et al. [10,11], Jain [12], Zinchenko and Ivanov [13]). Since copper is an important impurity in tokamaks, the Cu II spectrum has potential applications in fusion research, where its lines can be used for diagnostic purposes.

For several decades after the original analysis by Shenstone [1] the VUV wavelengths of Cu II calculated from the energy levels (i.e., Ritz wavelengths) were widely used as auxiliary wavelength standards. After the refinements of the measured UV wavelengths by Reader et al. [14] and by Kaufman and Ward [15], and after improved and greatly extended measurements by Ross [2] in the UV and visible ranges, the quality of the VUV Ritz wavelengths of Cu II seemed to be so good that

no further investigations of this spectrum were needed. The only inconvenience stemmed from the fact that Ross's thesis [2] was never published, although a large part of it was released with small modifications as a report of the Los Alamos National Laboratory, see Ross [16]. Energy levels and a few strongest lines from Ross [2] were included in the compilations by Sugar and Musgrove [17] and by Sansonetti and Martin [18], but the bulk of the wavelength and line intensity data remains nearly inaccessible. Thus, the initial goal of the present work was simply to digitize Ross's line lists and include them in the Atomic Spectra Database (ASD; see Kramida et al. [19]) of the National Institute of Standards and Technology (NIST) with consistent energy-level identifications. However, a close examination revealed several problems with Ross's data.

The first problem is with internal consistency of Ross's data. An important aspect of ASD is that it requires the observed wavelengths for an atom to be consistent with the energy levels tabulated for that atom. That is, the wavelengths derived from the energy levels (Ritz wavelengths) must agree with the observed wavelengths to within the stated uncertainties. However, in attempting to incorporate the data of Ross into ASD, we found that for a large number of lines the differences between observed and Ritz wavelengths were much greater than the uncertainties. We decided that, because of the importance of Ritz wavelengths for Cu II, this had to be investigated.

The second problem with Ross's data is the possible presence of systematic shifts in his wavelengths. Nave and Sansonetti [20] showed that Ritz wavelengths below 2400 Å (41667 cm^{-1}) derived from Ross's Cu II energy levels are systematically too low, the mean relative deviation being about 4×10^{-7}. This error is significantly greater than the average relative uncertainty of Ritz wavenumbers given by Ross, 1.2×10^{-7}. Near 2000 Å (50000 cm^{-1}), it corresponds to an error of 0.02 cm^{-1}, compared to the mean stated uncertainty of 0.006 cm^{-1}. This puts the usability of Ross's Ritz wavenumbers in the VUV into question.

The third problem is the absence of a consistent description of line intensities throughout the entire range of observed wavelengths. While Ross's own measurements cover the large range above 1980 Å, most of the observed intensities in the VUV region are furnished by old measurements of Shenstone [1], which were made with seven different instruments and with two different light sources. Additional measurements for some selections of strongest lines were made by Reader et al. [14] and by Kaufman and Ward [15], each with their own intensity scale.

Finally, Ross's theoretical interpretation of the energy levels, adopted by Sugar and Musgrove [17] and by Sansonetti and Martin [18], is inadequate. Ross used the *LS* coupling scheme in his analysis, as well as in his final level list. However, the observed fine-structure intervals indicate that the level structure of most configurations is best described by the J_1l (a.k.a. *JK*) coupling scheme, similar to the isoelectronic Ni I spectrum interpreted by Litzén et al. [21].

Another problem that needs to be addressed is the scarcity of available critically evaluated data on radiative transition probabilities (*A*-values). At present, the NIST ASD [19] includes only seven *A*-values of Cu II from the compilation of Wiese and Martin [22]. All of them have large estimated uncertainties ($\leq$40% for six transitions and $\leq$50% for one transition).

The main purpose of the present work is to solve the above-mentioned problems and construct a self-consistent set of recommended energy levels and wavelengths of Cu II supplemented with a uniform description of line intensities. Re-interpretation of the energy levels, as well as the search for possible classifications of previously unidentified lines, required new calculations, which necessarily produce radiative transition probabilities (*A*-values). Thus, we also critically evaluate all available data on *A*-values and extend them with our calculated ones found to be of sufficiently good accuracy.

The usability of the Cu II wavelengths as standards is limited by substantial hyperfine structure (HFS) splitting and presence of two stable isotopes, ^{63}Cu (69.15%) and ^{65}Cu (30.85%) in natural copper (Coursey et al. [23]). HFS and isotope shifts (IS) of a few tens of Cu II lines between 2218 Å and 8096 Å were first observed and roughly estimated by Shenstone [1] and then more accurately investigated by Elbel et al. [24,25]. The measured IS was in the range (0.001 to 0.101) cm^{-1}. For singly-excited $3d^9nl$ configurations the IS is smaller than 0.05 cm^{-1}, while for the doubly-excited $4d^84s^2$ configuration

it is about 0.1 cm^{-1}. The HFS constants A_{hfs} for several [$3d^9$]4s, 4p, 4d, 5s, 5p, 5d, 6s and [$3d^8$]$4s^2$ and 4s5p levels were found to range from 0.022 cm^{-1} to 0.075 cm^{-1} except for one level, $3d^9$4s $^3D_1$, having a very small $A_{hfs} = -0.004$ cm^{-1}. The nuclear spin I of both ^{63}Cu and ^{65}Cu is $I = 3/2$ [18]. Thus, depending on the total angular momentum J of the levels, the width of the HFS varies between 0.016 cm^{-1} and 0.5 cm^{-1}. The ionization energy of Cu^+ is 163669.2 cm^{-1} (20.292 39 eV) (Ross [2]). Thus, excitation of this spectrum requires temperatures in excess of 6000 K (0.5 eV). Such temperatures lead to Doppler broadening $\Delta\sigma_{Dop}/\sigma > 4 \times 10^{-6}$, resulting in line widths >0.4 cm^{-1} at wavelengths near 1000 Å, 0.2 cm^{-1} near 2000 Å, and 0.1 cm^{-1} near 4000 Å. As a result, most observed lines possess unresolved or partially resolved HFS and IS. The smallness of HFS and IS explains the scarcity of studies of these effects in Cu II. However, these effects should be relatively easy to observe in the infrared region. Such observations would be very valuable.

All wavelength measurements described in the present paper were made with natural copper samples. As we know, there is no such physical entity as an atom of natural copper. Thus, the energy levels and Ritz wavelengths derived from these measurements do not pertain to a real atom, but rather are empirical values that best describe the spectrum as normally observed.

2. Wavelength Measurements

The unfortunate consequence of the thorough analysis made by Ross [2,16] is that, in the 46 years after his thesis, there were no studies devoted specifically to Cu II. Instead, his Cu II Ritz wavelengths were widely used as secondary standards for investigation of other species. In particular, the archive of the NIST Atomic Spectroscopy Group has several tens of photographic plates with VUV spectra obtained with the 10.7 m normal incidence vacuum spectrograph with a 1200 lines/mm concave grating. These plates were recorded for studies of Y, Zr, Ge, La, and other elements. For calibration purposes, separate tracks were exposed on these plates with spectra of copper hollow cathodes. The latter, in addition to copper lines, contain lines of carrier gases (helium, neon, and argon), as well as hydrogen, carbon, oxygen, nitrogen, silicon, and germanium that were present as intrinsic or deliberately introduced impurities. These spectra were obtained in different years from 1969 to 1974. In addition to that, we have several high-resolution spectra recorded with two NIST vacuum Fourier transform spectrometers (FTS) in years 2002 to 2008 using Cu/Ge/Pt/Fe/Ne and Cu/Re/Ar/He hollow cathodes. The "new" measurements described in the Abstract were all made with these old recordings. However, we carried out new reductions of the wavelengths and re-analyzed the uncertainties, so it is in this sense that the measurements can be considered as new. To obtain a consistent and comprehensive description of the Cu II spectrum, we combined these new measurements with the old published data from Shenstone [1], Kaufman and Ward [15], and Ross [2,16], which we re-analyzed to evaluate the wavelength calibration, measurement uncertainties, and observed line intensities. Since this re-analysis depends on our new measurements, we describe them first.

Table 1 lists the exposures used in the present analysis. Since exposures used in grating measurements were taken over a period of several years, several different lamp designs were employed. The design of these lamps was similar to the one described in detail by Reader and Davis [26], except that a special fitting was made to attach them to the NIST vacuum spectrograph. The cathode was solid copper with a cylindrical hole of about 7 mm in diameter. Following Kaufman and Ward [15], small pieces of Ge and Si were placed in the cathode to obtain good reference lines in regions that were not covered well by Cu II. The carrier gas was a combination of flowing helium at a pressure of about 0.5 kPa (4 Torr) and neon or argon at about 70 Pa (0.5 Torr). The entrance slit of the spectrometer separated the lamp from the spectrometer chamber, which was maintained at a residual pressure of about 7×10^{-3} Pa (5×10^{-5} Torr). The demountable high-current lamp made at the University of Hannover, used several tens of years later in the FTS measurements, had a similar design described by Danzmann et al. [27]. Ar at a pressure of 200 Pa (1.5 Torr) with an addition of He at 70 Pa (0.5 Torr) was used as a carrier gas in spectrum 14, while Ne at a pressure of 270 Pa (2 Torr) was used in spectra 12 and 13. Pieces of Ge, Pt, Fe, or Re were placed inside the cathode. The grating spectrograms covered the region (636 to 2682) Å, while the FTS spectrograms covered the region (1792 to 11733) Å.

Table 1. Spectrograms used in the present measurements.

Exposure	Track	Region (Å)	Hollow Cathode Used	Impurities	Equip. [a]	Wavelength Standards [b]	Track Label	Date	Fit Poly [c]	St. Dev. [d]
1	1	636–827	Cu/He/Ar/Ne		NIVS	Ar II (11), Ne I (1), Cu II (TW-1) [e]	418	4/3/1974	2	0.0009
2	2	822–1000	Cu/Ge/Si/He/Ar	H, C, O	NIVS	H I (2), O I (9), O II (1), Ar II (2), Ge II (3)	419_tr42	4/4/1974	2	0.0013
	6	977–1166		H, C, N, O	NIVS	C I (2), C II (1), N I (2), O I (7), Ar I (2), Si II (2), Ge II (3)	419_tr42	4/4/1974	2	0.0013
3	5	824–1020	Cu/He	H, O	NIVS	H I (1), O I (5), Cu II (KW66-4, TW-10) [f]		12/17/1969	2	0.0012
4	7	1181–1360	Cu/Ge/Si/He/Ar	H, C, N, O	NIVS, LiF	C I (6), N I (3), Si II (6), Ge II (1), Cu II (KW66-6, TW-1) [g]	X431_tr27	10/24/1974	2	0.0024
	8	1339–1527			NIVS, LiF	C I (4), O I (1), Cu II (KW66-48)	X431_tr27	10/24/1974	2, 3 [k]	0.0021
5	9	1399–1590	Cu/He/Ar	C, N	NIVS	C I (1), Cu II (KW66-62, TW-4) [h]		12/16/1969	2, 2 [l]	0.0010
6	10	1398–1584	Cu/Si/He/Ne	C, N	NIVS	C I (3), Si II (1), Cu II (KW66-44, TW-1) [i]		1/15/1970	2	0.0012
	17	1920–2106			NIVS	C I (1), Cu II (R69-20)		1/15/1970	2	0.0021
7	11	1399–1587	Cu/Ge/Si/He	C, N	NIVS	C I (3), N I (1), Si II (2), Ge II (2), Cu II (KW66-66)	X434_tr52	11/11/1974	3	0.0014
	14	1560–1743			NIVS	C I (5), N I (1), Ge II (3), Cu II (KW66-21)	X434_tr52	11/11/1974	3	0.0016
8	12	1394–1584	Cu/Ge/Si/He	C, N	NIVS	C I (3), Si II (2), Ge II (3), Cu II (KW66-52)	X434_tr27	11/11/1974	2	0.0016
	13	1559–1743			NIVS	C I (1), Si I (3), Ge II (1), Cu I (1), Cu II (KW66-14)	X434_tr27	11/11/1974	2	0.0019
	15	1751–1939			NIVS	Si I (7), Si II (1), Cu I (1), Cu II (KW66-5)	X434_tr27	11/11/1974	2	0.0017
9	16	1790–1980	Cu/Si/He	C	NIVS	C I (1), Cu I (1), Cu II (KW66-4, R69-1, TW-2) [j]		11/10/1969	4	0.0012
10	18	1977–2162	Cu/Ge/Si/He	H, C, O	NIVS	Si I (2), Ge I (6), Ge II (2), Cu I (I), Cu II (R69-11)	X433_tr27	11/7/1974	2	0.0016
	20	2139–2315			NIVS	Si I (4), Ge I (1), Cu I (4), Cu II (R69-26)	X433_tr27	11/7/1974	5	0.0021
	21	2336–2517			NIVS	Si I (3), Cu I (1), Cu II (R69-13)	X433_tr27	11/7/1974	3	0.0017
	22	2490–2682			NIVS	O I (3), Si I (7), Ge I (3), Ge II (1), Cu II (KW66-2, R69-5)	X433_tr27	11/7/1974	2	0.0011
11	19	2117–2310	Cu/Ge/Si/He		NIVS	Si I (2), Ge I (1), Cu I (4), Cu II (R69-20)	E16-3	6/3/1969	2	0.0019
12	–	1792–3324	Cu/Ge/Pt/Fe/Ne		FTS	Ge I-II (37)		2002	1	1.7×10^{-8}
13	–	1825–3324	Cu/Ge/Pt/Fe/Ne		FTS	Ge I-II (37)		2002	1	2.0×10^{-8}
14	–	2769–11733	Cu/Re/Ar/He		FTS	Ar II (68)		2009	1	2.0×10^{-9}

[a] Equipment used: NIVS = Normal Incidence Vacuum Spectrograph (NIST, 10.7 m grating, reciprocal linear dispersion 0.78 Å); FTS = Fourier Transform Spectrometer (NIST, FT700 0.2 m vacuum FTS for spectra 12 and 13, and a 2 m vacuum FTS for spectrum 14); LiF = a LiF window was used to remove higher diffraction orders;

[b] The number of spectral lines of each spectrum used as standards is given in parentheses. Unless otherwise indicated, the standard wavelengths used in grating measurements were the Ritz wavelengths taken from the ASD database [19]. For Cu II lines used as standards, the references are as follows: KW66—Kaufman and Ward [15]; R69—Ross [2]; TW—this work. Standards used in the FTS measurements are described in the text;

[c] Power of the polynomial used to fit standard lines;

[d] For grating spectra (exposures 1–11), standard deviation of the measured wavenumbers of the standard lines from the fitted polynomial (Å); For FTS spectra (exposures 12–14), standard deviation of the correction factor from the linear fit (dimensionless);

[e] Cu II line at 826.9946 Å measured in 1st order on track 2 was used as standard on track 1;

[f] Ten Cu II lines measured in 1st order on track 2 were used as standards on track 5;

[g] Cu II line at 1275.5713 Å measured in 2nd order on track 22 was used as standard on track 7;

[h] Four Cu II lines measured in 1st order on tracks 10–12 were used as standards on track 9;

[i] Cu II line at 1407.1688 Å measured in 1st order on tracks 8, 11, and 12 was used as standard on track 10;

[j] Two Cu II lines measured in 1st order on track 15 were used as standards on track 16;

[k] Long-wavelength end of track 8 was fitted separately with a cubic polynomial;

[l] Short-wavelength end of track 9 was fitted separately with a 2nd degree polynomial.

The grating spectra were photographed on Kodak SWR plates and measured with a Grant semiautomatic comparator. (Commercial products are identified in this paper for adequate specification of the experimental procedure. This identification does not imply recommendation or endorsement by NIST.) Repeated measurements of the same plates were made, from which the measurement uncertainty of line positions was estimated to be 1.6 μm for isolated well-resolved lines, corresponding to statistical wavelengths uncertainties of 0.0012 Å. Most of the lines were measured on two to six different tracks. Thirty-eight Cu II lines were measured in the second order of diffraction, and one (861.9932 Å) in the third order, while the rest of them were measured in the first order. Below 1980 Å, most of the tracks had a sufficient number of impurity lines (H, He, C, N, O, Ne, Si, Ar, Ge), which were used as standards. Cu II lines accurately measured by Kaufman and Ward [15] were also used as standards in the region (860 to 1663) Å. In the region above 1980 Å, we used Ross's [2] interferometric and grating measurements as standards. Although later we found that Ross's wavelengths are systematically too long (see below), the average error in the wavelengths we used as standards in the grating spectra was only (-0.0004 ± 0.0008) Å, well below our total measurement uncertainties. Therefore, we did not remove the systematic errors from Ross's wavelengths used at this stage. The systematic uncertainty of each measured wavelength on our plates was estimated as a combination in quadrature of the standard deviation of the fitted polynomial (given in Table 1) and a mean uncertainty of standard wavelengths in the vicinity of the measured line. These systematic uncertainties were combined in quadrature with the statistical uncertainty (0.0012 Å for sharp isolated lines and up to 0.005 Å for blended or overexposed lines). Multiple measurements of the same line on different tracks were averaged with weights inversely proportional to squares of total uncertainties. The uncertainty of the mean was calculated as a combination in quadrature of the reduced statistical uncertainty and the straight average systematic uncertainty. In total, we have measured 1217 unique spectral lines in the grating spectra between 636 Å and 2682 Å, of which 938 were either identified as Cu II lines or did not have any identification, and the rest were identified as belonging to impurities noted above. The wavelengths determined in the present work have uncertainties ranging from 0.0008 Å to 0.010 Å. A number of lines reported by Kaufman and Ward [15] were overexposed on our plates, which led to significant systematic shifts in determining their positions. Such overexposed lines were not used in the current wavelength measurements.

Our FTS measurements were calibrated assuming a common calibration factor for all wavenumbers in each spectrogram. The value of the calibration factor was determined as a weighted mean of the ratio $\sigma/\sigma_{\mathrm{std}}$, where σ is the measured wavenumber, and σ_{std} is the tabulated wavenumber of the reference line. For the Ar II and Ge I-II lines used as standards in the FTS spectra, we used the Ritz values from ASD as σ_{std}. We used reciprocal squared uncertainties of σ_{std}, combined in quadrature with our measurement uncertainties (see below), as weights in this averaging. Uncertainties of thus obtained calibration factors (given in Table 1) represent the systematic uncertainties in our FTS measurements. Positions of the line centers σ, line widths W, signal-to-noise ratios S/N, and total integrated intensities were evaluated using the XGREMLIN code by Nave et al. [28] either automatically, assuming a Lorentzian profile for isolated symmetrical lines, Gaussian profile for nearly symmetrical but visibly perturbed lines, or manually with a Gaussian profile with a line width fixed at a visually estimated value.

For well-resolved symmetrical lines, statistical uncertainties of FTS measurements can be approximated by Equation (1) of Brault [29]:

$$\delta\sigma_{\mathrm{stat}} = \frac{k}{\sqrt{N_w}} \cdot \frac{W}{S/N}, \tag{1}$$

where σ is the wavenumber, W is the full width at half maximum of the line, N_w is the number of statistically-independent points in the line width, and k is a constant depending on the line shape and the algorithm used for fitting the line. For Gaussian profiles, k = 0.693. For an optimally sampled

spectrum, the interferogram is recorded to a path difference such that N_w is between 3 and 4 for the majority of the spectral lines. This gives the commonly-used approximation of

$$\delta\sigma_{\text{stat}} = \frac{W}{2 \cdot S/N} \tag{2}$$

Using $N_w = W/r$, where r is the resolution of the spectrum in cm^{-1}, Equation (1) can be re-written as:

$$\delta\sigma_{\text{stat}} = \frac{k}{S/N}\sqrt{rW} \tag{3}$$

Our spectra were taken with r = 0.015 cm^{-1} for the Cu/Re/Ar/He spectrum and r = 0.13 cm^{-1} for the Cu/Ge/Pt/Fe/Ne spectra. Typical line widths of symmetrical lines in our spectra range from 0.04 cm^{-1} around 10000 cm^{-1} to 0.25 cm^{-1} around 30000 cm^{-1}, giving values of N_w between 2.5 and 3. The instrumental line shape of the FTS comes from the finite length of the interferogram and is a sinc function of width r. When this is convolved with the Gaussian lines in our spectra, the increase in the width is negligible for a line with N_w = 3 and only 0.2% for a line with N_w = 2 and can thus be ignored in the calculation of the statistical uncertainty.

Many of the Cu lines are affected by HFS and cannot be adequately fitted using Gaussian profiles. For example, Figure 1 shows the profile of the Cu II line at 12852 cm^{-1}.

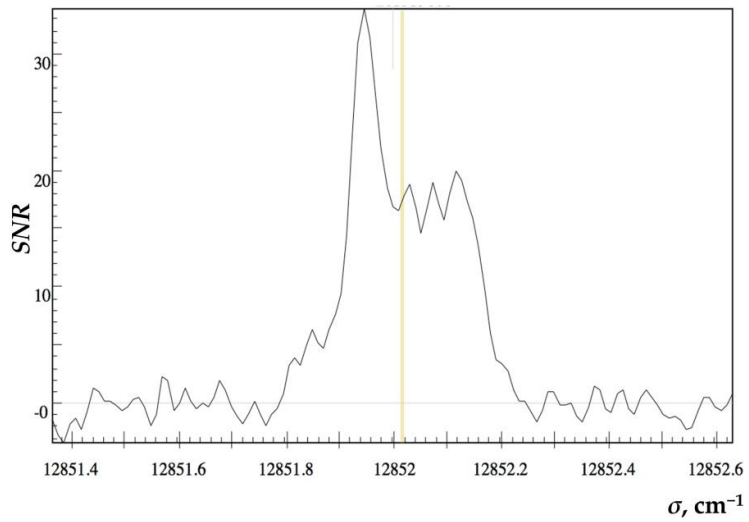

Figure 1. Profile of the Cu II line at 12852 cm^{-1} (7778.7 Å) as measured in our Fourier transform spectrometers (FTS) spectrum. This line has a partially resolved hyperfine structure (HFS). The vertical line indicates the center of gravity.

The position of such lines was estimated using the center of gravity. For strong isolated lines (S/N > 150), where it is easy to estimate the range for calculation of the center of gravity, Equation (3) can be used to estimate the uncertainty using k = 1 [29]. However, this uncertainty increases for weaker lines where it is not as easy to estimate the range of calculation for the center of gravity. The measurements are further complicated by the asymmetric HFS. Its precise shape and width is not studied so far for the Cu II spectrum. In our high-resolution Cu/Re/Ar/He spectrogram, HFS patterns are partially resolved in 230 out of total 352 Cu II lines. The average width of the HFS of those lines is W_{ave} = 0.14 cm^{-1}. Since the shapes of the HFS are unknown, an additional uncertainty in the measured centers of gravity arises from the possible omission (or erroneous inclusion) of a weak HFS component at the far wing of the line profile. The possible error caused by this effect of noise is easy to estimate by calculating the shift of the center of gravity of the structure:

$$\delta\sigma_{\mathrm{hfs}} = 0.5 W_{\mathrm{hfs}} I_{\mathrm{noise}} / (I_{\mathrm{tot}} + I_{\mathrm{noise}}), \quad (4)$$

where I_{tot} is the measured integrated intensity, W_{hfs} is the maximum of W_{ave} (see above) and the fitted width of the structure, and I_{noise} is the estimated possible integrated intensity of a hypothetical missed or erroneously included HFS component, equal to the root of mean square of the noise amplitude in the vicinity of the structure multiplied by the average width of sharp Cu II lines (equal to 5×10^{-6} times wavenumber for this spectrum).

The calibration of exposures 12 and 13, measured with a Cu/Ge/Pt/Ne hollow cathode, was made using 37 Ge I and II lines interferometrically measured by Kaufman and Andrew [30]. The reference wavenumbers from the latter paper have been decreased by 1.4 parts in 10^8 to put them on the scale of a recent measurement of ^{198}Hg by Sansonetti and Veza [31], as described in Nave and Sansonetti [32]. Exposure 14, made with a Cu/Re/Ar/He hollow cathode, was calibrated using 68 Ar II standards from Whaling et al. [33]. Uncertainties of the calibration factors were determined as the sum in quadrature of the statistical uncertainty (coming from the different values of the calibration factor derived from different standard lines) and the mean uncertainty of the standard lines.

The total uncertainty of Cu II measurements was determined as the sum in quadrature of statistical and systematic uncertainties. The former was taken as the sum in quadrature of Equations (3) and (4), and the latter is the uncertainty in the calibration factor (given in Table 1) times the wavenumber. Total uncertainties of our Cu II wavelengths measured by FTS range from 0.000025 Å to 0.023 Å.

Kaufman and Ward [15] photographed the VUV spectrum of a water-cooled hollow cathode discharge containing germanium and silicon in the first, second, and third orders of diffraction of the same 10.7 m Eagle-mounting vacuum grating spectrograph as used in the present work (designated as NIVS in Table 1). They reported 141 measured wavelengths of Cu II in the range (861 to 1663) Å. As wavelength standards, they used lines of Cu II, Ge I, and Si I that were either calculated (Ritz) or interferometrically measured. The reciprocal linear dispersion was 0.78 Å/mm in the first order of diffraction. Many of the reported lines were measured on several (up to 11) spectrograms. We estimated their measurement uncertainties by comparing the measured wavelengths with the Ritz values (using Ross's [2] energy levels) separately for lines measured only in the first order (0.003 Å for a single measurement), measured several times in the 1st order, but only once in the 2nd and/or 3rd order (0.0010 Å), and for lines measured on several spectrograms in several orders of diffraction (varying from 0.0004 Å to 0.0018 Å). These estimates agree well with those given explicitly by Kaufman and Ward for a few lines. Careful work was required to reconstruct the list of observed wavelengths, since some of the values given in Table III of Kaufman and Ward [15] are Ritz wavelengths, but many of them are also given in their Table I including the value of the residual $\lambda_{\mathrm{Ritz}} - \lambda_{\mathrm{obs}}$. Since there is no information regarding the wavelength standards actually used in various wavelength regions, all wavelengths reported by Kaufman and Ward [15] were adopted without corrections.

Ross [2,16] investigated the Cu II spectrum photographically from 1979 Å to 11217 Å using plane and concave grating spectrographs and Fabry-Perot interferometers. The light source was a water-cooled hollow cathode discharge with helium or neon as a buffer gas. Ross [2] noted that intensity of most Cu II lines was greatly enhanced when He at a pressure of about 0.9 kPa (7 Torr) was used as the carrier gas, while if Ne is used, only lines below 3000 Å arising from relatively low levels are excited. The standards for the Fabry-Perot interferograms were the lines of ^{198}Hg emitted by a water-cooled sealed electrodeless-discharge lamp containing argon carrier gas at a pressure of 33 Pa (0.25 Torr), with vacuum wavelengths 5462.27055 Å and 2537.2687 Å referred to Kaufman [34]. For grating measurements, a 9.2 m concave grating spectrograph with Paschen-Runge mounting was used. The grating had 600 lines/mm, was blazed at 10000 Å, and provided a reciprocal dispersion of ≈1.7 Å/mm. For calibration, interferometrically measured Cu II lines were used as standards.

As noted in the Introduction, subsequent studies reported some systematic errors in Ross's short-wavelength measurements. This can be explained by the fact that below 2200 Å, Ross encountered severe technical difficulties in his interferometric measurements, caused by strong absorption in the

crystalline quartz of the plates and windows. He partially solved the problem by removing the windows, which exposed the interferometer to spectroscopically non-standard air and did not permit thorough temperature control. In addition, Kaufman's values for the ^{198}Hg lines Ross used as standards, 5462.27046 Å and 2537.26877 Å [34], have since been re-evaluated. Their currently recommended vacuum wavelengths are 5462.27062(3) Å and 2537.268755(17) Å [35]. Additional errors could have been due to a possibly imperfect match between filling the interferometer's aperture with light from the hollow cathode and from the mercury lamp. To verify the calibration of Ross's wavelengths, we compared his reported wavelengths with those measured in our FTS spectra. Similar to FTS measurements, interferometric measurements of Ross can be corrected by a multiplicative factor [20]:

$$\sigma_c = (1 + k_{eff})\sigma_u, \quad (5)$$

where σ_c is the corrected wave number, σ_u is the uncorrected wave number, and the correction factor k_{eff} is determined from one or more internal standard lines in the spectrum, in this case from our wavenumbers measured by FTS. Dependence of thus derived k_{eff} on wavenumber is plotted in Figure 2.

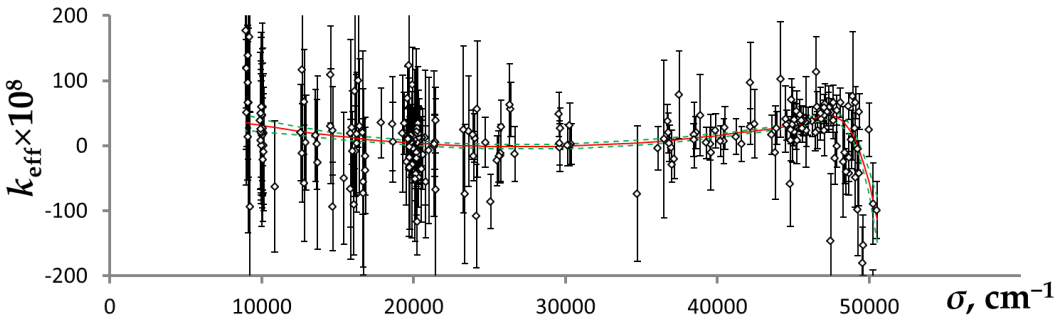

Figure 2. Dependence of calibration factor for interferometric measurements of Ross [2] on wavenumber. The error bars are measurement uncertainties of Ross [2] and our FTS data, combined in quadrature. The solid line is a weighted fit with two cubic polynomials stitched together at about 45,000 cm^{-1}. The dashed lines are 68% confidence intervals ($\pm$1 standard deviation) of the fit.

It should be noted that Figure 2 includes all Ross's lines that were also measured in our FTS spectra. Many of those lines were weak in our FTS spectra, resulting in large error bars in Figure 2. However, there was a sufficiently large number of strong lines with small error bars, which explain the very small uncertainties of the fitted curve in Figure 2.

Unlike FTS measurements, where k_{eff} is a constant over the entire range of measured lines, the calibration correction of Ross's measurements depends on wavenumber. This dependence is rather weak, and the value of k_{eff} is small ($<10^{-7}$) in the interval (17000 to 38000) cm^{-1} (6000 Å to 2700 Å), but k_{eff} notably increases (up to 3.5×10^{-7}) for infrared lines, and varies rapidly for the far-UV lines below 2700 Å. The accuracy of the fitted k_{eff} values varies from 3×10^{-8} to 3.5×10^{-7}, depending on the measurement uncertainties in Ross [2] and in our FTS data. It determines the systematic uncertainties in the Ross's wavenumbers as now re-calibrated.

This re-calibration and increased uncertainty associated with it allowed us to explain only a small part of numerous lines strongly deviating from Ritz wavelengths in Ross's list, noted in the Introduction. To explain the remaining problematic lines, additional factors contributing to uncertainties, not accounted for by Ross, must be considered. One such factor can be pressure shifts caused by relatively high pressure of He in his discharge, 0.9 kPa (7 Torr). Such shifts could cause quasi-random deviations of measured wavelengths in both directions from unperturbed values. Another contributing factor could be partially resolved HFS. The Doppler width reported by Ross for the sharp line at 2473 Å (40419 cm^{-1}) was about 0.1 cm^{-1}, which is of the same order of magnitude as most of the known HFS widths. He noted that partially-resolved HFS was indeed a problem in

his wavelength measurements, and that his tabulated results are centers of gravity of observed HFS structures. However, he did not give any details about the method with which these centers of gravity were determined. Such determination depends on the measurement accuracy of the relative intensities of the HFS components, which might have been distorted by non-linearity of response of photographic plates used by Ross. The shift in the measured center-of-gravity wavenumber caused by errors in intensity measurements would be some fraction of the HFS width. We accounted for both types of such possible shifts (caused by pressure and HFS) by adding in quadrature a constant quantity to the wavenumber-measurement uncertainties of Ross [2]. The value of this constant was found empirically to be 0.007 cm^{-1}. These increased uncertainties are statistically consistent with residuals $\sigma_{obs} - \sigma_{Ritz}$ of the level-optimization procedure (see Section 3).

Shenstone [1] made the most comprehensive study of the Cu II spectrum prior to Ross [2]. He photographed spectra of a copper hollow cathode (Schuler tube) filled with helium or neon using several spectrographs: 6.4 m and 3 m normal incidence grating spectrographs and two Hilger prism spectrographs for the UV and visible regions, a 2 m normal incidence vacuum grating spectrograph for the VUV region, and another concave grating spectrograph (in NBS) for the infrared region. Since Ross could not observe lines shorter than 1979 Å, Shenstone's line list remained the only source of information about observed Cu II lines and their intensities in the VUV. We have re-measured many of VUV lines listed by Shenstone with much greater accuracy. Most of his lines in the UV, visible, and infrared regions were re-measured by Ross [2]. However, 94 lines from Shenstone [1] ranging from 836 Å to 6870 Å were not observed in our and Ross's spectra. For 15 of them, Shenstone did not give a measured wavelength (apparently, because low resolution did not permit accurate measurement), but gave the observed intensity. Wavelength calibration and uncertainties of Shenstone's measurements were investigated by comparing them with Ritz wavelengths calculated from Ross's [2] energy levels. Because of the relatively low resolution of Shenstone's measurements, the small differences of Ross's Ritz wavelengths from more accurate ones obtained from our final level optimization (see Section 3) did not have any effect on this analysis. Since most of Shenstone's lines used in the final line list were measured with the vacuum grating spectrograph, we compare his measurements made on this instrument with Ritz wavelength in Figure 3.

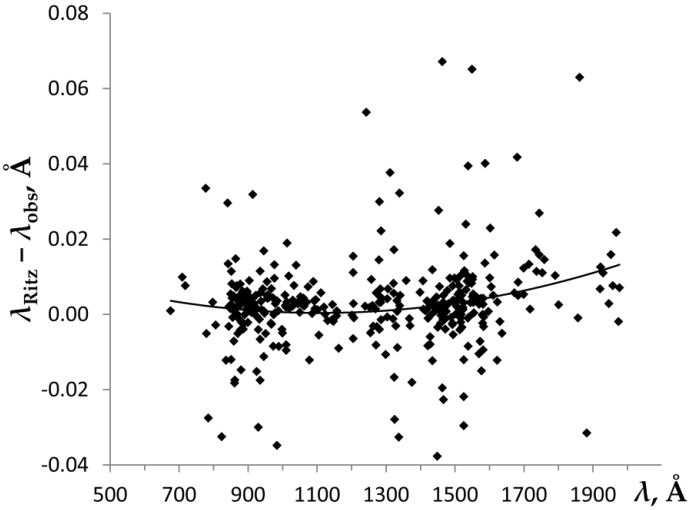

Figure 3. Deviations of vacuum ultraviolet (VUV) wavelengths measured by Shenstone [1] from Ritz values from Ross [2]. The solid line is a 2nd degree polynomial fit.

Although Figure 3 includes all wavelengths reported by Shenstone (excluding a few lines with extremely large deviations), assessment of uncertainties was made separately for "good" wavelengths given with three figures after the decimal point (in Å) and having no indication of blending or other

perturbations, for wavelengths given with two decimal figures (apparently, deemed less accurate by Shenstone), and for lines indicated as blended or perturbed, or having multiple classifications. The trend indicated in Figure 3 by a solid line was derived from accurately measured lines only. It resulted in a correction to Shenstone's VUV wavelength varying from +0.003 Å for the shortest wavelengths near 700 Å to +0.010 Å near 1980 Å. After this correction, the uncertainty for each category of lines was estimated as a root-mean-square (rms) of the residuals. These uncertainties were found to vary from 0.006 Å for the best measurements to 0.07 Å for the worst. A similar analysis was made separately for each spectrograph used by Shenstone.

For completeness, we included in our line list one line observed by Wagatsuma and Hirokawa [36] at 4485.3 Å, which was not reported by other observers. Since wavelengths reported by Wagatsuma and Hirokawa are the Ritz ones (owing to low precision of their measurements), we also give only the Ritz wavelength for this line.

In all the laboratory studies described above, only electric-dipole allowed (E1) lines could be observed, since densities in the discharge light sources are high enough to collisionally depopulate metastable levels, from which forbidden lines could emerge. However, four forbidden lines of Cu II were observed in other studies. The first observation known to us is that of Thackeray [3] who identified the line of Cu II at 3806.3 Å as the electric-quadrupole (E2) $3d^{10}\ ^1S_0$–$3d^9 4s\ ^1D_2$ transition in emission spectra of two nebulae, η Carinae and RR Telescopii. Another E2 transition, $3d^{10}\ ^1S_0$–$3d^9 4s\ ^3D_2$ at 4375.8 Å, as well as the hyperfine-induced $3d^{10}\ ^1S_0$–$3d^9 4s\ ^3D_3$ transition at 4558.7 Å, were observed but not identified in emission of RR Telescopii by Aller et al. [4]. The above-mentioned E2 transition at 3806.3 Å, as well as the magnetic-dipole (M1) $3d^{10}\ ^1S_0$–$3d^9 4s\ ^3D_1$ transition at 4165.7 Å, were observed and identified by McKenna et al. [5] in emission of the same nebula, RR Telescopii. In the laboratory, the two E2 transitions at 3806.3 Å and 4375.8 Å were observed (with an accuracy inferior to astrophysical observations) and their radiative decay rates were measured by Prior [37] in an electrostatic ion trap.

All observed and identified spectral lines of Cu II are collected in Appendix A, Table A1. In addition to observed lines, this table includes several predicted transitions, in particular, six M1 and E2 transitions between the levels of the first excited configuration, $3d^9 4s$. This table lists 2557 transitions corresponding to 2494 unique measured spectral lines, 677 of which were measured in this work, and includes 50 additional lines that are either predicted (not observed), observed but not measured, or were masked by stronger neighboring lines in observed spectra. In addition to observed wavelengths, Table A1 gives for each transition the Ritz wavelength with standard uncertainty obtained in the level optimization procedure (see Section 3), energy-level classification, intensity on a unified scale (see Section 5), and a reference to the source of the observed wavelength. For 555 transitions, we also give a critically evaluated transition probability (*A*-value) with its uncertainty estimate and a reference. Lines on which laser action was reported in the literature are marked with "L" in the Notes column.

In Table A1, wavelengths between 2000 Å and 20000 Å are given in standard air; outside of this region, they are in vacuum. Conversion from air to vacuum was made using the five-parameter formula from Peck and Reeder [38]. Ritz wavelengths and their uncertainties were obtained using the LOPT (level optimization) code [39] as described below in Section 3. Transition probabilities are either calculated in the present work or critically compiled from references [40–51] as described in Section 6.

3. Energy Levels

The precise positions of energy levels, as well as the Ritz wavelengths and their uncertainties, were derived from the identified lines listed in Table A1 using the least-squares level optimization code LOPT [39]. The resulting energy levels are listed in Table A2.

Of all 2557 transitions in Table A1, 113 were excluded from the level optimization procedure. Among those, there are 61 transitions that were either predicted (e.g., far-IR forbidden transitions), had poorly measured wavelengths (e.g., astrophysically observed forbidden lines), were severely

blended, or were masked by much stronger nearby lines. The remaining 52 lines were excluded because their observed wavelengths deviated too much from the Ritz values. In total, we used 2443 observed transitions in our level-optimization procedure. For comparison, Ross [2,16] used 1691 observed transitions in his level optimization.

If one compares the presently found energy levels with those given by Ross [2,16], the average agreement is good. The mean difference ($E_{\mathrm{TW}} - E_{\mathrm{Ross}}$) is only 0.007 cm^{-1} with a standard deviation of 0.016 cm^{-1} (the subscript "TW" means "this work"). However, a more detailed comparison shows that, of the 347 levels correctly identified by Ross, 156 deviate from those given in Table A2 by more than two (up to 11) combined uncertainties. Uncertainties of our level values are on average greater than those of Ross by a factor of 1.4, owing to our increased estimate of Ross's wavelength uncertainties. For only 32 levels our uncertainties are smaller than those of Ross (by up to a factor of eight). This improvement is due to our FTS measurements. Similar conclusions can be made for the Ritz wavelengths. Among about 500 Ritz VUV wavelengths listed by Ross, only a few are incorrect because of erroneous identifications described below. If these are excluded, the mean difference ($\sigma_{\mathrm{TW}} - \sigma_{\mathrm{Ross}}$) is 0.012 cm^{-1} with a standard deviation of 0.019 cm^{-1}. However, for 273 VUV lines (more than half of all given by Ross), Ross's Ritz wavelengths deviate from ours by more than twice the combined uncertainty. Our Table A1 includes 632 Ritz wavelengths for VUV lines below 2000 Å. Most of the new lines were observed and measured in this work.

The analysis that led to Tables A1 and A2 was made in an iterative manner. In the first step, after an initial list of all observed lines was constructed, it contained more than 600 unclassified lines, 143 of which were listed by Ross [2,16], 54 by Shenstone [1], one by Kaufman and Ward [15], and the rest were observed in our VUV grating spectra. Twenty-four of these lines (18 in Ross [2,16] and 6 in Shenstone [1]) were found to be due to previously identified transitions in Cu I. To find possible identifications for the remaining unknown lines and to find proper designations for the energy levels, we made a parametric analysis of the Cu II spectrum using Cowan's suite of atomic codes RCN/RCN2/RCG/RCE [52] (A version of the codes adapted by A. Kramida for Windows-based personal computers is available online: http://das101.isan.troitsk.ru/COWAN). In this analysis, we included the following sets of configurations: 3d^{10}, [3d^9](ns, nd) (n = 4–10), ng (n = 5–10), [3d^8](4s^2, 4p^2, 4s4d, 4s5s, 4d^2, 4s5d) in the even parity, and [3d^9](np, nf) (n = 4–8), nh (n = 6–8), [3d^8](4s4p, 4s4f, 4p4d, 4s5p, 4s5f) in the odd parity, 25 configurations in total. All known energy levels from Sugar and Musgrove [17] were included in the least-squares parametric fitting (LSF) with the RCE code. The calculations were made in the relativistic mode (HFR), including Breit corrections and correlation term (explained in the RCN manual). The fitted parameters were substituted as input for the RCG code to obtain a list of predicted lines with calculated A-values. The calculated A-values and energy levels, as well as known experimental levels, were used in the input files for the visual line-identification code IDEN1 originally designed by Azarov [53] and later programmed for Windows-based computers by one of the present authors (AK). Using this tool, we identified 117 previously unclassified lines with transitions between known energy levels, revised four levels and found 28 new energy levels. The revised and newly found energy levels explained 79 previously unclassified lines and involved revised classifications of 24 lines previously identified by Ross [2] and Shenstone [1].

At this stage of the analysis, it was also found that two levels listed by Ross [2] and included in the compilation of Sugar and Musgrove [17] had to be rejected. One of them, an undesignated odd-parity level with J = 1 at 144240.6 cm^{-1}, was retained by Ross from Shenstone's level list. It was identified by one line measured by Shenstone at 823.802 Å, which we re-measured to be at 823.8361(18) Å and identified with a transition between other previously known levels, 3d^{9}4s ^{1}D$_2$–3d^9(^{2}D$_{5/2}$)7p ^{2}[5/2]$^\circ_2$. It was also found that there are no possible unknown odd-parity levels with J = 1 sufficiently close to the value given by Ross to explain this level. Another rejected level is also of odd parity, designated by Ross as 3d^{9}6p ^{3}P$^\circ_0$ (at 141154.164 cm^{-1}). It was based by Ross on two lines, one observed by Shenstone at 853.56 Å and identified by Ross as a transition from this level to 3d^{9}4s ^{3}D$_1$, and another observed by Ross at 3217.641 Å, which he interpreted as a transition from this level to 3d^9(^{2}D$_{3/2}$)5s

$^2[3/2]_1$ (to be consistent with our tables, we use our new *JK* designations). Both these transitions were predicted to be extremely weak, certainly much weaker than other possible transitions from this level. We re-measured the first line to be at 853.544(2) Å and re-classified both lines as transitions from other levels. In addition, the energy given by Ross deviates too much from that predicted by our parametric fitting.

Two levels listed by Ross as $3d^9 6p\ ^3F^\circ_2$ and $^3D^\circ_1$ at 141244.576 cm^{-1} and 141734.167 cm^{-1}, respectively, were each based by Ross on several transitions to lower-lying even levels with $J = 1$ or 2. Most of the corresponding lines were previously observed and similarly identified by Shenstone. However, we found that observed line intensities agree much better with those predicted if assignments of these two levels are interchanged. Further proof for this revision was provided by our identification of two transitions from the lower of these two levels down to levels with $J = 3$. One of the corresponding lines was newly observed in our VUV spectrum, and another one was present among Ross's unclassified lines.

Following Shenstone [1], Ross interpreted the level at 137212.765 cm^{-1} as $3d^8 4s4p\ ^1P^\circ_1$. Sugar and Musgrove [17] gave a more specific designation, $3d^8(^3P)4s4p(^3P^\circ)\ ^1P^\circ_1$ based on a parametric calculation made by Roth [54]. We found three transitions connecting this level with even $J = 3$ levels. Since other combining levels have $J = 1$ and 2, the only possible J value for this level is 2. We labeled this strongly mixed level as $3d^8(^1G)4s4p(^3P^\circ)\ ^3F^\circ_2$, although it represents only 36% of the percentage composition; an equal contribution is from $3d^8(^3F)4s4p(^1P^\circ)\ ^3F^\circ_2$, followed by 14% of $3d^8(^3P)4s4p(^3P^\circ)\ ^1D^\circ_2$.

Ross found the level at 147491.888 cm^{-1}, which he designated as $3d^9 7p\ ^3F^\circ_3$ based on three weak lines at 3360.9941 Å, 9310.353 Å, and 9569.11 Å, identified as transitions from this level down to $3d^9 4d\ ^3G_3$, $3d^9 5d\ ^3P_2$, and $3d^9 5d\ ^3F_4$. Although these three lines indeed perfectly satisfy the Ritz combination principle, our calculations indicate that their intensities should be negligibly small, while much stronger transitions to other even-parity levels should occur, but were not observed by Ross. The strongest predicted transitions from this level are in the VUV region inaccessible to Ross. We have found three lines in our VUV exposures at 824.663 Å, 1609.342 Å, and 1924.548 Å, which have wavelengths and intensities consistent with this level, placing it at our new revised position, 147525.93 cm^{-1}. All other odd-parity levels with $J = 3$ predicted to occur within $\pm$2000 cm^{-1} from this energy are experimentally known, which leads us to conclude that the combination of three lines observed by Ross is spurious. We note that the density of observed lines in the UV, visible, and IR regions is sufficiently high to produce several tens of spurious combinations of two, and a few of three lines, which we observed in the combined line list. We could not find alternate identifications for the three lines assigned previously by Ross to this revised level.

Three other levels in Ross's list were found to be questionable, either because they were based on only one or two weak lines, or because the energy strongly disagrees with our parametric calculation. These levels are at 154838.963 cm^{-1}, 155244.833 cm^{-1}, and 156958.096 cm^{-1}, designated by Ross as $3d^9 8d\ ^3P_1$, $^3P_0$, and $^3F_2$, respectively.

After the new identifications were made, the new experimental energies were incorporated in the LSF procedure, and the questionable levels removed. We also inserted in the LSF several tens of levels belonging to the $[3d^9]$9d, 10d, 8g, 9g, 10g, 7f, 8f, 6h, 7h, and 8h levels whose positions were accurately extrapolated by Ritz-type quantum defect or polarization formulas (see Section 4). These levels were found to be sufficiently pure, unperturbed by interactions with other configurations, and thus the series formulas provided dependable results.

In this final LSF, 218 known even-parity levels were fitted with 38 free parameters with a standard deviation of 40 cm^{-1}, and 241 known odd-parity levels were fitted with 35 free parameters with a standard deviation of 72 cm^{-1}. The fitted (LSF) and ab initio Hartree-Fock (HF) values of parameters are given in Table A3. In both parities, the ζ_{3d} parameters of the $3d^n$ core were linked together in one group for all configurations, so that their LSF/HF ratio was the same for all members of the group, but was allowed to vary in the fitting. Other parameters, similar in different configurations, such as the

effective parameter α_{3d}, electrostatic parameter F^2(3d,3d) of the 3d^8 core, and configuration-interaction parameters, were also linked in similar groups, which decreased the number of free parameters and made the fitting more stable.

Using the transformation procedures implemented in Cowan's RCE code, eigenvector compositions were calculated in several coupling schemes. Similar to the spectrum of neutral nickel analyzed by Litzén et al. [21], most of the 3d^9nl configurations were found to be best described in the J_1l (otherwise known as JK or J_cK) coupling scheme, in which the total angular momentum of the core (3d^9 in this case) is combined with the orbital momentum of the valence electron to produce the K quantum number, which is then combined with the spin of the valence electron to obtain the final total angular momentum J. In Ni I, Litzén et al. [21] found the lowest [3d^9]nl configurations, 4s, 4p, and 5p, to be better described in the LS coupling scheme, which is also the best for the 3d^{8}4s^2 and other 3d$^8nln'l'$ configurations. In Cu II, our findings are similar, except that the 3d^{9}5p configuration is better described by J_1l coupling. The J_1l purity of the 3d^9nl configurations increases from 65% for 3d^{9}6p to 100% for 3d^9ns, nh ($n \geq 6$), and ng ($n \geq 6$), and generally increases with increasing n and l. This general trend is disrupted in 3d^{9}6p. This configuration strongly interacts with 3d^{8}4s4p, unlike 3d^{9}5p, for which this interaction is somewhat weaker, resulting in the average J_1l purity of 75%. For the 3d^{8}4s4p configuration, in agreement with the previous analysis by Roth [54], we found that the best description is obtained by first combining the quantum numbers of the 4s and 4p electrons with each other to produce an intermediate LSJ term (^{3}P$^\circ$ or ^{1}P$^\circ$) of the 4s4p valence shell, and then combine it with LSJ of the 3d^8 core. Although the average purity of 3d^{8}4s4p in this coupling scheme is rather high, 73%, many of its levels are strongly mixed with other configurations, rendering assignment of single-configuration labels arbitrary. Several levels attributed to this configuration have a leading percentage of the composition smaller than 30%. In a few cases, such as the levels at 139331.149 cm^{-1} (J = 3) and 139710.491 cm^{-1} (J = 2), we assigned labels corresponding to the second leading term in the composition, in order to preserve uniqueness of the labels within the J manifolds. The labels assigned to the levels do not fully describe their physical nature; percentage compositions given in Table A2 are somewhat better in this regard.

The high J_1l purity of the 3d^9ng configurations and very small values of parameters describing interactions between 3d^9 and ng shells allows for accurate prediction of the levels that were missing in Ross's levels list. This permitted us to find some of these levels from the lines left unclassified in his analysis.

For each level, Table A2 gives a number of observed lines on which this level is based. Most of the levels are based on more than two observed lines. However, 71 of them are derived from only one or two observed lines. Most of them are firmly identified, because the observed lines are the strongest predicted ones, and the level positions are confirmed by trends along series. Five of such levels are marked as questionable, because the corresponding series are strongly perturbed, or because the observed lines are not the strongest predicted to occur from these levels. The absence of predicted stronger lines could be explained by different registration sensitivity in exposures used in different spectral regions.

We identified the previously missing 3d^{8}4s^2 ^{1}S$_0$ level based on one line observed at 1807.8535 Å in two exposures in our VUV spectra and at 1807.84 Å by Shenstone [1]. We assigned this line to the strongest predicted transition from this level, terminating at 3d^{9}4p ^{1}P$^\circ_1$. Although this line is observed to be about 20 times stronger than predicted, this was the only unidentified line within the interval of $\pm$3000 cm^{-1}, and it places the 3d^{8}4s^2 ^{1}S$_0$ level within 25 cm^{-1} of its predicted position. Therefore, we believe that this identification is correct.

Five odd-parity levels are given in Table A2 with revised designations. The level with J = 3 at 121524.8509 cm^{-1} was previously labeled by Sugar and Musgrove [17] as 3d^{9}5p ^{3}D$^\circ$ with a 53% contribution of this term in the composition, as given by Roth [54]. Although our calculation yields the same leading term in the composition of this level, the total contribution from the 3d^{8}4s4p configuration is calculated to be greater than from 3d^{9}5p. Therefore, we designated this level by the second largest

component, $3d^8(^3F)4s4p(^3P^\circ)\ ^1F^\circ$. A marginally larger contribution of the $3d^9 5p\ ^3D^\circ$ term was found in the $J = 3$ level at 121079.1501 cm^{-1}, which we attributed to this configuration. The J_1l-coupling designation gives a better description of this level, the leading term being 54% of $3d^9(^2D_{5/2})5p\ ^2[5/2]^\circ$. In effect, the identifications of these two $J = 3$ levels at 121079.1501 cm^{-1} and 121524.8509 cm^{-1} have been interchanged. This revision is supported by better agreement of observed and calculated line intensities.

The $J = 4$ level at 134742.863 cm^{-1} was labeled by Sugar and Musgrove [17] as $3d^9 6p\ ^3F^\circ$, and its composition was given as 49% of this term and 39% of $3d^8(^1G)4s4p(^3P^\circ)\ ^3F^\circ$. We found the leading term to be 50% of $3d^8(^3F)4s4p(^1P^\circ)$, which we use as a revised label. We note that Sugar and Musgrove gave the same configuration and term label to another $J = 4$ level at 139395.786 cm^{-1} with almost the same percentage composition. We found for the latter level 59% contribution from $3d^9 6p\ ^3F^\circ$, but designated it in J_1l-coupling as $3d^9(^2D_{5/2})6p\ ^2[7/2]^\circ$.

Another $J = 4$ level at 137938.904 cm^{-1} was designated by Sugar and Musgrove [17] as $3d^8(^3F)4s4p(^1P^\circ)\ ^3F^\circ$ with 53% of this term in the composition. We found the leading terms to be 49% of $3d^8(^1G)4s4p(^3P^\circ)\ ^3F^\circ$, 39% of $3d^9 6p\ ^3F^\circ$, and only 5% of the term given as label by Sugar and Musgrove. We changed the label to the leading term indicated by our calculation.

The $J = 3$ level at 139331.149 cm^{-1} was designated by Sugar and Musgrove [17] as $3d^9 6p\ ^3D^\circ$ with 56% of this term in the composition. In our calculation, the leading *LS* term is found to be 46% of $3d^9 6p\ ^1F^\circ$. However, in J_1l-coupling adopted for the $3d^9 6p$ configuration, the leading term is 32% of $3d^9(^2D_{5/2})6p\ ^2[7/2]^\circ$, which is used to label another level having 62% of this term. Thus, we labeled the level at 139331.149 cm^{-1} by the second leading *LS* term of its composition, $3d^8(^1G)4s4p(^3P^\circ)\ ^3F^\circ$.

4. Ionization Energy

Ross [2] derived the value for the ionization limit by extrapolation of quantum defects along 12 series of the type $3d^9nl$ (two *n*s, nine *n*d, and one *n*f, with *n* ranging from 4 to 10 for the *n*s $J = 3$ series, 4 to 9 for the *n*s $J = 1$ series, and 4 to 8 for the rest). Although Ross used *LS* designations for all the levels involved, the series he chose are almost pure in J_1l coupling, resulting in smooth behavior of quantum defects along the series. Using the RITZPL computer code by Sansonetti [55], we repeated Ross's derivation with our more accurate level values and obtained slightly different values for the series limits. In the derivation of the limit, we added two more 5-member $3d^9nd$ series, in which we found some new identifications. The weighted average of the limits obtained closely agrees with the average value adopted by Ross. In addition, series limits obtained from six three-member series with an exact fit of the polarization formula (Sansonetti [56]) produced values in close agreement with this average. Thus, we adopted the value for the ionization limit given by Ross [2], 163669.2(5) cm^{-1} or 20.292 39(6) eV, which is now confirmed.

Table A2 includes predicted energies for 89 $[3d^9]nd$, *n*f, *n*g, and *n*h levels for which no reliable identification could be found in the observed spectra. These levels are not necessarily those that produce the strongest predicted lines. Rather, they are those that are easier to accurately predict, because the corresponding series have relatively small perturbations. In this derivation, we used predicted positions for centers of gravity of groups of closely located levels along series, using the RITZPL (quantum-defect formula) and POLAR (polarization-formula) extrapolation codes by Sansonetti [55,56], which we combined with fine-structure intervals predicted by the LSF (described in Section 3). Uncertainties assigned to these levels in Table A2 are weighted means of the "observed-calculated" residuals of the LSF, calculated separately for known levels with J_1l purities of $\geq$99%, (97 to 98) %, and (92 to 96) %. Some of the remaining unclassified lines observed by Ross [2,16], Shenstone [1], and by us may be due to these levels. However, we could not reliably identify them because of lack of observed Ritz combinations.

5. Line Intensities

Procedures used in the present work to adjust observed line intensities to a common scale were described in detail by Kramida [57,58]. In this derivation, line intensities observed in each experiment are roughly modeled as described by Boltzmann level populations with certain effective excitation temperature $T_{\rm eff}$. This temperature is found from a Boltzmann plot built using calculated transition probabilities. The ratios of predicted Boltzmann-population intensities are plotted against wavelengths to derive the response function of the registration equipment, which is then removed from the observed intensities to obtain an improved fit for $T_{\rm eff}$ from the Boltzmann plot. For photographic registration, an additional correction of non-linearity of intensity registration with exposure is deduced from a plot of ratios of calculated and observed intensities versus observed intensity. This procedure is repeated iteratively until convergence is achieved. Then it is easy to scale the reduced intensities observed in experiments with different $T_{\rm eff}$ and different sensitivity to a common value of $T_{\rm eff}$. In this way, we combined intensities observed in our 22 VUV and 3 FTS spectrograms listed in Table 1 with those reported by Shenstone [1], Kaufman and Ward [15], and Ross [2,16] and reduced them to the scale derived from Ross's observed intensities to produce the average values given in Table A1. This scale corresponds to $T_{\rm eff}$ = 1.5 eV, which is about average for all experiments included in the analysis. For different experiments, the fitted value of $T_{\rm eff}$ varied between 0.6 eV in some of our VUV exposures to 11 eV in observations of Kaufman and Ward [15]. It should be noted that in most experiments analyzed here populations of highly excited levels were enhanced by resonant transfer from excited levels of helium or other rare gases used in the discharges. This population transfer is the mechanism leading to population inversion and producing laser action observed in hollow-cathode discharges. Thus, it should be expected and is indeed observed that level populations deviate from the Boltzmann distribution by a factor of three on average and strongly vary depending on discharge conditions. Line intensities are given in Table A1 in terms of total energy flux under the line contour.

As noted in Section 2, only E1-allowed lines were observed in laboratory discharges. Thus, the intensity scale adopted for E1-forbidden lines is different from the allowed lines. It is based on relative intensities observed in nebulae spectra by Thackeray [3], Aller et al. [4], and McKenna et al. [5], modified in such a way that the relative intensities of lines from a common upper level are consistent for different observations.

6. Transition Probabilities

Transition probabilities of Cu II were reported in 42 papers, the full list of which can be found in the NIST Atomic Probability Bibliographic Database (Kramida and Fuhr [59]). In addition, we have calculated them using Cowan's codes [52] using our LSF parameters described in Section 3. To assess the uncertainties of all available data sets, we used evaluation procedures described by Kramida [57].

The initial reference data set was constructed of 41 A-values determined by Ortiz et al. [50] from branching fractions measured using laser-induced breakdown spectroscopy and lifetimes calculated using the Cowan suite of codes [52], modified by inclusion of core-polarization effects. The high accuracy of theoretical lifetimes used in that work was confirmed by excellent agreement with accurate measurements made by Pinnington et al. [51] and Cederquist et al. [43], as well as with other advanced calculations.

This initial selection was expanded by inclusion of theoretical A-values from Dong and Fritzsche [45] obtained in a large-scale multiconfiguration Dirac-Fock calculation accounting for relaxation effects in the orbitals. Uncertainties of these theoretical data were estimated by comparing the results obtained by those authors in the Babushkin (length) and Coulomb (velocity) gauges. This comparison indicated that the stronger lines with line strength $S > 10^{-6}$ a.u. were calculated with uncertainties in A-values of about 12% on average, while for weaker lines the average uncertainty was much larger, 60%. These conclusions are supported by good agreement (less than 10%) of calculated lifetimes with measurements. For 18 transitions the A-values reported by Dong and

Fritzsche [45] were normalized to lifetimes of the upper levels measured by Pinnington et al. [51] and by Cederquist et al. [43].

For three transitions representing the sole allowed decay channels of their upper levels, the lifetimes measured by Pinnington et al. [51] and by Cederquist et al. [43] were directly converted into *A*-values and also added to the reference data set. Further expansion of the reference data set was provided by results of Crespo López-Urrutia et al. [44] obtained by combining their own measurements of emission branching fractions with radiative lifetimes measured in other studies. From this work, the results obtained using the lifetimes reliably measured by Cederquist et al. [43] and by Kono and Hattori [48] were used without adjustments. However, for several transitions we re-normalized their results to lifetimes more accurately measured by Pinnington et al. [51]. Uncertainties of Crespo López-Urrutia et al. [44] were estimated by combining in quadrature systematic contributions from the uncertainties of the lifetimes and statistical uncertainties, which we estimated to vary from less than 5% for the strongest lines to 90% for the weakest lines, which we assumed to have a signal-to-noise ratio about 1.

Kono and Hattori [48] measured radiative lifetimes of some of the $3d^9 4p$ and $3d^9 5s$ levels by a delayed coincidence technique and combined them with branching fractions, some of which were measured in a specially designed discharge tube, and some of which were obtained in a single-configuration LSF-adjusted intermediate-coupling calculation. These authors did not report separately their measured branching fractions, which impedes assessment of their results. Instead, they used all of their data, both experimental and theoretical, together, and adjusted the resulting *A*-values to satisfy the *J*-file sum rule. We renormalized several of their reported *A*-values to radiative lifetimes measured more accurately by Brown et al. [42], Pinnington et al. [51], and Cederquist et al. [43] and estimated the uncertainties by a method similar to the one described above in evaluation of results of Crespo López-Urrutia et al. [44].

Assessment of measurements made by Neger and Jäger [49] and by Hefferlin et al. [47] (hereafter referred to as N88 and H71) presented the greatest difficulties, since they grossly disagree with each other. N88 reported relative transition probabilities (*A*-values) of seven Cu II lines measured by using an axial discharge type of an exploding copper wire. The rather vague description of these measurements does not include the temperature value used in the data reduction. However, Neger and Jäger compare their results with those reported by Lux [60], obtained with similar equipment, and note that Lux determined the plasma temperature to be 26500(3500) K (2.3(3) eV) from a Boltzmann plot using several Cu I lines with known transition probabilities. The relative *A*-values reported by N88 (using the line at 4555.92 Å as reference) have uncertainties ranging from 18% to 25% and perfectly agree with those of Lux [60]. Thus, we assumed that they used Lux's temperature value in their data reduction and restored the observed line intensities from the reported line ratios and this temperature. Two of the lines reported in N88 are in common with more accurate measurements of Ortiz et al. [50].

Hefferlin et al. [47] (H71) determined relative intensities of 11 Cu II lines from photoelectric radiance measurements on the Burnout V experimental magnetic-confinement fusion reactor at the Oak Ridge National Laboratory. To derive the relative $\log(gf)$ values from these measurements, they assumed the electron temperature to be 67 eV ($\pm$50%). Neger and Jäger [49] blamed this large uncertainty in the temperature value for the discrepancy of the H71 results with theirs. We note that Cu^+ should be completely ionized at this high temperature. Thus, an obvious path would be to dismiss the results of H71 as erroneous. However, their reported relative $\log(gf)$ values appear to be internally consistent and agree well with other independent estimates. Thus, we restored the observed line intensities from them, using the 67 eV temperature as reported in H71, and attempted to reconcile the two sets of relative intensities (from H71 and N88) by using the following procedure.

As a first step, to determine initial estimates of the excitation temperatures in H71 and N88, we used Boltzmann plots with reference *A*-values for the lines at 4043.48 Å and 4227.94 Å from Ortiz et al. [50], and for the line at 4909.73 Å from Cederquist et al. [43], while for all other lines we used our Cowan-code calculations. As a second step, using the temperatures derived from these

Boltzmann plots, we determined the adjusted A-values from the H71 and N88 observed line intensities. Then we replaced the Cowan-code A-values in the reference set with logarithmic means of thus obtained H71 and N88 adjusted A-values and found adjusted temperature values from the Boltzmann plots. The second step was repeated iteratively until reasonable convergence, i.e., until the change in the temperature values between iterations decreased below 0.001 eV. The final Boltzmann plots for H71 and N88 are shown in Figure 4a,b, respectively.

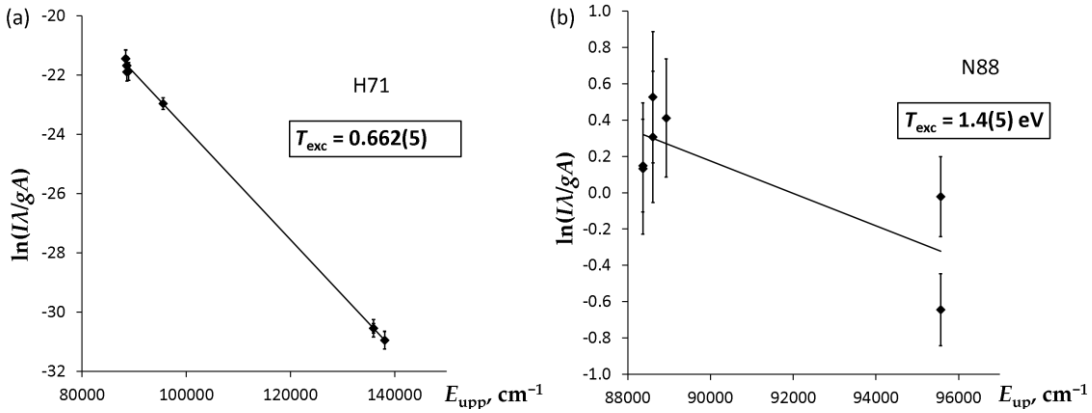

Figure 4. Boltzmann plots for relative intensities of observed lines: (**a**) Measurements of Hefferlin et al. [47] (H71); (**b**) Measurements of Neger and Jäger [49] (N88). The A-values used in these plots are the final adopted values given in Table A1. The error bars are combined uncertainties of A-values and relative intensities (see text).

The excitation temperatures determined for the H71 and N88 data sets are 0.662(5) eV and 1.4(5) eV, respectively. The latter is somewhat lower than the Lux [60] value used in N88, 2.3(3) eV. The final adjusted A-values deduced from the H71 and N88 data are compared with the adopted A-values in Figure 5. In this plot, the reference A-values used for the two leftmost lines (4043.48 Å and 4227.94 Å) and for the rightmost line at 4909.73 Å are from Ortiz et al. [50] and Cederquist et al. [43], while the rest of the lines use the mean of H71 and N88. The error bars are combined uncertainties of the measured line ratios and reference A-values. This plot shows that the adjusted A-values from H71 and N88 are consistent with each other, as well as with the adopted reference A-values.

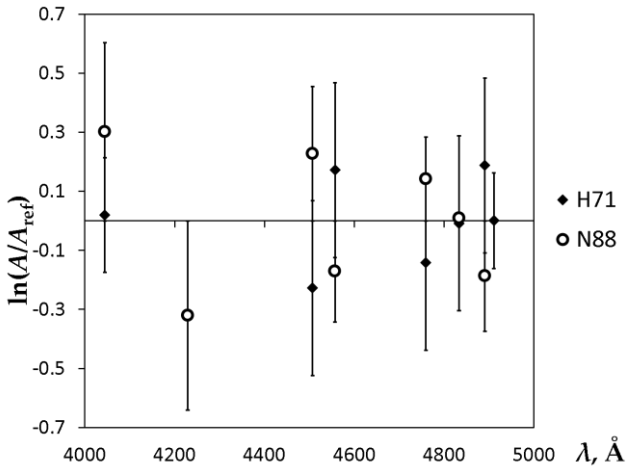

Figure 5. Comparison of adjusted A-values deduced from the line ratios reported by Hefferlin et al. [47] (H71) and by Neger and Jäger [49] (N88). The error bars are combined uncertainties of the measured line ratios and adopted reference A-values.

With the reference data set constructed from data described above, assessment of uncertainties in the theoretical study by Biémont et al. [41] was relatively easy to do by plotting the ratio of the calculated values to the reference ones against line strength S and calculating standard deviations for different ranges of S. This procedure resulted in estimated uncertainties of 9% for $S \geq 8.5$ atomic units (a.u.), 22% for S = (0.2 to 8.5) a.u., and 120% for $S < 0.2$ a.u.

Assessment procedures described above resulted in 210 reference A-values with uncertainties less than 25% covering a wide range of line strengths from 0.06 a.u. to 155 a.u., after which it became possible to evaluate the uncertainties of our LSF calculations. Comparison of our calculated A-values with the reference ones is illustrated in Figure 6.

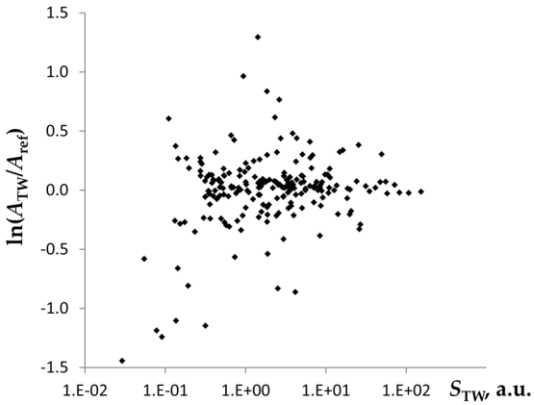

Figure 6. Comparison of transition probabilities calculated in this work (A_{TW}) with reference values (A_{ref}, see text). Natural logarithm of the ratio A_{TW}/A_{ref} is plotted against our calculated line strength, S_{TW} (in atomic units).

This plot displays a typical behavior of theoretical transition probabilities. Namely, the strongest lines exhibit the smallest discrepancies from the reference values, while for weaker lines the magnitude of discrepancies grows. A similar comparison was made between A-values produced in our two LSFs (the final and preliminary ones, described in Section 3). From these comparisons, we estimated the uncertainties of our A-values to be $\leq$10% for $S > 200$ a.u., $\leq$15% for S = (50 to 200) a.u., $\leq$30% for S = (4.3 to 50) a.u., and $\geq$50% for smaller S. We included 79 of our best calculated A-values in Table A1.

Studies of E1-forbidden transition probabilities of Cu II are very scarce. Garstang [46] calculated A-values for several M1 and E2 transitions from the first excited configuration, $3d^9 4s$, down to lower-lying levels of the same configuration and to the ground state, $3d^{10}\,{}^1S_0$. He used the pseudo-relativistic Hartree-Fock method with superposition of configurations and LSF-adjusted Slater parameters, similar to the one implemented in Cowan's codes [52] used in the present work, but limited by inclusion of only three low-lying configurations of even parity. Beck [61] made an ab initio restricted non-relativistic multiconfiguration Hartree-Fock calculation for the $3d^{10}\,{}^1S_0$–$3d^9 4s$ ${}^{1,3}D_2$ E2 transition and obtained $A = 2.33\ s^{-1}$, somewhat larger than the sum of Garstang's values for transitions from ${}^1D_2$, 1.7 s^{-1}, and ${}^3D_2$, 0.12 s^{-1}. Prior [37] measured the A-value for the $3d^{10}\,{}^1S_0$–$3d^9 4s$ ${}^1D_2$ transition at 3806.3 Å to be 1.60(24) s^{-1}, in excellent agreement with Garstang's semiempirical value. The most recent multiconfiguration Dirac-Hartree-Fock calculation of Andersson et al. [40] gave $A = 1.937\ s^{-1}$ for this transition. However, their calculated wavelength is 3724.7 Å, significantly shorter than experimental. Adjustment to the experimental wavelength yields $A_{adj} = 1.74\ s^{-1}$, in good agreement with Prior [37] and Garstang [46]. A similar adjustment of the value of Andersson et al. [40] for the $3d^{10}\ {}^1S_0$–$3d^9 4s\ {}^3D_2$ transition at 4375.8 Å (which Andersson et al. [40] calculated to be at 4275.8 Å) gives $A_{adj} = 0.093\ s^{-1}$, about 30% lower than Garstang's result. For these two E2 transitions, our A-values calculated with Cowan's codes are too high by a factor of about 1.7. We assume that our A-value for the predicted $3d^9 4s\ {}^3D_3$–${}^3D_1$ E2 transition at 48318 Å, $9 \times 10^{-8}\ s^{-1}$, has a similar

low accuracy. The $3d^{10}\ ^1S_0$–$3d^9 4s\ ^1D_2$ transition at 3806.3 Å was observed by Thackeray [3] and by McKenna et al. [5] in emission spectra of nebulae.

It should be noted that, in addition to the two E2 transitions mentioned above, Andersson et al. [40] give calculated *A*-values for the magnetic-octupole (M3) and hyperfine-induced $3d^{10}\ ^1S_0$–$3d^9 4s\ ^3D_3$ transitions at 4559 Å. The latter are different for various HFS components of the two isotopes (^{63}Cu and ^{65}Cu) and are typically on the order of a few times 10^{-9} s^{-1}, three orders of magnitude greater than for the M3 transition. This transition, as well as the $3d^{10}\ ^1S_0$–$3d^9 4s\ ^3D_2$ E2 transition at 4375.8 Å, was observed by Aller et al. [4] in the spectrum of the RR Telescopii nebula.

A-values for M1 transitions are relatively easier to calculate than E1 and E2 transitions, since their calculation does not involve radial integrals, but only amplitudes of eigenvector components. We compared our calculated *A*-values for M1 transitions with those of Garstang [46] and found that all of them agree to better than 15%. We included in Table A1 our *A*-value for the $3d^{10}\ ^1S_0$–$3d^9 4s\ ^3D_1$ M1 transition at 4165.7 Å, which was not given by Garstang [46]. It turned out to be extremely small, 2.1×10^{-12} s^{-1}. Our calculation indicates that there is no E2 contribution to the total decay rate of the $3d^9 4s\ ^3D_1$ level. This makes the identification of the line observed at this wavelength by McKenna et al. [5] with this transition questionable. Possible explanations for this observation could be (1) our calculated M1 *A*-value is greatly underestimated; (2) there is a considerable contribution of E2 transition to this line, which for unknown reason is computed as negligibly small by Cowan's codes; (3) hyperfine-induced transition significantly increases the total radiative rate; (4) the population of the $3d^9 4s\ ^3D_1$ level in RR Telescopii is many orders of magnitude greater than that of $^3D_2$ and $^1D_2$; or (5) the identification is incorrect, and the observed line is possibly due to some other species. As explained above, the first explanation is rather unlikely. To confirm or disprove the second and third explanations, more extensive atomic calculations are needed, while checking the fourth one requires population-kinetics modeling.

7. Conclusions

The present work provides a comprehensive list of all observed, classified, and predicted spectral lines of Cu II, which includes 2557 transitions with wavelengths from 675 Å to 10.9 μm. Over 600 of them were measured in this work using grating and Fourier-transform spectrometers. Experimental wavelengths of 2443 transitions were used in a least-squares level optimization procedure to produce optimized values for 379 energy levels, of which 29 are newly identified, and nine are revised. The previous analysis of Ross [2,16] is largely confirmed. However, our extended base for the levels optimization results in more dependable level values and Ritz wavelengths that can be used as secondary standards in the vacuum ultraviolet region. An improved theoretical interpretation of the energy levels was made by a parametric least-squares fitting with Cowan's atomic codes, which included all experimental levels. The fitted Slater parameters were used to calculate radiative transition probabilities for electric-dipole, magnetic-dipole, and electric-quadrupole transitions, which were critically evaluated together with other published data to construct a list of recommended *A*-values for 555 transitions.

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Author Contributions: All authors contributed equally to this work.

Conflicts of Interest: The authors declare no conflict of interest.

Appendix A

Table A1. Spectral lines of Cu II.

λ_{obs} [a] (Å)	σ_{obs} [b] (cm^{-1})	λ_{Ritz} [c] (Å)	$\Delta\lambda_{obs-Ritz}$ (Å)	I_{obs} [d] (arb. u.)	Char [e]	Lower Level		Upper Level		A (s^{-1})	Acc [f]	Line Ref. [g]	TP Ref. [g]	Notes [h]
675.5994(20)	148016.7(4)	675.60192(8)	−0.0025	73000		d^{10}	$^1S_0$	5f	$(3/2)^2[3/2]^\circ_1$			TW		
677.675(3)	147563.3(6)	677.67816(8)	−0.003	29000		d^{10}	$^1S_0$	7p	$(5/2)^2[3/2]^\circ_1$			TW		
685.1377(20)	145956.1(4)	685.14058(8)	−0.0029	240000		d^{10}	$^1S_0$	5f	$(5/2)^2[3/2]^\circ_1$			TW		
685.3922(20)	145901.9(4)	685.39671(8)	−0.0045	45000		d^{10}	$^1S_0$	5f	$(5/2)^2[1/2]^\circ_1$			TW		
709.3098(20)	140982.1(4)	709.31287(9)	−0.0031	250000		d^{10}	$^1S_0$	6p	$(3/2)^2[1/2]^\circ_1$			TW		
718.1766(20)	139241.5(4)	718.17860(9)	−0.0020	310000		d^{10}	$^1S_0$	6p	$(5/2)^2[3/2]^\circ_1$			TW		
724.4881(20)	138028.5(4)	724.48867(9)	−0.0006	490000		d^{10}	$^1S_0$	4f	$(3/2)^2[3/2]^\circ_1$			TW		
735.5215(11)	135957.95(20)	735.52023(9)	0.0013	780000		d^{10}	$^1S_0$	4f	$(5/2)^2[3/2]^\circ_1$			TW		
736.0331(8)	135863.46(16)	736.03185(9)	0.0012	870000		d^{10}	$^1S_0$	4f	$(5/2)^2[1/2]^\circ_1$			TW		
763.2658(20)	131016.0(3)	763.2692(3)	−0.0034	140000		4s	$^3D_3$	sp	$(^3P)^1P^\circ\ ^3P^\circ_2$			TWn		
768.4821(20)	130126.6(3)	768.48565(19)	−0.0035	150000		4s	$^3D_3$	8p	$(5/2)^2[3/2]^\circ_2$			TWn		
776.484(3)	128785.6(5)	776.4877(3)	−0.004	58000		4s	$^3D_1$	sp	$(^3P)^1P^\circ\ ^3P^\circ_0$			TWn		
777.739(3)	128577.8(5)	777.74333(3)	−0.004	56000		4s	$^3D_2$	8p	$(5/2)^2[3/2]^\circ_1$			TW		
779.2932(20)	128321.4(3)	779.29473(5)	−0.0015	590000		4s	$^3D_3$	sp	$(^1D)^1P^\circ\ ^1D^\circ_2$			TW		
779.328(3)	128315.6(5)	779.33660(4)	−0.008	480000		4s	$^3D_2$	6f	$(5/2)^2[1/2]^\circ_1$			TWn		
784.9098(20)	127403.2(3)	784.91229(5)	−0.0025	69000		4s	$^3D_2$	sp	$(^1D)^1P^\circ\ ^1D^\circ_2$			TW		
786.392(3)	127163.1(5)	786.39222(4)	−0.000	21000	*	4s	$^3D_1$	6f	$(5/2)^2[1/2]^\circ_1$			TWn		
786.392(3)	127163.1(5)	786.39795(4)	−0.006	21000	*	4s	$^1D_2$	6f	$(3/2)^2[3/2]^\circ_2$			TW		
787.907(3)	126918.5(5)	787.9056(3)	0.001	33000		4s	$^3D_2$	7p	$(3/2)^2[3/2]^\circ_1$			TWn		
788.012(3)	126901.6(5)	788.01778(20)	−0.006	45000		4s	$^1D_2$	sp	$(^1D)^1P^\circ\ ^1P^\circ_1$			TWn		
789.3937(20)	126679.5(3)	789.3933(3)	0.0004	100000	*	4s	$^1D_2$	sp	$(^3P)^1P^\circ\ ^3P^\circ_2$			TWn		
789.3937(20)	126679.5(3)	789.3977(3)	−0.0040	100000	*	4s	$^3D_2$	7p	$(3/2)^2[5/2]^\circ_2$			TWn		
789.6575(20)	126637.2(3)	789.65867(5)	−0.0011	59000		4s	$^3D_2$	7p	$(3/2)^2[1/2]^\circ_1$			TWn		
794.9719(20)	125790.6(3)	794.97430(20)	−0.0024	56000		4s	$^1D_2$	8p	$(5/2)^2[3/2]^\circ_2$			TWn		
797.4530(20)	125399.2(3)	797.45499(4)	−0.0020	560000		4s	$^3D_3$	7p	$(5/2)^2[3/2]^\circ_2$			TW		
797.6193(20)	125373.1(3)	797.6218(5)	−0.0025	35000		4s	$^3D_1$	7p	$(3/2)^2[1/2]^\circ_0$			TWn		
798.977(3)	125160.0(5)	798.97928(3)	−0.002	23000		4s	$^1D_2$	8p	$(5/2)^2[3/2]^\circ_1$			TW		
800.6592(20)	124897.1(3)	800.66084(5)	−0.0017	26000		4s	$^1D_2$	6f	$(5/2)^2[1/2]^\circ_1$			TWn		
801.8229(20)	124715.8(3)	801.82460(4)	−0.0017	84000		4s	$^3D_2$	7p	$(5/2)^2[3/2]^\circ_1$			TW		
803.3370(20)	124480.8(3)	803.33841(4)	−0.0014	77000		4s	$^3D_2$	7p	$(5/2)^2[3/2]^\circ_2$			TW		
806.5454(20)	123985.6(3)	806.54699(5)	−0.0016	180000		4s	$^1D_2$	sp	$(^1D)^1P^\circ\ ^1D^\circ_2$			TW		
809.2942(20)	123564.5(3)	809.29524(4)	−0.0011	17000		4s	$^3D_1$	7p	$(5/2)^2[3/2]^\circ_1$			TW		
809.706(3)	123501.6(5)	809.7079(3)	−0.002	12000		4s	$^1D_2$	7p	$(3/2)^2[3/2]^\circ_1$			TWn		
809.9630(20)	123462.4(3)	809.9649(3)	−0.0019	45000		4s	$^1D_2$	7p	$(3/2)^2[3/2]^\circ_2$			TWn		
810.9987(20)	123304.8(3)	810.99829(11)	0.0004	520000		d^{10}	$^1S_0$	5p	$(3/2)^2[3/2]^\circ_1$			TW		
810.6365(20)	123359.8(3)	810.6361(3)	0.0005	86000		4s	$^1D_2$	7p	$(3/2)^2[5/2]^\circ_3$			TWn		

Table A1. *Cont.*

λ_{obs} [a] (Å)	σ_{obs} [b] (cm^{-1})	λ_{Ritz} [c] (Å)	$\Delta\lambda_{obs-Ritz}$ (Å)	I_{obs} [d] (arb. u.)	Char [e]	Lower Level		Upper Level		A (s^{-1})	Acc [f]	Line Ref. [g]	TP Ref. [g]	Notes [h]
811.2843(20)	123261.4(3)	811.2839(4)	0.0004	110000		4s	$^1D_2$	7p	$(3/2)^2[5/2]^\circ_2$			TWn		
811.5559(20)	123220.1(3)	811.55946(5)	−0.0036	13000		4s	$^1D_2$	7p	$(3/2)^2[1/2]^\circ_1$			TWn		
813.882(3)	122867.9(4)	813.88328(11)	−0.001	760000		d^{10}	$^1S_0$	5p	$(3/2)^2[1/2]^\circ_1$			TW		
823.059(3)	121497.9(4)	823.05584(4)	0.004	2000		4s	$^1D_2$	7p	$(5/2)^2[5/2]^\circ_3$			TW		
823.8361(18)	121383.4(3)	823.83758(6)	−0.0015	90000		4s	$^1D_2$	7p	$(5/2)^2[5/2]^\circ_2$			TW		
824.4127(20)	121298.5(3)	824.41507(4)	−0.0024	6100		4s	$^1D_2$	7p	$(5/2)^2[3/2]^\circ_1$			TW		
824.6630(19)	121261.7(3)	824.6649(4)	−0.0019	90000		4s	$^1D_2$	7p	$(5/2)^2[7/2]^\circ_3$			TWn		
826.014(3)	121063.3(5)	826.01546(5)	−0.001	4400		4s	$^1D_2$	7p	$(5/2)^2[3/2]^\circ_2$			TW		
826.9946(22)	120919.8(3)	826.99598(12)	−0.0014	1100000		d^{10}	$^1S_0$	5p	$(5/2)^2[3/2]^\circ_1$			TW		
829.360(5)	120575.0(8)	829.35106(14)	0.008	7400		4s	$^3D_2$	sp	$(^1G)^3P^\circ\ ^3G^\circ_3$			TWn		
836.042(20)	119611(3)	836.02765(3)	0.014	27000		4s	$^3D_3$	6p	$(3/2)^2[3/2]^\circ_2$			S36c		
841.136(3)	118886.8(4)	841.13445(3)	0.002	30000		4s	$^3D_2$	6p	$(3/2)^2[3/2]^\circ_1$			TW		
842.4973(24)	118694.7(3)	842.49630(3)	0.0010	66000		4s	$^3D_2$	6p	$(3/2)^2[3/2]^\circ_2$			TW		
844.6125(21)	118397.5(3)	844.61287(4)	−0.0003	88000		4s	$^3D_2$	6p	$(3/2)^2[5/2]^\circ_2$			TW		
844.9124(21)	118355.5(3)	844.91208(4)	0.0003	410000		4s	$^3D_2$	6p	$(3/2)^2[5/2]^\circ_3$			TW		
848.8062(20)	117812.5(3)	848.80734(3)	−0.0011	920000		4s	$^3D_3$	6p	$(5/2)^2[5/2]^\circ_3$			TW		
849.3599(19)	117735.7(3)	849.35931(3)	0.0006	240000		4s	$^3D_1$	6p	$(3/2)^2[3/2]^\circ_1$			TW		
850.7481(19)	117543.6(3)	850.74794(3)	0.0001	140000		4s	$^3D_1$	6p	$(3/2)^2[3/2]^\circ_2$			TW		
851.3012(16)	117467.24(23)	851.30253(3)	−0.0013	1100000		4s	$^3D_3$	6p	$(5/2)^2[7/2]^\circ_4$			TW		
851.776(3)	117401.8(4)	851.77122(3)	0.004	21000		4s	$^3D_3$	sp	$(^1G)^3P^\circ\ ^3F^\circ_3$			TW		
852.9074(21)	117246.0(3)	852.90622(4)	0.0012	370000		4s	$^3D_1$	6p	$(3/2)^2[5/2]^\circ_2$			TW		
853.5444(24)	117158.5(3)	853.54260(15)	0.0018	45000		4s	$^1D_2$	sp	$(^1G)^3P^\circ\ ^3G^\circ_3$			TWn		
855.4770(19)	116893.9(3)	855.476052(24)	0.0009	270000		4s	$^3D_2$	6p	$(5/2)^2[5/2]^\circ_3$			TW		
855.6994(21)	116863.5(3)	855.70010(3)	−0.0007	720000		4s	$^3D_2$	sp	$(^3F)^1P^\circ\ ^3F^\circ_2$			TW		
858.4844(20)	116484.4(3)	858.486771(24)	−0.0024	990000		4s	$^3D_2$	sp	$(^1G)^3P^\circ\ ^3F^\circ_3$			TW		
858.5639(20)	116473.6(3)	858.566433(20)	−0.0025	890000		4s	$^3D_3$	6p	$(5/2)^2[7/2]^\circ_3$			TW		
859.1522(24)	116393.8(3)	859.15072(3)	0.0014	14000		4s	$^3D_2$	6p	$(5/2)^2[3/2]^\circ_1$			TW		
860.7214(24)	116181.6(3)	860.72158(4)	−0.0001	22000		4s	$^3D_2$	6p	$(5/2)^2[5/2]^\circ_2$			TW		
861.9932(11)	116010.19(14)	861.99338(6)	−0.0002	1900000		4s	$^3D_3$	sp	$(^1G)^3P^\circ\ ^3F^\circ_4$			TW		
862.8221(20)	115898.7(3)	862.82245(4)	−0.0003	78000		4s	$^3D_2$	6p	$(5/2)^2[3/2]^\circ_2$			TW		
864.163(4)	115718.9(5)	864.15435(3)	0.009	130000		4s	$^3D_3$	sp	$(^3P)^3P^\circ\ ^1D^\circ_2$			TW		
864.214(3)	115712.0(4)	864.21371(3)	0.001	670000		4s	$^3D_1$	sp	$(^3F)^1P^\circ\ ^3F^\circ_2$			TW		
865.3907(8)	115554.74(11)	865.389986(23)	0.0007	1600000		4s	$^3D_2$	6p	$(5/2)^2[7/2]^\circ_3$			K66		
866.4430(20)	115414.4(3)	866.442524(13)	0.0005	64000		4s	$^3D_2$	4f	$(3/2)^2[7/2]^\circ_3$			TW		
867.7321(21)	115242.9(3)	867.73348(3)	−0.0014	320000		4s	$^3D_1$	6p	$(5/2)^2[3/2]^\circ_1$			TW		
869.0634(18)	115066.40(24)	869.06394(3)	−0.0005	250000		4s	$^3D_2$	sp	$(^3F)^1P^\circ\ ^3D^\circ_1$			TW		
869.3338(24)	115030.6(3)	869.33592(4)	−0.0021	1200000		4s	$^3D_1$	6p	$(5/2)^2[5/2]^\circ_2$			TW		
870.5390(18)	114871.37(24)	870.538673(24)	0.0003	240000		4s	$^3D_3$	sp	$(^3F)^1P^\circ\ ^3D^\circ_2$			TW		
871.0674(18)	114801.68(24)	871.06737(3)	0.0000	130000		4s	$^3D_2$	sp	$(^3P)^3P^\circ\ ^1D^\circ_2$			TW		

Table A1. *Cont.*

λ_{obs} [a] (Å)	σ_{obs} [b] (cm^{-1})	λ_{Ritz} [c] (Å)	$\Delta\lambda_{obs-Ritz}$ (Å)	I_{obs} [d] (arb. u.)	Char [e]	Lower Level			Upper Level		A (s^{-1})	Acc [f]	Line Ref. [g]	TP Ref. [g]	Notes [h]
873.2629(21)	114513.0(3)	873.262654(21)	0.0003	310000		4s	$^3D_3$	sp	$(^3F)^1P^\circ\ ^3F^\circ_3$				TW		
876.7226(20)	114061.2(3)	876.722436(13)	0.0002	830000		4s	$^3D_3$	4f	$(5/2)^2[7/2]^\circ_3$				TW		
876.973(5)	114028.6(7)	876.962109(24)	0.011	420000		4s	$^3D_1$	4f	$(3/2)^2[3/2]^\circ_1$				TW		
877.0107(24)	114023.7(3)	877.01184(4)	−0.0012	890000		4s	$^3D_3$	sp	$(^3P)^3P^\circ\ ^5S^\circ_2$				TW		
877.5531(20)	113953.2(3)	877.554632(23)	−0.0015	820000		4s	$^3D_2$	sp	$(^3F)^1P^\circ\ ^3D^\circ_2$				TW		
877.8469(21)	113915.1(3)	877.84692(3)	0.0000	610000		4s	$^3D_1$	sp	$(^3F)^1P^\circ\ ^3D^\circ_1$				TW		
878.6984(8)	113804.69(10)	878.69833(3)	0.0001	1500000		4s	$^3D_3$	sp	$(^3F)^1P^\circ\ ^3D^\circ_3$				K66		
879.8897(24)	113650.6(3)	879.89110(3)	−0.0014	21000		4s	$^3D_1$	sp	$(^3P)^3P^\circ\ ^1D^\circ_2$				TW		
880.3225(24)	113594.7(3)	880.322766(20)	−0.0003	38000		4s	$^3D_2$	sp	$(^3F)^1P^\circ\ ^3F^\circ_3$				TW		
881.473(3)	113446.4(4)	881.47711(3)	−0.004	3100		4s	$^1D_2$	sp	$(^3F)^1P^\circ\ ^3F^\circ_2$				TW		
883.2800(20)	113214.4(3)	883.27981(3)	0.0002	41000		4s	$^3D_1$	sp	$(^1G)^3P^\circ\ ^3F^\circ_2$				TW,S36r		
883.8404(20)	113142.6(3)	883.838830(10)	0.0016	55000		4s	$^3D_2$	4f	$(5/2)^2[7/2]^\circ_3$				TW		
884.1340(21)	113105.0(3)	884.13295(4)	0.0011	290000		4s	$^3D_2$	sp	$(^3P)^3P^\circ\ ^5S^\circ_2$				TW		
884.4346(18)	113066.58(23)	884.43449(3)	0.0001	420000		4s	$^1D_2$	sp	$(^1G)^3P^\circ\ ^3F^\circ_3$				TW		
884.8262(20)	113016.5(3)	884.826019(13)	0.0002	34000		4s	$^3D_2$	4f	$(5/2)^2[1/2]^\circ_1$				TW		
885.8463(20)	112886.4(3)	885.846966(24)	−0.0006	770000		4s	$^3D_2$	sp	$(^3F)^1P^\circ\ ^3D^\circ_3$				TW		
886.4163(24)	112813.8(3)	886.413782(20)	0.0025	25000		4s	$^3D_3$	sp	$(^3F)^1P^\circ\ ^3F^\circ_4$				TW		
886.5113(20)	112801.7(3)	886.510950(24)	0.0004	280000		4s	$^3D_1$	sp	$(^3F)^1P^\circ\ ^3D^\circ_2$				TW		
886.9435(8)	112746.75(10)	886.94322(3)	0.0003	1300000		4s	$^3D_3$	sp	$(^3P)^3P^\circ\ ^3D^\circ_2$				K66		
890.5677(6)	112287.93(8)	890.56671(3)	0.0010	1300000		4s	$^3D_2$	sp	$(^3P)^3P^\circ\ ^3P^\circ_1$				K66		
891.7636(24)	112137.3(3)	891.76309(3)	0.0005	23000		4s	$^1D_2$	6p	$(5/2)^2[7/2]^\circ_3$				TW		
892.4154(6)	112055.44(8)	892.41418(3)	0.0012	1100000		4s	$^3D_3$	sp	$(^3P)^3P^\circ\ ^3D^\circ_3$				K66		
893.634(5)	111902.7(7)	893.624985(19)	0.009	1100000		4s	$^3D_1$	4f	$(5/2)^2[1/2]^\circ_0$				TW		
893.6787(6)	111897.04(8)	893.67746(3)	0.0012	940000		4s	$^3D_3$	sp	$(^3P)^3P^\circ\ ^3P^\circ_2$				K66		
894.2260(20)	111828.56(25)	894.227192(24)	−0.0012	860000		4s	$^3D_2$	sp	$(^3P)^3P^\circ\ ^3D^\circ_2$				TW		
896.7583(15)	111512.77(19)	896.758608(23)	−0.0003	1000000		4s	$^3D_2$	sp	$(^3P)^3P^\circ\ ^3D^\circ_1$				TW		
896.9741(20)	111485.94(25)	896.97600(3)	−0.0019	870000		4s	$^3D_1$	sp	$(^3P)^3P^\circ\ ^3P^\circ_0$				TW		
897.7927(18)	111384.29(22)	897.79300(3)	−0.0003	410000		4s	$^1D_2$	sp	$(^3P)^3P^\circ\ ^1D^\circ_2$				TW		
899.7904(18)	111136.99(22)	899.78867(3)	0.0018	910000	*	4s	$^3D_2$	sp	$(^3P)^3P^\circ\ ^3D^\circ_3$				TW		
899.7904(18)	111136.99(22)	899.79200(3)	−0.0016	910000	*	4s	$^3D_1$	sp	$(^3P)^3P^\circ\ ^3P^\circ_1$				TW		
901.0757(16)	110978.47(20)	901.07654(7)	−0.0009	660000	*	4s	$^1D_2$	sp	$(^3P)^3P^\circ\ ^1P^\circ_1$				TW,S36r		
901.0757(16)	110978.47(20)	901.07292(3)	0.0027	660000	*	4s	$^3D_2$	sp	$(^3P)^3P^\circ\ ^3P^\circ_2$				TW		
901.322(3)	110948.2(4)	901.32128(3)	0.000	25000		4s	$^1D_2$	sp	$(^1G)^3P^\circ\ ^3F^\circ_2$				TWn		
903.522(6)	110678.0(7)	903.52887(3)	−0.007	16000		4s	$^3D_1$	sp	$(^3P)^3P^\circ\ ^3D^\circ_2$				S36c		
906.1130(20)	110361.52(24)	906.11330(3)	−0.0003	670000		4s	$^3D_1$	sp	$(^3P)^3P^\circ\ ^3D^\circ_1$				TW		
910.5183(21)	109827.56(25)	910.51831(3)	−0.0000	240000		4s	$^3D_1$	sp	$(^3P)^3P^\circ\ ^3P^\circ_2$				TW		
911.630	109693.6	911.629867(16)		15000	:	4s	$^1D_2$	4f	$(5/2)^2[3/2]^\circ_1$				S36c		
911.679	109687.7	911.67901(4)		15000	:	4s	$^1D_2$	sp	$(^3P)^3P^\circ\ ^5S^\circ_2$				S36c		
912.025	109646.2	912.024525(12)		7400	:	4s	$^1D_2$	4f	$(5/2)^2[3/2]^\circ_2$				S36c		
912.4142(24)	109599.3(3)	912.415956(16)	−0.0018	15000		4s	$^1D_2$	4f	$(5/2)^2[1/2]^\circ_1$				TW		

Table A1. *Cont.*

λ_{obs} [a] (Å)	σ_{obs} [b] (cm^{-1})	λ_{Ritz} [c] (Å)	$\Delta\lambda_{obs-Ritz}$ (Å)	I_{obs} [d] (arb. u.)	Char [e]	Lower Level			Upper Level		A (s^{-1})	Acc [f]	Line Ref. [g]	TP Ref. [g]	Notes [h]
913.47(4)	109472(5)	913.50160(3)	−0.03	7300		4s	$^1D_2$	sp	$(^3F)^1P^\circ\ ^3D^\circ_3$				S36c		
914.2128(6)	109383.72(7)	914.21305(11)	−0.0003	830000		4s	$^3D_3$	sp	$(^3P)^3P^\circ\ ^5D^\circ_4$				K66		
917.3051(20)	109014.98(23)	917.30556(8)	−0.0004	380000		4s	$^3D_3$	sp	$(^3P)^3P^\circ\ ^5D^\circ_2$				TW		
922.0188(8)	108457.66(9)	922.01869(14)	0.0001	520000		4s	$^3D_3$	sp	$(^1D)^3P^\circ\ ^3P^\circ_2$				K66		
922.4141(16)	108411.18(19)	922.41586(3)	−0.0018	350000		4s	$^1D_2$	sp	$(^3P)^3P^\circ\ ^3D^\circ_2$				TW		
924.2381(8)	108197.23(9)	924.23840(7)	−0.0003	550000		4s	$^3D_2$	sp	$(^3P)^3P^\circ\ ^5D^\circ_3$				K66		
925.119(10)	108094.2(12)	925.09896(8)	0.020	510000	*	4s	$^3D_2$	sp	$(^3P)^3P^\circ\ ^5D^\circ_2$				TW		
925.119(10)	108094.2(12)	925.10963(3)	0.009	510000	*	4s	$^1D_2$	sp	$(^3P)^3P^\circ\ ^3D^\circ_1$				TW		
925.119(10)	108094.2(12)	925.12612(7)	−0.007	510000	*	4s	$^3D_2$	sp	$(^3P)^3P^\circ\ ^5D^\circ_1$				TW		
929.702(3)	107561.4(3)	929.70175(3)	0.000	18000		4s	$^1D_2$	sp	$(^3P)^3P^\circ\ ^3P^\circ_2$				TW		
929.8940(20)	107539.14(23)	929.89272(14)	0.0013	18000		4s	$^3D_2$	sp	$(^1D)^3P^\circ\ ^3P^\circ_2$				TW		
932.9398(8)	107188.05(9)	932.93989(10)	−0.0001	590000		4s	$^3D_3$	sp	$(^1D)^3P^\circ\ ^3D^\circ_3$		1.7e+08	C	K66	B00	
934.9761(18)	106954.61(21)	934.97102(14)	0.0050	280000	?	4s	$^3D_1$	sp	$(^3P)^3P^\circ\ ^5D^\circ_0$				TWn		
935.0564(14)	106945.42(17)	935.05755(8)	−0.0012	380000		4s	$^3D_1$	sp	$(^3P)^3P^\circ\ ^5D^\circ_2$				TW		
		935.08529(7)			m	4s	$^3D_1$	sp	$(^3P)^3P^\circ\ ^5D^\circ_1$				S36c		
935.2307(22)	106925.49(25)	935.23232(7)	−0.0016	450000		4s	$^3D_3$	sp	$(^1D)^3P^\circ\ ^3D^\circ_2$				TW		
935.3408(18)	106912.90(20)	935.34317(5)	−0.0023	360000		4s	$^3D_2$	sp	$(^1D)^3P^\circ\ ^3P^\circ_1$				TW		
935.892(3)	106849.9(3)	935.89753(15)	−0.006	620000		4s	$^3D_3$	sp	$(^1D)^3P^\circ\ ^3F^\circ_4$		1.12e+08	C	TW	B00	
937.815(6)	106630.8(7)	937.81726(7)	−0.002	48000		4s	$^3D_3$	sp	$(^1D)^3P^\circ\ ^3F^\circ_3$				S36c		
939.5218(15)	106437.12(16)	939.52288(6)	−0.0010	190000		4s	$^3D_3$	sp	$(^1D)^3P^\circ\ ^3F^\circ_2$				TW		
943.3333(18)	106007.07(20)	943.33466(7)	−0.0014	580000		4s	$^3D_2$	sp	$(^1D)^3P^\circ\ ^3D^\circ_2$		1.4e+08	C	TW	B00	
945.5223(17)	105761.65(19)	945.52474(6)	−0.0025	510000		4s	$^3D_1$	sp	$(^1D)^3P^\circ\ ^3P^\circ_1$				TW		
945.8771(21)	105721.98(24)	945.87663(7)	0.0005	400000		4s	$^3D_2$	sp	$(^1D)^3P^\circ\ ^3D^\circ_1$				TW		
945.9614(21)	105712.56(24)	945.96464(7)	−0.0033	460000		4s	$^3D_2$	sp	$(^1D)^3P^\circ\ ^3F^\circ_3$		1.1e+08	C	TW	B00	
947.6989(17)	105518.74(19)	947.70005(6)	−0.0011	14000		4s	$^3D_2$	sp	$(^1D)^3P^\circ\ ^3F^\circ_2$				TW		
951.4068(15)	105107.51(16)	951.40774(8)	−0.0010	24000		4s	$^3D_1$	sp	$(^1D)^3P^\circ\ ^3P^\circ_0$				TW		
954.3815(15)	104779.91(16)	954.38279(7)	−0.0013	270000		4s	$^1D_2$	sp	$(^3P)^3P^\circ\ ^5D^\circ_3$				TW		
955.306(5)	104678.5(6)	955.30043(8)	0.005	9900		4s	$^1D_2$	sp	$(^3P)^3P^\circ\ ^5D^\circ_2$				TW		
955.320(5)	104677.0(6)	955.32939(7)	−0.009	9900		4s	$^1D_2$	sp	$(^3P)^3P^\circ\ ^5D^\circ_1$				TW		
956.2871(17)	104571.11(19)	956.29010(7)	−0.0030	300000		4s	$^3D_1$	sp	$(^1D)^3P^\circ\ ^3D^\circ_1$		1.8e+08	C	TW	B00	
958.1503(17)	104367.76(19)	958.15393(6)	−0.0037	380000		4s	$^3D_1$	sp	$(^1D)^3P^\circ\ ^3F^\circ_2$		1.6e+08	C	TW	B00	
960.4115(17)	104122.04(19)	960.41317(15)	−0.0017	270000		4s	$^1D_2$	sp	$(^1D)^3P^\circ\ ^3P^\circ_2$				TW		
966.2283(21)	103495.21(23)	966.22839(6)	−0.0001	11000		4s	$^1D_2$	sp	$(^1D)^3P^\circ\ ^3P^\circ_1$				TW		
967.8711(21)	103319.54(23)	967.87255(7)	−0.0015	4800		4s	$^3D_3$	sp	$(^3P)^3P^\circ\ ^5P^\circ_2$				TW		
968.0392(17)	103301.60(18)	968.04176(16)	−0.0025	250000		4s	$^3D_3$	sp	$(^3P)^3P^\circ\ ^5P^\circ_3$				TW		
972.2703(19)	102852.06(20)	972.26872(10)	0.0016	24000		4s	$^1D_2$	sp	$(^1D)^3P^\circ\ ^3D^\circ_3$				TW		
973.509(10)	102721.2(11)	973.49928(20)	0.010	18000		4s	$^3D_2$	sp	$(^3P)^3P^\circ\ ^5P^\circ_1$				S36c		
974.7581(15)	102589.56(15)	974.75876(8)	−0.0007	200000		4s	$^1D_2$	sp	$(^1D)^3P^\circ\ ^3D^\circ_2$				TW		
976.5524(15)	102401.06(15)	976.55293(7)	−0.0005	110000		4s	$^3D_2$	sp	$(^3P)^3P^\circ\ ^5P^\circ_2$				TW		
976.7238(17)	102383.09(18)	976.72519(17)	−0.0014	35000		4s	$^3D_2$	sp	$(^3P)^3P^\circ\ ^5P^\circ_3$				TW		

Table A1. *Cont.*

λ_{obs} [a] (Å)	σ_{obs} [b] (cm^{-1})	λ_{Ritz} [c] (Å)	$\Delta\lambda_{obs-Ritz}$ (Å)	I_{obs} [d] (arb. u.)	Char [e]	Lower Level			Upper Level		A (s^{-1})	Acc [f]	Line Ref. [g]	TP Ref. [g]	Notes [h]
977.5662(13)	102294.86(14)	977.56714(7)	−0.0009	190000		4s	$^1D_2$	sp	$(^1D)^3P^\circ\ ^3F^\circ_3$				TW		
979.4200(15)	102101.25(16)	979.42055(6)	−0.0006	12000		4s	$^1D_2$	sp	$(^1D)^3P^\circ\ ^3F^\circ_2$				TW		
984.02(4)	101624(4)	983.979887(19)	0.04	9100		4s	$^3D_3$	5p	$(3/2)^2[3/2]^\circ_2$				S36c		
984.5331(15)	101570.98(15)	984.53339(21)	−0.0003	88000		4s	$^3D_1$	sp	$(^3P)^3P^\circ\ ^5P^\circ_1$				TW		
987.6568(12)	101249.75(12)	987.65677(8)	−0.0000	61000		4s	$^3D_1$	sp	$(^3P)^3P^\circ\ ^5P^\circ_2$				TW		
989.2364(12)	101088.07(12)	989.236270(17)	0.0002	30000		4s	$^3D_3$	5p	$(3/2)^2[5/2]^\circ_3$				TW		
992.9530(13)	100709.70(13)	992.952929(16)	0.0001	210000		4s	$^3D_2$	5p	$(3/2)^2[3/2]^\circ_2$				TW		
998.3067(14)	100169.62(14)	998.305876(14)	0.0008	40000		4s	$^3D_2$	5p	$(3/2)^2[5/2]^\circ_3$				TW		
999.797(3)	100020.3(3)	999.793812(15)	0.003	7600		4s	$^3D_2$	5p	$(3/2)^2[1/2]^\circ_1$				TW		
1001.0129(19)	99898.81(19)	1001.012710(14)	0.0002	22000		4s	$^3D_2$	5p	$(3/2)^2[5/2]^\circ_2$				TW		
1004.0540(17)	99596.24(17)	1004.055195(18)	−0.0012	330000		4s	$^3D_3$	sp	$(^3F)^3P^\circ\ ^1F^\circ_3$				TW		
1006.980(6)	99306.8(6)	1006.983925(18)	−0.004	13000		4s	$^3D_1$	5p	$(3/2)^2[3/2]^\circ_1$				S36c		
1008.5674(17)	99150.54(16)	1008.568623(17)	−0.0012	290000		4s	$^3D_3$	5p	$(5/2)^2[5/2]^\circ_3$				TW		
1008.7274(17)	99134.81(16)	1008.728151(15)	−0.0008	310000		4s	$^3D_2$	sp	$(^3F)^3P^\circ\ ^1D^\circ_2$				TW		
1010.2680(17)	98983.64(16)	1010.26867(8)	−0.0007	320000		4s	$^1D_2$	sp	$(^3P)^3P^\circ\ ^5P^\circ_2$				TW		
1010.4520(18)	98965.61(18)	1010.45303(18)	−0.0011	48000		4s	$^1D_2$	sp	$(^3P)^3P^\circ\ ^5P^\circ_3$				TW		
1010.640(3)	98947.2(3)	1010.639186(19)	0.001	18000		4s	$^3D_3$	5p	$(5/2)^2[5/2]^\circ_2$				TW		
1011.436	98869.4	1011.435606(17)		29000	:	4s	$^3D_1$	5p	$(3/2)^2[1/2]^\circ_1$				S36c		
1012.5956(18)	98756.11(18)	1012.596906(18)	−0.0013	290000		4s	$^3D_3$	5p	$(5/2)^2[7/2]^\circ_3$				TW		
1012.6813(18)	98747.75(18)	1012.683073(16)	−0.0017	50000		4s	$^3D_1$	5p	$(3/2)^2[5/2]^\circ_2$				TW		
1013.382(20)	98679.5(19)	1013.399849(15)	−0.018	15000		4s	$^3D_2$	sp	$(^3F)^3P^\circ\ ^1F^\circ_3$				S36c		
1017.9976(18)	98232.06(18)	1017.997872(13)	−0.0002	70000		4s	$^3D_2$	5p	$(5/2)^2[5/2]^\circ_3$				TW		
1018.0628(19)	98225.77(18)	1018.064039(22)	−0.0013	180000		4s	$^3D_1$	5p	$(3/2)^2[1/2]^\circ_0$				TW		
1018.7031(24)	98164.03(23)	1018.707024(17)	−0.0039	550000		4s	$^3D_3$	5p	$(5/2)^2[3/2]^\circ_2$				TW		
1019.6525(18)	98072.62(17)	1019.654307(13)	−0.0018	240000		4s	$^3D_2$	5p	$(5/2)^2[3/2]^\circ_1$				TW		
1020.1070(18)	98028.93(18)	1020.107372(16)	−0.0004	280000		4s	$^3D_2$	5p	$(5/2)^2[5/2]^\circ_2$				TW		
1022.102	97837.6	1022.101982(13)		91000	:	4s	$^3D_2$	5p	$(5/2)^2[7/2]^\circ_3$				S36c		
1027.825(3)	97292.8(3)	1027.830823(19)	−0.006	1800000		4s	$^1D_2$	5p	$(3/2)^2[3/2]^\circ_2$	1.7e+08	C	TW		B00	
1028.3251(18)	97245.51(17)	1028.327701(13)	−0.0026	670000		4s	$^3D_2$	5p	$(5/2)^2[3/2]^\circ_2$			TW			
1029.7493(18)	97111.01(17)	1029.750492(24)	−0.0012	290000		4s	$^3D_3$	sp	$(^3F)^3P^\circ\ ^3F^\circ_2$			TW			
1030.2612(18)	97062.76(17)	1030.26297(7)	−0.0017	500000		4s	$^3D_3$	sp	$(^3F)^3P^\circ\ ^1G^\circ_4$			TW			
1031.7650(18)	96921.30(17)	1031.766015(15)	−0.0010	240000		4s	$^3D_1$	5p	$(5/2)^2[3/2]^\circ_1$			TW			
1033.5668(18)	96752.33(17)	1033.567510(18)	−0.0007	200000		4s	$^1D_2$	5p	$(3/2)^2[5/2]^\circ_3$			TW			
1035.161(3)	96603.3(3)	1035.162498(19)	−0.001	85000		4s	$^1D_2$	5p	$(3/2)^2[1/2]^\circ_1$			TW			
1036.465(3)	96481.8(3)	1036.469217(18)	−0.004	1800000		4s	$^1D_2$	5p	$(3/2)^2[5/2]^\circ_2$	1.01e+08	C	TW		B00	
1039.341(3)	96214.8(3)	1039.34743(3)	−0.006	2100000		4s	$^3D_3$	sp	$(^3F)^3P^\circ\ ^3F^\circ_3$	2.0e+08	C	TW		B00	
1039.579(3)	96192.8(3)	1039.581895(21)	−0.003	1900000		4s	$^3D_2$	sp	$(^3F)^3P^\circ\ ^3F^\circ_2$	2.0e+08	C	TW		B00	
1044.5185(8)	95737.89(7)	1044.51849(6)	0.0000	2300000		4s	$^3D_3$	sp	$(^3F)^3P^\circ\ ^3F^\circ_4$	2.3e+08	C	K66		B00	
1044.7437(8)	95717.26(7)	1044.743170(19)	0.0005	2200000		4s	$^1D_2$	sp	$(^3F)^3P^\circ\ ^1D^\circ_2$	4.8e+08	C	K66		B00	
1049.3642(18)	95295.80(17)	1049.363833(22)	0.0004	770000		4s	$^3D_2$	sp	$(^3F)^3P^\circ\ ^3F^\circ_3$	1.11e+08	C	TW		B00	

Table A1. *Cont.*

λ_{obs} [a] (Å)	σ_{obs} [b] (cm^{-1})	λ_{Ritz} [c] (Å)	$\Delta\lambda_{obs-Ritz}$ (Å)	I_{obs} [d] (arb. u.)	Char [e]	Lower Level			Upper Level	A (s^{-1})	Acc [f]	Line Ref. [g]	TP Ref. [g]	Notes [h]
1049.7551(6)	95260.31(5)	1049.755242(19)	−0.0001	2100000		4s	$^1D_2$	sp	$(^3F)^3P^\circ\ ^1F^\circ_3$	1.04e+08	C	K66	B00	
1050.1523(18)	95224.28(17)	1050.15339(3)	−0.0010	530000		4s	$^3D_2$	sp	$(^3F)^3P^\circ\ ^3D^\circ_1$	1.4e+08	C	TW	B00	
1050.4013(18)	95201.71(17)	1050.40243(3)	−0.0012	520000		4s	$^3D_3$	sp	$(^3F)^3P^\circ\ ^3D^\circ_2$	8.2e+07	C	TW	B00	
1052.1742(18)	95041.30(16)	1052.174562(23)	−0.0004	1000000		4s	$^3D_1$	sp	$(^3F)^3P^\circ\ ^3F^\circ_2$	7.3e+07	C	TW	B00	
1054.6907(6)	94814.53(5)	1054.689891(17)	0.0008	2800000		4s	$^1D_2$	5p	$(5/2)^2[5/2]^\circ_3$	2.1e+08	C	K66	B00	
1055.792(3)	94715.6(3)	1055.79644(4)	−0.005	2500000		4s	$^3D_3$	sp	$(^3F)^3P^\circ\ ^3G^\circ_3$	2.1e+08	C	TW	B00	
1056.9549(6)	94611.42(5)	1056.954368(20)	0.0005	2300000		4s	$^1D_2$	5p	$(5/2)^2[5/2]^\circ_2$	4.0e+08	C	K66	B00	
1058.798(3)	94446.7(3)	1058.79854(4)	−0.000	1800000		4s	$^3D_3$	sp	$(^3F)^3P^\circ\ ^3D^\circ_3$	1.9e+08	C	TW	B00	
1059.0963(8)	94420.12(7)	1059.095825(18)	0.0005	1400000		4s	$^1D_2$	5p	$(5/2)^2[7/2]^\circ_3$			K66		
1060.631(3)	94283.5(3)	1060.63409(3)	−0.003	1700000		4s	$^3D_2$	sp	$(^3F)^3P^\circ\ ^3D^\circ_2$	3.0e+08	C	TW	B00	
1063.0027(18)	94073.14(16)	1063.00505(3)	−0.0024	1400000		4s	$^3D_1$	sp	$(^3F)^3P^\circ\ ^3D^\circ_1$	4.2e+08	C	TW	B00	
1065.7837(18)	93827.67(16)	1065.781839(17)	0.0019	560000		4s	$^1D_2$	5p	$(5/2)^2[3/2]^\circ_2$			TW		
1066.1356(18)	93796.70(16)	1066.13397(4)	0.0017	590000		4s	$^3D_2$	sp	$(^3F)^3P^\circ\ ^3G^\circ_3$			TW		
1069.1944(18)	93528.36(16)	1069.19523(4)	−0.0008	1000000		4s	$^3D_2$	sp	$(^3F)^3P^\circ\ ^3D^\circ_3$	1.03e+08	C	TW	B00	
1070.3134(18)	93430.58(16)	1070.31087(6)	0.0025	380000		4s	$^3D_3$	sp	$(^3F)^3P^\circ\ ^3G^\circ_4$			TW		
1073.7444(18)	93132.04(16)	1073.74516(3)	−0.0008	720000		4s	$^3D_1$	sp	$(^3F)^3P^\circ\ ^3D^\circ_2$	1.5e+08	C	TW	B00	
1077.889(20)	92773.9(17)	1077.87559(3)	0.013	20000		4s	$^1D_2$	sp	$(^3F)^3P^\circ\ ^3F^\circ_2$			S36c		
1086.1134(18)	92071.42(15)	1086.10984(8)	0.0036	72000		4s	$^3D_3$	sp	$(^3F)^3P^\circ\ ^5F^\circ_3$			TW		
1088.405(5)	91877.6(4)	1088.39510(3)	0.010	270000		4s	$^1D_2$	sp	$(^3F)^3P^\circ\ ^3F^\circ_3$			TW		
1089.237(6)	91807.4(5)	1089.24451(3)	−0.007	39000		4s	$^1D_2$	sp	$(^3F)^3P^\circ\ ^3D^\circ_1$			S36c		
1091.293(3)	91634.43(24)	1091.29136(8)	0.001	40000		4s	$^3D_2$	sp	$(^3F)^3P^\circ\ ^5F^\circ_2$			TW		
1094.399(3)	91374.35(24)	1094.40214(8)	−0.003	440000		4s	$^3D_3$	sp	$(^3F)^3P^\circ\ ^5F^\circ_4$			TW		
1097.0512(18)	91153.45(15)	1097.05257(8)	−0.0014	320000		4s	$^3D_2$	sp	$(^3F)^3P^\circ\ ^5F^\circ_3$			TW		
1100.523(3)	90865.86(24)	1100.52419(3)	−0.001	25000		4s	$^1D_2$	sp	$(^3F)^3P^\circ\ ^3D^\circ_2$			TW		
1101.836(6)	90757.6(5)	1101.83633(13)	−0.000	8200		4s	$^3D_1$	sp	$(^3F)^3P^\circ\ ^5F^\circ_1$			S36c		
1105.1751(18)	90483.40(15)	1105.17629(8)	−0.0012	60000		4s	$^3D_1$	sp	$(^3F)^3P^\circ\ ^5F^\circ_2$			TW		
1106.447	90379.4	1106.44670(4)		23000	:	4s	$^1D_2$	sp	$(^3F)^3P^\circ\ ^3G^\circ_3$			S36c		
1109.744	90110.9	1109.74420(4)		7200	:	4s	$^1D_2$	sp	$(^3F)^3P^\circ\ ^3D^\circ_3$			S36c		
1111.753(6)	89948.0(5)	1111.75742(11)	−0.004	3000		4s	$^3D_3$	sp	$(^3F)^3P^\circ\ ^5G^\circ_3$			S36c		
1119.9480(18)	89289.86(15)	1119.94659(11)	0.0014	98000		4s	$^3D_3$	sp	$(^3F)^3P^\circ\ ^5G^\circ_4$			TW		
1123.2265(18)	89029.24(14)	1123.22580(11)	0.0007	21000		4s	$^3D_2$	sp	$(^3F)^3P^\circ\ ^5G^\circ_3$			TW		
1127.2516(18)	88711.34(14)			18000		4p	$^3F^\circ_2$	10s	$(3/2)^2[3/2]_1$			TWn		
1130.888(12)	88426.1(9)	1130.8852(3)	0.003	4500	*	4s	$^3D_1$	sp	$(^3F)^3P^\circ\ ^5G^\circ_2$			S36c		
1130.888(12)	88426.1(9)	1130.89779(11)	−0.010	4500	*	4p	$^3P^\circ_1$	9s	$(3/2)^2[3/2]_2$			S36c		
		1130.96216(16)			m	4p	$^3P^\circ_2$	8d	$(5/2)^2[3/2]_1$			S36cn		
1135.3657(18)	88077.35(14)	1135.34826(20)	0.0174	8200	?	4p	$^3F^\circ_3$	10s	$(5/2)^2[5/2]_2$			TW		X
1142.6393(18)	87516.68(14)	1142.64027(10)	−0.0009	73000		4s	$^3D_2$	sp	$(^3F)^3P^\circ\ ^5D^\circ_2$			TW		
1144.853(3)	87347.48(22)	1144.85531(8)	−0.003	120000		4s	$^3D_3$	sp	$(^3F)^3P^\circ\ ^5D^\circ_3$			TW		
1147.7628(18)	87126.02(14)			25000		4s	$^3D_1$	sp	$(^3F)^3P^\circ\ ^5D^\circ_1$			TW		
1157.0194(18)	86428.97(14)	1157.02043(8)	−0.0010	15000		4s	$^3D_2$	sp	$(^3F)^3P^\circ\ ^5D^\circ_3$			TW		

Table A1. *Cont.*

λ_{obs} [a] (Å)	σ_{obs} [b] (cm^{-1})	λ_{Ritz} [c] (Å)	$\Delta\lambda_{obs-Ritz}$ (Å)	I_{obs} [d] (arb. u.)	Char [e]	Lower Level		Upper Level		A (s^{-1})	Acc [f]	Line Ref. [g]	TP Ref. [g]	Notes [h]
1157.8714(18)	86365.38(14)	1157.87172(10)	−0.0004	19000		4s	$^3D_1$	sp	$(^3F)^3P^\circ\ ^5D^\circ_2$			TW		
		1157.88056(11)			m	4p	$^3P^\circ_1$	9s	$(5/2)^2[5/2]_2$			TW		
1162.5991(18)	86014.17(13)	1162.60059(14)	−0.0015	6300		4s	$^3D_3$	sp	$(^3F)^3P^\circ\ ^5D^\circ_4$			TW		
1185.899	84324.2	1185.89903(5)		19000	:	4p	$^3P^\circ_2$	8s	$(5/2)^2[5/2]_3$			S36c		
1201.627(6)	83220.5(4)	1201.62566(8)	0.001	18000		4p	$^3F^\circ_3$	7d	$(5/2)^2[9/2]_4$			S36c		
1204.643(20)	83012.1(14)	1204.61568(7)	0.027	9100	*	4p	$^3F^\circ_4$	7d	$(5/2)^2[7/2]_4$			S36c		
1204.643(20)	83012.1(14)	1204.63538(5)	0.008	9100	*	4p	$^3F^\circ_4$	7d	$(5/2)^2[7/2]_3$			S36c		
1204.643(20)	83012.1(14)	1204.65288(9)	−0.010	9100	*	4s	$^1D_2$	sp	$(^3F)^3P^\circ\ ^5D^\circ_3$			S36c		
1205.180(12)	82975.2(8)	1205.14656(6)	0.034	4800	*	4p	$^3F^\circ_4$	7d	$(5/2)^2[5/2]_3$			S36c		
1205.180(12)	82975.2(8)	1205.19424(8)	−0.014	4800	*	4p	$^1F^\circ_3$	7d	$(3/2)^2[5/2]_3$			S36c		
1205.180(12)	82975.2(8)	1205.2024(3)	−0.022	4800	*	4p	$^3D^\circ_2$	9s	$(3/2)^2[3/2]_1$			S36c		
1205.180(12)	82975.2(8)	1205.21874(7)	−0.039	4800	*	4p	$^3F^\circ_2$	8s	$(3/2)^2[3/2]_2$			S36cn		
1205.901(6)	82925.5(4)	1205.90271(8)	−0.002	18000		4p	$^3F^\circ_4$	7d	$(5/2)^2[9/2]_5$			S36c		
1206.771(6)	82865.8(4)	1206.76906(5)	0.002	4400		4p	$^3P^\circ_1$	8s	$(5/2)^2[5/2]_2$			S36c		
1214.540	82335.7	1214.53971(8)		9600	:	4p	$^3D^\circ_3$	9s	$(5/2)^2[5/2]_3$			S36c		
1214.554	82334.7	1214.55446(5)		8600	:	4p	$^3F^\circ_3$	8s	$(5/2)^2[5/2]_2$			S36c		
1219.334	82012.0	1219.33363(5)		8500	:	4p	$^3F^\circ_4$	8s	$(5/2)^2[5/2]_3$			S36c		
1235.93(5)	80911(3)	1235.87291(5)	0.06	4000		4p	$^3F^\circ_2$	8s	$(5/2)^2[5/2]_2$			S36c		
1240.026(6)	80643.5(4)	1240.02707(5)	−0.001	7400		4p	$^3P^\circ_1$	6d	$(3/2)^2[3/2]_2$			S36c		
1241.964	80517.6	1241.96398(3)		14000	:	4p	$^3P^\circ_2$	7s	$(3/2)^2[3/2]_2$			S36c		
1243.03(5)	80448(3)	1243.08557(6)	−0.05	7300		4p	$^3P^\circ_1$	6d	$(3/2)^2[1/2]_1$			S36c		
1248.796(3)	80077.12(17)	1248.79156(5)	0.005	26000		4p	$^3P^\circ_2$	6d	$(5/2)^2[5/2]_3$			TW		
1250.058(4)	79996.30(22)	1250.04822(6)	0.010	69000		4p	$^3P^\circ_2$	6d	$(5/2)^2[3/2]_2$			TW		
1253.185(3)	79796.67(17)	1253.18074(7)	0.004	25000		4p	$^3P^\circ_2$	6d	$(5/2)^2[1/2]_1$			TW		
1255.163(6)	79670.9(4)	1255.15693(6)	0.006	6800		4p	$^3P^\circ_0$	6d	$(3/2)^2[3/2]_1$			S36c		
1257.675(6)	79511.8(4)	1257.68320(7)	−0.008	6700		4p	$^3P^\circ_0$	6d	$(3/2)^2[1/2]_1$			S36c		
1261.214(6)	79288.7(4)	1261.21537(5)	−0.001	3500		4p	$^1D^\circ_2$	8s	$(5/2)^2[5/2]_2$			S36c		
1262.929(6)	79181.0(4)	1262.92481(9)	0.004	19000		4p	$^3P^\circ_1$	6d	$(5/2)^2[1/2]_0$			S36c		
1265.510(3)	79019.53(17)	1265.50624(3)	0.004	72000		4p	$^3P^\circ_1$	7s	$(3/2)^2[3/2]_2$			TW		
1266.313(3)	78969.42(17)	1266.30992(4)	0.003	27000		4p	$^3P^\circ_1$	7s	$(3/2)^2[3/2]_1$			TW		
1268.71(5)	78820(3)	1268.66846(5)	0.04	3300		4p	$^3D^\circ_3$	8s	$(5/2)^2[5/2]_3$			S36c		
1269.446(6)	78774.5(4)	1269.44626(6)	0.000	6200		4p	$^3F^\circ_2$	6d	$(3/2)^2[5/2]_2$			S36c		
1271.327(6)	78658.0(4)	1271.31771(4)	0.010	12000		4p	$^3P^\circ_1$	6d	$(5/2)^2[5/2]_2$			S36c		
1272.043(3)	78613.69(17)	1272.04165(6)	0.001	31000		4p	$^3F^\circ_2$	6d	$(3/2)^2[7/2]_3$			TW		
1273.705(6)	78511.1(4)	1273.70053(5)	0.005	11000		4p	$^3P^\circ_1$	6d	$(5/2)^2[3/2]_1$			S36c		
1274.071	78488.6	1274.07065(3)		17000	:	4p	$^3F^\circ_3$	7s	$(3/2)^2[3/2]_2$			S36c		
1274.465	78464.3	1274.46493(3)		16000	:	4p	$^3P^\circ_2$	7s	$(5/2)^2[5/2]_2$			S36c		
1275.5713(15)	78396.24(9)	1275.57159(3)	−0.0003	75000		4p	$^3P^\circ_2$	7s	$(5/2)^2[5/2]_3$			TW		
1279.948(20)	78128.2(12)	1279.96123(5)	−0.013	2700		4p	$^3F^\circ_3$	6d	$(5/2)^2[5/2]_2$			S36c		

Table A1. *Cont.*

λ_{obs} [a] (Å)	σ_{obs} [b] (cm^{-1})	λ_{Ritz} [c] (Å)	$\Delta\lambda_{obs-Ritz}$ (Å)	I_{obs} [d] (arb. u.)	Char [e]	Lower Level		Upper Level		A (s^{-1})	Acc [f]	Line Ref. [g]	TP Ref. [g]	Notes [h]
1280.271(3)	78108.48(17)	1280.26800(4)	0.003	30000		4p	$^3F^\circ_3$	6d	$(5/2)^2[7/2]_3$			TW,S36r		
1281.094(3)	78058.29(17)	1281.09394(9)	−0.000	10000		s^2	$^3F_4$	7p	$(5/2)^2[5/2]^\circ_3$			TW		
1281.228(20)	78050.1(12)	1281.25682(6)	−0.029	16000		4p	$^3F^\circ_3$	6d	$(5/2)^2[5/2]_3$			S36c		
1281.462(3)	78035.88(17)	1281.46142(4)	0.000	44000		4p	$^3P^\circ_0$	7s	$(3/2)^2[3/2]_1$			TW		
1282.455(3)	77975.44(17)	1282.45466(5)	0.000	72000		4p	$^3F^\circ_3$	6d	$(5/2)^2[9/2]_4$			TW		
1283.824(6)	77892.3(4)	1283.82966(10)	−0.005	5300		s^2	$^3F_4$	7p	$(5/2)^2[7/2]^\circ_4$			S36c		
1284.872(3)	77828.74(16)	1284.87116(5)	0.001	36000		4p	$^3F^\circ_4$	6d	$(5/2)^2[7/2]_4$			TW		
1285.521(6)	77789.5(4)	1285.51841(5)	0.003	5400		4p	$^1F^\circ_3$	6d	$(3/2)^2[5/2]_3$			S36c		
1285.901(20)	77766.5(12)	1285.92203(6)	−0.021	5100		4p	$^3F^\circ_4$	6d	$(5/2)^2[5/2]_3$			S36c		
		1287.43101(6)			m	4p	$^1F^\circ_3$	6d	$(3/2)^2[7/2]_4$			TW		
1287.4690(8)	77671.77(5)	1287.46810(6)	0.0009	53000		4p	$^3F^\circ_4$	6d	$(5/2)^2[9/2]_5$			K66		
1297.550(4)	77068.31(21)	1297.54980(3)	0.000	4900		4p	$^3F^\circ_2$	7s	$(3/2)^2[3/2]_2$			TW		
1297.979(20)	77042.8(12)	1297.9922(9)	−0.013	4900		s^2	$^3F_2$	7p	$(3/2)^2[3/2]^\circ_1$			S36cn		
1298.3952(8)	77018.15(5)	1298.39471(4)	0.0005	60000		4p	$^3F^\circ_2$	7s	$(3/2)^2[3/2]_1$			K66		
1298.917(12)	76987.2(7)	1298.90527(6)	0.012	4700		4p	$^1D^\circ_2$	6d	$(3/2)^2[7/2]_3$			S36c		
1299.2684(8)	76966.39(5)	1299.26777(3)	0.0006	44000		4p	$^3P^\circ_1$	7s	$(5/2)^2[5/2]_2$			K66		
1303.661(4)	76707.04(21)	1303.66001(5)	0.001	2900		4p	$^3F^\circ_2$	6d	$(5/2)^2[5/2]_2$			TW		
1303.978(3)	76688.38(16)	1303.97824(4)	0.000	6400		4p	$^3F^\circ_2$	6d	$(5/2)^2[7/2]_3$			TW		
1305.562(3)	76595.40(16)	1305.56082(6)	0.001	19000		4p	$^3D^\circ_3$	6d	$(3/2)^2[7/2]_4$			TW		
1308.2982(6)	76435.17(4)	1308.29687(3)	0.0013	99000		4p	$^3F^\circ_3$	7s	$(5/2)^2[5/2]_2$			K66		
1309.464(3)	76367.12(16)	1309.46310(3)	0.001	52000		4p	$^3F^\circ_3$	7s	$(5/2)^2[5/2]_3$			TW		
1311.76(4)	76233.5(23)	1311.79458(10)	−0.04	3900		s^2	$^3F_3$	7p	$(5/2)^2[5/2]^\circ_3$			S36c		
1314.1498(8)	76094.83(5)	1314.14936(4)	0.0004	50000		4p	$^1F^\circ_3$	7s	$(3/2)^2[3/2]_2$			K66		
1314.3371(6)	76083.98(3)	1314.33637(3)	0.0007	150000		4p	$^3F^\circ_4$	7s	$(5/2)^2[5/2]_3$			K66		
1320.687(3)	75718.15(16)	1320.68581(5)	0.002	30000		4p	$^1F^\circ_3$	6d	$(5/2)^2[7/2]_4$			TW		
1321.798(3)	75654.53(16)	1321.79611(6)	0.002	11000		4p	$^1F^\circ_3$	6d	$(5/2)^2[5/2]_3$			TW		
1322.628(6)	75607.0(3)	1322.63248(13)	−0.004	21000		4p	$^1P^\circ_1$	6d	$(3/2)^2[1/2]_0$			S36c		
1323.188(20)	75575.0(11)	1323.20408(6)	−0.016	9700		4p	$^1F^\circ_3$	6d	$(5/2)^2[3/2]_2$			S36c		
1323.812(20)	75539.4(11)	1323.79410(6)	0.018	21000		4p	$^3D^\circ_1$	6d	$(3/2)^2[5/2]_2$			S36c		
1325.272(20)	75456.2(11)	1325.24199(5)	0.030	3300		4p	$^3D^\circ_1$	6d	$(3/2)^2[3/2]_2$			S36c		
1325.515(3)	75442.39(15)	1325.51345(3)	0.001	8300		4p	$^1D^\circ_2$	7s	$(3/2)^2[3/2]_2$			TW		
1326.396(3)	75392.26(15)	1326.39519(4)	0.001	28000		4p	$^1D^\circ_2$	7s	$(3/2)^2[3/2]_1$			TW		
1328.415(3)	75277.66(15)	1328.41289(5)	0.002	12000		4p	$^3D^\circ_2$	6d	$(3/2)^2[5/2]_3$			TW		
1329.656(20)	75207.4(11)	1329.66943(6)	−0.014	3100		4p	$^3D^\circ_2$	6d	$(3/2)^2[3/2]_2$			S36c		
1331.892(3)	75081.17(15)	1331.89052(5)	0.001	14000		4p	$^1D^\circ_2$	6d	$(5/2)^2[5/2]_2$			TW		
1332.224(3)	75062.46(15)	1332.22268(4)	0.001	17000		4p	$^1D^\circ_2$	6d	$(5/2)^2[7/2]_3$			TW		
1333.0457(8)	75016.18(5)	1333.04501(3)	0.0007	58000		4p	$^3D^\circ_3$	7s	$(3/2)^2[3/2]_2$			K66		
		1333.06670(3)			m	4p	$^3F^\circ_2$	7s	$(5/2)^2[5/2]_2$			TW		
1334.56(4)	74931.2(22)	1334.50604(5)	0.05	5500	p	4p	$^1D^\circ_2$	6d	$(5/2)^2[3/2]_1$			S36c		X
1334.650(4)	74926.02(20)	1334.65445(7)	−0.005	5800		4p	$^1P^\circ_1$	6d	$(3/2)^2[3/2]_1$			TW		

Table A1. *Cont.*

λ_{obs} [a] (Å)	σ_{obs} [b] (cm^{-1})	λ_{Ritz} [c] (Å)	$\Delta\lambda_{obs-Ritz}$ (Å)	I_{obs} [d] (arb. u.)	Char [e]	Lower Level		Upper Level		A (s^{-1})	Acc [f]	Line Ref. [g]	TP Ref. [g]	Notes [h]
1334.686(6)	74924.0(3)	1334.68792(17)	−0.002	1500		s^2	$^3F_2$	7p	$(5/2)^2[5/2]^\circ_2$			TW		
1337.55(4)	74763.8(22)	1337.51122(8)	0.03	1400		4p	$^1P^\circ_1$	6d	$(3/2)^2[1/2]_1$			S36c		
1339.46(4)	74656.7(22)	1339.49492(5)	−0.03	1300		4p	$^3D^\circ_3$	6d	$(5/2)^2[5/2]_2$			S36c		
1339.7734(23)	74639.49(13)	1339.77126(5)	0.0022	14000		4p	$^3D^\circ_3$	6d	$(5/2)^2[7/2]_4$			TW		
1340.9161(23)	74575.88(13)	1340.91390(6)	0.0022	6700		4p	$^3D^\circ_3$	6d	$(5/2)^2[5/2]_3$			TW		
1350.5963(20)	74041.37(11)	1350.59358(4)	0.0027	29000		4p	$^1F^\circ_3$	7s	$(5/2)^2[5/2]_2$			TW		
1351.8384(8)	73973.34(4)	1351.83646(3)	0.0019	53000		4p	$^1F^\circ_3$	7s	$(5/2)^2[5/2]_3$			K66		
1355.3066(8)	73784.04(4)	1355.30507(4)	0.0015	36000		4p	$^3D^\circ_1$	7s	$(3/2)^2[3/2]_1$			K66		
1358.7736(6)	73595.78(3)	1358.7729(3)	0.0007	15000000		d^{10}	$^1S_0$	4p	$^1P^\circ_1$	3.3e+08	C+	K66	B09	
1359.0107(8)	73582.94(4)	1359.00914(3)	0.0016	38000		4p	$^3D^\circ_2$	7s	$(3/2)^2[3/2]_2$			K66		
1359.9394(20)	73532.69(11)	1359.93602(4)	0.0034	11000		4p	$^3D^\circ_2$	7s	$(3/2)^2[3/2]_1$			TW		
1362.6004(6)	73389.09(3)	1362.59959(3)	0.0008	49000		4p	$^1D^\circ_2$	7s	$(5/2)^2[5/2]_2$			K66		
1363.506(2)	73340.36(13)	1363.50304(4)	0.003	12000		4p	$^1P^\circ_1$	7s	$(3/2)^2[3/2]_2$			TW		
1367.9508(6)	73102.04(3)	1367.9509(3)	−0.0001	5800000		d^{10}	$^1S_0$	4p	$^3D^\circ_1$	8.3e+07	C+	K66	D05	
1370.257(6)	72979.0(3)	1370.25181(6)	0.005	2700		4p	$^1P^\circ_1$	6d	$(5/2)^2[5/2]_2$			S36c		
1370.561(3)	72962.83(18)	1370.55975(3)	0.001	1800		4p	$^3D^\circ_3$	7s	$(5/2)^2[5/2]_2$			TW		
1371.8400(6)	72894.80(3)	1371.83967(3)	0.0003	43000		4p	$^3D^\circ_3$	7s	$(5/2)^2[5/2]_3$			K66		
1375.522(20)	72699.7(11)	1375.50173(4)	0.020	6900		4p	$^3P^\circ_2$	5d	$(3/2)^2[5/2]_3$			S36c		
1393.129(2)	71780.88(13)	1393.12738(3)	0.001	18000		4p	$^3D^\circ_1$	7s	$(5/2)^2[5/2]_2$			TW		
1398.6428(16)	71497.88(8)	1398.64196(11)	0.0009	40000		s^2	$^3F_4$	6p	$(3/2)^2[5/2]^\circ_3$			TW		
1399.3532(17)	71461.59(9)	1399.35262(3)	0.0005	15000		4p	$^3D^\circ_2$	7s	$(5/2)^2[5/2]_3$			TW		
1402.7785(8)	71287.09(4)	1402.77693(4)	0.0016	98000		4p	$^1P^\circ_1$	7s	$(5/2)^2[5/2]_2$			K66		
1403.985(3)	71225.85(16)	1403.99171(5)	−0.007	4900		4p	$^3P^\circ_1$	5d	$(3/2)^2[5/2]_2$			TW		
1407.1688(16)	71064.68(8)	1407.16862(5)	0.0001	60000		4p	$^3P^\circ_1$	5d	$(3/2)^2[3/2]_2$			TW		
1408.8131(23)	70981.74(12)	1408.81230(5)	0.0008	4900		4p	$^3P^\circ_1$	5d	$(3/2)^2[3/2]_1$			TW		
1414.4390(19)	70699.41(10)	1414.4371(4)	0.0019	26000		s^2	$^3F_2$	sp	$(^1G)^3P^\circ\ ^3G^\circ_3$			TWn		
1414.8980(15)	70676.47(8)	1414.89768(6)	0.0003	49000		4p	$^3P^\circ_1$	5d	$(3/2)^2[1/2]_1$			TW		
1418.4250(14)	70500.73(7)	1418.42631(3)	−0.0014	140000		4p	$^3P^\circ_2$	5d	$(5/2)^2[5/2]_3$			TW		
1419.7465(20)	70435.11(10)	1419.74554(4)	0.0010	7500		4p	$^3F^\circ_3$	5d	$(3/2)^2[7/2]_4$			TW		
1421.3746(13)	70354.43(7)	1421.37346(5)	0.0011	35000		4p	$^3P^\circ_2$	5d	$(5/2)^2[3/2]_1$			TW		
1421.7587(6)	70335.42(3)	1421.75866(4)	0.0000	200000		4p	$^3P^\circ_2$	5d	$(5/2)^2[3/2]_2$			K66		
1427.5920(12)	70048.03(6)	1427.59106(6)	0.0009	58000		4p	$^3P^\circ_0$	5d	$(3/2)^2[3/2]_1$			TW		
1427.8283(8)	70036.43(4)	1427.82905(7)	−0.0007	180000		s^2	$^3F_4$	6p	$(5/2)^2[5/2]^\circ_3$			K66		
1428.3572(8)	70010.50(4)	1428.35801(11)	−0.0008	190000		s^2	$^3F_3$	6p	$(3/2)^2[3/2]^\circ_2$			K66		
1430.2425(8)	69918.21(4)	1430.24252(5)	−0.0000	240000		4p	$^3P^\circ_2$	5d	$(5/2)^2[1/2]_1$			K66		
1433.8415(12)	69742.72(6)	1433.84011(7)	0.0014	53000		4p	$^3P^\circ_0$	5d	$(3/2)^2[1/2]_1$			TW		
1434.452(3)	69713.01(13)	1434.45240(14)	−0.000	3600		s^2	$^3F_3$	6p	$(3/2)^2[5/2]^\circ_2$			TWn		
1434.7712(12)	69697.52(6)	1434.76999(8)	0.0013	76000		4p	$^3P^\circ_1$	5d	$(5/2)^2[1/2]_0$			TW		
1434.9035(6)	69691.10(3)	1434.90377(9)	−0.0003	270000		s^2	$^3F_4$	6p	$(5/2)^2[7/2]^\circ_4$			K66		

Table A1. *Cont.*

λ_{obs} [a] (Å)	σ_{obs} [b] (cm^{-1})	λ_{Ritz} [c] (Å)	$\Delta\lambda_{obs-Ritz}$ (Å)	I_{obs} [d] (arb. u.)	Char [e]	Lower Level		Upper Level		A (s^{-1})	Acc [f]	Line Ref. [g]	TP Ref. [g]	Notes [h]
1435.3153(13)	69671.10(6)	1435.31565(13)	−0.0004	110000		s^2	$^3F_3$	6p	$(3/2)^2[5/2]^\circ_3$			TW		
1436.2352(12)	69626.48(6)	1436.23585(7)	−0.0007	130000		s^2	$^3F_4$	sp	$(^1G)^3P^\circ\ ^3F^\circ_3$			TW		
1442.1398(12)	69341.40(6)	1442.13845(4)	0.0014	66000		4p	$^3P^\circ_2$	6s	$(3/2)^2[3/2]_2$			TW		
1443.5423(12)	69274.04(6)	1443.54170(6)	0.0006	73000		4p	$^3F^\circ_2$	5d	$(3/2)^2[5/2]_2$			TW		
1444.1295(22)	69245.87(10)	1444.13017(4)	−0.0007	7700		4p	$^3P^\circ_2$	6s	$(3/2)^2[3/2]_1$			TW		
1445.9841(12)	69157.05(6)	1445.98335(4)	0.0007	97000		4p	$^3P^\circ_1$	5d	$(5/2)^2[5/2]_2$			TW		
1446.9008(22)	69113.24(10)	1446.90033(6)	0.0005	4600		4p	$^3F^\circ_2$	5d	$(3/2)^2[3/2]_2$			TW		
1448.6390(19)	69030.31(9)	1448.63819(6)	0.0008	6100		4p	$^3F^\circ_2$	5d	$(3/2)^2[3/2]_1$			TW		
1449.0578(8)	69010.36(4)	1449.05784(12)	−0.0000	180000		$s^2{}^3F_2$		6p	$(3/2)^2[3/2]^\circ_1$			K66		
1450.3032(12)	68951.10(6)	1450.30363(4)	−0.0004	170000		4p	$^3F^\circ_2$	5d	$(3/2)^2[7/2]_3$			TW		
1452.2950(12)	68856.53(6)	1452.29331(5)	0.0017	97000		4p	$^3P^\circ_1$	5d	$(5/2)^2[3/2]_1$			TW		
1452.670(20)	68838.7(9)	1452.69545(4)	−0.025	3600		4p	$^3P^\circ_1$	5d	$(5/2)^2[3/2]_2$			S36c		
1455.6643(13)	68697.16(6)	1455.66225(7)	0.0021	22000		s^2	$^3F_4$	6p	$(5/2)^2[7/2]^\circ_3$			TW		
1457.1778(12)	68625.81(6)	1457.17554(5)	0.0023	55000		4p	$^3F^\circ_3$	5d	$(5/2)^2[5/2]_2$			TW		
1458.0022(6)	68587.00(3)	1458.00133(5)	0.0009	150000		4p	$^3F^\circ_3$	5d	$(5/2)^2[7/2]_3$			K66		
1459.4131(6)	68520.70(3)	1459.41216(15)	0.0009	220000		s^2	$^3F_2$	6p	$(3/2)^2[5/2]^\circ_2$			K66		
1460.3076(13)	68478.72(6)	1460.30573(14)	0.0018	14000		s^2	$^3F_2$	6p	$(3/2)^2[5/2]^\circ_3$			TW		
1460.4620(13)	68471.48(6)	1460.45917(4)	0.0028	17000		4p	$^3F^\circ_3$	5d	$(5/2)^2[5/2]_3$			TW		
1461.5557(11)	68420.25(5)	1461.55369(5)	0.0020	60000		4p	$^3P^\circ_1$	5d	$(5/2)^2[1/2]_1$			TW		
1462.8534(18)	68359.55(9)	1462.85242(6)	0.0010	5100		s^2	$^3F_4$	4f	$(3/2)^2[9/2]^\circ_5$			TW		
1463.7512(6)	68317.62(3)	1463.75130(4)	−0.0001	350000		4p	$^3F^\circ_3$	5d	$(5/2)^2[9/2]_4$			K66		
1463.8367(6)	68313.63(3)	1463.83785(5)	−0.0012	200000		4p	$^3F^\circ_4$	5d	$(5/2)^2[7/2]_4$			K66		
1463.9947(12)	68306.26(6)	1463.99219(5)	0.0025	20000		4p	$^3F^\circ_3$	5d	$(5/2)^2[3/2]_2$			TW		
1464.1173(22)	68300.54(10)	1464.11637(6)	0.0009	4600		4p	$^1F^\circ_3$	5d	$(3/2)^2[5/2]_2$			TW		
1464.6035(11)	68277.86(5)	1464.60141(5)	0.0021	69000		4p	$^1F^\circ_3$	5d	$(3/2)^2[5/2]_3$			TW		
1465.0339(18)	68257.81(9)	1465.03633(14)	−0.0024	4300		s^2	$^3F_2$	6p	$(3/2)^2[1/2]^\circ_1$			TW		
1465.5404(6)	68234.22(3)	1465.54069(16)	−0.0003	170000		s^2	$^3F_4$	sp	$(^1G)^3P^\circ\ ^3F^\circ_4$			K66		
1466.0705(6)	68209.54(3)	1466.07026(9)	0.0002	280000		s^2	$^3F_3$	6p	$(5/2)^2[5/2]^\circ_3$			K66		
1466.5247(10)	68188.42(5)	1466.52373(4)	0.0010	79000		4p	$^3F^\circ_4$	5d	$(5/2)^2[5/2]_3$			K66		
1466.7305(12)	68178.85(6)	1466.72839(10)	0.0022	42000		s^2	$^3F_3$	sp	$(^3F)^1P^\circ\ ^3F^\circ_2$			TW		
1467.574(5)	68139.68(24)	1467.57153(6)	0.002	1400		4p	$^1F^\circ_3$	5d	$(3/2)^2[3/2]_2$			TW		
1469.6935(6)	68041.40(3)	1469.69291(5)	0.0006	150000		4p	$^1F^\circ_3$	5d	$(3/2)^2[7/2]_4$			K66		
1469.8457(12)	68034.35(5)	1469.84329(5)	0.0024	49000		4p	$^3F^\circ_4$	5d	$(5/2)^2[9/2]_4$			TW		
1470.6970(6)	67994.97(3)	1470.69711(4)	−0.0001	500000		4p	$^3F^\circ_4$	5d	$(5/2)^2[9/2]_5$			K66		
1471.072(5)	67977.65(24)	1471.07289(5)	−0.001	2700		4p	$^1F^\circ_3$	5d	$(3/2)^2[7/2]_3$			TW		
1472.3946(6)	67916.58(3)	1472.3950(4)	−0.0004	6800000		d^{10}	$^1S_0$	4p	$^3P^\circ_1$	8.e+06	E	K66	D05se	
1473.5295(8)	67864.27(4)	1473.53001(10)	−0.0005	100000		s^2	$^3F_3$	6p	$(5/2)^2[7/2]^\circ_4$			K66		
1473.9786(6)	67843.59(3)	1473.97844(4)	0.0002	190000		4p	$^3P^\circ_1$	6s	$(3/2)^2[3/2]_2$			K66		
1474.9348(6)	67799.61(3)	1474.93480(9)	−0.0000	230000		s^2	$^3F_3$	sp	$(^1G)^3P^\circ\ ^3F^\circ_3$			K66		
1475.4361(22)	67776.57(10)	1475.4383(9)	−0.0023	23000		s^2	$^1D_2$	sp	$(^1D)^1P^\circ\ ^1P^\circ_1$			TWn		

Table A1. *Cont.*

λ_{obs} [a] (Å)	σ_{obs} [b] (cm^{-1})	λ_{Ritz} [c] (Å)	$\Delta\lambda_{obs-Ritz}$ (Å)	I_{obs} [d] (arb. u.)	Char [e]	Lower Level		Upper Level		A (s^{-1})	Acc [f]	Line Ref. [g]	TP Ref. [g]	Notes [h]
1476.0596(6)	67747.94(3)	1476.05914(4)	0.0005	150000		4p	$^3P^\circ_1$	6s	$(3/2)^2[3/2]_1$			K66		
1478.2385(13)	67648.08(6)	1478.23606(6)	0.0024	23000		4p	$^1D^\circ_2$	5d	$(3/2)^2[5/2]_2$			TW		
1481.5438(6)	67497.16(3)	1481.54375(12)	0.0000	130000		s^2	$^3F_3$	6p	$(5/2)^2[5/2]^\circ_2$			K66		
1484.178(5)	67377.37(24)	1484.17557(13)	0.002	1200		s^2	$^3F_4$	sp	$(^1G)^3P^\circ\ ^3H^\circ_5$			TW		
1485.3282(8)	67325.19(4)	1485.32773(4)	0.0005	110000		4p	$^1D^\circ_2$	5d	$(3/2)^2[7/2]_3$			K66		
1485.6143(13)	67312.22(6)	1485.60994(4)	0.0043	53000		4p	$^3F^\circ_3$	6s	$(3/2)^2[3/2]_2$			TW		
1485.6788(8)	67309.30(4)	1485.67761(4)	0.0012	110000		4p	$^3P^\circ_2$	6s	$(5/2)^2[5/2]_2$			K66		
1487.612(5)	67221.81(24)	1487.60927(6)	0.003	1400		4p	$^3D^\circ_3$	5d	$(3/2)^2[5/2]_2$			TW		
1487.7805(12)	67214.22(5)	1487.77920(12)	0.0013	68000		s^2	$^3F_3$	6p	$(5/2)^2[3/2]^\circ_2$			TW		
1487.9719(12)	67205.57(5)	1487.96988(5)	0.0020	70000		4p	$^3F^\circ_2$	5d	$(5/2)^2[5/2]_2$			TW		
1488.1123(12)	67199.23(5)	1488.11000(4)	0.0023	53000		4p	$^3D^\circ_3$	5d	$(3/2)^2[5/2]_3$			TW		
1488.2853(13)	67191.42(6)	1488.2853(12)	−0.0000	34000		s^2	$^1D_2$	8p	$(5/2)^2[5/2]^\circ_2$			TWn		
1488.6366(6)	67175.56(3)	1488.63692(4)	−0.0003	1100000		4p	$^3P^\circ_2$	6s	$(5/2)^2[5/2]_3$			K66		
1488.8319(12)	67166.75(6)	1488.83094(5)	0.0009	120000		4p	$^3F^\circ_2$	5d	$(5/2)^2[7/2]_3$			TW		
1491.178(5)	67061.07(24)	1491.17634(6)	0.002	1400		4p	$^3D^\circ_3$	5d	$(3/2)^2[3/2]_2$			TW		
1491.384(6)	67051.8(3)	1491.39392(4)	−0.010	1200		4p	$^3F^\circ_2$	5d	$(5/2)^2[5/2]_3$			TW		
1492.1535(10)	67017.23(4)	1492.15247(11)	0.0010	95000		s^2	$^3F_2$	6p	$(5/2)^2[5/2]^\circ_3$			K66		
1492.6819(10)	66993.51(4)	1492.68146(13)	0.0004	100000		4p	$^1P^\circ_1$	5d	$(3/2)^2[1/2]_0$			K66		
1492.8346(6)	66986.66(3)	1492.83423(11)	0.0004	330000		s^2	$^3F_2$	sp	$(^3F)^1P^\circ\ ^3F^\circ_2$	5.5e+08	D+	K66	TW	
1493.3675(6)	66962.75(3)	1493.36656(4)	0.0009	180000		4p	$^3D^\circ_3$	5d	$(3/2)^2[7/2]_4$			K66		
1494.661(6)	66904.8(3)	1494.65244(5)	0.008	49000		4p	$^3F^\circ_2$	5d	$(5/2)^2[3/2]_1$			S36c		
1494.7930(19)	66898.89(8)	1494.79138(4)	0.0016	6700		4p	$^3D^\circ_3$	5d	$(3/2)^2[7/2]_3$			TW		
1495.4296(6)	66870.42(3)	1495.42965(9)	−0.0001	200000		$s^2{}^3F_3$		6p	$(5/2)^2[7/2]^\circ_3$			K66		
1496.6862(6)	66814.27(3)	1496.68654(4)	−0.0003	260000		4p	$^3P^\circ_0$	6s	$(3/2)^2[3/2]_1$			K66		
1498.5779(14)	66729.93(6)	1498.57545(7)	0.0024	18000		s^2	$^3F_3$	4f	$(3/2)^2[7/2]^\circ_3$			TW		
1499.5135(10)	66688.30(4)	1499.51299(7)	0.0005	79000		s^2	$^3F_3$	4f	$(3/2)^2[7/2]^\circ_4$			K66		
1500.016(3)	66665.97(13)	1500.0148(7)	0.001	14000		s^2	$^1D_2$	8p	$(5/2)^2[3/2]^\circ_2$			TWn		
1501.3359(12)	66607.35(5)	1501.33622(11)	−0.0003	110000		s^2	$^3F_2$	sp	$(^1G)^3P^\circ\ ^3F^\circ_3$			TW		
1502.811(3)	66541.96(13)	1502.80934(8)	0.002	2600		s^2	$^3F_3$	4f	$(3/2)^2[9/2]^\circ_4$			TW		
1503.3675(6)	66517.34(3)	1503.36800(13)	−0.0005	150000		s^2	$^3F_2$	6p	$(5/2)^2[3/2]^\circ_1$			K66		
1504.7561(6)	66455.95(3)	1504.75691(4)	−0.0008	220000		s^2	$^3F_4$	4f	$(5/2)^2[9/2]^\circ_5$			K66		
1505.3866(6)	66428.12(3)	1505.38756(4)	−0.0010	160000		s^2	$^3F_4$	4f	$(5/2)^2[7/2]^\circ_4$			K66		
1505.8576(12)	66407.34(5)	1505.85714(18)	0.0005	60000		s^2	$^3F_3$	sp	$(^1G)^3P^\circ\ ^3F^\circ_4$			TW		
1507.4705(22)	66336.29(10)	1507.4706(5)	−0.0000	9700		s^2	$^3P_2$	7f	$(5/2)^2[5/2]^\circ_2$			TWn		
1507.6008(22)	66330.56(10)	1507.59910(4)	0.0017	3200		s^2	$^3F_4$	4f	$(5/2)^2[5/2]^\circ_3$			TW		
1508.1835(6)	66304.93(3)	1508.18443(13)	−0.0009	170000		s^2	$^3F_2$	6p	$(5/2)^2[5/2]^\circ_2$			K66		
1508.4845(22)	66291.70(10)	1508.4829(15)	0.0016	6400		s^2	$^3P_2$	7f	$(5/2)^2[3/2]^\circ_1$			TWn		
1508.6313(6)	66285.25(3)	1508.63203(5)	−0.0007	150000		s^2	$^3F_4$	4f	$(5/2)^2[7/2]^\circ_3$			K66		
1510.5051(6)	66203.02(3)	1510.50562(5)	−0.0005	210000		4p	$^1F^\circ_3$	5d	$(5/2)^2[7/2]_4$			K66		
1510.724(3)	66193.41(13)	1510.72666(5)	−0.002	8900		4p	$^1F^\circ_3$	5d	$(5/2)^2[7/2]_3$			TW		

Table A1. *Cont.*

λ_{obs} [a] (Å)	σ_{obs} [b] (cm^{-1})	λ_{Ritz} [c] (Å)	$\Delta\lambda_{obs-Ritz}$ (Å)	I_{obs} [d] (arb. u.)	Char [e]	Lower Level		Upper Level		A (s^{-1})	Acc [f]	Line Ref. [g]	TP Ref. [g]	Notes [h]
1512.1738(12)	66129.96(5)	1512.17367(6)	0.0002	98000		s^2	$^3F_4$	sp	$(^3F)^1P^\circ\ ^3G^\circ_4$			TW		
1512.4640(8)	66117.28(3)	1512.46442(11)	−0.0004	97000		s^2	$^3F_3$	sp	$(^3P)^3P^\circ\ ^1D^\circ_2$			K66		
1512.5393(19)	66113.98(8)	1512.5391(6)	0.0003	18000		s^2	$^3P_1$	8p	$(3/2)^2[1/2]^\circ_1$			TWn		
1513.0157(22)	66093.17(9)	1513.0151(5)	0.0005	9800		s^2	$^3P_1$	7f	$(5/2)^2[5/2]^\circ_2$			TWn		
1513.3651(6)	66077.91(3)	1513.36565(4)	−0.0005	140000		4p	$^1F^\circ_3$	5d	$(5/2)^2[5/2]_3$			K66		
1513.9340(13)	66053.08(6)	1513.93287(14)	0.0011	46000		s^2	$^1D_2$	6f	$(5/2)^2[7/2]^\circ_3$			TW		
1514.2339(8)	66040.00(3)	1514.23361(6)	0.0003	80000		4p	$^3D^\circ_1$	5d	$(3/2)^2[5/2]_2$			K66		
1514.3380(12)	66035.46(5)	1514.33770(11)	0.0003	110000		s^2	$^1D_2$	8p	$(5/2)^2[3/2]^\circ_1$			TW		
1514.4921(6)	66028.74(3)	1514.49222(8)	−0.0001	700000		s^2	$^3F_4$	sp	$(^3F)^1P^\circ\ ^3D^\circ_3$	4.8e+08	D+	K66	TW	
1514.6461(13)	66022.02(6)	1514.64663(14)	−0.0005	48000		s^2	$^3F_2$	6p	$(5/2)^2[3/2]^\circ_2$			TW		
1514.805(5)	66015.12(23)	1514.80334(10)	0.001	13000		s^2	$^1D_2$	6f	$(5/2)^2[5/2]^\circ_2$			TW		
1515.456(3)	65986.75(12)	1515.46044(10)	−0.005	8600		s^2	$^1D_2$	6f	$(5/2)^2[3/2]^\circ_2$			TW		
1515.491(5)	65985.22(23)	1515.49438(15)	−0.004	4300		s^2	$^1D_2$	6f	$(5/2)^2[3/2]^\circ_1$			TW		
1516.9018(13)	65923.84(6)	1516.90090(5)	0.0009	43000		4p	$^1F^\circ_3$	5d	$(5/2)^2[9/2]_4$			TW		
1517.1600(12)	65912.63(5)	1517.15960(5)	0.0004	81000		4p	$^1F^\circ_3$	5d	$(5/2)^2[3/2]_2$			TW		
1517.6309(8)	65892.17(3)	1517.63100(4)	−0.0001	130000		4p	$^3F^\circ_2$	6s	$(3/2)^2[3/2]_2$			K66		
1517.9297(8)	65879.20(3)	1517.92967(6)	0.0000	87000		4p	$^3D^\circ_1$	5d	$(3/2)^2[3/2]_2$			K66		
1519.4914(6)	65811.49(3)	1519.49170(4)	−0.0003	410000		4p	$^3P^\circ_1$	6s	$(5/2)^2[5/2]_2$			K66		
1519.8366(6)	65796.55(3)	1519.83686(4)	−0.0003	540000		4p	$^3F^\circ_2$	6s	$(3/2)^2[3/2]_1$			K66		
		1519.84246(6)			m	4p	$^3D^\circ_1$	5d	$(3/2)^2[3/2]_1$			K66		
1519.923(3)	65792.81(13)	1519.9165(7)	0.007	11000	*	s^2	$^3P_0$	8p	$(3/2)^2[1/2]^\circ_1$			TWn		
1519.923(3)	65792.81(13)	1519.9261(7)	−0.003	11000	*	s^2	$^3F_2$	sp	$(^3P)^3P^\circ\ ^3S^\circ_1$			TWn		
1520.0166(12)	65788.75(5)	1520.01664(6)	−0.0000	53000		4p	$^3D^\circ_2$	5d	$(3/2)^2[5/2]_2$			TW		
1520.3899(12)	65772.60(5)	1520.38979(17)	0.0001	150000		s^2	$^1D_2$	6f	$(5/2)^2[1/2]^\circ_1$			TWn		
1520.5397(6)	65766.12(3)	1520.53944(5)	0.0003	150000		4p	$^3D^\circ_2$	5d	$(3/2)^2[5/2]_3$			K66		
1521.4252(22)	65727.84(9)	1521.4270(16)	−0.0018	8000		s^2	$^3P_0$	7f	$(5/2)^2[3/2]^\circ_1$			TWn		
1522.5070(19)	65681.14(8)	1522.50482(12)	0.0022	8900		s^2	$^3F_3$	sp	$(^1G)^3P^\circ\ ^3F^\circ_2$			TWn		
1522.5767(6)	65678.14(3)	1522.57664(11)	0.0001	97000		s^2	$^3F_2$	6p	$(5/2)^2[7/2]^\circ_3$			K66		
1523.7415(8)	65627.93(3)	1523.74102(6)	0.0005	76000		4p	$^3D^\circ_2$	5d	$(3/2)^2[3/2]_2$			K66		
1523.9231(15)	65620.11(6)	1523.9230(10)	0.0001	31000		s^2	$^3P_1$	8p	$(3/2)^2[3/2]^\circ_1$			TWn		
1524.8604(8)	65579.77(3)	1524.85998(5)	0.0004	130000		4p	$^1D^\circ_2$	5d	$(5/2)^2[5/2]_2$			K66		
1525.656(20)	65545.6(9)	1525.63103(13)	0.025	92000		s^2	$^3F_3$	sp	$(^3F)^1P^\circ\ ^3G^\circ_3$			S36c		
1525.6433(13)	65546.12(5)	1525.64065(7)	0.0026	73000		4p	$^1P^\circ_1$	5d	$(3/2)^2[5/2]_2$			TW		
1525.656(20)	65545.6(9)	1525.66850(6)	−0.013	97000		4p	$^3D^\circ_2$	5d	$(3/2)^2[3/2]_1$			S36c		
1525.7649(6)	65540.90(3)	1525.76429(5)	0.0006	150000		4p	$^1D^\circ_2$	5d	$(5/2)^2[7/2]_3$			K66		
1525.8388(8)	65537.72(3)	1525.83781(9)	0.0010	92000		s^2	$^3F_2$	4f	$(3/2)^2[7/2]^\circ_3$			K66		
1526.932(5)	65490.79(21)	1526.92724(7)	0.005	32000		4p	$^3D^\circ_1$	5d	$(3/2)^2[1/2]_1$			TW		
1526.9944(7)	65488.12(3)	1526.9931(5)	0.0013	130000		s^2	$^3P_2$	sp	$^3D^\circ_3$			K66n		
1527.8127(13)	65453.05(6)	1527.81239(9)	0.0003	42000		s^2	$^3F_2$	4f	$(3/2)^2[5/2]^\circ_2$			TW		
1528.4583(22)	65425.40(9)	1528.45612(3)	0.0022	4700		4p	$^1D^\circ_2$	5d	$(5/2)^2[5/2]_3$			TW		

Table A1. *Cont.*

λ_{obs} [a] (Å)	σ_{obs} [b] (cm^{-1})	λ_{Ritz} [c] (Å)	$\Delta\lambda_{obs-Ritz}$ (Å)	I_{obs} [d] (arb. u.)	Char [e]	Lower Level		Upper Level		A (s^{-1})	Acc [f]	Line Ref. [g]	TP Ref. [g]	Notes [h]
1528.785(20)	65411.4(9)	1528.89495(9)	−0.110	19000	?	s^2	$^3F_2$	4f	$(3/2)^2[5/2]^\circ_3$			S36c		X
1529.3927(22)	65385.43(9)	1529.39267(7)	0.0000	4900		4p	$^1P^\circ_1$	5d	$(3/2)^2[3/2]_2$			TW		
1531.2874(14)	65304.53(6)	1531.28647(11)	0.0010	70000		s^2	$^3F_2$	4f	$(3/2)^2[3/2]^\circ_1$			TW		
1531.3338(14)	65302.55(6)	1531.33448(7)	−0.0007	41000		4p	$^1P^\circ_1$	5d	$(3/2)^2[3/2]_1$			TW		
1531.4120(14)	65299.21(6)	1531.4121(10)	−0.0002	60000		s^2	$^3P_0$	8p	$(3/2)^2[3/2]^\circ_1$			TWn		
1531.8555(6)	65280.31(3)	1531.85562(4)	−0.0001	700000		4p	$^3F^\circ_3$	6s	$(5/2)^2[5/2]_2$			K66		
		1531.87878(5)			m	4p	$^1D^\circ_2$	5d	$(5/2)^2[3/2]_1$			TW		
1532.128(3)	65268.70(13)	1532.13042(10)	−0.003	390000		s^2	$^3F_3$	sp	$(^3F)^1P^\circ\ ^3D^\circ_2$	1.0e+09	D+	TW	TW	
1532.8083(15)	65239.73(6)	1532.80783(7)	0.0004	17000		4p	$^3D^\circ_2$	5d	$(3/2)^2[1/2]_1$			TW		
1533.9867(6)	65189.61(3)	1533.98624(12)	0.0005	170000		s^2	$^3F_2$	sp	$(^3F)^1P^\circ\ ^3D^\circ_1$			K66		
1534.6282(13)	65162.37(6)	1534.62719(10)	0.0010	43000		s^2	$^3F_3$	sp	$(^1G)^3P^\circ\ ^3H^\circ_4$			TW		
1535.0023(6)	65146.48(3)	1535.00194(4)	0.0004	350000		4p	$^3F^\circ_3$	6s	$(5/2)^2[5/2]_3$			K66		
1535.5242(6)	65124.34(3)	1535.52352(4)	0.0007	130000		4p	$^3D^\circ_3$	5d	$(5/2)^2[7/2]_4$			K66		
1536.193(5)	65096.00(21)	1536.19869(21)	−0.006	8200		s^2	$^3P_2$	6f	$(3/2)^2[3/2]^\circ_1$			TW		
1536.9317(16)	65064.70(7)	1536.93333(14)	−0.0016	24000		s^2	$^3P_2$	6f	$(3/2)^2[3/2]^\circ_2$			TW		
1537.3218(12)	65048.19(5)	1537.32130(14)	0.0005	120000		s^2	$^3P_2$	6f	$(3/2)^2[5/2]^\circ_3$			TW		
1537.5581(6)	65038.19(3)	1537.55884(8)	−0.0007	860000		s^2	$^3F_4$	sp	$(^3F)^1P^\circ\ ^3F^\circ_4$	1.4e+09	D+	K66	TW	
1538.4795(6)	64999.24(3)	1538.47917(3)	0.0003	96000		4p	$^3D^\circ_3$	5d	$(5/2)^2[5/2]_3$			K66		
1538.522(5)	64997.45(21)	1538.52706(8)	−0.005	40000		4p	$^1P^\circ_1$	5d	$(3/2)^2[1/2]_1$			TW		
1540.2392(6)	64924.98(3)	1540.23914(12)	0.0001	120000		s^2	$^3F_2$	sp	$(^3P)^3P^\circ\ ^1D^\circ_2$			K66		
1540.3886(6)	64918.68(3)	1540.38850(4)	0.0001	290000		4p	$^1F^\circ_3$	6s	$(3/2)^2[3/2]_2$			K66		
1540.5879(6)	64910.29(3)	1540.58814(9)	−0.0002	600000		s^2	$^3F_3$	sp	$(^3F)^1P^\circ\ ^3F^\circ_3$	9.e+08	D+	K66	TW	
1541.246(5)	64882.59(22)	1541.24593(13)	−0.000	5200		s^2	$^3P_1$	6f	$(3/2)^2[5/2]^\circ_2$			TW		
1541.7007(22)	64863.43(9)	1541.70280(5)	−0.0021	860000		4p	$^3F^\circ_4$	6s	$(5/2)^2[5/2]_3$			K66		
1541.7542(18)	64861.18(8)	1541.75580(18)	−0.0016	260000		s^2	$^1D_2$	sp	$(^1D)^1P^\circ\ ^1D^\circ_2$	1.4e+09	D+	K66	TW	
1541.9565(22)	64852.67(9)	1541.95701(21)	−0.0005	11000		s^2	$^3P_1$	6f	$(3/2)^2[3/2]^\circ_1$			TW		
1542.4007(13)	64834.00(6)	1542.40025(4)	0.0004	55000		4p	$^3D^\circ_3$	5d	$(5/2)^2[3/2]_2$			TW		
1542.6989(22)	64821.46(9)	1542.69717(14)	0.0017	10000		s^2	$^3P_1$	6f	$(3/2)^2[3/2]^\circ_2$			TW		
1543.1328(13)	64803.24(5)	1543.1327(9)	0.0001	64000		s^2	$^3P_2$	sp	$(^1D)^1P^\circ\ ^1P^\circ_1$			TWn		
1544.6764(6)	64738.48(3)	1544.67690(8)	−0.0005	430000		s^2	$^3F_3$	4f	$(5/2)^2[9/2]^\circ_4$			K66		
1547.9581(8)	64601.23(3)	1547.95800(7)	0.0001	59000		s^2	$^3F_3$	4f	$(5/2)^2[7/2]^\circ_4$			K66		
1548.4169(12)	64582.09(5)	1548.4165(12)	0.0004	200000		s^2	$^3P_2$	sp	$(^3P)^1P^\circ\ ^3P^\circ_2$	1.0e+09	D+	TWn	TW	
1548.942(3)	64560.22(12)	1548.9433(10)	−0.002	15000		s^2	$^3P_1$	sp	$(^1D)^1P^\circ\ ^1P^\circ_1$			TWn		
1549.56(7)	64534(3)	1549.62492(22)	−0.06	24000		s^2	$^3P_0$	6f	$(3/2)^2[3/2]^\circ_1$			S36nc		
1550.0971(17)	64512.09(7)	1550.09682(9)	0.0003	10000		4p	$^3D^\circ_1$	5d	$(5/2)^2[1/2]_0$			TW		
1550.2978(13)	64503.73(5)	1550.29648(7)	0.0014	29000		s^2	$^3F_3$	4f	$(5/2)^2[5/2]^\circ_3$			TW		
1550.6528(6)	64488.969(25)	1550.65296(13)	−0.0002	180000		s^2	$^3F_2$	sp	$(^1G)^3P^\circ\ ^3F^\circ_2$	7.3e+08	D+	K66n	TW	
1551.3886(6)	64458.383(25)	1551.38877(7)	−0.0002	250000		s^2	$^3F_3$	4f	$(5/2)^2[7/2]^\circ_3$			K66		
1552.297(5)	64420.66(22)	1552.29519(14)	0.002	1100		s^2	$^3F_3$	sp	$(^3P)^3P^\circ\ ^5S^\circ_2$			TW		
1552.6450(6)	64406.223(25)	1552.64631(10)	−0.0013	720000		s^2	$^3F_4$	sp	$(^3F)^1P^\circ\ ^3G^\circ_5$	1.9e+09	D+	K66	TW	

Table A1. *Cont.*

λ_{obs} [a] (Å)	σ_{obs} [b] (cm^{-1})	λ_{Ritz} [c] (Å)	$\Delta\lambda_{obs-Ritz}$ (Å)	I_{obs} [d] (arb. u.)	Char [e]	Lower Level		Upper Level		A (s^{-1})	Acc [f]	Line Ref. [g]	TP Ref. [g]	Notes [h]
1553.3473(13)	64377.11(5)	1553.3472(13)	0.0001	96000		s^2	$^1D_2$	7p	$(3/2)^2[3/2]^\circ_1$			TWn		
1553.8961(6)	64354.367(25)	1553.89596(14)	0.0001	210000		s^2	$^3F_2$	sp	$(^3F)^1P^\circ\ ^3G^\circ_3$	1.4e+09	D+	K66	TW	
1554.2933(12)	64337.92(5)	1554.2934(11)	−0.0001	120000		s^2	$^1D_2$	7p	$(3/2)^2[3/2]^\circ_2$			TWn		
1555.1336(6)	64303.157(25)	1555.13425(8)	−0.0007	810000		s^2	$^3F_3$	sp	$(^3F)^1P^\circ\ ^3G^\circ_4$	1.3e+09	D+	K66	TW	
1555.7018(6)	64279.671(25)	1555.70295(9)	−0.0012	880000		s^2	$^3F_4$	sp	$(^3P)^3P^\circ\ ^3D^\circ_3$	6.8e+08	D+	K66	TW	
1556.0269(8)	64266.24(3)	1556.02548(4)	0.0014	40000		4p	$^1D^\circ_2$	6s	$(3/2)^2[3/2]_2$			K66		
1556.6836(21)	64239.13(9)	1556.6810(10)	0.0027	19000		s^2	$^3P_0$	sp	$(^1D)^1P^\circ\ ^1P^\circ_1$			TWn		
1556.7668(12)	64235.70(5)	1556.7668(12)	0.0001	180000		s^2	$^1D_2$	7p	$(3/2)^2[5/2]^\circ_3$			TWn		
1557.5867(6)	64201.884(25)	1557.58652(10)	0.0002	110000		s^2	$^3F_3$	sp	$(^3F)^1P^\circ\ ^3D^\circ_3$			K66		
1558.1590(13)	64178.30(6)	1558.1587(13)	0.0003	62000		s^2	$^3P_1$	sp	$(^3P)^1P^\circ\ ^3P^\circ_0$			TWn		
1558.3446(6)	64170.659(25)	1558.34444(4)	0.0002	180000		4p	$^1D^\circ_2$	6s	$(3/2)^2[3/2]_1$			K66		
1559.1587(14)	64137.15(6)	1559.1576(13)	0.0011	210000		s^2	$^1D_2$	7p	$(3/2)^2[5/2]^\circ_2$			TWn		
1563.108(3)	63975.10(12)	1563.1083(13)	−0.000	9400		s^2	$^3P_1$	8p	$(5/2)^2[5/2]^\circ_2$			TWn		
1563.1959(13)	63971.51(5)	1563.19353(5)	0.0024	22000		4p	$^3D^\circ_1$	5d	$(5/2)^2[5/2]_2$			TW		
1565.9244(6)	63860.043(24)	1565.92414(4)	0.0003	190000		4p	$^3F^\circ_2$	6s	$(5/2)^2[5/2]_2$			K66		
1566.4148(4)	63840.051(16)	1566.41460(4)	0.0002	220000		4p	$^3D^\circ_3$	6s	$(3/2)^2[3/2]_2$			K66		
1569.2124(8)	63726.24(3)	1569.21212(4)	0.0003	40000		4p	$^3F^\circ_2$	6s	$(5/2)^2[5/2]_3$			K66		
1569.4154(11)	63717.99(4)	1569.41524(11)	0.0001	42000		s^2	$^3F_2$	sp	$(^3F)^1P^\circ\ ^3F^\circ_3$			TW		
1570.0365(11)	63692.79(4)	1570.0367(8)	−0.0002	94000		s^2	$^3P_2$	8p	$(5/2)^2[3/2]^\circ_2$			TW,S36r		
1570.5722(12)	63671.06(5)	1570.57051(5)	0.0017	17000		4p	$^3D^\circ_1$	5d	$(5/2)^2[3/2]_1$			TW		
1573.1666(22)	63566.06(9)	1573.16667(4)	−0.0001	4000		4p	$^3D^\circ_2$	5d	$(5/2)^2[5/2]_3$			TW		
1575.3547(12)	63477.77(5)	1575.35310(6)	0.0016	34000		4p	$^1P^\circ_1$	5d	$(5/2)^2[5/2]_2$			TW		
1576.0523(12)	63449.67(5)	1576.0520(8)	0.0003	47000		s^2	$^3P_1$	8p	$(5/2)^2[3/2]^\circ_2$			TWn		
1577.2693(22)	63400.71(9)	1577.26680(5)	0.0025	4500		4p	$^3D^\circ_2$	5d	$(5/2)^2[3/2]_2$			TW		
1579.4926(8)	63311.47(3)	1579.49148(9)	0.0011	64000		s^2	$^3F_2$	4f	$(5/2)^2[5/2]^\circ_3$			K66		
1580.0260(11)	63290.10(4)	1580.02469(9)	0.0013	43000		s^2	$^3F_2$	4f	$(5/2)^2[5/2]^\circ_2$			TW		
1580.6258(6)	63266.081(24)	1580.62531(9)	0.0005	71000		s^2	$^3F_2$	4f	$(5/2)^2[7/2]^\circ_3$			K66		
1581.4029(14)	63234.99(6)	1581.40630(5)	−0.0034	5300		4p	$^3D^\circ_1$	5d	$(5/2)^2[1/2]_1$			TW		
1581.420(12)	63234.3(5)	1581.41834(10)	0.001	2300		s^2	$^3F_2$	4f	$(5/2)^2[3/2]^\circ_1$			S36c		
1581.9962(6)	63211.277(24)	1581.99510(10)	0.0011	82000		s^2	$^3F_3$	sp	$(^3F)^1P^\circ\ ^3F^\circ_4$			K66		
1582.6074(20)	63186.86(8)	1582.60633(9)	0.0011	6600		s^2	$^3F_2$	4f	$(5/2)^2[3/2]^\circ_2$			TW		
1582.8471(11)	63177.30(4)	1582.84558(6)	0.0015	35000		4p	$^1P^\circ_1$	5d	$(5/2)^2[3/2]_1$			TW		
1583.6831(4)	63143.946(16)	1583.68224(10)	0.0009	160000		s^2	$^3F_3$	sp	$(^3P)^3P^\circ\ ^3D^\circ_2$			K66		
1586.276(5)	63040.74(21)	1586.27882(10)	−0.003	4100		s^2	$^3P_2$	6f	$(5/2)^2[5/2]^\circ_3$			TW		
1587.0607(22)	63009.56(9)	1587.05935(12)	0.0014	6100		s^2	$^3F_2$	sp	$(^3F)^1P^\circ\ ^3D^\circ_3$			TW		
1587.716(3)	62983.56(11)	1587.71486(5)	0.001	2600		4p	$^3D^\circ_2$	5d	$(5/2)^2[1/2]_1$			TW		
1590.1649(4)	62886.560(16)	1590.16460(4)	0.0003	110000		4p	$^1F^\circ_3$	6s	$(5/2)^2[5/2]_2$			K66		
1593.5559(4)	62752.741(16)	1593.55527(4)	0.0006	190000		4p	$^1F^\circ_3$	6s	$(5/2)^2[5/2]_3$			K66		
1596.749(6)	62627.26(24)	1596.74558(10)	0.003	5100		s^2	$^1D_2$	5f	$(3/2)^2[3/2]^\circ_1$			S36c		
1598.4025(4)	62562.465(16)	1598.40212(4)	0.0004	140000		4p	$^3D^\circ_1$	6s	$(3/2)^2[3/2]_1$			K66		

Table A1. *Cont.*

λ_{obs} [a] (Å)	σ_{obs} [b] (cm^{-1})	λ_{Ritz} [c] (Å)	$\Delta\lambda_{obs-Ritz}$ (Å)	I_{obs} [d] (arb. u.)	Char [e]	Lower Level			Upper Level	A (s^{-1})	Acc [f]	Line Ref. [g]	TP Ref. [g]	Notes [h]
1601.211(3)	62452.75(12)	1601.20967(12)	0.001	2800		s^2	$^3F_3$	sp	$(^3P)^3P^\circ\ ^3D^\circ_3$			TW		
1602.2739(8)	62411.30(3)	1602.27264(12)	0.0013	28000		s^2	$^3F_2$	sp	$(^3P)^3P^\circ\ ^3P^\circ_1$			K66		
1602.3887(4)	62406.831(16)	1602.38797(4)	0.0007	130000		4p	$^3D^\circ_2$	6s	$(3/2)^2[3/2]_2$			K66		
1603.2280(23)	62374.16(9)	1603.22651(14)	0.0014	13000		s^2	$^1D_2$	7p	$(5/2)^2[5/2]^\circ_3$			TW		
1604.8475(4)	62311.216(16)	1604.84729(4)	0.0002	56000		4p	$^3D^\circ_2$	6s	$(3/2)^2[3/2]_1$			K66		
1605.2810(4)	62294.390(16)	1605.28112(12)	−0.0001	150000		s^2	$^3F_3$	sp	$(^3P)^3P^\circ\ ^3P^\circ_2$			K66		
1606.1963(17)	62258.89(6)	1606.19537(24)	0.0009	76000		s^2	$^1D_2$	7p	$(5/2)^2[5/2]^\circ_2$			TW		
1606.8338(4)	62234.190(15)	1606.83396(4)	−0.0002	170000		4p	$^1D^\circ_2$	6s	$(5/2)^2[5/2]_2$			K66		
1608.3931(17)	62173.85(6)	1608.39195(15)	0.0012	87000		s^2	$^1D_2$	7p	$(5/2)^2[3/2]^\circ_1$			TW		
1608.6395(4)	62164.332(15)	1608.63928(6)	0.0002	72000		4p	$^1P^\circ_1$	6s	$(3/2)^2[3/2]_2$			K66		
1609.3421(23)	62137.19(9)	1609.3430(15)	−0.0009	10000		s^2	$^1D_2$	7p	$(5/2)^2[7/2]^\circ_3$			TWn		
1610.2967(8)	62100.36(3)	1610.29617(4)	0.0005	21000		4p	$^1D^\circ_2$	6s	$(5/2)^2[5/2]_3$			K66		
1611.1185(20)	62068.68(8)	1611.11784(6)	0.0006	12000		4p	$^1P^\circ_1$	6s	$(3/2)^2[3/2]_1$			TW		
1614.159(5)	61951.76(21)	1614.16058(12)	−0.001	2100		s^2	$^3F_2$	sp	$(^3P)^3P^\circ\ ^3D^\circ_2$			TW		
1614.4945(18)	61938.89(7)	1614.49462(18)	−0.0002	75000		s^2	$^1D_2$	7p	$(5/2)^2[3/2]^\circ_2$			TW		
1617.9152(8)	61807.94(3)	1617.91504(4)	0.0002	24000		4p	$^3D^\circ_3$	6s	$(5/2)^2[5/2]_2$			K66		
1621.4262(4)	61674.099(15)	1621.42522(4)	0.0010	84000		4p	$^3D^\circ_3$	6s	$(5/2)^2[5/2]_3$			K66		
1622.4281(4)	61636.013(15)	1622.42766(12)	0.0004	80000		s^2	$^3F_2$	sp	$(^3P)^3P^\circ\ ^3D^\circ_1$			K66		
1623.1726(6)	61607.743(23)	1623.1731(3)	−0.0005	36000		s^2	$^3F_4$	sp	$(^3P)^3P^\circ\ ^5D^\circ_4$			K66		
1629.603(3)	61364.65(12)	1629.6017(12)	0.001	9500		s^2	$^3P_2$	7p	$(3/2)^2[3/2]^\circ_2$			TWn		
1630.2669(18)	61339.65(7)	1630.26799(21)	−0.0011	32000		s^2	$^3F_4$	sp	$(^3P)^3P^\circ\ ^5D^\circ_3$			TW		
1636.0706(23)	61122.06(9)	1636.06917(21)	0.0014	19000		s^2	$^3P_2$	7p	$(3/2)^2[1/2]^\circ_1$			TWn		
1636.6049(20)	61102.10(7)	1636.60469(14)	0.0002	11000		s^2	$^3F_2$	sp	$(^3P)^3P^\circ\ ^3P^\circ_2$			TW		
1645.6583(23)	60765.95(8)	1645.6575(22)	0.0008	12000		s^2	$^3P_1$	7p	$(3/2)^2[1/2]^\circ_0$			TWn		
1649.4570(14)	60626.01(5)	1649.45739(4)	−0.0004	26000		4p	$^3D^\circ_1$	6s	$(5/2)^2[5/2]_2$			K66		
1656.322	60374.74	1656.32175(4)		27000	:	4p	$^3D^\circ_2$	6s	$(5/2)^2[5/2]_2$			S36c		
1660.0022(14)	60240.88(5)	1660.00075(4)	0.0014	18000		4p	$^3D^\circ_2$	6s	$(5/2)^2[5/2]_3$			K66		
1663.0029(14)	60132.19(5)	1663.00184(5)	0.0011	31000		4p	$^1P^\circ_1$	6s	$(5/2)^2[5/2]_2$			K66		
1672.7773(23)	59780.82(8)	1672.7755(4)	0.0018	8600		s^2	$^3F_3$	sp	$(^3P)^3P^\circ\ ^5D^\circ_4$			TW		
1680.27(4)	59514.1(14)	1680.31169(23)	−0.04	980		s^2	$^3F_3$	sp	$(^3P)^3P^\circ\ ^5D^\circ_3$			S36c		
1683.152(5)	59412.32(18)	1683.1596(3)	−0.007	34000	*	s^2	$^3F_4$	sp	$(^1D)^3P^\circ\ ^3D^\circ_3$	1.1e+08	C	TW	B00	
1683.152(5)	59412.32(18)	1683.1583(3)	−0.006	34000	*	s^2	$^3F_3$	sp	$(^3P)^3P^\circ\ ^5D^\circ_2$			TW		
1695.9031(23)	58965.63(8)	1695.90238(20)	0.0007	12000		s^2	$^3P_2$	7p	$(5/2)^2[3/2]^\circ_2$			TW		
1699.0958(20)	58854.83(7)	1699.0950(5)	0.0008	22000	*	s^2	$^3F_3$	sp	$(^1D)^3P^\circ\ ^3P^\circ_2$			TW		
1699.0958(20)	58854.83(7)	1699.10217(23)	−0.0064	22000	*	s^2	$^3F_4$	sp	$(^1D)^3P^\circ\ ^3F^\circ_3$			TW		
1702.9236(23)	58722.54(8)	1702.92295(21)	0.0006	8600		s^2	$^3P_1$	7p	$(5/2)^2[3/2]^\circ_2$			TW		
1714.655(20)	58320.8(7)	1714.6631(3)	−0.008	460		s^2	$^3F_2$	sp	$(^3P)^3P^\circ\ ^5D^\circ_3$			S36c		
1717.7188(22)	58216.75(7)	1717.7210(3)	−0.0023	11000		s^2	$^3F_2$	sp	$(^3P)^3P^\circ\ ^5D^\circ_1$			TW		
1734.2254(23)	57662.63(8)	1734.2267(5)	−0.0013	4200		s^2	$^3F_2$	sp	$(^1D)^3P^\circ\ ^3P^\circ_2$			TW		
1736.5531(22)	57585.34(7)	1736.5563(3)	−0.0032	8900		s^2	$^3F_3$	sp	$(^1D)^3P^\circ\ ^3D^\circ_3$			TW		

Table A1. *Cont.*

λ_{obs} [a] (Å)	σ_{obs} [b] (cm^{-1})	λ_{Ritz} [c] (Å)	$\Delta\lambda_{obs-Ritz}$ (Å)	I_{obs} [d] (arb. u.)	Char [e]	Lower Level		Upper Level		A (s^{-1})	Acc [f]	Line Ref. [g]	TP Ref. [g]	Notes [h]
1744.506(20)	57322.8(7)	1744.5159(3)	−0.010	22000		s^2	$^3F_3$	sp	$(^1D)^3P^\circ\ ^3D^\circ_2$	5.9e+07	C	S36c	B00	
1753.2791(21)	57035.99(7)	1753.28069(22)	−0.0016	21000		s^2	$^3F_2$	sp	$(^1D)^3P^\circ\ ^3P^\circ_1$			TW		
1759.5030(21)	56834.23(7)	1759.50415(22)	−0.0012	3400		s^2	$^3F_3$	sp	$(^1D)^3P^\circ\ ^3F^\circ_2$			TW		
1781.573(3)	56130.16(10)	1781.5715(3)	0.002	4400		s^2	$^3F_2$	sp	$(^1D)^3P^\circ\ ^3D^\circ_2$			TW		
1790.6606(21)	55845.31(7)	1790.6599(3)	0.0007	33000		s^2	$^3F_2$	sp	$(^1D)^3P^\circ\ ^3D^\circ_1$	4.5e+07	C	TW	B00	
1800.9806(24)	55525.31(7)	1800.9789(6)	0.0018	11000		s^2	$^3F_4$	sp	$(^3P)^3P^\circ\ ^5P^\circ_3$			TW		
1807.8535(21)	55314.22(7)			160000		4p	$^1P^\circ_1$	s^2	$^1S_0$			TW,S36r		
1856.937(20)	53852.1(6)	1856.92890(17)	0.009	14000		s^2	$^1D_2$	6p	$(5/2)^2[3/2]^\circ_1$			S36c		
1861.57(4)	53718.2(12)	1861.6226(3)	−0.06	10000		s^2	$^3F_3$	sp	$(^3P)^3P^\circ\ ^5P^\circ_2$			S36c		
1874.166(5)	53357.06(14)	1874.16676(18)	−0.001	14000		s^2	$^1D_2$	6p	$(5/2)^2[3/2]^\circ_2$			TW		
1875.74638(18)	53312.112(5)	1875.74622(7)	0.00016	20000		s^2	$^3F_4$	5p	$(3/2)^2[5/2]^\circ_3$			F		
1882.253(3)	53127.82(8)	1882.2566(10)	−0.003	17000		s^2	$^1D_2$	sp	$(^3P)^3P^\circ\ ^3S^\circ_1$			TWn		
1903.858(5)	52524.93(15)	1903.86698(15)	−0.009	410		s^2	$^1D_2$	sp	$(^3F)^1P^\circ\ ^3D^\circ_1$			TW		
1920.6709(8)	52065.141(22)	1920.67133(7)	−0.0004	43000		4p	$^3P^\circ_2$	4d	$(3/2)^2[5/2]_3$	1.5e+07	C	F	B00	
1922.14229(17)	52025.285(5)	1922.14231(11)	−0.00003	94000		s^2	$^3F_3$	5p	$(3/2)^2[3/2]^\circ_2$			F		
1924.548(3)	51960.26(9)	1924.5458(22)	0.002	5200		s^2	$^1G_4$	7p	$(5/2)^2[7/2]^\circ_3$			TWn		
1928.46(4)	51854.9(11)	1928.4863(3)	−0.03	46000		s^2	$^1D_2$	sp	$(^3P)^3P^\circ\ ^1P^\circ_1$			S36cn		
		1929.60764(17)			m	s^2	$^1D_2$	sp	$(^1G)^3P^\circ\ ^3F^\circ_2$			S36cn		
1929.75131(6)	51820.1488(16)	1929.75129(5)	0.00002	340000		s^2	$^3F_4$	sp	$(^3F)^3P^\circ\ ^1F^\circ_3$	2.1e+07	C	F	B00	
1942.3030(7)	51485.272(19)	1942.30290(12)	0.0001	31000		s^2	$^3F_3$	5p	$(3/2)^2[5/2]^\circ_3$			F		
1944.59596(14)	51424.564(4)	1944.59601(6)	−0.00005	6000000		4s	$^3D_3$	4p	$^3D^\circ_2$	1.99e+07	C+	F	D05se	
1946.4928(3)	51374.451(7)	1946.49291(7)	−0.0001	130000		s^2	$^3F_4$	5p	$(5/2)^2[5/2]^\circ_3$			F		
1952.5792(18)	51214.31(5)	1952.57557(12)	0.0037	97000		s^2	$^3F_3$	5p	$(3/2)^2[5/2]^\circ_2$			F		
1957.5176(3)	51085.108(8)	1957.51767(7)	−0.0000	190000		s^2	$^3F_4$	5p	$(5/2)^2[7/2]^\circ_4$			F		
1968.008(3)	50812.79(8)	1968.01129(8)	−0.003	9700		4p	$^3P^\circ_2$	4d	$(3/2)^2[1/2]_1$	1.8e+07	C	TW	O07	
1970.4936(6)	50748.707(15)	1970.49395(7)	−0.0004	760000		4s	$^3D_2$	4p	$^1P^\circ_1$	5.3e+06	C+	F	K82cor	
1974.467(3)	50646.57(8)	1974.46773(8)	−0.000	2800		s^2	$^1D_2$	4f	$(5/2)^2[5/2]^\circ_3$			TW		
1977.0266(3)	50581.009(6)	1977.02671(15)	−0.0001	80000		s^2	$^3F_2$	5p	$(3/2)^2[3/2]^\circ_1$			F		
1979.95578(4)	50506.1785(10)	1979.95579(3)	−0.00002	18000000		4s	$^3D_2$	4p	$^3D^\circ_2$	9.6e+07	C+	F	D05se	
1982.1503(20)	50450.26(5)	1982.14827(12)	0.0021	16000		s^2	$^3F_3$	sp	$(^3F)^3P^\circ\ ^1D^\circ_2$			F		
1984.763(3)	50383.85(8)	1984.76431(19)	−0.001	14000		s^2	$^3P_2$	6p	$(5/2)^2[3/2]^\circ_2$			TW		
1986.307(3)	50344.68(8)	1986.30794(14)	−0.001	8100		s^2	$^1D_2$	sp	$(^3F)^1P^\circ\ ^3D^\circ_3$			TW		
1989.85478(3)	50254.9236(9)	1989.85480(3)	−0.00001	7400000		4s	$^3D_2$	4p	$^3D^\circ_1$	9.8e+07	C+	F	D05	
1990.18000(19)	50246.711(5)	1990.18009(7)	−0.00009	670000		4p	$^3P^\circ_1$	4d	$(3/2)^2[3/2]_2$	1.3e+08	C	F	B00	
1993.8395(21)	50154.49(5)	1993.8395(12)	−0.0000	34000		s^2	$^3P_2$	sp	$(^3P)^3P^\circ\ ^3S^\circ_1$			TWn		
1994.257(3)	50143.98(8)	1994.25958(15)	−0.002	17000		s^2	$^3F_2$	5p	$(3/2)^2[1/2]^\circ_1$			TW		
1998.5575(16)	50036.09(4)	1998.55790(7)	−0.0004	34000		4p	$^3F^\circ_3$	4d	$(3/2)^2[5/2]_3$			F		
1999.5327(18)	50011.69(5)	1999.53361(8)	−0.0009	140000		4p	$^3P^\circ_1$	4d	$(3/2)^2[3/2]_1$	5.8e+07	C	TW	B00	
1999.69752(6)	49991.3640(16)	1999.69754(5)	−0.00002	20000000		4s	$^3D_3$	4p	$^3D^\circ_3$	2.13e+08	B	F	C94c	
2002.9033(20)	49911.36(5)	2002.9020(12)	0.0013	73000		s^2	$^3P_1$	sp	$(^3P)^3P^\circ\ ^3S^\circ_1$			TWn		

Table A1. *Cont.*

λ_{obs} [a] (Å)	σ_{obs} [b] (cm^{-1})	λ_{Ritz} [c] (Å)	$\Delta\lambda_{obs-Ritz}$ (Å)	I_{obs} [d] (arb. u.)	Char [e]	Lower Level		Upper Level		A (s^{-1})	Acc [f]	Line Ref. [g]	TP Ref. [g]	Notes [h]
2009.32(15)	49752(4)	2009.28239(8)	0.04	6800		4p	$^3F^\circ_4$	4d	$(3/2)^2[5/2]_3$			S36c		
2012.98037(14)	49661.540(4)	2012.98041(6)	−0.00004	1800000		4p	$^3P^\circ_2$	4d	$(5/2)^2[5/2]_3$	2.5e+08	C	F	B00	
2015.5822(4)	49597.442(10)	2015.58222(8)	0.0000	1400000		4s	$^3D_1$	4p	$^1P^\circ_1$	2.1e+07	C+	F	K82cor	
2015.8660(24)	49590.46(6)	2015.8649(12)	0.0011	39000		s^2	$^3P_0$	sp	$(^3P)^3P^\circ\ ^3S^\circ_1$			TWn		
2016.8964(6)	49565.129(14)	2016.89673(6)	−0.0003	1700000		4s	$^3D_3$	4p	$^1D^\circ_2$	8.1e+06	C+	F	D05se	
2017.6096(16)	49547.61(4)	2017.60977(12)	−0.0002	160000		s^2	$^3F_3$	5p	$(5/2)^2[5/2]^\circ_3$			F		
2022.1913(16)	49435.37(4)	2022.19147(7)	−0.0002	170000		4p	$^3F^\circ_3$	4d	$(3/2)^2[7/2]_4$	1.14e+07	C+	F	O07	
2025.48773(12)	49354.924(3)	2025.48775(5)	−0.00001	8100000		4s	$^3D_1$	4p	$^3D^\circ_2$	6.8e+07	C+	F	D05se	
2025.919(3)	49344.43(8)	2025.91683(13)	0.002	25000		s^2	$^3F_3$	5p	$(5/2)^2[5/2]^\circ_2$			TW		
2027.1336(6)	49314.858(15)	2027.13416(9)	−0.0005	610000		4p	$^3P^\circ_1$	4d	$(3/2)^2[1/2]_1$	1.3e+08	C	F	O07se	
2029.471(3)	49258.06(8)	2029.47227(16)	−0.001	37000		s^2	$^3F_2$	sp	$(^3F)^3P^\circ\ ^1D^\circ_2$			TW		
2029.9491(7)	49246.469(17)	2029.94908(6)	0.0000	560000		4p	$^3P^\circ_2$	4d	$(5/2)^2[3/2]_1$	8.0e+07	B	F	O07	
2031.03579(16)	49220.123(4)	2031.03598(6)	−0.00020	2700000		4p	$^3P^\circ_2$	4d	$(5/2)^2[3/2]_2$	4.5e+08	B	F	O07	
2033.844(3)	49152.18(8)	2033.84242(8)	0.001	62000		4p	$^3F^\circ_4$	4d	$(3/2)^2[7/2]_4$	8.9e+06	C+	TW	O07	
2035.85321(6)	49103.6704(15)	2035.85327(4)	−0.00006	19000000		4s	$^3D_1$	4p	$^3D^\circ_1$	3.7e+08	C+	F	D05	
2036.9201(3)	49077.954(8)	2036.92001(9)	0.0001	730000		4p	$^3P^\circ_0$	4d	$(3/2)^2[3/2]_1$	1.9e+08	C	F	B00	
2037.12672(4)	49072.9776(9)	2037.12668(3)	0.00004	13000000		4s	$^3D_2$	4p	$^3D^\circ_3$	1.36e+08	B	F	C94c	
2043.8019(5)	48912.725(11)	2043.80148(7)	0.0004	21000000		4s	$^3D_3$	4p	$^1F^\circ_3$	1.42e+08	C+	R1c	D05se	
2047.67825(16)	48820.143(4)	2047.67825(11)	−0.00000	1300000		4p	$^1P^\circ_1$	4d	$(3/2)^2[1/2]_0$	5.32e+08	B+	F	B09	
2054.25259(21)	48663.922(5)	2054.25263(8)	−0.00003	810000		4p	$^3F^\circ_2$	4d	$(3/2)^2[5/2]_2$	1.4e+08	C	F	B00	
2054.4171(3)	48660.025(7)	2054.41739(8)	−0.0003	960000		4p	$^3P^\circ_1$	4d	$(5/2)^2[1/2]_0$	6.7e+08	C	F	B00	
2054.97836(4)	48646.7370(10)	2054.97836(3)	0.00001	18000000		4s	$^3D_2$	4p	$^1D^\circ_2$	1.65e+08	C+	F	D05se	
2058.611(3)	48560.91(8)	2058.61377(13)	−0.003	49000		s^2	$^3F_3$	5p	$(5/2)^2[3/2]^\circ_2$			TW		
2062.4201(4)	48471.230(8)	2062.42011(6)	−0.0000	1500000		4p	$^3P^\circ_1$	4d	$(5/2)^2[5/2]_2$	1.7e+08	C	F	B00	
2066.2609(5)	48381.143(12)	2066.26109(10)	−0.0002	960000		4p	$^3P^\circ_0$	4d	$(3/2)^2[1/2]_1$	2.00e+08	B+	F	O07	
2067.368(3)	48355.23(7)	2067.36392(16)	0.004	35000		s^2	$^3F_2$	5p	$(5/2)^2[5/2]^\circ_3$			TW		
2069.9356(13)	48295.27(3)	2069.93487(7)	0.0007	240000		4p	$^3F^\circ_2$	4d	$(3/2)^2[3/2]_2$	3.7e+07	C	F	B00	
2074.213(3)	48195.68(8)	2074.20995(16)	0.003	39000		s^2	$^3F_2$	5p	$(5/2)^2[3/2]^\circ_1$			TW		
		2074.24066(15)			m	s^2	$^3P_1$	sp	$(^3F)^1P^\circ\ ^3D^\circ_2$			TW		
2078.66147(9)	48092.5549(21)	2078.66153(6)	−0.00005	6700000		4p	$^3P^\circ_2$	4d	$(5/2)^2[1/2]_1$	6.3e+08	B+	F	O07	
2080.0593(13)	48060.24(3)	2080.05953(9)	−0.0002	210000		4p	$^3F^\circ_2$	4d	$(3/2)^2[3/2]_1$	4.9e+07	C	R1c	B00	
2082.920(20)	47994.2(5)	2082.91535(6)	0.005	56000		4s	$^3D_2$	4p	$^1F^\circ_3$	1.0e+06	E	S36c	D05se	
2084.3229(20)	47961.94(5)	2084.32369(22)	−0.0008	170000		s^2	$^3F_4$	sp	$(^3F)^3P^\circ\ ^3F^\circ_4$			TW		
2085.2735(9)	47940.081(21)	2085.27476(6)	−0.0012	860000		4p	$^3F^\circ_3$	4d	$(5/2)^2[5/2]_2$	6.7e+07	C	R1c	B00	
2085.297(4)	47939.55(9)	2085.30956(7)	−0.013	2500000		4s	$^3D_3$	4p	$^3F^\circ_2$	4.1e+06	C+	TW	D05cor	
2087.91812(11)	47879.3666(25)	2087.91817(7)	−0.00005	3400000		4p	$^3F^\circ_2$	4d	$(3/2)^2[7/2]_3$	4.2e+08	B	F	B00	
2087.96979(24)	47878.182(5)	2087.96987(6)	−0.00008	3700000		4p	$^3F^\circ_3$	4d	$(5/2)^2[7/2]_3$	2.6e+08	C	F	B00	
2093.6366(5)	47748.606(11)	2093.63705(6)	−0.0004	2400000		4p	$^3P^\circ_1$	4d	$(5/2)^2[3/2]_1$	2.20e+08	B	R1c	O07	
2094.7925(9)	47722.261(21)	2094.79321(6)	−0.0007	290000		4p	$^3P^\circ_1$	4d	$(5/2)^2[3/2]_2$	2.21e+07	C+	R1c	O07	
2096.1891(14)	47690.47(3)	2096.19052(9)	−0.0014	120000		4p	$^1F^\circ_3$	4d	$(3/2)^2[5/2]_2$	1.6e+07	C	R1c	B00	

Table A1. *Cont.*

λ_{obs} [a] (Å)	σ_{obs} [b] (cm^{-1})	λ_{Ritz} [c] (Å)	$\Delta\lambda_{obs-Ritz}$ (Å)	I_{obs} [d] (arb. u.)	Char [e]	Lower Level		Upper Level		A (s^{-1})	Acc [f]	Line Ref. [g]	TP Ref. [g]	Notes [h]
2098.3067(3)	47642.348(7)	2098.30677(8)	−0.0001	1200000		4p	$^1F^\circ_3$	4d	$(3/2)^2[5/2]_3$	1.01e+08	C	F	B00	
2098.3971(2)	47640.295(6)	2098.39724(8)	−0.0001	5000000		4p	$^3F^\circ_4$	4d	$(5/2)^2[7/2]_4$	2.09e+08	B	F	O07	
2098.7405(9)	47632.502(21)	2098.74108(6)	−0.0006	300000		4p	$^3F^\circ_3$	4d	$(5/2)^2[5/2]_3$	2.0e+07	C	R1c	B00	
2100.397(3)	47594.94(7)	2100.39318(8)	0.004	53000		4p	$^3F^\circ_4$	4d	$(5/2)^2[7/2]_3$			TW		
2104.79587(5)	47495.4827(11)	2104.79586(4)	0.00002	62000000		4s	$^3D_1$	4p	$^1D^\circ_2$	7.7e+07	C+	F	D05se	
2106.3816(11)	47459.73(3)	2106.3791(3)	0.0025	240000		s^2	$^3F_3$	sp	$(^3F)^3P^\circ\ ^1G^\circ_4$			F		
2110.308(3)	47371.45(7)	2110.30833(15)	−0.001	90000		s^2	$^3P_2$	sp	$(^3F)^1P^\circ\ ^3D^\circ_3$			TW		
2111.2934(4)	47349.333(10)	2111.29323(8)	0.0001	860000		4p	$^3F^\circ_4$	4d	$(5/2)^2[5/2]_3$	6.6e+07	C	R1c	B00	
2112.09930(19)	47331.268(4)	2112.09946(9)	−0.00016	55000000		4s	$^1D_2$	4p	$^1P^\circ_1$	3.5e+08	C+	F	D05se	
2112.5245(14)	47321.74(3)	2112.52195(8)	0.0026	110000		4p	$^1F^\circ_3$	4d	$(3/2)^2[3/2]_2$	1.2e+07	C	R1c	B00	
2117.30881(9)	47214.8259(20)	2117.30874(7)	0.00006	12000000		4p	$^3F^\circ_3$	4d	$(5/2)^2[9/2]_4$	7.2e+08	B	F	O07	
2118.3748(20)	47191.07(5)	2118.37484(7)	−0.0001	260000		4p	$^3F^\circ_3$	4d	$(5/2)^2[3/2]_2$	2.7e+07	B	TW	O07	
2122.97861(13)	47088.745(3)	2122.97858(6)	0.00003	71000000		4s	$^1D_2$	4p	$^3D^\circ_2$	2.2e+08	C+	F	D05se	
2125.10512(12)	47041.631(3)	2125.10507(7)	0.00004	3800000		4p	$^1F^\circ_3$	4d	$(3/2)^2[7/2]_4$	2.28e+08	B+	F	O07	
2125.2670(5)	47038.048(12)	2125.26686(8)	0.0001	610000		4p	$^1D^\circ_2$	4d	$(3/2)^2[5/2]_2$	6.6e+07	C	F	B00	
2126.04361(6)	47020.8676(14)	2126.04362(5)	−0.00001	74000000		4s	$^3D_2$	4p	$^3F^\circ_2$	1.41e+08	B	F	C94c	
2130.0848(5)	46931.669(10)	2130.08459(9)	0.0002	1000000		4p	$^3F^\circ_4$	4d	$(5/2)^2[9/2]_4$	4.4e+07	B+	R1c	O07	
2131.2548(6)	46905.908(13)	2131.25595(8)	−0.0011	190000		4p	$^1F^\circ_3$	4d	$(3/2)^2[7/2]_3$	1.3e+07	C	R1c	B00	
2134.3400(4)	46838.113(9)	2134.34030(8)	−0.0003	9500000		4p	$^3F^\circ_4$	4d	$(5/2)^2[9/2]_5$	7.7e+08	B	R1c	B00	
2135.399	46814.89	2135.39887(8)			:	4p	$^3P^\circ_0$	4d	$(5/2)^2[3/2]_1$	4.e+07	E		O07se	
2135.98008(7)	46802.1541(16)	2135.98004(6)	0.00004	140000000		4s	$^3D_3$	4p	$^3F^\circ_4$	4.59e+08	A+	F	P97	
2144.706(10)	46611.76(22)	2144.70358(8)	0.002	160000	*	4p	$^3D^\circ_3$	4d	$(3/2)^2[5/2]_2$	1.5e+07	C	R1c	B00	
2144.706(10)	46611.76(22)	2144.72206(16)	−0.016	160000	*	s^2	$^3F_3$	sp	$(^3F)^3P^\circ\ ^3F^\circ_3$			R1c		
2145.4920(4)	46594.683(9)	2145.49206(7)	−0.0001	1200000		4p	$^3P^\circ_1$	4d	$(5/2)^2[1/2]_1$	1.14e+08	B	R1c	O07	
2146.9187(4)	46563.722(8)	2146.91894(7)	−0.0002	1100000		4p	$^3D^\circ_3$	4d	$(3/2)^2[5/2]_3$	1.04e+08	C	F	B00	
		2148.94587(6)			m	4p	$^3F^\circ_2$	4d	$(5/2)^2[5/2]_2$	1.12e+08	C	S36c	B00	
2148.9830(6)	46518.999(13)	2148.98283(8)	0.0002	59000000		4s	$^3D_3$	4p	$^3F^\circ_3$	8.8e+07	B	R1c	C94c	
2151.8083(4)	46457.927(9)	2151.80815(7)	0.0001	4200000		4p	$^3F^\circ_2$	4d	$(5/2)^2[7/2]_3$	2.59e+08	B	R1c	B00	
2152.910(20)	46434.2(4)	2152.90029(9)	0.010	23000		4p	$^1D^\circ_2$	4d	$(3/2)^2[3/2]_1$			S36c		
2158.4108(10)	46315.829(21)	2158.41130(19)	−0.0005	60000		s^2	$^3F_2$	sp	$(^3F)^3P^\circ\ ^3F^\circ_2$			R1c		
2161.31978(23)	46253.498(5)	2161.31990(7)	−0.00012	4200000		4p	$^1D^\circ_2$	4d	$(3/2)^2[7/2]_3$	3.1e+08	B	F	B00	
2161.7998(10)	46243.228(21)	2161.80255(7)	−0.0027	58000		4p	$^3D^\circ_3$	4d	$(3/2)^2[3/2]_2$			R1c		
2166.850(20)	46135.5(4)	2166.8678(3)	−0.018	21000		s^2	$^3F_3$	sp	$(^3F)^3P^\circ\ ^3F^\circ_4$			S36c		
2174.98119(9)	45963.0038(18)	2174.98126(6)	−0.00007	7500000		4p	$^3D^\circ_3$	4d	$(3/2)^2[7/2]_4$	4.9e+08	B	F	O07	
2179.41026(22)	45869.606(5)	2179.40994(6)	0.00033	72000000		4s	$^3D_1$	4p	$^3F^\circ_2$	2.15e+08	B	F	C94c	
2180.7508(5)	45841.413(11)			680000		s^2	$^3F_4$	sp	$(^3F)^3P^\circ\ ^3G^\circ_5$			R1c		
2181.4243(4)	45827.261(9)	2181.42461(7)	−0.0003	290000		4p	$^3D^\circ_3$	4d	$(3/2)^2[7/2]_3$	2.4e+07	C	R1c	B00	
2182.8585(5)	45797.154(11)	2182.85780(7)	0.0007	560000		4p	$^3F^\circ_2$	4d	$(5/2)^2[3/2]_1$	8.0e+07	C+	R1c	O07	
2189.3693(10)	45660.976(21)	2189.36930(8)	0.0000	240000		4p	$^3P^\circ_0$	4d	$(5/2)^2[1/2]_1$	1.3e+07	C	R1c	O07se	
2189.62967(9)	45655.5468(18)	2189.62971(6)	−0.00004	47000000		4s	$^1D_2$	4p	$^3D^\circ_3$	1.04e+08	B	F,R1c	C94c	
2190.500(20)	45637.4(4)	2190.5192(3)	−0.019	57000		s^2	$^1G_4$	6p	$(3/2)^2[5/2]^\circ_3$			S36c		

Table A1. *Cont.*

λ_{obs} [a] (Å)	σ_{obs} [b] (cm^{-1})	λ_{Ritz} [c] (Å)	$\Delta\lambda_{obs-Ritz}$ (Å)	I_{obs} [d] (arb. u.)	Char [e]	Lower Level		Upper Level		A (s^{-1})	Acc [f]	Line Ref. [g]	TP Ref. [g]	Notes [h]
2192.26759(8)	45600.6159(16)	2192.26753(6)	0.00007	73000000		4s	$^3D_2$	4p	$^3F^\circ_3$	2.8e+08	B	F	C94c	
2195.68180(17)	45529.716(4)	2195.68192(7)	−0.00012	4200000		4p	$^1F^\circ_3$	4d	$(5/2)^2[7/2]_4$	4.2e+08	B	F	O07	
2197.8688(15)	45484.42(3)	2197.86726(7)	0.0016	71000		4p	$^1F^\circ_3$	4d	$(5/2)^2[7/2]_3$			R1c		
2200.300(20)	45434.2(4)	2200.31543(20)	−0.015	47000		s^2	$^3P_0$	sp	$(^3P)^3P^\circ\ ^3D^\circ_1$			S36c		
2200.5078(3)	45429.874(6)	2200.50822(8)	−0.0004	1600000		4p	$^3D^\circ_1$	4d	$(3/2)^2[5/2]_2$	2.1e+08	C	F	B00	
2201.000(20)	45419.7(4)	2201.02822(20)	−0.028	33000		s^2	$^3F_2$	sp	$(^3F)^3P^\circ\ ^3F^\circ_3$			S36c		
2209.8049(4)	45238.760(8)	2209.80507(7)	−0.0002	1900000		4p	$^1F^\circ_3$	4d	$(5/2)^2[5/2]_3$	2.1e+08	C	R1c	B00	
2210.26692(11)	45229.3048(22)	2210.26693(6)	−0.00001	56000000		4s	$^1D_2$	4p	$^1D^\circ_2$	1.53e+08	C+	F	D05se	
2212.7470(6)	45178.617(12)	2212.74730(8)	−0.0003	1100000		4p	$^3D^\circ_2$	4d	$(3/2)^2[5/2]_2$	1.4e+08	C	F	B00	
2215.1054(3)	45130.521(5)	2215.10550(8)	−0.0001	3800000		4p	$^3D^\circ_2$	4d	$(3/2)^2[5/2]_3$	4.9e+08	B	F	B00	
2218.10770(6)	45069.4401(12)	2218.10772(5)	−0.00002	66000000		4s	$^3D_2$	4p	$^3P^\circ_1$	3.5e+08	C+	F	D05se	
2218.5123(4)	45061.222(9)	2218.51209(8)	0.0002	1900000		4p	$^3D^\circ_1$	4d	$(3/2)^2[3/2]_2$	2.6e+08	C	R1c	B00	
2221.649(3)	44997.60(6)	2221.6477(8)	0.001	99000		s^2	$^1D_2$	sp	$(^1D)^3P^\circ\ ^3P^\circ_2$			R1c		
2224.6906(5)	44936.092(10)	2224.69062(11)	−0.0000	1300000		4p	$^1P^\circ_1$	4d	$(3/2)^2[5/2]_2$	1.3e+08	C	R1c	B00	
2226.7798(4)	44893.936(8)	2226.77999(6)	−0.0002	2200000		4p	$^1D^\circ_2$	4d	$(5/2)^2[5/2]_2$	2.9e+08	C	R1c	B00	
2228.86748(6)	44851.8904(11)	2228.86745(6)	0.00003	35000000		4s	$^3D_1$	4p	$^3P^\circ_0$	3.88e+08	B+	F	P97	
2229.8529(4)	44832.072(8)	2229.85346(6)	−0.0006	1800000		4p	$^1D^\circ_2$	4d	$(5/2)^2[7/2]_3$	2.1e+08	C	R1c	B00	
2230.1439(7)	44826.223(15)	2230.14604(9)	−0.0022	1900000		4p	$^3D^\circ_1$	4d	$(3/2)^2[3/2]_1$	1.9e+08	C	R1c	B00	
2230.3979(7)	44821.118(13)	2230.39901(9)	−0.0011	440000		4p	$^1F^\circ_3$	4d	$(5/2)^2[9/2]_4$	2.0e+07	C	R1c	O07se	
2230.9512(6)	44810.003(12)	2230.95279(8)	−0.0016	1600000		4p	$^3D^\circ_2$	4d	$(3/2)^2[3/2]_2$	2.2e+08	C	R1c	B00	
2231.5817(4)	44797.343(8)	2231.58204(7)	−0.0003	1100000		4p	$^1F^\circ_3$	4d	$(5/2)^2[3/2]_2$	1.14e+08	B	R1c	O07	
2242.1424(11)	44586.363(21)	2242.14217(6)	0.0003	240000		4p	$^1D^\circ_2$	4d	$(5/2)^2[5/2]_3$	1.07e+07	C	R1c	B00	
2242.61775(10)	44576.9146(20)	2242.61764(7)	0.00011	54000000		4s	$^1D_2$	4p	$^1F^\circ_3$	2.5e+08	C+	F	D05se	
2242.718(3)	44574.93(5)	2242.71791(9)	−0.000	100000		4p	$^3D^\circ_2$	4d	$(3/2)^2[3/2]_1$	5.8e+07	C	TW	B00	
2243.0938(7)	44567.454(14)	2243.09395(10)	−0.0001	230000		4p	$^1P^\circ_1$	4d	$(3/2)^2[3/2]_2$	4.0e+07	C	R1c	B00	
2247.0017(5)	44489.953(11)	2247.00170(9)	−0.0000	66000000		4s	$^3D_3$	4p	$^3P^\circ_2$	3.3e+08	B	R1c	C94c	
2248.9666(4)	44451.086(8)	2248.96667(6)	−0.0001	1800000		4p	$^3D^\circ_3$	4d	$(5/2)^2[7/2]_4$	9.1e+07	B	R1c	O07	
2251.8564(5)	44394.047(9)	2251.85601(8)	0.0004	72000		4p	$^3D^\circ_2$	4d	$(3/2)^2[7/2]_3$	5.8e+06	C	R1c	B00	
2253.0326(16)	44370.87(3)	2253.0273(3)	0.0053	51000		s^2	$^1D_2$	sp	$(^1D)^3P^\circ\ ^3P^\circ_1$			R1c		
2254.9880(4)	44332.402(8)	2254.98778(11)	0.0002	620000		4p	$^1P^\circ_1$	4d	$(3/2)^2[3/2]_1$	1.9e+08	C	R1c	B00	
2263.2130(4)	44171.302(8)	2263.21318(6)	−0.0002	580000		4p	$^1D^\circ_2$	4d	$(5/2)^2[3/2]_1$	1.54e+08	B+	R1c	O07	
2263.7857(4)	44160.128(8)	2263.78578(6)	−0.0000	1700000		4p	$^3D^\circ_3$	4d	$(5/2)^2[5/2]_3$	1.8e+08	C	R1c	B00	
2264.5671(16)	44144.89(3)	2264.56423(6)	0.0029	50000		4p	$^1D^\circ_2$	4d	$(5/2)^2[3/2]_2$	1.4e+06	E	R1c	O07se	
2265.3643(4)	44129.358(8)	2265.36424(10)	0.0001	190000		4p	$^3D^\circ_1$	4d	$(3/2)^2[1/2]_1$	1.25e+08	B	R1c	O07	
2274.7407(6)	43947.476(11)	2274.74107(8)	−0.0004	150000		4p	$^3P^\circ_2$	5s	$(3/2)^2[3/2]_2$	4.e+06	E	R1c	C94	
2276.2577(4)	43918.191(8)	2276.25797(7)	−0.0003	16000000		4s	$^3D_1$	4p	$^3P^\circ_1$	6.3e+07	C+	R1c	D05se	
2278.3378(5)	43878.098(10)	2278.33737(10)	0.0004	220000		4p	$^3D^\circ_2$	4d	$(3/2)^2[1/2]_1$	1.32e+08	B+	R1c	O07	
2280.9423(4)	43827.999(8)	2280.9428(3)	−0.0005	260000		s^2	$^3F_3$	sp	$(^3F)^3P^\circ\ ^3G^\circ_4$			R1c		
2284.202(4)	43765.46(7)	2284.19835(22)	0.004	17000		s^2	$^1G_4$	sp	$(^1G)^3P^\circ\ ^3F^\circ_3$			R1c		

Table A1. *Cont.*

λ_{obs} [a] (Å)	σ_{obs} [b] (cm^{-1})	λ_{Ritz} [c] (Å)	$\Delta\lambda_{obs-Ritz}$ (Å)	I_{obs} [d] (arb. u.)	Char [e]	Lower Level		Upper Level		A (s^{-1})	Acc [f]	Line Ref. [g]	TP Ref. [g]	Notes [h]
2286.6447(4)	43718.712(8)	2286.64494(6)	−0.0002	810000		4p	$^3D^\circ_3$	4d	$(5/2)^2[3/2]_2$	1.52e+08	B+	R1c	O07	
2289.4160(4)	43665.797(8)	2289.41619(8)	−0.0002	170000		4p	$^3P^\circ_2$	5s	$(3/2)^2[3/2]_1$	7.e+06	D	R1c	C94	
2290.1606(7)	43651.600(14)	2290.16119(24)	−0.0006	49000		s^2	$^3F_2$	sp	$(^3F)^3P^\circ\ ^3D^\circ_3$			R1c		
2291.0018(4)	43635.575(8)	2291.00110(12)	0.0007	550000		4p	$^1P^\circ_1$	4d	$(3/2)^2[1/2]_1$	1.76e+08	B+	R1c	O07	
2292.6896(6)	43603.454(11)	2292.69060(8)	−0.0010	19000		4s	$^1D_2$	4p	$^3F^\circ_2$	4.e+05	E	R1c	D05cor	
2292.9699(6)	43598.124(11)	2292.9700(3)	−0.0002	20000		s^2	$^3F_4$	sp	$(^3F)^3P^\circ\ ^5F^\circ_4$			R1c		
2294.3674(4)	43571.571(8)	2294.36758(7)	−0.0002	15000000		4s	$^3D_2$	4p	$^3P^\circ_2$	3.4e+07	C+	R1c	C94c	
2299.4885(5)	43474.542(9)	2299.48891(10)	−0.0004	140000		4p	$^3D^\circ_1$	4d	$(5/2)^2[1/2]_0$	1.07e+08	C	R1c	B00	
2309.5189(4)	43285.747(8)	2309.51890(6)	−0.0000	200000		4p	$^3D^\circ_1$	4d	$(5/2)^2[5/2]_2$	1.02e+07	C	R1c	B00	
2315.681(5)	43170.57(10)	2315.6826(4)	−0.002	17000		s^2	$^1D_2$	sp	$(^1D)^3P^\circ\ ^3F^\circ_3$			R1c		
2323.0039(5)	43034.495(9)	2323.00409(6)	−0.0002	200000		4p	$^3D^\circ_2$	4d	$(5/2)^2[5/2]_2$			R1c		
2323.9280(6)	43017.383(11)	2323.92802(7)	0.0000	86000		4p	$^1D^\circ_2$	4d	$(5/2)^2[1/2]_1$			R1c		
2325.9100(17)	42980.73(3)	2325.90832(12)	0.0017	25000		4p	$^1P^\circ_1$	4d	$(5/2)^2[1/2]_0$			R1c		
2327.5669(6)	42950.137(11)	2327.5672(4)	−0.0003	12000		s^2	$^3F_3$	sp	$(^3F)^3P^\circ\ ^5F^\circ_2$			R1c		
2333.743(3)	42836.49(6)	2333.75088(22)	−0.008	23000		s^2	$^1G_4$	6p	$(5/2)^2[7/2]^\circ_3$			R1c		
2336.1707(4)	42791.971(8)	2336.17057(10)	0.0001	230000		4p	$^1P^\circ_1$	4d	$(5/2)^2[5/2]_2$	4.9e+07	C	R1c	B00	
2339.7275(5)	42726.924(10)	2339.72732(6)	0.0002	68000		4p	$^3D^\circ_2$	4d	$(5/2)^2[5/2]_3$			R1c		
2341.3713(12)	42696.930(21)			17000		s^2	$^3F_4$	sp	$(^3F)^3P^\circ\ ^5F^\circ_5$			R1c		
2342.1723(17)	42682.33(3)	2342.1734(4)	−0.0011	55000		s^2	$^3P_2$	sp	$(^3P)^3P^\circ\ ^5D^\circ_3$			R1c		
2347.890(20)	42578.4(4)	2347.8850(4)	0.005	9000	*	s^2	$^3P_2$	sp	$(^3P)^3P^\circ\ ^5D^\circ_1$			S36c		
2347.890(20)	42578.4(4)	2347.914(3)	−0.024	9000	*	5s	$(3/2)^2[3/2]_2$	sp	$(^3P)^1P^\circ\ ^3P^\circ_2$			S36cn		
2348.7330(4)	42563.115(8)	2348.73311(7)	−0.0001	120000		4p	$^3D^\circ_1$	4d	$(5/2)^2[3/2]_1$	2.8e+07	B	R1c	O07	
2350.1902(8)	42536.727(15)	2350.18820(6)	0.0020	14000		4p	$^3D^\circ_1$	4d	$(5/2)^2[3/2]_2$			R1c		
2352.2911(12)	42498.740(21)	2352.29447(19)	−0.0034	30000		s^2	$^1G_4$	4f	$(3/2)^2[9/2]^\circ_5$			R1c		
2353.9437(5)	42468.905(9)	2353.9434(4)	0.0003	27000		s^2	$^3F_3$	sp	$(^3F)^3P^\circ\ ^5F^\circ_3$			R1c		
2355.0143(6)	42449.600(11)	2355.01447(8)	−0.0001	610000		4p	$^3P^\circ_1$	5s	$(3/2)^2[3/2]_2$	2.5e+07	C+	R1c	K82	
2356.6402(5)	42420.316(9)	2356.64033(9)	−0.0001	1400000		4s	$^3D_1$	4p	$^3P^\circ_2$	3.0e+06	C+	R1c	C94c	
2360.6389(9)	42348.465(16)	2360.6391(9)	−0.0002	9200		s^2	$^3P_1$	sp	$(^3P)^3P^\circ\ ^5D^\circ_0$			R2nc		
2361.1901(12)	42338.579(21)	2361.1910(5)	−0.0008	37000		s^2	$^3P_1$	sp	$(^3P)^3P^\circ\ ^5D^\circ_2$			R1c		
2362.6809(9)	42311.867(16)	2362.68143(7)	−0.0005	26000		4p	$^3D^\circ_2$	4d	$(5/2)^2[3/2]_1$	6.3e+06	C+	R1c	O07	
2364.1538(6)	42285.508(10)	2364.15386(7)	−0.0000	57000		4p	$^3D^\circ_2$	4d	$(5/2)^2[3/2]_2$	3.4e+06	B	R1c	O07	
2366.980(3)	42235.03(5)	2366.9785(4)	0.001	8700		5s	$(5/2)^2[5/2]_3$	sp	$(^1D)^1P^\circ\ ^1D^\circ_2$			R1c		
2369.8893(5)	42183.179(9)	2369.88902(9)	0.0003	12000000		4s	$^1D_2$	4p	$^3F^\circ_3$	5.3e+07	B	R1c	C94c	
2370.7464(5)	42167.930(8)	2370.74698(8)	−0.0006	490000		4p	$^3P^\circ_1$	5s	$(3/2)^2[3/2]_1$	2.4e+07	C+	R1c	K82	
2376.3030(4)	42069.335(8)	2376.30277(10)	0.0003	330000		4p	$^1P^\circ_1$	4d	$(5/2)^2[3/2]_1$	1.61e+08	C+	R1c	O07se	
2377.7920(6)	42042.994(10)	2377.79223(10)	−0.0003	12000		4p	$^1P^\circ_1$	4d	$(5/2)^2[3/2]_2$	3.5e+06	D+	R1c	O07	
2378.4047(7)	42032.163(13)	2378.4063(6)	−0.0015	19000		s^2	$^3F_2$	sp	$(^3F)^3P^\circ\ ^5F^\circ_1$			R1c		
2378.8442(12)	42024.399(21)	2378.8439(9)	0.0002	220000		s^2	$^3P_2$	sp	$(^1D)^3P^\circ\ ^3P^\circ_2$			R1c		
2379.4048(12)	42014.499(21)	2379.4055(5)	−0.0007	53000		s^2	$^3P_0$	sp	$(^3P)^3P^\circ\ ^5D^\circ_1$			R1c		
2384.80(6)	41919.5(11)	2384.85893(9)	−0.06	49000		4p	$^3F^\circ_3$	5s	$(3/2)^2[3/2]_2$	6.e+05	E	S36c	K82cal	

Table A1. *Cont.*

λ_{obs} [a] (Å)	σ_{obs} [b] (cm^{-1})	λ_{Ritz} [c] (Å)	$\Delta\lambda_{obs-Ritz}$ (Å)	I_{obs} [d] (arb. u.)	Char [e]	Lower Level		Upper Level		A (s^{-1})	Acc [f]	Line Ref. [g]	TP Ref. [g]	Notes [h]
2384.9439(4)	41916.926(8)	2384.94408(9)	−0.0002	100000		4p	$^3P^\circ_2$	5s	$(5/2)^2[5/2]_2$	7.e+06	E	R1c	K82cal	
2385.0951(18)	41914.27(3)	2385.0945(4)	0.0006	7400		5s	$(5/2)^2[5/2]_2$	sp	$(^1D)^1P^\circ\ ^1D^\circ_2$			R1c		
2392.6852(18)	41781.32(3)	2392.6858(9)	−0.0006	6900		s^2	$^3P_1$	sp	$(^1D)^3P^\circ\ ^3P^\circ_2$			R1c		
2393.2599(5)	41771.287(9)	2393.2602(4)	−0.0003	23000		s^2	$^3F_3$	sp	$(^3F)^3P^\circ\ ^5F^\circ_4$			R1c		
2394.0296(5)	41757.858(9)	2394.0296(4)	−0.0000	20000		s^2	$^3F_2$	sp	$(^3F)^3P^\circ\ ^5F^\circ_2$			R1c		
2400.1140(7)	41652.008(12)	2400.11404(9)	−0.0001	3700000		4s	$^1D_2$	4p	$^3P^\circ_1$	6.9e+06	C+	R1c	D05se	
2403.3373(5)	41596.149(8)	2403.33713(9)	0.0002	2200000		4p	$^3P^\circ_2$	5s	$(5/2)^2[5/2]_3$	1.06e+08	C+	F	C94	
2414.1881(5)	41409.205(9)	2414.18856(8)	−0.0004	36000		4p	$^3D^\circ_1$	4d	$(5/2)^2[1/2]_1$	2.e+06	E	R1c	O07cal	
2414.8568(5)	41397.740(9)	2414.8563(4)	0.0005	37000		s^2	$^3P_2$	sp	$(^1D)^3P^\circ\ ^3P^\circ_1$			R1c		
2421.9424(6)	41276.637(11)	2421.9425(4)	−0.0001	6700		s^2	$^3F_2$	sp	$(^3F)^3P^\circ\ ^5F^\circ_3$			R1c		
2424.4338(3)	41234.223(5)	2424.43430(9)	−0.0005	1100000		4p	$^3P^\circ_0$	5s	$(3/2)^2[3/2]_1$	5.0e+07	C+	F	C94	
2426.558(5)	41198.13(8)	2426.5614(9)	−0.003	10000		4d	$(5/2)^2[9/2]_5$	8f	$(5/2)^2[11/2]^\circ_6$			R1c		
2426.996(9)	41190.69(15)	2427.016(3)	−0.019	5000		5s	$(5/2)^2[5/2]_2$	7p	$(3/2)^2[5/2]^\circ_2$			R2nc		
2428.9274(5)	41157.944(8)	2428.92746(8)	−0.0000	38000		4p	$^3D^\circ_2$	4d	$(5/2)^2[1/2]_1$	1.93e+07	C+	R1c	O07	
2430.6772(13)	41128.318(21)	2430.67651(24)	0.0007	5600		s^2	$^1G_4$	sp	$(^1G)^3P^\circ\ ^3H^\circ_4$			R1c		
2432.420(3)	41098.86(5)	2432.4183(5)	0.001	4800		4d	$(5/2)^2[9/2]_4$	8f	$(5/2)^2[11/2]^\circ_5$			R1c		
2442.6646(5)	40926.494(9)			90000		s^2	$^3F_4$	sp	$(^3F)^3P^\circ\ ^5G^\circ_5$			R1c		
2443.3256(5)	40915.423(8)	2443.32555(11)	0.0001	44000		4p	$^1P^\circ_1$	4d	$(5/2)^2[1/2]_1$	2.00e+07	B	R1c	O07	
2448.2143(13)	40833.727(21)	2448.2131(4)	0.0012	46000		s^2	$^3P_0$	sp	$(^1D)^3P^\circ\ ^3P^\circ_1$			R1c		
2452.951(6)	40754.88(10)	2452.9576(7)	−0.006	3900		s^2	$^3P_2$	sp	$(^1D)^3P^\circ\ ^3D^\circ_3$			R1c		
2456.008(4)	40704.16(7)	2455.99461(18)	0.013	7600		s^2	$^1G_4$	4f	$(5/2)^2[9/2]^\circ_4$			R1c		
2462.6140(19)	40594.98(3)	2462.61266(17)	0.0014	11000		s^2	$^1G_4$	4f	$(5/2)^2[9/2]^\circ_5$			R1c		
2464.307(5)	40567.10(8)	2464.30282(17)	0.004	3500		s^2	$^1G_4$	4f	$(5/2)^2[7/2]^\circ_4$			R1c		
2468.3475(8)	40500.690(13)	2468.3480(6)	−0.0005	33000		s^2	$^3P_1$	sp	$(^1D)^3P^\circ\ ^3P^\circ_0$			R1c		
2468.5000(5)	40498.187(8)	2468.50111(9)	−0.0011	170000		4p	$^3F^\circ_2$	5s	$(3/2)^2[3/2]_2$	1.30e+07	C+	R1c	K82	
2473.3333(4)	40419.053(7)	2473.33345(9)	−0.0002	570000		4p	$^3P^\circ_1$	5s	$(5/2)^2[5/2]_2$	5.9e+07	C+	R1c	C94	
2476.4439(7)	40368.287(11)	2476.44459(19)	−0.0007	15000		s^2	$^1G_4$	4f	$(5/2)^2[11/2]^\circ_5$			R1c		
2483.784(5)	40249.00(8)	2483.7876(5)	−0.003	2900		s^2	$^3P_1$	sp	$(^1D)^3P^\circ\ ^3D^\circ_2$			R1c		
2485.7919(5)	40216.489(8)	2485.79176(9)	0.0002	1000000		4p	$^3F^\circ_2$	5s	$(3/2)^2[3/2]_1$	1.42e+08	C+	R1c	C94	L
2489.6523(6)	40154.136(10)	2489.65236(11)	−0.0001	660000		4s	$^1D_2$	4p	$^3P^\circ_2$	1.0e+06	D+	R1c	C94c	
2499.001(8)	40003.94(12)	2499.0132(4)	−0.013	4900		s^2	$^3P_2$	sp	$(^1D)^3P^\circ\ ^3F^\circ_2$			R1c		
2501.4933(13)	39964.076(21)	2501.4947(5)	−0.0014	4800		s^2	$^3P_1$	sp	$(^1D)^3P^\circ\ ^3D^\circ_1$			R1c		
2506.2727(3)	39887.871(5)	2506.27258(10)	0.0001	1000000		4p	$^3F^\circ_3$	5s	$(5/2)^2[5/2]_2$	2.0e+08	C+	F	C94	L
2514.2919(10)	39760.659(16)	2514.2931(4)	−0.0012	4200		s^2	$^3P_1$	sp	$(^1D)^3P^\circ\ ^3F^\circ_2$			R1c		
2515.0822(7)	39748.166(11)	2515.0831(3)	−0.0008	8400		5s	$(5/2)^2[5/2]_3$	7p	$(5/2)^2[5/2]^\circ_3$			R1c		
2518.9484(5)	39687.164(8)	2518.9484(5)	−0.0001	34000		s^2	$^3F_3$	sp	$(^3F)^3P^\circ\ ^5G^\circ_4$			R1c		
2526.3277(14)	39571.246(21)	2526.3234(4)	0.0043	1900		s^2	$^3F_4$	sp	$(^3F)^3P^\circ\ ^5D^\circ_3$			R1c		
2526.5923(5)	39567.103(7)	2526.59232(10)	−0.0000	500000		4p	$^3F^\circ_3$	5s	$(5/2)^2[5/2]_3$	2.7e+07	C+	R1c	K82	
2529.30395(21)	39524.686(3)	2529.30385(10)	0.00010	940000		4p	$^1F^\circ_3$	5s	$(3/2)^2[3/2]_2$	1.06e+08	C+	F	C94	
2542.9345(8)	39312.840(12)	2542.9357(4)	−0.0012	3200		5s	$(5/2)^2[5/2]_3$	7p	$(5/2)^2[3/2]^\circ_2$			R1c		
2544.80509(20)	39283.945(3)	2544.80482(11)	0.00027	1200000		4p	$^3F^\circ_4$	5s	$(5/2)^2[5/2]_3$	1.94e+08	B	F	B00	

Table A1. *Cont.*

λ_{obs} [a] (Å)	σ_{obs} [b] (cm^{-1})	λ_{Ritz} [c] (Å)	$\Delta\lambda_{obs-Ritz}$ (Å)	I_{obs} [d] (arb. u.)	Char [e]	Lower Level		Upper Level		A (s^{-1})	Acc [f]	Line Ref. [g]	TP Ref. [g]	Notes [h]
2553.3430(5)	39152.595(8)	2553.3430(5)	−0.0000	14000		s^2	$^3F_2$	sp	$(^3F)^3P^\circ\ ^5G^\circ_3$			R1c		
2556.3698(9)	39106.241(13)	2556.3691(3)	0.0007	2800		4d	$(5/2)^2[9/2]_5$	7f	$(5/2)^2[9/2]^\circ_5$			R1c		
2558.2130(5)	39078.067(8)	2558.2134(4)	−0.0004	5400		4d	$(5/2)^2[9/2]_5$	7f	$(5/2)^2[11/2]^\circ_6$			R1c		
2559.4301(14)	39059.485(21)	2559.4301(13)	−0.0000	2700		4d	$(5/2)^2[3/2]_2$	7f	$(5/2)^2[5/2]^\circ_2$			R2nc		
2559.7925(20)	39053.96(3)	2559.7938(18)	−0.0012	1300		4d	$(5/2)^2[3/2]_1$	8p	$(3/2)^2[1/2]^\circ_1$			R2nc		
2564.7257(6)	38978.841(9)	2564.7264(4)	−0.0007	5100		4d	$(5/2)^2[9/2]_4$	7f	$(5/2)^2[11/2]^\circ_5$			R1c		
2565.0459(7)	38973.975(10)	2565.0471(5)	−0.0011	2500		4d	$(3/2)^2[7/2]_3$	7f	$(3/2)^2[9/2]^\circ_4$			R1c		
2568.9061(20)	38915.41(3)	2568.9075(4)	−0.0014	2400		4d	$(5/2)^2[1/2]_1$	6f	$(3/2)^2[3/2]^\circ_2$			R1c		
2571.7551(6)	38872.306(9)	2571.75556(8)	−0.0004	220000		4p	$^1D^\circ_2$	5s	$(3/2)^2[3/2]_2$	1.10e+07	C+	R1c	K82	
2574.4124(7)	38832.185(11)	2574.4125(5)	−0.0001	2100		s^2	$^3F_3$	sp	$(^3F)^3P^\circ\ ^5D^\circ_2$			R1c		
2574.6371(7)	38828.796(11)	2574.6371(5)	−0.0000	4600		4d	$(3/2)^2[7/2]_4$	7f	$(3/2)^2[9/2]^\circ_5$			R1c		
2590.4012(9)	38592.515(14)	2590.3994(4)	0.0019	990		4d	$(5/2)^2[5/2]_3$	7f	$(5/2)^2[7/2]^\circ_4$			R1c		
2590.52825(17)	38590.6226(25)	2590.52826(8)	−0.00001	440000		4p	$^1D^\circ_2$	5s	$(3/2)^2[3/2]_1$	6.0e+07	C+	F	C94	L
2598.8126(6)	38467.613(9)	2598.81194(10)	0.0006	400000		4p	$^3F^\circ_2$	5s	$(5/2)^2[5/2]_2$	4.2e+07	C+	R1c	K82	L
2600.26992(14)	38446.0554(20)	2600.26973(8)	0.00018	500000		4p	$^3D^\circ_3$	5s	$(3/2)^2[3/2]_2$	1.01e+08	C+	F	C94	
2604.5253(21)	38383.24(3)	2604.5089(11)	0.0164	870	?	sp	$(^3F)^3P^\circ\ ^3F^\circ_3$	10s	$(5/2)^2[5/2]_2$			R1c		X
2606.5804(14)	38352.984(21)	2606.5819(5)	−0.0015	1700		4d	$(5/2)^2[7/2]_3$	7f	$(5/2)^2[7/2]^\circ_3$			R1c		
2606.8761(8)	38348.634(12)	2606.8759(4)	0.0001	3400		4d	$(5/2)^2[7/2]_3$	7f	$(5/2)^2[9/2]^\circ_4$			R1c		
2606.9973(10)	38346.850(15)	2606.9973(4)	0.0001	2500		4d	$(5/2)^2[7/2]_3$	7f	$(5/2)^2[7/2]^\circ_4$			R1c		
2607.041	38346.21	2607.0410(4)			:	4d	$(5/2)^2[7/2]_3$	7f	$(5/2)^2[5/2]^\circ_3$					
2609.9088(6)	38304.075(9)	2609.9094(3)	−0.0006	8400		4d	$(5/2)^2[7/2]_4$	7f	$(5/2)^2[9/2]^\circ_5$			R1c		
2610.7937(14)	38291.094(21)	2610.7940(5)	−0.0003	1600		4d	$(5/2)^2[5/2]_2$	7f	$(5/2)^2[7/2]^\circ_3$			R1c		
2611.2544(8)	38284.338(11)	2611.2546(4)	−0.0002	810		4d	$(5/2)^2[5/2]_2$	7f	$(5/2)^2[5/2]^\circ_3$			R1c		
2614.4127(7)	38238.092(11)	2614.4126(7)	0.0001	15000		s^2	$^3F_4$	sp	$(^3F)^3P^\circ\ ^5D^\circ_4$			R1c		
2619.2104(5)	38168.054(8)	2619.21044(15)	−0.0000	8000		s^2	$^1D_2$	5p	$(3/2)^2[3/2]^\circ_2$			R1c		
2620.6656(5)	38146.862(7)	2620.66627(10)	−0.0007	56000		4p	$^3F^\circ_2$	5s	$(5/2)^2[5/2]_3$	1.3e+06	E	R1c	K82cal	
2636.6187(6)	37916.065(8)	2636.61965(16)	−0.0010	2200		s^2	$^1D_2$	5p	$(3/2)^2[3/2]^\circ_1$			R1c		
2648.6056(7)	37744.477(9)	2648.6059(4)	−0.0003	3000		s^2	$^3F_3$	sp	$(^3F)^3P^\circ\ ^5D^\circ_3$			R1c		
2655.9644(7)	37639.906(9)	2655.9642(5)	0.0002	840		s^2	$^3F_2$	sp	$(^3F)^3P^\circ\ ^5D^\circ_2$			R1c		
2666.2906(5)	37494.140(8)	2666.29047(11)	0.0001	230000		4p	$^1F^\circ_3$	5s	$(5/2)^2[5/2]_2$	2.0e+07	C+	R1c	K82	
2667.4229(15)	37478.224(21)	2667.4250(4)	−0.0021	990		5s	$(3/2)^2[3/2]_1$	7p	$(5/2)^2[3/2]^\circ_1$			R1c		
2676.0660(6)	37357.184(8)	2676.06654(15)	−0.0005	3100		s^2	$^1D_2$	5p	$(3/2)^2[5/2]^\circ_2$			R1c		
2681.4966(15)	37281.533(21)	2681.4957(7)	0.0008	2100		5s	$(3/2)^2[3/2]_2$	7p	$(5/2)^2[5/2]^\circ_2$			R1c		
2682.7484(8)	37264.137(11)	2682.75015(9)	−0.0017	440		4p	$^3D^\circ_1$	5s	$(3/2)^2[3/2]_2$	9.e+05	E	R1c	K82cal	
2689.2993(5)	37173.370(7)	2689.29932(11)	0.0000	410000		4p	$^1F^\circ_3$	5s	$(5/2)^2[5/2]_3$	5.9e+07	C+	R1c	C94	
2692.4978(15)	37129.213(21)	2692.4942(4)	0.0036	3200		4d	$(5/2)^2[7/2]_3$	6f	$(3/2)^2[9/2]^\circ_4$			R1c		
2700.96242(17)	37012.8599(24)	2700.96252(9)	−0.00011	520000		4p	$^3D^\circ_2$	5s	$(3/2)^2[3/2]_2$	1.02e+08	C+	F	C94	
2703.18424(13)	36982.4398(18)	2703.18448(8)	−0.00024	540000		4p	$^3D^\circ_1$	5s	$(3/2)^2[3/2]_1$	1.17e+08	C+	F	C94	
2704.5194(23)	36964.18(3)	2704.5157(16)	0.0037	1100		s^2	$^3P_1$	sp	$(^3P)^3P^\circ\ ^5P^\circ_1$			R1c		
2708.2695(8)	36913.003(11)	2708.2695(3)	−0.0000	7200		4d	$(5/2)^2[1/2]_1$	8p	$(5/2)^2[3/2]^\circ_1$			R1c		
2709.7592(6)	36892.711(8)	2709.7597(3)	−0.0006	1600		4d	$(5/2)^2[1/2]_1$	6f	$(5/2)^2[5/2]^\circ_2$			R1c		

Table A1. *Cont.*

λ_{obs} [a] (Å)	σ_{obs} [b] (cm^{-1})	λ_{Ritz} [c] (Å)	$\Delta\lambda_{obs-Ritz}$ (Å)	I_{obs} [d] (arb. u.)	Char [e]	Lower Level		Upper Level		A (s^{-1})	Acc [f]	Line Ref. [g]	TP Ref. [g]	Notes [h]
2710.2454(16)	36886.093(21)	2710.2434(6)	0.0020	2700		s^2	$^3P_2$	sp	$(^3P)^3P^\circ\ ^5P^\circ_2$			R1c		
2710.6069(16)	36881.173(21)	2710.6071(7)	−0.0001	700		4d	$(5/2)^2[1/2]_0$	6f	$(3/2)^2[3/2]^\circ_1$			R1c		
2711.5767(23)	36867.98(3)	2711.5711(13)	0.0057	350		s^2	$^3P_2$	sp	$(^3P)^3P^\circ\ ^5P^\circ_3$			R2nc		
2711.8649(6)	36864.066(8)	2711.8639(3)	0.0010	18000		4d	$(5/2)^2[1/2]_1$	6f	$(5/2)^2[3/2]^\circ_2$			R1c		
2713.5078(5)	36841.748(7)	2713.50740(10)	0.0004	400000		4p	$^1D^\circ_2$	5s	$(5/2)^2[5/2]_2$	8.9e+07	C+	R1c	C94	
2715.4038(6)	36816.024(8)	2715.4039(6)	−0.0000	10000		4d	$(5/2)^2[1/2]_1$	6f	$(5/2)^2[1/2]^\circ_0$			R1c		
2718.7770(3)	36770.349(4)	2718.77770(14)	−0.0007	440000		4p	$^1P^\circ_1$	5s	$(3/2)^2[3/2]_2$	8.0e+07	C+	F	C94	
2721.6764(2)	36731.179(3)	2721.67628(9)	0.0002	300000		4p	$^3D^\circ_2$	5s	$(3/2)^2[3/2]_1$	3.9e+07	C+	F	K82	L
2727.6947(6)	36650.142(8)	2727.6948(5)	−0.0001	620		4d	$(5/2)^2[1/2]_1$	6f	$(5/2)^2[1/2]^\circ_1$			R2nc		
2728.204(7)	36643.30(10)	2728.2019(16)	0.002	310		s^2	$^3P_0$	sp	$(^3P)^3P^\circ\ ^5P^\circ_1$			R1c		
2731.9477(6)	36593.089(7)	2731.94820(16)	−0.0005	6300		s^2	$^1D_2$	sp	$(^3F)^3P^\circ\ ^1D^\circ_2$			R1c		
2737.3415(6)	36520.989(7)	2737.34194(10)	−0.0005	48000		4p	$^1D^\circ_2$	5s	$(5/2)^2[5/2]_3$	1.9e+06	D	R1c	C94	
2739.7662(6)	36488.669(8)	2739.76664(14)	−0.0004	86000		4p	$^1P^\circ_1$	5s	$(3/2)^2[3/2]_1$	4.0e+06	D	R1c	C94	
2745.2710(6)	36415.506(7)	2745.27056(10)	0.0005	140000		4p	$^3D^\circ_3$	5s	$(5/2)^2[5/2]_2$	1.40e+07	C+	R1c	C94	
2757.3283(7)	36256.276(9)	2757.3290(4)	−0.0007	770		4d	$(3/2)^2[1/2]_1$	6f	$(3/2)^2[5/2]^\circ_2$			R1c		
2759.6070(8)	36226.340(11)	2759.6065(7)	0.0005	760		4d	$(3/2)^2[1/2]_1$	6f	$(3/2)^2[3/2]^\circ_1$			R1c		
2762.481(20)	36188.6(3)	2762.4581(4)	0.023	1000	*	4d	$(3/2)^2[5/2]_3$	7f	$(5/2)^2[7/2]^\circ_4$			R1c		
2762.481(20)	36188.6(3)	2762.5072(5)	−0.026	1000	*	4d	$(3/2)^2[5/2]_3$	7f	$(5/2)^2[5/2]^\circ_3$			R1c		
2769.6690(6)	36094.738(7)	2769.66882(9)	0.0002	310000		4p	$^3D^\circ_3$	5s	$(5/2)^2[5/2]_3$	6.7e+07	C+	R1c	C94	
2788.2614(7)	35854.067(9)	2788.2619(3)	−0.0005	5700		4d	$(5/2)^2[9/2]_5$	6f	$(5/2)^2[9/2]^\circ_5$			R1c		
2789.2226(17)	35841.712(21)	2789.2218(12)	0.0009	210		5p	$(5/2)^2[7/2]^\circ_3$	10s	$(5/2)^2[5/2]_2$			R1c		
2791.7945(6)	35808.695(8)	2791.7947(4)	−0.0002	54000		4d	$(5/2)^2[9/2]_5$	6f	$(5/2)^2[11/2]^\circ_6$			R1c		
2792.224(11)	35803.19(14)	2792.2125(3)	0.012	420	*	4d	$(5/2)^2[9/2]_5$	6f	$(5/2)^2[11/2]^\circ_5$			R1c		
2792.224(11)	35803.19(14)	2792.2312(4)	−0.007	420	*	4d	$(5/2)^2[3/2]_2$	6f	$(5/2)^2[7/2]^\circ_3$			R1c		
2793.6079(7)	35785.452(9)	2793.6091(3)	−0.0012	620		4d	$(5/2)^2[3/2]_2$	8p	$(5/2)^2[3/2]^\circ_1$			R1c		
2795.2979(6)	35763.818(8)	2795.2980(3)	−0.0001	8000		4d	$(5/2)^2[3/2]_2$	6f	$(5/2)^2[5/2]^\circ_3$			R1c		
2795.6571(7)	35759.223(9)	2795.6567(3)	0.0004	4600		4d	$(5/2)^2[9/2]_4$	6f	$(5/2)^2[9/2]^\circ_4$			R1c		
2795.8729(11)	35756.463(14)	2795.8732(3)	−0.0003	610		4d	$(5/2)^2[9/2]_4$	6f	$(5/2)^2[7/2]^\circ_4$			R1c		
2796.2625(7)	35751.482(9)	2796.2624(5)	0.0001	820		4d	$(3/2)^2[7/2]_3$	6f	$(3/2)^2[7/2]^\circ_3$			R1c		
2797.2549(6)	35738.798(8)	2797.2557(3)	−0.0008	7500		4d	$(5/2)^2[3/2]_1$	6f	$(5/2)^2[5/2]^\circ_2$			R1c		
2797.4336(6)	35736.516(8)	2797.4337(3)	−0.0001	8300		4d	$(5/2)^2[3/2]_2$	6f	$(5/2)^2[3/2]^\circ_2$			R1c		
2797.5493(12)	35735.038(16)	2797.5494(5)	−0.0001	410		4d	$(5/2)^2[3/2]_2$	6f	$(5/2)^2[3/2]^\circ_1$			R1c		
2798.8296(17)	35718.692(21)			200		5p	$(5/2)^2[7/2]^\circ_4$	10s	$(5/2)^2[5/2]_3$			R1c		
2799.5280(6)	35709.781(8)	2799.5291(3)	−0.0010	35000		4d	$(5/2)^2[9/2]_4$	6f	$(5/2)^2[11/2]^\circ_5$			R1c		
2799.6805(6)	35707.837(8)	2799.6812(4)	−0.0007	10000		4d	$(3/2)^2[7/2]_3$	6f	$(3/2)^2[9/2]^\circ_4$			R1c		
2801.0500(6)	35690.379(8)	2801.05008(16)	−0.0001	1000		s^2	$^1D_2$	5p	$(5/2)^2[5/2]^\circ_3$			R1c		
2801.3182(24)	35686.96(3)	2801.3220(17)	−0.0038	400		4d	$(3/2)^2[3/2]_2$	sp	$^3D^\circ_3$			R2nc		
2803.2711(17)	35662.102(21)	2803.2706(6)	0.0005	390		4d	$(5/2)^2[3/2]_1$	6f	$(5/2)^2[1/2]^\circ_0$			R1c		
2804.1888(17)	35650.432(21)	2804.1896(12)	−0.0008	200		5p	$(5/2)^2[5/2]^\circ_2$	10s	$(5/2)^2[5/2]_2$			R1c		
2807.1550(8)	35612.763(10)	2807.1556(5)	−0.0006	770		4d	$(3/2)^2[7/2]_4$	6f	$(3/2)^2[7/2]^\circ_4$			R1c		
2810.3655(17)	35572.082(21)	2810.3657(4)	−0.0002	190		4d	$(3/2)^2[7/2]_4$	6f	$(3/2)^2[9/2]^\circ_4$			R1c		

Table A1. *Cont.*

λ_{obs} [a] (Å)	σ_{obs} [b] (cm^{-1})	λ_{Ritz} [c] (Å)	$\Delta\lambda_{obs-Ritz}$ (Å)	I_{obs} [d] (arb. u.)	Char [e]	Lower Level		Upper Level		A (s^{-1})	Acc [f]	Line Ref. [g]	TP Ref. [g]	Notes [h]
2810.8038(6)	35566.536(7)	2810.8039(4)	−0.0001	14000		4d	$(3/2)^2[7/2]_4$	6f	$(3/2)^2[9/2]^\circ_5$			R1c		
2813.6315(7)	35530.793(9)	2813.63100(16)	0.0005	2900		s^2	$^1D_2$	5p	$(5/2)^2[3/2]^\circ_1$			R1c		
2816.1978(9)	35498.417(11)	2816.1982(5)	−0.0004	3700		4d	$(3/2)^2[3/2]_1$	6f	$(3/2)^2[3/2]^\circ_2$			R1c		
2817.0843(7)	35487.247(9)	2817.08465(18)	−0.0004	370		s^2	$^1D_2$	5p	$(5/2)^2[5/2]^\circ_2$			R1c		
2828.6968(7)	35341.570(9)	2828.6970(3)	−0.0002	3500		4d	$(5/2)^2[5/2]_3$	6f	$(5/2)^2[9/2]^\circ_4$			R1c		
2828.9184(12)	35338.802(15)	2828.9187(3)	−0.0003	3500		4d	$(5/2)^2[5/2]_3$	6f	$(5/2)^2[7/2]^\circ_4$			R1c		
2830.2314(8)	35322.408(10)	2830.2323(3)	−0.0008	6100		4d	$(5/2)^2[5/2]_3$	6f	$(5/2)^2[5/2]^\circ_3$			R1c		
2832.4214(7)	35295.099(9)	2832.4217(3)	−0.0004	3400		4d	$(5/2)^2[5/2]_3$	6f	$(5/2)^2[3/2]^\circ_2$			R1c		
2833.053(2)	35287.23(3)	2833.0250(5)	0.028	170	?	sp	$(^3F)^3P^\circ\ ^3D^\circ_3$	7d	$(5/2)^2[3/2]_2$			R1c		X
2834.9699(17)	35263.372(21)	2834.9704(5)	−0.0005	510		4d	$(3/2)^2[3/2]_2$	6f	$(3/2)^2[3/2]^\circ_2$			R1c		
2836.2898(8)	35246.962(10)	2836.2911(5)	−0.0013	4600		4d	$(3/2)^2[3/2]_2$	6f	$(3/2)^2[5/2]^\circ_3$			R1c		
2836.6971(17)	35241.902(21)	2836.7201(6)	−0.0230	840	?	sp	$(^3F)^3P^\circ\ ^3F^\circ_2$	9s	$(5/2)^2[5/2]_2$			R1c		X
2837.3682(6)	35233.566(7)	2837.36814(10)	0.0001	150000		4p	$^3D^\circ_1$	5s	$(5/2)^2[5/2]_2$	2.3e+07	C+	R1c	C94	
2840.4918(6)	35194.823(8)	2840.49162(17)	0.0002	5800		s^2	$^3P_2$	5p	$(3/2)^2[3/2]^\circ_2$			R1c		
2846.8683(7)	35115.996(8)	2846.8693(5)	−0.0009	4300		4d	$(5/2)^2[7/2]_3$	6f	$(5/2)^2[7/2]^\circ_3$			R1c		
2848.4999(6)	35095.883(8)	2848.5005(3)	−0.0005	11000		4d	$(5/2)^2[7/2]_3$	6f	$(5/2)^2[9/2]^\circ_4$			R1c		
2848.7252(6)	35093.108(8)	2848.7252(3)	−0.0000	9100		4d	$(5/2)^2[7/2]_3$	6f	$(5/2)^2[7/2]^\circ_4$			R1c		
2849.9526(10)	35077.995(12)	2849.9500(3)	0.0026	160		4d	$(5/2)^2[7/2]_3$	6f	$(5/2)^2[5/2]^\circ_2$			R1c		
2851.8949(8)	35054.106(10)	2851.8944(5)	0.0005	4700		4d	$(5/2)^2[5/2]_2$	6f	$(5/2)^2[7/2]^\circ_3$			R1c		
2852.0764(7)	35051.875(8)	2852.0764(3)	0.0001	12000		4d	$(5/2)^2[7/2]_4$	6f	$(5/2)^2[9/2]^\circ_5$			R1c		
2852.1785(11)	35050.621(13)	2852.1793(3)	−0.0008	6300		4d	$(5/2)^2[7/2]_4$	6f	$(5/2)^2[9/2]^\circ_4$			R1c		
2852.4042(6)	35047.847(8)	2852.4046(3)	−0.0004	3900		4d	$(5/2)^2[7/2]_4$	6f	$(5/2)^2[7/2]^\circ_4$			R1c		
2853.7403(7)	35031.439(8)	2853.7401(3)	0.0002	630		4d	$(5/2)^2[7/2]_4$	6f	$(5/2)^2[5/2]^\circ_3$			R1c		
2854.9858(7)	35016.157(9)	2854.9860(3)	−0.0002	2100		4d	$(5/2)^2[5/2]_2$	6f	$(5/2)^2[5/2]^\circ_2$			R1c		
		2855.0785(5)			m	4d	$(3/2)^2[5/2]_3$	6f	$(3/2)^2[7/2]^\circ_3$			R1nc		
2855.0930(17)	35014.842(21)	2855.0937(3)	−0.0007	310		4d	$(5/2)^2[5/2]_2$	6f	$(5/2)^2[5/2]^\circ_3$			R1c		
2855.3206(7)	35012.052(8)	2855.3215(5)	−0.0009	4700		4d	$(3/2)^2[5/2]_3$	6f	$(3/2)^2[7/2]^\circ_4$			R1c		
2856.2109(7)	35001.138(8)	2856.2100(4)	0.0010	310		4d	$(5/2)^2[7/2]_4$	6f	$(5/2)^2[11/2]^\circ_5$			R1c		
2857.4418(17)	34986.062(21)	2857.4425(5)	−0.0007	310		4d	$(5/2)^2[5/2]_2$	6f	$(5/2)^2[3/2]^\circ_1$			R1c		
2857.7484(6)	34982.309(8)	2857.74808(11)	0.0003	19000		4p	$^3D^\circ_2$	5s	$(5/2)^2[5/2]_2$	5.e+05	E	R1c	K82cal	
2859.0051(7)	34966.932(8)	2859.0054(5)	−0.0003	5300		4d	$(3/2)^2[5/2]_2$	6f	$(3/2)^2[7/2]^\circ_3$			R1c		
2859.9192(7)	34955.757(9)	2859.9187(4)	0.0005	2300		4d	$(3/2)^2[5/2]_2$	6f	$(3/2)^2[5/2]^\circ_2$			R1c		
2860.2493(9)	34951.723(11)	2860.24866(19)	0.0006	1100		s^2	$^3P_1$	5p	$(3/2)^2[3/2]^\circ_2$			R1c		
2862.3233(7)	34926.399(8)	2862.3233(5)	−0.0000	3000		4d	$(3/2)^2[5/2]_3$	6f	$(3/2)^2[5/2]^\circ_3$			R1c		
2866.2706(17)	34878.302(21)	2866.2702(5)	0.0004	740		4d	$(3/2)^2[5/2]_2$	6f	$(3/2)^2[5/2]^\circ_3$			R1c		
2868.7914(8)	34847.656(9)	2868.7906(4)	0.0008	440		4d	$(5/2)^2[1/2]_0$	8p	$(5/2)^2[3/2]^\circ_1$			R1c		
2872.9461(7)	34797.263(8)	2872.9460(5)	0.0001	580		4d	$(5/2)^2[1/2]_0$	6f	$(5/2)^2[3/2]^\circ_1$			R1c		
2875.3341(7)	34768.365(9)	2875.3346(5)	−0.0005	570		5p	$(5/2)^2[3/2]^\circ_2$	8d	$(5/2)^2[5/2]_3$			R1c		
2877.6996(6)	34739.786(7)	2877.69898(16)	0.0007	170000		4p	$^1P^\circ_1$	5s	$(5/2)^2[5/2]_2$	2.3e+07	C+	R1c	C94	
2880.7003(7)	34703.600(9)	2880.69947(17)	0.0009	2000		s^2	$^1D_2$	5p	$(5/2)^2[3/2]^\circ_2$			R1c		
2881.0216(8)	34699.730(9)	2881.02191(20)	−0.0003	1000		s^2	$^3P_1$	5p	$(3/2)^2[3/2]^\circ_1$			R1c		
2883.1886(18)	34673.651(21)			2800		5p	$(5/2)^2[3/2]^\circ_2$	8d	$(5/2)^2[1/2]_1$			R1c		

Table A1. *Cont.*

λ_{obs} [a] (Å)	σ_{obs} [b] (cm^{-1})	λ_{Ritz} [c] (Å)	$\Delta\lambda_{obs-Ritz}$ (Å)	I_{obs} [d] (arb. u.)	Char [e]	Lower Level	Upper Level	A (s^{-1})	Acc [f]	Line Ref. [g]	TP Ref. [g]	Notes [h]
2884.1954(6)	34661.548(8)	2884.19598(11)	−0.0006	41000		4p $^3D^\circ_2$	5s $(5/2)^2[5/2]_3$	1.20e+07	C+	R1c	C94	
2884.7560(7)	34654.812(9)	2884.75571(16)	0.0003	280		$s^2 {}^3P_2$	5p $(3/2)^2[5/2]^\circ_3$			R1c		
2897.2206(7)	34505.726(8)	2897.21944(17)	0.0011	1200		$s^2 {}^3P_2$	5p $(3/2)^2[1/2]^\circ_1$			R1c		
2907.9162(8)	34378.816(10)	2907.9158(3)	0.0004	1300		$s^2 {}^3P_0$	5p $(3/2)^2[3/2]^\circ_1$			R1c		
2908.863(3)	34367.63(3)	2908.8746(4)	−0.012	130		sp $(^3F)^3P^\circ {}^3D^\circ_3$	8s $(5/2)^2[5/2]_3$			R1c		X
2912.4526(18)	34325.271(21)			250		5p $(5/2)^2[3/2]^\circ_1$	8d $(5/2)^2[1/2]_0$			R1c		
2917.7762(9)	34262.646(11)	2917.77629(20)	−0.0001	620		$s^2 {}^3P_1$	5p $(3/2)^2[1/2]^\circ_1$			R1c		
2923.2569(18)	34198.411(21)	2923.2586(8)	−0.0017	240		5p $(5/2)^2[7/2]^\circ_3$	8d $(5/2)^2[7/2]_3$			R1c		
2926.2499(7)	34163.434(8)	2926.2501(4)	−0.0002	240		5p $(5/2)^2[3/2]^\circ_2$	9s $(5/2)^2[5/2]_3$			R1c		
2927.2539(7)	34151.717(9)	2927.2535(5)	0.0003	2900		5p $(5/2)^2[7/2]^\circ_3$	8d $(5/2)^2[9/2]_4$			R1c		
2928.1916(18)	34140.781(21)	2928.18542(19)	0.0062	240		$s^2 {}^3P_1$	5p $(3/2)^2[5/2]^\circ_2$			R1c		
2931.789(3)	34098.89(4)	2931.7851(4)	0.004	230		sp $(^3F)^3P^\circ {}^3G^\circ_3$	8s $(5/2)^2[5/2]_3$			R1c		
2932.2253(7)	34093.818(9)	2932.2254(6)	−0.0002	1200		5p $(5/2)^2[7/2]^\circ_4$	8d $(5/2)^2[7/2]_4$			R1c		
2933.565(6)	34078.25(7)	2933.5614(6)	0.003	230		sp $(^3F)^3P^\circ {}^3F^\circ_4$	7d $(5/2)^2[7/2]_4$			R1c		
2936.9553(7)	34038.912(8)	2936.9555(7)	−0.0002	2900		5p $(5/2)^2[7/2]^\circ_4$	8d $(5/2)^2[9/2]_5$			R1c		
2939.7041(9)	34007.084(10)	2939.7036(8)	0.0005	1100		5p $(5/2)^2[5/2]^\circ_2$	8d $(5/2)^2[7/2]_3$			R1c		
2941.2137(18)	33989.631(21)	2941.2085(6)	0.0052	1100		sp $(^3F)^3P^\circ {}^3F^\circ_4$	7d $(5/2)^2[9/2]_5$			R1c		
2942.623(5)	33973.35(6)	2942.6237(18)	−0.001	230		5p $(5/2)^2[3/2]^\circ_1$	8d $(5/2)^2[5/2]_2$			R1c		
2945.370(8)	33941.66(9)	2945.3640(3)	0.007	6100		$s^2 {}^3P_0$	5p $(3/2)^2[1/2]^\circ_1$			S36c		
2947.3037(11)	33919.401(12)	2947.3037(11)	0.0000	670		5p $(5/2)^2[3/2]^\circ_1$	8d $(5/2)^2[3/2]_1$			R1c		
2949.3463(18)	33895.911(21)	2949.3453(10)	0.0010	550		5p $(3/2)^2[5/2]^\circ_3$	9d $(5/2)^2[9/2]_4$			R1c		
2957.3211(19)	33804.511(21)	2957.3242(6)	−0.0032	1100		5p $(5/2)^2[5/2]^\circ_3$	8d $(5/2)^2[7/2]_4$			R1c		
2959.3285(19)	33781.581(21)	2959.3276(5)	0.0009	740		5p $(5/2)^2[5/2]^\circ_3$	8d $(5/2)^2[5/2]_3$			R1c		
2968.744(3)	33674.44(3)	2968.7445(4)	−0.000	200		4d $(3/2)^2[7/2]_3$	6f $(5/2)^2[9/2]^\circ_4$			R1c		
2973.6495(7)	33618.897(8)	2973.64712(23)	0.0024	1300		$s^2 {}^3P_1$	5p $(3/2)^2[1/2]^\circ_0$			R1c		
2975.271(5)	33600.57(6)	2975.2681(3)	0.003	300		sp $(^3F)^3P^\circ {}^3F^\circ_3$	7d $(5/2)^2[7/2]_3$			R1c		
2975.6294(8)	33596.529(9)	2975.6286(7)	0.0008	1200		5p $(5/2)^2[7/2]^\circ_3$	9s $(5/2)^2[5/2]_2$			R1c		
2977.0081(19)	33580.971(21)	2977.0087(16)	−0.0006	1100		5p $(3/2)^2[5/2]^\circ_2$	9s $(3/2)^2[3/2]_1$			R1c		
2981.7867(12)	33527.156(14)	2981.7860(4)	0.0007	1000		5s $(5/2)^2[5/2]_3$	6p $(3/2)^2[3/2]^\circ_2$			R1c		
2981.945(3)	33525.38(3)	2981.9449(5)	−0.000	1400		sp $(^3F)^3P^\circ {}^3F^\circ_3$	7d $(5/2)^2[9/2]_4$			R1c		
2983.7677(10)	33504.898(11)	2983.7658(3)	0.0018	1100		4d $(5/2)^2[1/2]_1$	5f $(3/2)^2[3/2]^\circ_1$			R1c		
2986.3345(8)	33476.101(9)	2986.3327(3)	0.0017	5700		4d $(5/2)^2[1/2]_1$	5f $(3/2)^2[3/2]^\circ_2$			R1c		
2987.2351(7)	33466.009(8)	2987.2353(5)	−0.0002	1400		5p $(5/2)^2[7/2]^\circ_4$	9s $(5/2)^2[5/2]_3$			R1c		
2992.6695(19)	33405.241(21)	2992.6698(7)	−0.0003	460		5p $(5/2)^2[5/2]^\circ_2$	9s $(5/2)^2[5/2]_2$			R1c		
2993.024(5)	33401.28(5)			460		5p $(3/2)^2[3/2]^\circ_2$	8d $(3/2)^2[5/2]_2$			R1c		
2993.2667(8)	33398.576(9)	2993.2675(4)	−0.0008	920		5s $(5/2)^2[5/2]_2$	6p $(3/2)^2[3/2]^\circ_1$			R1c		
2996.8412(19)	33358.741(21)	2996.8382(6)	0.0030	720		sp $(^3F)^3P^\circ {}^1F^\circ_3$	8d $(5/2)^2[7/2]_4$			R1c		
2998.893(5)	33335.92(6)	2998.8956(6)	−0.003	180		sp $(^3F)^3P^\circ {}^1F^\circ_3$	8d $(5/2)^2[5/2]_3$			R1c		
2999.8710(19)	33325.051(21)	2999.8701(8)	0.0009	530		5p $(3/2)^2[5/2]^\circ_3$	9s $(3/2)^2[3/2]_2$			R1c		
3004.058(5)	33278.60(6)	3004.0555(5)	0.003	260		4d $(3/2)^2[3/2]_2$	6f $(5/2)^2[7/2]^\circ_3$			R1c		
3010.5921(19)	33206.381(21)	3010.5910(4)	0.0011	1700		5s $(5/2)^2[5/2]_2$	6p $(3/2)^2[3/2]^\circ_2$			R1c		
3012.2768(19)	33187.811(21)	3012.2786(5)	−0.0018	170		5s $(5/2)^2[5/2]_3$	6p $(3/2)^2[5/2]^\circ_3$			R1c		

Table A1. *Cont.*

λ_{obs} [a] (Å)	σ_{obs} [b] (cm^{-1})	λ_{Ritz} [c] (Å)	$\Delta\lambda_{obs-Ritz}$ (Å)	I_{obs} [d] (arb. u.)	Char [e]	Lower Level		Upper Level		A (s^{-1})	Acc [f]	Line Ref. [g]	TP Ref. [g]	Notes [h]
3013.2896(11)	33176.656(12)	3013.2888(5)	0.0008	170		5p	$(5/2)^2[5/2]^\circ_3$	9s	$(5/2)^2[5/2]_3$			R1c		
3014.5445(8)	33162.846(9)	3014.54413(18)	0.0004	6200		s^2	$^3P_2$	sp	$(^3F)^3P^\circ\ ^1F^\circ_3$			R1c		
3024.1816(19)	33057.171(21)	3024.1822(19)	−0.0005	230		5s	$(3/2)^2[3/2]_2$	sp	$(^1G)^3P^\circ\ ^3G^\circ_3$			R2nc		
3027.388(6)	33022.16(6)	3027.3945(17)	−0.006	76		5p	$(3/2)^2[3/2]^\circ_1$	9s	$(3/2)^2[3/2]_1$			R1c		
3037.6082(20)	32911.061(21)	3037.6081(19)	0.0001	140		sp	$(^3F)^3P^\circ\ ^1D^\circ_2$	8d	$(5/2)^2[5/2]_2$			R1c		
3037.801(3)	32908.97(3)	3037.8031(6)	−0.002	710		5s	$(5/2)^2[5/2]_2$	6p	$(3/2)^2[5/2]^\circ_2$			R1c		
3041.6787(8)	32867.019(9)	3041.6786(5)	0.0002	4500		5s	$(5/2)^2[5/2]_2$	6p	$(3/2)^2[5/2]^\circ_3$			R1c		
3042.8556(8)	32854.308(9)	3042.8551(5)	0.0005	340		5p	$(5/2)^2[3/2]^\circ_1$	7d	$(3/2)^2[3/2]_2$			R1c		
3049.2831(10)	32785.058(11)	3049.2836(8)	−0.0005	130		5p	$(3/2)^2[3/2]^\circ_2$	9s	$(3/2)^2[3/2]_2$			R1c		
3051.9472(20)	32756.441(21)	3051.9509(7)	−0.0038	130		sp	$(^3F)^3P^\circ\ ^1F^\circ_3$	9s	$(5/2)^2[5/2]_2$			R1c		
3052.1596(20)	32754.161(21)	3052.15798(24)	0.0016	130		s^2	$^1D_2$	sp	$(^3F)^3P^\circ\ ^3F^\circ_3$			R1c		
3053.5737(15)	32738.993(16)	3053.5735(6)	0.0003	190		5p	$(5/2)^2[3/2]^\circ_1$	7d	$(3/2)^2[1/2]_1$			R1c		
3055.6134(8)	32717.140(9)	3055.61251(18)	0.0009	500		s^2	$^3P_2$	5p	$(5/2)^2[5/2]^\circ_3$			R1c		
3056.8491(9)	32703.914(9)	3056.8484(3)	0.0007	310		sp	$(^3F)^3P^\circ\ ^3F^\circ_2$	7d	$(5/2)^2[7/2]_3$			R1c		
3059.8637(9)	32671.695(10)	3059.8632(5)	0.0005	420		5p	$(5/2)^2[5/2]^\circ_3$	7d	$(3/2)^2[7/2]_4$			R1c		
3062.2814(8)	32645.902(8)	3062.2814(5)	−0.0000	590		5s	$(5/2)^2[5/2]_2$	6p	$(3/2)^2[1/2]^\circ_1$			R1c		
3066.6018(12)	32599.910(13)	3066.5985(3)	0.0033	400		sp	$(^3F)^3P^\circ\ ^3F^\circ_3$	8s	$(5/2)^2[5/2]_3$			R1c		
3080.3202(20)	32454.730(21)	3080.3284(6)	−0.0082	400		sp	$(^3F)^3P^\circ\ ^5F^\circ_2$	7s	$(3/2)^2[3/2]_2$			R1c		
3081.4480(14)	32442.852(15)	3081.4527(3)	−0.0046	150		4d	$(5/2)^2[9/2]_4$	5f	$(3/2)^2[7/2]^\circ_4$			R1c		
3082.935(3)	32427.21(3)	3082.9348(3)	−0.000	97		4d	$(5/2)^2[3/2]_2$	5f	$(3/2)^2[5/2]^\circ_2$			R1c		
3083.3677(8)	32422.654(8)	3083.3669(3)	0.0009	970		4d	$(5/2)^2[3/2]_2$	5f	$(3/2)^2[5/2]^\circ_3$			R1c		
3085.4342(20)	32400.940(21)	3085.4421(3)	−0.0079	95		4d	$(5/2)^2[3/2]_1$	5f	$(3/2)^2[5/2]^\circ_2$			R1c		
3085.5818(20)	32399.390(21)	3085.6280(3)	−0.0462	94	?	4d	$(5/2)^2[9/2]_4$	5f	$(3/2)^2[5/2]^\circ_3$			R1c		X
3088.7489(7)	32366.170(8)	3088.74858(24)	0.0003	550		4d	$(5/2)^2[9/2]_4$	5f	$(3/2)^2[9/2]^\circ_5$			R1c		
3097.8651(13)	32270.929(13)	3097.86615(23)	−0.0011	410		s^2	$^3P_1$	5p	$(5/2)^2[5/2]^\circ_2$			R1c		
3110.4745(10)	32140.112(10)	3110.4732(4)	0.0013	70		sp	$(^3F)^3P^\circ\ ^3D^\circ_3$	6d	$(3/2)^2[7/2]_4$			R1c		
3121.3959(8)	32027.662(8)	3121.3961(5)	−0.0002	150		4d	$(5/2)^2[9/2]_5$	7p	$(5/2)^2[7/2]^\circ_4$			R1c		
3121.6428(7)	32025.129(7)	3121.6415(3)	0.0013	240		4d	$(5/2)^2[5/2]_3$	5f	$(3/2)^2[7/2]^\circ_4$			R1c		
3121.8708(21)	32022.790(21)	3121.8736(3)	−0.0027	90		4d	$(5/2)^2[5/2]_3$	5f	$(3/2)^2[7/2]^\circ_3$			R1c		
3124.7229(8)	31993.563(8)	3124.7222(3)	0.0006	440		s^2	$^3P_0$	5p	$(5/2)^2[3/2]^\circ_1$			R1c		
3139.7885(9)	31840.054(9)	3139.7857(6)	0.0028	610	bl	sp	$(^3F)^3P^\circ\ ^1D^\circ_2$	7d	$(3/2)^2[5/2]_2$			R1c		
3140.4073(9)	31833.781(9)	3140.4064(6)	0.0008	230		sp	$(^3F)^3P^\circ\ ^1D^\circ_2$	7d	$(3/2)^2[5/2]_3$			R1c		
3146.0122(8)	31777.068(8)	3146.0119(3)	0.0003	480		4d	$(5/2)^2[7/2]_3$	5f	$(3/2)^2[7/2]^\circ_3$			R1c		
3148.7869(8)	31749.067(8)	3148.7856(5)	0.0013	170		sp	$(^3F)^3P^\circ\ ^1D^\circ_2$	7d	$(3/2)^2[7/2]_3$			R1c		
3149.6815(21)	31740.050(21)	3149.6769(3)	0.0046	260	bl	4d	$(5/2)^2[7/2]_3$	5f	$(3/2)^2[5/2]^\circ_2$			R1c		
3150.2634(9)	31734.187(9)	3150.2636(3)	−0.0002	88		4d	$(5/2)^2[7/2]_4$	5f	$(3/2)^2[7/2]^\circ_4$			R1c		
3150.540(8)	31731.40(8)	3150.4999(3)	0.040	4600	?	4d	$(5/2)^2[7/2]_4$	5f	$(3/2)^2[7/2]^\circ_3$			S36c		X
3150.6422(9)	31730.372(9)	3150.64124(19)	0.0010	3000		s^2	$^3P_2$	5p	$(5/2)^2[3/2]^\circ_2$			R1c		
3151.0505(7)	31726.261(7)	3151.0506(3)	−0.0001	10000		5s	$(5/2)^2[5/2]_3$	6p	$(5/2)^2[5/2]^\circ_3$			R1c		
3152.9000(7)	31707.651(7)	3152.8992(3)	0.0008	3500		4d	$(5/2)^2[7/2]_3$	5f	$(3/2)^2[9/2]^\circ_4$			R1c		
3154.0935(8)	31695.653(8)	3154.0934(4)	0.0001	550		5s	$(5/2)^2[5/2]_3$	sp	$(^3F)^1P^\circ\ ^3F^\circ_2$			R1c		
3155.3760(9)	31682.771(9)	3155.3765(5)	−0.0005	380		4d	$(5/2)^2[5/2]_3$	7p	$(5/2)^2[5/2]^\circ_3$			R1c		

Table A1. *Cont.*

λ_{obs} [a] (Å)	σ_{obs} [b] (cm^{-1})	λ_{Ritz} [c] (Å)	$\Delta\lambda_{obs-Ritz}$ (Å)	I_{obs} [d] (arb. u.)	Char [e]	Lower Level	Upper Level	A (s^{-1})	Acc [f]	Line Ref. [g]	TP Ref. [g]	Notes [h]
3155.8323(21)	31678.190(21)	3155.8290(3)	0.0033	190		4d $(5/2)^2[5/2]_2$	5f $(3/2)^2[5/2]^\circ_2$			R1c		
3156.2820(7)	31673.677(7)	3156.2817(3)	0.0003	1900		4d $(5/2)^2[5/2]_2$	5f $(3/2)^2[5/2]^\circ_3$			R1c		
3157.8901(8)	31657.548(8)	3157.88937(23)	0.0007	1900		4d $(5/2)^2[7/2]_4$	5f $(3/2)^2[9/2]^\circ_5$			R1c		
3158.6729(8)	31649.703(8)	3158.6734(5)	−0.0005	3700		5s $(3/2)^2[3/2]_1$	6p $(3/2)^2[3/2]^\circ_1$			R1c		
3162.0434(7)	31615.968(7)	3162.0438(4)	−0.0004	2300		5p $(5/2)^2[3/2]^\circ_2$	7d $(5/2)^2[5/2]_3$			R1c		
3163.6838(11)	31599.575(11)	3163.6842(4)	−0.0003	610		4d $(5/2)^2[5/2]_2$	5f $(3/2)^2[3/2]^\circ_2$			R1c		
3166.5879(7)	31570.596(7)	3166.5873(5)	0.0006	3500		5p $(5/2)^2[3/2]^\circ_2$	7d $(5/2)^2[3/2]_2$			R1c		
3170.6936(8)	31529.717(8)	3170.6935(7)	0.0001	540		5p $(3/2)^2[1/2]^\circ_0$	7d $(3/2)^2[3/2]_1$			R1c		
3173.6092(9)	31500.752(9)	3173.6088(3)	0.0004	330		sp $(^3F)^3P^\circ\ ^3D^\circ_2$	6d $(3/2)^2[5/2]_3$			R1c		
3174.9680(12)	31487.271(11)	3174.96642(22)	0.0016	840		s^2 $^3P_1$	5p $(5/2)^2[3/2]^\circ_2$			R1c		
3176.3094(16)	31473.974(16)	3176.3108(3)	−0.0014	230		4d $(5/2)^2[1/2]_1$	5f $(5/2)^2[5/2]^\circ_2$			R1c		
3177.7392(8)	31459.813(8)	3177.7397(7)	−0.0005	1700		5p $(5/2)^2[3/2]^\circ_2$	7d $(5/2)^2[1/2]_1$			R1c		
3177.9692(8)	31457.536(8)	3177.9705(5)	−0.0012	2700		5s $(3/2)^2[3/2]_1$	6p $(3/2)^2[3/2]^\circ_2$			R1c		
3179.3173(17)	31444.198(17)	3179.3163(4)	0.0010	230		4d $(5/2)^2[1/2]_1$	5f $(5/2)^2[3/2]^\circ_1$			R1c		
3179.7846(8)	31439.577(8)	3179.7842(4)	0.0004	6400		4d $(5/2)^2[1/2]_0$	5f $(3/2)^2[3/2]^\circ_1$			R1c		
3180.2932(9)	31434.550(9)	3180.2935(6)	−0.0003	470		5p $(3/2)^2[1/2]^\circ_0$	7d $(3/2)^2[1/2]_1$			R1c		
3180.7930(21)	31429.610(21)	3180.7922(4)	0.0008	230		sp $(^3F)^3P^\circ\ ^3D^\circ_2$	6d $(3/2)^2[3/2]_2$			R1c		
3182.1717(7)	31415.994(7)	3182.1718(3)	−0.0002	11000		4d $(5/2)^2[1/2]_1$	5f $(5/2)^2[3/2]^\circ_2$			R1c		
3184.6224(12)	31391.819(12)	3184.6233(5)	−0.0010	480		4d $(5/2)^2[7/2]_4$	7p $(5/2)^2[5/2]^\circ_3$			R1c		
3184.8404(8)	31389.670(8)	3184.8409(3)	−0.0005	15000		4d $(5/2)^2[1/2]_1$	5f $(5/2)^2[1/2]^\circ_1$			R1c		
3185.7249(7)	31380.955(7)	3185.7256(4)	−0.0006	4000		5s $(5/2)^2[5/2]_3$	6p $(5/2)^2[7/2]^\circ_4$			R1c		
3186.0148(7)	31378.100(7)	3186.0153(4)	−0.0005	6400		4d $(5/2)^2[1/2]_1$	5f $(5/2)^2[1/2]^\circ_0$			R1c		
3186.3411(8)	31374.887(8)	3186.3415(4)	−0.0004	3000		5s $(5/2)^2[5/2]_2$	sp $(^3F)^1P^\circ\ ^3F^\circ_2$			R1c		
3187.0427(13)	31367.980(13)	3187.0386(5)	0.0041	1200		5s $(3/2)^2[3/2]_2$	6p $(3/2)^2[3/2]^\circ_1$			R1c		
3188.7231(22)	31351.450(21)	3188.7259(4)	−0.0028	490		sp $(^3F)^3P^\circ\ ^3D^\circ_2$	6d $(3/2)^2[7/2]_3$			R1c		
3192.3023(22)	31316.300(21)	3192.3011(3)	0.0012	250		5s $(5/2)^2[5/2]_3$	sp $(^1G)^3P^\circ\ ^3F^\circ_3$			R1c		
3198.1052(10)	31259.480(9)	3198.1052(8)	−0.0001	1000		5p $(5/2)^2[3/2]^\circ_1$	7d $(5/2)^2[1/2]_0$			R1c		
3204.5231(16)	31196.877(16)	3204.5259(6)	−0.0029	640		sp $(^3F)^3P^\circ\ ^3G^\circ_4$	6d $(5/2)^2[7/2]_3$			R1c		
3206.6848(13)	31175.847(12)	3206.6848(5)	−0.0000	1800		5s $(3/2)^2[3/2]_2$	6p $(3/2)^2[3/2]^\circ_2$			R1c		
3208.3026(16)	31160.127(16)	3208.3076(6)	−0.0050	1500		5s $(3/2)^2[3/2]_1$	6p $(3/2)^2[5/2]^\circ_2$			R1c		
3216.9896(14)	31075.987(14)	3216.9895(6)	0.0001	520		5p $(3/2)^2[5/2]^\circ_2$	7d $(3/2)^2[5/2]_2$			R1c		
3217.3123(22)	31072.870(21)	3217.3104(4)	0.0019	650		5p $(5/2)^2[7/2]^\circ_3$	7d $(5/2)^2[5/2]_2$			R1c		
3217.6410(17)	31069.696(17)	3217.6411(6)	−0.0001	390		5p $(3/2)^2[5/2]^\circ_2$	7d $(3/2)^2[5/2]_3$			R1rc		
3218.2664(15)	31063.658(15)	3218.2653(6)	0.0011	260		sp $(^3F)^3P^\circ\ ^3G^\circ_4$	6d $(5/2)^2[9/2]_4$			R1c		
3218.6278(16)	31060.170(16)	3218.6244(5)	0.0034	390		5p $(5/2)^2[7/2]^\circ_3$	7d $(5/2)^2[7/2]_4$			R1c		
3218.7642(8)	31058.854(8)	3218.7651(4)	−0.0009	2000		5p $(5/2)^2[7/2]^\circ_3$	7d $(5/2)^2[7/2]_3$			R1c		
3221.9702(22)	31027.950(21)	3221.9718(6)	−0.0016	260		5p $(3/2)^2[5/2]^\circ_2$	7d $(3/2)^2[3/2]_2$			R1c		
3225.3388(8)	30995.545(8)	3225.3392(3)	−0.0004	2100		5s $(5/2)^2[5/2]_2$	sp $(^1G)^3P^\circ\ ^3F^\circ_3$			R1c		
3226.3290(16)	30986.033(16)	3226.3301(12)	−0.0011	260		5p $(3/2)^2[1/2]^\circ_1$	7d $(3/2)^2[1/2]_0$			R1c		
3226.4395(9)	30984.972(9)	3226.4380(5)	0.0015	640		5p $(3/2)^2[5/2]^\circ_2$	7d $(3/2)^2[7/2]_3$			R1c		
3226.5812(10)	30983.611(9)	3226.5808(5)	0.0004	5200		5p $(5/2)^2[7/2]^\circ_3$	7d $(5/2)^2[9/2]_4$			R1c		
3229.5526(8)	30955.105(8)	3229.5524(5)	0.0003	970		5p $(5/2)^2[7/2]^\circ_4$	7d $(5/2)^2[7/2]_4$			R1c		

Table A1. *Cont.*

λ_{obs} [a] (Å)	σ_{obs} [b] (cm^{-1})	λ_{Ritz} [c] (Å)	$\Delta\lambda_{obs-Ritz}$ (Å)	I_{obs} [d] (arb. u.)	Char [e]	Lower Level		Upper Level		A (s^{-1})	Acc [f]	Line Ref. [g]	TP Ref. [g]	Notes [h]
3233.3754(13)	30918.508(12)	3233.3722(4)	0.0032	1000		5p	$(5/2)^2[7/2]^\circ_4$	7d	$(5/2)^2[5/2]_3$			R1c		
3234.6710(14)	30906.125(13)	3234.6691(6)	0.0019	510		5p	$(3/2)^2[1/2]^\circ_1$	7d	$(3/2)^2[3/2]_2$			R1c		
3234.7336(10)	30905.527(9)	3234.7341(5)	−0.0005	930		5s	$(5/2)^2[5/2]_2$	6p	$(5/2)^2[3/2]^\circ_1$			R1c		
3237.1430(16)	30882.525(15)	3237.1420(7)	0.0009	250		sp	$(^3F)^3P^\circ\ ^5F^\circ_3$	7s	$(5/2)^2[5/2]_2$			R1c		
3237.2417(11)	30881.583(11)	3237.2413(5)	0.0004	1100		5p	$(5/2)^2[5/2]^\circ_2$	7d	$(5/2)^2[5/2]_2$			R1c		
		3237.5629(5)			m	5p	$(5/2)^2[7/2]^\circ_4$	7d	$(5/2)^2[9/2]_4$			R1nc		
3237.5736(12)	30878.417(11)	3237.5752(6)	−0.0016	1300		5s	$(3/2)^2[3/2]_2$	6p	$(3/2)^2[5/2]^\circ_2$			R1c		
3238.7160(10)	30867.526(10)	3238.7141(4)	0.0019	1900		5p	$(5/2)^2[5/2]^\circ_2$	7d	$(5/2)^2[7/2]_3$			R1c		
3238.8232(8)	30866.504(7)	3238.8228(6)	0.0005	5500		5p	$(5/2)^2[7/2]^\circ_4$	7d	$(5/2)^2[9/2]_5$			R1c		
3239.6499(13)	30858.628(12)	3239.6507(5)	−0.0008	250		sp	$(^3F)^3P^\circ\ ^1D^\circ_2$	8s	$(3/2)^2[3/2]_2$			R1c		
3241.8139(12)	30838.030(11)	3241.8139(5)	−0.0000	860		5p	$(5/2)^2[3/2]^\circ_1$	7d	$(5/2)^2[5/2]_2$			R1c		
3242.425(10)	30832.21(10)	3242.4129(5)	0.012	250	*	5p	$(5/2)^2[5/2]^\circ_2$	7d	$(5/2)^2[5/2]_3$			R1nc		
3242.425(10)	30832.21(10)	3242.4292(7)	−0.004	250	*	sp	$(^3F)^3P^\circ\ ^1D^\circ_2$	8s	$(3/2)^2[3/2]_1$			R1c		
3245.9402(14)	30798.829(13)	3245.9405(6)	−0.0003	1500		5p	$(3/2)^2[5/2]^\circ_3$	7d	$(3/2)^2[5/2]_3$			R1c		
3246.7898(22)	30790.770(21)	3246.7839(7)	0.0059	620		5p	$(3/2)^2[1/2]^\circ_1$	7d	$(3/2)^2[1/2]_1$			R1c		
3250.4652(8)	30755.955(8)	3250.4650(4)	0.0003	11000		4d	$(3/2)^2[1/2]_1$	5f	$(3/2)^2[3/2]^\circ_2$			R1c		
3250.8739(13)	30752.089(12)	3250.8733(7)	0.0006	1200		5p	$(5/2)^2[3/2]^\circ_1$	7d	$(5/2)^2[3/2]_1$			R1c		
3251.76(3)	30743.7(3)	3251.7620(6)	0.00	240	*	sp	$(^3F)^3P^\circ\ ^3G^\circ_4$	5g	$(5/2)^2[11/2]_5$			R1c		
3251.76(3)	30743.7(3)	3251.7913(5)	−0.03	240	*	5p	$(5/2)^2[3/2]^\circ_1$	7d	$(5/2)^2[3/2]_2$			R1c		
3252.7830(8)	30734.041(8)	3252.7838(6)	−0.0008	2400		5p	$(3/2)^2[5/2]^\circ_3$	7d	$(3/2)^2[7/2]_4$			R1c		
3253.1078(12)	30730.972(11)	3253.1070(5)	0.0008	1200		5s	$(5/2)^2[5/2]_3$	6p	$(5/2)^2[3/2]^\circ_2$			R1c		
3257.1234(16)	30693.086(15)	3257.1222(5)	0.0012	240		5s	$(5/2)^2[5/2]_2$	6p	$(5/2)^2[5/2]^\circ_2$			R1c		
3260.0249(11)	30665.770(11)	3260.0253(5)	−0.0004	2400		5p	$(5/2)^2[5/2]^\circ_3$	7d	$(5/2)^2[7/2]_4$			R1c		
3260.1697(17)	30664.408(16)	3260.1697(4)	0.0000	240		5p	$(5/2)^2[5/2]^\circ_3$	7d	$(5/2)^2[7/2]_3$			R1c		
3261.6469(8)	30650.520(8)	3261.6476(3)	−0.0007	1800		5p	$(5/2)^2[3/2]^\circ_2$	8s	$(5/2)^2[5/2]_3$			R1c		
3263.5546(14)	30632.604(13)	3263.5530(7)	0.0017	350		5p	$(5/2)^2[3/2]^\circ_1$	7d	$(5/2)^2[1/2]_1$			R1c		
3263.9177(11)	30629.197(10)	3263.9177(4)	0.0000	3500		5p	$(5/2)^2[5/2]^\circ_3$	7d	$(5/2)^2[5/2]_3$			R1c		
3265.3948(14)	30615.342(13)	3265.3933(6)	0.0015	1100		5s	$(3/2)^2[3/2]_2$	6p	$(3/2)^2[1/2]^\circ_1$			R1c		
3268.0990(16)	30590.010(15)	3268.0988(7)	0.0002	230		5p	$(3/2)^2[1/2]^\circ_0$	8s	$(3/2)^2[3/2]_1$			R1c		
3268.1895(14)	30589.163(13)	3268.1879(5)	0.0016	450		5p	$(5/2)^2[5/2]^\circ_3$	7d	$(5/2)^2[9/2]_4$			R1c		
3268.7591(13)	30583.833(12)	3268.7589(5)	0.0002	1400		5p	$(5/2)^2[5/2]^\circ_3$	7d	$(5/2)^2[3/2]_2$			R1c		
3270.1104(16)	30571.195(15)	3270.1113(4)	−0.0008	1000		sp	$(^3F)^3P^\circ\ ^3D^\circ_1$	6d	$(3/2)^2[5/2]_2$			R1c		
3275.9027(13)	30517.143(12)	3275.9057(6)	−0.0031	2200		5p	$(3/2)^2[3/2]^\circ_1$	7d	$(3/2)^2[5/2]_2$			R1c		
3278.9653(23)	30488.640(21)	3278.9636(4)	0.0017	210		sp	$(^3F)^3P^\circ\ ^3D^\circ_1$	6d	$(3/2)^2[3/2]_2$			R1c		
3281.0757(23)	30469.030(21)	3281.0724(6)	0.0034	210		5p	$(3/2)^2[3/2]^\circ_1$	7d	$(3/2)^2[3/2]_2$			R1c		
3281.6964(8)	30463.268(8)	3281.69629(23)	0.0001	9700		4d	$(5/2)^2[9/2]_5$	5f	$(5/2)^2[9/2]^\circ_5$			R1c		
3282.0106(9)	30460.351(8)	3282.01019(24)	0.0005	1100		4d	$(5/2)^2[9/2]_5$	5f	$(5/2)^2[9/2]^\circ_4$			R1c		
3282.6022(11)	30454.862(10)	3282.6016(3)	0.0006	530		4d	$(5/2)^2[9/2]_5$	5f	$(5/2)^2[7/2]^\circ_4$			R1c		
3283.0958(16)	30450.283(15)	3283.0969(4)	−0.0011	210		sp	$(^3F)^3P^\circ\ ^3D^\circ_1$	6d	$(3/2)^2[3/2]_1$			R1c		
3283.2431(13)	30448.917(12)	3283.2433(7)	−0.0002	940		5p	$(3/2)^2[3/2]^\circ_1$	7d	$(3/2)^2[3/2]_1$			R1c		
3290.4174(4)	30382.530(4)	3290.41683(16)	0.0005	38000		4d	$(5/2)^2[9/2]_5$	5f	$(5/2)^2[11/2]^\circ_6$	5.9e+07	D+	F_Re	TW	

Table A1. *Cont.*

λ_{obs} [a] (Å)	σ_{obs} [b] (cm^{-1})	λ_{Ritz} [c] (Å)	$\Delta\lambda_{obs-Ritz}$ (Å)	I_{obs} [d] (arb. u.)	Char [e]	Lower Level		Upper Level		A (s^{-1})	Acc [f]	Line Ref. [g]	TP Ref. [g]	Notes [h]
3291.0597(8)	30376.600(7)	3291.05952(22)	0.0002	1100		4d	$(5/2)^2[9/2]_5$	5f	$(5/2)^2[11/2]^\circ_5$			R1c		
3291.8090(16)	30369.686(15)	3291.8073(3)	0.0017	2000		4d	$(5/2)^2[9/2]_4$	5f	$(5/2)^2[9/2]^\circ_5$			R1c		
3292.1232(8)	30366.788(7)	3292.1232(3)	−0.0000	7700		4d	$(5/2)^2[9/2]_4$	5f	$(5/2)^2[9/2]^\circ_4$			R1c		
3292.7189(10)	30361.294(9)	3292.7183(3)	0.0007	3500		4d	$(5/2)^2[9/2]_4$	5f	$(5/2)^2[7/2]^\circ_4$			R1c		
3292.9965(13)	30358.735(12)	3292.9984(3)	−0.0020	1500		4d	$(5/2)^2[9/2]_4$	5f	$(5/2)^2[7/2]^\circ_3$			R1c		
3293.3326(9)	30355.637(8)	3293.3327(4)	−0.0001	2800		4d	$(3/2)^2[7/2]_3$	5f	$(3/2)^2[7/2]^\circ_3$			R1c		
3294.3354(8)	30346.397(7)	3294.3355(3)	−0.0002	3800		4d	$(5/2)^2[3/2]_2$	5f	$(5/2)^2[5/2]^\circ_2$			R1c		
3295.1019(8)	30339.338(7)	3295.1018(3)	0.0001	11000		4d	$(5/2)^2[3/2]_2$	5f	$(5/2)^2[5/2]^\circ_3$			R1c		
3297.1983(8)	30320.048(7)	3297.1986(3)	−0.0003	9300		4d	$(5/2)^2[3/2]_1$	5f	$(5/2)^2[5/2]^\circ_2$			R1c		
3297.3461(12)	30318.689(11)	3297.3492(4)	−0.0031	1200		4d	$(3/2)^2[7/2]_3$	5f	$(3/2)^2[5/2]^\circ_2$			R1c		
3297.5688(10)	30316.642(9)	3297.5686(4)	0.0002	1400		4d	$(5/2)^2[3/2]_2$	5f	$(5/2)^2[3/2]^\circ_1$			R1c		
3300.2124(14)	30292.358(13)	3300.2124(4)	0.0000	380		sp	$(^3F)^3P^\circ\ ^3G^\circ_3$	7s	$(3/2)^2[3/2]_2$			R1c		
3300.4370(9)	30290.296(9)	3300.4373(4)	−0.0003	6100		4d	$(5/2)^2[3/2]_1$	5f	$(5/2)^2[3/2]^\circ_1$			R1c		
3300.6409(9)	30288.425(9)	3300.6406(3)	0.0003	9100		4d	$(5/2)^2[3/2]_2$	5f	$(5/2)^2[3/2]^\circ_2$			R1c		
3300.8815(9)	30286.218(8)	3300.8808(3)	0.0006	13000		4d	$(3/2)^2[7/2]_3$	5f	$(3/2)^2[9/2]^\circ_4$	5.4e+07	D+	R1c	TW	
3301.2286(7)	30283.034(6)	3301.22844(23)	0.0001	25000		4d	$(5/2)^2[9/2]_4$	5f	$(5/2)^2[11/2]^\circ_5$	5.6e+07	D+	F_Re	TW	
3303.1817(12)	30265.128(11)	3303.1836(6)	−0.0018	1400		5p	$(3/2)^2[3/2]^\circ_2$	7d	$(3/2)^2[5/2]_2$			R1c		
3303.5132(21)	30262.091(20)	3303.5122(4)	0.0010	5800	*	4d	$(5/2)^2[3/2]_2$	5f	$(5/2)^2[1/2]^\circ_1$			R1c		
3303.5132(21)	30262.091(20)	3303.5147(3)	−0.0015	5800	*	4d	$(5/2)^2[3/2]_1$	5f	$(5/2)^2[3/2]^\circ_2$			R1c		
3303.8698(10)	30258.825(9)	3303.8706(6)	−0.0008	2300		5p	$(3/2)^2[3/2]^\circ_2$	7d	$(3/2)^2[5/2]_3$			R1c		
3306.3890(15)	30235.771(14)	3306.3913(4)	−0.0023	180		4d	$(5/2)^2[3/2]_1$	5f	$(5/2)^2[1/2]^\circ_1$			R1c		
3307.6576(11)	30224.175(10)	3307.6570(4)	0.0006	1200		4d	$(5/2)^2[3/2]_1$	5f	$(5/2)^2[1/2]^\circ_0$			R1c		
3307.8727(13)	30222.210(12)	3307.8664(4)	0.0063	1200		4d	$(3/2)^2[7/2]_4$	5f	$(3/2)^2[7/2]^\circ_4$			R1c		X
3308.1052(14)	30220.086(13)	3308.1074(5)	−0.0023	1100		sp	$(^3F)^3P^\circ\ ^1F^\circ_3$	7d	$(5/2)^2[7/2]_4$			R1c		
3308.2526(15)	30218.739(14)	3308.2561(4)	−0.0035	180		sp	$(^3F)^3P^\circ\ ^1F^\circ_3$	7d	$(5/2)^2[7/2]_3$			R1c		
3308.4337(13)	30217.085(12)	3308.4367(6)	−0.0029	360		5p	$(3/2)^2[3/2]^\circ_2$	7d	$(3/2)^2[3/2]_2$			R1c		
3310.338(3)	30199.70(3)	3310.3389(4)	−0.001	89		sp	$(^3F)^3P^\circ\ ^3D^\circ_3$	6d	$(5/2)^2[5/2]_2$			R1c		
3312.0278(13)	30184.296(11)	3312.0276(4)	0.0001	550		sp	$(^3F)^3P^\circ\ ^3D^\circ_3$	6d	$(5/2)^2[7/2]_4$			R1c		
3312.1151(14)	30183.500(13)	3312.1155(5)	−0.0004	970		sp	$(^3F)^3P^\circ\ ^1F^\circ_3$	7d	$(5/2)^2[5/2]_3$			R1c		
3312.6771(10)	30178.380(9)	3312.6783(3)	−0.0012	610		4d	$(3/2)^2[7/2]_4$	5f	$(3/2)^2[5/2]^\circ_3$			R1c		
3315.7440(8)	30150.467(7)	3315.7431(3)	0.0010	1300		4d	$(3/2)^2[7/2]_4$	5f	$(3/2)^2[9/2]^\circ_4$			R1c		
3316.2756(8)	30145.634(7)	3316.2752(3)	0.0004	16000		4d	$(3/2)^2[7/2]_4$	5f	$(3/2)^2[9/2]^\circ_5$	5.6e+07	D+	R1c	TW	
3316.5116(16)	30143.489(15)	3316.5129(6)	−0.0013	260		sp	$(^3F)^3P^\circ\ ^1F^\circ_3$	7d	$(5/2)^2[9/2]_4$			R1c		
3317.1383(8)	30137.794(7)	3317.1386(4)	−0.0003	5500		4d	$(3/2)^2[3/2]_1$	5f	$(3/2)^2[5/2]^\circ_2$			R1c		
3318.3147(23)	30127.110(21)	3318.3232(12)	−0.0085	84		sp	$(^3F)^3P^\circ\ ^5F^\circ_1$	7s	$(5/2)^2[5/2]_2$			R1c		
3319.0203(11)	30120.706(10)	3319.0216(5)	−0.0013	840		sp	$(^3F)^3P^\circ\ ^3D^\circ_3$	6d	$(5/2)^2[5/2]_3$			R1c		
3321.1137(23)	30101.720(21)	3321.1114(7)	0.0023	500		5p	$(3/2)^2[3/2]^\circ_2$	7d	$(3/2)^2[1/2]_1$			R1c		
3321.5526(8)	30097.743(8)	3321.5528(3)	−0.0002	1400		5p	$(5/2)^2[7/2]^\circ_3$	8s	$(5/2)^2[5/2]_2$			R1c		
3321.7168(14)	30096.255(13)	3321.7165(8)	0.0003	410		4d	$(3/2)^2[1/2]_1$	7p	$(5/2)^2[3/2]^\circ_2$			R1c		
3322.6363(10)	30087.927(9)	3322.6351(4)	0.0012	2000		4d	$(3/2)^2[3/2]_1$	5f	$(3/2)^2[3/2]^\circ_1$			R1c		
3324.8295(9)	30068.080(8)	3324.8292(7)	0.0003	1200		5p	$(3/2)^2[5/2]^\circ_2$	8s	$(3/2)^2[3/2]_1$			R1c		

Table A1. *Cont.*

λ_{obs} [a] (Å)	σ_{obs} [b] (cm^{-1})	λ_{Ritz} [c] (Å)	$\Delta\lambda_{obs-Ritz}$ (Å)	I_{obs} [d] (arb. u.)	Char [e]	Lower Level		Upper Level		A (s^{-1})	Acc [f]	Line Ref. [g]	TP Ref. [g]	Notes [h]
3325.0235(13)	30066.326(11)	3325.0210(4)	0.0025	720		5s	$(5/2)^2[5/2]_2$	6p	$(5/2)^2[7/2]^\circ_3$			R1c		
3325.8187(14)	30059.137(12)	3325.8184(4)	0.0003	3000		4d	$(3/2)^2[3/2]_1$	5f	$(3/2)^2[3/2]^\circ_2$			R1c		
3325.9236(13)	30058.189(11)	3325.9242(4)	−0.0006	400		5p	$(5/2)^2[7/2]^\circ_3$	8s	$(5/2)^2[5/2]_3$			R1c		
3327.9129(16)	30040.222(15)	3327.9161(5)	−0.0032	160		sp	$(^3F)^3P^\circ\ ^3D^\circ_3$	6d	$(5/2)^2[3/2]_2$			R1c		
3335.4075(14)	29972.725(12)	3335.4064(5)	0.0011	520		5p	$(3/2)^2[1/2]^\circ_1$	8s	$(3/2)^2[3/2]_2$			R1c		
3337.5951(12)	29953.080(11)	3337.5942(4)	0.0008	3000		5p	$(5/2)^2[7/2]^\circ_4$	8s	$(5/2)^2[5/2]_3$			R1c		
3338.0369(14)	29949.116(12)	3338.03567(24)	0.0012	9200		4d	$(5/2)^2[5/2]_3$	5f	$(5/2)^2[9/2]^\circ_4$			R1c		
3338.6475(9)	29943.638(8)	3338.6475(3)	0.0001	9900		4d	$(5/2)^2[5/2]_3$	5f	$(5/2)^2[7/2]^\circ_4$	2.7e+07	D+	R1c	TW	
3338.9360(9)	29941.051(8)	3338.9355(3)	0.0005	3600		4d	$(5/2)^2[5/2]_3$	5f	$(5/2)^2[7/2]^\circ_3$			R1c		
3339.0850(9)	29939.715(8)	3339.0845(4)	0.0006	3600		4d	$(3/2)^2[3/2]_2$	5f	$(3/2)^2[7/2]^\circ_3$			R1c		
3340.8308(13)	29924.070(11)	3340.8312(8)	−0.0003	720		5s	$(5/2)^2[5/2]_3$	sp	$(^1G)^3P^\circ\ ^3F^\circ_4$			R1c		
3341.7610(13)	29915.741(11)	3341.7607(5)	0.0003	570		sp	$(^3F)^3P^\circ\ ^3G^\circ_3$	6d	$(5/2)^2[7/2]_4$			R1c		
3342.8004(10)	29906.439(9)	3342.8003(4)	0.0001	710		5p	$(5/2)^2[5/2]^\circ_2$	8s	$(5/2)^2[5/2]_2$			R1c		
3342.9641(9)	29904.975(8)	3342.9640(3)	0.0001	1800		4d	$(5/2)^2[5/2]_3$	5f	$(5/2)^2[5/2]^\circ_2$			R1c		
3343.2140(24)	29902.740(21)	3343.2134(4)	0.0006	280		4d	$(3/2)^2[3/2]_2$	5f	$(3/2)^2[5/2]^\circ_2$			R1c		
3343.7214(9)	29898.202(8)	3343.7215(3)	−0.0001	14000		4d	$(3/2)^2[3/2]_2$	5f	$(3/2)^2[5/2]^\circ_3$			R1c		
3343.7515(9)	29897.933(8)	3343.7531(3)	−0.0016	14000		4d	$(5/2)^2[5/2]_3$	5f	$(5/2)^2[5/2]^\circ_3$			R1c		
3347.2268(18)	29866.892(16)	3347.2279(4)	−0.0011	140		5p	$(5/2)^2[5/2]^\circ_2$	8s	$(5/2)^2[5/2]_3$			R1c		
3347.6754(9)	29862.890(8)	3347.6762(3)	−0.0008	550		5p	$(5/2)^2[3/2]^\circ_1$	8s	$(5/2)^2[5/2]_2$			R1c		
3348.7955(14)	29852.902(12)	3348.7967(4)	−0.0012	540		4d	$(3/2)^2[3/2]_2$	5f	$(3/2)^2[3/2]^\circ_1$			R1c		
3348.8824(14)	29852.127(12)	3348.8809(5)	0.0015	620		sp	$(^3F)^3P^\circ\ ^3G^\circ_3$	6d	$(5/2)^2[5/2]_3$			R1c		
3349.4567(8)	29847.009(7)	3349.4569(3)	−0.0002	4200		4d	$(5/2)^2[5/2]_3$	5f	$(5/2)^2[3/2]^\circ_2$			R1c		
3352.0324(12)	29824.075(11)	3352.0304(4)	0.0020	6400		4d	$(3/2)^2[3/2]_2$	5f	$(3/2)^2[3/2]^\circ_2$			R1c		
3352.079	29823.66	3352.0793(6)			:	5p	$(3/2)^2[5/2]^\circ_3$	8s	$(3/2)^2[3/2]_2$					
3354.0672(12)	29805.983(11)	3354.0677(3)	−0.0005	330		sp	$(^3F)^3P^\circ\ ^3D^\circ_2$	7s	$(3/2)^2[3/2]_2$			R1c		
3355.3107(13)	29794.937(11)	3355.31179(19)	−0.0011	130		5s	$(5/2)^2[5/2]_2$	4f	$(3/2)^2[5/2]^\circ_3$			R1c		
3356.8877(17)	29780.940(15)	3356.8867(3)	0.0010	64		s^2	$^3P_2$	sp	$(^3F)^3P^\circ\ ^3F^\circ_3$			R1c		
3357.4722(10)	29775.756(9)	3357.4732(5)	−0.0010	640		sp	$(^3F)^3P^\circ\ ^1D^\circ_2$	7d	$(5/2)^2[5/2]_2$			R1c		
3357.9368(14)	29771.636(12)	3357.9364(5)	0.0004	510		sp	$(^3F)^3P^\circ\ ^3G^\circ_3$	6d	$(5/2)^2[3/2]_2$			R1c		
3359.0587(9)	29761.693(8)	3359.0575(4)	0.0012	950		sp	$(^3F)^3P^\circ\ ^1D^\circ_2$	7d	$(5/2)^2[7/2]_3$			R1c		
3359.7217(9)	29755.820(8)	3359.7209(3)	0.0008	670		sp	$(^3F)^3P^\circ\ ^3D^\circ_2$	7s	$(3/2)^2[3/2]_1$			R1c		
3363.8287(17)	29719.491(15)	3363.8300(10)	−0.0013	310		4d	$(3/2)^2[3/2]_1$	7p	$(5/2)^2[5/2]^\circ_2$			R1c		
3365.4414(17)	29705.250(15)	3365.4436(7)	−0.0021	610		sp	$(^3F)^3P^\circ\ ^5D^\circ_3$	5d	$(3/2)^2[3/2]_2$			R1c		
3365.6475(8)	29703.431(7)	3365.6470(3)	0.0005	11000		4d	$(5/2)^2[7/2]_3$	5f	$(5/2)^2[9/2]^\circ_4$	2.9e+07	D+	R1c	TW	
3366.2696(10)	29697.942(9)	3366.2690(3)	0.0006	10000		4d	$(5/2)^2[7/2]_3$	5f	$(5/2)^2[7/2]^\circ_4$			R1c		
3366.5619(8)	29695.364(7)	3366.5618(3)	0.0001	6100		4d	$(5/2)^2[7/2]_3$	5f	$(5/2)^2[7/2]^\circ_3$			R1c		
3366.8560(24)	29692.770(21)	3366.8553(4)	0.0007	120		5s	$(5/2)^2[5/2]_2$	4f	$(3/2)^2[3/2]^\circ_1$			R1c		
3370.1508(11)	29663.742(10)	3370.1503(4)	0.0005	610		5p	$(5/2)^2[5/2]^\circ_3$	8s	$(5/2)^2[5/2]_3$			R1c		
3370.4529(7)	29661.083(6)	3370.45289(23)	−0.0000	22000		4d	$(5/2)^2[7/2]_4$	5f	$(5/2)^2[9/2]^\circ_5$	4.3e+07	D+	F_Re	TW	
3370.6573(11)	29659.285(10)	3370.6573(3)	−0.0001	1100		4d	$(5/2)^2[7/2]_3$	5f	$(5/2)^2[5/2]^\circ_2$			R1c		
3370.7846(8)	29658.165(7)	3370.7840(3)	0.0006	5900		4d	$(5/2)^2[7/2]_4$	5f	$(5/2)^2[9/2]^\circ_4$			R1c		
3371.4075(9)	29652.685(8)	3371.4079(3)	−0.0004	6200		4d	$(5/2)^2[7/2]_4$	5f	$(5/2)^2[7/2]^\circ_4$			R1c		

Table A1. *Cont.*

λ_{obs} [a] (Å)	σ_{obs} [b] (cm^{-1})	λ_{Ritz} [c] (Å)	$\Delta\lambda_{obs-Ritz}$ (Å)	I_{obs} [d] (arb. u.)	Char [e]	Lower Level		Upper Level		A (s^{-1})	Acc [f]	Line Ref. [g]	TP Ref. [g]	Notes [h]
3371.7016(9)	29650.099(8)	3371.7016(3)	−0.0000	870		4d	$(5/2)^2[7/2]_4$	5f	$(5/2)^2[7/2]^\circ_3$			R1c		
3373.5914(8)	29633.490(7)	3373.5912(3)	0.0002	9700		4d	$(5/2)^2[5/2]_2$	5f	$(5/2)^2[7/2]^\circ_3$			R1c		
3374.4423(13)	29626.018(11)	3374.4427(4)	−0.0005	170		5s	$(3/2)^2[3/2]_1$	sp	$(^3F)^1P^\circ\ ^3F^\circ_2$			R1c		
3374.9515(8)	29621.548(7)	3374.9510(4)	0.0005	12000		4d	$(3/2)^2[5/2]_3$	5f	$(3/2)^2[7/2]^\circ_4$	4.6e+07	D+	R1c	TW	
3375.2221(12)	29619.173(11)	3375.2222(4)	−0.0000	1400		4d	$(3/2)^2[5/2]_3$	5f	$(3/2)^2[7/2]^\circ_3$			R1c		
3376.6139(8)	29606.965(7)	3376.6143(3)	−0.0004	1300		4d	$(5/2)^2[7/2]_4$	5f	$(5/2)^2[5/2]^\circ_3$			R1c		
3377.0834(17)	29602.849(15)	3377.0829(4)	0.0006	170		sp	$(^3F)^3P^\circ\ ^3F^\circ_2$	6d	$(3/2)^2[5/2]_2$			R1c		
3377.2601(14)	29601.300(12)	3377.2583(3)	0.0019	110		4d	$(5/2)^2[7/2]_3$	5f	$(5/2)^2[3/2]^\circ_2$			R1c		
3377.7037(8)	29597.412(7)	3377.7038(3)	−0.0001	5300		4d	$(5/2)^2[5/2]_2$	5f	$(5/2)^2[5/2]^\circ_2$			R1c		
3378.3846(15)	29591.448(13)	3378.3831(4)	0.0015	170		sp	$(^3F)^3P^\circ\ ^3F^\circ_2$	6d	$(3/2)^2[5/2]_3$			R1c		
3378.5094(8)	29590.354(7)	3378.5094(3)	0.0001	3500		4d	$(5/2)^2[5/2]_2$	5f	$(5/2)^2[5/2]^\circ_3$			R1c		
3379.4421(9)	29582.188(8)	3379.4410(4)	0.0011	500		4d	$(3/2)^2[5/2]_3$	5f	$(3/2)^2[5/2]^\circ_2$			R1c		
3379.9595(9)	29577.660(8)	3379.9602(3)	−0.0007	3800		4d	$(3/2)^2[5/2]_3$	5f	$(3/2)^2[5/2]^\circ_3$			R1c		
3380.3311(8)	29574.409(7)	3380.33017(22)	0.0009	1100		4d	$(5/2)^2[7/2]_4$	5f	$(5/2)^2[11/2]^\circ_5$			R1c		
3380.7117(8)	29571.079(7)	3380.7116(4)	0.0002	7600		4d	$(3/2)^2[5/2]_2$	5f	$(3/2)^2[7/2]^\circ_3$	3.4e+07	D+	R1c	TW	
3381.1021(11)	29567.665(10)	3381.1027(4)	−0.0006	1400		4d	$(5/2)^2[5/2]_2$	5f	$(5/2)^2[3/2]^\circ_1$			R1c		
3384.3322(8)	29539.446(7)	3384.3324(3)	−0.0002	1300		4d	$(5/2)^2[5/2]_2$	5f	$(5/2)^2[3/2]^\circ_2$			R1c		
3384.7698(14)	29535.627(12)	3384.7669(6)	0.0029	160		5p	$(3/2)^2[3/2]^\circ_1$	8s	$(3/2)^2[3/2]_2$			R1c		
3384.9450(9)	29534.098(8)	3384.9442(4)	0.0009	3600		4d	$(3/2)^2[5/2]_2$	5f	$(3/2)^2[5/2]^\circ_2$			R1c		
3385.4657(9)	29529.556(8)	3385.4650(3)	0.0006	2100		4d	$(3/2)^2[5/2]_2$	5f	$(3/2)^2[5/2]^\circ_3$			R1c		
3387.3535(17)	29513.099(15)	3387.3515(4)	0.0021	100		4d	$(5/2)^2[5/2]_2$	5f	$(5/2)^2[1/2]^\circ_1$			R1c		
3387.7986(17)	29509.222(15)	3387.8000(8)	−0.0015	210		5p	$(3/2)^2[3/2]^\circ_1$	8s	$(3/2)^2[3/2]_1$			R1c		
3388.4491(14)	29503.557(12)	3388.4504(4)	−0.0013	420		4d	$(3/2)^2[5/2]_3$	5f	$(3/2)^2[3/2]^\circ_2$			R1c		
		3390.6470(10)			m	4d	$(3/2)^2[3/2]_2$	7p	$(5/2)^2[5/2]^\circ_2$			R1c		
3390.664(20)	29484.29(17)	3390.6678(4)	−0.004	260		4d	$(3/2)^2[5/2]_2$	5f	$(3/2)^2[3/2]^\circ_1$			R1c		
3390.9325(24)	29481.950(21)	3390.9337(4)	−0.0012	100		sp	$(^3F)^3P^\circ\ ^3F^\circ_2$	6d	$(3/2)^2[3/2]_1$			R1c		
3392.7462(24)	29466.190(21)	3392.7444(4)	0.0019	130		s^2	$^3P_1$	sp	$(^3F)^3P^\circ\ ^3D^\circ_1$			R1c		
3393.9761(18)	29455.513(16)	3393.9803(13)	−0.0042	150	*	sp	$(^3P)^3P^\circ\ ^5P^\circ_2$	7g	$(5/2)^2[7/2]_3$			R1c		X
3393.9761(18)	29455.513(16)	3393.9829(4)	−0.0069	150	*	4d	$(3/2)^2[5/2]_2$	5f	$(3/2)^2[3/2]^\circ_2$			R1c		X
3393.9909(15)	29455.384(13)	3393.9914(6)	−0.0004	150		sp	$(^3F)^3P^\circ\ ^3G^\circ_4$	7s	$(5/2)^2[5/2]_3$			R1c		
3395.2150(9)	29444.765(8)	3395.2154(4)	−0.0004	2000		sp	$(^3F)^3P^\circ\ ^3D^\circ_2$	6d	$(5/2)^2[5/2]_2$			R1c		
3395.5206(10)	29442.115(9)	3395.5191(4)	0.0015	450		sp	$(^3F)^3P^\circ\ ^3F^\circ_2$	6d	$(3/2)^2[7/2]_3$			R1c		
3397.3752(9)	29426.043(8)	3397.3754(3)	−0.0002	740		sp	$(^3F)^3P^\circ\ ^3D^\circ_2$	6d	$(5/2)^2[7/2]_3$			R1c		
3400.4535(9)	29399.406(8)	3400.4535(6)	0.0000	96		4d	$(3/2)^2[3/2]_2$	7p	$(5/2)^2[3/2]^\circ_1$			R1c		
3402.8301(9)	29378.873(7)	3402.8303(4)	−0.0002	1500		4d	$(5/2)^2[1/2]_0$	5f	$(5/2)^2[3/2]^\circ_1$			R1c		
3406.835(2)	29344.340(21)	3406.8351(4)	−0.000	140		5s	$(3/2)^2[3/2]_2$	sp	$(^3F)^1P^\circ\ ^3F^\circ_2$			R1c		
3409.1599(8)	29324.327(7)	3409.1597(4)	0.0001	1400		4d	$(5/2)^2[1/2]_0$	5f	$(5/2)^2[1/2]^\circ_1$			R1c		
3410.4564(17)	29313.180(15)	3410.4549(5)	0.0015	90		5s	$(5/2)^2[5/2]_2$	sp	$(^3P)^3P^\circ\ ^1D^\circ_2$			R1c		
3410.6738(13)	29311.311(11)	3410.6739(9)	−0.0000	90		5p	$(3/2)^2[1/2]^\circ_1$	7d	$(5/2)^2[1/2]_0$			R1c		
3412.2696(10)	29297.604(9)	3412.2691(4)	0.0005	130		sp	$(^3F)^3P^\circ\ ^3D^\circ_2$	6d	$(5/2)^2[3/2]_1$			R1c		
3413.7074(14)	29285.265(12)	3413.7080(5)	−0.0007	180		sp	$(^3F)^3P^\circ\ ^3D^\circ_2$	6d	$(5/2)^2[3/2]_2$			R1c		

Table A1. *Cont.*

λ_{obs} [a] (Å)	σ_{obs} [b] (cm^{-1})	λ_{Ritz} [c] (Å)	$\Delta\lambda_{obs-Ritz}$ (Å)	I_{obs} [d] (arb. u.)	Char [e]	Lower Level		Upper Level		A (s^{-1})	Acc [f]	Line Ref. [g]	TP Ref. [g]	Notes [h]
3413.8952(9)	29283.654(8)	3413.8957(6)	−0.0006	220		5p	$(3/2)^2[3/2]^\circ_2$	8s	$(3/2)^2[3/2]_2$			R1c		
3416.9362(12)	29257.593(11)	3416.9349(4)	0.0012	170		sp	$(^3F)^3P^\circ\ ^1F^\circ_3$	8s	$(5/2)^2[5/2]_2$			R1c		
3421.5612(10)	29218.046(8)	3421.5612(4)	−0.0001	850		sp	$(^3F)^3P^\circ\ ^1F^\circ_3$	8s	$(5/2)^2[5/2]_3$			R1c		
3428.7658(10)	29156.654(8)	3428.7659(5)	−0.0001	330		5s	$(3/2)^2[3/2]_1$	6p	$(5/2)^2[3/2]^\circ_1$			R1c		
3430.1011(12)	29145.304(10)	3430.1015(4)	−0.0004	81		s^2	$^3P_0$	sp	$(^3F)^3P^\circ\ ^3D^\circ_1$			R1c		
3433.9380(9)	29112.740(8)	3433.9259(7)	0.0120	120	?	4d	$(3/2)^2[5/2]_3$	7p	$(5/2)^2[7/2]^\circ_4$			R1c		X
3437.1829(19)	29085.256(16)	3437.1784(5)	0.0045	78		sp	$(^3F)^3P^\circ\ ^3D^\circ_2$	6d	$(5/2)^2[1/2]_1$			R1c		
3444.1360(17)	29026.540(14)	3444.1368(7)	−0.0008	75		sp	$(^3F)^3P^\circ\ ^3D^\circ_1$	6d	$(5/2)^2[1/2]_0$			R1c		
3445.9053(16)	29011.637(13)	3445.9035(5)	0.0018	37		5p	$(3/2)^2[5/2]^\circ_2$	7d	$(5/2)^2[5/2]_2$			R1c		
3451.4534(9)	28965.003(8)	3451.4543(4)	−0.0009	360		5s	$(3/2)^2[3/2]_2$	sp	$(^1G)^3P^\circ\ ^3F^\circ_3$			R1c		
3453.9306(10)	28944.230(9)	3453.9308(6)	−0.0002	540		5s	$(3/2)^2[3/2]_1$	6p	$(5/2)^2[5/2]^\circ_2$			R1c		
3460.045(3)	28893.080(21)	3460.0456(7)	−0.000	350		sp	$(^3F)^3P^\circ\ ^3F^\circ_4$	6d	$(5/2)^2[7/2]_4$			R1c		
3460.4304(14)	28889.865(11)	3460.4309(5)	−0.0005	69		5p	$(3/2)^2[1/2]^\circ_1$	7d	$(5/2)^2[5/2]_2$			R1c		
3461.9510(15)	28877.176(12)	3461.9515(5)	−0.0005	100		5s	$(5/2)^2[5/2]_2$	sp	$(^1G)^3P^\circ\ ^3F^\circ_2$			R1nc		
3463.4085(10)	28865.024(9)	3463.4094(3)	−0.0009	140		sp	$(^3F)^3P^\circ\ ^3D^\circ_1$	7s	$(3/2)^2[3/2]_2$			R1c		
3467.679(3)	28829.480(21)	3467.6793(7)	−0.001	200		sp	$(^3F)^3P^\circ\ ^3F^\circ_4$	6d	$(5/2)^2[5/2]_3$			R1c		
3469.4366(10)	28814.873(9)	3469.4375(4)	−0.0009	1000		sp	$(^3F)^3P^\circ\ ^3D^\circ_1$	7s	$(3/2)^2[3/2]_1$			R1c		
3470.7569(14)	28803.912(11)	3470.7552(8)	0.0017	130		5p	$(3/2)^2[1/2]^\circ_1$	7d	$(5/2)^2[3/2]_1$			R1c		
3471.1558(10)	28800.602(8)	3471.1560(4)	−0.0003	260		sp	$(^3F)^3P^\circ\ ^1D^\circ_2$	8s	$(5/2)^2[5/2]_2$			R1c		
3472.0275(10)	28793.371(9)	3472.0278(3)	−0.0003	130		sp	$(^3F)^3P^\circ\ ^3F^\circ_3$	7s	$(3/2)^2[3/2]_2$			R1c		
3473.0008(10)	28785.302(8)	3473.0010(4)	−0.0002	330		5s	$(5/2)^2[5/2]_3$	sp	$(^3F)^1P^\circ\ ^3D^\circ_2$			R1c		
3476.4708(17)	28756.571(14)	3476.4703(7)	0.0005	97		sp	$(^3F)^3P^\circ\ ^3F^\circ_4$	6d	$(5/2)^2[9/2]_4$			R1c		
3478.950(3)	28736.080(21)	3478.9487(7)	0.001	640		sp	$(^3F)^3P^\circ\ ^3F^\circ_4$	6d	$(5/2)^2[9/2]_5$			R1c		
3483.8304(9)	28695.825(8)	3483.8297(4)	0.0006	310		4d	$(3/2)^2[1/2]_1$	5f	$(5/2)^2[3/2]^\circ_2$			R1c		
3487.0291(9)	28669.502(7)	3487.0290(4)	0.0001	470		4d	$(3/2)^2[1/2]_1$	5f	$(5/2)^2[1/2]^\circ_1$			R1c		
3488.0212(16)	28661.348(13)	3488.0222(6)	−0.0010	31		5s	$(3/2)^2[3/2]_1$	6p	$(5/2)^2[3/2]^\circ_2$			R1c		
3488.4370(9)	28657.932(7)	3488.4369(5)	0.0001	150		4d	$(3/2)^2[1/2]_1$	5f	$(5/2)^2[1/2]^\circ_0$			R1c		
3501.612(3)	28550.110(21)	3501.6122(4)	−0.000	59		5p	$(5/2)^2[3/2]^\circ_2$	6d	$(3/2)^2[5/2]_2$			R1c		
3503.0098(9)	28538.716(8)	3503.0101(3)	−0.0003	150		5p	$(5/2)^2[3/2]^\circ_2$	6d	$(3/2)^2[5/2]_3$			R1c		
3504.6643(15)	28525.244(12)	3504.6642(4)	0.0001	59		s^2	$^3P_1$	sp	$(^3F)^3P^\circ\ ^3D^\circ_2$			R1c		
3506.8362(11)	28507.578(9)	3506.8359(4)	0.0003	330		sp	$(^3F)^3P^\circ\ ^3D^\circ_3$	7s	$(5/2)^2[5/2]_2$			R1c		
3507.3014(10)	28503.797(8)	3507.3011(4)	0.0003	58		sp	$(^3F)^3P^\circ\ ^3D^\circ_1$	6d	$(5/2)^2[5/2]_2$			R1c		
3515.2292(11)	28439.515(9)	3515.2302(4)	−0.0011	850		sp	$(^3F)^3P^\circ\ ^3D^\circ_3$	7s	$(5/2)^2[5/2]_3$			R1c		
3516.1395(14)	28432.152(11)	3516.1396(4)	−0.0001	110		sp	$(^3F)^3P^\circ\ ^3F^\circ_3$	6d	$(5/2)^2[5/2]_2$			R1c		
3516.7786(9)	28426.985(8)	3516.7792(3)	−0.0006	280		5s	$(5/2)^2[5/2]_3$	sp	$(^3F)^1P^\circ\ ^3F^\circ_3$			R1c		
3518.0440(10)	28416.761(8)	3518.0449(4)	−0.0009	230		sp	$(^3F)^3P^\circ\ ^3F^\circ_3$	6d	$(5/2)^2[7/2]_4$			R1c		
3518.4565(9)	28413.429(7)	3518.4562(3)	0.0003	420		sp	$(^3F)^3P^\circ\ ^3F^\circ_3$	6d	$(5/2)^2[7/2]_3$			R1c		
3522.643(3)	28379.660(21)	3522.6429(6)	0.000	84		5s	$(3/2)^2[3/2]_2$	6p	$(5/2)^2[3/2]^\circ_2$			R1c		
3525.5026(16)	28356.644(13)	3525.5023(5)	0.0003	55		sp	$(^3F)^3P^\circ\ ^3D^\circ_1$	6d	$(5/2)^2[3/2]_1$			R1c		
3525.9383(15)	28353.140(12)	3525.9370(4)	0.0013	140		sp	$(^3F)^3P^\circ\ ^3F^\circ_3$	6d	$(5/2)^2[5/2]_3$			R1c		
3534.6784(20)	28283.034(16)	3534.6781(9)	0.0002	27		5p	$(5/2)^2[3/2]^\circ_1$	6d	$(3/2)^2[1/2]_0$			R1c		
3534.809(5)	28281.99(4)	3534.8076(3)	0.002	410	*	4d	$(3/2)^2[7/2]_3$	5f	$(5/2)^2[9/2]^\circ_4$			R1c		

Table A1. *Cont.*

λ_{obs} [a] (Å)	σ_{obs} [b] (cm^{-1})	λ_{Ritz} [c] (Å)	$\Delta\lambda_{obs-Ritz}$ (Å)	I_{obs} [d] (arb. u.)	Char [e]	Lower Level		Upper Level	A (s^{-1})	Acc [f]	Line Ref. [g]	TP Ref. [g]	Notes [h]
3534.809(5)	28281.99(4)	3534.8127(5)	−0.004	410	*	s^2	$^3P_2$	sp $(^3F)^3P^\circ\ ^3G^\circ_3$			R1c		
3535.0258(14)	28280.254(11)	3535.0262(4)	−0.0003	1100		sp	$(^3F)^3P^\circ\ ^3F^\circ_3$	6d $(5/2)^2[9/2]_4$			R1c		
3535.4942(10)	28276.508(8)	3535.4937(3)	0.0005	220		4d	$(3/2)^2[7/2]_3$	5f $(5/2)^2[7/2]^\circ_4$			R1c		
3535.8163(12)	28273.932(9)	3535.8167(3)	−0.0004	190		4d	$(3/2)^2[7/2]_3$	5f $(5/2)^2[7/2]^\circ_3$			R1c		
3535.9757(10)	28272.657(8)	3535.9767(5)	−0.0009	140		sp	$(^3F)^3P^\circ\ ^3F^\circ_3$	6d $(5/2)^2[3/2]_2$			R1c		
3540.1850(15)	28239.042(12)	3540.1870(5)	−0.0020	110		sp	$(^3F)^3P^\circ\ ^3G^\circ_3$	7s $(5/2)^2[5/2]_2$			R1c		
3540.3356(19)	28237.841(15)	3540.3346(4)	0.0010	110		4d	$(3/2)^2[7/2]_3$	5f $(5/2)^2[5/2]^\circ_2$			R1c		
3541.2200(20)	28230.789(16)	3541.2196(4)	0.0004	27		4d	$(3/2)^2[7/2]_3$	5f $(5/2)^2[5/2]^\circ_3$			R1c		
3546.7568(21)	28186.719(17)	3546.7551(5)	0.0017	27		5p	$(3/2)^2[3/2]^\circ_2$	7d $(5/2)^2[7/2]_3$			R1c		
3548.7423(11)	28170.949(9)	3548.7419(4)	0.0004	1400		sp	$(^3F)^3P^\circ\ ^3G^\circ_3$	7s $(5/2)^2[5/2]_3$			R1c		
3551.4887(13)	28149.165(10)	3551.4887(3)	0.0001	530		4d	$(3/2)^2[7/2]_4$	5f $(5/2)^2[9/2]^\circ_5$			R1c		
3551.8563(10)	28146.252(8)	3551.8563(3)	−0.0000	210		4d	$(3/2)^2[7/2]_4$	5f $(5/2)^2[9/2]^\circ_4$			R1c		
3552.5495(12)	28140.760(9)	3552.5490(3)	0.0005	110		4d	$(3/2)^2[7/2]_4$	5f $(5/2)^2[7/2]^\circ_4$			R1c		
3552.8735(15)	28138.194(12)	3552.8751(3)	−0.0016	53		4d	$(3/2)^2[7/2]_4$	5f $(5/2)^2[7/2]^\circ_3$			R1c		
3555.4287(21)	28117.972(17)	3555.43262(15)	−0.0039	53		5s	$(5/2)^2[5/2]_3$	4f $(5/2)^2[7/2]^\circ_4$			R1c		
3556.915(5)	28106.22(4)	3556.9167(3)	−0.001	79	*	5s	$(5/2)^2[5/2]_2$	sp $(^3F)^1P^\circ\ ^3F^\circ_3$			R1c		
3556.915(5)	28106.22(4)	3556.9231(7)	−0.008	79	*	5p	$(3/2)^2[3/2]^\circ_2$	7d $(5/2)^2[3/2]_2$			R1nc		
3558.332(4)	28095.03(3)	3558.3303(4)	0.002	52		4d	$(3/2)^2[7/2]_4$	5f $(5/2)^2[5/2]^\circ_3$			R1c		
3562.4574(10)	28062.497(8)	3562.4572(3)	0.0002	100		4d	$(3/2)^2[7/2]_4$	5f $(5/2)^2[11/2]^\circ_5$			R1c		
3563.1578(10)	28056.981(8)	3563.1580(4)	−0.0002	78		4d	$(3/2)^2[3/2]_1$	5f $(5/2)^2[5/2]^\circ_2$			R1c		
3565.7620(21)	28036.491(17)	3565.7601(4)	0.0018	52		5p	$(3/2)^2[5/2]^\circ_2$	8s $(5/2)^2[5/2]_2$			R1c		
3565.8472(10)	28035.821(8)	3565.8496(4)	−0.0024	210		5s	$(3/2)^2[3/2]_2$	6p $(5/2)^2[7/2]^\circ_3$			R1c		
3566.9405(11)	28027.228(9)	3566.9405(5)	−0.0000	52		4d	$(3/2)^2[3/2]_1$	5f $(5/2)^2[3/2]^\circ_1$			R1c		
3567.801(3)	28020.470(21)	3567.79746(15)	0.003	73		5s	$(5/2)^2[5/2]_3$	4f $(5/2)^2[5/2]^\circ_3$			R1c		
3568.7006(18)	28013.405(14)	3568.7005(4)	0.0001	78		s^2	$^3P_2$	sp $(^3F)^3P^\circ\ ^3D^\circ_3$			R1c		
3573.5908(14)	27975.072(11)	3573.58964(18)	0.0011	520		5s	$(5/2)^2[5/2]_3$	4f $(5/2)^2[7/2]^\circ_3$			R1c		
3575.373(4)	27961.13(3)	3575.3666(24)	0.006	26	*	sp	$(^1D)^3P^\circ\ ^3F^\circ_2$	9s $(3/2)^2[3/2]_1$			R1nc		
3575.373(4)	27961.13(3)	3575.3746(5)	−0.002	26	*	4d	$(3/2)^2[3/2]_1$	5f $(5/2)^2[1/2]^\circ_0$			R1c		
3577.5874(19)	27943.821(15)	3577.5764(4)	0.0110	51	?	5s	$(3/2)^2[3/2]_1$	4f $(3/2)^2[3/2]^\circ_1$			R1c		X
3578.4051(17)	27937.436(13)	3578.4043(6)	0.0008	130		5s	$(5/2)^2[5/2]_3$	sp $(^3P)^3P^\circ\ ^5S^\circ_2$			R1c		
3581.3166(13)	27914.724(10)	3581.3179(4)	−0.0013	26		5p	$(3/2)^2[1/2]^\circ_1$	8s $(5/2)^2[5/2]_2$			R1c		
3583.6322(15)	27896.687(11)	3583.6328(3)	−0.0005	77		sp	$(^3F)^3P^\circ\ ^3F^\circ_2$	7s $(3/2)^2[3/2]_2$			R1c		
3588.6079(9)	27858.009(7)	3588.6074(3)	0.0005	200		4d	$(3/2)^2[3/2]_2$	5f $(5/2)^2[7/2]^\circ_3$			R1c		
3590.0862(10)	27846.538(8)	3590.0870(3)	−0.0008	650		sp	$(^3F)^3P^\circ\ ^3F^\circ_2$	7s $(3/2)^2[3/2]_1$			R1c		
3592.1150(19)	27830.811(15)	3592.1139(5)	0.0011	51		5p	$(5/2)^2[7/2]^\circ_3$	6d $(3/2)^2[7/2]_4$			R1c		
3592.3528(10)	27828.969(8)	3592.3522(5)	0.0005	770		5s	$(3/2)^2[3/2]_1$	sp $(^3F)^1P^\circ\ ^3D^\circ_1$			R1c		
3593.2610(10)	27821.935(8)	3593.2613(4)	−0.0002	100		4d	$(3/2)^2[3/2]_2$	5f $(5/2)^2[5/2]^\circ_2$			R1c		
3594.1722(18)	27814.882(14)	3594.1729(4)	−0.0008	130		4d	$(3/2)^2[3/2]_2$	5f $(5/2)^2[5/2]^\circ_3$			R1c		
3597.100(3)	27792.240(21)	3597.1080(5)	−0.008	51		4d	$(3/2)^2[3/2]_2$	5f $(5/2)^2[3/2]^\circ_1$			R1c		
3600.4380(11)	27766.477(8)	3600.4382(4)	−0.0002	76		5p	$(5/2)^2[5/2]^\circ_2$	6d $(3/2)^2[5/2]_2$			R1c		
3600.7635(10)	27763.967(7)	3600.7638(4)	−0.0002	130		4d	$(3/2)^2[3/2]_2$	5f $(5/2)^2[3/2]^\circ_2$			R1c		
3601.9187(19)	27755.063(15)	3601.9162(4)	0.0025	200		5p	$(5/2)^2[5/2]^\circ_2$	6d $(3/2)^2[5/2]_3$			R1c		

Table A1. *Cont.*

λ_{obs} [a] (Å)	σ_{obs} [b] (cm^{-1})	λ_{Ritz} [c] (Å)	$\Delta\lambda_{obs-Ritz}$ (Å)	I_{obs} [d] (arb. u.)	Char [e]	Lower Level		Upper Level		A (s^{-1})	Acc [f]	Line Ref. [g]	TP Ref. [g]	Notes [h]
3602.2331(11)	27752.641(8)	3602.2324(3)	0.0007	1200		sp	$(^3F)^3P^\circ\ ^3D^\circ_2$	7s	$(5/2)^2[5/2]_2$			R1c		
3606.6576(11)	27718.596(8)	3606.6576(4)	0.0000	1900		5s	$(5/2)^2[5/2]_3$	sp	$(^3F)^1P^\circ\ ^3D^\circ_3$			R1c		
3611.0901(10)	27684.573(7)	3611.0902(3)	−0.0001	370		sp	$(^3F)^3P^\circ\ ^3D^\circ_2$	7s	$(5/2)^2[5/2]_3$			R1c		
3611.172	27683.94	3611.1721(4)			:	5p	$(5/2)^2[5/2]^\circ_2$	6d	$(3/2)^2[3/2]_2$					
3615.0429(20)	27654.303(16)	3615.04192(19)	0.0010	25		5s	$(5/2)^2[5/2]_2$	4f	$(5/2)^2[7/2]^\circ_3$			R1c		
3616.8636(10)	27640.382(7)	3616.8630(4)	0.0007	890		5p	$(5/2)^2[3/2]^\circ_1$	6d	$(3/2)^2[3/2]_2$			R1c		
3621.4008(19)	27605.753(15)	3621.4013(5)	−0.0005	26		5p	$(5/2)^2[5/2]^\circ_2$	6d	$(3/2)^2[7/2]_3$			R1c		
3621.8942(11)	27601.992(8)	3621.8927(4)	0.0016	77		5p	$(5/2)^2[3/2]^\circ_1$	6d	$(3/2)^2[3/2]_1$			R1c		
3626.350(3)	27568.080(21)	3626.3111(9)	0.039	77	?	sp	$(^3F)^3P^\circ\ ^1G^\circ_4$	6d	$(5/2)^2[7/2]_4$			R1c		X
3626.973(3)	27563.340(21)	3626.9734(4)	−0.000	51		5p	$(5/2)^2[5/2]^\circ_3$	6d	$(3/2)^2[5/2]_2$			R1c		
3628.4741(10)	27551.940(8)	3628.4733(4)	0.0008	130		5p	$(5/2)^2[5/2]^\circ_3$	6d	$(3/2)^2[5/2]_3$			R1c		
3629.0907(16)	27547.259(12)	3629.0858(5)	0.0049	51		5s	$(3/2)^2[3/2]_2$	sp	$(^3F)^1P^\circ\ ^3D^\circ_1$			R1c		
3629.3186(19)	27545.529(15)	3629.3176(3)	0.0011	26		4d	$(3/2)^2[5/2]_3$	5f	$(5/2)^2[9/2]^\circ_4$			R1c		
3630.0412(11)	27540.046(8)	3630.0408(3)	0.0004	100		4d	$(3/2)^2[5/2]_3$	5f	$(5/2)^2[7/2]^\circ_4$			R1c		
3630.6454(10)	27535.463(7)	3630.6450(4)	0.0004	380		sp	$(^3F)^3P^\circ\ ^3F^\circ_2$	6d	$(5/2)^2[5/2]_2$			R1c		
3631.6198(22)	27528.075(17)	3631.61939(23)	0.0004	51		5s	$(5/2)^2[5/2]_2$	4f	$(5/2)^2[1/2]^\circ_1$			R1c		
3633.1159(10)	27516.740(8)	3633.1151(4)	0.0008	520		sp	$(^3F)^3P^\circ\ ^3F^\circ_2$	6d	$(5/2)^2[7/2]_3$			R1c		
3635.1554(17)	27501.302(13)	3635.1443(4)	0.0111	210	bl	4d	$(3/2)^2[5/2]_3$	5f	$(5/2)^2[5/2]^\circ_2$			R1c		X
3636.0783(17)	27494.322(13)	3636.0773(4)	0.0009	77		4d	$(3/2)^2[5/2]_3$	5f	$(5/2)^2[5/2]^\circ_3$			R1c		
3637.867(3)	27480.800(21)	3637.8663(4)	0.001	26		5p	$(5/2)^2[5/2]^\circ_3$	6d	$(3/2)^2[3/2]_2$			R1c		
3641.0912(20)	27456.470(15)	3641.0918(5)	−0.0007	52		sp	$(^3F)^3P^\circ\ ^3F^\circ_2$	6d	$(5/2)^2[5/2]_3$			R1c		
3641.7928(11)	27451.180(8)	3641.7903(4)	0.0025	1000		s^2	$^1G_4$	5p	$(3/2)^2[5/2]^\circ_3$			R1c		
3642.4505(14)	27446.224(11)	3642.4488(4)	0.0017	77		4d	$(3/2)^2[5/2]_2$	5f	$(5/2)^2[5/2]^\circ_3$			R1c		
3642.8238(22)	27443.411(17)	3642.8229(4)	0.0009	26		4d	$(3/2)^2[5/2]_3$	5f	$(5/2)^2[3/2]^\circ_2$			R1c		
3643.0146(11)	27441.974(8)	3643.0150(5)	−0.0004	770		5p	$(5/2)^2[3/2]^\circ_1$	6d	$(3/2)^2[1/2]_1$			R1c		
3643.7566(10)	27436.386(7)	3643.7571(5)	−0.0005	1300		5p	$(5/2)^2[5/2]^\circ_3$	6d	$(3/2)^2[7/2]_4$			R1c		
3647.081(4)	27411.38(3)	3647.0800(10)	0.001	160		sp	$(^3F)^3P^\circ\ ^1G^\circ_4$	6d	$(5/2)^2[9/2]_5$			R1c		
3648.2463(20)	27402.622(15)	3648.2475(5)	−0.0011	52		5p	$(5/2)^2[5/2]^\circ_3$	6d	$(3/2)^2[7/2]_3$			R1c		
3648.8875(15)	27397.807(11)	3648.8850(4)	0.0025	390		5s	$(5/2)^2[5/2]_2$	sp	$(^3F)^1P^\circ\ ^3D^\circ_3$			R1c		
3649.2205(22)	27395.307(17)	3649.2180(4)	0.0025	52		4d	$(3/2)^2[5/2]_2$	5f	$(5/2)^2[3/2]^\circ_2$			R1c		
3651.800(3)	27375.960(21)	3651.7990(5)	0.001	100		sp	$(^3F)^3P^\circ\ ^3F^\circ_2$	6d	$(5/2)^2[3/2]_2$			R1c		
3664.2913(10)	27282.636(8)	3664.2900(5)	0.0014	130		5s	$(3/2)^2[3/2]_2$	sp	$(^3P)^3P^\circ\ ^1D^\circ_2$			R1c		
3678.6688(20)	27176.009(15)	3678.6702(6)	−0.0014	80		sp	$(^3F)^3P^\circ\ ^3F^\circ_2$	6d	$(5/2)^2[1/2]_1$			R1c		
3682.4238(14)	27148.298(11)	3682.4254(7)	−0.0016	3900		sp	$(^3F)^3P^\circ\ ^3F^\circ_4$	7s	$(5/2)^2[5/2]_3$			R1c		
3686.5552(10)	27117.875(8)	3686.5539(4)	0.0013	16000		4p	$^3F^\circ_3$	s^2	$^1G_4$	9.7e+05	C+	R1c	O07	
3693.3279(12)	27068.148(9)	3693.3271(10)	0.0009	81		4d	$(3/2)^2[1/2]_0$	7p	$(3/2)^2[1/2]^\circ_1$			R2nc		
3703.9305(11)	26990.667(8)	3703.9285(5)	0.0020	680		sp	$(^3F)^3P^\circ\ ^1F^\circ_3$	6d	$(3/2)^2[7/2]_4$			R1c		
3724.1764(11)	26843.940(8)	3724.1770(3)	−0.0006	390		5p	$(5/2)^2[3/2]^\circ_2$	7s	$(3/2)^2[3/2]_2$			R1c		
3725.4537(17)	26834.737(12)	3725.4544(4)	−0.0007	110		4p	$^3F^\circ_4$	s^2	$^1G_4$			R1c		
3728.6574(10)	26811.681(7)	3728.6569(4)	0.0005	280		sp	$(^3F)^3P^\circ\ ^3D^\circ_1$	7s	$(5/2)^2[5/2]_2$			R1c		
3730.3433(10)	26799.564(7)	3730.3437(5)	−0.0005	250		5s	$(5/2)^2[5/2]_2$	sp	$(^3P)^3P^\circ\ ^3P^\circ_1$			R1c		
3731.1462(13)	26793.797(9)	3731.1479(3)	−0.0018	170		5p	$(5/2)^2[3/2]^\circ_2$	7s	$(3/2)^2[3/2]_1$			R1c		

Table A1. *Cont.*

λ_{obs} [a] (Å)	σ_{obs} [b] (cm^{-1})	λ_{Ritz} [c] (Å)	$\Delta\lambda_{obs-Ritz}$ (Å)	I_{obs} [d] (arb. u.)	Char [e]	Lower Level		Upper Level		A (s^{-1})	Acc [f]	Line Ref. [g]	TP Ref. [g]	Notes [h]
3738.6488(10)	26740.029(7)	3738.6478(3)	0.0010	1700		sp	$(^3F)^3P^\circ\ ^3F^\circ_3$	7s	$(5/2)^2[5/2]_2$			R1c		
3740.3281(11)	26728.024(8)	3740.3278(4)	0.0003	280		5s	$(5/2)^2[5/2]_3$	sp	$(^3F)^1P^\circ\ ^3F^\circ_4$			R1c		
3742.0597(10)	26715.656(7)	3742.0592(4)	0.0006	430		5s	$(3/2)^2[3/2]_1$	sp	$(^3F)^1P^\circ\ ^3D^\circ_2$			R1c		
3748.1909(10)	26671.956(7)	3748.1901(3)	0.0008	1800		sp	$(^3F)^3P^\circ\ ^3F^\circ_3$	7s	$(5/2)^2[5/2]_3$			R1c		
3749.782(10)	26660.64(7)	3749.7756(4)	0.006	400	*	5s	$(5/2)^2[5/2]_3$	sp	$(^3P)^3P^\circ\ ^3D^\circ_2$			R1c		
3749.782(10)	26660.64(7)	3749.7826(5)	−0.001	400	*	sp	$(^3F)^3P^\circ\ ^1D^\circ_2$	6d	$(3/2)^2[5/2]_2$			R1c		
3751.3859(10)	26649.241(7)	3751.3858(4)	0.0001	310		sp	$(^3F)^3P^\circ\ ^1D^\circ_2$	6d	$(3/2)^2[5/2]_3$			R1c		
3761.4270(14)	26578.103(10)	3761.4269(5)	0.0001	150		sp	$(^3F)^3P^\circ\ ^1D^\circ_2$	6d	$(3/2)^2[3/2]_2$			R1c		
3766.8662(14)	26539.726(10)	3766.8669(5)	−0.0007	230		sp	$(^3F)^3P^\circ\ ^1D^\circ_2$	6d	$(3/2)^2[3/2]_1$			R1c		
3772.5256(10)	26499.913(7)	3772.5262(5)	−0.0006	480		sp	$(^3F)^3P^\circ\ ^1D^\circ_2$	6d	$(3/2)^2[7/2]_3$			R1c		
3774.9743(20)	26482.724(14)	3774.9751(4)	−0.0008	59		5p	$(5/2)^2[3/2]^\circ_2$	6d	$(5/2)^2[5/2]_2$			R1c		
3777.6444(10)	26464.006(7)	3777.6455(3)	−0.0011	150		5p	$(5/2)^2[3/2]^\circ_2$	6d	$(5/2)^2[7/2]_3$			R1c		
3781.9355(12)	26433.980(9)	3781.9350(4)	0.0005	290		5s	$(3/2)^2[3/2]_2$	sp	$(^3F)^1P^\circ\ ^3D^\circ_2$			R1c		
3786.2696(10)	26403.721(7)	3786.2702(5)	−0.0006	3200		5p	$(5/2)^2[3/2]^\circ_2$	6d	$(5/2)^2[5/2]_3$			R1c		
3795.4413(11)	26339.919(8)	3795.4419(4)	−0.0006	450		5s	$(5/2)^2[5/2]_2$	sp	$(^3P)^3P^\circ\ ^3D^\circ_2$			R1c		
3796.0675(12)	26335.574(8)	3796.0687(4)	−0.0012	580		5p	$(5/2)^2[3/2]^\circ_2$	6d	$(5/2)^2[3/2]_1$			R1c		
3796.1694(12)	26334.867(9)	3796.1694(11)	−0.0000	820		5p	$(3/2)^2[1/2]^\circ_1$	6d	$(3/2)^2[1/2]_0$			R1c		
3797.8489(10)	26323.221(7)	3797.8496(5)	−0.0007	4200		5p	$(5/2)^2[3/2]^\circ_2$	6d	$(5/2)^2[3/2]_2$			R1c		
3801.5563(10)	26297.551(7)	3801.5556(5)	0.0007	670		5p	$(3/2)^2[1/2]^\circ_0$	6d	$(3/2)^2[3/2]_1$			R1c		
3806.27(5)	26265.0(3)	3806.333(3)	−0.06	7400		d^{10}	$^1S_0$	4s	$^1D_2$	1.58e+00	C+	T53,M97,P84	P84	X,E2
3818.8787(11)	26178.268(7)	3818.8793(8)	−0.0006	2000		5p	$(5/2)^2[3/2]^\circ_1$	6d	$(5/2)^2[1/2]_0$			R1c		
3824.8323(11)	26137.521(8)	3824.8321(6)	0.0002	1000		5p	$(3/2)^2[1/2]^\circ_0$	6d	$(3/2)^2[1/2]_1$			R1c		
3826.9209(10)	26123.256(7)	3826.9216(6)	−0.0007	3000		5p	$(5/2)^2[3/2]^\circ_2$	6d	$(5/2)^2[1/2]_1$			R1c		
3836.1646(11)	26060.310(7)	3836.1655(3)	−0.0010	1800		5p	$(5/2)^2[5/2]^\circ_2$	7s	$(3/2)^2[3/2]_2$			R1c		
3841.4818(11)	26024.240(7)	3841.4819(4)	−0.0001	590		5s	$(5/2)^2[5/2]_2$	sp	$(^3P)^3P^\circ\ ^3D^\circ_1$			R1c		
3842.5889(12)	26016.742(8)	3842.5882(3)	0.0007	2000		5p	$(5/2)^2[3/2]^\circ_1$	7s	$(3/2)^2[3/2]_2$			R1c		
3843.5628(13)	26010.150(9)	3843.5624(3)	0.0004	150		5p	$(5/2)^2[5/2]^\circ_2$	7s	$(3/2)^2[3/2]_1$			R1c		
3849.5824(13)	25969.479(9)	3849.5810(5)	0.0014	1700		5s	$(5/2)^2[5/2]_3$	sp	$(^3P)^3P^\circ\ ^3D^\circ_3$			R1c		
3850.0092(15)	25966.600(10)	3850.0099(3)	−0.0007	1600		5p	$(5/2)^2[3/2]^\circ_1$	7s	$(3/2)^2[3/2]_1$			R1c		
3851.1050(11)	25959.212(7)	3851.1020(4)	0.0030	890		s^2	$^1G_4$	sp	$(^3F)^3P^\circ\ ^1F^\circ_3$			R1c		
3859.41(6)	25903.4(4)	3859.4330(7)	−0.02	180		4d	$(5/2)^2[3/2]_2$	6p	$(3/2)^2[3/2]^\circ_2$			S36c		
3861.3421(11)	25890.391(8)	3861.3424(4)	−0.0004	1300		5p	$(5/2)^2[7/2]^\circ_3$	6d	$(5/2)^2[5/2]_2$			R1c		
3862.1245(11)	25885.146(8)	3862.1243(4)	0.0002	1200		5p	$(3/2)^2[5/2]^\circ_2$	6d	$(3/2)^2[5/2]_3$			R1c		
3863.6403(11)	25874.991(8)	3863.6404(4)	−0.0001	1200		5p	$(5/2)^2[7/2]^\circ_3$	6d	$(5/2)^2[7/2]_4$			R1c		
3864.1370(11)	25871.665(7)	3864.1365(4)	0.0005	3200		5p	$(5/2)^2[7/2]^\circ_3$	6d	$(5/2)^2[7/2]_3$			R1c		
3866.3047(11)	25857.160(7)	3866.3035(3)	0.0013	1200		5p	$(5/2)^2[5/2]^\circ_3$	7s	$(3/2)^2[3/2]_2$			R1c		
3868.3711(11)	25843.348(7)	3868.3707(3)	0.0004	1100		sp	$(^3F)^3P^\circ\ ^3F^\circ_2$	7s	$(5/2)^2[5/2]_2$			R1c		
3871.334(3)	25823.570(21)	3871.3321(10)	0.002	210		sp	$(^3F)^3P^\circ\ ^1G^\circ_4$	7s	$(5/2)^2[5/2]_3$			R1c		
3872.7645(15)	25814.031(10)	3872.7678(5)	−0.0033	550		5p	$(3/2)^2[5/2]^\circ_2$	6d	$(3/2)^2[3/2]_2$			R1c		
3873.2075(11)	25811.078(7)	3873.2058(6)	0.0017	940		5s	$(5/2)^2[5/2]_3$	sp	$(^3P)^3P^\circ\ ^3P^\circ_2$			R1c		
3878.5873(12)	25775.278(8)	3878.5875(3)	−0.0002	860		sp	$(^3F)^3P^\circ\ ^3F^\circ_2$	7s	$(5/2)^2[5/2]_3$			R1c		

Table A1. *Cont.*

λ_{obs} [a] (Å)	σ_{obs} [b] (cm^{-1})	λ_{Ritz} [c] (Å)	$\Delta\lambda_{obs-Ritz}$ (Å)	I_{obs} [d] (arb. u.)	Char [e]	Lower Level		Upper Level		A (s^{-1})	Acc [f]	Line Ref. [g]	TP Ref. [g]	Notes [h]
3878.667	25774.75	3878.6670(5)			:	5p	$(3/2)^2[1/2]^\circ_1$	6d	$(3/2)^2[5/2]_2$					
3879.3966(11)	25769.901(7)	3879.3976(4)	−0.0010	3800		5p	$(5/2)^2[7/2]^\circ_4$	6d	$(5/2)^2[7/2]_4$			R1c		
3879.8973(21)	25766.576(14)	3879.8977(4)	−0.0005	140		5p	$(5/2)^2[7/2]^\circ_4$	6d	$(5/2)^2[7/2]_3$			R1c		
3884.1312(9)	25738.489(6)	3884.1313(5)	−0.0001	8100		5p	$(5/2)^2[7/2]^\circ_3$	6d	$(5/2)^2[9/2]_4$	3.1e+07	D+	F_Re	TW	
3884.5339(11)	25735.821(7)	3884.5350(5)	−0.0010	3800		5p	$(3/2)^2[5/2]^\circ_2$	6d	$(3/2)^2[7/2]_3$	3.1e+07	D+	R1c	TW	
3885.2865(17)	25730.836(11)	3885.2789(5)	0.0076	85	bl	5p	$(5/2)^2[7/2]^\circ_3$	6d	$(5/2)^2[3/2]_2$			R1c		X
3890.0864(14)	25699.088(9)	3890.0865(4)	−0.0001	2200		5p	$(5/2)^2[5/2]^\circ_2$	6d	$(5/2)^2[5/2]_2$			R1c		
3891.1277(12)	25692.211(8)	3891.1267(5)	0.0010	1500		5p	$(3/2)^2[1/2]^\circ_1$	6d	$(3/2)^2[3/2]_2$			R1c		
3892.9237(11)	25680.358(7)	3892.9223(4)	0.0014	3000		5p	$(5/2)^2[5/2]^\circ_2$	6d	$(5/2)^2[7/2]_3$			R1c		
3894.6198(21)	25669.175(14)	3894.61915(19)	0.0006	280		5s	$(3/2)^2[3/2]_2$	4f	$(5/2)^2[5/2]^\circ_3$			R1c		
3896.6915(11)	25655.527(7)	3896.6912(4)	0.0003	1900		5p	$(5/2)^2[3/2]^\circ_1$	6d	$(5/2)^2[5/2]_2$			R1c		
3896.9491(20)	25653.832(13)	3896.9487(5)	0.0004	280		5p	$(3/2)^2[1/2]^\circ_1$	6d	$(3/2)^2[3/2]_1$			R1c		
3897.7292(20)	25648.698(13)	3897.7262(5)	0.0030	2500		5s	$(5/2)^2[5/2]_2$	sp	$(^3P)^3P^\circ\ ^3D^\circ_3$			R1c		
3900.0557(11)	25633.397(7)	3900.0565(5)	−0.0008	1100		5p	$(5/2)^2[7/2]^\circ_4$	6d	$(5/2)^2[9/2]_4$			R1c		
3901.2315(12)	25625.672(8)	3901.2316(5)	−0.0000	280		5p	$(3/2)^2[5/2]^\circ_3$	6d	$(3/2)^2[5/2]_2$			R1c		
3902.0837(24)	25620.076(16)	3902.0821(5)	0.0016	140		5p	$(5/2)^2[5/2]^\circ_2$	6d	$(5/2)^2[5/2]_3$			R1c		
3902.9667(12)	25614.280(8)	3902.9668(4)	−0.0002	2500		5p	$(3/2)^2[5/2]^\circ_3$	6d	$(3/2)^2[5/2]_3$			R1c		
3903.1761(7)	25612.905(5)	3903.1759(5)	0.0002	8200		5p	$(5/2)^2[7/2]^\circ_4$	6d	$(5/2)^2[9/2]_5$	3.5e+07	D+	F_Re	TW	
3905.1121(14)	25600.208(9)	3905.1133(6)	−0.0012	830		4d	$(3/2)^2[1/2]_0$	5f	$(3/2)^2[3/2]^\circ_1$			R1c		
3907.2743(24)	25586.042(16)	3907.2616(8)	0.0127	82	?	5s	$(3/2)^2[3/2]_2$	sp	$(^3P)^3P^\circ\ ^5S^\circ_2$			R1c		X
3912.4911(12)	25551.927(8)	3912.4900(5)	0.0011	690		5p	$(5/2)^2[5/2]^\circ_2$	6d	$(5/2)^2[3/2]_1$			R1c		
3913.8355(14)	25543.150(9)	3913.8369(5)	−0.0014	160		5p	$(3/2)^2[5/2]^\circ_3$	6d	$(3/2)^2[3/2]_2$			R1c		
3914.311(3)	25540.050(21)	3914.3081(9)	0.002	110	bl	4d	$(5/2)^2[9/2]_4$	6p	$(3/2)^2[5/2]^\circ_3$			R1c		
3918.3817(12)	25513.515(8)	3918.3792(4)	0.0025	400		s^2	$^1G_4$	5p	$(5/2)^2[5/2]^\circ_3$			R1c		
3919.1725(11)	25508.366(7)	3919.1710(4)	0.0016	1000		5p	$(5/2)^2[3/2]^\circ_1$	6d	$(5/2)^2[3/2]_1$			R1c		
3920.6546(11)	25498.724(7)	3920.6561(5)	−0.0015	4000		5p	$(3/2)^2[5/2]^\circ_3$	6d	$(3/2)^2[7/2]_4$	3.3e+07	D+	R1c	TW	
3921.071(10)	25496.02(7)	3921.0693(5)	0.002	130	*	5p	$(5/2)^2[3/2]^\circ_1$	6d	$(5/2)^2[3/2]_2$			R1c		
3921.071(10)	25496.02(7)	3921.0811(4)	−0.010	130	*	5p	$(5/2)^2[5/2]^\circ_3$	6d	$(5/2)^2[5/2]_2$			R1c		
3921.4136(15)	25493.789(10)	3921.4117(6)	0.0019	450		5p	$(3/2)^2[1/2]^\circ_1$	6d	$(3/2)^2[1/2]_1$			R1c		
3923.4504(11)	25480.555(7)	3923.4506(5)	−0.0003	2100		5p	$(5/2)^2[5/2]^\circ_3$	6d	$(5/2)^2[7/2]_4$			R1c		
3923.9630(12)	25477.226(8)	3923.9622(4)	0.0008	400		5p	$(5/2)^2[5/2]^\circ_3$	6d	$(5/2)^2[7/2]_3$			R1c		
3925.8560(11)	25464.942(7)	3925.8554(5)	0.0006	390		5p	$(3/2)^2[5/2]^\circ_3$	6d	$(3/2)^2[7/2]_3$			R1c		
3933.2684(11)	25416.953(7)	3933.2688(5)	−0.0004	2000		5p	$(5/2)^2[5/2]^\circ_3$	6d	$(5/2)^2[5/2]_3$			R1c		
3934.1202(11)	25411.450(7)	3934.1175(3)	0.0027	470		sp	$(^3F)^3P^\circ\ ^1F^\circ_3$	7s	$(3/2)^2[3/2]_2$			R1c		
3935.9626(14)	25399.555(9)	3935.9560(6)	0.0067	380	bl	5s	$(3/2)^2[3/2]_1$	sp	$(^3P)^3P^\circ\ ^3P^\circ_0$			R1c		X
3940.9702(12)	25367.282(8)	3940.9707(5)	−0.0004	300		5s	$(3/2)^2[3/2]_2$	sp	$(^3F)^1P^\circ\ ^3D^\circ_3$			R1c		
3944.5822(12)	25344.054(8)	3944.5826(5)	−0.0004	490		5p	$(5/2)^2[5/2]^\circ_3$	6d	$(5/2)^2[9/2]_4$			R1c		
3945.5770(12)	25337.664(8)	3945.5767(5)	0.0004	2300		5p	$(3/2)^2[3/2]^\circ_1$	6d	$(3/2)^2[5/2]_2$			R1c		
3945.7664(13)	25336.448(9)	3945.7662(5)	0.0002	1500		5p	$(5/2)^2[5/2]^\circ_3$	6d	$(5/2)^2[3/2]_2$			R1c		
3952.0661(11)	25296.062(7)	3952.0660(6)	0.0001	980		5p	$(5/2)^2[3/2]^\circ_1$	6d	$(5/2)^2[1/2]_1$			R1c		
3958.4734(13)	25255.118(8)	3958.4707(5)	0.0027	840		5p	$(3/2)^2[3/2]^\circ_1$	6d	$(3/2)^2[3/2]_2$			R1c		
3974.3504(22)	25154.229(14)	3974.3528(7)	−0.0024	91		4d	$(5/2)^2[5/2]_2$	6p	$(3/2)^2[3/2]^\circ_2$			R1c		

Table A1. *Cont.*

λ_{obs} [a] (Å)	σ_{obs} [b] (cm^{-1})	λ_{Ritz} [c] (Å)	$\Delta\lambda_{obs-Ritz}$ (Å)	I_{obs} [d] (arb. u.)	Char [e]	Lower Level		Upper Level		A (s^{-1})	Acc [f]	Line Ref. [g]	TP Ref. [g]	Notes [h]
3975.5387(13)	25146.711(8)	3975.5380(9)	0.0007	90		4d	$(3/2)^2[1/2]_0$	7p	$(5/2)^2[3/2]^\circ_1$			R1c		
3985.2145(11)	25085.657(7)	3985.2136(5)	0.0009	700		5p	$(3/2)^2[3/2]^\circ_2$	6d	$(3/2)^2[5/2]_2$			R1c		
3987.0237(11)	25074.274(7)	3987.0244(5)	−0.0007	2300		5p	$(3/2)^2[3/2]^\circ_2$	6d	$(3/2)^2[5/2]_3$			R1c		
3990.7807(13)	25050.670(8)	3990.7773(5)	0.0033	960		5s	$(3/2)^2[3/2]_1$	sp	$(^3P)^3P^\circ\ ^3P^\circ_1$			R1c		
3993.3023(12)	25034.852(8)	3993.3022(5)	0.0001	2600		sp	$(^3F)^3P^\circ\ ^1F^\circ_3$	6d	$(5/2)^2[7/2]_4$			R1c		
3998.3675(12)	25003.138(8)	3998.3684(5)	−0.0009	860		5p	$(3/2)^2[3/2]^\circ_2$	6d	$(3/2)^2[3/2]_2$			R1c		
4003.4759(12)	24971.235(8)	4003.4736(5)	0.0023	1600		sp	$(^3F)^3P^\circ\ ^1F^\circ_3$	6d	$(5/2)^2[5/2]_3$			R1c		
4004.5155(14)	24964.752(9)	4004.5160(6)	−0.0004	400		5p	$(3/2)^2[3/2]^\circ_2$	6d	$(3/2)^2[3/2]_1$			R1c		
4006.1651(12)	24954.473(7)	4006.1666(3)	−0.0015	1500		sp	$(^3F)^3P^\circ\ ^1D^\circ_2$	7s	$(3/2)^2[3/2]_2$			R1c		
4014.2360(12)	24904.301(7)	4014.2342(4)	0.0018	870		sp	$(^3F)^3P^\circ\ ^1D^\circ_2$	7s	$(3/2)^2[3/2]_1$			R1c		
4015.1963(12)	24898.345(8)	4015.1954(5)	0.0009	860		sp	$(^3F)^3P^\circ\ ^1F^\circ_3$	6d	$(5/2)^2[9/2]_4$			R1c		
4016.4254(14)	24890.726(9)	4016.4218(6)	0.0036	1500		sp	$(^3F)^3P^\circ\ ^1F^\circ_3$	6d	$(5/2)^2[3/2]_2$			R1c		
4030.3508(21)	24804.727(13)	4030.3525(7)	−0.0018	330		5p	$(3/2)^2[3/2]^\circ_2$	6d	$(3/2)^2[1/2]_1$			R1c		
4032.6469(12)	24790.604(7)	4032.6470(3)	−0.0001	1500		5p	$(5/2)^2[3/2]^\circ_2$	7s	$(5/2)^2[5/2]_2$			R1c		
4042.549(3)	24729.880(21)	4042.5473(7)	0.002	67		4d	$(5/2)^2[1/2]_1$	6p	$(5/2)^2[3/2]^\circ_1$			R1c		
4043.4879(9)	24724.139(6)	4043.4858(5)	0.0021	27000		4p	$^1F^\circ_3$	s^2	$^1G_4$	1.14e+06	C+	F_Re	O07	
4043.7515(4)	24722.527(3)	4043.75122(21)	0.0003	17000		5p	$(5/2)^2[3/2]^\circ_2$	7s	$(5/2)^2[5/2]_3$			F_Re		
4053.6529(21)	24662.142(13)	4053.6521(4)	0.0008	3100		5p	$(3/2)^2[1/2]^\circ_0$	7s	$(3/2)^2[3/2]_1$			R1c		
4065.0094(12)	24593.244(7)	4065.0090(4)	0.0004	1600		sp	$(^3F)^3P^\circ\ ^1D^\circ_2$	6d	$(5/2)^2[5/2]_2$			R1c		
4065.3723(22)	24591.049(13)	4065.3730(5)	−0.0007	230		5s	$(3/2)^2[3/2]_1$	sp	$(^3P)^3P^\circ\ ^3D^\circ_2$			R1c		
4068.1058(12)	24574.526(7)	4068.1056(4)	0.0001	2000		sp	$(^3F)^3P^\circ\ ^1D^\circ_2$	6d	$(5/2)^2[7/2]_3$			R1c		
4089.4787(13)	24446.094(8)	4089.4788(5)	−0.0001	480		sp	$(^3F)^3P^\circ\ ^1D^\circ_2$	6d	$(5/2)^2[3/2]_1$			R1c		
4112.4816(13)	24309.359(8)	4112.4801(5)	0.0015	820		5s	$(3/2)^2[3/2]_2$	sp	$(^3P)^3P^\circ\ ^3D^\circ_2$			R1c		
4118.2403(24)	24275.367(14)	4118.2398(5)	0.0005	57		5s	$(3/2)^2[3/2]_1$	sp	$(^3P)^3P^\circ\ ^3D^\circ_1$			R1c		
4125.171(4)	24234.580(21)	4125.1717(8)	−0.000	11		4d	$(5/2)^2[1/2]_1$	6p	$(5/2)^2[3/2]^\circ_2$			R1c		
4125.9352(17)	24230.094(10)	4125.9352(9)	0.0001	65		5p	$(3/2)^2[1/2]^\circ_1$	6d	$(5/2)^2[1/2]_0$			R1c		
4131.3610(4)	24198.2729(25)	4131.3610(3)	0.0000	16000		5p	$(5/2)^2[7/2]^\circ_3$	7s	$(5/2)^2[5/2]_2$			F_Re		
4132.7116(21)	24190.365(12)	4132.7109(3)	0.0007	1000		5p	$(3/2)^2[5/2]^\circ_2$	7s	$(3/2)^2[3/2]_2$			R1c		
4141.2965(5)	24140.219(3)	4141.2968(4)	−0.0003	9700		5p	$(3/2)^2[5/2]^\circ_2$	7s	$(3/2)^2[3/2]_1$			F_Re		
4143.0170(13)	24130.195(7)	4143.01624(20)	0.0007	2100		5p	$(5/2)^2[7/2]^\circ_3$	7s	$(5/2)^2[5/2]_3$			R1c		
4147.8136(20)	24102.291(11)	4147.8131(6)	0.0004	190		4d	$(5/2)^2[3/2]_2$	6p	$(5/2)^2[5/2]^\circ_3$			R1c		
4151.904(3)	24078.544(15)	4151.9059(6)	−0.002	47		4d	$(5/2)^2[9/2]_4$	6p	$(5/2)^2[5/2]^\circ_3$			R1c		
4153.6234(13)	24068.579(7)	4153.6236(3)	−0.0003	3600		5p	$(3/2)^2[1/2]^\circ_1$	7s	$(3/2)^2[3/2]_2$			R1c		
4154.642(4)	24062.680(21)	4154.642(4)	−0.000	9		s^2	$^3P_2$	sp	$(^3F)^3P^\circ\ ^5G^\circ_2$			R1c		
4161.13984(15)	24025.1034(9)	4161.13989(14)	−0.00005	17000		5p	$(5/2)^2[7/2]^\circ_4$	7s	$(5/2)^2[5/2]_3$			F_Re		
4162.2967(14)	24018.426(8)	4162.2967(4)	0.0000	3000		5p	$(3/2)^2[1/2]^\circ_1$	7s	$(3/2)^2[3/2]_1$			R1c		
4164.2826(10)	24006.972(6)	4164.2827(3)	−0.0001	8700		5p	$(5/2)^2[5/2]^\circ_2$	7s	$(5/2)^2[5/2]_2$			F_Re		
4165.67(15)	23999.0(9)	4165.775(3)	−0.10	3		d^{10}	$^1S_0$	4s	$^3D_1$	2.1e−12	C+	M97	TW	X,M1
4166.5884(23)	23993.687(13)	4166.5874(5)	0.0010	350		5s	$(3/2)^2[3/2]_2$	sp	$(^3P)^3P^\circ\ ^3D^\circ_1$			R1c		
4171.8513(5)	23963.419(3)	4171.8521(3)	−0.0007	10000		5p	$(5/2)^2[3/2]^\circ_1$	7s	$(5/2)^2[5/2]_2$			F_Re		
4176.1248(12)	23938.897(7)	4176.1247(3)	0.0001	1400		5p	$(5/2)^2[5/2]^\circ_2$	7s	$(5/2)^2[5/2]_3$			R1c		

Table A1. *Cont.*

λ_{obs} [a] (Å)	σ_{obs} [b] (cm^{-1})	λ_{Ritz} [c] (Å)	$\Delta\lambda_{obs-Ritz}$ (Å)	I_{obs} [d] (arb. u.)	Char [e]	Lower Level		Upper Level		A (s^{-1})	Acc [f]	Line Ref. [g]	TP Ref. [g]	Notes [h]
4179.5117(4)	23919.4987(21)	4179.5113(3)	0.0003	12000		5p	$(3/2)^2[5/2]^\circ_3$	7s	$(3/2)^2[3/2]_2$			F_Re		
4185.149(4)	23887.280(21)	4185.1555(11)	−0.006	8		s^2	$^1D_2$	sp	$(^3F)^3P^\circ\ ^5D^\circ_3$			R1c		
4195.3590(16)	23829.148(9)	4195.3583(5)	0.0007	210		5p	$(3/2)^2[5/2]^\circ_2$	6d	$(5/2)^2[5/2]_2$			R1c		
4195.7735(13)	23826.794(8)	4195.7740(7)	−0.0005	340		4d	$(5/2)^2[9/2]_5$	6p	$(5/2)^2[7/2]^\circ_4$			R1c		
4198.6561(13)	23810.436(8)	4198.6568(4)	−0.0007	240		5p	$(3/2)^2[5/2]^\circ_2$	6d	$(5/2)^2[7/2]_3$			R1c		
4199.435(4)	23806.020(21)	4199.4464(9)	−0.011	110		4d	$(3/2)^2[3/2]_1$	6p	$(3/2)^2[3/2]^\circ_1$			R1c		
4201.735(3)	23792.990(17)	4201.7309(10)	0.004	15		5p	$(3/2)^2[3/2]^\circ_1$	6d	$(5/2)^2[1/2]_0$			R1c		
4201.888(4)	23792.120(21)	4201.8877(16)	0.001	22		sp	$(^3P)^3P^\circ\ ^5D^\circ_3$	8d	$(5/2)^2[9/2]_4$			R1c		
4207.672(3)	23759.417(16)	4207.5870(9)	0.085	15	?	sp	$(^3F)^3P^\circ\ ^3G^\circ_4$	5d	$(3/2)^2[5/2]_3$			R1c		X
4209.321(4)	23750.110(21)	4209.3213(10)	−0.000	29		4d	$(3/2)^2[1/2]_1$	6p	$(3/2)^2[1/2]^\circ_1$			R1c		
4211.8649(8)	23735.766(5)	4211.86561(23)	−0.0007	11000		5p	$(5/2)^2[5/2]^\circ_3$	7s	$(5/2)^2[5/2]_3$			F_Re		
4212.315(3)	23733.232(16)	4212.3160(7)	−0.001	14		4d	$(5/2)^2[9/2]_4$	6p	$(5/2)^2[7/2]^\circ_4$			R1c		
4216.9124(13)	23707.356(7)	4216.9115(5)	0.0008	640		5p	$(3/2)^2[1/2]^\circ_1$	6d	$(5/2)^2[5/2]_2$			R1c		
4219.38(20)	23693.5(11)	4219.5840(6)	−0.20	340		4d	$(5/2)^2[3/2]_2$	sp	$(^1G)^3P^\circ\ ^3F^\circ_3$			S36c		
4221.427(2)	23682.000(14)	4221.4276(5)	−0.000	69		5p	$(3/2)^2[5/2]^\circ_2$	6d	$(5/2)^2[3/2]_1$			R1c		
4223.8195(14)	23668.588(8)	4223.8197(6)	−0.0002	100		4d	$(5/2)^2[9/2]_4$	sp	$(^1G)^3P^\circ\ ^3F^\circ_3$			R1c		
4224.344(4)	23665.650(21)	4224.3455(3)	−0.002	14		4d	$(5/2)^2[1/2]_1$	4f	$(3/2)^2[5/2]^\circ_2$			R1c		
4225.1956(14)	23660.880(8)	4225.1967(6)	−0.0012	140		4d	$(5/2)^2[5/2]_3$	6p	$(5/2)^2[5/2]^\circ_3$			R1c		
4227.9422(14)	23645.509(8)	4227.9397(5)	0.0025	7900		4p	$^3D^\circ_3$	s^2	$^1G_4$	5.1e+05	B	R1c	O07	
4230.4486(14)	23631.500(8)	4230.4495(4)	−0.0009	4000		5p	$(3/2)^2[3/2]^\circ_1$	7s	$(3/2)^2[3/2]_2$			R1c		
4232.8346(15)	23618.180(8)	4232.8362(6)	−0.0016	130		5s	$(3/2)^2[3/2]_2$	sp	$(^3P)^3P^\circ\ ^3D^\circ_3$			R1c		
4239.4445(20)	23581.356(11)	4239.4468(4)	−0.0023	7000		5p	$(3/2)^2[3/2]^\circ_1$	7s	$(3/2)^2[3/2]_1$			F_Re		
4240.410(3)	23575.985(14)	4240.4120(8)	−0.002	64		4d	$(5/2)^2[3/2]_1$	6p	$(5/2)^2[3/2]^\circ_1$			R1c		
4241.31(4)	23570.97(22)	4241.271(3)	0.04	48	*	sp	$(^3P)^3P^\circ\ ^5D^\circ_4$	8d	$(5/2)^2[7/2]_4$			R1nc		
4241.31(4)	23570.97(22)	4241.3236(9)	−0.01	48	*	4d	$(3/2)^2[3/2]_2$	6p	$(3/2)^2[3/2]^\circ_1$			R1c		
4243.2516(15)	23560.199(8)	4243.2501(5)	0.0015	320		5p	$(3/2)^2[1/2]^\circ_1$	6d	$(5/2)^2[3/2]_1$			R1c		
4246.9860(20)	23539.483(11)	4246.9715(4)	0.0145	390	*	5p	$(3/2)^2[5/2]^\circ_3$	6d	$(5/2)^2[7/2]_3$			R1nc		X
4246.9860(20)	23539.483(11)	4246.9847(7)	0.0013	390	*	4d	$(3/2)^2[1/2]_0$	5f	$(5/2)^2[3/2]^\circ_1$			R1c		
4251.0194(15)	23517.149(8)	4251.0200(6)	−0.0006	300		4d	$(5/2)^2[1/2]_1$	4f	$(3/2)^2[3/2]^\circ_1$			R1c		
4254.630(4)	23497.190(21)	4254.6275(11)	0.003	12		4d	$(3/2)^2[7/2]_3$	6p	$(3/2)^2[5/2]^\circ_2$			R2nc		
4255.6348(14)	23491.644(8)	4255.6343(4)	0.0006	1100		4d	$(5/2)^2[1/2]_1$	4f	$(3/2)^2[3/2]^\circ_2$			R1c		
4256.846(4)	23484.960(21)	4256.8484(7)	−0.002	30		4d	$(3/2)^2[1/2]_0$	5f	$(5/2)^2[1/2]^\circ_1$			R1c		
4267.611(4)	23425.720(21)	4267.6128(13)	−0.002	120		s^2	$^1G_4$	sp	$(^3F)^3P^\circ\ ^1G^\circ_4$			R1c		
4268.103(4)	23423.020(21)	4268.1012(12)	0.002	18		sp	$(^3F)^3P^\circ\ ^5F^\circ_4$	5d	$(5/2)^2[9/2]_5$			R1c		
4276.0484(9)	23379.499(5)	4276.0496(4)	−0.0012	8700		5p	$(3/2)^2[3/2]^\circ_2$	7s	$(3/2)^2[3/2]_2$			F_Re		
4277.805(4)	23369.900(21)	4277.8016(6)	0.003	150		4d	$(5/2)^2[7/2]_4$	6p	$(5/2)^2[5/2]^\circ_3$			R1c		
4279.9621(15)	23358.120(8)	4279.9594(3)	0.0028	5100		sp	$(^3F)^3P^\circ\ ^1F^\circ_3$	7s	$(5/2)^2[5/2]_2$			R1c		
4280.845(4)	23353.300(21)	4280.8437(6)	0.002	6		4d	$(5/2)^2[5/2]_2$	6p	$(5/2)^2[5/2]^\circ_3$			R1c		
4281.838(3)	23347.889(15)	4281.8368(8)	0.001	29		5p	$(3/2)^2[1/2]^\circ_1$	6d	$(5/2)^2[1/2]_1$			R1c		
4285.2433(13)	23329.334(7)	4285.2420(4)	0.0012	2000		5p	$(3/2)^2[3/2]^\circ_2$	7s	$(3/2)^2[3/2]_1$			R1c		
4286.465(3)	23322.683(16)	4286.4615(7)	0.004	11		4d	$(5/2)^2[5/2]_2$	sp	$(^3F)^1P^\circ\ ^3F^\circ_2$			R1c		
4287.13(6)	23319.1(3)	4287.0450(10)	0.08	180		4d	$(3/2)^2[7/2]_4$	6p	$(3/2)^2[5/2]^\circ_3$			S36c		

Table A1. *Cont.*

λ_{obs} [a] (Å)	σ_{obs} [b] (cm^{-1})	λ_{Ritz} [c] (Å)	$\Delta\lambda_{obs-Ritz}$ (Å)	I_{obs} [d] (arb. u.)	Char [e]	Lower Level		Upper Level		A (s^{-1})	Acc [f]	Line Ref. [g]	TP Ref. [g]	Notes [h]
4287.779(3)	23315.537(17)	4287.7744(7)	0.005	11		4d	$(5/2)^2[5/2]_3$	6p	$(5/2)^2[7/2]^\circ_4$			R1c		
4291.084(3)	23297.580(16)	4291.0824(24)	0.002	640		5s	$(5/2)^2[5/2]_3$	sp	$(^3P)^3P^\circ\ ^5D^\circ_4$			R1c		
4292.4705(14)	23290.055(8)	4292.4694(3)	0.0011	9000		sp	$(^3F)^3P^\circ\ ^1F^\circ_3$	7s	$(5/2)^2[5/2]_3$			R1c		
4296.123(3)	23270.256(14)	4296.1187(5)	0.004	17		5p	$(3/2)^2[3/2]^\circ_1$	6d	$(5/2)^2[5/2]_2$			R1c		
4299.696(3)	23250.920(16)	4299.6946(6)	0.001	11		4d	$(5/2)^2[5/2]_3$	sp	$(^1G)^3P^\circ\ ^3F^\circ_3$			R1c		
4308.710(3)	23202.274(16)	4308.7114(9)	−0.001	28		4d	$(3/2)^2[5/2]_2$	6p	$(3/2)^2[3/2]^\circ_1$			R1c		
4320.7611(19)	23137.564(10)	4320.7616(7)	−0.0005	270		4d	$(5/2)^2[1/2]_1$	sp	$(^3P)^3P^\circ\ ^1D^\circ_2$			R1c		
4335.639(3)	23058.167(16)	4335.6353(9)	0.004	17		4d	$(3/2)^2[5/2]_3$	6p	$(3/2)^2[3/2]^\circ_2$			R1c		
4341.039(3)	23029.484(15)	4341.0414(14)	−0.002	17		5s	$(5/2)^2[5/2]_3$	sp	$(^3P)^3P^\circ\ ^5D^\circ_3$			R1c		
4343.152(4)	23018.280(21)	4343.1532(5)	−0.001	11		5p	$(3/2)^2[3/2]^\circ_2$	6d	$(5/2)^2[5/2]_2$			R1c		
4344.700(4)	23010.080(21)	4344.6972(9)	0.003	6		4d	$(3/2)^2[5/2]_2$	6p	$(3/2)^2[3/2]^\circ_2$			R1c		
4346.687(4)	22999.560(21)	4346.6883(5)	−0.001	240		5p	$(3/2)^2[3/2]^\circ_2$	6d	$(5/2)^2[7/2]_3$			R1c		
4357.339(4)	22943.340(21)	4357.3345(6)	0.004	6		4d	$(5/2)^2[5/2]_2$	sp	$(^1G)^3P^\circ\ ^3F^\circ_3$			R1c		
4360.102(3)	22928.797(14)	4360.0973(17)	0.005	47		5s	$(5/2)^2[5/2]_3$	sp	$(^3P)^3P^\circ\ ^5D^\circ_2$			R1c		
4365.3705(14)	22901.127(7)	4365.3697(3)	0.0008	7300		sp	$(^3F)^3P^\circ\ ^1D^\circ_2$	7s	$(5/2)^2[5/2]_2$			R1c		
4373.460(3)	22858.770(15)	4373.4591(7)	0.001	18		5p	$(3/2)^2[3/2]^\circ_2$	6d	$(5/2)^2[3/2]_2$			R1c		
4375.8(5)	22847(3)	4375.690(3)	0.1	2000		d^{10}	$^1S_0$	4s	$^3D_2$	9.e−02	D+	A73,P84	A08adj	X,E2
4378.3840(14)	22833.061(7)	4378.3848(3)	−0.0007	1500		sp	$(^3F)^3P^\circ\ ^1D^\circ_2$	7s	$(5/2)^2[5/2]_3$			R1c		
4396.423(3)	22739.375(15)	4396.4196(6)	0.004	13		4d	$(5/2)^2[9/2]_4$	6p	$(5/2)^2[7/2]^\circ_3$			R1c		
4402.363(3)	22708.694(16)	4402.3616(15)	0.002	33		5s	$(5/2)^2[5/2]_2$	sp	$(^3P)^3P^\circ\ ^5D^\circ_3$			R1c		
4410.941(3)	22664.535(17)	4410.9371(9)	0.004	7		4d	$(5/2)^2[1/2]_0$	6p	$(5/2)^2[3/2]^\circ_1$			R1c		
4419.088(4)	22622.750(21)	4419.0825(3)	0.006	7		4d	$(5/2)^2[3/2]_2$	4f	$(3/2)^2[7/2]^\circ_3$			R1c		
4422.583(3)	22604.871(16)	4422.5816(15)	0.002	15		5s	$(5/2)^2[5/2]_2$	sp	$(^3P)^3P^\circ\ ^5D^\circ_1$			R1c		
4435.693(3)	22538.066(15)	4435.6906(4)	0.002	80		4d	$(5/2)^2[3/2]_2$	4f	$(3/2)^2[5/2]^\circ_2$			R1c		
4440.8836(15)	22511.721(8)	4440.8827(4)	0.0009	520		4d	$(5/2)^2[3/2]_1$	4f	$(3/2)^2[5/2]^\circ_2$			R1c		
4441.709(14)	22507.54(7)	4441.7193(7)	−0.011	180		sp	$(^3F)^3P^\circ\ ^3D^\circ_3$	5d	$(3/2)^2[7/2]_4$			R1c		
4444.8314(14)	22491.727(7)	4444.8307(3)	0.0007	1200		4d	$(5/2)^2[3/2]_2$	4f	$(3/2)^2[5/2]^\circ_3$			R1c		
4462.6902(16)	22401.721(8)	4462.6875(5)	0.0027	1600		4d	$(5/2)^2[9/2]_4$	4f	$(3/2)^2[9/2]^\circ_5$			R1c		
4485.280	22288.90	4485.2800(6)			:	4d	$(5/2)^2[1/2]_1$	sp	$(^3F)^1P^\circ\ ^3D^\circ_2$			W93		
4495.356(3)	22238.942(15)	4495.3577(8)	−0.002	38		sp	$(^3F)^3P^\circ\ ^3G^\circ_3$	5d	$(3/2)^2[7/2]_4$			R1c		
4505.9982(8)	22186.418(4)	4505.9996(4)	−0.0013	11000		4p	$^3P^\circ_2$	s^2	$^3P_1$	6.3e+05	C	F_Re	H71,N88	L
4515.5194(15)	22139.637(7)	4515.5195(3)	−0.0001	960		4d	$(5/2)^2[5/2]_3$	4f	$(3/2)^2[7/2]^\circ_4$			R1c		
4516.0492(15)	22137.040(7)	4516.0499(4)	−0.0007	2700		5p	$(3/2)^2[5/2]^\circ_2$	7s	$(5/2)^2[5/2]_2$			R1c		
4529.983(3)	22068.951(15)	4529.9803(3)	0.002	70		5p	$(3/2)^2[5/2]^\circ_2$	7s	$(5/2)^2[5/2]_3$			R1c		
4533.814(4)	22050.300(21)	4533.8122(3)	0.002	54		4d	$(5/2)^2[5/2]_3$	4f	$(3/2)^2[5/2]^\circ_3$			R1c		
4541.0325(15)	22015.251(7)	4541.0337(4)	−0.0013	6900		5p	$(3/2)^2[1/2]^\circ_1$	7s	$(5/2)^2[5/2]_2$			R1c		
4542.15(4)	22009.82(19)	4542.1167(8)	0.04	390	*	4d	$(5/2)^2[3/2]_2$	sp	$(^3P)^3P^\circ\ ^1D^\circ_2$			R1c		
4542.15(4)	22009.82(19)	4542.1719(10)	−0.02	390	*	4d	$(3/2)^2[1/2]_1$	6p	$(5/2)^2[3/2]^\circ_1$			R1c		
4546.433(3)	21989.099(12)	4546.4353(6)	−0.002	410		sp	$(^3F)^3P^\circ\ ^3D^\circ_2$	5d	$(3/2)^2[5/2]_3$			R1c		
4551.807(3)	21963.141(13)	4551.8069(8)	−0.000	260		4d	$(3/2)^2[7/2]_3$	sp	$(^3F)^1P^\circ\ ^3F^\circ_2$			R1c		
4555.9211(5)	21943.307(3)	4555.9193(4)	0.0018	18000		4p	$^3P^\circ_2$	s^2	$^3P_2$	7.1e+05	C	F_Re	H71,N88	L

Table A1. *Cont.*

λ_{obs} [a] (Å)	σ_{obs} [b] (cm^{-1})	λ_{Ritz} [c] (Å)	$\Delta\lambda_{obs-Ritz}$ (Å)	I_{obs} [d] (arb. u.)	Char [e]	Lower Level		Upper Level		A (s^{-1})	Acc [f]	Line Ref. [g]	TP Ref. [g]	Notes [h]
4557.5077(15)	21935.668(7)	4557.5079(4)	−0.0002	1100		4d	$(5/2)^2[7/2]_3$	4f	$(3/2)^2[7/2]^\circ_3$			R1c		
4558.7(5)	21929.9(24)	4558.949(4)	−0.2	3000		d^{10}	$^1S_0$	4s	$^3D_3$			A73		X,HF
4575.180(7)	21850.94(3)	4575.1748(4)	0.005	550	*	4d	$(5/2)^2[7/2]_3$	4f	$(3/2)^2[5/2]^\circ_2$			R1c		
		4575.185(3)			m	sp	$(^3P)^3P^\circ\ ^3D^\circ_2$	10s	$(5/2)^2[5/2]_2$			R1c		
4575.180(7)	21850.94(3)	4575.1871(7)	−0.007	550	*	sp	$(^3F)^3P^\circ\ ^3D^\circ_2$	5d	$(3/2)^2[3/2]_2$			R1c		
4575.6529(15)	21848.681(7)	4575.6532(3)	−0.0003	850		4d	$(5/2)^2[7/2]_4$	4f	$(3/2)^2[7/2]^\circ_4$			R1c		
4584.899(3)	21804.623(12)	4584.8994(3)	−0.001	60		4d	$(5/2)^2[7/2]_3$	4f	$(3/2)^2[5/2]^\circ_3$			R1c		
4586.274(3)	21798.084(13)	4586.2719(3)	0.002	300		5p	$(3/2)^2[5/2]^\circ_3$	7s	$(5/2)^2[5/2]_3$			R1c		
4588.1661(15)	21789.095(7)	4588.1667(4)	−0.0006	620		4d	$(5/2)^2[5/2]_2$	4f	$(3/2)^2[5/2]^\circ_2$			R1c		
4589.601(3)	21782.285(12)	4589.6035(8)	−0.003	220		4d	$(3/2)^2[3/2]_1$	sp	$(^3F)^1P^\circ\ ^3F^\circ_2$			R1c		
4594.330(3)	21759.863(13)	4594.3638(14)	−0.034	200	?	sp	$(^3F)^3P^\circ\ ^5F^\circ_3$	6s	$(3/2)^2[3/2]_2$			R1c		X
4594.436(3)	21759.358(15)	4594.4374(3)	−0.001	130		4d	$(5/2)^2[7/2]_4$	4f	$(3/2)^2[5/2]^\circ_3$			R1c		
4596.9056(15)	21747.671(7)	4596.9063(5)	−0.0007	4800		4d	$(5/2)^2[7/2]_3$	4f	$(3/2)^2[9/2]^\circ_4$			R1c		
4597.9473(15)	21742.744(7)	4597.9466(3)	0.0007	3200		4d	$(5/2)^2[5/2]_2$	4f	$(3/2)^2[5/2]^\circ_3$			R1c		
4606.5041(21)	21702.356(10)	4606.4944(5)	0.0097	730	bl	4d	$(5/2)^2[7/2]_4$	4f	$(3/2)^2[9/2]^\circ_4$			R1c		X
4608.4661(16)	21693.117(7)	4608.4662(5)	−0.0001	3100		4d	$(5/2)^2[7/2]_4$	4f	$(3/2)^2[9/2]^\circ_5$			R1c		
4609.416(3)	21688.646(14)	4609.3996(6)	0.016	560		sp	$(^3F)^3P^\circ\ ^3D^\circ_2$	5d	$(3/2)^2[7/2]_3$			R1c		X
4619.659(3)	21640.559(15)	4619.6507(6)	0.008	82		4d	$(5/2)^2[5/2]_2$	4f	$(3/2)^2[3/2]^\circ_1$			R1c		
4625.097(3)	21615.114(13)	4625.1004(5)	−0.003	2100		4d	$(5/2)^2[5/2]_2$	4f	$(3/2)^2[3/2]^\circ_2$			R1c		
4631.801(3)	21583.829(16)	4631.8076(7)	−0.007	90		4d	$(3/2)^2[7/2]_3$	sp	$(^1G)^3P^\circ\ ^3F^\circ_3$			R1c		
4635.260(3)	21567.722(12)	4635.2599(16)	0.000	230		4d	$(5/2)^2[7/2]_4$	sp	$(^1G)^3P^\circ\ ^3F^\circ_4$			R1c		
4639.5854(16)	21547.616(8)	4639.5835(9)	0.0019	1100		4d	$(5/2)^2[3/2]_1$	sp	$(^1G)^3P^\circ\ ^3F^\circ_2$			R1nc		
4647.012(5)	21513.180(21)	4647.0121(12)	−0.000	950		4d	$(5/2)^2[9/2]_5$	sp	$(^1G)^3P^\circ\ ^3H^\circ_5$			R1c		
4649.2705(16)	21502.730(7)	4649.27084(23)	−0.0003	6700		4d	$(5/2)^2[1/2]_1$	4f	$(5/2)^2[5/2]^\circ_2$			R1c		
4660.3044(17)	21451.820(8)	4660.3070(7)	−0.0026	5600		4d	$(5/2)^2[1/2]_0$	4f	$(3/2)^2[3/2]^\circ_1$			R1c		
4661.3627(16)	21446.950(7)	4661.3620(3)	0.0007	7100		4d	$(5/2)^2[1/2]_1$	4f	$(5/2)^2[3/2]^\circ_1$			R1c		
4662.654(3)	21441.010(12)	4662.6475(11)	0.007	13000		4d	$(5/2)^2[1/2]_1$	sp	$(^3P)^3P^\circ\ ^5S^\circ_2$			R1c		
4667.315(2)	21419.599(11)	4667.3119(12)	0.003	11000		4d	$(5/2)^2[9/2]_4$	sp	$(^1G)^3P^\circ\ ^3H^\circ_5$			R1c		
4671.7016(2)	21399.4867(11)	4671.70176(20)	−0.0002	29000		4d	$(5/2)^2[1/2]_1$	4f	$(5/2)^2[3/2]^\circ_2$	5.6e+07	D+	F_Re	TW	
4673.5772(5)	21390.8989(25)	4673.5774(5)	−0.0002	20000		4d	$(5/2)^2[1/2]_1$	4f	$(5/2)^2[1/2]^\circ_0$	1.6e+08	D+	F_Re	TW	L
4681.9938(5)	21352.4459(22)	4681.9935(3)	0.0003	36000		4d	$(5/2)^2[1/2]_1$	4f	$(5/2)^2[1/2]^\circ_1$	1.1e+08	D+	F_Re	TW	L
4687.7662(18)	21326.153(8)	4687.7648(4)	0.0014	3000		5p	$(3/2)^2[3/2]^\circ_2$	7s	$(5/2)^2[5/2]_2$			R1c		
4702.125(3)	21261.032(13)	4702.1291(9)	−0.004	550		4d	$(5/2)^2[5/2]_2$	sp	$(^3P)^3P^\circ\ ^1D^\circ_2$			R1c		
4737.909(4)	21100.456(16)	4737.9023(11)	0.006	170		4d	$(3/2)^2[3/2]_1$	6p	$(5/2)^2[5/2]^\circ_2$			R1c		
4744.588(3)	21070.751(11)	4744.5892(8)	−0.001	520		sp	$(^3F)^3P^\circ\ ^3D^\circ_1$	5d	$(3/2)^2[5/2]_2$			R1c		
4753.4684(16)	21031.389(7)	4753.4691(7)	−0.0007	2100		4d	$(5/2)^2[9/2]_4$	sp	$(^1G)^3P^\circ\ ^3H^\circ_4$			R1c		
4758.4334(9)	21009.445(4)	4758.4334(7)	0.0000	15000		4p	$^3P^\circ_1$	s^2	$^3P_0$	1.3e+06	C	F_Re	H71,N88	
4765.913(3)	20976.472(14)	4765.9115(6)	0.002	62		sp	$(^3F)^3P^\circ\ ^3F^\circ_3$	5d	$(3/2)^2[5/2]_3$			R1c		
4766.7392(16)	20972.837(7)	4766.7394(9)	−0.0002	4500		4d	$(5/2)^2[1/2]_1$	sp	$(^3P)^3P^\circ\ ^3P^\circ_0$			R1c		
4772.9651(17)	20945.481(7)	4772.9656(5)	−0.0005	590		4d	$(3/2)^2[1/2]_1$	4f	$(3/2)^2[5/2]^\circ_2$			R1c		
4781.0855(17)	20909.907(8)	4781.0769(8)	0.0086	670		sp	$(^3F)^3P^\circ\ ^3D^\circ_1$	5d	$(3/2)^2[3/2]_2$			R1c		X
4792.709(3)	20859.194(14)	4792.7117(21)	−0.002	430		5s	$(3/2)^2[3/2]_1$	sp	$(^3P)^3P^\circ\ ^5D^\circ_2$			R1c		

Table A1. *Cont.*

λ_{obs} [a] (Å)	σ_{obs} [b] (cm^{-1})	λ_{Ritz} [c] (Å)	$\Delta\lambda_{obs-Ritz}$ (Å)	I_{obs} [d] (arb. u.)	Char [e]	Lower Level		Upper Level		A (s^{-1})	Acc [f]	Line Ref. [g]	TP Ref. [g]	Notes [h]
4797.306(3)	20839.208(14)	4797.3080(18)	−0.002	150		5s	$(5/2)^2[5/2]_3$	sp	$(^1D)^3P^\circ\ ^3D^\circ_2$			R1c		
4800.112(3)	20827.027(11)	4800.1106(8)	0.001	590		sp	$(^3F)^3P^\circ\ ^3D^\circ_1$	5d	$(3/2)^2[3/2]_1$			R1c		
4800.584(3)	20824.980(14)	4800.5808(9)	0.003	370		4d	$(5/2)^2[5/2]_2$	sp	$(^1G)^3P^\circ\ ^3F^\circ_2$			R1nc		
4805.6557(19)	20803.001(8)	4805.6527(6)	0.0030	3600		4d	$(5/2)^2[3/2]_2$	sp	$(^3F)^1P^\circ\ ^3F^\circ_3$			R1c		
4807.0463(17)	20796.983(7)	4807.0463(8)	0.0000	7000		4d	$(3/2)^2[1/2]_1$	4f	$(3/2)^2[3/2]^\circ_1$			R1c		
4811.1487(21)	20779.250(9)	4811.1475(6)	0.0012	1000		4d	$(5/2)^2[9/2]_4$	sp	$(^3F)^1P^\circ\ ^3F^\circ_3$			R1c		
4812.9476(5)	20771.4831(22)	4812.9474(4)	0.0003	36000		4d	$(3/2)^2[1/2]_1$	4f	$(3/2)^2[3/2]^\circ_2$	1.3e+08	D+	F_Re	TW	
4814.868(4)	20763.199(16)	4814.868(4)	0.000	310		5s	$(5/2)^2[5/2]_3$	sp	$(^1D)^3P^\circ\ ^3F^\circ_4$			R1c		
4820.269(3)	20739.934(15)	4820.2672(6)	0.002	160		sp	$(^3F)^3P^\circ\ ^3F^\circ_3$	5d	$(3/2)^2[7/2]_4$			R1c		
4829.3349(17)	20701.001(7)	4829.3340(3)	0.0009	1100		4d	$(5/2)^2[9/2]_5$	4f	$(5/2)^2[9/2]^\circ_4$			R1c		
4832.2454(17)	20688.533(7)	4832.2439(5)	0.0014	14000		4p	$^3P^\circ_1$	s^2	$^3P_1$	2.5e+05	C	R1c	H71,N88	
4833.761(3)	20682.046(12)	4833.7603(9)	0.001	1000		4d	$(3/2)^2[1/2]_1$	sp	$(^3F)^1P^\circ\ ^3D^\circ_1$			R1c		
4834.673(3)	20678.146(12)	4834.6703(18)	0.002	440		5s	$(3/2)^2[3/2]_2$	sp	$(^3P)^3P^\circ\ ^5D^\circ_3$			R1c		
4836.799(2)	20669.054(11)	4836.7982(8)	0.001	790		sp	$(^3F)^3P^\circ\ ^3D^\circ_3$	5d	$(5/2)^2[7/2]_4$			R1c		
4837.434(3)	20666.341(15)	4837.4350(20)	−0.001	360		4d	$(5/2)^2[1/2]_0$	sp	$(^3P)^3P^\circ\ ^1P^\circ_1$			R2nc		
4840.1833(17)	20654.604(7)	4840.1829(8)	0.0005	1100		4d	$(3/2)^2[7/2]_3$	6p	$(5/2)^2[7/2]^\circ_3$			R1c		
4841.832(3)	20647.573(15)	4841.8320(24)	−0.000	91	?	4f	$(5/2)^2[9/2]^\circ_5$	8g	$(5/2)^2[11/2]_6$			R2nc		
4847.3822(17)	20623.930(7)	4847.3823(8)	−0.0000	1500		4d	$(5/2)^2[1/2]_1$	sp	$(^3P)^3P^\circ\ ^3P^\circ_1$			R1c		
4851.2625(11)	20607.434(5)	4851.2617(4)	0.0008	12000		4d	$(5/2)^2[9/2]_4$	4f	$(5/2)^2[9/2]^\circ_4$	2.9e+07	D+	F_Re	TW	
4854.98733(18)	20591.6237(7)	4854.98743(17)	−0.00011	34000		4d	$(5/2)^2[9/2]_5$	4f	$(5/2)^2[9/2]^\circ_5$	3.5e+07	D+	F_Re	TW	L
4859.068(7)	20574.33(3)	4859.0673(19)	0.001	97		5s	$(3/2)^2[3/2]_2$	sp	$(^3P)^3P^\circ\ ^5D^\circ_1$			R1c		
4861.5612(18)	20563.780(8)	4861.56049(20)	0.0008	3600		4d	$(5/2)^2[9/2]_5$	4f	$(5/2)^2[7/2]^\circ_4$			R1c		
4866.254(3)	20543.951(12)	4866.2550(8)	−0.001	700		sp	$(^3F)^3P^\circ\ ^3D^\circ_3$	5d	$(5/2)^2[5/2]_3$			R1c		
4873.3056(17)	20514.223(7)	4873.3035(5)	0.0021	9900		4d	$(3/2)^2[7/2]_3$	4f	$(3/2)^2[7/2]^\circ_3$	2.4e+07	D+	F_Re	TW	
4877.151(3)	20498.050(13)	4877.1492(3)	0.002	100		4d	$(5/2)^2[9/2]_4$	4f	$(5/2)^2[9/2]^\circ_5$			R1c		
4883.2352(17)	20472.510(7)	4883.2351(4)	0.0001	2900		4d	$(3/2)^2[7/2]_3$	4f	$(3/2)^2[7/2]^\circ_4$			R1c		
4883.7832(17)	20470.213(7)	4883.7825(3)	0.0007	2900		4d	$(5/2)^2[9/2]_4$	4f	$(5/2)^2[7/2]^\circ_4$			R1c		
4889.7005(17)	20445.441(7)	4889.6998(5)	0.0008	12000		4p	$^3P^\circ_1$	s^2	$^3P_2$	1.9e+05	C	R1c	H71,N88	
4893.506(3)	20429.543(11)	4893.5089(5)	−0.003	770		4d	$(3/2)^2[7/2]_3$	4f	$(3/2)^2[5/2]^\circ_2$			R1c		
4896.414(3)	20417.408(14)	4896.4163(10)	−0.002	1900		4d	$(3/2)^2[1/2]_1$	sp	$(^3P)^3P^\circ\ ^1D^\circ_2$			R1c		
4900.472(3)	20400.501(11)	4900.4712(9)	0.001	920		sp	$(^3F)^3P^\circ\ ^3G^\circ_3$	5d	$(5/2)^2[7/2]_4$			R1c		
4901.42635(21)	20396.5291(9)	4901.42634(15)	0.00002	26000		4d	$(5/2)^2[3/2]_2$	4f	$(5/2)^2[5/2]^\circ_3$	6.2e+07	D+	F_Re	TW	
4904.534(4)	20383.605(16)	4904.5146(21)	0.020	110	?	4f	$(5/2)^2[3/2]^\circ_1$	9s	$(3/2)^2[3/2]_2$			R1c		X
4905.768(3)	20378.478(11)	4905.7667(5)	0.001	580		4d	$(3/2)^2[7/2]_4$	4f	$(3/2)^2[7/2]^\circ_3$			R1c		
4906.5663(3)	20375.1629(11)	4906.56612(16)	0.0001	21000		4d	$(5/2)^2[3/2]_2$	4f	$(5/2)^2[5/2]^\circ_2$	4.4e+07	D+	F_Re	TW	
4907.1427(24)	20372.770(10)	4907.1424(4)	0.0002	1000		4d	$(5/2)^2[9/2]_4$	4f	$(5/2)^2[5/2]^\circ_3$			R1c		
4908.2819(24)	20368.041(10)	4908.2838(8)	−0.0019	970		4d	$(5/2)^2[7/2]_3$	sp	$(^1G)^3P^\circ\ ^3H^\circ_4$			F_Re		
4909.0397(13)	20364.897(5)	4909.0390(5)	0.0007	6100		4d	$(5/2)^2[9/2]_5$	4f	$(5/2)^2[11/2]^\circ_5$			F_Re		
4909.73351(2)	20362.01913(10)	4909.733510(20)	0.00000	160000		4d	$(5/2)^2[9/2]_5$	4f	$(5/2)^2[11/2]^\circ_6$	2.04e+08	B+	F_Re	C84	L
4912.3645(5)	20351.1138(21)	4912.3644(3)	0.0001	17000		4d	$(5/2)^2[3/2]_2$	4f	$(5/2)^2[7/2]^\circ_3$			F_Re		
4912.91989(16)	20348.8131(7)	4912.91987(14)	0.00002	29000		4d	$(5/2)^2[3/2]_1$	4f	$(5/2)^2[5/2]^\circ_2$	6.0e+07	D+	F_Re	TW	
4915.8321(17)	20336.758(7)	4915.8312(4)	0.0009	11000		4d	$(3/2)^2[7/2]_4$	4f	$(3/2)^2[7/2]^\circ_4$	2.5e+07	D+	F_Re	TW	
4918.1079(21)	20327.348(9)	4918.1061(4)	0.0019	2400		4d	$(5/2)^2[9/2]_4$	4f	$(5/2)^2[7/2]^\circ_3$			R1c		

Table A1. *Cont.*

λ_{obs} [a] (Å)	σ_{obs} [b] (cm^{-1})	λ_{Ritz} [c] (Å)	$\Delta\lambda_{obs-Ritz}$ (Å)	I_{obs} [d] (arb. u.)	Char [e]	Lower Level		Upper Level		A (s^{-1})	Acc [f]	Line Ref. [g]	TP Ref. [g]	Notes [h]
4918.3779(5)	20326.2320(20)	4918.3778(4)	0.0000	54000		4d	$(3/2)^2[7/2]_3$	4f	$(3/2)^2[9/2]^\circ_4$	2.9e+08	C	F_Re	H71	
4920.0348(12)	20319.387(5)	4920.0345(4)	0.0003	6800		4d	$(5/2)^2[3/2]_2$	4f	$(5/2)^2[3/2]^\circ_1$			F_Re		
4921.4627(21)	20313.492(9)	4921.4666(12)	−0.0039	5900		4d	$(5/2)^2[3/2]_2$	sp	$(^3P)^3P^\circ\ ^5S^\circ_2$			F_Re		
4926.4228(5)	20293.0397(22)	4926.4232(3)	−0.0004	26000		4d	$(5/2)^2[3/2]_1$	4f	$(5/2)^2[3/2]^\circ_1$	9.e+07	D+	F_Re	TW	
4926.811(4)	20291.440(17)	4926.8186(15)	−0.007	740		sp	$(^3F)^3P^\circ\ ^5F^\circ_4$	6s	$(5/2)^2[5/2]_3$			R1c		
4927.860(3)	20287.121(14)	4927.8590(12)	0.001	830		4d	$(5/2)^2[3/2]_1$	sp	$(^3P)^3P^\circ\ ^5S^\circ_2$			R1c		
4930.713(3)	20275.383(11)	4930.7110(8)	0.002	620		sp	$(^3F)^3P^\circ\ ^3G^\circ_3$	5d	$(5/2)^2[5/2]_3$			R1c		
4931.55496(20)	20271.9213(8)	4931.55505(16)	−0.00009	28000		4d	$(5/2)^2[3/2]_2$	4f	$(5/2)^2[3/2]^\circ_2$	7.1e+07	D+	F_Re	TW	
4931.6982(5)	20271.3325(20)	4931.6981(4)	0.0001	140000		4d	$(5/2)^2[9/2]_4$	4f	$(5/2)^2[11/2]^\circ_5$	1.9e+08	C	F_Re	H71	L
4933.0777(24)	20265.664(10)	4933.0745(5)	0.0032	1100		4d	$(5/2)^2[9/2]_5$	sp	$(^3F)^1P^\circ\ ^3G^\circ_4$			R1c		
4937.22029(23)	20248.6601(9)	4937.22031(22)	−0.00002	26000		4d	$(3/2)^2[3/2]_1$	4f	$(3/2)^2[5/2]^\circ_2$	1.1e+08	D+	F_Re	TW	
4937.516(3)	20247.449(11)	4937.5188(4)	−0.003	1100		4d	$(3/2)^2[7/2]_4$	4f	$(3/2)^2[5/2]^\circ_3$			R1c		
4937.9740(4)	20245.5693(16)	4937.97372(21)	0.0003	16000		4d	$(5/2)^2[3/2]_1$	4f	$(5/2)^2[3/2]^\circ_2$	2.8e+07	D+	F_Re	TW	
4939.648(3)	20238.709(11)	4939.6526(8)	−0.005	1200		4d	$(3/2)^2[3/2]_2$	6p	$(5/2)^2[7/2]^\circ_3$			R1c		
4940.0695(17)	20236.982(7)	4940.0693(6)	0.0002	4700		4d	$(5/2)^2[3/2]_1$	4f	$(5/2)^2[1/2]^\circ_0$			R1c		
4940.912(8)	20233.53(3)	4940.9093(20)	0.003	130		5s	$(5/2)^2[5/2]_2$	sp	$(^1D)^3P^\circ\ ^3D^\circ_1$			R1c		
4943.0240(7)	20224.886(3)	4943.0250(4)	−0.0010	20000		4d	$(5/2)^2[3/2]_2$	4f	$(5/2)^2[1/2]^\circ_1$	4.0e+07	D+	F_Re	TW	
4949.4750(18)	20198.526(7)	4949.4735(4)	0.0015	3700		4d	$(5/2)^2[3/2]_1$	4f	$(5/2)^2[1/2]^\circ_1$			R1c		
4951.4463(18)	20190.484(7)	4951.4464(6)	−0.0000	4200		4d	$(3/2)^2[7/2]_4$	4f	$(3/2)^2[9/2]^\circ_4$			F_Re		
4951.6184(14)	20189.783(6)	4951.6201(3)	−0.0016	12000		4d	$(5/2)^2[5/2]_3$	4f	$(5/2)^2[9/2]^\circ_4$			F_Re		
4953.7244(5)	20181.1995(20)	4953.7246(4)	−0.0002	82000		4d	$(3/2)^2[7/2]_4$	4f	$(3/2)^2[9/2]^\circ_5$	3.1e+08	C	F_Re	H71	
4955.9564(18)	20172.111(7)	4955.9566(5)	−0.0002	6300		4d	$(5/2)^2[9/2]_4$	sp	$(^3F)^1P^\circ\ ^3G^\circ_4$			R1c		
4969.8062(18)	20115.896(7)	4969.8046(6)	0.0016	4400		4d	$(5/2)^2[7/2]_3$	sp	$(^3F)^1P^\circ\ ^3F^\circ_3$	1.1e+07	D+	R1c	TW	
4971.222(4)	20110.167(15)	4971.2261(9)	−0.004	280		sp	$(^3F)^3P^\circ\ ^3G^\circ_3$	5d	$(5/2)^2[3/2]_2$			R1c		
4973.136(3)	20102.429(12)	4973.1394(7)	−0.004	280		sp	$(^3F)^3P^\circ\ ^3F^\circ_2$	5d	$(3/2)^2[5/2]_2$			R1c		
4973.6975(19)	20100.158(8)	4973.6959(8)	0.0016	9000		4d	$(3/2)^2[3/2]_1$	4f	$(3/2)^2[3/2]^\circ_1$	3.6e+07	D+	F_Re	TW	
4974.1542(15)	20098.313(6)	4974.1533(5)	0.0008	9700		4d	$(3/2)^2[3/2]_2$	4f	$(3/2)^2[7/2]^\circ_3$	3.0e+07	D+	F_Re	TW	
4975.064(3)	20094.637(12)	4975.0659(8)	−0.002	560		4d	$(5/2)^2[3/2]_2$	sp	$(^3F)^1P^\circ\ ^3D^\circ_3$			R1c		
4980.0153(19)	20074.659(8)	4980.0135(6)	0.0018	11000		4d	$(3/2)^2[3/2]_1$	4f	$(3/2)^2[3/2]^\circ_2$			R1c		
4981.0125(23)	20070.640(9)	4981.0133(6)	−0.0008	670		4d	$(5/2)^2[7/2]_4$	sp	$(^3F)^1P^\circ\ ^3F^\circ_3$			R1c		
4985.1421(23)	20054.014(9)	4985.1381(6)	0.0040	5100		4d	$(5/2)^2[5/2]_2$	sp	$(^3F)^1P^\circ\ ^3F^\circ_3$	2.1e+07	D+	R1c	TW	
4985.50499(7)	20052.5541(3)	4985.50498(7)	0.00001	70000		4d	$(5/2)^2[5/2]_3$	4f	$(5/2)^2[7/2]^\circ_4$	9.7e+07	C+	F_Re	TW	
4988.327(4)	20041.212(15)	4988.326(4)	0.000	430		5d	$(5/2)^2[9/2]_5$	8f	$(5/2)^2[11/2]^\circ_6$	5.7e+06	D+	R1c	TW	
4995.2054(22)	20013.614(9)	4995.2055(5)	−0.0001	800		4d	$(3/2)^2[3/2]_2$	4f	$(3/2)^2[5/2]^\circ_2$			R1c		
4999.584(3)	19996.088(12)	4999.5826(20)	0.001	440		5d	$(5/2)^2[9/2]_4$	8f	$(5/2)^2[11/2]^\circ_5$			R1c		
5002.294(3)	19985.255(12)	5002.2998(10)	−0.006	440		4d	$(3/2)^2[3/2]_1$	sp	$(^3F)^1P^\circ\ ^3D^\circ_1$			R1c		
5006.79983(15)	19967.2680(6)	5006.79978(15)	0.00005	46000		4d	$(3/2)^2[3/2]_2$	4f	$(3/2)^2[5/2]^\circ_3$	1.20e+08	C+	F_Re	TW	
5009.8505(3)	19955.1095(10)	5009.85058(17)	−0.0001	35000		4d	$(5/2)^2[5/2]_3$	4f	$(5/2)^2[5/2]^\circ_3$	5.4e+07	D+	F_Re	TW	
5012.6197(3)	19944.0855(12)	5012.6199(3)	−0.0002	37000		4d	$(5/2)^2[7/2]_3$	4f	$(5/2)^2[9/2]^\circ_4$	9.6e+07	C+	F_Re	TW	L
5015.2190(8)	19933.749(3)	5015.22038(21)	−0.0014	11000		4d	$(5/2)^2[5/2]_3$	4f	$(5/2)^2[5/2]^\circ_2$			F_Re		
5020.126(3)	19914.266(10)	5020.1256(5)	0.000	2000		4p	$^3F^\circ_3$	s^2	$^3P_2$			R1c		
5021.2785(4)	19909.6939(15)	5021.27849(23)	0.0000	32000		4d	$(5/2)^2[5/2]_3$	4f	$(5/2)^2[7/2]^\circ_3$	3.2e+07	E	F_Re	TW	L

Table A1. *Cont.*

λ_{obs} [a] (Å)	σ_{obs} [b] (cm^{-1})	λ_{Ritz} [c] (Å)	$\Delta\lambda_{obs-Ritz}$ (Å)	I_{obs} [d] (arb. u.)	Char [e]	Lower Level		Upper Level		A (s^{-1})	Acc [f]	Line Ref. [g]	TP Ref. [g]	Notes [h]
5022.599(3)	19904.459(11)	5022.6044(7)	−0.005	760		sp	$(^3F)^3P^\circ\ ^3D^\circ_2$	5d	$(5/2)^2[7/2]_3$			R1c		
5024.0251(16)	19898.810(6)	5024.0227(3)	0.0024	8700		4d	$(5/2)^2[7/2]_4$	4f	$(5/2)^2[9/2]^\circ_4$			F_Re		
5030.789(3)	19872.057(11)	5030.7892(12)	−0.000	1400		4d	$(5/2)^2[5/2]_3$	sp	$(^3P)^3P^\circ\ ^5S^\circ_2$			R1c		
5031.299(3)	19870.040(10)	5031.2968(8)	0.003	1400		4d	$(3/2)^2[5/2]_2$	6p	$(5/2)^2[7/2]^\circ_3$			R1c		
5032.544(3)	19865.125(11)	5032.5461(8)	−0.002	1100		4d	$(3/2)^2[3/2]_2$	4f	$(3/2)^2[3/2]^\circ_1$			R1c		
5034.171(3)	19858.705(13)	5034.1729(8)	−0.002	460		sp	$(^3F)^3P^\circ\ ^3F^\circ_2$	5d	$(3/2)^2[3/2]_1$			R1c		
5036.7302(21)	19848.616(8)	5036.7320(7)	−0.0019	540		4d	$(5/2)^2[1/2]_1$	sp	$(^3P)^3P^\circ\ ^3D^\circ_1$			R1c		
5039.0109(13)	19839.632(5)	5039.0141(6)	−0.0032	17000		4d	$(3/2)^2[3/2]_2$	4f	$(3/2)^2[3/2]^\circ_2$	3.9e+07	D+	F_Re	TW	
5041.3310(9)	19830.502(4)	5041.33123(23)	−0.0003	14000		4d	$(5/2)^2[5/2]_3$	4f	$(5/2)^2[3/2]^\circ_2$	1.6e+07	D+	F_Re	TW	
5042.093(3)	19827.505(11)	5042.0348(18)	0.058	310	?	sp	$(^3F)^3P^\circ\ ^1G^\circ_4$	5d	$(3/2)^2[7/2]_3$			R1c		X
5044.2776(21)	19818.918(8)	5044.2768(10)	0.0008	940		4d	$(5/2)^2[3/2]_1$	sp	$(^3P)^3P^\circ\ ^3P^\circ_0$			R1c		
5047.34772(23)	19806.8629(9)	5047.34770(18)	0.00002	27000		4d	$(5/2)^2[7/2]_3$	4f	$(5/2)^2[7/2]^\circ_4$			F_Re		
5051.79210(4)	19789.43784(14)	5051.79209(4)	0.00000	120000		4d	$(5/2)^2[7/2]_4$	4f	$(5/2)^2[9/2]^\circ_5$	1.55e+08	C+	F_Re	TW	L
5054.344(3)	19779.447(10)	5054.3487(6)	−0.005	950		sp	$(^3F)^3P^\circ\ ^3F^\circ_2$	5d	$(3/2)^2[7/2]_3$			R1c		
5054.7758(20)	19777.757(8)	5054.7728(5)	0.0030	1300		4d	$(3/2)^2[5/2]_3$	4f	$(3/2)^2[7/2]^\circ_3$			R1c		
5058.90906(16)	19761.5981(6)	5058.90923(14)	−0.00017	48000		4d	$(5/2)^2[7/2]_4$	4f	$(5/2)^2[7/2]^\circ_4$	4.8e+07	D+	F_Re	TW	
5059.418(5)	19759.611(21)	5059.4131(13)	0.005	160		6s	$(5/2)^2[5/2]_2$	6f	$(3/2)^2[5/2]^\circ_2$			R1c		
5060.6437(9)	19754.825(4)	5060.6415(5)	0.0022	16000		4p	$^3P^\circ_0$	s^2	$^3P_1$	4.1e+05	C	F_Re	H71	L
5065.45858(8)	19736.0471(3)	5065.45861(8)	−0.00002	70000		4d	$(3/2)^2[5/2]_3$	4f	$(3/2)^2[7/2]^\circ_4$	1.61e+08	C+	F_Re	TW	
5067.09416(17)	19729.6767(7)	5067.09423(17)	−0.00008	46000		4d	$(3/2)^2[5/2]_2$	4f	$(3/2)^2[7/2]^\circ_3$	1.23e+08	C+	F_Re	TW	
5069.431(3)	19720.584(11)	5069.4315(10)	−0.001	1600		4d	$(3/2)^2[3/2]_1$	sp	$(^3P)^3P^\circ\ ^1D^\circ_2$			R1c		
5072.3034(6)	19709.4147(23)	5072.30253(22)	0.0008	32000		4d	$(5/2)^2[7/2]_3$	4f	$(5/2)^2[5/2]^\circ_3$			F_Re		
5076.5136(20)	19693.069(8)	5076.5143(5)	−0.0007	830		4d	$(3/2)^2[5/2]_3$	4f	$(3/2)^2[5/2]^\circ_2$			R1c		
5077.8070(18)	19688.053(7)	5077.8071(3)	−0.0001	6300		4d	$(5/2)^2[7/2]_3$	4f	$(5/2)^2[5/2]^\circ_2$			R1c		
5081.099(4)	19675.296(14)	5081.1053(16)	−0.006	330		5s	$(3/2)^2[3/2]_1$	sp	$(^1D)^3P^\circ\ ^3P^\circ_1$			R1c		
5082.525(4)	19669.778(14)	5082.5262(15)	−0.001	160		5p	$(5/2)^2[3/2]^\circ_1$	5d	$(3/2)^2[1/2]_0$			R1c		
5083.9795(12)	19664.150(5)	5083.97879(22)	0.0007	21000		4d	$(5/2)^2[7/2]_4$	4f	$(5/2)^2[5/2]^\circ_3$			F_Re		
5084.0173(5)	19664.0034(18)	5084.0175(3)	−0.0002	14000		4d	$(5/2)^2[7/2]_3$	4f	$(5/2)^2[7/2]^\circ_3$			F_Re,R1r		
5088.27603(10)	19647.5455(4)	5088.27603(9)	0.00000	57000		4d	$(5/2)^2[5/2]_2$	4f	$(5/2)^2[5/2]^\circ_3$			F_Re		
5088.4882(8)	19646.726(3)	5088.4896(4)	−0.0013	25000		4d	$(3/2)^2[5/2]_3$	4f	$(3/2)^2[5/2]^\circ_3$	4.8e+07	D+	F_Re	TW	
5088.9426(11)	19644.972(4)	5088.9421(5)	0.0005	19000		4d	$(3/2)^2[5/2]_2$	4f	$(3/2)^2[5/2]^\circ_2$	5.2e+07	D+	F_Re	TW	
5089.492(5)	19642.851(21)	5089.4972(7)	−0.005	330		sp	$(^3F)^3P^\circ\ ^3D^\circ_2$	5d	$(5/2)^2[3/2]_1$			R1c		
5093.81535(17)	19626.1799(7)	5093.81536(14)	−0.00001	41000		4d	$(5/2)^2[5/2]_2$	4f	$(5/2)^2[5/2]^\circ_2$	4.9e+07	D+	F_Re	TW	
5094.442(3)	19623.766(11)	5094.4408(7)	0.001	330		sp	$(^3F)^3P^\circ\ ^3D^\circ_2$	5d	$(5/2)^2[3/2]_2$			R1c		
5095.7489(19)	19618.733(7)	5095.7478(3)	0.0011	3100		4d	$(5/2)^2[7/2]_4$	4f	$(5/2)^2[7/2]^\circ_3$			R1c		
5100.0629(10)	19602.138(4)	5100.0650(3)	−0.0021	12000		4d	$(5/2)^2[5/2]_2$	4f	$(5/2)^2[7/2]^\circ_3$			F_Re		
5100.9790(21)	19598.618(8)	5100.9762(5)	0.0028	9900		4d	$(3/2)^2[5/2]_2$	4f	$(3/2)^2[5/2]^\circ_3$	1.6e+07	D+	R1c	TW	
5103.283(3)	19589.770(13)	5103.2831(6)	−0.000	830		4d	$(3/2)^2[5/2]_3$	4f	$(3/2)^2[9/2]^\circ_4$			R1c		
5104.573(3)	19584.818(11)	5104.5755(3)	−0.002	830		4d	$(5/2)^2[7/2]_3$	4f	$(5/2)^2[3/2]^\circ_2$			R1c		
5108.3335(19)	19570.402(7)	5108.3328(4)	0.0007	7300		4d	$(5/2)^2[5/2]_2$	4f	$(5/2)^2[3/2]^\circ_1$			R1c		
5109.825(3)	19564.691(13)	5109.8270(21)	−0.002	500		sp	$(^1D)^3P^\circ\ ^3D^\circ_1$	5g	$(3/2)^2[5/2]_2$			R1c		
5109.880(6)	19564.481(21)	5109.8767(13)	0.003	330		4d	$(5/2)^2[5/2]_2$	sp	$(^3P)^3P^\circ\ ^5S^\circ_2$			R1c		
5110.3417(19)	19562.712(7)	5110.3409(5)	0.0008	1700		4d	$(5/2)^2[7/2]_4$	4f	$(5/2)^2[11/2]^\circ_5$			R1c		

Table A1. *Cont.*

λ_{obs} [a] (Å)	σ_{obs} [b] (cm^{-1})	λ_{Ritz} [c] (Å)	$\Delta\lambda_{obs-Ritz}$ (Å)	I_{obs} [d] (arb. u.)	Char [e]	Lower Level		Upper Level		A (s^{-1})	Acc [f]	Line Ref. [g]	TP Ref. [g]	Notes [h]
5115.535(3)	19542.852(13)	5115.5386(11)	−0.004	170		sp	$(^3F)^3P^\circ\ ^3D^\circ_1$	5d	$(5/2)^2[1/2]_0$			R1c		
5120.7535(4)	19522.9360(15)	5120.75319(19)	0.0003	20000		4d	$(5/2)^2[5/2]_2$	4f	$(5/2)^2[3/2]^\circ_2$	2.0e+07	D+	F_Re	TW	
5121.765(3)	19519.080(13)	5121.7672(7)	−0.002	1000		4d	$(3/2)^2[5/2]_3$	4f	$(3/2)^2[3/2]^\circ_2$			R1c		
5124.4745(7)	19508.760(3)	5124.4753(5)	−0.0007	30000		4d	$(5/2)^2[7/2]_3$	sp	$(^3F)^1P^\circ\ ^3G^\circ_4$			F_Re		
5127.682(3)	19496.556(13)	5127.7027(9)	−0.020	570		4d	$(3/2)^2[5/2]_2$	4f	$(3/2)^2[3/2]^\circ_1$			R1c		X
5127.7428(21)	19496.326(8)	5127.7327(8)	0.0101	630	?	4d	$(5/2)^2[3/2]_2$	sp	$(^3P)^3P^\circ\ ^3P^\circ_1$			R1c		X
5130.583(3)	19485.533(12)	5130.5829(10)	0.000	920		4d	$(3/2)^2[3/2]_2$	sp	$(^3P)^3P^\circ\ ^1D^\circ_2$			R1c		
5133.123(3)	19475.890(11)	5133.1211(4)	0.002	500		4d	$(5/2)^2[5/2]_2$	4f	$(5/2)^2[1/2]^\circ_1$			R1c		
5134.6720(24)	19470.016(9)	5134.6725(9)	−0.0005	170		4d	$(5/2)^2[3/2]_1$	sp	$(^3P)^3P^\circ\ ^3P^\circ_1$			R1c		
5136.3939(19)	19463.489(7)	5136.3932(5)	0.0007	1300		4d	$(5/2)^2[7/2]_4$	sp	$(^3F)^1P^\circ\ ^3G^\circ_4$			R1c		
5138.613(4)	19455.085(17)	5138.6113(20)	0.001	340		4d	$(3/2)^2[5/2]_3$	sp	$(^1G)^3P^\circ\ ^3F^\circ_4$			R1c		
5151.206(2)	19407.522(9)	5151.2073(8)	−0.001	2500		4d	$(5/2)^2[7/2]_3$	sp	$(^3F)^1P^\circ\ ^3D^\circ_3$			R1c		
5157.255(4)	19384.761(14)	5157.2580(9)	−0.003	340		sp	$(^3F)^3P^\circ\ ^3D^\circ_3$	6s	$(3/2)^2[3/2]_2$			R1c		
5158.0914(6)	19381.6168(21)	5158.0916(4)	−0.0002	13000		4d	$(5/2)^2[1/2]_0$	4f	$(5/2)^2[3/2]^\circ_1$	2.4e+07	D+	F_Re	TW	
5159.103(4)	19377.817(17)	5159.0971(13)	0.006	2300		sp	$(^3F)^3P^\circ\ ^3F^\circ_4$	5d	$(5/2)^2[7/2]_4$			R1c		
5163.252(3)	19362.244(11)	5163.2501(8)	0.002	330		4d	$(5/2)^2[7/2]_4$	sp	$(^3F)^1P^\circ\ ^3D^\circ_3$			R1c		
5167.6923(22)	19345.609(8)	5167.6825(8)	0.0098	11000	?	4d	$(5/2)^2[5/2]_2$	sp	$(^3F)^1P^\circ\ ^3D^\circ_3$			R1c		X
5171.644(3)	19330.828(12)	5171.6406(13)	0.003	570		4d	$(3/2)^2[7/2]_3$	sp	$(^3F)^1P^\circ\ ^3G^\circ_3$			R1c		
5175.9651(23)	19314.689(9)	5175.9637(23)	0.0014	1400	*	4d	$(3/2)^2[3/2]_1$	sp	$(^3P)^3P^\circ\ ^1P^\circ_1$			R1nc		
5175.9651(23)	19314.689(9)	5175.9653(10)	−0.0002	1400	*	4d	$(5/2)^2[1/2]_1$	sp	$(^3P)^3P^\circ\ ^3P^\circ_2$			R1c		
5183.3664(7)	19287.110(3)	5183.3664(5)	−0.0000	19000		4d	$(5/2)^2[1/2]_0$	4f	$(5/2)^2[1/2]^\circ_1$	2.4e+07	D+	F_Re	TW	
5184.052(3)	19284.561(11)	5184.0520(11)	−0.000	340		4d	$(3/2)^2[3/2]_1$	sp	$(^1G)^3P^\circ\ ^3F^\circ_2$			R1nc		
5192.638(6)	19252.671(21)	5192.6239(13)	0.015	240		sp	$(^3F)^3P^\circ\ ^3F^\circ_4$	5d	$(5/2)^2[5/2]_3$			R1c		
5194.349(4)	19246.331(16)	5194.3399(17)	0.009	170		sp	$(^3F)^3P^\circ\ ^5F^\circ_2$	6s	$(5/2)^2[5/2]_2$			R1c		
5205.112(4)	19206.536(17)	5205.1059(8)	0.006	500		sp	$(^3F)^3P^\circ\ ^3D^\circ_2$	5d	$(5/2)^2[1/2]_1$			R1c		
5207.1357(22)	19199.070(8)	5207.1340(15)	0.0018	29000		4d	$(3/2)^2[7/2]_4$	sp	$(^1G)^3P^\circ\ ^3H^\circ_5$			R1c		
5229.518(3)	19116.900(10)	5229.5194(11)	−0.002	3200		4d	$(3/2)^2[5/2]_2$	sp	$(^3P)^3P^\circ\ ^1D^\circ_2$			R1c		
5229.709(6)	19116.201(21)	5229.7107(10)	−0.002	170		sp	$(^3F)^3P^\circ\ ^3G^\circ_3$	6s	$(3/2)^2[3/2]_2$			R1c		
5234.471(23)	19098.81(8)	5234.429(3)	0.042	170	*	sp	$(^3P)^3P^\circ\ ^1P^\circ_1$	9s	$(3/2)^2[3/2]_2$			R1nc		
5234.471(23)	19098.81(8)	5234.4943(14)	−0.023	170	*	sp	$(^3F)^3P^\circ\ ^3F^\circ_4$	5d	$(5/2)^2[9/2]_4$			R1c		
5239.5473(24)	19080.307(9)	5239.5490(8)	−0.0017	330		4d	$(5/2)^2[9/2]_4$	sp	$(^3F)^1P^\circ\ ^3F^\circ_4$			R1c		
5245.340(3)	19059.237(12)	5245.3423(13)	−0.003	19000		sp	$(^3F)^3P^\circ\ ^3F^\circ_4$	5d	$(5/2)^2[9/2]_5$			R1c		
5247.109(4)	19052.811(16)	5247.1155(9)	−0.007	160		4d	$(3/2)^2[7/2]_3$	sp	$(^3F)^1P^\circ\ ^3D^\circ_2$			R1c		
5247.976(4)	19049.661(16)	5247.9750(7)	0.001	160		5p	$(5/2)^2[3/2]^\circ_2$	5d	$(3/2)^2[5/2]_2$			R1c		
5251.545(3)	19036.718(9)	5251.5445(8)	0.000	330		4d	$(5/2)^2[3/2]_2$	sp	$(^3P)^3P^\circ\ ^3D^\circ_2$			R1c		
5254.2141(20)	19027.046(7)	5254.2139(6)	0.0002	350		5p	$(5/2)^2[3/2]^\circ_2$	5d	$(3/2)^2[5/2]_3$			R1c		
5258.8249(21)	19010.364(8)	5258.8237(8)	0.0011	580		4d	$(5/2)^2[3/2]_1$	sp	$(^3P)^3P^\circ\ ^3D^\circ_2$			R1c		
5261.0461(22)	19002.338(8)	5261.0443(8)	0.0018	330		sp	$(^3F)^3P^\circ\ ^3D^\circ_1$	5d	$(5/2)^2[5/2]_2$			R1c		
5269.9892(14)	18970.091(5)	5269.9904(6)	−0.0012	23000		4p	$^3P^\circ_2$	s^2	$^1D_2$			F_Re		
5276.5244(15)	18946.597(5)	5276.5241(9)	0.0003	16000		4d	$(3/2)^2[7/2]_3$	sp	$(^1G)^3P^\circ\ ^3H^\circ_4$			F_Re		
5280.9533(23)	18930.707(8)	5280.9563(7)	−0.0030	480		sp	$(^3F)^3P^\circ\ ^3F^\circ_3$	5d	$(5/2)^2[5/2]_2$			R1c		
5285.360(4)	18914.923(13)	5285.3600(13)	0.000	480		4d	$(3/2)^2[3/2]_2$	sp	$(^3F)^1P^\circ\ ^3G^\circ_3$			R1c		
5289.1103(21)	18901.512(8)	5289.1096(6)	0.0007	800		sp	$(^3F)^3P^\circ\ ^3F^\circ_3$	5d	$(5/2)^2[7/2]_4$			R1c		

Table A1. *Cont.*

λ_{obs} [a] (Å)	σ_{obs} [b] (cm^{-1})	λ_{Ritz} [c] (Å)	$\Delta\lambda_{obs-Ritz}$ (Å)	I_{obs} [d] (arb. u.)	Char [e]	Lower Level		Upper Level		A (s^{-1})	Acc [f]	Line Ref. [g]	TP Ref. [g]	Notes [h]
5291.8196(20)	18891.835(7)	5291.8216(7)	−0.0020	1600		sp	$(^3F)^3P^\circ\ ^3F^\circ_3$	5d	$(5/2)^2[7/2]_3$			R1c		
5297.4020(23)	18871.927(8)	5297.4047(9)	−0.0028	480		4d	$(3/2)^2[3/2]_1$	sp	$(^3F)^1P^\circ\ ^3D^\circ_2$			R1c		
5310.771(3)	18824.421(11)	5310.7694(24)	0.001	310		4f	$(5/2)^2[1/2]^\circ_1$	7g	$(5/2)^2[3/2]_2$			R1c		
5314.6020(22)	18810.851(8)	5314.6025(9)	−0.0005	480		4d	$(3/2)^2[7/2]_4$	sp	$(^1G)^3P^\circ\ ^3H^\circ_4$			R1c		
5315.989(4)	18805.942(15)	5315.9868(7)	0.003	160		5p	$(5/2)^2[3/2]^\circ_2$	5d	$(3/2)^2[3/2]_1$			R1c		
5321.666(3)	18785.883(12)	5321.666(3)	0.000	310		4f	$(5/2)^2[1/2]^\circ_0$	7g	$(5/2)^2[3/2]_1$			R1c		
5321.840(3)	18785.267(11)	5321.8352(21)	0.005	310	*	4f	$(5/2)^2[3/2]^\circ_2$	7g	$(5/2)^2[5/2]_2$			R1nc		
5321.840(3)	18785.267(11)	5321.8386(23)	0.002	310	*	4f	$(5/2)^2[3/2]^\circ_2$	7g	$(5/2)^2[5/2]_3$			R1c		
5324.070(4)	18777.398(13)	5324.0734(24)	−0.003	310		4f	$(5/2)^2[3/2]^\circ_2$	7g	$(5/2)^2[3/2]_2$			R1c		
5324.3542(21)	18776.397(7)	5324.3531(6)	0.0011	1500		sp	$(^3F)^3P^\circ\ ^3F^\circ_3$	5d	$(5/2)^2[5/2]_3$			R1c		
5325.319(3)	18772.994(12)	5325.3132(19)	0.006	310		4f	$(5/2)^2[11/2]^\circ_5$	7g	$(5/2)^2[11/2]_5$			R1c		
5327.9841(23)	18763.605(8)			920		4f	$(5/2)^2[11/2]^\circ_6$	7g	$(5/2)^2[13/2]_7$	1.1e+07	D+	R1c	TW	
5328.8109(22)	18760.694(8)			1600		4f	$(5/2)^2[11/2]^\circ_5$	7g	$(5/2)^2[13/2]_6$	1.1e+07	D+	R1c	TW	
5328.963(4)	18760.157(13)			460		4f	$(3/2)^2[3/2]^\circ_2$	7g	$(3/2)^2[5/2]_3$	9.e+06	D+	R1c	TW	
5331.63(4)	18750.78(14)	5331.6093(19)	0.02	150	*	4f	$(5/2)^2[7/2]^\circ_4$	8d	$(5/2)^2[7/2]_4$			R1nc		X
5331.63(4)	18750.78(14)	5331.674(3)	−0.05	150	*	5s	$(3/2)^2[3/2]_2$	sp	$(^1D)^3P^\circ\ ^3D^\circ_3$			R1c		X
5335.317(3)	18737.818(12)	5335.3169(21)	−0.000	300		4f	$(5/2)^2[3/2]^\circ_1$	7g	$(5/2)^2[5/2]_2$			R2nc		
5335.518(3)	18737.112(12)	5335.5179(6)	−0.000	300		4p	$^3F^\circ_2$	s^2	$^3P_1$			R1c		
5336.203(3)	18734.707(12)			150		4f	$(3/2)^2[3/2]^\circ_1$	7g	$(3/2)^2[5/2]_2$			R1c		
5337.580(13)	18729.87(5)	5337.5664(20)	0.013	150	*	4f	$(5/2)^2[3/2]^\circ_1$	7g	$(5/2)^2[3/2]_2$			R1c		
5337.580(13)	18729.87(5)	5337.593(3)	−0.013	150	*	4f	$(5/2)^2[3/2]^\circ_1$	7g	$(5/2)^2[3/2]_1$			R1c		
5338.460(3)	18726.784(10)	5338.4584(6)	0.002	300		4d	$(3/2)^2[1/2]_1$	4f	$(5/2)^2[3/2]^\circ_1$			R1c		
5340.098(3)	18721.041(11)	5340.0973(8)	0.001	1300		4d	$(5/2)^2[3/2]_2$	sp	$(^3P)^3P^\circ\ ^3D^\circ_1$			R1c		
5340.878(3)	18718.305(12)	5340.8750(20)	0.003	300		4f	$(5/2)^2[7/2]^\circ_3$	7g	$(5/2)^2[9/2]_4$			R1c		
5342.197(3)	18713.684(12)	5342.1987(24)	−0.001	150		4f	$(5/2)^2[7/2]^\circ_3$	7g	$(5/2)^2[7/2]_3$			R1c		
		5344.316(4)			m	4f	$(3/2)^2[9/2]^\circ_4$	7g	$(3/2)^2[9/2]_4$			R1nc		
5344.366(4)	18706.091(16)	5344.3657(21)	0.000	150	*	4f	$(5/2)^2[7/2]^\circ_3$	7g	$(5/2)^2[5/2]_2$			R1nc		
5344.366(4)	18706.091(16)	5344.3692(24)	−0.003	150	*	4f	$(5/2)^2[7/2]^\circ_3$	7g	$(5/2)^2[5/2]_3$			R1c		
5345.160(3)	18703.312(10)	5345.154(3)	0.006	420	*	4f	$(3/2)^2[9/2]^\circ_5$	7g	$(3/2)^2[11/2]_5$			R1c		
5345.160(3)	18703.312(10)			420	*	4f	$(3/2)^2[9/2]^\circ_5$	7g	$(3/2)^2[11/2]_6$	1.1e+07	D+	R1nc	TW	
5345.576(2)	18701.857(9)	5345.5723(9)	0.003	300		sp	$(^3F)^3P^\circ\ ^3D^\circ_1$	5d	$(5/2)^2[3/2]_1$			R1c		
5347.6243(22)	18694.693(8)	5347.6243(8)	−0.0000	1500		4d	$(5/2)^2[3/2]_1$	sp	$(^3P)^3P^\circ\ ^3D^\circ_1$			R1c		
5347.684(3)	18694.484(11)	5347.6891(8)	−0.005	750		4d	$(3/2)^2[7/2]_3$	sp	$(^3F)^1P^\circ\ ^3F^\circ_3$			R1c		
5347.809(3)	18694.047(12)	5347.809(3)	0.000	420		4f	$(3/2)^2[9/2]^\circ_4$	7g	$(3/2)^2[11/2]_5$	1.1e+07	D+	R1c	TW	
5349.076(4)	18689.619(13)	5349.0730(24)	0.003	150		4f	$(5/2)^2[5/2]^\circ_2$	7g	$(5/2)^2[7/2]_3$			R1c		
5351.245(4)	18682.043(14)	5351.2456(21)	−0.000	150	*	4f	$(5/2)^2[5/2]^\circ_2$	7g	$(5/2)^2[5/2]_2$			R1nc		
5351.245(4)	18682.043(14)	5351.2491(24)	−0.004	150	*	4f	$(5/2)^2[5/2]^\circ_2$	7g	$(5/2)^2[5/2]_3$			R1c		
5351.579(4)	18680.878(12)	5351.5804(12)	−0.001	300		4d	$(3/2)^2[5/2]_2$	sp	$(^1G)^3P^\circ\ ^3F^\circ_2$			R1nc		
5352.0268(21)	18679.315(7)	5352.0245(5)	0.0023	6000		4d	$(3/2)^2[1/2]_1$	4f	$(5/2)^2[3/2]^\circ_2$			R1c		
5353.863(4)	18672.908(12)	5353.8649(20)	−0.002	300		4f	$(5/2)^2[5/2]^\circ_3$	7g	$(5/2)^2[9/2]_4$			R1c		
5354.4850(20)	18670.740(7)	5354.4863(8)	−0.0013	4500		4d	$(3/2)^2[1/2]_1$	4f	$(5/2)^2[1/2]^\circ_0$			R1c		
5355.186(3)	18668.294(11)	5355.1870(24)	−0.001	410		4f	$(5/2)^2[5/2]^\circ_3$	7g	$(5/2)^2[7/2]_4$	7.4e+06	D+	R1c	TW	
5356.8109(21)	18662.633(7)	5356.8091(8)	0.0018	2100		4d	$(5/2)^2[5/2]_3$	sp	$(^3F)^1P^\circ\ ^3F^\circ_4$			R1c		

Table A1. *Cont.*

λ_{obs} [a] (Å)	σ_{obs} [b] (cm^{-1})	λ_{Ritz} [c] (Å)	$\Delta\lambda_{obs-Ritz}$ (Å)	I_{obs} [d] (arb. u.)	Char [e]	Lower Level		Upper Level		A (s^{-1})	Acc [f]	Line Ref. [g]	TP Ref. [g]	Notes [h]
5357.374(4)	18660.670(13)	5357.3727(21)	0.002	300	*	4f	$(5/2)^2[5/2]^\circ_3$	7g	$(5/2)^2[5/2]_2$			R1nc		
5357.374(4)	18660.670(13)	5357.3761(24)	−0.002	300	*	4f	$(5/2)^2[5/2]^\circ_3$	7g	$(5/2)^2[5/2]_3$			R1c		
5361.907(4)	18644.894(12)	5361.914(4)	−0.007	150	*	4f	$(3/2)^2[5/2]^\circ_3$	7g	$(3/2)^2[7/2]_3$			R1c		
5361.907(4)	18644.894(12)			150	*	4f	$(3/2)^2[5/2]^\circ_3$	7g	$(3/2)^2[7/2]_4$	9.e+06	D+	R1nc	TW	
5365.5363(20)	18632.284(7)	5365.5363(6)	−0.0000	5500		4d	$(3/2)^2[1/2]_1$	4f	$(5/2)^2[1/2]^\circ_1$			R1c		
5366.243(3)	18629.831(11)	5366.2476(7)	−0.005	440		sp	$(^3F)^3P^\circ\ ^3D^\circ_2$	6s	$(3/2)^2[3/2]_2$			R1c		
5368.3825(21)	18622.406(7)	5368.3839(7)	−0.0013	7400		sp	$(^3F)^3P^\circ\ ^3F^\circ_3$	5d	$(5/2)^2[9/2]_4$			R1c		
5371.6264(21)	18611.160(7)	5371.6264(7)	0.0001	880		sp	$(^3F)^3P^\circ\ ^3F^\circ_3$	5d	$(5/2)^2[3/2]_2$			R1c		
5375.276(4)	18598.524(12)	5375.276(4)	0.000	290		4f	$(3/2)^2[5/2]^\circ_2$	7g	$(3/2)^2[7/2]_3$	8.1e+06	D+	R1c	TW	
5381.9479(23)	18575.468(8)	5381.9511(21)	−0.0032	430	*	4f	$(5/2)^2[7/2]^\circ_4$	7g	$(5/2)^2[9/2]_4$			R1c		
5381.9479(23)	18575.468(8)	5381.9485(20)	−0.0006	430	*	4f	$(5/2)^2[7/2]^\circ_4$	7g	$(5/2)^2[9/2]_5$	8.2e+06	D+	R1nc	TW	
5382.329(4)	18574.152(15)	5382.3347(19)	−0.006	140		4f	$(5/2)^2[7/2]^\circ_4$	7g	$(5/2)^2[11/2]_5$			R1c		
5383.289(4)	18570.842(12)	5383.2871(24)	0.001	140		4f	$(5/2)^2[7/2]^\circ_4$	7g	$(5/2)^2[7/2]_4$			R1c		
5384.818(3)	18565.569(11)	5384.8222(16)	−0.005	430		4d	$(3/2)^2[1/2]_0$	6p	$(3/2)^2[1/2]^\circ_1$			R1c		
5386.435(4)	18559.995(14)	5386.437(4)	−0.003	420	*	4f	$(3/2)^2[7/2]^\circ_4$	7g	$(3/2)^2[9/2]_4$			R1c		
5386.435(4)	18559.995(14)			420	*	4f	$(3/2)^2[7/2]^\circ_4$	7g	$(3/2)^2[9/2]_5$	1.0e+07	D+	R1nc	TW	
5386.8405(22)	18558.597(8)	5386.8419(10)	−0.0014	720		4d	$(5/2)^2[1/2]_0$	sp	$(^3P)^3P^\circ\ ^3P^\circ_1$			R1c		
5390.029(4)	18547.619(13)	5390.0296(21)	−0.001	140	*	4f	$(5/2)^2[9/2]^\circ_5$	7g	$(5/2)^2[9/2]_4$			R1c		
5390.029(4)	18547.619(13)	5390.0270(20)	0.002	140	*	4f	$(5/2)^2[9/2]^\circ_5$	7g	$(5/2)^2[9/2]_5$			R1nc		
5390.4163(22)	18546.286(8)	5390.4169(13)	−0.0006	4800		4d	$(3/2)^2[5/2]_2$	sp	$(^3F)^1P^\circ\ ^3G^\circ_3$			R1c		
5391.6966(22)	18541.882(8)	5391.6987(10)	−0.0021	1700		4d	$(5/2)^2[9/2]_5$	sp	$(^3F)^1P^\circ\ ^3G^\circ_5$			R1c		
5393.9372(21)	18534.180(7)	5393.9372(7)	0.0001	2600		sp	$(^3F)^3P^\circ\ ^3D^\circ_2$	6s	$(3/2)^2[3/2]_1$			R1c		
5397.2943(21)	18522.652(7)	5397.2952(5)	−0.0008	580		4d	$(3/2)^2[7/2]_3$	4f	$(5/2)^2[9/2]^\circ_4$			R1c		
5397.37	18522.38	5397.3730(17)			:	sp	$(^3F)^1P^\circ\ ^3D^\circ_3$	9s	$(5/2)^2[5/2]_3$					
5398.573(4)	18518.266(12)	5398.573(4)	−0.000	140		4f	$(3/2)^2[7/2]^\circ_3$	7g	$(3/2)^2[9/2]_4$	9.e+06	D+	R1c	TW	
5403.714(4)	18500.647(13)	5403.7093(9)	0.005	140		5p	$(5/2)^2[3/2]^\circ_2$	5d	$(3/2)^2[1/2]_1$			R1c		
5405.652(3)	18494.013(11)	5405.6515(6)	0.001	280		4p	$^3F^\circ_2$	s^2	$^3P_2$			R1c		
5407.447(3)	18487.877(11)	5407.4452(23)	0.001	280		5s	$(3/2)^2[3/2]_2$	sp	$(^1D)^3P^\circ\ ^3D^\circ_2$			R1c		
5408.383(4)	18484.675(12)	5408.3840(24)	−0.001	280		5s	$(3/2)^2[3/2]_1$	sp	$(^1D)^3P^\circ\ ^3D^\circ_1$			R1c		
5422.002(4)	18438.246(12)	5422.0053(21)	−0.003	140		4f	$(5/2)^2[9/2]^\circ_4$	7g	$(5/2)^2[9/2]_4$			R1c		
5422.392(3)	18436.920(11)	5422.3947(19)	−0.003	270		4f	$(5/2)^2[9/2]^\circ_4$	7g	$(5/2)^2[11/2]_5$	7.2e+06	D+	R1c	TW	
5428.274(3)	18416.944(11)	5428.2724(9)	0.001	140		4d	$(5/2)^2[7/2]_3$	sp	$(^3F)^1P^\circ\ ^3F^\circ_4$			R1c		
5437.1438(21)	18386.899(7)	5437.1431(5)	0.0006	2100		4d	$(3/2)^2[7/2]_4$	4f	$(5/2)^2[9/2]^\circ_4$			R1c		
5437.5787(23)	18385.428(8)	5437.5790(4)	−0.0002	6700		4d	$(3/2)^2[7/2]_3$	4f	$(5/2)^2[7/2]^\circ_4$			R1c		
5441.6461(22)	18371.686(7)	5441.6471(9)	−0.0011	2100		4d	$(5/2)^2[7/2]_4$	sp	$(^3F)^1P^\circ\ ^3F^\circ_4$			R1c		
5448.1914(23)	18349.615(8)	5448.1938(9)	−0.0024	260		4d	$(5/2)^2[7/2]_3$	sp	$(^3P)^3P^\circ\ ^3D^\circ_2$			R1c		
5449.409(4)	18345.516(12)	5449.4072(10)	0.002	2700		4d	$(5/2)^2[3/2]_2$	sp	$(^3P)^3P^\circ\ ^3D^\circ_3$			R1c		
5458.0942(22)	18316.323(7)	5458.0941(9)	0.0001	390		4d	$(3/2)^2[5/2]_3$	sp	$(^3F)^1P^\circ\ ^3D^\circ_2$			R1c		
5466.57(6)	18287.94(20)	5466.5527(5)	0.01	1600	*	4d	$(3/2)^2[7/2]_3$	4f	$(5/2)^2[5/2]^\circ_3$			R1c		
5466.57(6)	18287.94(20)	5466.6267(9)	−0.06	1600	*	4d	$(5/2)^2[5/2]_2$	sp	$(^3P)^3P^\circ\ ^3D^\circ_2$			R1c		
5468.563(3)	18281.260(9)	5468.5633(19)	−0.000	510		5s	$(3/2)^2[3/2]_1$	sp	$(^1D)^3P^\circ\ ^3F^\circ_2$			R1c		
5469.376(3)	18278.541(10)	5469.3734(8)	0.003	1300		4d	$(3/2)^2[3/2]_2$	sp	$(^3F)^1P^\circ\ ^3F^\circ_3$			R1c		

Table A1. *Cont.*

λ_{obs} [a] (Å)	σ_{obs} [b] (cm^{-1})	λ_{Ritz} [c] (Å)	$\Delta\lambda_{obs-Ritz}$ (Å)	I_{obs} [d] (arb. u.)	Char [e]	Lower Level		Upper Level		A (s^{-1})	Acc [f]	Line Ref. [g]	TP Ref. [g]	Notes [h]
5469.6826(21)	18277.518(7)	5469.6819(4)	0.0006	4400		4d	$(3/2)^2[7/2]_4$	4f	$(5/2)^2[9/2]^\circ_5$			R1c		
5472.465(3)	18268.225(11)	5472.4631(10)	0.002	130		4d	$(3/2)^2[5/2]_2$	sp	$(^3F)^1P^\circ\ ^3D^\circ_2$			R1c		
5472.9475(24)	18266.614(8)	5472.9467(5)	0.0007	740		4d	$(3/2)^2[7/2]_3$	4f	$(5/2)^2[5/2]^\circ_2$			R1c		
5473.01	18266.42	5473.006(2)			:	sp	$(^3F)^1P^\circ\ ^3F^\circ_3$	7g	$(5/2)^2[9/2]_4$					
5473.119(4)	18266.040(12)	5473.1211(8)	−0.002	920		5p	$(5/2)^2[5/2]^\circ_2$	5d	$(3/2)^2[5/2]_2$			R1c		
		5473.1623(16)			m	4f	$(5/2)^2[7/2]^\circ_3$	9s	$(5/2)^2[5/2]_3$			R1nc		
5477.127(3)	18252.676(11)	5477.1275(13)	−0.001	130		4d	$(3/2)^2[1/2]_1$	sp	$(^3P)^3P^\circ\ ^3P^\circ_0$			R1c		
5478.0268(23)	18249.677(8)	5478.0262(4)	0.0006	3700		4d	$(3/2)^2[7/2]_4$	4f	$(5/2)^2[7/2]^\circ_4$			R1c		
5479.9089(22)	18243.409(7)	5479.9071(7)	0.0018	3700		5p	$(5/2)^2[5/2]^\circ_2$	5d	$(3/2)^2[5/2]_3$			R1c		
5480.1613(24)	18242.569(8)	5480.1619(5)	−0.0006	1900		4d	$(3/2)^2[7/2]_3$	4f	$(5/2)^2[7/2]^\circ_3$			R1c		
5482.524(3)	18234.708(10)	5482.5262(15)	−0.002	790		sp	$(^3F)^3P^\circ\ ^3G^\circ_4$	6s	$(5/2)^2[5/2]_3$			R1c		
5486.205(3)	18222.473(11)	5486.2037(8)	0.001	120		5p	$(5/2)^2[3/2]^\circ_1$	5d	$(3/2)^2[5/2]_2$			R1c		
5493.5268(22)	18198.186(7)	5493.5289(6)	−0.0021	240		5p	$(5/2)^2[7/2]^\circ_3$	5d	$(3/2)^2[7/2]_4$			R1c		
5495.0454(23)	18193.157(8)	5495.0446(23)	0.0008	430		5s	$(3/2)^2[3/2]_2$	sp	$(^1D)^3P^\circ\ ^3F^\circ_3$			R1c		
5496.868(3)	18187.126(11)	5496.8685(11)	−0.001	510		4d	$(5/2)^2[3/2]_2$	sp	$(^3P)^3P^\circ\ ^3P^\circ_2$			R1c		
5504.021(4)	18163.488(12)	5504.0559(5)	−0.035	120	?	4d	$(3/2)^2[7/2]_3$	4f	$(5/2)^2[3/2]^\circ_2$			R1c		X
5504.844(3)	18160.774(11)	5504.8442(11)	−0.000	240		4d	$(5/2)^2[3/2]_1$	sp	$(^3P)^3P^\circ\ ^3P^\circ_2$			R1c		
5507.428(4)	18152.254(12)	5507.4337(4)	−0.006	240		4d	$(3/2)^2[7/2]_4$	4f	$(5/2)^2[5/2]^\circ_3$			R1c		
5512.8649(22)	18134.351(7)	5512.8650(6)	−0.0001	240		5p	$(5/2)^2[7/2]^\circ_3$	5d	$(3/2)^2[7/2]_3$			R1c		
5521.249(3)	18106.815(9)	5521.2475(5)	0.001	230		4d	$(3/2)^2[7/2]_4$	4f	$(5/2)^2[7/2]^\circ_3$			R1c		
5521.729(3)	18105.239(9)	5521.7315(8)	−0.002	1100		5p	$(5/2)^2[5/2]^\circ_2$	5d	$(3/2)^2[3/2]_2$			R1c		
5525.438(3)	18093.088(9)	5525.4391(6)	−0.001	230		5p	$(5/2)^2[7/2]^\circ_4$	5d	$(3/2)^2[7/2]_4$			R1c		
5525.53	18092.78	5525.532(6)			:	sp	$(^3F)^1P^\circ\ ^3D^\circ_2$	8d	$(5/2)^2[5/2]_2$					
5527.1968(22)	18087.330(7)	5527.1993(7)	−0.0025	2200		4d	$(3/2)^2[7/2]_3$	sp	$(^3F)^1P^\circ\ ^3G^\circ_4$			R1c		
5527.6813(22)	18085.744(7)	5527.6804(5)	0.0009	690		4d	$(3/2)^2[3/2]_1$	4f	$(5/2)^2[5/2]^\circ_2$			R1c		
5534.668(3)	18062.913(10)	5534.6726(8)	−0.004	230		5p	$(5/2)^2[5/2]^\circ_3$	5d	$(3/2)^2[5/2]_2$			R1c		
5535.0494(22)	18061.669(7)	5535.0478(8)	0.0016	4100		5p	$(5/2)^2[3/2]^\circ_1$	5d	$(3/2)^2[3/2]_2$			R1c		
5537.670(20)	18053.12(7)	5537.6662(21)	0.004	340		sp	$(^3F)^3P^\circ\ ^1G^\circ_4$	5d	$(5/2)^2[7/2]_4$			R1c		
5538.3836(22)	18050.796(7)	5538.3835(6)	0.0001	880		4d	$(3/2)^2[7/2]_4$	4f	$(5/2)^2[11/2]^\circ_5$			R1c		
5541.6120(22)	18040.280(7)	5541.6123(6)	−0.0003	1300		5p	$(5/2)^2[5/2]^\circ_3$	5d	$(3/2)^2[5/2]_3$			R1c		
5543.5368(22)	18034.016(7)	5543.5385(7)	−0.0016	1900		sp	$(^3F)^3P^\circ\ ^3F^\circ_2$	5d	$(5/2)^2[5/2]_2$			R1c		
5544.7815(22)	18029.968(7)	5544.7803(6)	0.0012	220		4d	$(3/2)^2[3/2]_1$	4f	$(5/2)^2[3/2]^\circ_1$			R1c		
5555.5122(22)	17995.143(7)	5555.5123(7)	−0.0001	5500		sp	$(^3F)^3P^\circ\ ^3F^\circ_2$	5d	$(5/2)^2[7/2]_3$			R1c		
5558.314(3)	17986.072(11)	5558.3108(10)	0.003	110		4d	$(3/2)^2[7/2]_3$	sp	$(^3F)^1P^\circ\ ^3D^\circ_3$			R1c		
5559.417(4)	17982.504(11)	5559.4167(5)	0.000	110		4d	$(3/2)^2[3/2]_1$	4f	$(5/2)^2[3/2]^\circ_2$			R1c		
5560.5761(24)	17978.755(8)	5560.5739(8)	0.0022	610		5p	$(5/2)^2[3/2]^\circ_1$	5d	$(3/2)^2[3/2]_1$			R1c		
5562.074(3)	17973.913(11)	5562.0730(8)	0.001	110		4d	$(3/2)^2[3/2]_1$	4f	$(5/2)^2[1/2]^\circ_0$			R1c		
5562.6460(23)	17972.065(7)	5562.6478(9)	−0.0018	770		4d	$(5/2)^2[5/2]_2$	sp	$(^3P)^3P^\circ\ ^3D^\circ_1$			R1c		
5567.002(3)	17958.004(9)	5567.0018(8)	−0.000	210		4d	$(3/2)^2[5/2]_3$	sp	$(^3F)^1P^\circ\ ^3F^\circ_3$			R1c		
5569.670(3)	17949.401(11)	5569.6723(16)	−0.002	210		5d	$(5/2)^2[9/2]_5$	7f	$(5/2)^2[9/2]^\circ_5$			R1c		
5571.6406(24)	17943.052(8)	5571.6415(7)	−0.0009	210		5p	$(5/2)^2[5/2]^\circ_2$	5d	$(3/2)^2[7/2]_3$			R1c		
5578.4356(23)	17921.196(7)	5578.4337(17)	0.0019	520		5d	$(5/2)^2[9/2]_5$	7f	$(5/2)^2[11/2]^\circ_6$	1.0e+07	D+	R1c	TW	

Table A1. *Cont.*

λ_{obs} [a] (Å)	σ_{obs} [b] (cm^{-1})	λ_{Ritz} [c] (Å)	$\Delta\lambda_{obs-Ritz}$ (Å)	I_{obs} [d] (arb. u.)	Char [e]	Lower Level		Upper Level		A (s^{-1})	Acc [f]	Line Ref. [g]	TP Ref. [g]	Notes [h]
5579.431(4)	17917.999(12)	5579.4269(20)	0.004	210		5d	$(5/2)^2[3/2]_2$	7f	$(5/2)^2[5/2]^\circ_3$			R1c		
5581.9475(24)	17909.921(8)	5581.9507(9)	−0.0032	310		4d	$(3/2)^2[5/2]_2$	sp	$(^3F)^1P^\circ\ ^3F^\circ_3$			R1c		
5582.173(4)	17909.196(11)	5582.1725(18)	0.001	100		5d	$(5/2)^2[9/2]_4$	7f	$(5/2)^2[9/2]^\circ_4$			R1c		
5583.864(3)	17903.773(11)	5583.8665(11)	−0.002	210		4d	$(3/2)^2[1/2]_1$	sp	$(^3P)^3P^\circ\ ^3P^\circ_1$			R1c		
5584.346(3)	17902.230(11)	5584.3413(22)	0.004	480		5d	$(3/2)^2[7/2]_3$	7f	$(3/2)^2[9/2]^\circ_4$	9.e+06	D+	R1c	TW	
5591.382(3)	17879.700(9)	5591.3777(6)	0.005	210		sp	$(^3F)^3P^\circ\ ^3F^\circ_2$	5d	$(5/2)^2[5/2]_3$			R1c		
5592.5298(24)	17876.032(8)	5592.5272(19)	0.0026	510		5d	$(5/2)^2[9/2]_4$	7f	$(5/2)^2[11/2]^\circ_5$	9.e+06	D+	R1c	TW	
5593.7697(13)	17872.070(4)	5593.7708(4)	−0.0011	5400		4d	$(3/2)^2[3/2]_2$	4f	$(5/2)^2[5/2]^\circ_3$			F_Re		
5600.4662(23)	17850.701(7)	5600.4661(5)	0.0001	500		4d	$(3/2)^2[3/2]_2$	4f	$(5/2)^2[5/2]^\circ_2$			R1c		
5600.581(4)	17850.334(11)	5600.5810(10)	0.000	300		4d	$(3/2)^2[7/2]_4$	sp	$(^3F)^1P^\circ\ ^3D^\circ_3$			R1c		
5607.282(3)	17829.001(9)	5607.2823(22)	0.000	300		5d	$(3/2)^2[7/2]_4$	7f	$(3/2)^2[9/2]^\circ_5$	8.e+06	D+	R1c	TW	
5608.027(3)	17826.635(8)	5608.0216(5)	0.005	200		4d	$(3/2)^2[3/2]_2$	4f	$(5/2)^2[7/2]^\circ_3$			R1c		
5615.2350(23)	17803.751(7)	5615.2379(6)	−0.0030	5500		5p	$(5/2)^2[5/2]^\circ_3$	5d	$(3/2)^2[7/2]_4$			R1c		
5618.016(3)	17794.938(11)	5618.0200(6)	−0.004	98		4d	$(3/2)^2[3/2]_2$	4f	$(5/2)^2[3/2]^\circ_1$			R1c		
5619.885(7)	17789.021(21)	5619.8874(16)	−0.003	190		4d	$(3/2)^2[3/2]_2$	sp	$(^3P)^3P^\circ\ ^5S^\circ_2$			R1c		
5620.7814(23)	17786.183(7)	5620.7805(5)	0.0008	850		4d	$(3/2)^2[5/2]_3$	4f	$(5/2)^2[9/2]^\circ_4$			R1c		
5621.7027(24)	17783.268(8)	5621.7019(10)	0.0009	530		4d	$(5/2)^2[1/2]_0$	sp	$(^3P)^3P^\circ\ ^3D^\circ_1$			R1c		
5629.240(3)	17759.456(11)	5629.218(3)	0.022	190	?	5d	$(5/2)^2[5/2]_3$	7f	$(5/2)^2[7/2]^\circ_3$			R1c		X
5630.589(4)	17755.202(11)	5630.5900(18)	−0.001	95		5d	$(5/2)^2[5/2]_3$	7f	$(5/2)^2[9/2]^\circ_4$			R1c		
5631.153(3)	17753.425(11)	5631.1561(18)	−0.003	190		5d	$(5/2)^2[5/2]_3$	7f	$(5/2)^2[7/2]^\circ_4$			R1c		
5631.358(3)	17752.777(11)	5631.3600(20)	−0.002	95		5d	$(5/2)^2[5/2]_3$	7f	$(5/2)^2[5/2]^\circ_3$			R1c		
5633.0442(23)	17747.464(7)	5633.0461(5)	−0.0020	3400		4d	$(3/2)^2[3/2]_2$	4f	$(5/2)^2[3/2]^\circ_2$			R1c		
5633.602(3)	17745.707(10)	5633.6032(12)	−0.001	950		4d	$(5/2)^2[5/2]_3$	sp	$(^3P)^3P^\circ\ ^3P^\circ_2$			R1c		
5635.5118(23)	17739.693(7)	5635.5130(11)	−0.0012	3000		4d	$(5/2)^2[7/2]_4$	sp	$(^3F)^1P^\circ\ ^3G^\circ_5$			R1c		
5637.162(4)	17734.501(13)	5637.1546(21)	0.007	190		sp	$(^3F)^3P^\circ\ ^1G^\circ_4$	5d	$(5/2)^2[9/2]_5$			R1c		
5637.468(3)	17733.536(8)	5637.4686(8)	−0.000	1100		sp	$(^3F)^3P^\circ\ ^3F^\circ_2$	5d	$(5/2)^2[3/2]_1$			R1c		
5641.2645(23)	17721.603(7)	5641.2645(18)	−0.0000	2300		5p	$(3/2)^2[1/2]^\circ_1$	5d	$(3/2)^2[1/2]_0$			R1c		
5643.5338(24)	17714.477(8)	5643.5346(7)	−0.0008	280		sp	$(^3F)^3P^\circ\ ^3F^\circ_2$	5d	$(5/2)^2[3/2]_2$			R1c		
5648.0170(24)	17700.416(8)	5648.0161(6)	0.0009	430		4d	$(3/2)^2[3/2]_2$	4f	$(5/2)^2[1/2]^\circ_1$			R1c		
5651.708(4)	17688.857(11)	5651.7093(9)	−0.001	370		sp	$(^3F)^3P^\circ\ ^3D^\circ_1$	6s	$(3/2)^2[3/2]_2$			R1c		
5656.632(3)	17673.459(10)	5656.6271(10)	0.005	7300		5p	$(5/2)^2[3/2]^\circ_1$	5d	$(3/2)^2[1/2]_1$			R1c		
5664.4833(23)	17648.963(7)	5664.4829(5)	0.0004	2900		4d	$(3/2)^2[5/2]_3$	4f	$(5/2)^2[7/2]^\circ_4$			R1c		
5667.434(3)	17639.775(11)	5667.4344(19)	−0.001	180		5d	$(5/2)^2[7/2]_3$	7f	$(5/2)^2[9/2]^\circ_4$	5.8e+06	D+	R1c	TW	
5668.007(3)	17637.991(10)	5668.0080(18)	−0.001	180		5d	$(5/2)^2[7/2]_3$	7f	$(5/2)^2[7/2]^\circ_4$			R1c		
5670.329(3)	17630.769(10)	5670.3245(16)	0.004	350		5d	$(5/2)^2[7/2]_4$	7f	$(5/2)^2[9/2]^\circ_5$	7.4e+06	D+	R1c	TW	
5674.694(4)	17617.207(12)	5674.6947(7)	−0.001	180	*	sp	$(^3F)^3P^\circ\ ^3F^\circ_3$	6s	$(3/2)^2[3/2]_2$			R1c		
5674.694(4)	17617.207(12)	5674.6968(9)	−0.003	180	*	sp	$(^3F)^3P^\circ\ ^1F^\circ_3$	5d	$(3/2)^2[5/2]_2$			R1nc		
5676.005(3)	17613.137(10)	5676.0028(11)	0.002	1300		4d	$(5/2)^2[7/2]_4$	sp	$(^3P)^3P^\circ\ ^3D^\circ_3$			R1c		
5678.556(3)	17605.224(11)	5678.554(3)	0.002	87		5d	$(5/2)^2[5/2]_2$	7f	$(5/2)^2[7/2]^\circ_3$			R1c		
5681.353(3)	17596.559(11)	5681.3597(11)	−0.007	87		4d	$(5/2)^2[5/2]_2$	sp	$(^3P)^3P^\circ\ ^3D^\circ_3$			R1c		
5681.998(3)	17594.559(9)	5681.9923(7)	0.006	430		sp	$(^3F)^3P^\circ\ ^1F^\circ_3$	5d	$(3/2)^2[5/2]_3$			R1c		
5682.433(3)	17593.214(9)	5682.4316(9)	0.001	2100		sp	$(^3F)^3P^\circ\ ^3D^\circ_1$	6s	$(3/2)^2[3/2]_1$			R1c		

Table A1. *Cont.*

λ_{obs} [a] (Å)	σ_{obs} [b] (cm^{-1})	λ_{Ritz} [c] (Å)	$\Delta\lambda_{obs-Ritz}$ (Å)	I_{obs} [d] (arb. u.)	Char [e]	Lower Level		Upper Level	A (s^{-1})	Acc [f]	Line Ref. [g]	TP Ref. [g]	Notes [h]
5689.83(4)	17570.34(12)	5689.8869(11)	−0.06	170		4d	$(3/2)^2[3/2]_2$	sp	$(^3F)^1P^\circ\ ^3D^\circ_3$			S36c		
5694.526(3)	17555.852(10)	5694.5253(14)	0.001	170		4d	$(3/2)^2[3/2]_1$	sp	$(^3P)^3P^\circ\ ^3P^\circ_0$			R1c		
5695.931(3)	17551.521(10)	5695.9321(5)	−0.001	340		4d	$(3/2)^2[5/2]_3$	4f	$(5/2)^2[5/2]^\circ_3$			R1c		
5706.012(4)	17520.514(12)	5706.0055(7)	0.006	450		4p	$^1F^\circ_3$	s^2	$^3P_2$			R1c		
5710.7111(24)	17506.097(7)	5710.7089(5)	0.0022	250		4d	$(3/2)^2[5/2]_3$	4f	$(5/2)^2[7/2]^\circ_3$			R1c		
5711.586(4)	17503.416(11)	5711.5823(5)	0.003	250		4d	$(3/2)^2[5/2]_2$	4f	$(5/2)^2[5/2]^\circ_3$			R1c		
5721.7840(24)	17472.220(7)	5721.7856(7)	−0.0015	4100		4p	$^3P^\circ_1$	s^2	$^1D_2$			R1c		
5726.442(3)	17458.009(11)	5726.4406(6)	0.001	160		4d	$(3/2)^2[5/2]_2$	4f	$(5/2)^2[7/2]^\circ_3$			R1c		
5731.004(4)	17444.110(12)	5731.0007(11)	0.004	160		4d	$(3/2)^2[1/2]_1$	sp	$(^3P)^3P^\circ\ ^3D^\circ_2$			R1c		
5736.659(4)	17426.915(11)	5736.6603(5)	−0.001	160		4d	$(3/2)^2[5/2]_3$	4f	$(5/2)^2[3/2]^\circ_2$			R1c		
5752.536(4)	17378.819(11)	5752.5355(6)	0.000	580		4d	$(3/2)^2[5/2]_2$	4f	$(5/2)^2[3/2]^\circ_2$			R1c		
5759.015(4)	17359.266(11)	5759.0170(20)	−0.002	150		sp	$(^3F)^1P^\circ\ ^3G^\circ_5$	6g	$(5/2)^2[11/2]_6$			R1c		
5759.4219(24)	17358.040(7)	5759.4213(7)	0.0005	6300		sp	$(^3F)^3P^\circ\ ^1F^\circ_3$	5d	$(3/2)^2[7/2]_4$			R1c		
5761.220(3)	17352.622(8)	5761.2165(10)	0.004	2000		sp	$(^3F)^3P^\circ\ ^3D^\circ_3$	6s	$(5/2)^2[5/2]_2$			R1c		
5761.8052(24)	17350.860(7)	5761.8056(7)	−0.0003	2200		4d	$(3/2)^2[5/2]_3$	sp	$(^3F)^1P^\circ\ ^3G^\circ_4$			R1c		
5768.143(4)	17331.796(11)	5768.1482(7)	−0.005	150		4d	$(3/2)^2[5/2]_2$	4f	$(5/2)^2[1/2]^\circ_1$			R1c		
5779.656(4)	17297.270(12)	5779.6592(8)	−0.003	360		sp	$(^3F)^3P^\circ\ ^3F^\circ_2$	5d	$(5/2)^2[1/2]_1$			R1c		
5783.920(4)	17284.519(11)	5783.9194(20)	0.001	6400		5p	$(3/2)^2[3/2]^\circ_1$	5d	$(3/2)^2[1/2]_0$			R1c		
5801.130(7)	17233.242(21)	5801.116(3)	0.014	140		5s	$(5/2)^2[5/2]_3$	sp	$(^3P)^3P^\circ\ ^5P^\circ_2$			R1c		
5805.989(3)	17218.822(8)	5805.9869(11)	0.002	4700		sp	$(^3F)^3P^\circ\ ^3D^\circ_3$	6s	$(5/2)^2[5/2]_3$			R1c		
5825.823(2)	17160.200(7)	5825.8247(9)	−0.002	9100		sp	$(^3F)^3P^\circ\ ^1D^\circ_2$	5d	$(3/2)^2[5/2]_2$	1.1e+07	D+	R1c	TW	
5833.5146(24)	17137.573(7)	5833.5141(7)	0.0005	6400		sp	$(^3F)^3P^\circ\ ^1D^\circ_2$	5d	$(3/2)^2[5/2]_3$	7.9e+06	D+	R1c	TW	
5836.619(4)	17128.458(13)	5836.6234(11)	−0.004	130		4d	$(3/2)^2[1/2]_1$	sp	$(^3P)^3P^\circ\ ^3D^\circ_1$			R1c		
5842.495(3)	17111.233(8)	5842.4918(7)	0.003	1900		4p	$^1D^\circ_2$	s^2	$^3P_1$			R1c		
5851.787(4)	17084.062(11)	5851.7811(12)	0.006	930		sp	$(^3F)^3P^\circ\ ^3G^\circ_3$	6s	$(5/2)^2[5/2]_2$			R1c		
5858.54(10)	17064.4(3)	5858.353(5)	0.19	9100		sp	$(^3F)^1P^\circ\ ^3F^\circ_2$	7g	$(3/2)^2[7/2]_3$			S36cn		X
5890.443(4)	16971.949(11)	5890.4592(12)	−0.016	120		4d	$(3/2)^2[3/2]_2$	sp	$(^3P)^3P^\circ\ ^3P^\circ_1$			R1c		X
5897.971(3)	16950.287(7)	5897.9758(12)	−0.005	23000		sp	$(^3F)^3P^\circ\ ^3G^\circ_3$	6s	$(5/2)^2[5/2]_3$			R1c		
5901.188(3)	16941.047(10)	5901.1910(8)	−0.003	1700		4p	$^3F^\circ_3$	s^2	$^1D_2$			R1c		
5909.753(3)	16916.494(9)	5909.7579(9)	−0.005	1500		sp	$(^3F)^3P^\circ\ ^1D^\circ_2$	5d	$(3/2)^2[3/2]_1$			R1c		
5910.813(4)	16913.460(11)	5910.8150(20)	−0.002	57		sp	$(^3F)^1P^\circ\ ^3F^\circ_4$	7d	$(5/2)^2[9/2]_5$			R1c		
5926.691(3)	16868.147(8)	5926.6916(6)	−0.000	1300		4p	$^1D^\circ_2$	s^2	$^3P_2$			R1c		
5929.634(3)	16859.777(10)	5929.6380(11)	−0.004	110		4d	$(3/2)^2[7/2]_4$	sp	$(^3F)^1P^\circ\ ^3F^\circ_4$			R1c		
5937.576(2)	16837.224(7)	5937.5815(7)	−0.005	2000		sp	$(^3F)^3P^\circ\ ^1D^\circ_2$	5d	$(3/2)^2[7/2]_3$	1.0e+07	D+	R1c	TW	
5939.775(7)	16830.992(21)	5939.7773(20)	−0.002	54		sp	$(^1G)^3P^\circ\ ^3H^\circ_4$	6g	$(3/2)^2[11/2]_5$			R1c		
5941.1951(4)	16826.9685(10)	5941.1951(3)	−0.0001	31000		5p	$(5/2)^2[3/2]^\circ_2$	5d	$(5/2)^2[5/2]_3$	3.6e+07	D+	F_Re	TW	
5941.826(4)	16825.183(11)	5941.8291(17)	−0.003	1600		4d	$(3/2)^2[1/2]_0$	6p	$(5/2)^2[3/2]^\circ_1$			R1c		
5979.015(3)	16720.532(8)	5979.0193(8)	−0.004	2800		sp	$(^3F)^3P^\circ\ ^3F^\circ_2$	6s	$(3/2)^2[3/2]_2$			R1c		
5988.3141(17)	16694.567(5)	5988.3135(14)	0.0006	7600		5p	$(5/2)^2[3/2]^\circ_1$	5d	$(5/2)^2[1/2]_0$	9.e+07	D+	F_Re	TW	
5993.259(3)	16680.793(7)	5993.2605(8)	−0.001	3200		5p	$(5/2)^2[3/2]^\circ_2$	5d	$(5/2)^2[3/2]_1$			R1c		
5995.5902(19)	16674.307(5)	5995.5876(10)	0.0026	4600		5p	$(3/2)^2[1/2]^\circ_0$	5d	$(3/2)^2[3/2]_1$	3.0e+07	D+	F_Re	TW	
6000.1169(8)	16661.7272(22)	6000.1168(6)	0.0001	38000		5p	$(5/2)^2[3/2]^\circ_2$	5d	$(5/2)^2[3/2]_2$	7.5e+07	D+	F_Re	TW	
6002.304(4)	16655.656(10)	6002.305(3)	−0.000	98		6s	$(5/2)^2[5/2]_3$	sp	$(^1D)^1P^\circ\ ^1D^\circ_2$			R1c		

Table A1. *Cont.*

λ_{obs} [a] (Å)	σ_{obs} [b] (cm^{-1})	λ_{Ritz} [c] (Å)	$\Delta\lambda_{obs-Ritz}$ (Å)	I_{obs} [d] (arb. u.)	Char [e]	Lower Level		Upper Level		A (s^{-1})	Acc [f]	Line Ref. [g]	TP Ref. [g]	Notes [h]
6013.411(3)	16624.893(7)	6013.4138(8)	−0.003	3200	sp	$(^3F)^3P^\circ\ ^3F^\circ_2$	6s	$(3/2)^2[3/2]_1$				R1c		
6018.369(5)	16611.196(13)	6018.3711(12)	−0.002	480	sp	$(^3F)^3P^\circ\ ^1D^\circ_2$	5d	$(3/2)^2[1/2]_1$				R1c		
6023.263(3)	16597.700(7)	6023.2636(9)	−0.000	3900	sp	$(^3F)^3P^\circ\ ^3D^\circ_2$	6s	$(5/2)^2[5/2]_2$				R1c		
6050.917(4)	16521.845(11)	6050.916(3)	0.001	91	6s	$(5/2)^2[5/2]_2$	sp	$(^1D)^1P^\circ\ ^1D^\circ_2$				R1c		
6071.492(4)	16465.858(10)	6071.4896(22)	0.002	130	sp	$(^3F)^1P^\circ\ ^3G^\circ_3$	6g	$(3/2)^2[9/2]_4$				R1c		
6072.217(3)	16463.891(7)	6072.2167(9)	0.001	4200	sp	$(^3F)^3P^\circ\ ^3D^\circ_2$	6s	$(5/2)^2[5/2]_3$				R1c		
6080.3334(19)	16441.915(5)	6080.3370(7)	−0.0036	11000	4p	$^3D^\circ_3$	s^2	$^3P_2$				F_Re		
6083.086(4)	16434.475(10)	6083.0848(22)	0.001	130	6p	$(5/2)^2[7/2]^\circ_3$	8d	$(5/2)^2[9/2]_4$		6.9e+06	D+	R1c	TW	
6085.021(4)	16429.250(11)	6085.021(3)	−0.000	87	4d	$(5/2)^2[1/2]_1$	sp	$(^3P)^3P^\circ\ ^5D^\circ_1$				R1c		
6097.328(3)	16396.088(8)	6097.3235(10)	0.004	4800	5p	$(3/2)^2[5/2]^\circ_2$	5d	$(3/2)^2[5/2]_2$		1.9e+07	D+	R1c	TW	
6099.989(3)	16388.936(7)	6099.9896(7)	−0.001	3700	5p	$(5/2)^2[7/2]^\circ_3$	5d	$(5/2)^2[5/2]_2$				R1c		
6105.747(3)	16373.480(7)	6105.7469(8)	0.000	3600	5p	$(3/2)^2[5/2]^\circ_2$	5d	$(3/2)^2[5/2]_3$		9.e+06	D+	R1c	TW	
6107.4055(21)	16369.034(6)	6107.4083(12)	−0.0028	5100	5p	$(3/2)^2[1/2]^\circ_0$	5d	$(3/2)^2[1/2]_1$		3.3e+07	D+	F_Re	TW	
6110.872(3)	16359.748(7)	6110.8706(7)	0.002	3700	5p	$(5/2)^2[7/2]^\circ_3$	5d	$(5/2)^2[7/2]_4$				R1c		
6114.4926(14)	16350.061(4)	6114.4911(7)	0.0016	15000	5p	$(5/2)^2[7/2]^\circ_3$	5d	$(5/2)^2[7/2]_3$		3.4e+07	D+	F_Re	TW	
6150.3818(9)	16254.6548(23)	6150.3813(6)	0.0005	16000	5p	$(5/2)^2[7/2]^\circ_4$	5d	$(5/2)^2[7/2]_4$		3.6e+07	D+	F_Re	TW	
6154.2215(8)	16244.5134(21)	6154.2211(7)	0.0004	25000	5p	$(5/2)^2[3/2]^\circ_2$	5d	$(5/2)^2[1/2]_1$		1.0e+08	D+	F_Re	TW	
6157.716(4)	16235.296(10)	6157.7151(10)	0.000	4700	5p	$(3/2)^2[5/2]^\circ_2$	5d	$(3/2)^2[3/2]_2$				R1c		
6157.956(8)	16234.662(21)	6157.9650(6)	−0.009	530	5p	$(5/2)^2[7/2]^\circ_3$	5d	$(5/2)^2[5/2]_3$				R1c		
6160.573(4)	16227.765(11)	6160.5707(14)	0.003	320	4d	$(3/2)^2[7/2]_4$	sp	$(^3F)^1P^\circ\ ^3G^\circ_5$				R1c		
6172.033(3)	16197.634(7)	6172.0339(8)	−0.000	16000	5p	$(5/2)^2[5/2]^\circ_2$	5d	$(5/2)^2[5/2]_2$		3.4e+07	D+	F_Re	TW	
6174.296(5)	16191.698(12)	6174.2920(12)	0.004	190	4d	$(3/2)^2[5/2]_3$	sp	$(^3P)^3P^\circ\ ^3D^\circ_2$				R1c		
6186.8770(14)	16158.772(4)	6186.8803(8)	−0.0033	18000	5p	$(5/2)^2[5/2]^\circ_2$	5d	$(5/2)^2[7/2]_3$		3.6e+07	D+	F_Re	TW	
6188.6763(11)	16154.075(3)	6188.6761(7)	0.0002	12000	5p	$(5/2)^2[3/2]^\circ_1$	5d	$(5/2)^2[5/2]_2$		3.1e+07	D+	F_Re	TW	
6189.317(4)	16152.402(11)	6189.3237(10)	−0.007	760	5p	$(3/2)^2[5/2]^\circ_2$	5d	$(3/2)^2[3/2]_1$				R1c		
6192.684(4)	16143.620(11)	6192.6855(12)	−0.001	76	4d	$(3/2)^2[5/2]_2$	sp	$(^3P)^3P^\circ\ ^3D^\circ_2$				R1c		
6198.091(3)	16129.537(7)	6198.0890(5)	0.002	5000	5p	$(5/2)^2[7/2]^\circ_4$	5d	$(5/2)^2[5/2]_3$		9.e+06	D+	R1c	TW	
6199.751(3)	16125.219(8)	6199.7460(10)	0.005	1700	5p	$(3/2)^2[5/2]^\circ_3$	5d	$(3/2)^2[5/2]_2$				R1c		
6203.715(4)	16114.915(11)	6203.712(3)	0.004	37	6p	$(5/2)^2[3/2]^\circ_2$	8d	$(5/2)^2[5/2]_3$				R1c		
6204.2569(19)	16113.507(5)	6204.2577(10)	−0.0008	11000	5p	$(3/2)^2[1/2]^\circ_1$	5d	$(3/2)^2[3/2]_2$		4.9e+07	D+	F_Re	TW	
6208.4527(19)	16102.618(5)	6208.4549(8)	−0.0022	9900	5p	$(3/2)^2[5/2]^\circ_3$	5d	$(3/2)^2[5/2]_3$		2.9e+07	D+	F_Re	TW	
6208.988(4)	16101.230(10)	6208.9891(14)	−0.001	75	4d	$(3/2)^2[7/2]_4$	sp	$(^3P)^3P^\circ\ ^3D^\circ_3$				R1c		
6214.542(4)	16086.839(11)			150	6p	$(5/2)^2[3/2]^\circ_2$	8d	$(5/2)^2[3/2]_2$				R1c		
6216.9386(8)	16080.6383(21)	6216.9385(6)	0.0001	39000	5p	$(5/2)^2[7/2]^\circ_3$	5d	$(5/2)^2[9/2]_4$		9.4e+07	C+	F_Re	TW	
6219.8492(9)	16073.1134(22)	6219.8488(7)	0.0005	24000	5p	$(3/2)^2[5/2]^\circ_2$	5d	$(3/2)^2[7/2]_3$		9.4e+07	C+	F_Re	TW	
6221.288(4)	16069.396(11)	6221.2875(7)	0.001	740	5p	$(5/2)^2[7/2]^\circ_3$	5d	$(5/2)^2[3/2]_2$				R1c		
6231.396(3)	16043.331(8)	6231.3934(6)	0.002	290	5p	$(5/2)^2[5/2]^\circ_2$	5d	$(5/2)^2[5/2]_3$				R1c		
6236.344(3)	16030.601(7)	6236.3471(10)	−0.003	1200	5p	$(3/2)^2[1/2]^\circ_1$	5d	$(3/2)^2[3/2]_1$				R1c		
6250.417(3)	15994.508(8)	6250.4216(8)	−0.005	720	5p	$(5/2)^2[5/2]^\circ_3$	5d	$(5/2)^2[5/2]_2$				R1c		
6257.838(3)	15975.542(7)	6257.8373(7)	0.000	3400	5p	$(5/2)^2[7/2]^\circ_4$	5d	$(5/2)^2[9/2]_4$		4.1e+06	D+	F_Re	TW	
6261.8477(13)	15965.311(3)	6261.8464(6)	0.0013	19000	5p	$(5/2)^2[5/2]^\circ_3$	5d	$(5/2)^2[7/2]_4$		3.7e+07	D+	F_Re	TW	
6265.650(3)	15955.623(7)	6265.6480(8)	0.002	2800	5p	$(5/2)^2[5/2]^\circ_3$	5d	$(5/2)^2[7/2]_3$				R1c		
6273.34762(8)	15936.04484(21)	6273.34763(8)	−0.00000	47000	5p	$(5/2)^2[7/2]^\circ_4$	5d	$(5/2)^2[9/2]_5$		1.06e+08	C+	F_Re	TW	

Table A1. *Cont.*

λ_{obs} [a] (Å)	σ_{obs} [b] (cm^{-1})	λ_{Ritz} [c] (Å)	$\Delta\lambda_{obs-Ritz}$ (Å)	I_{obs} [d] (arb. u.)	Char [e]	Lower Level		Upper Level		A (s^{-1})	Acc [f]	Line Ref. [g]	TP Ref. [g]	Notes [h]
6276.660(5)	15927.636(14)	6276.6713(19)	−0.012	14000		sp	$(^3F)^3P^\circ\ ^3F^\circ_4$	6s	$(5/2)^2[5/2]_3$			R1c		
6288.695(3)	15897.154(7)	6288.6936(9)	0.001	6600		5p	$(5/2)^2[5/2]^\circ_2$	5d	$(5/2)^2[3/2]_1$	1.7e+07	D+	R1c	TW	
6296.239(4)	15878.107(11)	6296.2430(8)	−0.004	34		5p	$(5/2)^2[5/2]^\circ_2$	5d	$(5/2)^2[3/2]_2$			R1c		
6299.864(5)	15868.969(11)	6299.810(3)	0.054	34	?	sp	$(^3P)^3P^\circ\ ^1D^\circ_2$	6g	$(3/2)^2[5/2]_3$			R1c		X
6301.0135(8)	15866.0749(21)	6301.0137(7)	−0.0001	27000		5p	$(3/2)^2[5/2]^\circ_3$	5d	$(3/2)^2[7/2]_4$	1.0e+08	C+	F_Re	TW	
6305.9712(10)	15853.601(3)	6305.9718(8)	−0.0006	12000		5p	$(5/2)^2[3/2]^\circ_1$	5d	$(5/2)^2[3/2]_1$	5.7e+07	D+	F_Re	TW	
6311.3006(21)	15840.214(5)	6311.3059(5)	−0.0053	18000		5p	$(5/2)^2[5/2]^\circ_3$	5d	$(5/2)^2[5/2]_3$	3.5e+07	D+	F_Re	TW	
6312.491(3)	15837.227(7)	6312.4915(11)	−0.000	14000		5p	$(3/2)^2[3/2]^\circ_1$	5d	$(3/2)^2[5/2]_2$	5.8e+07	D+	R1c	TW	
6313.564(3)	15834.535(7)	6313.5627(7)	0.001	1000		5p	$(5/2)^2[3/2]^\circ_1$	5d	$(5/2)^2[3/2]_2$			R1c		
6317.788(3)	15823.950(7)	6317.7831(12)	0.004	1300		4p	$^3D^\circ_1$	s^2	$^3P_0$			R1c		
6318.944(5)	15821.053(13)	6318.9422(15)	0.002	33		4d	$(3/2)^2[3/2]_2$	sp	$(^3P)^3P^\circ\ ^3D^\circ_3$			R1c		
6326.465(3)	15802.245(7)	6326.4649(8)	0.000	2500		5p	$(3/2)^2[5/2]^\circ_3$	5d	$(3/2)^2[7/2]_3$	5.0e+06	D+	R1c	TW	
6357.414(3)	15725.318(7)	6357.4193(13)	−0.005	16000		5p	$(3/2)^2[1/2]^\circ_1$	5d	$(3/2)^2[1/2]_1$	5.5e+07	D+	F_Re	TW	
6363.566(5)	15710.115(11)	6363.568(4)	−0.001	32		6p	$(3/2)^2[5/2]^\circ_3$	9d	$(5/2)^2[9/2]_4$			R1c		
6373.267(3)	15686.203(8)	6373.2678(7)	−0.001	6900		5p	$(5/2)^2[5/2]^\circ_3$	5d	$(5/2)^2[9/2]_4$			R1c		
6377.248(7)	15676.410(17)	6377.2432(12)	0.005	13000		5p	$(3/2)^2[3/2]^\circ_1$	5d	$(3/2)^2[3/2]_2$			R1c		
6377.842(3)	15674.951(7)	6377.8383(7)	0.004	19000		5p	$(5/2)^2[5/2]^\circ_3$	5d	$(5/2)^2[3/2]_2$	1.9e+07	D+	F_Re	TW	
6380.758(4)	15667.788(9)	6380.7645(7)	−0.007	1300		5p	$(5/2)^2[3/2]^\circ_2$	6s	$(3/2)^2[3/2]_2$			R1c		
6385.263(3)	15656.734(7)	6385.2618(10)	0.001	1200		sp	$(^3F)^3P^\circ\ ^3D^\circ_1$	6s	$(5/2)^2[5/2]_2$			R1c		
6393.074(6)	15637.604(15)	6393.0792(20)	−0.005	130	*	sp	$(^3F)^1P^\circ\ ^3G^\circ_4$	6g	$(5/2)^2[9/2]_4$			R1c		
6393.074(6)	15637.604(15)	6393.0735(21)	0.001	130	*	sp	$(^3F)^1P^\circ\ ^3G^\circ_4$	6g	$(5/2)^2[9/2]_5$			R1nc		
6393.957(3)	15635.446(8)	6393.9587(13)	−0.002	2100		sp	$(^3F)^1P^\circ\ ^3G^\circ_4$	6g	$(5/2)^2[11/2]_5$	3.4e+06	D+	R1c	TW	
6403.384(3)	15612.428(8)	6403.3840(15)	−0.000	9600		4d	$(3/2)^2[1/2]_0$	4f	$(3/2)^2[3/2]^\circ_1$	2.7e+07	D+	R1c	TW	
6411.142(4)	15593.535(10)	6411.1518(12)	−0.010	10000		5p	$(3/2)^2[3/2]^\circ_1$	5d	$(3/2)^2[3/2]_1$	5.8e+07	D+	F_Re	TW	
6414.569(3)	15585.204(7)	6414.5612(11)	0.008	12000		5p	$(3/2)^2[3/2]^\circ_2$	5d	$(3/2)^2[5/2]_2$	1.4e+07	D+	R1c	TW	
6414.625(3)	15585.069(7)	6414.6165(8)	0.008	16000		sp	$(^3F)^3P^\circ\ ^3F^\circ_3$	6s	$(5/2)^2[5/2]_2$			R1c		
6418.160(4)	15576.483(10)	6418.1566(24)	0.004	2100		4f	$(5/2)^2[1/2]^\circ_1$	6g	$(5/2)^2[3/2]_2$	1.5e+07	D+	R1c	TW	
		6418.192(3)			m	4f	$(5/2)^2[1/2]^\circ_1$	6g	$(5/2)^2[3/2]_1$			R1nc		
6419.941(9)	15572.162(21)	6419.9515(7)	−0.010	62		5p	$(5/2)^2[3/2]^\circ_2$	6s	$(3/2)^2[3/2]_1$			R1c		
6423.8842(11)	15562.604(3)	6423.8846(8)	−0.0003	19000		5p	$(3/2)^2[3/2]^\circ_2$	5d	$(3/2)^2[5/2]_3$	5.6e+07	C+	F_Re	TW	
6427.416(9)	15554.052(21)	6427.411(3)	0.005	31		4f	$(5/2)^2[3/2]^\circ_2$	6g	$(5/2)^2[7/2]_3$			R1c		
6432.416(3)	15541.962(7)	6432.415(3)	0.001	5600		4f	$(5/2)^2[3/2]^\circ_2$	6g	$(5/2)^2[5/2]_3$	1.5e+07	D+	R1c	TW	
6433.597(4)	15539.109(10)	6433.5944(22)	0.003	920		4f	$(5/2)^2[11/2]^\circ_6$	6g	$(5/2)^2[11/2]_6$	2.7e+06	D+	R1c	TW	
6434.081(5)	15537.941(12)	6434.075(3)	0.006	610		4f	$(5/2)^2[1/2]^\circ_0$	6g	$(5/2)^2[3/2]_1$			R1c		
6434.799(3)	15536.208(8)	6434.7944(13)	0.004	610		4f	$(5/2)^2[11/2]^\circ_5$	6g	$(5/2)^2[11/2]_5$			R1c		
6437.596(3)	15529.458(8)	6437.5974(24)	−0.002	460		4f	$(5/2)^2[3/2]^\circ_2$	6g	$(5/2)^2[3/2]_2$	6.7e+06	D+	R1c	TW	
6441.202(5)	15520.764(12)	6441.1920(9)	0.010	1200		4p	$^3F^\circ_2$	s^2	$^1D_2$			R1c		
6441.677(3)	15519.618(8)	6441.6790(8)	−0.002	13000		sp	$(^3F)^3P^\circ\ ^1F^\circ_3$	5d	$(5/2)^2[7/2]_4$			R1c		
6441.7371(11)	15519.474(3)			10000		4f	$(5/2)^2[11/2]^\circ_6$	6g	$(5/2)^2[13/2]_7$	2.4e+07	D+	F_Re	TW	
6442.964(3)	15516.519(7)	6442.964(3)	−0.000	7600		4f	$(5/2)^2[11/2]^\circ_5$	6g	$(5/2)^2[13/2]_6$	2.3e+07	D+	R1c	TW	
6443.587(3)	15515.019(8)	6443.587(3)	0.000	4900		4f	$(3/2)^2[3/2]^\circ_2$	6g	$(3/2)^2[5/2]_3$	2.0e+07	D+	R1c	TW	
6445.692(20)	15509.95(5)	6445.673(3)	0.020	1400	*	6p	$(5/2)^2[3/2]^\circ_2$	9s	$(5/2)^2[5/2]_3$			R1nc		
6445.692(20)	15509.95(5)	6445.7022(9)	−0.010	1400	*	sp	$(^3F)^3P^\circ\ ^1F^\circ_3$	5d	$(5/2)^2[7/2]_3$			R1c		

Table A1. *Cont.*

λ_{obs} [a] (Å)	σ_{obs} [b] (cm^{-1})	λ_{Ritz} [c] (Å)	$\Delta\lambda_{obs-Ritz}$ (Å)	I_{obs} [d] (arb. u.)	Char [e]	Lower Level		Upper Level		A (s^{-1})	Acc [f]	Line Ref. [g]	TP Ref. [g]	Notes [h]
6447.627(5)	15505.296(13)	6447.632(3)	−0.005	61		sp	$(^1G)^3P^\circ\ ^3F^\circ_3$	8d	$(5/2)^2[9/2]_4$			R1c		
6448.558(3)	15503.059(8)	6448.5593(8)	−0.002	20000		4p	$^3D^\circ_1$	s^2	$^3P_1$			R1c		
6449.63(3)	15500.49(7)	6449.6175(15)	0.01	30	*	4d	$(3/2)^2[5/2]_3$	sp	$(^3P)^3P^\circ\ ^3D^\circ_3$			R1c		
6449.63(3)	15500.49(7)	6449.655(3)	−0.03	30	*	sp	$(^3P)^3P^\circ\ ^5S^\circ_2$	6g	$(5/2)^2[5/2]_2$			R1nc		
6449.63(3)	15500.49(7)	6449.659(4)	−0.03	30	*	sp	$(^3P)^3P^\circ\ ^5S^\circ_2$	6g	$(5/2)^2[5/2]_3$			R1nc		
6450.874(3)	15497.493(8)	6450.8738(17)	−0.000	610		4d	$(3/2)^2[1/2]_0$	sp	$(^3F)^1P^\circ\ ^3D^\circ_1$			R1c		
6452.116(3)	15494.508(7)	6452.1161(24)	0.000	1300		4f	$(5/2)^2[3/2]^\circ_1$	6g	$(5/2)^2[5/2]_2$	1.4e+07	D+	R1c	TW	
6454.161(3)	15489.601(8)			910		4f	$(3/2)^2[3/2]^\circ_1$	6g	$(3/2)^2[5/2]_2$			R1c		
6454.894(9)	15487.842(21)	6454.895(3)	−0.001	30		6p	$(5/2)^2[7/2]^\circ_4$	8d	$(5/2)^2[7/2]_4$			R1rc		
6456.119(13)	15484.90(3)	6456.140(9)	−0.021	30		5s	$(3/2)^2[3/2]_1$	sp	$(^3P)^3P^\circ\ ^5P^\circ_1$			R1c		
6457.187(3)	15482.342(7)	6457.1848(19)	0.002	2600		4f	$(5/2)^2[7/2]^\circ_3$	6g	$(5/2)^2[9/2]_4$			R1c		
6457.368(4)	15481.908(10)	6457.371(3)	−0.004	1600		4f	$(5/2)^2[3/2]^\circ_1$	6g	$(5/2)^2[3/2]_1$			R1c		
6458.263(9)	15479.762(21)	6458.259(3)	0.004	61		4f	$(3/2)^2[9/2]^\circ_5$	6g	$(3/2)^2[9/2]_5$			R1c		
6460.304(3)	15474.870(8)	6460.304(3)	0.001	1000		4f	$(5/2)^2[7/2]^\circ_3$	6g	$(5/2)^2[7/2]_3$			R1c		
6462.140(3)	15470.475(8)	6462.1413(20)	−0.002	60		4f	$(3/2)^2[9/2]^\circ_4$	6g	$(3/2)^2[9/2]_4$			R1c		
6462.70(10)	15469.13(24)	6462.6086(21)	0.09	1000		4f	$(3/2)^2[7/2]^\circ_3$	7d	$(3/2)^2[7/2]_3$			S36c		
6465.342(15)	15462.81(4)	6465.3543(24)	−0.012	30	*	4f	$(5/2)^2[7/2]^\circ_3$	6g	$(5/2)^2[5/2]_2$			R1c		
6465.342(15)	15462.81(4)	6465.359(3)	−0.017	30	*	4f	$(5/2)^2[7/2]^\circ_3$	6g	$(5/2)^2[5/2]_3$			R1c		
6466.245(3)	15460.653(7)			5600		4f	$(3/2)^2[9/2]^\circ_5$	6g	$(3/2)^2[11/2]_6$	2.3e+07	D+	R1c	TW	
6470.1386(19)	15451.350(5)	6470.1383(19)	0.0003	8600		4f	$(3/2)^2[9/2]^\circ_4$	6g	$(3/2)^2[11/2]_5$	2.3e+07	D+	F_Re	TW	
6470.160(3)	15451.298(7)	6470.1668(8)	−0.006	15000		sp	$(^3F)^3P^\circ\ ^3F^\circ_3$	6s	$(5/2)^2[5/2]_3$			F_Re		
6475.426(4)	15438.734(9)	6475.4257(24)	−0.000	1000		4f	$(5/2)^2[5/2]^\circ_2$	6g	$(5/2)^2[5/2]_2$	7.5e+06	D+	R1c	TW	
6476.184(4)	15436.925(9)	6476.1819(19)	0.003	1000		4f	$(5/2)^2[5/2]^\circ_3$	6g	$(5/2)^2[9/2]_4$			R1c		
6477.868(9)	15432.912(21)	6477.860(3)	0.008	120		6p	$(5/2)^2[7/2]^\circ_4$	8d	$(5/2)^2[9/2]_5$			R1c		
6479.316(3)	15429.463(7)	6479.3164(21)	−0.000	4100		4f	$(5/2)^2[5/2]^\circ_3$	6g	$(5/2)^2[7/2]_4$	1.5e+07	D+	R1c	TW	
6481.436(3)	15424.418(7)	6481.4350(12)	0.001	15000		5p	$(3/2)^2[3/2]^\circ_2$	5d	$(3/2)^2[3/2]_2$	3.4e+07	D+	R1c	TW	
		6484.404(3)			m	4f	$(5/2)^2[5/2]^\circ_3$	6g	$(5/2)^2[5/2]_3$	6.5e+06	D+	R1nc	TW	
6484.417(3)	15417.326(8)	6484.4174(9)	−0.000	7800		5p	$(5/2)^2[3/2]^\circ_1$	5d	$(5/2)^2[1/2]_1$	1.4e+07	D+	F_Re	TW	
6488.816(3)	15406.875(7)	6488.814(3)	0.002	2700		4f	$(3/2)^2[5/2]^\circ_3$	6g	$(3/2)^2[7/2]_4$	1.9e+07	D+	R1c	TW	
6494.029(3)	15394.507(6)	6494.0320(6)	−0.003	18000		sp	$(^3F)^3P^\circ\ ^1F^\circ_3$	5d	$(5/2)^2[5/2]_3$			F_Re		
6497.040(9)	15387.372(21)	6497.041(3)	−0.001	89		4f	$(3/2)^2[5/2]^\circ_3$	6g	$(3/2)^2[5/2]_3$			R1c		
6508.401(3)	15360.514(7)	6508.400(3)	0.001	2700		4f	$(3/2)^2[5/2]^\circ_2$	6g	$(3/2)^2[7/2]_3$	1.7e+07	D+	R1c	TW	
6516.458(3)	15341.522(8)	6516.4637(12)	−0.006	6600		5p	$(3/2)^2[3/2]^\circ_2$	5d	$(3/2)^2[3/2]_1$			R1c		
6517.316(3)	15339.501(7)	6517.3166(21)	−0.000	6600		4f	$(5/2)^2[7/2]^\circ_4$	6g	$(5/2)^2[9/2]_5$	1.7e+07	D+	R1c	TW	
6518.236(4)	15337.337(9)	6518.2366(12)	−0.001	150		4f	$(5/2)^2[7/2]^\circ_4$	6g	$(5/2)^2[11/2]_5$			R1c		
6520.497(3)	15332.019(8)	6520.4970(21)	−0.000	1000		4f	$(5/2)^2[7/2]^\circ_4$	6g	$(5/2)^2[7/2]_4$	5.7e+06	D+	R1c	TW	
6521.270(6)	15330.200(13)	6521.2756(14)	−0.005	480		4p	$^1P^\circ_1$	s^2	$^3P_0$			R1c		
6523.820(3)	15324.209(7)	6523.820(3)	−0.000	4500		4f	$(3/2)^2[7/2]^\circ_4$	6g	$(3/2)^2[9/2]_5$	2.1e+07	D+	R1c	TW	
6525.641(9)	15319.932(21)	6525.650(3)	−0.008	29		4f	$(5/2)^2[7/2]^\circ_4$	6g	$(5/2)^2[5/2]_3$			R1c		
6526.646(6)	15317.574(13)	6526.655(3)	−0.009	88		4f	$(3/2)^2[7/2]^\circ_4$	6g	$(3/2)^2[7/2]_4$			R1c		
6529.167(3)	15311.658(8)	6529.1668(21)	0.001	1000		4f	$(5/2)^2[9/2]^\circ_5$	6g	$(5/2)^2[9/2]_5$	4.6e+06	D+	R1c	TW	
6530.082(3)	15309.514(7)	6530.0829(22)	−0.001	13000		4f	$(5/2)^2[9/2]^\circ_5$	6g	$(5/2)^2[11/2]_6$	2.0e+07	D+	R1c	TW	

Table A1. *Cont.*

λ_{obs} [a] (Å)	σ_{obs} [b] (cm^{-1})	λ_{Ritz} [c] (Å)	$\Delta\lambda_{obs-Ritz}$ (Å)	I_{obs} [d] (arb. u.)	Char [e]	Lower Level		Upper Level		A (s^{-1})	Acc [f]	Line Ref. [g]	TP Ref. [g]	Notes [h]
6536.679(9)	15294.062(21)	6536.6969(17)	−0.017	29		4d	$(3/2)^2[5/2]_2$	sp	$(^3P)^3P^\circ\ ^3P^\circ_2$			R1c		
6541.637(3)	15282.471(7)	6541.6369(20)	0.000	3400		4f	$(3/2)^2[7/2]^\circ_3$	6g	$(3/2)^2[9/2]_4$	1.9e+07	D+	R1c	TW	
6544.485(6)	15275.822(14)	6544.480(3)	0.004	58	*	4f	$(3/2)^2[7/2]^\circ_3$	6g	$(3/2)^2[7/2]_4$			R1nc		
6544.485(6)	15275.822(14)	6544.489(3)	−0.004	58	*	4f	$(3/2)^2[7/2]^\circ_3$	6g	$(3/2)^2[7/2]_3$			R1c		
6550.304(5)	15262.251(12)	6550.3097(9)	−0.006	150		5p	$(3/2)^2[3/2]^\circ_2$	5d	$(3/2)^2[7/2]_3$			R1c		
6551.286(3)	15259.964(8)	6551.2873(8)	−0.002	1900		4p	$^3D^\circ_1$	s^2	$^3P_2$			R1c		
6554.791(6)	15251.804(13)	6554.7923(9)	−0.002	5100		4p	$^3D^\circ_2$	s^2	$^3P_1$			R1c		
6556.193(6)	15248.542(14)	6556.206(3)	−0.013	430		4d	$(5/2)^2[1/2]_1$	sp	$(^1D)^3P^\circ\ ^3P^\circ_1$			R1c		
6559.657(4)	15240.489(9)	6559.6523(8)	0.005	13000		sp	$(^3F)^3P^\circ\ ^1F^\circ_3$	5d	$(5/2)^2[9/2]_4$	4.9e+06	D+	R1c	TW	
6564.492(3)	15229.264(8)	6564.4941(8)	−0.002	10000		sp	$(^3F)^3P^\circ\ ^1F^\circ_3$	5d	$(5/2)^2[3/2]_2$			R1c		
6567.949(6)	15221.249(13)	6567.9621(7)	−0.013	290		5s	$(5/2)^2[5/2]_2$	5p	$(3/2)^2[3/2]^\circ_2$	5.1e+05	C	R1c	B00	
6576.147(6)	15202.273(13)	6576.1510(20)	−0.004	1000		4f	$(5/2)^2[9/2]^\circ_4$	6g	$(5/2)^2[9/2]_4$	4.3e+06	D+	R1c	TW	
6577.0812(15)	15200.114(3)	6577.0816(12)	−0.0003	5700		4f	$(5/2)^2[9/2]^\circ_4$	6g	$(5/2)^2[11/2]_5$	1.5e+07	D+	F_Re	TW	
6579.376(9)	15194.812(21)	6579.386(3)	−0.010	57		4f	$(5/2)^2[9/2]^\circ_4$	6g	$(5/2)^2[7/2]_3$			R1c		
6592.896(9)	15163.652(21)	6592.900(3)	−0.004	120		5s	$(3/2)^2[3/2]_1$	sp	$(^3P)^3P^\circ\ ^5P^\circ_2$			R1c		
6602.096(9)	15142.522(21)	6602.094(3)	0.003	57		6p	$(5/2)^2[5/2]^\circ_3$	8d	$(5/2)^2[7/2]_4$			R1c		
6603.527(9)	15139.242(21)	6603.523(4)	0.003	29		6p	$(3/2)^2[5/2]^\circ_3$	9s	$(3/2)^2[3/2]_2$			R1c		
6612.087(9)	15119.642(21)	6612.086(3)	0.001	57		6p	$(5/2)^2[5/2]^\circ_3$	8d	$(5/2)^2[5/2]_3$			R1c		
6624.291(3)	15091.787(7)	6624.2890(9)	0.002	8200		sp	$(^3F)^3P^\circ\ ^1D^\circ_2$	5d	$(5/2)^2[5/2]_2$	2.2e+07	D+	R1c	TW	
6626.243(3)	15087.341(8)	6626.2420(20)	0.001	710		5d	$(5/2)^2[1/2]_1$	8p	$(5/2)^2[3/2]^\circ_1$			R1c		
6631.476(3)	15075.436(7)	6631.4733(7)	0.003	3300		5p	$(5/2)^2[7/2]^\circ_3$	6s	$(3/2)^2[3/2]_2$			R1c		
6635.173(7)	15067.037(17)	6635.1692(18)	0.003	85		5d	$(5/2)^2[1/2]_1$	6f	$(5/2)^2[5/2]^\circ_2$			R1c		
6641.395(3)	15052.920(7)	6641.3938(9)	0.002	8000		sp	$(^3F)^3P^\circ\ ^1D^\circ_2$	5d	$(5/2)^2[7/2]_3$	2.6e+07	D+	R1c	TW	
6647.796(4)	15038.427(10)	6647.7986(18)	−0.003	850		5d	$(5/2)^2[1/2]_1$	6f	$(5/2)^2[3/2]^\circ_2$			R1c		
6648.764(5)	15036.237(11)	6648.7717(14)	−0.008	7300		5p	$(3/2)^2[3/2]^\circ_2$	5d	$(3/2)^2[1/2]_1$	1.1e+07	D+	R1c	TW	
6651.323(4)	15030.453(10)	6651.3254(21)	−0.003	700		sp	$(^3F)^1P^\circ\ ^3F^\circ_3$	6g	$(5/2)^2[9/2]_4$	3.8e+06	D+	R1c	TW	
6654.635(9)	15022.972(21)	6654.635(3)	−0.000	56		sp	$(^3F)^1P^\circ\ ^3F^\circ_3$	6g	$(5/2)^2[7/2]_3$			R1c		
6660.961(3)	15008.705(7)	6660.9606(8)	0.000	9200		4p	$^3D^\circ_2$	s^2	$^3P_2$			R1c		
6663.950(9)	15001.972(21)	6663.9466(6)	0.004	560		5s	$(5/2)^2[5/2]_3$	5p	$(3/2)^2[5/2]^\circ_3$			R1c		
6692.710(6)	14937.507(14)	6692.7144(7)	−0.005	700		sp	$(^3F)^3P^\circ\ ^1D^\circ_2$	5d	$(5/2)^2[5/2]_3$			R1c		
6711.983(6)	14894.615(12)	6711.980(3)	0.003	56		5d	$(3/2)^2[1/2]_1$	6f	$(3/2)^2[5/2]^\circ_2$			R1c		
6716.700(3)	14884.155(7)	6716.7062(8)	−0.007	1300		5p	$(5/2)^2[5/2]^\circ_2$	6s	$(3/2)^2[3/2]_2$			R1c		
6717.687(6)	14881.968(12)	6717.687(4)	−0.001	280		5s	$(3/2)^2[3/2]_2$	sp	$(^3P)^3P^\circ\ ^5P^\circ_2$			R1c		
6725.481(10)	14864.722(21)	6725.490(4)	−0.010	28		5d	$(3/2)^2[1/2]_1$	6f	$(3/2)^2[3/2]^\circ_1$			R2c		
6725.834(10)	14863.942(21)	6725.850(8)	−0.016	28		5s	$(3/2)^2[3/2]_2$	sp	$(^3P)^3P^\circ\ ^5P^\circ_3$			R1nc		
6736.397(5)	14840.633(10)	6736.4201(7)	−0.023	6300		5p	$(5/2)^2[3/2]^\circ_1$	6s	$(3/2)^2[3/2]_2$			R1c		X
6739.599(3)	14833.582(7)	6739.598(3)	0.002	140		5d	$(3/2)^2[1/2]_1$	6f	$(3/2)^2[3/2]^\circ_2$	7.4e+06	D+	R1c	TW	
6743.740(7)	14824.474(16)	6743.737(3)	0.003	56		5d	$(5/2)^2[1/2]_1$	6f	$(5/2)^2[1/2]^\circ_1$			R2nc		
6758.855(4)	14791.323(8)	6758.8577(10)	−0.003	6300		sp	$(^3F)^3P^\circ\ ^1D^\circ_2$	5d	$(5/2)^2[3/2]_1$	1.0e+07	D+	R1c	TW	
6760.142(5)	14788.506(11)	6760.1422(8)	0.000	56		5p	$(5/2)^2[5/2]^\circ_2$	6s	$(3/2)^2[3/2]_1$			R1c		
6765.794(10)	14776.152(21)	6765.7884(19)	0.006	28		sp	$(^1G)^3P^\circ\ ^3H^\circ_4$	6g	$(5/2)^2[11/2]_5$			R1c		
6767.561(7)	14772.294(16)	6767.5789(9)	−0.018	28		sp	$(^3F)^3P^\circ\ ^1D^\circ_2$	5d	$(5/2)^2[3/2]_2$			R1c		
6770.361(3)	14766.186(7)	6770.3604(10)	0.000	3100		4p	$^1P^\circ_1$	s^2	$^3P_2$			R1c		

Table A1. *Cont.*

λ_{obs} [a] (Å)	σ_{obs} [b] (cm^{-1})	λ_{Ritz} [c] (Å)	$\Delta\lambda_{obs-Ritz}$ (Å)	I_{obs} [d] (arb. u.)	Char [e]	Lower Level		Upper Level		A (s^{-1})	Acc [f]	Line Ref. [g]	TP Ref. [g]	Notes [h]
6779.440(7)	14746.410(15)	6779.4453(18)	−0.005	28		5p	$(3/2)^2[1/2]^\circ_1$	5d	$(5/2)^2[1/2]_0$			R1c		
6780.114(4)	14744.945(9)	6780.1122(7)	0.002	4900		5p	$(5/2)^2[3/2]^\circ_1$	6s	$(3/2)^2[3/2]_1$			R1c		
6786.482(5)	14731.110(11)	6786.4808(7)	0.001	84		5s	$(5/2)^2[5/2]_3$	5p	$(3/2)^2[5/2]^\circ_2$			R1c		
6802.138(3)	14697.204(7)	6802.1387(19)	−0.001	220		5d	$(5/2)^2[9/2]_5$	6f	$(5/2)^2[9/2]^\circ_5$	3.5e+06	D+	R1c	TW	
6806.215(3)	14688.401(7)	6806.2136(9)	0.001	4100		sp	$(^3F)^3P^\circ\ ^3F^\circ_2$	6s	$(5/2)^2[5/2]_2$			R1c		
6809.6453(23)	14681.001(5)	6809.6436(8)	0.0016	5200		5p	$(5/2)^2[5/2]^\circ_3$	6s	$(3/2)^2[3/2]_2$			F_Re		
6814.690(14)	14670.13(3)	6814.6913(22)	−0.001	28		5d	$(5/2)^2[3/2]_2$	8p	$(5/2)^2[3/2]^\circ_1$			R1c		
6821.060(5)	14656.434(11)	6821.0571(19)	0.002	140		5d	$(5/2)^2[9/2]_4$	6f	$(5/2)^2[9/2]^\circ_4$	3.2e+06	D+	R1c	TW	
6822.342(8)	14653.679(17)	6822.3460(19)	−0.004	28		5d	$(5/2)^2[9/2]_4$	6f	$(5/2)^2[7/2]^\circ_4$			R1c		
6823.201(3)	14651.833(7)	6823.2010(23)	0.000	6400		5d	$(5/2)^2[9/2]_5$	6f	$(5/2)^2[11/2]^\circ_6$	1.8e+07	D+	R1c	TW	
6824.750(4)	14648.508(8)	6824.7493(19)	0.001	700		5d	$(5/2)^2[3/2]_2$	6f	$(5/2)^2[5/2]^\circ_3$	7.2e+06	D+	R1c	TW	
6830.531(3)	14636.112(7)	6830.5296(22)	0.001	1300		5d	$(3/2)^2[7/2]_3$	6f	$(3/2)^2[9/2]^\circ_4$	1.8e+07	D+	R1c	TW	
6833.026(4)	14630.766(9)	6833.0244(19)	0.002	560		5d	$(5/2)^2[3/2]_1$	6f	$(5/2)^2[5/2]^\circ_2$	8.1e+06	D+	R1c	TW	
6837.491(4)	14621.212(8)	6837.4936(18)	−0.002	720		5d	$(5/2)^2[3/2]_2$	6f	$(5/2)^2[3/2]^\circ_2$	9.e+06	D+	R1c	TW	
6844.156(3)	14606.974(7)	6844.1542(20)	0.002	3200		5d	$(5/2)^2[9/2]_4$	6f	$(5/2)^2[11/2]^\circ_5$	1.8e+07	D+	R1c	TW	
6846.104(20)	14602.82(4)	6846.065(3)	0.039	880		sp	$(^3F)^3P^\circ\ ^1G^\circ_4$	6s	$(5/2)^2[5/2]_3$			R1c		
6847.112(7)	14600.669(14)	6847.112(3)	−0.000	170		5d	$(5/2)^2[3/2]_1$	6f	$(5/2)^2[3/2]^\circ_1$			R1c		
6849.991(6)	14594.532(13)	6849.988(4)	0.003	56		4d	$(5/2)^2[1/2]_1$	sp	$(^1D)^3P^\circ\ ^3P^\circ_0$			R1c		
6852.428(7)	14589.342(14)	6852.432(3)	−0.004	84		5d	$(3/2)^2[3/2]_1$	6f	$(3/2)^2[5/2]^\circ_2$			R1c		
6863.061(3)	14566.739(7)	6863.0599(23)	0.001	2100		5d	$(3/2)^2[7/2]_4$	6f	$(3/2)^2[9/2]^\circ_5$	1.8e+07	D+	R1c	TW	
6867.88(20)	14556.5(4)	6868.184(4)	−0.30	470		4d	$(5/2)^2[5/2]_2$	sp	$(^3P)^3P^\circ\ ^5D^\circ_2$			S36c		
6868.790(3)	14554.589(7)	6868.7864(9)	0.004	2900		sp	$(^3F)^3P^\circ\ ^3F^\circ_2$	6s	$(5/2)^2[5/2]_3$			R1c		
6872.230(3)	14547.303(7)	6872.2293(10)	0.001	3200		4p	$^1F^\circ_3$	s^2	$^1D_2$			R1c		
6879.403(3)	14532.136(7)	6879.4043(7)	−0.001	2500		5s	$(5/2)^2[5/2]_2$	5p	$(3/2)^2[1/2]^\circ_1$	5.5e+06	C	R1c	B00	
6893.496(6)	14502.427(12)	6893.4896(18)	0.006	220		5d	$(5/2)^2[5/2]_3$	6f	$(5/2)^2[9/2]^\circ_4$			R1c		
6894.810(4)	14499.663(9)	6894.8061(18)	0.004	700		5d	$(5/2)^2[5/2]_3$	6f	$(5/2)^2[7/2]^\circ_4$	1.0e+07	D+	R1c	TW	
6902.617(4)	14483.263(9)	6902.6139(19)	0.003	560		5d	$(5/2)^2[5/2]_3$	6f	$(5/2)^2[5/2]^\circ_3$	8.0e+06	D+	R1c	TW	
6915.653(10)	14455.962(21)	6915.6509(18)	0.002	56		5d	$(5/2)^2[5/2]_3$	6f	$(5/2)^2[3/2]^\circ_2$			R1c		
6928.602(6)	14428.946(12)	6928.592(3)	0.009	340		5d	$(3/2)^2[3/2]_2$	6f	$(3/2)^2[5/2]^\circ_3$	1.1e+07	D+	R1c	TW	
6937.552(4)	14410.331(8)	6937.5472(7)	0.005	2100		5s	$(5/2)^2[5/2]_2$	5p	$(3/2)^2[5/2]^\circ_2$	3.9e+06	C	R1c	B00	
6939.099(7)	14407.119(14)	6939.098(3)	0.001	280		5d	$(5/2)^2[7/2]_3$	6f	$(5/2)^2[7/2]^\circ_3$	4.8e+06	D+	R1c	TW	
6948.795(7)	14387.015(15)	6948.7964(20)	−0.001	2000		5d	$(5/2)^2[7/2]_3$	6f	$(5/2)^2[9/2]^\circ_4$	1.1e+07	D+	R1c	TW	
6950.139(6)	14384.234(13)	6950.1341(20)	0.005	1700		5d	$(5/2)^2[7/2]_3$	6f	$(5/2)^2[7/2]^\circ_4$	3.1e+06	D+	R1c	TW	
6952.870(4)	14378.583(7)	6952.8664(20)	0.004	4200		5d	$(5/2)^2[7/2]_4$	6f	$(5/2)^2[9/2]^\circ_5$	1.4e+07	D+	R1c	TW	
6953.480(10)	14377.322(21)	6953.4782(20)	0.002	110		5d	$(5/2)^2[7/2]_4$	6f	$(5/2)^2[9/2]^\circ_4$			R1c		
6953.930(6)	14376.391(13)	6953.914(3)	0.016	2100		5d	$(3/2)^2[5/2]_3$	6f	$(3/2)^2[7/2]^\circ_4$	1.5e+07	D+	R1c	TW	
6954.820(10)	14374.552(21)	6954.8176(19)	0.002	230		5d	$(5/2)^2[7/2]_4$	6f	$(5/2)^2[7/2]^\circ_4$	4.4e+06	D+	R1c	TW	
6957.884(10)	14368.222(20)	6957.869(3)	0.015	1800	*	5d	$(5/2)^2[5/2]_2$	6f	$(5/2)^2[7/2]^\circ_3$	1.1e+07	D+	R1c	TW	
6957.884(10)	14368.222(20)	6957.876(4)	0.008	1800	*	sp	$(^1G)^3P^\circ\ ^3H^\circ_5$	6g	$(5/2)^2[13/2]_6$			R1c		
6957.884(10)	14368.222(20)	6957.876(3)	0.008	1800	*	5d	$(3/2)^2[5/2]_3$	6f	$(3/2)^2[5/2]^\circ_2$			R1c		
6963.433(10)	14356.772(21)	6963.427(3)	0.006	230		5d	$(3/2)^2[5/2]_2$	6f	$(3/2)^2[7/2]^\circ_3$	1.3e+07	D+	R1c	TW	
6968.846(10)	14345.622(21)	6968.847(3)	−0.002	57		5d	$(3/2)^2[5/2]_2$	6f	$(3/2)^2[5/2]^\circ_2$			R1c		
6976.305(10)	14330.282(21)	6976.2990(20)	0.006	230		5d	$(5/2)^2[5/2]_2$	6f	$(5/2)^2[5/2]^\circ_2$	5.6e+06	D+	R1c	TW	

Table A1. *Cont.*

λ_{obs} [a] (Å)	σ_{obs} [b] (cm^{-1})	λ_{Ritz} [c] (Å)	$\Delta\lambda_{obs-Ritz}$ (Å)	I_{obs} [d] (arb. u.)	Char [e]	Lower Level		Upper Level		A (s^{-1})	Acc [f]	Line Ref. [g]	TP Ref. [g]	Notes [h]
6977.571(4)	14327.683(8)	6977.5641(10)	0.007	4300		5p	$(3/2)^2[5/2]^\circ_2$	5d	$(5/2)^2[5/2]_2$			R1c		
6986.548(8)	14309.273(17)	6986.5269(20)	0.021	2100		5p	$(3/2)^2[3/2]^\circ_1$	5d	$(5/2)^2[1/2]_0$			R1c		
6996.556(5)	14288.805(9)	6996.5446(10)	0.012	1400		5p	$(3/2)^2[5/2]^\circ_2$	5d	$(5/2)^2[7/2]_3$			R1c		
7022.859(4)	14235.289(7)	7022.8519(9)	0.007	2800		sp	$(^3F)^3P^\circ\ ^1F^\circ_3$	6s	$(3/2)^2[3/2]_2$			R1c		
7037.388(4)	14205.899(8)	7037.3853(10)	0.003	2900		5p	$(3/2)^2[1/2]^\circ_1$	5d	$(5/2)^2[5/2]_2$			R1c		
7083.772(6)	14112.882(12)	7083.7743(13)	−0.003	730		5p	$(3/2)^2[1/2]^\circ_0$	5d	$(5/2)^2[1/2]_1$			R1c		
7123.112(11)	14034.939(21)	7123.106(3)	0.006	59	*	6s	$(5/2)^2[5/2]_2$	7p	$(5/2)^2[5/2]^\circ_3$			R1c		
7123.112(11)	14034.939(21)	7123.1061(21)	0.006	59	*	sp	$(^3F)^1P^\circ\ ^3G^\circ_5$	5g	$(3/2)^2[11/2]_6$			R1c		
7123.112(11)	14034.939(21)	7123.1212(21)	−0.010	59	*	sp	$(^3F)^1P^\circ\ ^3G^\circ_5$	5g	$(3/2)^2[11/2]_5$			R1c		
7127.032(8)	14027.218(15)	7127.0305(11)	0.002	150		5p	$(3/2)^2[5/2]^\circ_2$	5d	$(5/2)^2[3/2]_1$			R1c		
7139.649(5)	14002.431(10)	7139.653(3)	−0.004	1500		6s	$(5/2)^2[5/2]_3$	7p	$(5/2)^2[7/2]^\circ_4$			R1c		
7157.757(5)	13967.006(10)	7157.7517(8)	0.006	1500		5s	$(5/2)^2[5/2]_3$	sp	$(^3F)^3P^\circ\ ^1D^\circ_2$	5.2e+05	C	R1c	B00	
7182.106(7)	13919.655(14)	7182.104(5)	0.002	60		6s	$(5/2)^2[5/2]_2$	7p	$(5/2)^2[5/2]^\circ_2$			R1c		
7189.458(4)	13905.422(7)	7189.4534(12)	0.004	1300		5p	$(3/2)^2[1/2]^\circ_1$	5d	$(5/2)^2[3/2]_1$			R1c		
7194.900(3)	13894.903(6)	7194.8933(10)	0.007	6800		4p	$^1D^\circ_2$	s^2	$^1D_2$			F_Re		
7255.7937(20)	13778.293(4)	7255.7899(9)	0.0038	6400		sp	$(^3F)^3P^\circ\ ^1D^\circ_2$	6s	$(3/2)^2[3/2]_2$	6.5e+06	D+	F_Re	TW	
7271.507(6)	13748.519(11)	7271.4991(10)	0.008	460		5p	$(3/2)^2[5/2]^\circ_3$	5d	$(5/2)^2[9/2]_4$			R1c		
7306.511(4)	13682.653(7)	7306.5042(9)	0.007	3700		sp	$(^3F)^3P^\circ\ ^1D^\circ_2$	6s	$(3/2)^2[3/2]_1$			R1c		
7326.007(4)	13646.242(7)	7326.0039(8)	0.003	6900		5s	$(5/2)^2[5/2]_2$	sp	$(^3F)^3P^\circ\ ^1D^\circ_2$	1.80e+07	B	R1c	B00	
7331.6940(19)	13635.656(4)	7331.6941(7)	−0.0001	5100		5p	$(5/2)^2[3/2]^\circ_2$	6s	$(5/2)^2[5/2]_2$			F_Re		
7382.275(3)	13542.229(6)	7382.2720(14)	0.003	3500		4d	$(3/2)^2[1/2]_0$	4f	$(5/2)^2[3/2]^\circ_1$	1.6e+07	D+	F_Re	TW	
7396.156(6)	13516.815(11)	7396.1523(12)	0.003	1900		5p	$(3/2)^2[3/2]^\circ_2$	5d	$(5/2)^2[5/2]_2$			R1c		
7399.8836(16)	13510.005(3)	7399.8787(7)	0.0049	14000		5s	$(5/2)^2[5/2]_3$	sp	$(^3F)^3P^\circ\ ^1F^\circ_3$	2.57e+07	B	F_Re	B00	
7404.3561(11)	13501.8442(20)	7404.3532(6)	0.0029	55000		5p	$(5/2)^2[3/2]^\circ_2$	6s	$(5/2)^2[5/2]_3$	2.0e+07	D+	F_Re	TW	L
7417.483(5)	13477.950(9)	7417.4819(12)	0.001	2400		5p	$(3/2)^2[3/2]^\circ_2$	5d	$(5/2)^2[7/2]_3$			R1c		
7420.556(4)	13472.368(7)	7420.5668(9)	−0.010	4100		5s	$(3/2)^2[3/2]_1$	5p	$(3/2)^2[3/2]^\circ_2$	3.1e+06	C	R1c	B00	
7422.602(5)	13468.656(9)	7422.5904(11)	0.011	790		4p	$^3D^\circ_3$	s^2	$^1D_2$			R1c		
7434.155(4)	13447.725(7)	7434.1525(15)	0.002	3700		4d	$(3/2)^2[1/2]_0$	4f	$(5/2)^2[1/2]^\circ_1$	1.3e+07	D+	R1c	TW	
7438.1504(13)	13440.5007(24)	7438.1505(10)	−0.0001	11000		5p	$(3/2)^2[1/2]^\circ_0$	6s	$(3/2)^2[3/2]_1$	1.0e+07	D+	F_Re	TW	
7481.554(8)	13362.528(15)	7481.5552(10)	−0.001	190		5p	$(3/2)^2[3/2]^\circ_2$	5d	$(5/2)^2[5/2]_3$			R1c		
7493.289(8)	13341.602(14)	7493.2883(20)	0.000	130		6p	$(5/2)^2[7/2]^\circ_3$	7d	$(5/2)^2[7/2]_3$	3.0e+06	D+	R1c	TW	
7562.0141(17)	13220.350(3)	7562.0167(9)	−0.0026	16000		5s	$(3/2)^2[3/2]_1$	5p	$(3/2)^2[3/2]^\circ_1$	3.8e+07	B	F_Re	B00	
7564.324(8)	13216.314(14)	7564.3057(14)	0.018	64		5p	$(3/2)^2[3/2]^\circ_2$	5d	$(5/2)^2[3/2]_1$			R1c		
7575.242(7)	13197.266(12)	7575.2309(12)	0.011	220		5p	$(3/2)^2[3/2]^\circ_2$	5d	$(5/2)^2[3/2]_2$			R1c		
7579.023(3)	13190.681(5)	7579.0283(10)	−0.005	20000		5s	$(3/2)^2[3/2]_2$	5p	$(3/2)^2[3/2]^\circ_2$	4.1e+07	B	F_Re	B00	
7579.850(5)	13189.242(9)	7579.8494(9)	0.001	8400		5s	$(5/2)^2[5/2]_2$	sp	$(^3F)^3P^\circ\ ^1F^\circ_3$	1.15e+07	B	F_Re	B00	
7583.273(8)	13183.289(13)	7583.339(4)	−0.066	64	?	4d	$(5/2)^2[1/2]_0$	sp	$(^1D)^3P^\circ\ ^3P^\circ_1$			R1c		X
7652.3326(7)	13064.3147(12)	7652.3337(5)	−0.0011	26000		5s	$(5/2)^2[5/2]_3$	5p	$(5/2)^2[5/2]^\circ_3$	2.35e+07	B	F_Re	B00	
7664.6451(12)	13043.3283(20)	7664.6465(7)	−0.0014	52000		5p	$(5/2)^2[7/2]^\circ_3$	6s	$(5/2)^2[5/2]_2$	3.5e+07	D+	F_Re	TW	L
7681.787(4)	13014.223(7)	7681.7968(10)	−0.010	570		5p	$(3/2)^2[5/2]^\circ_2$	6s	$(3/2)^2[3/2]_2$			R1c		
7712.418(6)	12962.535(9)	7712.421(3)	−0.003	640		6p	$(5/2)^2[3/2]^\circ_2$	7d	$(5/2)^2[5/2]_3$	3.7e+06	D+	R1c	TW	
7726.637(4)	12938.681(6)	7726.6439(10)	−0.007	9000		5s	$(3/2)^2[3/2]_2$	5p	$(3/2)^2[3/2]^\circ_1$	1.70e+07	B	F_Re	B00	
7738.6656(12)	12918.5693(21)	7738.6644(9)	0.0012	30000		5p	$(3/2)^2[5/2]^\circ_2$	6s	$(3/2)^2[3/2]_1$	4.5e+07	D+	F_Re	TW	L

Table A1. *Cont.*

λ_{obs} [a] (Å)	σ_{obs} [b] (cm^{-1})	λ_{Ritz} [c] (Å)	$\Delta\lambda_{obs-Ritz}$ (Å)	I_{obs} [d] (arb. u.)	Char [e]	Lower Level		Upper Level		A (s^{-1})	Acc [f]	Line Ref. [g]	TP Ref. [g]	Notes [h]
7739.499(8)	12917.179(14)	7739.505(4)	−0.006	1600		6p	$(5/2)^2[3/2]^\circ_2$	7d	$(5/2)^2[3/2]_2$	7.1e+06	D+	R1c	TW	
7744.0889(18)	12909.522(3)	7744.0905(8)	−0.0016	7800		5p	$(5/2)^2[7/2]^\circ_3$	6s	$(5/2)^2[5/2]_3$			F_Re		
7754.3688(20)	12892.408(3)	7754.3653(10)	0.0035	11000		5p	$(3/2)^2[1/2]^\circ_1$	6s	$(3/2)^2[3/2]_2$	9.e+06	D+	F_Re	TW	
7766.516(9)	12872.244(16)	7766.511(7)	0.006	32		6p	$(3/2)^2[1/2]^\circ_1$	7d	$(3/2)^2[1/2]_0$			R1c		
7773.196(7)	12861.182(12)	7773.1992(9)	−0.003	3200		5s	$(5/2)^2[5/2]_3$	5p	$(5/2)^2[5/2]^\circ_2$	1.08e+06	C	R1c	B00	
7778.7353(13)	12852.0236(22)	7778.7347(8)	0.0006	25000		5p	$(5/2)^2[5/2]^\circ_2$	6s	$(5/2)^2[5/2]_2$	1.3e+07	D+	F_Re	TW	L
7805.1886(13)	12808.4659(21)	7805.1878(7)	0.0008	26000		5p	$(5/2)^2[3/2]^\circ_1$	6s	$(5/2)^2[5/2]_2$	1.6e+07	D+	F_Re	TW	L
7807.6534(12)	12804.4224(20)	7807.6526(7)	0.0007	82000		5p	$(5/2)^2[7/2]^\circ_4$	6s	$(5/2)^2[5/2]_3$	3.6e+07	C+	F_Re	TW	L
7812.3182(19)	12796.777(3)	7812.3164(10)	0.0018	10000		5p	$(3/2)^2[1/2]^\circ_1$	6s	$(3/2)^2[3/2]_1$	1.2e+07	D+	F_Re	TW	
7820.577(4)	12783.264(6)	7820.5768(10)	−0.000	7300		5s	$(3/2)^2[3/2]_1$	5p	$(3/2)^2[1/2]^\circ_1$	1.51e+07	B	F_Re	B00	
7825.6528(12)	12774.9718(20)	7825.6530(7)	−0.0002	59000		5s	$(5/2)^2[5/2]_3$	5p	$(5/2)^2[7/2]^\circ_4$	5.2e+07	B	F_Re	B00	L
7845.0792(12)	12743.3378(20)	7845.0795(9)	−0.0003	24000		5p	$(3/2)^2[5/2]^\circ_3$	6s	$(3/2)^2[3/2]_2$	3.8e+07	D+	F_Re	TW	L
7853.984(9)	12728.890(15)	7853.980(4)	0.004	190		6p	$(5/2)^2[5/2]^\circ_2$	7d	$(5/2)^2[5/2]_2$			R1c		
7860.576(5)	12718.216(7)	7860.5740(10)	0.002	5700		5p	$(5/2)^2[5/2]^\circ_2$	6s	$(5/2)^2[5/2]_3$			R1c		
7862.652(9)	12714.857(14)	7862.654(3)	−0.002	250		6p	$(5/2)^2[5/2]^\circ_2$	7d	$(5/2)^2[7/2]_3$	2.9e+06	D+	R1c	TW	
7886.076(9)	12677.091(15)	7886.097(5)	−0.021	61		6p	$(3/2)^2[1/2]^\circ_1$	7d	$(3/2)^2[1/2]_1$			R1c		
7890.568(4)	12669.874(6)	7890.5666(8)	0.001	3500		5s	$(5/2)^2[5/2]_3$	5p	$(5/2)^2[7/2]^\circ_3$	5.8e+06	B	F_Re	B00	
7895.8050(13)	12661.4700(22)	7895.8039(8)	0.0011	21000		5s	$(3/2)^2[3/2]_1$	5p	$(3/2)^2[5/2]^\circ_2$	4.3e+07	B	F_Re	B00	L
7902.5482(13)	12650.6660(21)	7902.5499(8)	−0.0017	25000		5s	$(3/2)^2[3/2]_2$	5p	$(3/2)^2[5/2]^\circ_3$	4.9e+07	B	F_Re	B00	L
7907.351(10)	12642.983(16)	7907.364(5)	−0.014	61		6p	$(5/2)^2[5/2]^\circ_2$	7d	$(5/2)^2[3/2]_1$			R1c		
7944.4368(6)	12583.9633(10)	7944.4365(5)	0.0003	17000		5s	$(5/2)^2[5/2]_2$	5p	$(5/2)^2[3/2]^\circ_1$	4.7e+07	B	F_Re	B00	L
7967.067(5)	12548.220(8)	7967.065(4)	0.002	2100		6p	$(3/2)^2[5/2]^\circ_3$	7d	$(3/2)^2[7/2]_4$	1.0e+07	D+	R1c	TW	
7972.031(5)	12540.406(7)	7972.0306(10)	0.000	7800		5s	$(5/2)^2[5/2]_2$	5p	$(5/2)^2[5/2]^\circ_2$	2.9e+07	B	R1c	B00	
7981.574(9)	12525.413(15)	7981.4451(23)	0.128	59	?	4f	$(5/2)^2[7/2]^\circ_3$	6d	$(3/2)^2[7/2]_4$			R1c		X
7988.1598(13)	12515.0857(20)	7988.1620(7)	−0.0022	47000		5p	$(5/2)^2[5/2]^\circ_3$	6s	$(5/2)^2[5/2]_3$	1.7e+07	D+	F_Re	TW	L
7996.793(3)	12501.575(5)	7996.7854(10)	0.007	9000		5s	$(3/2)^2[3/2]_2$	5p	$(3/2)^2[1/2]^\circ_1$	3.2e+07	B	F_Re	B00	
8006.515(5)	12486.394(8)	8006.525(4)	−0.009	440		6p	$(3/2)^2[5/2]^\circ_2$	7d	$(3/2)^2[7/2]_3$	5.9e+06	D+	R2nc	TW	
8026.479(3)	12455.338(5)	8026.4828(12)	−0.004	7100		5p	$(3/2)^2[3/2]^\circ_1$	6s	$(3/2)^2[3/2]_2$	8.2e+06	D+	F_Re	TW	
8042.489(7)	12430.544(11)	8042.494(4)	−0.005	230		6p	$(5/2)^2[3/2]^\circ_1$	7d	$(5/2)^2[3/2]_1$			R1c		
		8053.200(6)			m	6p	$(3/2)^2[5/2]^\circ_2$	7d	$(3/2)^2[1/2]_1$			R1c		
8053.339(16)	12413.796(24)	8053.358(4)	−0.019	230		sp	$(^1G)^3P^\circ\ ^3F^\circ_3$	7d	$(5/2)^2[7/2]_4$	2.3e+06	D+	R1c	TW	
8054.227(7)	12412.428(11)	8054.239(3)	−0.012	110		sp	$(^1G)^3P^\circ\ ^3F^\circ_3$	7d	$(5/2)^2[7/2]_3$			R1c		
8074.999(7)	12380.498(11)	8074.999(3)	0.000	420		6p	$(5/2)^2[7/2]^\circ_3$	8s	$(5/2)^2[5/2]_2$	3.5e+06	D+	R1c	TW	
8075.456(7)	12379.797(11)	8075.4576(10)	−0.001	2300		5s	$(3/2)^2[3/2]_2$	5p	$(3/2)^2[5/2]^\circ_2$	2.8e+05	C	R1c	B00	
8088.5846(15)	12359.7038(23)	8088.5888(11)	−0.0042	13000		5p	$(3/2)^2[3/2]^\circ_1$	6s	$(3/2)^2[3/2]_1$	1.6e+07	D+	F_Re	TW	
8095.5267(14)	12349.1051(21)	8095.5268(8)	−0.0001	26000		5s	$(5/2)^2[5/2]_2$	5p	$(5/2)^2[7/2]^\circ_3$	3.7e+07	B	F_Re	B00	
8098.519(7)	12344.542(11)	8098.5396(14)	−0.020	550		sp	$(^3F)^1P^\circ\ ^3G^\circ_4$	5g	$(3/2)^2[9/2]_5$			R1c		
8100.868(7)	12340.963(11)	8100.883(3)	−0.015	83		6p	$(5/2)^2[7/2]^\circ_3$	8s	$(5/2)^2[5/2]_3$			R1c		
8103.352(7)	12337.180(11)	8103.353(4)	−0.001	550		sp	$(^1G)^3P^\circ\ ^3F^\circ_3$	7d	$(5/2)^2[9/2]_4$	2.7e+06	D+	R1c	TW	
8154.003(6)	12260.545(9)	8154.012(4)	−0.009	2000		6p	$(5/2)^2[7/2]^\circ_4$	7d	$(5/2)^2[9/2]_5$	5.4e+06	D+	R1c	TW	
8192.221(6)	12203.347(9)	8192.2333(13)	−0.012	10700		5p	$(3/2)^2[3/2]^\circ_2$	6s	$(3/2)^2[3/2]_2$	2.0e+07	D+	F_Re	TW	
8192.330(3)	12203.185(4)	8192.3279(10)	0.002	3300		sp	$(^3F)^3P^\circ\ ^1F^\circ_3$	6s	$(5/2)^2[5/2]_2$	5.9e+06	D+	F_Re	TW	

Table A1. *Cont.*

λ_{obs} [a] (Å)	σ_{obs} [b] (cm^{-1})	λ_{Ritz} [c] (Å)	$\Delta\lambda_{obs-Ritz}$ (Å)	I_{obs} [d] (arb. u.)	Char [e]	Lower Level		Upper Level		A (s^{-1})	Acc [f]	Line Ref. [g]	TP Ref. [g]	Notes [h]
8201.898(7)	12188.949(11)	8201.908(4)	−0.010	52		6p	$(3/2)^2[3/2]^\circ_2$	7d	$(3/2)^2[7/2]_3$			R1c		
8235.272(4)	12139.553(6)	8235.2788(14)	−0.007	5600		5s	$(3/2)^2[3/2]_1$	5p	$(3/2)^2[1/2]^\circ_0$	4.6e+07	B	F_Re	B00	
8256.944(6)	12107.691(9)	8256.9412(13)	0.002	3000		5p	$(3/2)^2[3/2]^\circ_2$	6s	$(3/2)^2[3/2]_1$			F_Re		
8277.5525(14)	12077.5460(21)	8277.5527(8)	−0.0003	20000		5s	$(5/2)^2[5/2]_3$	5p	$(5/2)^2[3/2]^\circ_2$	4.3e+07	B	F_Re	B00	
8283.1521(14)	12069.3813(21)	8283.1520(9)	0.0000	23000		sp	$(^3F)^3P^\circ\ ^1F^\circ_3$	6s	$(5/2)^2[5/2]_3$			F_Re		
8298.461(7)	12047.116(11)	8298.465(3)	−0.004	72		sp	$(^3F)^1P^\circ\ ^3F^\circ_2$	7d	$(5/2)^2[5/2]_2$			R1c		
8306.475(5)	12035.493(7)	8306.4866(14)	−0.011	890		4p	$^3D^\circ_2$	s^2	$^1D_2$			R1c		
8308.148(7)	12033.070(11)	8308.150(3)	−0.002	120		sp	$(^3F)^1P^\circ\ ^3F^\circ_2$	7d	$(5/2)^2[7/2]_3$			R1c		
8328.395(6)	12003.817(8)	8328.393(3)	0.001	470		6p	$(5/2)^2[5/2]^\circ_3$	7d	$(5/2)^2[7/2]_4$	3.1e+06	D+	R1c	TW	
8333.074(7)	11997.077(10)	8333.072(4)	0.001	470		6p	$(5/2)^2[3/2]^\circ_2$	8s	$(5/2)^2[5/2]_3$	2.3e+06	D+	R1c	TW	
8333.617(8)	11996.294(12)	8333.6418(20)	−0.024	580		sp	$(^3F)^1P^\circ\ ^3G^\circ_5$	5g	$(5/2)^2[9/2]_5$			R1c		
8336.333(5)	11992.386(8)	8336.3323(20)	0.001	3500		sp	$(^3F)^1P^\circ\ ^3G^\circ_5$	5g	$(5/2)^2[11/2]_6$	1.4e+06	D+	R1c	TW	
8353.837(7)	11967.259(10)	8353.843(3)	−0.006	230		6p	$(5/2)^2[5/2]^\circ_3$	7d	$(5/2)^2[5/2]_3$	3.1e+06	D+	R1c	TW	
8381.868(7)	11927.237(11)	8381.872(4)	−0.004	45		6p	$(5/2)^2[5/2]^\circ_3$	7d	$(5/2)^2[9/2]_4$			R1c		
8385.624(7)	11921.895(11)	8385.629(4)	−0.005	67		6p	$(5/2)^2[5/2]^\circ_3$	7d	$(5/2)^2[3/2]_2$			R1c		
8394.566(8)	11909.195(11)	8394.5745(12)	−0.008	110		4f	$(5/2)^2[9/2]^\circ_4$	5g	$(3/2)^2[9/2]_5$			R1c		
8402.897(7)	11897.388(9)	8402.9047(11)	−0.007	1600		5s	$(3/2)^2[3/2]_1$	sp	$(^3F)^3P^\circ\ ^1D^\circ_2$	3.9e+06	C	R1c	B00	
8450.062(8)	11830.982(11)	8450.078(3)	−0.016	63		sp	$(^3F)^1P^\circ\ ^3D^\circ_2$	6d	$(3/2)^2[5/2]_3$ ^1D			R1c		
8477.298(5)	11792.971(7)	8477.3077(17)	−0.009	3900		4p	$^1P^\circ_1$	s^2	textsubscript2			R1c		
8503.394(5)	11756.780(7)	8503.3976(9)	−0.004	3600		5s	$(5/2)^2[5/2]_2$	5p	$(5/2)^2[3/2]^\circ_2$	1.6e+06	C	R1c	B00	
8511.0626(20)	11746.187(3)	8511.0647(10)	−0.0021	11000		sp	$(^3F)^3P^\circ\ ^1D^\circ_2$	6s	$(5/2)^2[5/2]_2$	1.0e+07	D+	F_Re	TW	
8535.196(11)	11712.975(15)	8535.2020(23)	−0.006	77		sp	$(^3P)^3P^\circ\ ^3D^\circ_1$	5g	$(5/2)^2[5/2]_2$			R1c		
8574.093(11)	11659.838(15)	8574.083(3)	0.010	110		sp	$(^3F)^1P^\circ\ ^3F^\circ_4$	6d	$(5/2)^2[9/2]_5$			R1c		
8606.681(10)	11615.690(13)	8606.6732(12)	0.008	690		5s	$(3/2)^2[3/2]_2$	sp	$(^3F)^3P^\circ\ ^1D^\circ_2$	7.9e+06	B	R1c	B00	
8609.132(5)	11612.384(7)	8609.1359(12)	−0.004	1100		sp	$(^3F)^3P^\circ\ ^1D^\circ_2$	6s	$(5/2)^2[5/2]_3$			R1c		
8729.820(9)	11451.845(12)	8729.822(3)	−0.002	160		sp	$(^1G)^3P^\circ\ ^3H^\circ_4$	5g	$(3/2)^2[11/2]_5$			R1c		
8730.233(7)	11451.303(9)	8730.232(3)	0.002	110		sp	$(^1G)^3P^\circ\ ^3F^\circ_3$	8s	$(5/2)^2[5/2]_2$			R1c		
8797.094(7)	11364.269(9)	8797.0968(22)	−0.002	380		sp	$(^3F)^1P^\circ\ ^3F^\circ_4$	5g	$(5/2)^2[9/2]_5$	1.6e+06	D+	R1c	TW	
8800.120(8)	11360.362(10)	8800.122(3)	−0.002	74		sp	$(^3F)^1P^\circ\ ^3F^\circ_4$	5g	$(5/2)^2[11/2]_5$			R1c		
8810.397(8)	11347.110(10)	8810.397(4)	0.000	290		6p	$(5/2)^2[7/2]^\circ_4$	8s	$(5/2)^2[5/2]_3$	2.4e+06	D+	R1c	TW	
8937.241(8)	11186.064(10)	8937.281(3)	−0.039	13		5d	$(5/2)^2[5/2]_3$	5f	$(3/2)^2[7/2]^\circ_4$			R1c		X
8959.159(9)	11158.698(11)	8959.1604(12)	−0.001	1300		5s	$(3/2)^2[3/2]_2$	sp	$(^3F)^3P^\circ\ ^1F^\circ_3$	1.6e+05	C	R1c	B00	
8967.150(9)	11148.754(11)	8967.143(4)	0.007	250		sp	$(^1G)^3P^\circ\ ^3F^\circ_2$	6d	$(3/2)^2[1/2]_1$			R1rc		
8991.446(9)	11118.629(11)	8991.447(7)	−0.001	12		sp	$(^3P)^3P^\circ\ ^1P^\circ_1$	6d	$(3/2)^2[1/2]_1$			R2nc		
9001.419(8)	11106.311(9)	9001.428(5)	−0.009	25		6p	$(3/2)^2[3/2]^\circ_1$	8s	$(3/2)^2[3/2]_2$			R1c		
9005.757(8)	11100.961(9)	9005.754(4)	0.003	4300		sp	$(^3F)^1P^\circ\ ^3G^\circ_3$	5g	$(3/2)^2[9/2]_4$	2.5e+06	D+	R1c	TW	
9015.187(9)	11089.349(11)	9015.144(4)	0.043	310		sp	$(^3F)^1P^\circ\ ^3G^\circ_3$	5g	$(3/2)^2[7/2]_4$			R1rc		X
9029.347(8)	11071.959(9)	9029.343(4)	0.003	300		sp	$(^3F)^1P^\circ\ ^3F^\circ_2$	8s	$(5/2)^2[5/2]_2$			R1c		
9036.147(8)	11063.627(9)	9036.132(4)	0.015	600		sp	$(^1G)^3P^\circ\ ^3H^\circ_5$	5g	$(3/2)^2[11/2]_6$	9.e+05	D+	R1rc	TW	
9067.974(8)	11024.796(10)	9067.9717(16)	0.002	180		5s	$(5/2)^2[5/2]_3$	sp	$(^3F)^3P^\circ\ ^3F^\circ_2$	3.9e+05	C	R1c	B00	
9086.933(9)	11001.793(11)	9086.928(4)	0.005	1200		6p	$(5/2)^2[5/2]^\circ_3$	8s	$(5/2)^2[5/2]_3$	1.7e+06	D+	R1c	TW	

Table A1. *Cont.*

λ_{obs} [a] (Å)	σ_{obs} [b] (cm^{-1})	λ_{Ritz} [c] (Å)	$\Delta\lambda_{obs-Ritz}$ (Å)	I_{obs} [d] (arb. u.)	Char [e]	Lower Level		Upper Level		A (s^{-1})	Acc [f]	Line Ref. [g]	TP Ref. [g]	Notes [h]
9089.413(9)	10998.792(11)	9089.4094(24)	0.003	46		5d	$(5/2)^2[7/2]_3$	5f	$(3/2)^2[9/2]^\circ_4$			R1c		
9093.704(9)	10993.602(11)	9093.632(4)	0.072	12		sp	$(^3P)^3P^\circ\ ^1D^\circ_2$	6d	$(3/2)^2[5/2]_2$			R1c		X
9096.064(9)	10990.749(11)	9096.054(6)	0.011	81		5d	$(5/2)^2[1/2]_1$	7p	$(5/2)^2[3/2]^\circ_2$			R1c		
9097.529(9)	10988.980(11)	9097.525(3)	0.004	460		sp	$(^3P)^3P^\circ\ ^3P^\circ_2$	7s	$(5/2)^2[5/2]_3$			R1c		
9098.493(9)	10987.815(11)	9098.489(3)	0.005	69		5d	$(5/2)^2[5/2]_2$	5f	$(3/2)^2[5/2]^\circ_3$			R1c		
9101.459(12)	10984.235(15)	9101.4285(22)	0.030	23		5d	$(5/2)^2[7/2]_4$	5f	$(3/2)^2[9/2]^\circ_5$			R1c		
9103.234(6)	10982.093(8)	9103.2366(12)	−0.003	2600		5p	$(3/2)^2[5/2]^\circ_2$	6s	$(5/2)^2[5/2]_2$			R1c		
9107.895(9)	10976.473(11)	9107.878(6)	0.016	230		5s	$(5/2)^2[5/2]_3$	sp	$(^3F)^3P^\circ\ ^1G^\circ_4$	9.1e+04	C	R1c	B00	
9115.700(9)	10967.075(11)	9115.643(10)	0.057	46	?	5f	$(5/2)^2[11/2]^\circ_5$	9d	$(5/2)^2[9/2]_4$			R1c		X
9125.941(9)	10954.767(11)	9125.932(4)	0.009	340		sp	$(^1G)^3P^\circ\ ^3F^\circ_2$	5g	$(3/2)^2[7/2]_3$			R2nc		
9154.181(18)	10920.973(21)	9154.160(4)	0.021	170		sp	$(^1G)^3P^\circ\ ^3F^\circ_2$	5g	$(3/2)^2[5/2]_3$			R2c		
9158.409(9)	10915.931(11)	9158.393(4)	0.016	450		sp	$(^3P)^3P^\circ\ ^3P^\circ_1$	5g	$(5/2)^2[3/2]_1$			R1c		
9179.306(12)	10891.081(14)	9179.319(7)	−0.014	610		5d	$(3/2)^2[1/2]_1$	7p	$(3/2)^2[1/2]^\circ_1$			R2nc		
9205.3214(22)	10860.301(3)	9205.3242(12)	−0.0028	5800		5p	$(3/2)^2[1/2]^\circ_1$	6s	$(5/2)^2[5/2]_2$			F_Re		
9219.491(10)	10843.610(12)	9219.466(5)	0.025	32		5d	$(5/2)^2[5/2]_3$	7p	$(5/2)^2[5/2]^\circ_3$			R1c		
9226.742(10)	10835.088(12)	9226.7371(12)	0.005	730		5s	$(3/2)^2[3/2]_1$	5p	$(5/2)^2[3/2]^\circ_1$	1.3e+06	C	R1c	B00	
9230.567(11)	10830.599(13)	9230.577(3)	−0.010	370		sp	$(^3P)^3P^\circ\ ^3D^\circ_3$	7s	$(5/2)^2[5/2]_3$			R1c		
9234.272(8)	10826.253(10)	9234.258(3)	0.014	1300		sp	$(^3F)^1P^\circ\ ^3D^\circ_3$	6d	$(5/2)^2[7/2]_4$			R1c		
9277.399(12)	10775.926(14)	9277.400(9)	−0.000	11	?	5f	$(5/2)^2[9/2]^\circ_5$	8g	$(5/2)^2[11/2]_6$	4.6e+06	D+	R1nc	TW	
9296.634(12)	10753.631(14)	9296.580(6)	0.054	21		sp	$(^1D)^3P^\circ\ ^3F^\circ_2$	5d	$(3/2)^2[5/2]_3$			R1c		X
9312.387(13)	10735.440(15)	9312.450(9)	−0.064	21		5f	$(5/2)^2[9/2]^\circ_5$	7g	$(3/2)^2[11/2]_5$			R1c		X
9317.944(9)	10729.037(10)	9317.943(4)	0.002	260		sp	$(^3F)^1P^\circ\ ^3D^\circ_1$	6d	$(3/2)^2[5/2]_2$			R1c		
9324.302(9)	10721.722(10)	9324.3128(20)	−0.011	21		sp	$(^3F)^1P^\circ\ ^3G^\circ_4$	6d	$(5/2)^2[7/2]_3$			R1c		
9331.893(6)	10713.000(7)	9331.8965(12)	−0.004	2400		5s	$(3/2)^2[3/2]_2$	5p	$(5/2)^2[5/2]^\circ_3$	1.2e+06	C	R1c	B00	
9339.711(8)	10704.032(9)	9339.7151(17)	−0.004	360		5s	$(5/2)^2[5/2]_2$	sp	$(^3F)^3P^\circ\ ^3F^\circ_2$	6.8e+05	C	R1c	B00	
9364.118(14)	10676.133(16)	9364.046(7)	0.072	10		4d	$(3/2)^2[7/2]_4$	sp	$(^1D)^3P^\circ\ ^3F^\circ_3$			R1c		X
9374.435(19)	10664.383(21)	9374.4412(23)	−0.006	10		4f	$(5/2)^2[3/2]^\circ_2$	6d	$(5/2)^2[5/2]_2$			R1c		
9391.049(12)	10645.517(14)	9390.9259(21)	0.123	21	?	4f	$(5/2)^2[3/2]^\circ_2$	6d	$(5/2)^2[7/2]_3$			R1c		X
9415.060(9)	10618.368(10)	9415.044(6)	0.016	21		4d	$(3/2)^2[7/2]_3$	sp	$(^1D)^3P^\circ\ ^3F^\circ_2$			R1c		
9424.164(12)	10608.110(14)	9424.151(4)	0.013	100		sp	$(^3F)^1P^\circ\ ^3D^\circ_1$	6d	$(3/2)^2[3/2]_1$			R1c		
9444.862(10)	10584.863(11)	9444.858(10)	0.005	10		4d	$(3/2)^2[5/2]_2$	sp	$(^1D)^3P^\circ\ ^3D^\circ_3$			R1c		
9451.495(11)	10577.435(12)	9451.5130(13)	−0.018	1400		5p	$(3/2)^2[5/2]^\circ_3$	6s	$(5/2)^2[5/2]_3$			R1c		
9458.336(9)	10569.785(10)	9458.335(3)	0.000	72		4f	$(5/2)^2[7/2]^\circ_3$	6d	$(5/2)^2[7/2]_4$			R1c		
9459.889(10)	10568.049(11)	9459.895(4)	−0.005	31		sp	$(^3F)^1P^\circ\ ^3G^\circ_4$	6d	$(5/2)^2[9/2]_5$			R1c		
9460.791(9)	10567.042(10)	9460.790(5)	0.001	1000		sp	$(^3P)^3P^\circ\ ^3P^\circ_0$	5g	$(5/2)^2[3/2]_1$			R1c		
9461.294(10)	10566.480(11)	9461.3089(22)	−0.015	10		4f	$(5/2)^2[7/2]^\circ_3$	6d	$(5/2)^2[7/2]_3$			R1c		
9473.011(12)	10553.411(13)	9473.0050(12)	0.006	1300		5s	$(3/2)^2[3/2]_2$	5p	$(5/2)^2[3/2]^\circ_1$	1.13e+06	C	R1c	B00	
9474.119(10)	10552.176(11)	9474.106(5)	0.013	10		5d	$(5/2)^2[7/2]_4$	7p	$(5/2)^2[7/2]^\circ_4$			R1c		
9485.256(10)	10539.787(11)	9485.2726(23)	−0.017	21		4f	$(5/2)^2[5/2]^\circ_3$	6d	$(5/2)^2[5/2]_2$			R1c		
9492.663(19)	10531.563(21)	9492.653(4)	0.010	10		4f	$(3/2)^2[3/2]^\circ_1$	6d	$(3/2)^2[3/2]_2$			R1c		
9493.808(21)	10530.293(23)	9493.987(16)	−0.179	10	?	sp	$(^3P)^3P^\circ\ ^5P^\circ_3$	6s	$(3/2)^2[3/2]_2$			R2c		X
9500.248(10)	10523.154(11)	9500.262(3)	−0.014	52		sp	$(^3P)^3P^\circ\ ^3D^\circ_1$	7s	$(5/2)^2[5/2]_2$			R1c		
9502.093(10)	10521.111(11)	9502.1498(21)	−0.057	10	?	4f	$(5/2)^2[5/2]^\circ_3$	6d	$(5/2)^2[7/2]_3$			R1c		X

Table A1. *Cont.*

λ_{obs} [a] (Å)	σ_{obs} [b] (cm^{-1})	λ_{Ritz} [c] (Å)	$\Delta\lambda_{obs-Ritz}$ (Å)	I_{obs} [d] (arb. u.)	Char [e]	Lower Level		Upper Level		A (s^{-1})	Acc [f]	Line Ref. [g]	TP Ref. [g]	Notes [h]
9504.184(9)	10518.796(10)	9504.220(4)	−0.035	360		sp	$(^3P)^3P^\circ\ ^1D^\circ_2$	5g	$(3/2)^2[7/2]_3$			R1c		X
9505.598(10)	10517.232(11)	9505.605(3)	−0.008	10		4f	$(5/2)^2[3/2]^\circ_2$	6d	$(5/2)^2[3/2]_1$			R1c		
9510.299(19)	10512.033(21)	9510.298(7)	0.001	42		sp	$(^3P)^3P^\circ\ ^5P^\circ_2$	6s	$(3/2)^2[3/2]_2$			R1c		
9512.262(8)	10509.864(9)	9512.2653(15)	−0.004	2900		5s	$(3/2)^2[3/2]_2$	5p	$(5/2)^2[5/2]^\circ_2$	1.3e+06	C	R1c	B00	
9515.588(11)	10506.190(12)	9515.595(3)	−0.007	210		4f	$(5/2)^2[7/2]^\circ_3$	6d	$(5/2)^2[5/2]_3$			R1c		
9527.379(10)	10493.188(11)	9527.376(4)	0.003	31		4f	$(3/2)^2[3/2]^\circ_1$	6d	$(3/2)^2[3/2]_1$			R1c		
9530.897(10)	10489.315(11)	9530.905(3)	−0.008	160		4f	$(5/2)^2[11/2]^\circ_5$	6d	$(5/2)^2[9/2]_4$			R1c		
9546.928(10)	10471.701(11)	9546.928(3)	−0.000	210		4f	$(5/2)^2[11/2]^\circ_6$	6d	$(5/2)^2[9/2]_5$			R1c		
9548.691(10)	10469.768(11)	9548.702(3)	−0.011	21		4f	$(5/2)^2[3/2]^\circ_1$	6d	$(5/2)^2[3/2]_1$			R1c		
9565.600(10)	10451.261(11)	9565.623(4)	−0.024	53		4f	$(3/2)^2[9/2]^\circ_5$	6d	$(3/2)^2[7/2]_4$			R1c		
9585.611(10)	10429.442(11)	9585.628(3)	−0.017	32		4f	$(3/2)^2[5/2]^\circ_3$	6d	$(3/2)^2[3/2]_2$			R1c		
9597.666(20)	10416.343(21)	9597.614(7)	0.052	11		sp	$(^3P)^3P^\circ\ ^5P^\circ_2$	6s	$(3/2)^2[3/2]_1$			R1c		
9599.817(10)	10414.009(11)	9599.843(3)	−0.026	11		4f	$(5/2)^2[5/2]^\circ_2$	6d	$(5/2)^2[3/2]_1$			R1c		
9602.377(10)	10411.232(11)	9602.374(3)	0.003	22		4f	$(3/2)^2[7/2]^\circ_4$	6d	$(3/2)^2[5/2]_3$			R1c		
9605.15(9)	10408.22(10)	9605.075(6)	0.08	54	*	5d	$(5/2)^2[5/2]_3$	7p	$(5/2)^2[3/2]^\circ_2$			R1c		
9605.15(9)	10408.22(10)	9605.193(4)	−0.04	54	*	4f	$(3/2)^2[9/2]^\circ_4$	6d	$(3/2)^2[7/2]_3$			R1c		
9610.896(10)	10402.004(11)	9610.884(5)	0.012	430		5d	$(5/2)^2[1/2]_0$	5f	$(3/2)^2[3/2]^\circ_1$	5.9e+06	D+	R1c	TW	
9613.596(20)	10399.083(21)	9613.594(3)	0.002	65		4f	$(5/2)^2[9/2]^\circ_5$	6d	$(5/2)^2[7/2]_4$			R1c		
9630.420(10)	10380.916(11)	9630.428(3)	−0.009	11		4f	$(3/2)^2[7/2]^\circ_3$	6d	$(3/2)^2[5/2]_2$			R1c		
9630.969(11)	10380.324(11)	9631.023(3)	−0.054	11		4f	$(5/2)^2[5/2]^\circ_3$	6d	$(5/2)^2[3/2]_2$			R1c		X
9637.149(11)	10373.668(12)	9637.148(3)	0.000	1100		sp	$(^3F)^1P^\circ\ ^3D^\circ_3$	5g	$(5/2)^2[9/2]_4$			R1c		
9646.751(10)	10363.342(11)	9646.770(3)	−0.019	22		4f	$(5/2)^2[7/2]^\circ_4$	6d	$(5/2)^2[5/2]_3$			R1c		
9649.361(10)	10360.539(11)	9649.378(3)	−0.017	110	*	sp	$(^3F)^1P^\circ\ ^3D^\circ_3$	5g	$(5/2)^2[7/2]_4$			R1c		X
9649.361(10)	10360.539(11)	9649.399(3)	−0.038	110	*	sp	$(^3F)^1P^\circ\ ^3D^\circ_3$	5g	$(5/2)^2[7/2]_3$			R1nc		X
9651.107(10)	10358.665(11)	9651.115(4)	−0.008	22		4f	$(3/2)^2[3/2]^\circ_2$	6d	$(3/2)^2[1/2]_1$			R1c		
9657.363(11)	10351.954(11)	9657.369(4)	−0.005	22		4f	$(5/2)^2[1/2]^\circ_1$	6d	$(5/2)^2[1/2]_1$			R1c		
9664.119(10)	10344.717(11)	9664.140(3)	−0.020	11		4f	$(3/2)^2[5/2]^\circ_2$	6d	$(3/2)^2[3/2]_1$			R1c		
9670.167(10)	10338.248(11)	9670.172(8)	−0.006	11		6d	$(5/2)^2[9/2]_4$	8f	$(5/2)^2[11/2]^\circ_5$	3.5e+06	D+	R1c	TW	
9688.602(8)	10318.577(8)	9688.6189(13)	−0.017	1600		5s	$(3/2)^2[3/2]_2$	5p	$(5/2)^2[7/2]^\circ_3$	2.5e+05	C	R1c	B00	
9715.855(20)	10289.633(21)	9715.789(3)	0.066	12		4f	$(5/2)^2[9/2]^\circ_4$	6d	$(5/2)^2[7/2]_4$			R1c		X
9718.927(10)	10286.381(11)	9718.9263(24)	0.000	23		4f	$(5/2)^2[9/2]^\circ_4$	6d	$(5/2)^2[7/2]_3$			R1c		
9732.121(21)	10272.435(22)	9732.1007(17)	0.021	1100	*	sp	$(^3F)^1P^\circ\ ^3G^\circ_4$	5g	$(5/2)^2[9/2]_5$			R1nc		
9732.148(13)	10272.407(13)	9732.1264(21)	0.022	1100	*	sp	$(^3F)^1P^\circ\ ^3G^\circ_4$	5g	$(5/2)^2[9/2]_4$	2.1e+06	D+	F_Re	TW	
9734.473(10)	10269.953(11)	9734.488(3)	−0.015	24		4f	$(5/2)^2[7/2]^\circ_4$	6d	$(5/2)^2[9/2]_5$			R1c		
9735.802(4)	10268.551(4)	9735.8031(20)	−0.001	6700		sp	$(^3F)^1P^\circ\ ^3G^\circ_4$	5g	$(5/2)^2[11/2]_5$	9.e+06	D+	F_Re	TW	
		9781.688(5)			m	sp	$(^3F)^1P^\circ\ ^3D^\circ_1$	5g	$(3/2)^2[5/2]_2$			R1c		
9781.844(13)	10220.219(13)	9781.880(4)	−0.037	120		4f	$(3/2)^2[7/2]^\circ_3$	6d	$(3/2)^2[7/2]_3$			R1c		X
9792.465(10)	10209.134(11)	9792.4709(19)	−0.006	50		4f	$(5/2)^2[1/2]^\circ_1$	5g	$(5/2)^2[5/2]_2$			R1c		
9794.085(10)	10207.445(10)	9794.067(3)	0.018	38		sp	$(^3P)^3P^\circ\ ^3D^\circ_2$	7s	$(5/2)^2[5/2]_2$			R1c		
9813.2038(22)	10187.5583(23)	9813.2047(20)	−0.0009	8600		4f	$(5/2)^2[1/2]^\circ_1$	5g	$(5/2)^2[3/2]_2$	4.1e+07	C+	F_Re	TW	
9813.334(8)	10187.423(8)	9813.325(4)	0.009	2600		4f	$(5/2)^2[1/2]^\circ_1$	5g	$(5/2)^2[3/2]_1$	1.7e+07	D+	R1c	TW	
9817.398(9)	10183.206(9)	9817.3974(12)	0.001	240		4f	$(5/2)^2[3/2]^\circ_2$	5g	$(5/2)^2[7/2]_3$	1.8e+06	D+	R1c	TW	
9824.237(10)	10176.117(11)	9824.2394(9)	−0.002	100		4f	$(5/2)^2[11/2]^\circ_6$	5g	$(5/2)^2[9/2]_5$			R1c		

Table A1. *Cont.*

λ_{obs} [a] (Å)	σ_{obs} [b] (cm^{-1})	λ_{Ritz} [c] (Å)	$\Delta\lambda_{obs-Ritz}$ (Å)	I_{obs} [d] (arb. u.)	Char [e]	Lower Level		Upper Level		A (s^{-1})	Acc [f]	Line Ref. [g]	TP Ref. [g]	Notes [h]
9827.041(12)	10173.213(12)	9827.0477(21)	−0.006	78		4f	$(5/2)^2[11/2]^\circ_5$	5g	$(5/2)^2[9/2]_4$			R1c		
9827.982(4)	10172.240(4)	9827.9787(7)	0.003	3200		4f	$(5/2)^2[11/2]^\circ_6$	5g	$(5/2)^2[11/2]_6$	7.5e+06	D+	F_Re	TW	
9828.973(10)	10171.214(10)	9828.9743(16)	−0.001	710		5p	$(3/2)^2[3/2]^\circ_2$	6s	$(5/2)^2[5/2]_2$			R1c		
9830.795(4)	10169.329(4)	9830.7965(20)	−0.001	2700		4f	$(5/2)^2[11/2]^\circ_5$	5g	$(5/2)^2[11/2]_5$	7.7e+06	D+	F_Re	TW	
9835.299(10)	10164.672(11)	9835.299(3)	−0.001	100		4f	$(3/2)^2[3/2]^\circ_2$	5g	$(3/2)^2[7/2]_3$			R1c		
9837.8361(21)	10162.0505(22)	9837.8372(17)	−0.0011	10000		4f	$(5/2)^2[3/2]^\circ_2$	5g	$(5/2)^2[5/2]_3$	4.4e+07	C+	F_Re	TW	
9850.495(5)	10148.991(6)	9850.504(4)	−0.010	2400		4f	$(5/2)^2[1/2]^\circ_0$	5g	$(5/2)^2[3/2]_1$	2.8e+07	D+	F_Re	TW	
9858.723(7)	10140.521(8)	9858.7254(24)	−0.002	2500		4f	$(5/2)^2[3/2]^\circ_2$	5g	$(5/2)^2[3/2]_2$	1.9e+07	D+	R1c	TW	
9861.28027(17)	10137.89135(18)			21000		4f	$(5/2)^2[11/2]^\circ_6$	5g	$(5/2)^2[13/2]_7$	6.7e+07	B	F_Re	TW	
9864.13643(18)	10134.95593(19)			19000		4f	$(5/2)^2[11/2]^\circ_5$	5g	$(5/2)^2[13/2]_6$	6.6e+07	B	F_Re	TW	
9868.0934(21)	10130.8920(22)	9868.0940(21)	−0.0006	9100		4f	$(3/2)^2[3/2]^\circ_2$	5g	$(3/2)^2[5/2]_3$	5.6e+07	C+	F_Re	TW	
9870.816(16)	10128.098(17)	9870.8012(20)	0.014	97		5s	$(5/2)^2[5/2]_3$	sp	$(^3F)^3P^\circ\ ^3F^\circ_3$	5.4e+05	C	R1c	B00	
9878.465(8)	10120.255(9)	9878.193(5)	0.273	280	?	sp	$(^3P)^3P^\circ\ ^5S^\circ_2$	5g	$(5/2)^2[5/2]_2$			R1c		X
9881.464(3)	10117.184(3)	9881.4639(15)	0.000	8400		4f	$(5/2)^2[7/2]^\circ_3$	5g	$(5/2)^2[9/2]_4$	2.1e+07	D	F_Re	TW	
9883.730(9)	10114.864(9)	9883.7091(24)	0.021	560		4f	$(3/2)^2[9/2]^\circ_5$	5g	$(3/2)^2[9/2]_5$	5.4e+06	D+	R1c	TW	
9883.9672(10)	10114.6216(10)	9883.9674(10)	−0.0001	5100		4f	$(5/2)^2[3/2]^\circ_1$	5g	$(5/2)^2[5/2]_2$	3.9e+07	C+	F_Re	TW	
9884.996(11)	10113.569(11)	9884.989(4)	0.007	28		6p	$(5/2)^2[7/2]^\circ_3$	6d	$(3/2)^2[7/2]_4$			R1c		
9892.939(4)	10105.448(4)	9892.940(4)	−0.000	4800		4f	$(3/2)^2[3/2]^\circ_1$	5g	$(3/2)^2[5/2]_2$	3.1e+07	D	F_Re	TW	
9894.337(7)	10104.021(7)	9894.3443(14)	−0.007	5300		4f	$(5/2)^2[7/2]^\circ_3$	5g	$(5/2)^2[7/2]_3$	1.0e+07	D+	R1c	TW	
9899.567(11)	10098.683(11)	9899.414(6)	0.153	57	?	sp	$(^3P)^3P^\circ\ ^5S^\circ_2$	5g	$(5/2)^2[3/2]_1$			R1c		X
9905.136(23)	10093.005(24)	9905.091(3)	0.045	1800	*	4f	$(5/2)^2[3/2]^\circ_1$	5g	$(5/2)^2[3/2]_2$	3.7e+06	D+	F_Re	TW	
9905.18(8)	10092.97(8)	9905.214(4)	−0.04	1800	*	4f	$(5/2)^2[3/2]^\circ_1$	5g	$(5/2)^2[3/2]_1$	1.5e+07	D+	R1c	TW	
9911.988(12)	10086.028(12)	9911.986(3)	0.002	58		sp	$(^3F)^1P^\circ\ ^3D^\circ_2$	7s	$(3/2)^2[3/2]_1$			R1c		
9915.090(21)	10082.873(22)	9915.0672(18)	0.022	630	*	4f	$(5/2)^2[7/2]^\circ_3$	5g	$(5/2)^2[5/2]_2$			R1c		
9915.090(21)	10082.873(22)	9915.1061(20)	−0.017	630	*	4f	$(5/2)^2[7/2]^\circ_3$	5g	$(5/2)^2[5/2]_3$			R1c		
9916.4171(3)	10081.5233(3)	9916.4172(3)	−0.0001	15000		4f	$(3/2)^2[9/2]^\circ_5$	5g	$(3/2)^2[11/2]_6$	6.6e+07	B	F_Re	TW	
9917.9509(10)	10079.9642(10)	9917.9510(10)	−0.0001	9800		4f	$(5/2)^2[5/2]^\circ_2$	5g	$(5/2)^2[7/2]_3$	3.8e+07	C+	F_Re	TW	
9925.5883(4)	10072.2080(4)	9925.5883(4)	−0.0000	13000		4f	$(3/2)^2[9/2]^\circ_4$	5g	$(3/2)^2[11/2]_5$	6.5e+07	B	F_Re	TW	
9926.0209(15)	10071.7690(16)	9926.0211(13)	−0.0002	4900		4f	$(5/2)^2[5/2]^\circ_3$	5g	$(5/2)^2[9/2]_4$			F_Re		
9938.775(4)	10058.844(4)	9938.7730(16)	0.002	5300		4f	$(5/2)^2[5/2]^\circ_2$	5g	$(5/2)^2[5/2]_2$	2.1e+07	C+	F_Re	TW	
9938.9960(6)	10058.6207(6)	9938.9960(6)	0.0000	11000		4f	$(5/2)^2[5/2]^\circ_3$	5g	$(5/2)^2[7/2]_4$	4.4e+07	C+	F_Re	TW	
9948.895(11)	10048.612(11)	9948.8880(21)	0.007	61		4f	$(3/2)^2[5/2]^\circ_3$	5g	$(3/2)^2[9/2]_4$			R1c		
9959.970(3)	10037.439(3)	9959.9679(18)	0.002	5800		4f	$(5/2)^2[5/2]^\circ_3$	5g	$(5/2)^2[5/2]_3$	1.9e+07	C+	F_Re	TW	
9960.3485(8)	10037.0575(8)	9960.3485(8)	−0.0000	11000		4f	$(3/2)^2[5/2]^\circ_3$	5g	$(3/2)^2[7/2]_4$	5.6e+07	B	F_Re	TW	
9981.399(12)	10015.890(12)	9981.379(3)	0.020	130		4f	$(5/2)^2[5/2]^\circ_3$	5g	$(5/2)^2[3/2]_2$	1.9e+06	D+	R1c	TW	
9994.027(11)	10003.234(11)	9994.019(3)	0.008	900		4f	$(3/2)^2[5/2]^\circ_3$	5g	$(3/2)^2[5/2]_3$	9.e+06	D+	R1c	TW	
10006.588(3)	9990.678(3)	10006.5881(24)	−0.001	8400		4f	$(3/2)^2[5/2]^\circ_2$	5g	$(3/2)^2[7/2]_3$	4.9e+07	C+	F_Re	TW	
10022.9672(3)	9974.3510(3)	10022.9672(3)	−0.0000	20000		4f	$(5/2)^2[7/2]^\circ_4$	5g	$(5/2)^2[9/2]_5$	4.9e+07	B	F_Re	TW	
10026.894(4)	9970.445(4)	10026.8943(17)	−0.001	1500		4f	$(5/2)^2[7/2]^\circ_4$	5g	$(5/2)^2[11/2]_5$			F_Re		
10036.224(3)	9961.176(3)	10036.2243(9)	−0.000	5700		4f	$(5/2)^2[7/2]^\circ_4$	5g	$(5/2)^2[7/2]_4$	1.64e+07	C+	F_Re	TW	
10038.0920(5)	9959.3223(5)	10038.0919(5)	0.0001	14000		4f	$(3/2)^2[7/2]^\circ_4$	5g	$(3/2)^2[9/2]_5$	6.0e+07	B	F_Re	TW	
10040.499(13)	9956.935(13)	10040.481(5)	0.017	560		4f	$(3/2)^2[5/2]^\circ_2$	5g	$(3/2)^2[5/2]_2$	9.e+06	D+	R1c	TW	

Table A1. *Cont.*

λ_{obs} [a] (Å)	σ_{obs} [b] (cm^{-1})	λ_{Ritz} [c] (Å)	$\Delta\lambda_{obs-Ritz}$ (Å)	I_{obs} [d] (arb. u.)	Char [e]	Lower Level		Upper Level		A (s^{-1})	Acc [f]	Line Ref. [g]	TP Ref. [g]	Notes [h]
10049.773(12)	9947.746(12)	10049.7881(19)	−0.015	1200		4f	$(3/2)^2[7/2]^\circ_4$	5g	$(3/2)^2[7/2]_4$	9.e+06	D+	R1c	TW	
10051.0231(20)	9946.5092(20)	10051.0218(6)	0.0014	5100		4f	$(5/2)^2[9/2]^\circ_5$	5g	$(5/2)^2[9/2]_5$	1.32e+07	C+	F_Re	TW	
10054.93572(22)	9942.63880(21)	10054.93573(22)	−0.00001	24000		4f	$(5/2)^2[9/2]^\circ_5$	5g	$(5/2)^2[11/2]_6$	5.8e+07	B	F_Re	TW	
10057.609(11)	9939.996(11)	10057.6090(20)	−0.000	180		4f	$(5/2)^2[7/2]^\circ_4$	5g	$(5/2)^2[5/2]_3$	1.7e+06	D+	R1c	TW	
10080.3499(10)	9917.5719(10)	10080.3499(10)	−0.0000	11000		4f	$(3/2)^2[7/2]^\circ_3$	5g	$(3/2)^2[9/2]_4$	5.5e+07	B	F_Re	TW	
10092.14(3)	9905.99(3)	10092.1155(21)	0.02	990	*	4f	$(3/2)^2[7/2]^\circ_3$	5g	$(3/2)^2[7/2]_4$	1.4e+06	D+	R1nc	TW	
10092.14(3)	9905.99(3)	10092.151(3)	−0.01	990	*	4f	$(3/2)^2[7/2]^\circ_3$	5g	$(3/2)^2[7/2]_3$	7.3e+06	D+	R1c	TW	
10162.808(8)	9837.103(8)	10162.8099(18)	−0.001	3800		4f	$(5/2)^2[9/2]^\circ_4$	5g	$(5/2)^2[9/2]_4$	1.25e+07	C+	F_Re	TW	
10166.8202(21)	9833.2217(20)	10166.8192(16)	0.0010	18000		4f	$(5/2)^2[9/2]^\circ_4$	5g	$(5/2)^2[11/2]_5$	4.4e+07	B	F_Re	TW	
10176.433(12)	9823.933(11)	10176.4346(17)	−0.002	1700		4f	$(5/2)^2[9/2]^\circ_4$	5g	$(5/2)^2[7/2]_3$	1.4e+06	D+	R1c	TW	
10193.660(10)	9807.331(10)	10193.6484(21)	0.012	1100		5s	$(5/2)^2[5/2]_2$	sp	$(^3F)^3P^\circ\ ^3F^\circ_3$			R1c		
10225.073(10)	9777.201(10)	10225.077(4)	−0.003	1700		6p	$(5/2)^2[7/2]^\circ_3$	5g	$(3/2)^2[9/2]_4$			R1c		
10237.22(3)	9765.60(3)	10237.183(4)	0.03	120	*	6p	$(5/2)^2[7/2]^\circ_3$	5g	$(3/2)^2[7/2]_4$			R1nc		
10237.22(3)	9765.60(3)	10237.219(4)	−0.00	120	*	6p	$(5/2)^2[7/2]^\circ_3$	5g	$(3/2)^2[7/2]_3$			R1c		
10247.043(10)	9756.239(9)	10247.038(4)	0.005	1300		sp	$(^3F)^1P^\circ\ ^3D^\circ_2$	6d	$(5/2)^2[7/2]_3$	1.9e+06	D+	R1c	TW	
10278.686(16)	9726.204(15)	10278.6604(14)	0.026	540		5s	$(3/2)^2[3/2]_2$	5p	$(5/2)^2[3/2]^\circ_2$			R1c		
10297.40(3)	9708.53(3)	10297.147(5)	0.25	56	?	sp	$(^1G)^3P^\circ\ ^3H^\circ_4$	6d	$(5/2)^2[9/2]_5$			R1c		X
10343.469(10)	9665.287(9)	10343.472(3)	−0.003	6100		sp	$(^3F)^1P^\circ\ ^3F^\circ_3$	5g	$(5/2)^2[9/2]_4$	1.17e+07	C+	R1c	TW	
10357.603(10)	9652.098(9)	10357.586(3)	0.017	780		sp	$(^3F)^1P^\circ\ ^3F^\circ_3$	5g	$(5/2)^2[7/2]_3$	4.8e+06	D+	R1c	TW	
10380.323(21)	9630.972(20)	10380.297(3)	0.026	130	*	sp	$(^3F)^1P^\circ\ ^3F^\circ_3$	5g	$(5/2)^2[5/2]_2$			R1nc		
10380.323(21)	9630.972(20)	10380.340(3)	−0.016	130	*	sp	$(^3F)^1P^\circ\ ^3F^\circ_3$	5g	$(5/2)^2[5/2]_3$			R1c		
10424.302(8)	9590.341(7)	10424.309(3)	−0.007	3700		5d	$(5/2)^2[1/2]_1$	5f	$(5/2)^2[3/2]^\circ_2$	1.2e+07	D+	F_Re	TW	
10453.012(7)	9564.000(7)	10453.004(4)	0.008	4800		5d	$(5/2)^2[1/2]_1$	5f	$(5/2)^2[1/2]^\circ_1$	2.7e+07	D+	F_Re	TW	
10465.664(10)	9552.438(10)	10465.665(4)	−0.002	3800		5d	$(5/2)^2[1/2]_1$	5f	$(5/2)^2[1/2]^\circ_0$	3.6e+07	D+	F_Re	TW	
10575.703(11)	9453.046(10)	10575.690(6)	0.013	180		6p	$(5/2)^2[5/2]^\circ_2$	6d	$(3/2)^2[7/2]_3$	3.0e+06	D+	R1c	TW	
10609.294(11)	9423.116(10)	10609.300(5)	−0.006	240		5d	$(3/2)^2[1/2]_1$	5f	$(3/2)^2[3/2]^\circ_1$	1.0e+07	D+	R1c	TW	
10624.895(12)	9409.280(11)	10624.901(4)	−0.007	96		sp	$(^1G)^3P^\circ\ ^3H^\circ_4$	5g	$(5/2)^2[11/2]_5$			R1c		
10641.797(11)	9394.335(9)	10641.822(5)	−0.025	3600		5d	$(3/2)^2[1/2]_1$	5f	$(3/2)^2[3/2]^\circ_2$	3.0e+07	D+	F_Re	TW	
10742.332(8)	9306.416(7)	10742.3392(23)	−0.007	4800		5d	$(5/2)^2[9/2]_5$	5f	$(5/2)^2[9/2]^\circ_5$	7.7e+06	D+	F_Re	TW	
10745.703(12)	9303.497(11)	10745.703(3)	−0.001	110		5d	$(5/2)^2[9/2]_5$	5f	$(5/2)^2[9/2]^\circ_4$			R1c		
10752.044(14)	9298.010(12)	10752.046(3)	−0.002	53		5d	$(5/2)^2[9/2]_5$	5f	$(5/2)^2[7/2]^\circ_4$			R1c		
10768.359(14)	9283.923(12)	10768.360(4)	−0.001	210		5d	$(3/2)^2[7/2]_3$	5f	$(3/2)^2[7/2]^\circ_3$	5.7e+06	D+	R1c	TW	
10787.828(10)	9267.168(9)	10787.827(3)	0.001	210		5d	$(5/2)^2[3/2]_2$	5f	$(5/2)^2[7/2]^\circ_3$	1.9e+06	D+	R1c	TW	
10791.529(10)	9263.990(9)	10791.519(3)	0.010	1400		5d	$(5/2)^2[9/2]_4$	5f	$(5/2)^2[9/2]^\circ_4$	7.e+06	D+	R1c	TW	
10797.923(12)	9258.504(11)	10797.915(3)	0.008	160		5d	$(5/2)^2[9/2]_4$	5f	$(5/2)^2[7/2]^\circ_4$			R1c		
10800.96(3)	9255.90(3)	10800.929(3)	0.03	110	*	5d	$(5/2)^2[9/2]_4$	5f	$(5/2)^2[7/2]^\circ_3$			R1c		
10800.985(12)	9255.879(10)	10800.972(7)	0.014	110	*	sp	$(^3F)^3P^\circ\ ^5D^\circ_3$	4d	$(3/2)^2[5/2]_2$			F_Re		
10836.3452(6)	9225.6765(5)	10836.3453(6)	−0.0001	8300		5d	$(5/2)^2[9/2]_5$	5f	$(5/2)^2[11/2]^\circ_6$	4.2e+07	D+	F_Re	TW	
10849.473(3)	9214.514(3)	10849.477(3)	−0.004	6300		5d	$(3/2)^2[7/2]_3$	5f	$(3/2)^2[9/2]^\circ_4$	4.1e+07	D+	F_Re	TW	
10852.407(10)	9212.022(9)	10852.401(4)	0.007	2100		5d	$(5/2)^2[3/2]_1$	5f	$(5/2)^2[5/2]^\circ_2$	1.8e+07	D+	R1c	TW	
10865.050(17)	9201.303(15)	10865.010(5)	0.039	100		5d	$(5/2)^2[3/2]_2$	5f	$(5/2)^2[3/2]^\circ_1$			R1c		
10885.074(16)	9184.376(14)	10885.066(5)	0.008	200	*	sp	$(^1G)^3P^\circ\ ^3F^\circ_3$	6d	$(3/2)^2[7/2]_4$	2.1e+06	D+	R1c	TW	

Table A1. *Cont.*

λ_{obs} [a] (Å)	σ_{obs} [b] (cm^{-1})	λ_{Ritz} [c] (Å)	$\Delta\lambda_{obs-Ritz}$ (Å)	I_{obs} [d] (arb. u.)	Char [e]	Lower Level		Upper Level		A (s^{-1})	Acc [f]	Line Ref. [g]	TP Ref. [g]	Notes [h]
10885.074(16)	9184.376(14)	10885.064(8)	0.010	200	*	sp	$(^3F)^1P^\circ\ ^3D^\circ_1$	6d	$(5/2)^2[1/2]_0$			R1c		
10889.9718(12)	9180.2457(11)	10889.9720(12)	−0.0003	6800		5d	$(5/2)^2[9/2]_4$	5f	$(5/2)^2[11/2]^\circ_5$	4.2e+07	D+	F_Re	TW	
10904.886(9)	9167.691(7)	10904.902(5)	−0.016	2600		5d	$(3/2)^2[3/2]_1$	5f	$(3/2)^2[5/2]^\circ_2$	2.8e+07	D+	F_Re	TW	
10925.167(13)	9150.672(11)	10925.155(4)	0.012	97		5d	$(3/2)^2[7/2]_4$	5f	$(3/2)^2[9/2]^\circ_4$	1.3e+06	D+	R1c	TW	
10929.791(10)	9146.800(9)	10929.799(4)	−0.008	480		5d	$(5/2)^2[3/2]_2$	5f	$(5/2)^2[1/2]^\circ_1$	1.2e+07	D+	R1c	TW	
10930.9327(21)	9145.8452(17)	10930.9342(19)	−0.0015	5300		5d	$(3/2)^2[7/2]_4$	5f	$(3/2)^2[9/2]^\circ_5$	4.2e+07	D+	F_Re	TW	
10959.809(11)	9121.748(9)	10959.819(5)	−0.010	4600		5d	$(3/2)^2[3/2]_2$	5f	$(3/2)^2[7/2]^\circ_3$	3.0e+06	D+	R1c	TW	
10964.502(11)	9117.844(9)	10964.527(5)	−0.025	3200		5d	$(3/2)^2[3/2]_1$	5f	$(3/2)^2[3/2]^\circ_1$	1.0e+07	D+	R1c	TW	
10966.532(11)	9116.156(9)	10966.524(5)	0.008	900		5d	$(5/2)^2[3/2]_1$	5f	$(5/2)^2[1/2]^\circ_0$	7.e+06	D+	R1c	TW	
10973.938(5)	9110.004(4)	10973.944(3)	−0.006	3100		5d	$(5/2)^2[5/2]_3$	5f	$(5/2)^2[9/2]^\circ_4$	5.5e+06	D+	F_Re	TW	
10980.553(5)	9104.516(4)	10980.559(3)	−0.006	4700		5d	$(5/2)^2[5/2]_3$	5f	$(5/2)^2[7/2]^\circ_4$	2.0e+07	D+	F_Re	TW	
10983.677(10)	9101.926(8)	10983.675(3)	0.002	1600		5d	$(5/2)^2[5/2]_3$	5f	$(5/2)^2[7/2]^\circ_3$	3.9e+06	D+	R1c	TW	
11008.410(12)	9081.477(10)	11008.408(4)	0.002	3300		sp	$(^3F)^1P^\circ\ ^3D^\circ_3$	7s	$(5/2)^2[5/2]_3$			R1c		
11009.932(6)	9080.221(5)	11009.932(4)	−0.000	3200		5d	$(3/2)^2[3/2]_2$	5f	$(3/2)^2[5/2]^\circ_3$	2.9e+07	D+	F_Re	TW	
11027.380(13)	9065.854(11)	11027.388(3)	−0.008	190		5d	$(5/2)^2[5/2]_3$	5f	$(5/2)^2[5/2]^\circ_2$	1.6e+06	D+	R1c	TW	
11035.977(10)	9058.792(8)	11035.978(4)	−0.002	2700		5d	$(5/2)^2[5/2]_3$	5f	$(5/2)^2[5/2]^\circ_3$	1.6e+07	D+	R1c	TW	
11098.345(11)	9007.885(9)	11098.352(3)	−0.006	150		5d	$(5/2)^2[5/2]_3$	5f	$(5/2)^2[3/2]^\circ_2$	4.5e+06	D+	R1c	TW	
11100.523(11)	9006.118(9)	11100.529(5)	−0.006	150		5d	$(3/2)^2[3/2]_2$	5f	$(3/2)^2[3/2]^\circ_2$	1.1e+07	D+	R1c	TW	
11114.771(5)	8994.573(4)	11114.773(3)	−0.001	2500		5d	$(5/2)^2[7/2]_3$	5f	$(5/2)^2[9/2]^\circ_4$	2.4e+07	D+	F_Re	TW	
11121.559(10)	8989.083(8)	11121.558(3)	0.001	3300		5d	$(5/2)^2[7/2]_3$	5f	$(5/2)^2[7/2]^\circ_4$	9.e+06	E	R1c	TW	
11123.1488(20)	8987.7987(16)	11123.1487(18)	0.0001	6400		5d	$(5/2)^2[7/2]_4$	5f	$(5/2)^2[9/2]^\circ_5$	3.3e+07	D+	F_Re	TW	
11124.761(11)	8986.496(9)	11124.755(4)	0.006	2400		5d	$(5/2)^2[7/2]_3$	5f	$(5/2)^2[7/2]^\circ_3$	1.2e+07	D+	R1c	TW	
11125.451(5)	8985.939(4)	11125.454(4)	−0.003	3400		5d	$(3/2)^2[5/2]_3$	5f	$(3/2)^2[7/2]^\circ_4$	3.5e+07	D+	F_Re	TW	
11126.754(11)	8984.886(9)	11126.756(3)	−0.001	2100		5d	$(5/2)^2[7/2]_4$	5f	$(5/2)^2[9/2]^\circ_4$	4.5e+06	D+	R1c	TW	
11133.556(12)	8979.397(9)	11133.556(3)	0.000	2300		5d	$(5/2)^2[7/2]_4$	5f	$(5/2)^2[7/2]^\circ_4$	9.e+06	D+	R1c	TW	
11141.872(21)	8972.695(17)	11141.845(5)	0.027	490		sp	$(^3F)^1P^\circ\ ^3D^\circ_1$	7s	$(3/2)^2[3/2]_1$			R1c		
11156.494(10)	8960.935(8)	11156.492(5)	0.002	3400		5d	$(3/2)^2[5/2]_2$	5f	$(3/2)^2[7/2]^\circ_3$	3.2e+07	D+	R1c	TW	
11173.078(11)	8947.635(8)	11173.081(4)	−0.003	2200		5d	$(5/2)^2[5/2]_2$	5f	$(5/2)^2[7/2]^\circ_3$	2.2e+07	D+	F_Re	TW	
11180.070(13)	8942.039(11)	11180.072(4)	−0.002	800		5d	$(3/2)^2[5/2]_3$	5f	$(3/2)^2[5/2]^\circ_3$	1.0e+07	D+	R1c	TW	
11190.552(13)	8933.663(11)	11190.534(4)	0.018	94		5d	$(5/2)^2[7/2]_4$	5f	$(5/2)^2[5/2]^\circ_3$	2.0e+06	D+	R1c	TW	
11202.751(12)	8923.935(9)	11202.717(5)	0.034	350		5d	$(3/2)^2[5/2]_2$	5f	$(3/2)^2[5/2]^\circ_2$	1.1e+07	D+	R1c	TW	
11208.490(13)	8919.366(11)	11208.425(5)	0.065	84		5d	$(3/2)^2[5/2]_2$	5f	$(3/2)^2[5/2]^\circ_3$	1.2e+06	D+	R1c	TW	X
11218.324(11)	8911.547(9)	11218.317(4)	0.007	1200		5d	$(5/2)^2[5/2]_2$	5f	$(5/2)^2[5/2]^\circ_2$	1.6e+07	D+	R1c	TW	
11227.209(11)	8904.495(9)	11227.208(4)	0.000	1100		5d	$(5/2)^2[5/2]_2$	5f	$(5/2)^2[5/2]^\circ_3$	5.4e+06	D+	R1c	TW	
23063.7	4335.82	23063.701(9)			:	4s	$^3D_3$	4s	$^1D_2$	2.0e−01	C+		TW,G64	M1
29261.7	3417.43	29261.733(10)			:	4s	$^3D_2$	4s	$^1D_2$	1.55e−02	C+		TW,G64	M1
44127.2	2266.18	44127.15(3)			:	4s	$^3D_1$	4s	$^1D_2$	2.7e−02	C+		TW,G64	M1

Table A1. *Cont.*

λ_{obs} [a] (Å)	σ_{obs} [b] (cm^{-1})	λ_{Ritz} [c] (Å)	$\Delta\lambda_{obs-Ritz}$ (Å)	I_{obs} [d] (arb. u.)	Char [e]	Lower Level		Upper Level		A (s^{-1})	Acc [f]	Line Ref. [g]	TP Ref. [g]	Notes [h]
48317.6	2069.639	48317.60(4)			:	4s	$^3D_3$	4s	$^3D_1$	9.e−08	E		TW	E2
86861.8	1151.254	86861.79(7)			:	4s	$^3D_2$	4s	$^3D_1$	5.6e−02	C+		TW,G64	M1
108887	918.385	108886.80(16)			:	4s	$^3D_3$	4s	$^3D_2$	1.8e−02	C+		TW,G64	M1

[a] Observed wavelength between 2000 Å and 20000 Å is given in standard air; outside of this region, it is in vacuum. The standard uncertainty in the last decimal place is given in parentheses after the value. Conversion from air to vacuum was made using the five-parameter formula from Peck and Reeder [38];

[b] Observed wavenumber in vacuum;

[c] Ritz wavelength and its uncertainty were obtained in the least-squares level optimization procedure using the LOPT code [39]. For lines that alone determine one of the energy levels of the transition, this column is blank;

[d] Observed intensities from different experiments have been normalized to a uniform scale (see text). They are proportional to the energy flux under the line profile and have uncertainties of a factor of three on average. Intensities of parity-forbidden transitions are given on a different scale, since most of them were observed only in nebulas;

[e] Line character code: bl—blended line; p—perturbed by a close line; *—the given intensity value is shared by two or more transitions; m—masked by another strong line (no wavelength measurement available);—the value given in the observed wavelength column is a rounded Ritz wavelength (no wavelength measurement available); ?—questionable identification;

[f] Transition probability accuracy code: A+—transition probability uncertainty is likely ≤2%; B+—≤7%; B—≤7%; C+—≤18%; C—≤25%; D—≤50%; E—>50%;

[g] Key to observed wavelength and transition probability references: A73—Aller et al. [4]; A08—Andersson et al. [40]; B00—Biémont et al. [41]; B09—Brown et al. [42]; C84—Cederquist et al. [43]; C94—Crespo López-Urrutia et al. [44]; D05—Dong and Fritzsche [45]; G64—Garstang [46]; H71—Hefferlin et al. [47]; K66—Kaufman and Ward [15]; K82—Kono and Hattori [48]; M97—McKenna et al. [5]; N88—Neger and Jäger [49]; O07—Ortiz et al. [50]; P84—Prior [37]; P97—Pinnington et al. [51]; R1—Ross [2]; R2—Ross [16]; S36—Shenstone [1]; T53—Thackeray [3]; W93—Wagatsuma and Hirokawa [36]; F—this work, FTS measurements with Cu/Ge/Pt/Ar hollow cathode; F_Re—this work, measurements with Cu/Re/Ar hollow cathode; TW—this work, grating measurements. Lower-case letters after the reference have the following meaning: c—corrected in this work; n—new identification; r—revised identification; cal—calculated A-value; se—A-value was semiempirically adjusted by ratio of observed and calculated lifetime;

[h] Notes: X—excluded from level-optimization procedure; L—lasing line; M1—magnetic-dipole transition; E2—electric-quadrupole transition; HF—hyperfine-induced transition.

Table A2. Energy levels of Cu II.

	Label [a]	Configuration	Term	J	Level [b], cm^{-1}	Unc. [c], cm^{-1}	Landé g [d]	Leading Percentages [e]	Note [f]	N_{lines} [g]
d^{10}	^{1}S	$3d^{10}$	^{1}S	0	0.000	0.017		97% + 2% 4d ^{1}S		15
4s	^{3}D	$3d^9$4s	^{3}D	3	21928.7326	0.0014	1.32	98%		59
4s	^{3}D	$3d^9$4s	^{3}D	2	22847.1176	–	1.16	89% + 9% 4s ^{1}D		77
4s	^{3}D	$3d^9$4s	^{3}D	1	23998.3718	0.0009	0.48	98%		48
4s	^{1}D	$3d^9$4s	^{1}D	2	26264.5502	0.0012	1.00	89% + 9% 4s ^{3}D		64
4p	^{3}P°	$3d^9$4p	^{3}P°	2	66418.6849	0.0014	1.49	96% + 2% 4p ^{3}D°		31
4p	^{3}P°	$3d^9$4p	^{3}P°	1	67916.5572	0.0011	1.49	95% + 2% 4p ^{1}P°		42
4p	^{3}F°	$3d^9$4p	^{3}F°	3	68447.7349	0.0013	1.06	62% + 34% 4p ^{1}F°		32
4p	^{3}F°	$3d^9$4p	^{3}F°	4	68730.8876	0.0017	1.23	98%		23
4p	^{3}P°	$3d^9$4p	^{3}P°	0	68850.2628	0.0014		98%		12
s^2	^{3}F	$3d^8$4s^2	^{3}F	4	69704.7015	0.0019		95% + 4% p^2 (^{3}F)^{1}S ^{3}F		32
4p	^{3}F°	$3d^9$4p	^{3}F°	2	69867.9849	0.0011	0.67	88% + 6% 4p ^{3}D°		37
4p	^{1}F°	$3d^9$4p	^{1}F°	3	70841.4669	0.0014		49% + 31% 4p ^{3}D° + 17% 4p ^{3}F°		40
4p	^{1}D°	$3d^9$4p	^{1}D°	2	71493.8548	0.0007	1.08	54% + 35% 4p ^{3}D° + 9% 4p ^{3}F°		36
s^2	^{3}F	$3d^8$4s^2	^{3}F	3	71531.542	0.003		95% + 4% p^2 (^{3}F)^{1}S ^{3}F		57
4p	^{3}D°	$3d^9$4p	^{3}D°	3	71920.0961	0.0008		64% + 19% 4p ^{3}F° + 15% 4p ^{1}F°		36
s^2	^{3}F	$3d^8$4s^2	^{3}F	2	72723.817	0.004		94% + 4% p^2 (^{3}F)^{1}S ^{3}F		52
4p	^{3}D°	$3d^9$4p	^{3}D°	1	73102.0408	0.0007	0.47	92% + 3% 4p ^{1}P°		31
4p	^{3}D°	$3d^9$4p	^{3}D°	2	73353.2957	0.0008	0.99	54% + 41% 4p ^{1}D°		39
4p	^{1}P°	$3d^9$4p	^{1}P°	1	73595.8143	0.0018	1.04	93% + 4% 4p ^{3}D°		36
s^2	^{1}D	$3d^8$4s^2	^{1}D	2	85388.772	0.003		73% + 21% s^2 ^{3}P		49
s^2	^{3}P	$3d^8$4s^2	^{3}P	2	88362.001	0.003		74% + 21% s^2 ^{1}D		44
s^2	^{3}P	$3d^8$4s^2	^{3}P	1	88605.096	0.004		95% + 4% p^2 (^{3}P)^{1}S ^{3}P		38
s^2	^{3}P	$3d^8$4s^2	^{3}P	0	88926.002	0.003		95% + 4% p^2 (^{3}P)^{1}S ^{3}P		17
s^2	^{1}G	$3d^8$4s^2	^{1}G	4	95565.619	0.003	0.98	95% + 4% p^2 (^{1}G)^{1}S ^{1}G		18
sp	(^{3}F)^{3}P° ^{5}D°	$3d^8$(^{3}F)4s4p(^{3}P°)	^{5}D°	4	107942.795	0.010		93% + 4% sp (^{3}P)^{3}P° ^{5}D°		2
5s	$(5/2)^2$[5/2]	$3d^9$($^2D_{5/2}$)5s	^{2}[5/2]	3	108014.8372	0.0012		100%		48
5s	$(5/2)^2$[5/2]	$3d^9$($^2D_{5/2}$)5s	^{2}[5/2]	2	108335.6078	0.0012		98% + 2% 5s $(3/2)^2$[3/2]		48
sp	(^{3}F)^{3}P° ^{5}D°	$3d^8$(^{3}F)4s4p(^{3}P°)	^{5}D°	3	109276.015	0.006		91% + 4% sp (^{3}P)^{3}P° ^{5}D°		8
5s	$(3/2)^2$[3/2]	$3d^9$($^2D_{3/2}$)5s	^{2}[3/2]	1	110084.4773	0.0011		100%		34
sp	(^{3}F)^{3}P° ^{5}D°	$3d^8$(^{3}F)4s4p(^{3}P°)	^{5}D°	2	110363.725	0.008		91% + 5% sp (^{3}P)^{3}P° ^{5}D°		4
5s	$(3/2)^2$[3/2]	$3d^9$($^2D_{3/2}$)5s	^{2}[3/2]	2	110366.1542	0.0011		98% + 2% 5s $(5/2)^2$[5/2]		47
sp	(^{3}F)^{3}P° ^{5}G°	$3d^8$(^{3}F)4s4p(^{3}P°)	^{5}G°	5	110631.196	0.009		82% + 13% sp (^{3}F)^{3}P° ^{5}F°		1
sp	(^{3}F)^{3}P° ^{5}D°	$3d^8$(^{3}F)4s4p(^{3}P°)	^{5}D°	1	111124.39	0.14		93% + 5% sp (^{3}P)^{3}P° ^{5}D°		1
sp	(^{3}F)^{3}P° ^{5}G°	$3d^8$(^{3}F)4s4p(^{3}P°)	^{5}G°	4	111218.705	0.008		83% + 10% sp (^{3}F)^{3}P° ^{5}F° + 5% sp (^{3}F)^{3}P° ^{3}G°		2
sp	(^{3}F)^{3}P° ^{5}G°	$3d^8$(^{3}F)4s4p(^{3}P°)	^{5}G°	3	111876.412	0.008		89% + 7% sp (^{3}F)^{3}P° ^{5}F°		3
sp	(^{3}F)^{3}P° ^{5}F°	$3d^8$(^{3}F)4s4p(^{3}P°)	^{5}F°	5	112401.632	0.022		86% + 12% sp (^{3}F)^{3}P° ^{5}G°		1
sp	(^{3}F)^{3}P° ^{5}G°	$3d^8$(^{3}F)4s4p(^{3}P°)	^{5}G°	2	112424.679	0.023		95% + 3% sp (^{3}F)^{3}P° ^{5}F°		2
sp	(^{3}F)^{3}P° ^{5}F°	$3d^8$(^{3}F)4s4p(^{3}P°)	^{5}F°	4	113302.823	0.006		84% + 9% sp (^{3}F)^{3}P° ^{5}G°		5
sp	(^{3}F)^{3}P° ^{5}F°	$3d^8$(^{3}F)4s4p(^{3}P°)	^{5}F°	3	114000.452	0.007		86% + 7% sp (^{3}F)^{3}P° ^{5}G°		5

Table A2. *Cont.*

	Label [a]	Configuration	Term	J	Level [b], cm^{-1}	Unc. [c], cm^{-1}	Landé g [d]	Leading Percentages [e]	Note [f]	N_{lines} [g]
sp	$(^3F)^3P^\circ\ ^5F^\circ$	$3d^8(^3F)4s4p(^3P^\circ)$	$^5F^\circ$	2	114481.674	0.006		92% + 3% sp $(^3F)^3P^\circ\ ^5G^\circ$		6
4d	$(5/2)^2[1/2]$	$3d^9(^2D_{5/2})4d$	$^2[1/2]$	1	114511.2386	0.0012		91% + 7% 4d $(3/2)^2[1/2]$ + 1% 4d2		39
sp	$(^3F)^3P^\circ\ ^5F^\circ$	$3d^8(^3F)4s4p(^3P^\circ)$	$^5F^\circ$	1	114755.953	0.011		97%		3
sp	$(^3F)^3P^\circ\ ^3G^\circ$	$3d^8(^3F)4s4p(^3P^\circ)$	$^3G^\circ$	4	115359.532	0.005		71% + 20% sp $(^3F)^3P^\circ\ ^1G^\circ$ + 6% sp $(^3F)^3P^\circ\ ^5G^\circ$		7
sp	$(^3F)^3P^\circ\ ^3G^\circ$	$3d^8(^3F)4s4p(^3P^\circ)$	$^3G^\circ$	5	115546.114	0.011		93% + 6% sp $(^3F)^3P^\circ\ ^5G^\circ$		1
4d	$(5/2)^2[9/2]$	$3d^9(^2D_{5/2})4d$	$^2[9/2]$	5	115568.99497	0.0012		99%		22
4d	$(5/2)^2[3/2]$	$3d^9(^2D_{5/2})4d$	$^2[3/2]$	2	115638.8036	0.0011		93% + 4% 4d $(5/2)^2[5/2]$ + 2% 4d $(3/2)^2[3/2]$		42
4d	$(5/2)^2[9/2]$	$3d^9(^2D_{5/2})4d$	$^2[9/2]$	4	115662.5622	0.0014		97% + 1% 4d $(5/2)^2[7/2]$		32
4d	$(5/2)^2[3/2]$	$3d^9(^2D_{5/2})4d$	$^2[3/2]$	1	115665.1539	0.0011		97% + 1% 4d $(3/2)^2[1/2]$ + 1% 4d $(3/2)^2[3/2]$		30
4d	$(5/2)^2[5/2]$	$3d^9(^2D_{5/2})4d$	$^2[5/2]$	3	116080.2237	0.0010		97% + 1% 4d $(5/2)^2[7/2]$ + 1% 4d $(3/2)^2[5/2]$		35
4d	$(5/2)^2[7/2]$	$3d^9(^2D_{5/2})4d$	$^2[7/2]$	3	116325.9148	0.0011		93% + 4% 4d $(3/2)^2[7/2]$ + 1% 4d $(5/2)^2[5/2]$		37
4d	$(5/2)^2[7/2]$	$3d^9(^2D_{5/2})4d$	$^2[7/2]$	4	116371.18040	0.0011		95% + 2% 4d $(3/2)^2[7/2]$ + 1% 4d $(5/2)^2[9/2]$		35
sp	$(^3F)^3P^\circ\ ^3D^\circ$	$3d^8(^3F)4s4p(^3P^\circ)$	$^3D^\circ$	3	116375.406	0.003		44% + 35% sp $(^3F)^3P^\circ\ ^3G^\circ$ + 13% sp $(^3F)^3P^\circ\ ^3F^\circ$		17
4d	$(5/2)^2[5/2]$	$3d^9(^2D_{5/2})4d$	$^2[5/2]$	2	116387.7873	0.0010		92% + 3% 4d $(3/2)^2[3/2]$ + 3% 4d $(5/2)^2[3/2]$		43
4d	$(5/2)^2[1/2]$	$3d^9(^2D_{5/2})4d$	$^2[1/2]$	0	116576.5758	0.0018		53% + 45% 4d $(3/2)^2[1/2]$		16
sp	$(^3F)^3P^\circ\ ^3G^\circ$	$3d^8(^3F)4s4p(^3P^\circ)$	$^3G^\circ$	3	116643.960	0.003		57% + 36% sp $(^3F)^3P^\circ\ ^3D^\circ$		17
sp	$(^3F)^3P^\circ\ ^3D^\circ$	$3d^8(^3F)4s4p(^3P^\circ)$	$^3D^\circ$	2	117130.340	0.003		75% + 10% sp $(^3F)^3P^\circ\ ^3F^\circ$		27
4d	$(3/2)^2[1/2]$	$3d^9(^2D_{3/2})4d$	$^2[1/2]$	1	117231.4014	0.0019		91% + 7% 4d $(5/2)^2[1/2]$		28
sp	$(^3F)^3P^\circ\ ^3F^\circ$	$3d^8(^3F)4s4p(^3P^\circ)$	$^3F^\circ$	4	117666.626	0.005		88% + 3% sp $(^3F)^3P^\circ\ ^5F^\circ$		15
4d	$(3/2)^2[7/2]$	$3d^9(^2D_{3/2})4d$	$^2[7/2]$	3	117747.3504	0.0015		95% + 4% 4d $(5/2)^2[7/2]$		37
4d	$(3/2)^2[7/2]$	$3d^9(^2D_{3/2})4d$	$^2[7/2]$	4	117883.0985	0.0013		96% + 2% 4d $(5/2)^2[7/2]$		35
4d	$(3/2)^2[3/2]$	$3d^9(^2D_{3/2})4d$	$^2[3/2]$	1	117928.2197	0.0018		98%		31
sp	$(^3F)^3P^\circ\ ^3D^\circ$	$3d^8(^3F)4s4p(^3P^\circ)$	$^3D^\circ$	1	118071.302	0.003		87% + 6% sp $(^1D)^3P^\circ\ ^3D^\circ$		22
sp	$(^3F)^3P^\circ\ ^3F^\circ$	$3d^8(^3F)4s4p(^3P^\circ)$	$^3F^\circ$	3	118142.950	0.003		63% + 14% sp $(^3F)^3P^\circ\ ^1F^\circ$ + 10% sp $(^3F)^3P^\circ\ ^3D^\circ$		32
4d	$(3/2)^2[3/2]$	$3d^9(^2D_{3/2})4d$	$^2[3/2]$	2	118163.2663	0.0015		82% + 12% 4d $(3/2)^2[5/2]$ + 2% 4d $(5/2)^2[5/2]$		42
4d	$(3/2)^2[5/2]$	$3d^9(^2D_{3/2})4d$	$^2[5/2]$	3	118483.8135	0.0015		98% + 1% 4d $(5/2)^2[5/2]$		37
4d	$(3/2)^2[5/2]$	$3d^9(^2D_{3/2})4d$	$^2[5/2]$	2	118531.9058	0.0016		86% + 12% 4d $(3/2)^2[3/2]$ + 1% 4d $(5/2)^2[3/2]$		35
sp	$(^3F)^3P^\circ\ ^1G^\circ$	$3d^8(^3F)4s4p(^3P^\circ)$	$^1G^\circ$	4	118991.330	0.007		75% + 20% sp $(^3F)^3P^\circ\ ^3G^\circ$		9
sp	$(^3F)^3P^\circ\ ^3F^\circ$	$3d^8(^3F)4s4p(^3P^\circ)$	$^3F^\circ$	2	119039.6355	0.0019		82% + 8% sp $(^3F)^3P^\circ\ ^3D^\circ$		34
5p	$(5/2)^2[3/2]^\circ$	$3d^9(^2D_{5/2})5p$	$^2[3/2]^\circ$	2	120092.3828	0.0012		96% + 2% sp + 1% 5p $(3/2)^2[3/2]^\circ$		40
5p	$(5/2)^2[7/2]^\circ$	$3d^9(^2D_{5/2})5p$	$^2[7/2]^\circ$	3	120684.7128	0.0013		86% + 13% sp		33
5p	$(5/2)^2[7/2]^\circ$	$3d^9(^2D_{5/2})5p$	$^2[7/2]^\circ$	4	120789.80865	0.0013		95% + 4% sp		20
5p	$(5/2)^2[5/2]^\circ$	$3d^9(^2D_{5/2})5p$	$^2[5/2]^\circ$	2	120876.0141	0.0015		51% + 41% sp + 3% 5p $(3/2)^2[3/2]^\circ$		41
5p	$(5/2)^2[3/2]^\circ$	$3d^9(^2D_{5/2})5p$	$^2[3/2]^\circ$	1	120919.5715	0.0012		83% + 15% 5p $(3/2)^2[1/2]^\circ$ + 1% sp		43
5p	$(5/2)^2[5/2]^\circ$	$3d^9(^2D_{5/2})5p$	$^2[5/2]^\circ$	3	121079.1501	0.0012		54% + 35% sp + 3% 5p $(3/2)^2[5/2]^\circ$		45
sp	$(^3F)^3P^\circ\ ^1F^\circ$	$3d^8(^3F)4s4p(^3P^\circ)$	$^1F^\circ$	3	121524.8509	0.0014		39% + 43% 5p $^3D^\circ$ + 6% sp $(^3F)^3P^\circ\ ^3F^\circ$	cd	37
sp	$(^3F)^3P^\circ\ ^1D^\circ$	$3d^8(^3F)4s4p(^3P^\circ)$	$^1D^\circ$	2	121981.8546	0.0015		36% + 32% 5p $^3D^\circ$ + 22% 5p $^3F^\circ$		44
5p	$(3/2)^2[1/2]^\circ$	$3d^9(^2D_{3/2})5p$	$^2[1/2]^\circ$	0	122224.0199	0.0020		99%		13
4d	$(3/2)^2[1/2]$	$3d^9(^2D_{3/2})4d$	$^2[1/2]$	0	122415.957	0.003		45% + 34% 4d $(5/2)^2[1/2]$ + 10% 5d $(5/2)^2[1/2]$		12
5p	$(3/2)^2[5/2]^\circ$	$3d^9(^2D_{3/2})5p$	$^2[5/2]^\circ$	2	122745.9491	0.0013		85% + 4% 5p $(3/2)^2[3/2]^\circ$ + 4% 5p $(5/2)^2[5/2]^\circ$		39

Table A2. *Cont.*

	Label [a]	Configuration	Term	J	Level [b], cm^{-1}	Unc. [c], cm^{-1}	Landé g [d]	Leading Percentages [e]	Note [f]	N_{lines} [g]
5p	$(3/2)^2[1/2]^\circ$	$3d^9(^2D_{3/2})5p$	$^2[1/2]^\circ$	1	122867.7407	0.0015		75% + 14% 5p $(5/2)^2[3/2]^\circ$ + 9% 5p $(3/2)^2[3/2]^\circ$		39
5p	$(3/2)^2[5/2]^\circ$	$3d^9(^2D_{3/2})5p$	$^2[5/2]^\circ$	3	123016.8175	0.0014		91% + 7% sp + 1% 5p $(5/2)^2[7/2]^\circ$		27
5p	$(3/2)^2[3/2]^\circ$	$3d^9(^2D_{3/2})5p$	$^2[3/2]^\circ$	1	123304.823	0.003		86% + 9% 5p $(3/2)^2[1/2]^\circ$ + 4% sp		27
5p	$(3/2)^2[3/2]^\circ$	$3d^9(^2D_{3/2})5p$	$^2[3/2]^\circ$	2	123556.8261	0.0016		76% + 13% sp + 3% 5p $(5/2)^2[5/2]^\circ$		43
sp	$(^3P)^3P^\circ$ $^5P^\circ$	$3d^8(^3P)4s4p(^3P^\circ)$	$^5P^\circ$	3	125230.061	0.017		88% + 8% sp $(^1D)^3P^\circ$ $^3D^\circ$		6
sp	$(^3P)^3P^\circ$ $^5P^\circ$	$3d^8(^3P)4s4p(^3P^\circ)$	$^5P^\circ$	2	125248.121	0.008		88% + 3% sp $(^1D)^3P^\circ$ $^3P^\circ$		11
sp	$(^3P)^3P^\circ$ $^5P^\circ$	$3d^8(^3P)4s4p(^3P^\circ)$	$^5P^\circ$	1	125569.33	0.04		94% + 2% sp $(^1D)^3P^\circ$ $^3P^\circ$		5
sp	$(^1D)^3P^\circ$ $^3F^\circ$	$3d^8(^1D)4s4p(^3P^\circ)$	$^3F^\circ$	2	128365.736	0.006		69% + 15% sp $(^1D)^3P^\circ$ $^3D^\circ$		10
sp	$(^1D)^3P^\circ$ $^3F^\circ$	$3d^8(^1D)4s4p(^3P^\circ)$	$^3F^\circ$	3	128559.314	0.008		68% + 11% sp $(^3P)^3P^\circ$ $^5D^\circ$ + 9% sp $(^1D)^3P^\circ$ $^3D^\circ$		6
sp	$(^1D)^3P^\circ$ $^3D^\circ$	$3d^8(^1D)4s4p(^3P^\circ)$	$^3D^\circ$	1	128569.150	0.008		66% + 9% sp $(^1D)^3P^\circ$ $^3P^\circ$ + 9% sp $(^3P)^3P^\circ$ $^3P^\circ$		7
sp	$(^1D)^3P^\circ$ $^3F^\circ$	$3d^8(^1D)4s4p(^3P^\circ)$	$^3F^\circ$	4	128778.037	0.017		64% + 28% sp $(^3P)^3P^\circ$ $^5D^\circ$		2
sp	$(^1D)^3P^\circ$ $^3D^\circ$	$3d^8(^1D)4s4p(^3P^\circ)$	$^3D^\circ$	2	128854.036	0.008		59% + 19% sp $(^1D)^3P^\circ$ $^3F^\circ$		8
s^2	^1S	$3d^84s^2$	^1S	0	128910.03	0.06		94% + 5% p^2 $(^1S)^1S$ ^1S	N	1
sp	$(^1D)^3P^\circ$ $^3P^\circ$	$3d^8(^1D)4s4p(^3P^\circ)$	$^3P^\circ$	0	129105.778	0.009		63% + 32% sp $(^3P)^3P^\circ$ $^3P^\circ$		3
sp	$(^1D)^3P^\circ$ $^3D^\circ$	$3d^8(^1D)4s4p(^3P^\circ)$	$^3D^\circ$	3	129116.774	0.011		69% + 10% sp $(^1D)^3P^\circ$ $^3F^\circ$ + 7% sp $(^3P)^3P^\circ$ $^5P^\circ$		6
sp	$(^1D)^3P^\circ$ $^3P^\circ$	$3d^8(^1D)4s4p(^3P^\circ)$	$^3P^\circ$	1	129759.750	0.006		56% + 19% sp $(^1D)^3P^\circ$ $^3D^\circ$ + 18% sp $(^3P)^3P^\circ$ $^3P^\circ$		9
sp	$(^1D)^3P^\circ$ $^3P^\circ$	$3d^8(^1D)4s4p(^3P^\circ)$	$^3P^\circ$	2	130386.404	0.016		74% + 12% sp $(^3P)^3P^\circ$ $^3P^\circ$ + 8% sp $(^1D)^3P^\circ$ $^3D^\circ$		8
sp	$(^3P)^3P^\circ$ $^5D^\circ$	$3d^8(^3P)4s4p(^3P^\circ)$	$^5D^\circ$	1	130940.488	0.008		91% + 5% sp $(^3F)^3P^\circ$ $^5D^\circ$		8
sp	$(^3P)^3P^\circ$ $^5D^\circ$	$3d^8(^3P)4s4p(^3P^\circ)$	$^5D^\circ$	2	130943.661	0.009		88% + 5% sp $(^3F)^3P^\circ$ $^5D^\circ$		9
sp	$(^3P)^3P^\circ$ $^5D^\circ$	$3d^8(^3P)4s4p(^3P^\circ)$	$^5D^\circ$	0	130953.558	0.016		91% + 6% sp $(^3F)^3P^\circ$ $^5D^\circ$	N	2
sp	$(^3P)^3P^\circ$ $^5D^\circ$	$3d^8(^3P)4s4p(^3P^\circ)$	$^5D^\circ$	3	131044.310	0.008		81% + 11% sp $(^1D)^3P^\circ$ $^3F^\circ$		10
sp	$(^3P)^3P^\circ$ $^5D^\circ$	$3d^8(^3P)4s4p(^3P^\circ)$	$^5D^\circ$	4	131312.426	0.013		66% + 25% sp $(^1D)^3P^\circ$ $^3F^\circ$ + 5% sp $(^1G)^3P^\circ$ $^3F^\circ$		5
6s	$(5/2)^2[5/2]$	$3d^9(^2D_{5/2})6s$	$^2[5/2]$	3	133594.2323	0.0013		100%		27
6s	$(5/2)^2[5/2]$	$3d^9(^2D_{5/2})6s$	$^2[5/2]$	2	133728.0387	0.0013		100%		29
sp	$(^3P)^3P^\circ$ $^3P^\circ$	$3d^8(^3P)4s4p(^3P^\circ)$	$^3P^\circ$	2	133825.927	0.004		55% + 22% sp $(^3P)^3P^\circ$ $^3D^\circ$ + 9% sp $(^1D)^3P^\circ$ $^3P^\circ$		13
sp	$(^3P)^3P^\circ$ $^3D^\circ$	$3d^8(^3P)4s4p(^3P^\circ)$	$^3D^\circ$	3	133984.325	0.004		47% + 31% sp $(^3F)^1P^\circ$ $^3D^\circ$ + 6% sp $(^1D)^3P^\circ$ $^3D^\circ$		14
sp	$(^3F)^1P^\circ$ $^3G^\circ$	$3d^8(^3F)4s4p(^1P^\circ)$	$^3G^\circ$	5	134110.870	0.004		93% + 2% 4f $^3G^\circ$		9
sp	$(^3P)^3P^\circ$ $^3D^\circ$	$3d^8(^3P)4s4p(^3P^\circ)$	$^3D^\circ$	1	134359.847	0.003		52% + 24% sp $(^3P)^3P^\circ$ $^3P^\circ$ + 10% sp $(^1D)^3P^\circ$ $^3P^\circ$		16
sp	$(^3P)^3P^\circ$ $^3D^\circ$	$3d^8(^3P)4s4p(^3P^\circ)$	$^3D^\circ$	2	134675.522	0.003		50% + 22% sp $(^3P)^3P^\circ$ $^3P^\circ$ + 7% sp $(^3F)^1P^\circ$ $^3D^\circ$		18
sp	$(^3F)^1P^\circ$ $^3F^\circ$	$3d^8(^3F)4s4p(^1P^\circ)$	$^3F^\circ$	4	134742.863	0.003		50% + 31% sp $(^3F)^1P^\circ$ $^3G^\circ$ + 7% sp $(^1G)^3P^\circ$ $^3F^\circ$	cd	13
sp	$(^3P)^3P^\circ$ $^3P^\circ$	$3d^8(^3P)4s4p(^3P^\circ)$	$^3P^\circ$	1	135135.168	0.003		38% + 32% sp $(^3P)^3P^\circ$ $^3D^\circ$ + 14% sp $(^1D)^3P^\circ$ $^3P^\circ$		10
sp	$(^3P)^3P^\circ$ $^3P^\circ$	$3d^8(^3P)4s4p(^3P^\circ)$	$^3P^\circ$	0	135484.075	0.004		60% + 31% sp $(^1D)^3P^\circ$ $^3P^\circ$ + 5% 4f $^3P^\circ$		6
6s	$(3/2)^2[3/2]$	$3d^9(^2D_{3/2})6s$	$^2[3/2]$	1	135664.5204	0.0015		100%		21
sp	$(^3F)^1P^\circ$ $^3D^\circ$	$3d^8(^3F)4s4p(^1P^\circ)$	$^3D^\circ$	3	135733.433	0.003		26% sp $(^3P)^3P^\circ$ $^3D^\circ$ + 14% sp $(^3F)^1P^\circ$ $^3F^\circ$ + 13% sp $(^3F)^1P^\circ$ $^3D^\circ$		20
6s	$(3/2)^2[3/2]$	$3d^9(^2D_{3/2})6s$	$^2[3/2]$	2	135760.1548	0.0016		99%		27
sp	$(^3F)^1P^\circ$ $^3G^\circ$	$3d^8(^3F)4s4p(^1P^\circ)$	$^3G^\circ$	4	135834.6720	0.0019		49% + 22% sp $(^3F)^1P^\circ$ $^3F^\circ$ + 9% 4f $^3G^\circ$		17
4f	$(5/2)^2[1/2]^\circ$	$3d^9(^2D_{5/2})4f$	$^2[1/2]^\circ$	1	135863.6857	0.0016		97% + 2% sp + 1% 4f $(5/2)^2[3/2]^\circ$		19
4f	$(5/2)^2[1/2]^\circ$	$3d^9(^2D_{5/2})4f$	$^2[1/2]^\circ$	0	135902.1365	0.0023		94% + 4% sp		8
4f	$(5/2)^2[3/2]^\circ$	$3d^9(^2D_{5/2})4f$	$^2[3/2]^\circ$	2	135910.7245	0.0011		94% + 4% 4f $(5/2)^2[5/2]^\circ$ + 2% sp		23

Table A2. *Cont.*

	Label [a]	Configuration	Term	J	Level [b], cm^{-1}	Unc. [c], cm^{-1}	Landé g [d]	Leading Percentages [e]	Note [f]	N_{lines} [g]
4f	$(5/2)^2[11/2]^\circ$	$3d^9(^2D_{5/2})4f$	$^2[11/2]^\circ$	6	135931.01412	0.0012		99% + 1% sp		5
4f	$(5/2)^2[11/2]^\circ$	$3d^9(^2D_{5/2})4f$	$^2[11/2]^\circ$	5	135933.89499	0.0019		98% + 1% sp		11
sp	$(^3P)^3P^\circ\ ^5S^\circ$	$3d^8(^3P)4s4p(^3P^\circ)$	$^5S^\circ$	2	135952.279	0.005		83% + 4% 4f $^1D^\circ$		12
4f	$(5/2)^2[3/2]^\circ$	$3d^9(^2D_{5/2})4f$	$^2[3/2]^\circ$	1	135958.1919	0.0016		97% + 2% sp + 1% 4f $(5/2)^2[1/2]^\circ$		20
4f	$(5/2)^2[7/2]^\circ$	$3d^9(^2D_{5/2})4f$	$^2[7/2]^\circ$	3	135989.9176	0.0012		41% + 37% sp + 11% 4f $(5/2)^2[5/2]^\circ$		33
4f	$(5/2)^2[5/2]^\circ$	$3d^9(^2D_{5/2})4f$	$^2[5/2]^\circ$	2	136013.9671	0.0011		84% + 9% sp + 5% 4f $(5/2)^2[3/2]^\circ$		17
4f	$(5/2)^2[5/2]^\circ$	$3d^9(^2D_{5/2})4f$	$^2[5/2]^\circ$	3	136035.3328	0.0010		86% + 11% 4f $(5/2)^2[7/2]^\circ$ + 3% sp		28
4f	$(5/2)^2[7/2]^\circ$	$3d^9(^2D_{5/2})4f$	$^2[7/2]^\circ$	4	136132.77781	0.0010		88% + 8% 4f $(5/2)^2[9/2]^\circ$ + 3% sp		26
4f	$(5/2)^2[9/2]^\circ$	$3d^9(^2D_{5/2})4f$	$^2[9/2]^\circ$	5	136160.61825	0.0011		98% + 2% sp		14
4f	$(5/2)^2[9/2]^\circ$	$3d^9(^2D_{5/2})4f$	$^2[9/2]^\circ$	4	136269.9996	0.0014		75% + 14% sp + 9% 4f $(5/2)^2[7/2]^\circ$		20
5d	$(5/2)^2[1/2]$	$3d^9(^2D_{5/2})5d$	$^2[1/2]$	1	136336.8971	0.0020		98% + 1% 5d $(3/2)^2[1/2]$		17
sp	$(^3F)^1P^\circ\ ^3F^\circ$	$3d^8(^3F)4s4p(^1P^\circ)$	$^3F^\circ$	3	136441.817	0.003		25% + 25% sp $(^3F)^1P^\circ\ ^3G^\circ$ + 11% sp $(^1G)^3P^\circ\ ^3F^\circ$		21
sp	$(^1G)^3P^\circ\ ^3H^\circ$	$3d^8(^1G)4s4p(^3P^\circ)$	$^3H^\circ$	4	136693.948	0.003		97%		10
5d	$(5/2)^2[9/2]$	$3d^9(^2D_{5/2})5d$	$^2[9/2]$	5	136725.85349	0.0013		100%		14
5d	$(5/2)^2[3/2]$	$3d^9(^2D_{5/2})5d$	$^2[3/2]$	2	136754.1104	0.0018		97% + 2% 5d $(5/2)^2[5/2]$		25
5d	$(5/2)^2[9/2]$	$3d^9(^2D_{5/2})5d$	$^2[9/2]$	4	136765.3514	0.0018		99%		20
5d	$(5/2)^2[3/2]$	$3d^9(^2D_{5/2})5d$	$^2[3/2]$	1	136773.1713	0.0021		99%		19
sp	$(^3F)^1P^\circ\ ^3D^\circ$	$3d^8(^3F)4s4p(^1P^\circ)$	$^3D^\circ$	2	136800.137	0.003		41% + 18% sp $(^3P)^3P^\circ\ ^1D^\circ$ + 14% 6p		14
5d	$(5/2)^2[5/2]$	$3d^9(^2D_{5/2})5d$	$^2[5/2]$	3	136919.3511	0.0014		99% + 1% 5d $(5/2)^2[7/2]$		36
5d	$(5/2)^2[7/2]$	$3d^9(^2D_{5/2})5d$	$^2[7/2]$	3	137034.778	0.003		99% + 1% 5d $(5/2)^2[5/2]$ + 1% 5d $(3/2)^2[7/2]$		23
5d	$(5/2)^2[7/2]$	$3d^9(^2D_{5/2})5d$	$^2[7/2]$	4	137044.4647	0.0017		99%		22
5d	$(5/2)^2[5/2]$	$3d^9(^2D_{5/2})5d$	$^2[5/2]$	2	137073.6465	0.0019		97% + 2% 5d $(5/2)^2[3/2]$		24
sp	$(^3F)^1P^\circ\ ^3G^\circ$	$3d^8(^3F)4s4p(^1P^\circ)$	$^3G^\circ$	3	137078.190	0.005		52% + 19% sp $(^3F)^1P^\circ\ ^3F^\circ$ + 14% sp $(^1G)^3P^\circ\ ^3F^\circ$		7
sp	$(^1G)^3P^\circ\ ^3H^\circ$	$3d^8(^1G)4s4p(^3P^\circ)$	$^3H^\circ$	5	137082.175	0.005		96% + 2% 4f 1H°		6
sp	$(^1G)^3P^\circ\ ^3F^\circ$	$3d^8(^1G)4s4p(^3P^\circ)$	$^3F^\circ$	2	137212.779	0.004		36% + 36% sp $(^3F)^1P^\circ\ ^3F^\circ$ + 14% sp $(^3P)^3P^\circ\ ^1D^\circ$	RJ	12
sp	$(^3P)^3P^\circ\ ^1P^\circ$	$3d^8(^3P)4s4p(^3P^\circ)$	$^1P^\circ$	1	137242.914	0.008		82% + 5% sp $(^3P)^3P^\circ\ ^3P^\circ$	N	6
5d	$(5/2)^2[1/2]$	$3d^9(^2D_{5/2})5d$	$^2[1/2]$	0	137614.140	0.004		60% + 37% 5d $(3/2)^2[1/2]$ + 1% 6d $(5/2)^2[1/2]$		7
sp	$(^3P)^3P^\circ\ ^1D^\circ$	$3d^8(^3P)4s4p(^3P^\circ)$	$^1D^\circ$	2	137648.800	0.004		50% + 9% sp $(^3P)^3P^\circ\ ^3D^\circ$ + 9% sp $(^3F)^1P^\circ\ ^3D^\circ$		15
sp	$(^3F)^1P^\circ\ ^3D^\circ$	$3d^8(^3F)4s4p(^1P^\circ)$	$^3D^\circ$	1	137913.450	0.004		28% + 16% 4f $^3D^\circ$ + 16% 4f		13
sp	$(^1G)^3P^\circ\ ^3F^\circ$	$3d^8(^1G)4s4p(^3P^\circ)$	$^3F^\circ$	4	137938.904	0.007		49% + 39% 6p $^3F^\circ$ + 5% sp $(^3F)^1P^\circ\ ^3F^\circ$	cd	6
4f	$(3/2)^2[3/2]^\circ$	$3d^9(^2D_{3/2})4f$	$^2[3/2]^\circ$	2	138002.8856	0.0023		94% + 3% sp + 2% 4f $(3/2)^2[5/2]^\circ$		10
4f	$(3/2)^2[3/2]^\circ$	$3d^9(^2D_{3/2})4f$	$^2[3/2]^\circ$	1	138028.384	0.003		59% + 26% sp + 10% 6p		14
4f	$(3/2)^2[9/2]^\circ$	$3d^9(^2D_{3/2})4f$	$^2[9/2]^\circ$	5	138064.2971	0.0021		99% + 1% sp		10
4f	$(3/2)^2[9/2]^\circ$	$3d^9(^2D_{3/2})4f$	$^2[9/2]^\circ$	4	138073.5826	0.0022		98% + 1% sp		10
4f	$(3/2)^2[5/2]^\circ$	$3d^9(^2D_{3/2})4f$	$^2[5/2]^\circ$	3	138130.5345	0.0015		97% + 1% 4f $(3/2)^2[7/2]^\circ$		17
4f	$(3/2)^2[5/2]^\circ$	$3d^9(^2D_{3/2})4f$	$^2[5/2]^\circ$	2	138176.8797	0.0018		89% + 7% sp + 1% 4f $(3/2)^2[3/2]^\circ$		17
4f	$(3/2)^2[7/2]^\circ$	$3d^9(^2D_{3/2})4f$	$^2[7/2]^\circ$	4	138219.8605	0.0015		98%		12
4f	$(3/2)^2[7/2]^\circ$	$3d^9(^2D_{3/2})4f$	$^2[7/2]^\circ$	3	138261.5822	0.0017		93% + 1% sp + 1% 4f $(3/2)^2[5/2]^\circ$		19
6p	$(5/2)^2[7/2]^\circ$	$3d^9(^2D_{5/2})6p$	$^2[7/2]^\circ$	3	138401.956	0.003		62% + 29% sp + 2% 6p $(5/2)^2[5/2]^\circ$		21
sp	$(^3P)^3P^\circ\ ^3S^\circ$	$3d^8(^3P)4s4p(^3P^\circ)$	$^3S^\circ$	1	138516.49	0.03		97%	N	5

Table A2. *Cont.*

	Label [a]	Configuration	Term	J	Level [b], cm^{-1}	Unc. [c], cm^{-1}	Landé g [d]	Leading Percentages [e]	Note [f]	N_{lines} [g]
5d	$(3/2)^2[1/2]$	$3d^9(^2D_{3/2})5d$	$^2[1/2]$	1	138593.046	0.003		98% + 1% 5d $(5/2)^2[1/2]$		17
6p	$(5/2)^2[3/2]^\circ$	$3d^9(^2D_{5/2})6p$	$^2[3/2]^\circ$	2	138745.817	0.005		91% + 4% sp + 3% 6p $(5/2)^2[5/2]^\circ$		14
5d	$(3/2)^2[7/2]$	$3d^9(^2D_{3/2})5d$	$^2[7/2]$	3	138819.0637	0.0019		99% + 1% 5d $(5/2)^2[7/2]$		15
5d	$(3/2)^2[7/2]$	$3d^9(^2D_{3/2})5d$	$^2[7/2]$	4	138882.8921	0.0019		99%		15
5d	$(3/2)^2[3/2]$	$3d^9(^2D_{3/2})5d$	$^2[3/2]$	1	138898.334	0.003		99%		18
5d	$(3/2)^2[3/2]$	$3d^9(^2D_{3/2})5d$	$^2[3/2]$	2	138981.246	0.003		97% + 2% 5d $(3/2)^2[5/2]$ + 1% 5d $(5/2)^2[3/2]$		19
6p	$(5/2)^2[5/2]^\circ$	$3d^9(^2D_{5/2})6p$	$^2[5/2]^\circ$	2	139028.705	0.005		41% + 40% sp + 11% 6p $(3/2)^2[5/2]^\circ$		11
5d	$(3/2)^2[5/2]$	$3d^9(^2D_{3/2})5d$	$^2[5/2]$	3	139119.4295	0.0020		100%		18
5d	$(3/2)^2[5/2]$	$3d^9(^2D_{3/2})5d$	$^2[5/2]$	2	139142.049	0.003		97% + 2% 5d $(3/2)^2[3/2]$		24
6p	$(5/2)^2[3/2]^\circ$	$3d^9(^2D_{5/2})6p$	$^2[3/2]^\circ$	1	139241.130	0.005		73% + 7% 6p $(3/2)^2[3/2]^\circ$ + 4% 6p $(3/2)^2[1/2]^\circ$		13
sp	$(^1G)^3P^\circ\ ^3F^\circ$	$3d^8(^1G)4s4p(^3P^\circ)$	$^3F^\circ$	3	139331.149	0.003		21% + 46% 6p $^1F^\circ$ + 15% 6p $^3D^\circ$	cd	21
6p	$(5/2)^2[7/2]^\circ$	$3d^9(^2D_{5/2})6p$	$^2[7/2]^\circ$	4	139395.786	0.004		59% + 37% sp		11
sp	$(^3F)^1P^\circ\ ^3F^\circ$	$3d^8(^3F)4s4p(^1P^\circ)$	$^3F^\circ$	2	139710.491	0.004		19% + 42% 6p $^1D^\circ$ + 15% sp $(^1G)^3P^\circ\ ^3F^\circ$		15
6p	$(5/2)^2[5/2]^\circ$	$3d^9(^2D_{5/2})6p$	$^2[5/2]^\circ$	3	139741.097	0.003		59% + 31% sp + 4% 6p $(5/2)^2[7/2]^\circ$		18
5d	$(3/2)^2[1/2]$	$3d^9(^2D_{3/2})5d$	$^2[1/2]$	0	140589.344	0.006		47% + 20% 6d $(5/2)^2[1/2]$ + 17% 5d $(5/2)^2[1/2]$		4
6p	$(3/2)^2[1/2]^\circ$	$3d^9(^2D_{3/2})6p$	$^2[1/2]^\circ$	1	140981.510	0.005		94% + 3% 6p $(5/2)^2[3/2]^\circ$ + 2% sp		8
6p	$(3/2)^2[5/2]^\circ$	$3d^9(^2D_{3/2})6p$	$^2[5/2]^\circ$	3	141202.628	0.006		89% + 8% sp		12
6p	$(3/2)^2[5/2]^\circ$	$3d^9(^2D_{3/2})6p$	$^2[5/2]^\circ$	2	141244.556	0.006		62% + 22% sp + 13% 6p $(3/2)^2[3/2]^\circ$	ci	9
6p	$(3/2)^2[3/2]^\circ$	$3d^9(^2D_{3/2})6p$	$^2[3/2]^\circ$	2	141542.001	0.005		73% + 13% 6p $(3/2)^2[5/2]^\circ$ + 10% sp		13
6p	$(3/2)^2[3/2]^\circ$	$3d^9(^2D_{3/2})6p$	$^2[3/2]^\circ$	1	141734.175	0.005		79% + 16% sp + 1% 5p	ci	10
sp	$(^1G)^3P^\circ\ ^3G^\circ$	$3d^8(^1G)4s4p(^3P^\circ)$	$^3G^\circ$	3	143423.319	0.020		99%	N	4
7s	$(5/2)^2[5/2]$	$3d^9(^2D_{5/2})7s$	$^2[5/2]$	3	144814.9118	0.0014		100%		26
7s	$(5/2)^2[5/2]$	$3d^9(^2D_{5/2})7s$	$^2[5/2]$	2	144882.9859	0.0016		100%		26
5f	$(5/2)^2[1/2]^\circ$	$3d^9(^2D_{5/2})5f$	$^2[1/2]^\circ$	0	145889.334	0.004		100%		6
5f	$(5/2)^2[1/2]^\circ$	$3d^9(^2D_{5/2})5f$	$^2[1/2]^\circ$	1	145900.904	0.003		84% + 16% 5f $(5/2)^2[3/2]^\circ$		10
5f	$(5/2)^2[3/2]^\circ$	$3d^9(^2D_{5/2})5f$	$^2[3/2]^\circ$	2	145927.231	0.003		100%		13
5f	$(5/2)^2[11/2]^\circ$	$3d^9(^2D_{5/2})5f$	$^2[11/2]^\circ$	5	145945.5969	0.0019		100%		5
5f	$(5/2)^2[11/2]^\circ$	$3d^9(^2D_{5/2})5f$	$^2[11/2]^\circ$	6	145951.5299	0.0014		100%		2
5f	$(5/2)^2[3/2]^\circ$	$3d^9(^2D_{5/2})5f$	$^2[3/2]^\circ$	1	145955.447	0.004		84% + 16% 5f $(5/2)^2[1/2]^\circ$		10
5f	$(5/2)^2[5/2]^\circ$	$3d^9(^2D_{5/2})5f$	$^2[5/2]^\circ$	3	145978.142	0.003		98% + 2% 5f $(5/2)^2[7/2]^\circ$		12
5f	$(5/2)^2[5/2]^\circ$	$3d^9(^2D_{5/2})5f$	$^2[5/2]^\circ$	2	145985.199	0.003		100%		12
5f	$(5/2)^2[7/2]^\circ$	$3d^9(^2D_{5/2})5f$	$^2[7/2]^\circ$	3	146021.279	0.003		98% + 2% 5f $(5/2)^2[5/2]^\circ$		13
5f	$(5/2)^2[7/2]^\circ$	$3d^9(^2D_{5/2})5f$	$^2[7/2]^\circ$	4	146023.862	0.003		86% + 14% 5f $(5/2)^2[9/2]^\circ$		13
5f	$(5/2)^2[9/2]^\circ$	$3d^9(^2D_{5/2})5f$	$^2[9/2]^\circ$	4	146029.350	0.003		86% + 14% 5f $(5/2)^2[7/2]^\circ$		13
5f	$(5/2)^2[9/2]^\circ$	$3d^9(^2D_{5/2})5f$	$^2[9/2]^\circ$	5	146032.2635	0.0021		100%		7
5g	$(5/2)^2[3/2]$	$3d^9(^2D_{5/2})5g$	$^2[3/2]$	1	146051.118	0.004		100%		5
5g	$(5/2)^2[3/2]$	$3d^9(^2D_{5/2})5g$	$^2[3/2]$	2	146051.2431	0.003		100%		4
5g	$(5/2)^2[13/2]$	$3d^9(^2D_{5/2})5g$	$^2[13/2]$	6	146068.85092	0.0019		100%		1
5g	$(5/2)^2[13/2]$	$3d^9(^2D_{5/2})5g$	$^2[13/2]$	7	146068.90547	0.0012		100%		1
5g	$(5/2)^2[5/2]$	$3d^9(^2D_{5/2})5g$	$^2[5/2]$	3	146072.7739	0.0020		100%		5
5g	$(5/2)^2[5/2]$	$3d^9(^2D_{5/2})5g$	$^2[5/2]$	2	146072.8134	0.0018		100%		6

Table A2. *Cont.*

	Label [a]	Configuration	Term	J	Level [b], cm^{-1}	Unc. [c], cm^{-1}	Landé g [d]	Leading Percentages [e]	Note [f]	N_{lines} [g]
5g	$(5/2)^2[7/2]$	$3d^9(^2D_{5/2})5g$	$^2[7/2]$	3	146093.9312	0.0014		100%		5
5g	$(5/2)^2[7/2]$	$3d^9(^2D_{5/2})5g$	$^2[7/2]$	4	146093.9535	0.0012		100%		2
5g	$(5/2)^2[11/2]$	$3d^9(^2D_{5/2})5g$	$^2[11/2]$	5	146103.2223	0.0018		100%		7
5g	$(5/2)^2[11/2]$	$3d^9(^2D_{5/2})5g$	$^2[11/2]$	6	146103.25704	0.0011		100%		3
5g	$(5/2)^2[9/2]$	$3d^9(^2D_{5/2})5g$	$^2[9/2]$	4	146107.1016	0.0016		100%		7
5g	$(5/2)^2[9/2]$	$3d^9(^2D_{5/2})5g$	$^2[9/2]$	5	146107.1288	0.0010		100%		6
6d	$(5/2)^2[1/2]$	$3d^9(^2D_{5/2})6d$	$^2[1/2]$	1	146215.634	0.004		98% + 1% 6d $(5/2)^2[3/2]$		7
6d	$(5/2)^2[9/2]$	$3d^9(^2D_{5/2})6d$	$^2[9/2]$	5	146402.715	0.004		100%		8
6d	$(5/2)^2[3/2]$	$3d^9(^2D_{5/2})6d$	$^2[3/2]$	2	146415.599	0.004		97% + 2% 6d $(5/2)^2[5/2]$		12
6d	$(5/2)^2[9/2]$	$3d^9(^2D_{5/2})6d$	$^2[9/2]$	4	146423.201	0.003		100%		10
6d	$(5/2)^2[3/2]$	$3d^9(^2D_{5/2})6d$	$^2[3/2]$	1	146427.948	0.003		99% + 1% 6d $(5/2)^2[1/2]$		12
6d	$(5/2)^2[5/2]$	$3d^9(^2D_{5/2})6d$	$^2[5/2]$	3	146496.100	0.003		99% + 1% 6d $(5/2)^2[7/2]$		16
6d	$(5/2)^2[7/2]$	$3d^9(^2D_{5/2})6d$	$^2[7/2]$	3	146556.381	0.003		99% + 1% 6d $(5/2)^2[5/2]$		19
6d	$(5/2)^2[7/2]$	$3d^9(^2D_{5/2})6d$	$^2[7/2]$	4	146559.703	0.003		100%		14
6d	$(5/2)^2[5/2]$	$3d^9(^2D_{5/2})6d$	$^2[5/2]$	2	146575.101	0.003		97% + 2% 6d $(5/2)^2[3/2]$ + 1% 7s $(3/2)^2[3/2]$		23
7s	$(3/2)^2[3/2]$	$3d^9(^2D_{3/2})7s$	$^2[3/2]$	1	146886.1667	0.0021		100%		20
7s	$(3/2)^2[3/2]$	$3d^9(^2D_{3/2})7s$	$^2[3/2]$	2	146936.3180	0.0018		99%		24
6d	$(5/2)^2[1/2]$	$3d^9(^2D_{5/2})6d$	$^2[1/2]$	0	147097.835	0.005		60% + 29% 6d $(3/2)^2[1/2]$ + 4% 7d $(5/2)^2[1/2]$		6
7p	$(5/2)^2[3/2]^\circ$	$3d^9(^2D_{5/2})7p$	$^2[3/2]^\circ$	2	147327.659	0.007		94% + 4% sp + 1% 7p $(5/2)^2[5/2]^\circ$		10
7p	$(5/2)^2[7/2]^\circ$	$3d^9(^2D_{5/2})7p$	$^2[7/2]^\circ$	3	147525.93	0.06		98% + 1% sp	R	3
7p	$(5/2)^2[3/2]^\circ$	$3d^9(^2D_{5/2})7p$	$^2[3/2]^\circ$	1	147562.672	0.006		94% + 3% sp + 1% 5f $(3/2)^2[3/2]^\circ$		8
7p	$(5/2)^2[7/2]^\circ$	$3d^9(^2D_{5/2})7p$	$^2[7/2]^\circ$	4	147596.655	0.006		100%		4
7p	$(5/2)^2[5/2]^\circ$	$3d^9(^2D_{5/2})7p$	$^2[5/2]^\circ$	2	147647.699	0.009		94% + 3% sp + 2% 7p $(5/2)^2[3/2]^\circ$		7
7p	$(5/2)^2[5/2]^\circ$	$3d^9(^2D_{5/2})7p$	$^2[5/2]^\circ$	3	147762.990	0.005		98%		9
5f	$(3/2)^2[3/2]^\circ$	$3d^9(^2D_{3/2})5f$	$^2[3/2]^\circ$	2	147987.359	0.004		99%		8
5f	$(3/2)^2[3/2]^\circ$	$3d^9(^2D_{3/2})5f$	$^2[3/2]^\circ$	1	148016.157	0.004		99% + 1% 7p $(5/2)^2[3/2]^\circ$		11
5f	$(3/2)^2[9/2]^\circ$	$3d^9(^2D_{3/2})5f$	$^2[9/2]^\circ$	5	148028.7360	0.0023		100%		5
5f	$(3/2)^2[9/2]^\circ$	$3d^9(^2D_{3/2})5f$	$^2[9/2]^\circ$	4	148033.574	0.003		100%		6
5f	$(3/2)^2[5/2]^\circ$	$3d^9(^2D_{3/2})5f$	$^2[5/2]^\circ$	3	148061.467	0.003		97% + 2% 5f $(3/2)^2[7/2]^\circ$		9
5f	$(3/2)^2[5/2]^\circ$	$3d^9(^2D_{3/2})5f$	$^2[5/2]^\circ$	2	148066.011	0.003		99%		11
5f	$(3/2)^2[7/2]^\circ$	$3d^9(^2D_{3/2})5f$	$^2[7/2]^\circ$	3	148102.986	0.003		97% + 3% 5f $(3/2)^2[5/2]^\circ$		9
5f	$(3/2)^2[7/2]^\circ$	$3d^9(^2D_{3/2})5f$	$^2[7/2]^\circ$	4	148105.366	0.003		100%		5
5g	$(3/2)^2[5/2]$	$3d^9(^2D_{3/2})5g$	$^2[5/2]$	3	148133.777	0.003		100%		3
5g	$(3/2)^2[5/2]$	$3d^9(^2D_{3/2})5g$	$^2[5/2]$	2	148133.832	0.005		100%		3
5g	$(3/2)^2[11/2]$	$3d^9(^2D_{3/2})5g$	$^2[11/2]$	5	148145.7906	0.0022		100%		3
5g	$(3/2)^2[11/2]$	$3d^9(^2D_{3/2})5g$	$^2[11/2]$	6	148145.8203	0.0021		100%		3
5g	$(3/2)^2[7/2]$	$3d^9(^2D_{3/2})5g$	$^2[7/2]$	3	148167.557	0.003		100%		5
5g	$(3/2)^2[7/2]$	$3d^9(^2D_{3/2})5g$	$^2[7/2]$	4	148167.5920	0.0017		100%		4
5g	$(3/2)^2[9/2]$	$3d^9(^2D_{3/2})5g$	$^2[9/2]$	4	148179.1541	0.0019		100%		4
5g	$(3/2)^2[9/2]$	$3d^9(^2D_{3/2})5g$	$^2[9/2]$	5	148179.1829	0.0016		100%		4

Table A2. *Cont.*

	Label [a]	Configuration	Term	J	Level [b], cm^{-1}	Unc. [c], cm^{-1}	Landé g [d]	Leading Percentages [e]	Note [f]	N_{lines} [g]
6d	$(3/2)^2[1/2]$	$3d^9(^2D_{3/2})6d$	$^2[1/2]$	1	148361.542	0.004		99%		10
6d	$(3/2)^2[7/2]$	$3d^9(^2D_{3/2})6d$	$^2[7/2]$	3	148481.763	0.003		100%		11
6d	$(3/2)^2[7/2]$	$3d^9(^2D_{3/2})6d$	$^2[7/2]$	4	148515.532	0.004		100%		9
6d	$(3/2)^2[3/2]$	$3d^9(^2D_{3/2})6d$	$^2[3/2]$	1	148521.575	0.003		100%		12
6d	$(3/2)^2[3/2]$	$3d^9(^2D_{3/2})6d$	$^2[3/2]$	2	148559.958	0.003		99% + 1% 6d $(3/2)^2[5/2]$		15
6d	$(3/2)^2[5/2]$	$3d^9(^2D_{3/2})6d$	$^2[5/2]$	3	148631.096	0.003		100%		13
6d	$(3/2)^2[5/2]$	$3d^9(^2D_{3/2})6d$	$^2[5/2]$	2	148642.489	0.003		99% + 1% 6d $(3/2)^2[3/2]$		13
6d	$(3/2)^2[1/2]$	$3d^9(^2D_{3/2})6d$	$^2[1/2]$	0	149202.607	0.007		51% + 28% 7d $(5/2)^2[1/2]$ + 6% 6d $(5/2)^2[1/2]$		3
7p	$(3/2)^2[1/2]^\circ$	$3d^9(^2D_{3/2})7p$	$^2[1/2]^\circ$	0	149371.08	0.08		94% + 5% sp	N	2
7p	$(3/2)^2[1/2]^\circ$	$3d^9(^2D_{3/2})7p$	$^2[1/2]^\circ$	1	149484.111	0.008		95% + 4% sp + 1% 7p $(5/2)^2[3/2]^\circ$	N	5
7p	$(3/2)^2[5/2]^\circ$	$3d^9(^2D_{3/2})7p$	$^2[5/2]^\circ$	2	149525.97	0.05		64% + 26% 7p $(3/2)^2[3/2]^\circ$ + 8% sp	N	4
7p	$(3/2)^2[5/2]^\circ$	$3d^9(^2D_{3/2})7p$	$^2[5/2]^\circ$	3	149624.47	0.05		92% + 6% sp	N	2
7p	$(3/2)^2[3/2]^\circ$	$3d^9(^2D_{3/2})7p$	$^2[3/2]^\circ$	2	149726.69	0.05		63% + 33% 7p $(3/2)^2[5/2]^\circ$ + 3% sp	N	3
7p	$(3/2)^2[3/2]^\circ$	$3d^9(^2D_{3/2})7p$	$^2[3/2]^\circ$	1	149765.88	0.05		95% + 4% sp	N	4
sp	$(^1D)^1P^\circ\ ^1D^\circ$	$3d^8(^1D)4s4p(^1P^\circ)$	$^1D^\circ$	2	150249.887	0.008		38% + 28% sp $(^3P)^1P^\circ\ ^3P^\circ$ + 11% 7p $^1D^\circ$		8
8s	$(5/2)^2[5/2]$	$3d^9(^2D_{5/2})8s$	$^2[5/2]$	3	150742.896	0.003		100%		13
8s	$(5/2)^2[5/2]$	$3d^9(^2D_{5/2})8s$	$^2[5/2]$	2	150782.454	0.003		100%		13
6f	$(5/2)^2[1/2]^\circ$	$3d^9(^2D_{5/2})6f$	$^2[1/2]^\circ$	1	151161.379	0.007		63% + 21% sp + 5% 8p $(5/2)^2[3/2]^\circ$	N	6
6f	$(5/2)^2[1/2]^\circ$	$3d^9(^2D_{5/2})6f$	$^2[1/2]^\circ$	0	151327.262	0.008		98% + 1% sp		2
6f	$(5/2)^2[11/2]^\circ$	$3d^9(^2D_{5/2})6f$	$^2[11/2]^\circ$	5	151372.330	0.004		100%		4
6f	$(5/2)^2[3/2]^\circ$	$3d^9(^2D_{5/2})6f$	$^2[3/2]^\circ$	1	151373.840	0.006		96% + 3% 6f $(5/2)^2[1/2]^\circ$		5
6f	$(5/2)^2[3/2]^\circ$	$3d^9(^2D_{5/2})6f$	$^2[3/2]^\circ$	2	151375.318	0.004		52% + 46% 6f $(5/2)^2[5/2]^\circ$		7
6f	$(5/2)^2[11/2]^\circ$	$3d^9(^2D_{5/2})6f$	$^2[11/2]^\circ$	6	151377.688	0.005		100%		2
6f	$(5/2)^2[5/2]^\circ$	$3d^9(^2D_{5/2})6f$	$^2[5/2]^\circ$	3	151402.621	0.004		71% + 28% 6f $(5/2)^2[7/2]^\circ$		7
6f	$(5/2)^2[5/2]^\circ$	$3d^9(^2D_{5/2})6f$	$^2[5/2]^\circ$	2	151403.942	0.004		53% + 44% 6f $(5/2)^2[3/2]^\circ$		8
6f	$(5/2)^2[7/2]^\circ$	$3d^9(^2D_{5/2})6f$	$^2[7/2]^\circ$	4	151419.022	0.004		90% + 10% 6f $(5/2)^2[9/2]^\circ$		8
6f	$(5/2)^2[9/2]^\circ$	$3d^9(^2D_{5/2})6f$	$^2[9/2]^\circ$	4	151421.791	0.004		90% + 10% 6f $(5/2)^2[7/2]^\circ$		9
6f	$(5/2)^2[9/2]^\circ$	$3d^9(^2D_{5/2})6f$	$^2[9/2]^\circ$	5	151423.056	0.004		100%		4
8p	$(5/2)^2[3/2]^\circ$	$3d^9(^2D_{5/2})8p$	$^2[3/2]^\circ$	1	151424.241	0.004		33% 6f $(5/2)^2[1/2]^\circ$ + 36% sp + 20% 8p $(5/2)^2[3/2]^\circ$		8
6g	$(5/2)^2[3/2]$	$3d^9(^2D_{5/2})6g$	$^2[3/2]$	1	151440.091	0.008		100%		2
6g	$(5/2)^2[3/2]$	$3d^9(^2D_{5/2})6g$	$^2[3/2]$	2	151440.178	0.006		100%		2
6f	$(5/2)^2[7/2]^\circ$	$3d^9(^2D_{5/2})6f$	$^2[7/2]^\circ$	3	151441.899	0.006		70% + 27% 6f $(5/2)^2[5/2]^\circ$ + 2% sp		7
6g	$(5/2)^2[13/2]$	$3d^9(^2D_{5/2})6g$	$^2[13/2]$	6	151450.414	0.007		100%		2
6g	$(5/2)^2[13/2]$	$3d^9(^2D_{5/2})6g$	$^2[13/2]$	7	151450.488	0.003		100%		1
6g	$(5/2)^2[5/2]$	$3d^9(^2D_{5/2})6g$	$^2[5/2]$	3	151452.690	0.007		100%		4
6g	$(5/2)^2[5/2]$	$3d^9(^2D_{5/2})6g$	$^2[5/2]$	2	151452.701	0.006		100%		4
6h	$(5/2)^2[5/2]^\circ$	$3d^9(^2D_{5/2})6h$	$^2[5/2]^\circ$	2	[151458.3]	6		100%	pf	0
6h	$(5/2)^2[5/2]^\circ$	$3d^9(^2D_{5/2})6h$	$^2[5/2]^\circ$	3	[151458.4]	6		100%	pf	0
6h	$(5/2)^2[15/2]^\circ$	$3d^9(^2D_{5/2})6h$	$^2[15/2]^\circ$	7	[151461.7]	6		100%	pf	0
6h	$(5/2)^2[15/2]^\circ$	$3d^9(^2D_{5/2})6h$	$^2[15/2]^\circ$	8	[151461.8]	6		100%	pf	0
6h	$(5/2)^2[7/2]^\circ$	$3d^9(^2D_{5/2})6h$	$^2[7/2]^\circ$	3	[151463.9]	6		100%	pf	0

Table A2. *Cont.*

	Label [a]	Configuration	Term	J	Level [b], cm^{-1}	Unc. [c], cm^{-1}	Landé g [d]	Leading Percentages [e]	Note [f]	N_{lines} [g]
6h	$(5/2)^2[7/2]^\circ$	$3d^9(^2D_{5/2})6h$	$^2[7/2]^\circ$	4	[151464.0]	6		100%	pf	0
6g	$(5/2)^2[7/2]$	$3d^9(^2D_{5/2})6g$	$^2[7/2]$	3	151464.789	0.006		100%		4
6g	$(5/2)^2[7/2]$	$3d^9(^2D_{5/2})6g$	$^2[7/2]$	4	151464.796	0.005		100%		2
6h	$(5/2)^2[9/2]^\circ$	$3d^9(^2D_{5/2})6h$	$^2[9/2]^\circ$	4	[151468.8]	6		100%	pf	0
6h	$(5/2)^2[9/2]^\circ$	$3d^9(^2D_{5/2})6h$	$^2[9/2]^\circ$	5	[151468.9]	6		100%	pf	0
6h	$(5/2)^2[13/2]^\circ$	$3d^9(^2D_{5/2})6h$	$^2[13/2]^\circ$	6	[151469.8]	6		100%	pf	0
6h	$(5/2)^2[13/2]^\circ$	$3d^9(^2D_{5/2})6h$	$^2[13/2]^\circ$	7	[151470.0]	6		100%	pf	0
6g	$(5/2)^2[11/2]$	$3d^9(^2D_{5/2})6g$	$^2[11/2]$	5	151470.113	0.003		100%		5
6g	$(5/2)^2[11/2]$	$3d^9(^2D_{5/2})6g$	$^2[11/2]$	6	151470.130	0.005		100%		3
6h	$(5/2)^2[11/2]^\circ$	$3d^9(^2D_{5/2})6h$	$^2[11/2]^\circ$	5	[151471.4]	6		100%	pf	0
6h	$(5/2)^2[11/2]^\circ$	$3d^9(^2D_{5/2})6h$	$^2[11/2]^\circ$	6	[151471.5]	6		100%	pf	0
6g	$(5/2)^2[9/2]$	$3d^9(^2D_{5/2})6g$	$^2[9/2]$	4	151472.264	0.005		100%		5
6g	$(5/2)^2[9/2]$	$3d^9(^2D_{5/2})6g$	$^2[9/2]$	5	151472.278	0.005		100%		3
7d	$(5/2)^2[1/2]$	$3d^9(^2D_{5/2})7d$	$^2[1/2]$	1	151552.191	0.007		98% + 1% 7d $(5/2)^2[3/2]$		2
7d	$(5/2)^2[9/2]$	$3d^9(^2D_{5/2})7d$	$^2[9/2]$	5	151656.317	0.005		100%		5
7d	$(5/2)^2[3/2]$	$3d^9(^2D_{5/2})7d$	$^2[3/2]$	2	151662.985	0.005		96% + 4% 7d $(5/2)^2[5/2]$		6
7d	$(5/2)^2[9/2]$	$3d^9(^2D_{5/2})7d$	$^2[9/2]$	4	151668.328	0.005		99%		7
7d	$(5/2)^2[3/2]$	$3d^9(^2D_{5/2})7d$	$^2[3/2]$	1	151671.666	0.006		99% + 1% 7d $(5/2)^2[1/2]$		4
7d	$(5/2)^2[5/2]$	$3d^9(^2D_{5/2})7d$	$^2[5/2]$	3	151708.347	0.004		99% + 1% 7d $(5/2)^2[7/2]$		8
7d	$(5/2)^2[7/2]$	$3d^9(^2D_{5/2})7d$	$^2[7/2]$	3	151743.558	0.003		99% + 1% 7d $(5/2)^2[5/2]$		13
7d	$(5/2)^2[7/2]$	$3d^9(^2D_{5/2})7d$	$^2[7/2]$	4	151744.916	0.005		99%		8
7d	$(5/2)^2[5/2]$	$3d^9(^2D_{5/2})7d$	$^2[5/2]$	2	151757.601	0.004		96% + 4% 7d $(5/2)^2[3/2]$		8
8p	$(5/2)^2[3/2]^\circ$	$3d^9(^2D_{5/2})8p$	$^2[3/2]^\circ$	2	152054.78	0.03		53% + 21% 8p $(5/2)^2[5/2]^\circ$ + 20% sp	N	5
7d	$(5/2)^2[1/2]$	$3d^9(^2D_{5/2})7d$	$^2[1/2]$	0	152179.051	0.007		52% + 28% 7d $(3/2)^2[1/2]$ + 9% 8d $(5/2)^2[1/2]$		2
8p	$(5/2)^2[5/2]^\circ$	$3d^9(^2D_{5/2})8p$	$^2[5/2]^\circ$	2	152580.19	0.05		65% + 27% 8p $(5/2)^2[3/2]^\circ$ + 7% sp	N	2
sp	$(^3P)^1P^\circ\ ^3P^\circ$	$3d^8(^3P)4s4p(^1P^\circ)$	$^3P^\circ$	0	152783.41	0.05		77% + 9% 8p $^3P^\circ$ + 5% 7p $^3P^\circ$	N	2
8s	$(3/2)^2[3/2]$	$3d^9(^2D_{3/2})8s$	$^2[3/2]$	1	152814.032	0.007		100%		4
8s	$(3/2)^2[3/2]$	$3d^9(^2D_{3/2})8s$	$^2[3/2]$	2	152840.475	0.005		100%		6
sp	$(^3P)^1P^\circ\ ^3P^\circ$	$3d^8(^3P)4s4p(^1P^\circ)$	$^3P^\circ$	2	152944.11	0.05		39% + 19% sp $(^1D)^1P^\circ\ ^1D^\circ$ + 16% 8p $^3D^\circ$	N	4
sp	$(^1D)^1P^\circ\ ^1P^\circ$	$3d^8(^1D)4s4p(^1P^\circ)$	$^1P^\circ$	1	153165.24	0.04		22% + 18% 6f $^3D^\circ$ + 17% 6f $^1P^\circ$	N	5
6f	$(3/2)^2[5/2]^\circ$	$3d^9(^2D_{3/2})6f$	$^2[5/2]^\circ$	3	153410.212	0.006		89% + 8% sp + 1% 6f $(3/2)^2[7/2]^\circ$		5
6f	$(3/2)^2[3/2]^\circ$	$3d^9(^2D_{3/2})6f$	$^2[3/2]^\circ$	2	153426.632	0.006		52% + 42% 6f $(3/2)^2[5/2]^\circ$ + 5% sp		7
6f	$(3/2)^2[9/2]^\circ$	$3d^9(^2D_{3/2})6f$	$^2[9/2]^\circ$	5	153449.633	0.005		100%		2
6f	$(3/2)^2[9/2]^\circ$	$3d^9(^2D_{3/2})6f$	$^2[9/2]^\circ$	4	153455.178	0.005		100%		4
6f	$(3/2)^2[3/2]^\circ$	$3d^9(^2D_{3/2})6f$	$^2[3/2]^\circ$	1	153457.747	0.009		55% + 23% sp + 15% 8p $(3/2)^2[1/2]^\circ$		6
6f	$(3/2)^2[5/2]^\circ$	$3d^9(^2D_{3/2})6f$	$^2[5/2]^\circ$	2	153487.668	0.005		56% + 37% 6f $(3/2)^2[3/2]^\circ$ + 5% sp		8
6f	$(3/2)^2[7/2]^\circ$	$3d^9(^2D_{3/2})6f$	$^2[7/2]^\circ$	4	153495.854	0.006		100%		3
6f	$(3/2)^2[7/2]^\circ$	$3d^9(^2D_{3/2})6f$	$^2[7/2]^\circ$	3	153498.834	0.006		98% + 2% 6f $(3/2)^2[5/2]^\circ$		3
6g	$(3/2)^2[5/2]$	$3d^9(^2D_{3/2})6g$	$^2[5/2]$	3	153517.905	0.007		100%		2
6g	$(3/2)^2[5/2]$	$3d^9(^2D_{3/2})6g$	$^2[5/2]$	2	153517.985	0.008		100%		1
6g	$(3/2)^2[11/2]$	$3d^9(^2D_{3/2})6g$	$^2[11/2]$	5	153524.933	0.005		100%		2

Table A2. *Cont.*

	Label [a]	Configuration	Term	J	Level [b], cm^{-1}	Unc. [c], cm^{-1}	Landé g [d]	Leading Percentages [e]	Note [f]	N_{lines} [g]
6g	$(3/2)^2[11/2]$	$3d^9(^2D_{3/2})6g$	$^2[11/2]$	6	153524.950	0.007		100%		1
6g	$(3/2)^2[7/2]$	$3d^9(^2D_{3/2})6g$	$^2[7/2]$	3	153537.395	0.007		100%		2
6g	$(3/2)^2[7/2]$	$3d^9(^2D_{3/2})6g$	$^2[7/2]$	4	153537.414	0.006		100%		3
6h	$(3/2)^2[7/2]^\circ$	$3d^9(^2D_{3/2})6h$	$^2[7/2]^\circ$	3	[153543.7]	6		100%	pf	0
6h	$(3/2)^2[7/2]^\circ$	$3d^9(^2D_{3/2})6h$	$^2[7/2]^\circ$	4	[153543.8]	6		100%	pf	0
6g	$(3/2)^2[9/2]$	$3d^9(^2D_{3/2})6g$	$^2[9/2]$	4	153544.054	0.005		100%		3
6g	$(3/2)^2[9/2]$	$3d^9(^2D_{3/2})6g$	$^2[9/2]$	5	153544.069	0.007		100%		2
6h	$(3/2)^2[13/2]^\circ$	$3d^9(^2D_{3/2})6h$	$^2[13/2]^\circ$	6	[153546.0]	6		100%	pf	0
6h	$(3/2)^2[13/2]^\circ$	$3d^9(^2D_{3/2})6h$	$^2[13/2]^\circ$	7	[153546.2]	6		100%	pf	0
6h	$(3/2)^2[9/2]^\circ$	$3d^9(^2D_{3/2})6h$	$^2[9/2]^\circ$	4	[153552.0]	6		100%	pf	0
6h	$(3/2)^2[9/2]^\circ$	$3d^9(^2D_{3/2})6h$	$^2[9/2]^\circ$	5	[153552.1]	6		100%	pf	0
6h	$(3/2)^2[11/2]^\circ$	$3d^9(^2D_{3/2})6h$	$^2[11/2]^\circ$	5	[153554.3]	6		100%	pf	0
6h	$(3/2)^2[11/2]^\circ$	$3d^9(^2D_{3/2})6h$	$^2[11/2]^\circ$	6	[153554.4]	6		100%	pf	0
7d	$(3/2)^2[1/2]$	$3d^9(^2D_{3/2})7d$	$^2[1/2]$	1	153658.567	0.006		99%		5
7d	$(3/2)^2[7/2]$	$3d^9(^2D_{3/2})7d$	$^2[7/2]$	3	153730.935	0.005		100%		5
7d	$(3/2)^2[7/2]$	$3d^9(^2D_{3/2})7d$	$^2[7/2]$	4	153750.851	0.005		100%		3
7d	$(3/2)^2[3/2]$	$3d^9(^2D_{3/2})7d$	$^2[3/2]$	1	153753.738	0.007		100%		2
7d	$(3/2)^2[3/2]$	$3d^9(^2D_{3/2})7d$	$^2[3/2]$	2	153773.884	0.006		97% + 3% 7d $(3/2)^2[5/2]$		5
7d	$(3/2)^2[5/2]$	$3d^9(^2D_{3/2})7d$	$^2[5/2]$	3	153815.644	0.006		100%		5
7d	$(3/2)^2[5/2]$	$3d^9(^2D_{3/2})7d$	$^2[5/2]$	2	153821.937	0.006		97% + 3% 7d $(3/2)^2[3/2]$		4
sp	$(^3P)^1P^\circ\ ^3D^\circ$	$3d^8(^3P)4s4p(^1P^\circ)$	$^3D^\circ$	3	153850.18	0.04		62% + 9% sp $(^1D)^1P^\circ\ ^1F^\circ$ + 8% 8p $^3F^\circ$	N	2
7d	$(3/2)^2[1/2]$	$3d^9(^2D_{3/2})7d$	$^2[1/2]$	0	153853.763	0.011		49% + 44% 8d $(5/2)^2[1/2]$ + 2% 8d $(3/2)^2[1/2]$		2
8p	$(3/2)^2[3/2]^\circ$	$3d^9(^2D_{3/2})8p$	$^2[3/2]^\circ$	1	154225.21	0.04		38% + 44% sp + 6% 7f $(5/2)^2[3/2]^\circ$	N	2
9s	$(5/2)^2[5/2]$	$3d^9(^2D_{5/2})9s$	$^2[5/2]$	3	154255.815	0.005		100%		4
9s	$(5/2)^2[5/2]$	$3d^9(^2D_{5/2})9s$	$^2[5/2]$	2	154281.251	0.008		100%		4
7f	$(5/2)^2[11/2]^\circ$	$3d^9(^2D_{5/2})7f$	$^2[11/2]^\circ$	5	154641.392	0.006		99%		2
7f	$(5/2)^2[11/2]^\circ$	$3d^9(^2D_{5/2})7f$	$^2[11/2]^\circ$	6	154647.056	0.005		100%		2
7f	$(5/2)^2[3/2]^\circ$	$3d^9(^2D_{5/2})7f$	$^2[3/2]^\circ$	1	154653.77?	0.07		51% + 25% 8p $(3/2)^2[3/2]^\circ$ + 12% 8p $(3/2)^2[1/2]^\circ$	N	2
7f	$(5/2)^2[5/2]^\circ$	$3d^9(^2D_{5/2})7f$	$^2[5/2]^\circ$	3	154672.123	0.006		62% + 37% 7f $(5/2)^2[7/2]^\circ$		4
7f	$(5/2)^2[7/2]^\circ$	$3d^9(^2D_{5/2})7f$	$^2[7/2]^\circ$	4	154672.766	0.006		91% + 9% 7f $(5/2)^2[9/2]^\circ$		5
7f	$(5/2)^2[9/2]^\circ$	$3d^9(^2D_{5/2})7f$	$^2[9/2]^\circ$	4	154674.551	0.006		91% + 9% 7f $(5/2)^2[7/2]^\circ$		4
7f	$(5/2)^2[9/2]^\circ$	$3d^9(^2D_{5/2})7f$	$^2[9/2]^\circ$	5	154675.247	0.005		100%		4
7f	$(5/2)^2[7/2]^\circ$	$3d^9(^2D_{5/2})7f$	$^2[7/2]^\circ$	3	154678.877	0.008		62% + 36% 7f $(5/2)^2[5/2]^\circ$ + 1% sp		3
7g	$(5/2)^2[3/2]$	$3d^9(^2D_{5/2})7g$	$^2[3/2]$	1	154688.020	0.011		100%		2
7g	$(5/2)^2[3/2]$	$3d^9(^2D_{5/2})7g$	$^2[3/2]$	2	154688.112	0.009		100%		3
7g	$(5/2)^2[13/2]$	$3d^9(^2D_{5/2})7g$	$^2[13/2]$	6	154694.589	0.008		100%		1
7g	$(5/2)^2[13/2]$	$3d^9(^2D_{5/2})7g$	$^2[13/2]$	7	154694.619	0.008		100%		1
7g	$(5/2)^2[5/2]$	$3d^9(^2D_{5/2})7g$	$^2[5/2]$	3	154695.997	0.008		100%		4
7g	$(5/2)^2[5/2]$	$3d^9(^2D_{5/2})7g$	$^2[5/2]$	2	154696.009	0.007		100%	N	5
7f	$(5/2)^2[5/2]^\circ$	$3d^9(^2D_{5/2})7f$	$^2[5/2]^\circ$	2	154698.288	0.020		39% + 28% 8p $(3/2)^2[3/2]^\circ$ + 15% 7f $(5/2)^2[3/2]^\circ$	N	3
7h	$(5/2)^2[5/2]^\circ$	$3d^9(^2D_{5/2})7h$	$^2[5/2]^\circ$	2	[154702.4]	2.0		100%	pf	0

Table A2. *Cont.*

	Label [a]	Configuration	Term	J	Level [b], cm^{-1}	Unc. [c], cm^{-1}	Landé g [d]	Leading Percentages [e]	Note [f]	N_{lines} [g]
7h	$(5/2)^2[5/2]^\circ$	$3d^9(^2D_{5/2})7h$	$^2[5/2]^\circ$	3	[154702.5]	2.0		100%	pf	0
7g	$(5/2)^2[7/2]$	$3d^9(^2D_{5/2})7g$	$^2[7/2]$	3	154703.597	0.008		100%		2
7g	$(5/2)^2[7/2]$	$3d^9(^2D_{5/2})7g$	$^2[7/2]$	4	154703.625	0.008		100%		2
7h	$(5/2)^2[15/2]^\circ$	$3d^9(^2D_{5/2})7h$	$^2[15/2]^\circ$	7	[154704.6]	2.0		100%	pf	0
7h	$(5/2)^2[15/2]^\circ$	$3d^9(^2D_{5/2})7h$	$^2[15/2]^\circ$	8	[154704.6]	2.0		100%	pf	0
7h	$(5/2)^2[7/2]^\circ$	$3d^9(^2D_{5/2})7h$	$^2[7/2]^\circ$	3	[154706.0]	2.0		100%	pf	0
7h	$(5/2)^2[7/2]^\circ$	$3d^9(^2D_{5/2})7h$	$^2[7/2]^\circ$	4	[154706.1]	2.0		100%	pf	0
7g	$(5/2)^2[11/2]$	$3d^9(^2D_{5/2})7g$	$^2[11/2]$	5	154706.911	0.007		100%		3
7g	$(5/2)^2[9/2]$	$3d^9(^2D_{5/2})7g$	$^2[9/2]$	4	154708.235	0.007		100%		5
7g	$(5/2)^2[9/2]$	$3d^9(^2D_{5/2})7g$	$^2[9/2]$	5	154708.244	0.007		100%	N	2
7h	$(5/2)^2[9/2]^\circ$	$3d^9(^2D_{5/2})7h$	$^2[9/2]^\circ$	4	[154709.1]	2.0		100%	pf	0
7h	$(5/2)^2[9/2]^\circ$	$3d^9(^2D_{5/2})7h$	$^2[9/2]^\circ$	5	[154709.1]	2.0		100%	pf	0
7h	$(5/2)^2[13/2]^\circ$	$3d^9(^2D_{5/2})7h$	$^2[13/2]^\circ$	6	[154709.7]	2.0		100%	pf	0
7h	$(5/2)^2[13/2]^\circ$	$3d^9(^2D_{5/2})7h$	$^2[13/2]^\circ$	7	[154709.8]	2.0		100%	pf	0
7h	$(5/2)^2[11/2]^\circ$	$3d^9(^2D_{5/2})7h$	$^2[11/2]^\circ$	5	[154710.7]	2.0		100%	pf	0
7h	$(5/2)^2[11/2]^\circ$	$3d^9(^2D_{5/2})7h$	$^2[11/2]^\circ$	6	[154710.8]	2.0		100%	pf	0
8p	$(3/2)^2[1/2]^\circ$	$3d^9(^2D_{3/2})8p$	$^2[1/2]^\circ$	1	154719.09	0.03		29% + 32% 8p $(3/2)^2[3/2]^\circ$ + 19% sp	N	3
8d	$(5/2)^2[1/2]$	$3d^9(^2D_{5/2})8d$	$^2[1/2]$	1	154766.034	0.022		98% + 1% 8d $(5/2)^2[3/2]$		1
8d	$(5/2)^2[9/2]$	$3d^9(^2D_{5/2})8d$	$^2[9/2]$	5	154828.718	0.008		100%		2
8d	$(5/2)^2[3/2]$	$3d^9(^2D_{5/2})8d$	$^2[3/2]$	2	154832.657	0.011		95% + 5% 8d $(5/2)^2[5/2]$		1
8d	$(5/2)^2[9/2]$	$3d^9(^2D_{5/2})8d$	$^2[9/2]$	4	154836.434	0.006		100%		4
8d	$(5/2)^2[3/2]$	$3d^9(^2D_{5/2})8d$	$^2[3/2]$	1	154838.973?	0.013		98% + 1% 8d $(5/2)^2[1/2]$		2
8d	$(5/2)^2[5/2]$	$3d^9(^2D_{5/2})8d$	$^2[5/2]$	3	154860.741	0.006		98% + 1% 8d $(5/2)^2[7/2]$		5
8d	$(5/2)^2[7/2]$	$3d^9(^2D_{5/2})8d$	$^2[7/2]$	3	154883.104	0.009		98% + 1% 8d $(5/2)^2[5/2]$		2
8d	$(5/2)^2[7/2]$	$3d^9(^2D_{5/2})8d$	$^2[7/2]$	4	154883.625	0.007		100%		6
8d	$(5/2)^2[5/2]$	$3d^9(^2D_{5/2})8d$	$^2[5/2]$	2	154892.916	0.020		95% + 5% 8d $(5/2)^2[3/2]$		2
8d	$(5/2)^2[1/2]$	$3d^9(^2D_{5/2})8d$	$^2[1/2]$	0	155244.842?	0.021		32% + 29% 9d $(5/2)^2[1/2]$ + 20% 8d $(3/2)^2[1/2]$		1
9s	$(3/2)^2[3/2]$	$3d^9(^2D_{3/2})9s$	$^2[3/2]$	1	156326.913	0.018		100%		4
9s	$(3/2)^2[3/2]$	$3d^9(^2D_{3/2})9s$	$^2[3/2]$	2	156341.878	0.009		99% + 1% 10s $(5/2)^2[5/2]$		5
10s	$(5/2)^2[5/2]$	$3d^9(^2D_{5/2})10s$	$^2[5/2]$	3	156508.501	0.022		100%		1
10s	$(5/2)^2[5/2]$	$3d^9(^2D_{5/2})10s$	$^2[5/2]$	2	156526.436	0.015		99% + 1% 9s $(3/2)^2[3/2]$		2
7f	$(3/2)^2[9/2]^\circ$	$3d^9(^2D_{3/2})7f$	$^2[9/2]^\circ$	5	156711.894	0.007		91% + 6% 8f $(5/2)^2[11/2]^\circ$ + 3% 8f $(5/2)^2[9/2]^\circ$		2
7f	$(3/2)^2[9/2]^\circ$	$3d^9(^2D_{3/2})7f$	$^2[9/2]^\circ$	4	156721.308	0.007		97% + 3% 8f $(5/2)^2[9/2]^\circ$		2
7f	$(3/2)^2[7/2]^\circ$	$3d^9(^2D_{3/2})7f$	$^2[7/2]^\circ$	4	[156754.9]	7		99% + 1% 8f $(5/2)^2[7/2]^\circ$	sf	0
8f	$(5/2)^2[11/2]^\circ$	$3d^9(^2D_{5/2})8f$	$^2[11/2]^\circ$	5	156761.443	0.008		94% + 6% 7f $(3/2)^2[9/2]^\circ$		3
7g	$(3/2)^2[5/2]$	$3d^9(^2D_{3/2})7g$	$^2[5/2]$	3	156763.044	0.014		99% + 1% 8g $(5/2)^2[5/2]$		1
7g	$(3/2)^2[5/2]$	$3d^9(^2D_{3/2})7g$	$^2[5/2]$	2	156763.090	0.011		99% + 1% 8g $(5/2)^2[5/2]$		1
8f	$(5/2)^2[11/2]^\circ$	$3d^9(^2D_{5/2})8f$	$^2[11/2]^\circ$	6	156767.066	0.016		100%		2
7g	$(3/2)^2[11/2]$	$3d^9(^2D_{3/2})7g$	$^2[11/2]$	6	156767.609	0.011		99% + 1% 8g $(5/2)^2[11/2]$	N	1
7g	$(3/2)^2[11/2]$	$3d^9(^2D_{3/2})7g$	$^2[11/2]$	5	156767.630	0.011		99% + 1% 8g $(5/2)^2[11/2]$		2
7g	$(3/2)^2[7/2]$	$3d^9(^2D_{3/2})7g$	$^2[7/2]$	3	156775.405	0.014		99% + 1% 8g $(5/2)^2[7/2]$		2

Table A2. *Cont.*

	Label [a]	Configuration	Term	J	Level [b], cm^{-1}	Unc. [c], cm^{-1}	Landé g [d]	Leading Percentages [e]	Note [f]	N_{lines} [g]
7g	$(3/2)^2[7/2]$	$3d^9(^2D_{3/2})7g$	$^2[7/2]$	4	156775.430	0.014		99% + 1% 8g $(5/2)^2[7/2]$	N	1
8f	$(5/2)^2[7/2]^\circ$	$3d^9(^2D_{5/2})8f$	$^2[7/2]^\circ$	4	[156779.7]	7		94% + 5% 8f $(5/2)^2[9/2]^\circ$ + 1% 7f $(3/2)^2[7/2]^\circ$	sf	0
7g	$(3/2)^2[9/2]$	$3d^9(^2D_{3/2})7g$	$^2[9/2]$	4	156779.847	0.014		100%		2
7g	$(3/2)^2[9/2]$	$3d^9(^2D_{3/2})7g$	$^2[9/2]$	5	156779.855	0.014		100%	N	1
8f	$(5/2)^2[9/2]^\circ$	$3d^9(^2D_{5/2})8f$	$^2[9/2]^\circ$	4	[156781.7]	7		92% + 5% 8f $(5/2)^2[7/2]^\circ$ + 2% 7f $(3/2)^2[9/2]^\circ$	sf	0
8f	$(5/2)^2[9/2]^\circ$	$3d^9(^2D_{5/2})8f$	$^2[9/2]^\circ$	5	[156782.4]	7		97% + 3% 7f $(3/2)^2[9/2]^\circ$	sf	0
8g	$(5/2)^2[3/2]$	$3d^9(^2D_{5/2})8g$	$^2[3/2]$	2	[156797.3]	2.0		100%	pf	0
8g	$(5/2)^2[7/2]$	$3d^9(^2D_{5/2})8g$	$^2[7/2]$	3	[156805.7]	2.0		99% + 1% 7g $(3/2)^2[7/2]$	pf	0
8g	$(5/2)^2[9/2]$	$3d^9(^2D_{5/2})8g$	$^2[9/2]$	5	[156807.8]	2.0		100%	pf	0
8g	$(5/2)^2[11/2]$	$3d^9(^2D_{5/2})8g$	$^2[11/2]$	6	156808.189?	0.010		99% + 1% 7g $(3/2)^2[11/2]$	N	2
9d	$(5/2)^2[9/2]$	$3d^9(^2D_{5/2})9d$	$^2[9/2]$	5	[156888.5]	2.0		100%	sf	0
9d	$(5/2)^2[9/2]$	$3d^9(^2D_{5/2})9d$	$^2[9/2]$	4	156912.740	0.011		51% + 44% 8d $(3/2)^2[7/2]$ + 5% 9d $(5/2)^2[7/2]$		2
8d	$(3/2)^2[5/2]$	$3d^9(^2D_{3/2})8d$	$^2[5/2]$	2	156958.11?	0.06		42% + 38% 9d $(5/2)^2[5/2]$ + 16% 8d $(3/2)^2[3/2]$		1
9g	$(5/2)^2[3/2]$	$3d^9(^2D_{5/2})9g$	$^2[3/2]$	2	[158241.1]	2.0		100%	pf	0
9g	$(5/2)^2[7/2]$	$3d^9(^2D_{5/2})9g$	$^2[7/2]$	3	[158246.8]	2.0		100%	pf	0
10d	$(5/2)^2[1/2]$	$3d^9(^2D_{5/2})10d$	$^2[1/2]$	1	[158285.3]	4		98% + 2% 10d $(5/2)^2[3/2]$	sf	0
10d	$(5/2)^2[3/2]$	$3d^9(^2D_{5/2})10d$	$^2[3/2]$	2	[158306.0]	5		95% + 4% 10d $(5/2)^2[5/2]$	sf	0
10d	$(5/2)^2[9/2]$	$3d^9(^2D_{5/2})10d$	$^2[9/2]$	5	[158306.9]	2.0		100%	sf	0
10d	$(5/2)^2[9/2]$	$3d^9(^2D_{5/2})10d$	$^2[9/2]$	4	[158308.9]	2.0		100%	sf	0
10d	$(5/2)^2[3/2]$	$3d^9(^2D_{5/2})10d$	$^2[3/2]$	1	[158310.4]	4		98% + 2% 10d $(5/2)^2[1/2]$	sf	0
10d	$(5/2)^2[5/2]$	$3d^9(^2D_{5/2})10d$	$^2[5/2]$	3	[158323.3]	4		98% + 2% 10d $(5/2)^2[7/2]$	sf	0
10d	$(5/2)^2[5/2]$	$3d^9(^2D_{5/2})10d$	$^2[5/2]$	2	[158333.4]	5		95% + 4% 10d $(5/2)^2[3/2]$	sf	0
10d	$(5/2)^2[7/2]$	$3d^9(^2D_{5/2})10d$	$^2[7/2]$	3	[158334.1]	4		98% + 2% 10d $(5/2)^2[5/2]$	sf	0
10d	$(5/2)^2[7/2]$	$3d^9(^2D_{5/2})10d$	$^2[7/2]$	4	[158334.2]	2.0		100%	sf	0
10s	$(3/2)^2[3/2]$	$3d^9(^2D_{3/2})10s$	$^2[3/2]$	1	158579.33	0.14		100%	N	1
8f	$(3/2)^2[9/2]^\circ$	$3d^9(^2D_{3/2})8f$	$^2[9/2]^\circ$	4	[158851.1]	8		100%	sf	0
8f	$(3/2)^2[7/2]^\circ$	$3d^9(^2D_{3/2})8f$	$^2[7/2]^\circ$	4	[158864.4]	8		100%	sf	0
8g	$(3/2)^2[5/2]$	$3d^9(^2D_{3/2})8g$	$^2[5/2]$	3	[158869.3]	2.0		100%	pf	0
8g	$(3/2)^2[11/2]$	$3d^9(^2D_{3/2})8g$	$^2[11/2]$	6	[158871.7]	2.0		100%	pf	0
8g	$(3/2)^2[7/2]$	$3d^9(^2D_{3/2})8g$	$^2[7/2]$	4	[158875.8]	2.0		100%	pf	0
8h	$(3/2)^2[7/2]^\circ$	$3d^9(^2D_{3/2})8h$	$^2[7/2]^\circ$	3	[158876.9]	2.0		100%	pf	0
8h	$(3/2)^2[7/2]^\circ$	$3d^9(^2D_{3/2})8h$	$^2[7/2]^\circ$	4	[158877.0]	2.0		100%	pf	0
8h	$(3/2)^2[13/2]^\circ$	$3d^9(^2D_{3/2})8h$	$^2[13/2]^\circ$	6	[158877.9]	2.0		100%	pf	0
8g	$(3/2)^2[9/2]$	$3d^9(^2D_{3/2})8g$	$^2[9/2]$	5	[158878.0]	2.0		100%	pf	0
8h	$(3/2)^2[13/2]^\circ$	$3d^9(^2D_{3/2})8h$	$^2[13/2]^\circ$	7	[158878.0]	2.0		100%	pf	0
8h	$(3/2)^2[9/2]^\circ$	$3d^9(^2D_{3/2})8h$	$^2[9/2]^\circ$	4	[158880.4]	2.0		100%	pf	0
8h	$(3/2)^2[9/2]^\circ$	$3d^9(^2D_{3/2})8h$	$^2[9/2]^\circ$	5	[158880.5]	2.0		100%	pf	0
8h	$(3/2)^2[11/2]^\circ$	$3d^9(^2D_{3/2})8h$	$^2[11/2]^\circ$	5	[158881.4]	2.0		100%	pf	0
8h	$(3/2)^2[11/2]^\circ$	$3d^9(^2D_{3/2})8h$	$^2[11/2]^\circ$	6	[158881.5]	2.0		100%	pf	0
9d	$(3/2)^2[1/2]$	$3d^9(^2D_{3/2})9d$	$^2[1/2]$	1	[158935.9]	4		99%	sf	0

Table A2. *Cont.*

	Label [a]	Configuration	Term	J	Level [b], cm^{-1}	Unc. [c], cm^{-1}	Landé g [d]	Leading Percentages [e]	Note [f]	N_{lines} [g]
9d	$(3/2)^2[7/2]$	$3d^9(^2D_{3/2})9d$	$^2[7/2]$	3	[158961.1]	2.0		100%	sf	0
9d	$(3/2)^2[7/2]$	$3d^9(^2D_{3/2})9d$	$^2[7/2]$	4	[158966.7]	2.0		100%	sf	0
9d	$(3/2)^2[3/2]$	$3d^9(^2D_{3/2})9d$	$^2[3/2]$	1	[158970.8]	2.0		100%	sf	0
9d	$(3/2)^2[3/2]$	$3d^9(^2D_{3/2})9d$	$^2[3/2]$	2	[158977.0]	5		96% + 4% 9d $(3/2)^2[5/2]$	sf	0
9d	$(3/2)^2[5/2]$	$3d^9(^2D_{3/2})9d$	$^2[5/2]$	3	[158999.4]	2.0		100%	sf	0
9d	$(3/2)^2[5/2]$	$3d^9(^2D_{3/2})9d$	$^2[5/2]$	2	[159000.4]	5		96% + 4% 9d $(3/2)^2[3/2]$	sf	0
10g	$(5/2)^2[3/2]$	$3d^9(^2D_{5/2})10g$	$^2[3/2]$	2	[159273.3]	2.0		100%	pf	0
10g	$(5/2)^2[7/2]$	$3d^9(^2D_{5/2})10g$	$^2[7/2]$	3	[159277.4]	2.0		100%	pf	0
9g	$(3/2)^2[5/2]$	$3d^9(^2D_{3/2})9g$	$^2[5/2]$	3	[160312.5]	2.0		100%	pf	0
9g	$(3/2)^2[11/2]$	$3d^9(^2D_{3/2})9g$	$^2[11/2]$	6	[160314.1]	2.0		100%	pf	0
9g	$(3/2)^2[7/2]$	$3d^9(^2D_{3/2})9g$	$^2[7/2]$	4	[160317.0]	2.0		100%	pf	0
9g	$(3/2)^2[9/2]$	$3d^9(^2D_{3/2})9g$	$^2[9/2]$	5	[160318.5]	2.0		100%	pf	0
10d	$(3/2)^2[1/2]$	$3d^9(^2D_{3/2})10d$	$^2[1/2]$	1	[160361.5]	4		99%	sf	0
10d	$(3/2)^2[7/2]$	$3d^9(^2D_{3/2})10d$	$^2[7/2]$	3	[160378.4]	2.0		100%	sf	0
10d	$(3/2)^2[7/2]$	$3d^9(^2D_{3/2})10d$	$^2[7/2]$	4	[160382.2]	2.0		100%	sf	0
10d	$(3/2)^2[3/2]$	$3d^9(^2D_{3/2})10d$	$^2[3/2]$	1	[160385.0]	2.0		100%	sf	0
10d	$(3/2)^2[3/2]$	$3d^9(^2D_{3/2})10d$	$^2[3/2]$	2	[160388.7]	5		96% + 3% 10d $(3/2)^2[5/2]$	sf	0
10d	$(3/2)^2[5/2]$	$3d^9(^2D_{3/2})10d$	$^2[5/2]$	3	[160404.5]	2.0		100%	sf	0
10d	$(3/2)^2[5/2]$	$3d^9(^2D_{3/2})10d$	$^2[5/2]$	2	[160405.1]	5		96% + 3% 10d $(3/2)^2[3/2]$	sf	0
10g	$(3/2)^2[5/2]$	$3d^9(^2D_{3/2})10g$	$^2[5/2]$	3	[161344.3]	2.0		100%	pf	0
10g	$(3/2)^2[11/2]$	$3d^9(^2D_{3/2})10g$	$^2[11/2]$	6	[161345.4]	2.0		100%	pf	0
10g	$(3/2)^2[7/2]$	$3d^9(^2D_{3/2})10g$	$^2[7/2]$	4	[161347.6]	2.0		100%	pf	0
10g	$(3/2)^2[9/2]$	$3d^9(^2D_{3/2})10g$	$^2[9/2]$	5	[161348.6]	2.0		100%	pf	0
		Cu III ($3d^9\,^2D_{5/2}$)	Limit		163669.2	0.5				

[a] Label used in the column of Leading Percentages;

[b] Level values were obtained in the least-squares optimization procedure using the LOPT code [39] (see text), except the following: (1) Values in square brackets were obtained using extrapolations along level series (see column "Notes"); (2) The ionization limit is quoted from Ross [2] (see text). A question mark after the value indicates an uncertain identification;

[c] Uncertainties (one standard deviation) are specified for separations from the $3d^94s\ ^3D_2$ level (at 22847.1176 cm^{-1}). To determine uncertainties relative to the ground level, the given values should be combined in quadrature with the uncertainty of the ground level, 0.017 cm^{-1};

[d] Experimental Landé g-factors are quoted from Sugar and Musgrove [17];

[e] The three leading contributions to the eigenvector are given, if their rounded value is $\geq$1%. The first percentage refers to the configuration and term given in the second and third columns, unless otherwise specified after the percentage value. For the $3d^9nl$ levels designated in the J_1l (a.k.a. JK) coupling scheme, the percentage value of the $3d^84s4p$ configuration is the sum of percentage contributions of all terms of this configuration;

[f] Key to the notes: N—newly identified level; R—revised level value (new identification); RJ—revised J value (was 1 in Sugar and Musgrove [17] and Ross [2]); ci—the two previously known levels, for which the identifications have been interchanged; cd—previously known levels, for which the configuration and/or term designations have been revised; sf, pf—level values found by extrapolation using the Ritz quantum-defect or polarization formulas, respectively (see text in Section 4), in combination with the least-squares parametric fitting (see text);

[g] Number of connecting lines included in the level optimization procedure for this level.

Table A3. Least-squares fitting parameters for Cu II.

Configuration	Parameter [a]	LSF [b]	STD [c]	Group [d]	HFR [e]	LSF/HF
Even parity						
$3d^{10}$	E_{av}	5775.8	52		0.0	
$3d^9$4s	E_{av}	26843.5	21		9367.0	2.8658
	ζ(3d)	819.9	2.0	1	814.7	1.0064
	G^2(3d,4s)	8519.5	132	2	9945.5	0.8566
$3d^9$4d	E_{av}	119071.8	12		98893.7	1.2040
	ζ(3d)	827.0	2.0	1	821.7	1.0064
	ζ(4d)	13.7	fixed		13.7	1.0000
	F^2(3d,4d)	3237.5	96		4085.1	0.7925
	F^4(3d,4d)	1109.0	fixed		1386.3	0.8000
	G^0(3d,4d)	1426.8	47		1440.0	0.9908
	G^2(3d,4d)	705.6	152		1276.5	0.5528
	G^4(3d,4d)	538.0	228		890.6	0.6041
$3d^9$5s	E_{av}	109078.5	20		92286.1	1.1820
	ζ(3d)	826.4	2.0	1	821.1	1.0064
	G^2(3d,5s)	1537.1	24	2	1794.4	0.8566
$3d^9$5d	E_{av}	137813.1	10		120253.4	1.1460
	ζ(3d)	827.6	2.0	1	822.3	1.0064
	ζ(5d)	6.1	fixed		6.1	1.0000
	F^2(3d,5d)	1905.2	73	5	1567.9	1.2152
	F^4(3d,5d)	463.5	fixed		579.4	0.8000
	G^0(3d,5d)	455.2	20	8	616.8	0.7380
	G^2(3d,5d)	412.6	18	8	559.0	0.7380
	G^4(3d,5d)	290.1	13	8	393.0	0.7380
$3d^9$5g	E_{av}	146914.9	9		129486.8	1.1346
	ζ(3d)	828.0	2.0	1	822.7	1.0064
	F^2(3d,5g)	133.4	fixed		166.7	0.8000
	F^4(3d,5g)	5.2	fixed		6.5	0.8000
$3d^9$6s	E_{av}	134521.0	20		117385.5	1.1460
	ζ(3d)	827.4	2.0	1	822.1	1.0064
	G^2(3d,6s)	564.8	9	2	659.4	0.8566
$3d^9$6d	E_{av}	147347.9	10		129891.5	1.1344
	ζ(3d)	827.8	2.0	1	822.5	1.0064
	ζ(6d)	3.2	fixed		3.2	1.0000
	F^2(3d,6d)	952.5	36	5	783.9	1.2152
	F^4(3d,6d)	240.4	fixed		300.5	0.8000
	G^0(3d,6d)	182.2	17	9	320.8	0.5680
	G^2(3d,6d)	166.8	15	9	293.6	0.5680
	G^4(3d,6d)	117.6	11	9	207.0	0.5680
$3d^9$6g	E_{av}	152289.1	9		134856.3	1.1293
	ζ(3d)	828.0	2.0	1	822.7	1.0064
	F^2(3d,6g)	77.6	fixed		97.0	0.8000
	F^4(3d,6g)	3.9	fixed		4.9	0.8000
$3d^9$7s	E_{av}	145697.1	20		128417.0	1.1346
	ζ(3d)	827.7	2.0	1	822.4	1.0064
	G^2(3d,7s)	273.2	4	2	318.9	0.8566
$3d^9$7d	E_{av}	152539.1	10		135114.4	1.1290
	ζ(3d)	827.9	2.0	1	822.6	1.0064
	ζ(7d)	1.9	fixed		1.9	1.0000
	F^2(3d,7d)	546.1	21	5	449.4	1.2152
	F^4(3d,7d)	140.5	fixed		175.6	0.8000
	G^0(3d,7d)	149.8	fixed		187.2	0.8000
	G^2(3d,7d)	166.8	fixed		172.4	0.8000
	G^4(3d,7d)	117.6	fixed		121.8	0.8000
$3d^9$7g	E_{av}	155529.5	10		138096.9	1.1262
	ζ(3d)	828.0	2.0	1	822.7	1.0064
	F^2(3d,7g)	49.0	fixed		61.3	0.8000
	F^4(3d,7g)	2.7	fixed		3.4	0.8000

Table A3. *Cont.*

Configuration	Parameter [a]	LSF [b]	STD [c]	Group [d]	HFR [e]	LSF/HF
Even parity						
$3d^9 8s$	E_{av}	151604.1	20		134260.1	1.1292
	$\zeta(3d)$	827.8	2.0	1	822.5	1.0064
	$G^2(3d,8s)$	153.2	2.0	2	178.9	0.8566
$3d^9 8d$	E_{av}	155694.0	14		138268.4	1.1260
	$\zeta(3d)$	827.9	2.0	1	822.6	1.0064
	$\zeta(8d)$	1.2	fixed		1.2	1.0000
	$F^2(3d,8d)$	342.5	13	5	281.9	1.2152
	$F^4(3d,8d)$	89.1	fixed		111.4	0.8000
	$G^0(3d,8d)$	95.0	fixed		118.8	0.8000
	$G^2(3d,8d)$	87.7	fixed		109.6	0.8000
	$G^4(3d,8d)$	62.0	fixed		77.5	0.8000
$3d^9 8g$	E_{av}	157632.2	17		140200.6	1.1243
	$\zeta(3d)$	828.0	2.0	1	822.7	1.0064
	$F^2(3d,8g)$	32.9	fixed		41.1	0.8000
	$F^4(3d,8g)$	2.0	fixed		2.5	0.8000
$3d^9 9s$	E_{av}	155106.1	20		137730.5	1.1262
	$\zeta(3d)$	827.9	2.0	1	822.6	1.0064
	$G^2(3d,9s)$	94.7	1.0	2	110.5	0.8566
$3d^9 9d$	E_{av}	157752.1	14		140319.6	1.1242
	$\zeta(3d)$	828.0	2.0	1	822.7	1.0064
	$\zeta(9d)$	0.8	fixed		0.8	1.0000
	$F^2(3d,9d)$	229.1	9	5	188.5	1.2152
	$F^4(3d,9d)$	60.0	fixed		75.0	0.8000
	$G^0(3d,9d)$	64.0	fixed		80.0	0.8000
	$G^2(3d,9d)$	59.2	fixed		74.0	0.8000
	$G^4(3d,9d)$	41.8	fixed		52.2	0.8000
$3d^9 9g$	E_{av}	159073.9	17		141643.1	1.1231
	$\zeta(3d)$	828.0	2.0	1	822.7	1.0064
	$F^2(3d,9g)$	23.1	fixed		28.9	0.8000
	$F^4(3d,9g)$	1.4	fixed		1.7	0.8000
$3d^9 10s$	E_{av}	157351.8	23		139959.4	1.1243
	$\zeta(3d)$	827.9	2.0	1	822.6	1.0064
	$G^2(3d,10s)$	62.5	1.0	2	73.0	0.8566
$3d^9 10d$	E_{av}	159159.7	10		141729.3	1.1230
	$\zeta(3d)$	828.0	2.0	1	822.7	1.0064
	$\zeta(10d)$	0.6	fixed		0.6	1.0000
	$F^2(3d,10d)$	160.7	6	5	132.3	1.2152
	$F^4(3d,10d)$	42.3	fixed		52.9	0.8000
	$G^0(3d,10d)$	45.1	fixed		56.4	0.8000
	$G^2(3d,10d)$	41.8	fixed		52.2	0.8000
	$G^4(3d,10d)$	29.5	fixed		36.9	0.8000
$3d^9 10g$	E_{av}	160104.8	17		142674.4	1.1222
	$\zeta(3d)$	828.0	2.0	1	822.7	1.0064
	$F^2(3d,10g)$	16.8	fixed		21.0	0.8000
	$F^4(3d,10g)$	1.1	fixed		1.4	0.8000
$3d^8 4s^2$	E_{av}	88372.4	16		62522.0	1.4135
	$F^2(3d,3d)$	91560.3	114	3	109696.0	0.8347
	$F^4(3d,3d)$	58255.9	103	4	68373.1	0.8520
	$\alpha(3d)$	93.8	3	7	0.0	
	$\zeta(3d)$	892.2	3	1	886.5	1.0064
$3d^8 4p^2$	E_{av}	188427.0	fixed		162579.7	1.1590
	$F^2(3d,3d)$	92340.0	115	3	110630.1	0.8347
	$F^4(3d,3d)$	58793.9	104	4	69004.6	0.8520
	$\alpha(3d)$	93.8	3	7	0.0	
	$F^2(4p,4p)$	28518.8	fixed		35648.5	0.8000
	$\zeta(3d)$	898.5	3	1	892.8	1.0064
	$\zeta(4p)$	619.0	fixed		619.0	1.0000
	$F^2(3d,4p)$	12983.5	fixed		16229.4	0.8000
	$G^1(3d,4p)$	4628.9	fixed		5786.1	0.8000
	$G^3(3d,4p)$	3922.3	fixed		4902.9	0.8000

Table A3. *Cont.*

Configuration	Parameter [a]	LSF [b]	STD [c]	Group [d]	HFR [e]	LSF/HF
Even parity						
$3d^8 4s4d$	E_{av}	186352.1	fixed		160504.8	1.1610
	F^2(3d,3d)	92375.3	115	3	110672.4	0.8347
	F^4(3d,3d)	58816.8	104	4	69031.5	0.8520
	α(3d)	93.8	3	7	0.0	
	ζ(3d)	898.6	3	1	892.9	1.0064
	F^2(3d,4d)	5461.6	208	5	4494.5	1.2152
	G^2(3d,4s)	9256.3	144	2	10805.6	0.8566
$3d^8 4s5s$	E_{av}	178348.4	fixed		152501.1	1.1695
	F^2(3d,3d)	92277.5	115	3	110555.2	0.8347
	F^4(3d,3d)	58748.9	104	4	68951.7	0.8520
	α(3d)	93.8	3	7	0.0	
	ζ(3d)	897.8	3	1	892.1	1.0064
	G^2(3d,4s)	9552.4	148	2	11151.3	0.8566
	G^2(3d,5s)	1270.3	20	2	1482.9	0.8566
$3d^8 4d^2$	E_{av}	307518.0	fixed		281670.7	1.0918
	F^2(3d,3d)	93279.6	116	3	111755.9	0.8347
	F^4(3d,3d)	59441.2	105	4	69764.2	0.8520
	α(3d)	93.8	3	7	0.0	
	ζ(3d)	906.0	3	1	900.2	1.0064
	F^2(3d,4d)	7552.1	288	5	6214.9	1.2152
$3d^8 4s5d$	E_{av}	209861.7	fixed		184014.4	1.1405
	F^2(3d,3d)	92407.3	115	3	110710.8	0.8347
	F^4(3d,3d)	58838.5	104	4	69056.9	0.8520
	α(3d)	93.8	3	7	0.0	
	ζ(3d)	899.0	3	1	893.3	1.0064
	F^2(3d,5d)	1997.4	76	5	1643.7	1.2152
	G^2(3d,4s)	9429.0	147	2	11007.3	0.8566
Configuration interaction						
$3d^9 4d$-$3d^9 5d$	R_d^0(3d4d,3d5d)	147.8	7	6	135.3	1.0921
	R_d^2(3d4d,3d5d)	2400.9	108	6	2198.4	1.0921
	R_d^4(3d4d,3d5d)	959.9	43	6	879.0	1.0921
	R_e^0(3d4d,3d5d)	1028.7	46	6	942.0	1.0921
	R_e^2(3d4d,3d5d)	921.6	41	6	843.9	1.0921
	R_e^4(3d4d,3d5d)	645.4	29	6	591.0	1.0921
$3d^9 4d$-$3d^9 6d$	R_d^0(3d4d,3d6d)	106.6	5	6	97.6	1.0921
	R_d^2(3d4d,3d6d)	1631.1	73	6	1493.6	1.0921
	R_d^4(3d4d,3d6d)	684.3	31	6	626.6	1.0921
	R_e^0(3d4d,3d6d)	741.5	33	6	679.0	1.0921
	R_e^2(3d4d,3d6d)	667.2	30	6	610.9	1.0921
	R_e^4(3d4d,3d6d)	467.9	21	6	428.4	1.0921
$3d^9 4d$-$3d^9 7d$	R_d^0(3d4d,3d7d)	81.5	4	6	74.6	1.0921
	R_d^2(3d4d,3d7d)	1212.2	54	6	1110.0	1.0921
	R_d^4(3d4d,3d7d)	520.2	23	6	476.3	1.0921
	R_e^0(3d4d,3d7d)	566.5	25	6	518.7	1.0921
	R_e^2(3d4d,3d7d)	510.8	23	6	467.7	1.0921
	R_e^4(3d4d,3d7d)	358.5	16	6	328.3	1.0921
$3d^9 4d$-$3d^9 8d$	R_d^0(3d4d,3d8d)	64.9	3	6	59.4	1.0921
	R_d^2(3d4d,3d8d)	950.0	43	6	869.9	1.0921
	R_d^4(3d4d,3d8d)	412.8	18	6	378.0	1.0921
	R_e^0(3d4d,3d8d)	451.0	20	6	413.0	1.0921
	R_e^2(3d4d,3d8d)	407.2	18	6	372.9	1.0921
	R_e^4(3d4d,3d8d)	286.0	13	6	261.9	1.0921
$3d^9 4d$-$3d^9 9d$	R_d^0(3d4d,3d9d)	53.2	2.0	6	48.7	1.0921
	R_d^2(3d4d,3d9d)	771.9	35	6	706.8	1.0921
	R_d^4(3d4d,3d9d)	338.0	15	6	309.5	1.0921
	R_e^0(3d4d,3d9d)	370.1	17	6	338.9	1.0921
	R_e^2(3d4d,3d9d)	334.4	15	6	306.2	1.0921
	R_e^4(3d4d,3d9d)	234.9	11	6	215.1	1.0921

Table A3. *Cont.*

Configuration	Parameter [a]	LSF [b]	STD [c]	Group [d]	HFR [e]	LSF/HF
Configuration interaction						
$3d^9$4d-$3d^9$10d	R_d^0(3d4d,3d10d)	44.8	2.0	6	41.0	1.0921
	R_d^2(3d4d,3d10d)	643.8	29	6	589.5	1.0921
	R_d^4(3d4d,3d10d)	283.4	13	6	259.5	1.0921
	R_e^0(3d4d,3d10d)	310.7	14	6	284.5	1.0921
	R_e^2(3d4d,3d10d)	281.0	13	6	257.3	1.0921
	R_e^4(3d4d,3d10d)	197.5	9	6	180.8	1.0921
$3d^9$5d-$3d^9$6d	R_d^2(3d5d,3d6d)	1147.0	51	6	1050.3	1.0921
	R_d^4(3d5d,3d6d)	454.3	20	6	416.0	1.0921
	R_e^0(3d5d,3d6d)	485.8	22	6	444.8	1.0921
	R_e^2(3d5d,3d6d)	442.4	20	6	405.1	1.0921
	R_e^4(3d5d,3d6d)	311.5	14	6	285.2	1.0921
$3d^9$5d-$3d^9$7d	R_d^2(3d5d,3d7d)	850.8	38	6	779.1	1.0921
	R_d^4(3d5d,3d7d)	346.3	16	6	317.1	1.0921
	R_e^0(3d5d,3d7d)	371.2	17	6	339.9	1.0921
	R_e^2(3d5d,3d7d)	339.0	15	6	310.4	1.0921
	R_e^4(3d5d,3d7d)	238.7	11	6	218.6	1.0921
$3d^9$5d-$3d^9$8d	R_d^2(3d5d,3d8d)	666.6	30	6	610.4	1.0921
	R_d^4(3d5d,3d8d)	275.3	12	6	252.1	1.0921
	R_e^0(3d5d,3d8d)	295.5	13	6	270.6	1.0921
	R_e^2(3d5d,3d8d)	270.3	12	6	247.5	1.0921
	R_e^4(3d5d,3d8d)	190.6	9	6	174.5	1.0921
$3d^9$5d-$3d^9$9d	R_d^2(3d5d,3d9d)	541.3	24	6	495.7	1.0921
	R_d^4(3d5d,3d9d)	225.8	10	6	206.8	1.0921
	R_e^0(3d5d,3d9d)	242.4	11	6	222.0	1.0921
	R_e^2(3d5d,3d9d)	222.0	10	6	203.3	1.0921
	R_e^4(3d5d,3d9d)	156.6	7	6	143.4	1.0921
$3d^9$5d-$3d^9$10d	R_d^2(3d5d,3d10d)	451.6	20	6	413.5	1.0921
	R_d^4(3d5d,3d10d)	189.4	8	6	173.4	1.0921
	R_e^0(3d5d,3d10d)	203.7	9	6	186.5	1.0921
	R_e^2(3d5d,3d10d)	186.4	8	6	170.7	1.0921
	R_e^4(3d5d,3d10d)	131.6	6	6	120.5	1.0921
$3d^9$6d-$3d^9$7d	R_d^2(3d6d,3d7d)	631.0	28	6	577.8	1.0921
	R_d^4(3d6d,3d7d)	250.7	11	6	229.6	1.0921
	R_e^0(3d6d,3d7d)	267.7	12	6	245.1	1.0921
	R_e^2(3d6d,3d7d)	245.7	11	6	225.0	1.0921
	R_e^4(3d6d,3d7d)	173.4	8	6	158.8	1.0921
$3d^9$6d-$3d^9$8d	R_d^2(3d6d,3d8d)	494.0	22	6	452.3	1.0921
	R_d^4(3d6d,3d8d)	199.6	9	6	182.8	1.0921
	R_e^0(3d6d,3d8d)	213.3	10	6	195.3	1.0921
	R_e^2(3d6d,3d8d)	196.0	9	6	179.5	1.0921
	R_e^4(3d6d,3d8d)	138.5	6	6	126.8	1.0921
$3d^9$6d-$3d^9$9d	R_d^2(3d6d,3d9d)	401.0	18	6	367.2	1.0921
	R_d^4(3d6d,3d9d)	163.7	7	6	149.9	1.0921
	R_e^0(3d6d,3d9d)	175.1	8	6	160.3	1.0921
	R_e^2(3d6d,3d9d)	161.0	7	6	147.4	1.0921
	R_e^4(3d6d,3d9d)	113.7	5	6	104.1	1.0921
$3d^9$6d-$3d^9$10d	R_d^2(3d6d,3d10d)	334.6	15	6	306.4	1.0921
	R_d^4(3d6d,3d10d)	137.3	6	6	125.7	1.0921
	R_e^0(3d6d,3d10d)	146.9	7	6	134.5	1.0921
	R_e^2(3d6d,3d10d)	135.3	6	6	123.9	1.0921
	R_e^4(3d6d,3d10d)	95.6	4	6	87.5	1.0921
$3d^9$7d-$3d^9$8d	R_d^2(3d7d,3d8d)	382.7	17	6	350.4	1.0921
	R_d^4(3d7d,3d8d)	152.8	7	6	139.9	1.0921
	R_e^0(3d7d,3d8d)	163.0	7	6	149.3	1.0921
	R_e^2(3d7d,3d8d)	150.2	7	6	137.5	1.0921
	R_e^4(3d7d,3d8d)	106.0	5	6	97.1	1.0921

Table A3. *Cont.*

Configuration	Parameter [a]	LSF [b]	STD [c]	Group [d]	HFR [e]	LSF/HF
Configuration interaction						
$3d^9$7d-$3d^9$9d	R_d^2(3d7d,3d9d)	310.7	14	6	284.5	1.0921
	R_d^4(3d7d,3d9d)	125.4	6	6	114.8	1.0921
	R_e^0(3d7d,3d9d)	133.7	6	6	122.4	1.0921
	R_e^2(3d7d,3d9d)	123.4	6	6	113.0	1.0921
	R_e^4(3d7d,3d9d)	87.3	4	6	79.9	1.0921
$3d^9$7d-$3d^9$10d	R_d^2(3d7d,3d10d)	259.2	12	6	237.3	1.0921
	R_d^4(3d7d,3d10d)	105.3	5	6	96.4	1.0921
	R_e^0(3d7d,3d10d)	112.3	5	6	102.8	1.0921
	R_e^2(3d7d,3d10d)	103.6	5	6	94.9	1.0921
	R_e^4(3d7d,3d10d)	73.3	3	6	67.1	1.0921
$3d^9$8d-$3d^9$9d	R_d^2(3d8d,3d9d)	249.3	11	6	228.3	1.0921
	R_d^4(3d8d,3d9d)	99.9	4	6	91.5	1.0921
	R_e^0(3d8d,3d9d)	106.5	5	6	97.5	1.0921
	R_e^2(3d8d,3d9d)	98.4	4	6	90.1	1.0921
	R_e^4(3d8d,3d9d)	69.6	3	6	63.7	1.0921
$3d^9$8d-$3d^9$10d	R_d^2(3d8d,3d10d)	207.8	9	6	190.3	1.0921
	R_d^4(3d8d,3d10d)	83.9	4	6	76.8	1.0921
	R_e^0(3d8d,3d10d)	89.4	4	6	81.9	1.0921
	R_e^2(3d8d,3d10d)	82.8	4	6	75.8	1.0921
	R_e^4(3d8d,3d10d)	58.5	3	6	53.6	1.0921
$3d^9$9d-$3d^9$10d	R_d^2(3d9d,3d10d)	171.3	8	6	156.9	1.0921
	R_d^4(3d9d,3d10d)	68.8	3	6	63.0	1.0921
	R_e^0(3d9d,3d10d)	73.3	3	6	67.1	1.0921
	R_e^2(3d9d,3d10d)	67.9	3	6	62.2	1.0921
	R_e^4(3d9d,3d10d)	48.1	2.0	6	44.0	1.0921
Odd parity						
$3d^9$4p	E_{av}	73281.0	22		53995.6	1.3572
	ζ(3d)	828.8	5	1	818.3	1.0128
	ζ(4p)	538.0	20	9	444.2	1.2112
	F^2(3d,4p)	13098.9	152		13901.7	0.9423
	G^1(3d,4p)	4368.5	65		5338.7	0.8183
	G^3(3d,4p)	3615.9	363		4299.1	0.8411
$3d^9$4f	E_{av}	136895.6	17		119289.7	1.1476
	ζ(3d)	833.2	5	1	822.7	1.0128
$3d^9$5p	E_{av}	121911.6	24		104871.2	1.1625
	ζ(3d)	832.0	5	1	821.5	1.0128
	ζ(5p)	159.8	6	9	131.9	1.2112
	F^2(3d,5p)	3512.5	21	2	3548.4	0.9899
	G^1(3d,5p)	1262.1	94	3	1287.6	0.9802
	G^3(3d,5p)	1174.4	306	10	1102.4	1.0653
$3d^9$5f	E_{av}	146833.4	16		129308.6	1.1355
	ζ(3d)	833.2	5	1	822.7	1.0128
$3d^9$6p	E_{av}	139748.8	29		122652.3	1.1394
	ζ(3d)	832.7	5	1	822.2	1.0128
	ζ(6p)	69.9	3	9	57.7	1.2112
	F^2(3d,6p)	1443.6	9	2	1458.4	0.9899
	G^1(3d,6p)	521.8	39	3	532.4	0.9802
	G^3(3d,6p)	493.4	129	10	463.1	1.0653
$3d^9$6f	E_{av}	152224.4	17		134753.4	1.1297
	ζ(3d)	833.2	5	1	822.7	1.0128
$3d^9$6h	E_{av}	152299.5	16		134875.8	1.1292
	ζ(3d)	833.2	5	1	822.7	1.0128
$3d^9$7p	E_{av}	148438.8	22		131122.8	1.1321
	ζ(3d)	833.0	5	1	822.5	1.0128
	ζ(7p)	36.8	1.0	9	30.4	1.2112
	F^2(3d,7p)	738.7	4	2	746.3	0.9899
	G^1(3d,7p)	268.6	20	3	274.0	0.9802
	G^3(3d,7p)	255.8	67	10	240.1	1.0653

Table A3. *Cont.*

Configuration	Parameter [a]	LSF [b]	STD [c]	Group [d]	HFR [e]	LSF/HF
Odd parity						
$3d^9 7f$	E_{av}	155498.8	22		138032.9	1.1265
	$\zeta(3d)$	833.2	5	1	822.7	1.0128
$3d^9 7h$	E_{av}	155540.7	21		138110.8	1.1262
	$\zeta(3d)$	833.2	5	1	822.7	1.0128
$3d^9 8p$	E_{av}	153145.3	54		135833.1	1.1275
	$\zeta(3d)$	833.1	5	1	822.6	1.0128
	$\zeta(8p)$	21.8	1.0	9	18.0	1.2112
	$F^2(3d,8p)$	429.6	3	2	434.0	0.9899
	$G^1(3d,8p)$	156.8	12	3	160.0	0.9802
	$G^3(3d,8p)$	150.0	39	10	140.8	1.0653
$3d^9 8f$	E_{av}	157610.4	28		140157.8	1.1245
	$\zeta(3d)$	833.2	5	1	822.7	1.0128
$3d^9 8h$	E_{av}	157629.5	26		140210.6	1.1242
	$\zeta(3d)$	833.2	5	1	822.7	1.0128
$3d^8 4s4p$	E_{av}	132837.3	12		104548.6	1.2706
	$F^2(3d,3d)$	92783.8	119	4	110131.5	0.8425
	$F^4(3d,3d)$	59745.4	207	5	68667.5	0.8701
	$\alpha(3d)$	84.8	3	8	0.0	
	$\zeta(3d)$	900.8	5	1	889.4	1.0128
	$\zeta(4p)$	732.4	27	9	604.7	1.2112
	$F^2(3d,4p)$	15857.7	94	2	16019.7	0.9899
	$G^2(3d,4s)$	8059.3	145	7	10125.0	0.7960
	$G^1(3d,4p)$	5532.7	82	11	5751.7	0.9619
	$G^3(3d,4p)$	4703.6	208	12	4854.4	0.9689
	$G^1(4s,4p)$	37321.3	52	6	47726.6	0.7820
$3d^8 4s4f$	E_{av}	211778.8	fixed		183501.6	1.1541
	$F^2(3d,3d)$	93301.4	119	4	110745.9	0.8425
	$F^4(3d,3d)$	60104.6	208	5	69080.2	0.8701
	$\alpha(3d)$	84.8	3	8	0.0	
	$\zeta(3d)$	905.0	5	1	893.6	1.0128
	$G^2(3d,4s)$	8816.3	158	7	11076.0	0.7960
$3d^8 4p4d$	E_{av}	244758.6	fixed		216481.4	1.1306
	$F^2(3d,3d)$	93638.6	120	4	111146.1	0.8425
	$F^4(3d,3d)$	60341.3	209	5	69352.4	0.8701
	$\alpha(3d)$	84.8	3	8	0.0	
	$\zeta(3d)$	907.5	5	1	896.1	1.0128
	$\zeta(4p)$	873.4	33	9	721.1	1.2112
	$F^2(3d,4p)$	17746.3	105	2	17927.6	0.9899
	$G^1(3d,4p)$	6222.8	92	11	6469.1	0.9619
	$G^3(3d,4p)$	5367.4	237	12	5539.4	0.9689
$3d^8 4s5p$	E_{av}	195045.6	fixed		166768.4	1.1696
	$F^2(3d,3d)$	93179.2	119	4	110600.7	0.8425
	$F^4(3d,3d)$	60019.6	208	5	68982.6	0.8701
	$\alpha(3d)$	84.8	3	8	0.0	
	$\zeta(3d)$	903.9	5	1	892.5	1.0128
	$\zeta(5p)$	182.9	7	9	151.0	1.2112
	$F^2(3d,5p)$	3559.6	21	2	3596.0	0.9899
	$G^2(3d,4s)$	8773.2	158	7	11021.9	0.7960
	$G^1(3d,5p)$	1184.8	89	3	1208.8	0.9802
	$G^3(3d,5p)$	1145.1	298	10	1074.9	1.0653
	$G^1(4s,5p)$	4181.2	6	6	5346.9	0.7820

Table A3. *Cont.*

Configuration	Parameter [a]	LSF [b]	STD [c]	Group [d]	HFR [e]	LSF/HF
Odd parity						
$3d^8 4s5f$	E_{av}	222119.6	fixed		193842.4	1.1459
	F^2(3d,3d)	93300.7	119	4	110745.0	0.8425
	F^4(3d,3d)	60104.1	208	5	69079.8	0.8701
	α(3d)	84.8	3	8	0.0	
	ζ(3d)	905.0	5	1	893.6	1.0128
	G^2(3d,4s)	8827.6	159	7	11090.3	0.7960

[a] All omitted single-configuration parameters were fixed at HFR values scaled by a factor of 0.80 for the direct and exchange electrostatic parameters F^k and G^k, and 1.0 for spin-orbit parameters ζ. All omitted configuration-interaction parameters were fixed at HFR values scaled by a factor of 0.94 in both parities;
[b] Parameter values determined in the least-squares fitting procedure (see Section 3);
[c] Standard deviation of the least-squares fitting;
[d] Parameters within each numbered group were linked together in the LSF procedure, so that the ratios to ab initio HFR values were the same for each parameter in the group;
[e] The ab initio Hartree-Fock-Relativistic parameter values as computed by Cowan's codes [52]. In this calculation, we included both relativistic and Breit corrections (in Cowan's codes, the latter affect only the average energies of configurations) and used the scaling factor of 1.0 for the exchange contribution.

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