Atomic Data and Nuclear Data Tables 126 (2019) 70–157

Contents lists available at ScienceDirect

Atomic Data and Nuclear Data Tables

journal homepage: www.elsevier.com/locate/adt

Multiconfiguration Dirac–Hartree–Fock energy levels, weighted oscillator strengths, transitions probabilities, lifetimes, hyperfine constants, Landé g-factors and isotope shifts of *Xe LIII*

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ARTICLE INFO

Article history:
Received 1 March 2018
Received in revised form 4 April 2018
Accepted 19 April 2018
Available online 2 August 2018

Keywords:
Multiconfiguration Dirac–Hartree–Fock
Relativistic configuration interaction
Transition probability
Hyperfine constants
Landé g_J factors
Isotope shifts

ABSTRACT

Energy levels, weighted oscillator strengths and transition probabilities, lifetimes, hyperfine interaction constants, Landé g_J factors and isotope shifts are calculated for all levels of $1s^2$ and $1snl$ ($n = 2 - 7$) configurations of He-like xenon ion (*Xe LIII*). Multiconfigurational Dirac–Hartree–Fock (MCDHF) method is adopted for calculating these spectroscopic data. Comparisons are made with similar data obtained with FAC (Flexible Atomic Code) to assess the accuracy of the results. Transition probabilities are reported for all $E1$, $E2$, $M1$ and $M2$ transitions from the ground level. Breit interactions and quantum electrodynamics effects are estimated in extensive Relativistic Configuration Interaction (RCI) calculations. Comparisons were made with the available data in the literature and good agreement was found which confirms the reliability of our results. The accuracy of the present calculations is high enough to facilitate identification of many observed spectral lines. Almost all atomic data of He-like xenon ion presented in this paper are calculated for the first time.

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https://doi.org/10.1016/j.adt.2018.04.003
0092-640X/

Contents

1. Introduction

In recent years, there have been extensive spectroscopic studies, both experimental and theoretical, of helium isoelectronic sequence. An analysis of the spectra of solar, stellar and other astrophysical plasmas by many space missions, such as SOHO, Chandra and XMM Newton shows the presence of highly ionized atoms [1]. In addition, they are injected as impurities into tokamak plasmas [2,3]. In particular, high Z elements of the fifth period are being increasingly used as injected impurities for tokamak fusion plasmas. Also, the inert gas atoms show a significant importance in the diagnostics of laboratory plasmas. Furthermore, atomic data (namely energy levels, weighted oscillator strengths, radiative rates, lifetimes, hyperfine structure and landé g_j factors and isotope shifts) are required for many ions in order to estimate the power loss from the impurities in the forthcoming fusion reactors, such as ITER project [4].

In the last few years, various theoretical and experimental research for providing atomic data for He-like ions have been carried out. But for He-like Xe, a limited number of studies has been carried out for providing atomic data for higher levels. In a recent review, Saloman [5] has listed energy levels for many ions of xenon, but unfortunately there is a paucity of data for this ion of interest. These data are available at the National Institute of Standards and Technology (NIST) [6] database. Energy levels were calculated for the ground state and $n = 2$ singlet states of heliumlike ions with nuclear charges in the range $4 \leq Z \leq 92$ by Cheng et al. [7]. Plante et al. [8] performed relativistic all-order many-body calculations on the He-isoelectronic sequence in the range $Z = 5$–100 and included Breit energy and other higher order correction terms in their calculations. Drake [9] carried out extensive two-electron quantum electrodynamics (QED) calculations using a unified method. Indelicato [10] adopted the multi-configuration Dirac–Fock (MCDF) formalism to study the properties of He-like ions. Recently, energies and rates from $2s3p$–$1s2s$ transitions were calculated for 23 ions (He-like) in the range $Z = 14$–54 using multi-configuration Dirac–Fock wave functions by L. Natarajan et al. [11].

For correct interpretation of the experimentally observed spectra in the stellar and laboratory induced high-temperature plasmas, accurate theoretical data regarding the atomic transitions of highly ionized atoms are needed [12].

As previously published [13–15], we continue to focus on He-like ions. We report in this work the hereabove mentioned parameters for a comparatively larger number of levels/transitions by performing a large-scale multiconfiguration Dirac–Hartree–Fock

(MCDHF) [16] method to calculate the 97 lowest fine-structure levels for *Xe LIII*, in an effort to offer complete and consistent data sets of high accuracy. The calculations have been divided into two main groups, with even and odd parity. Also, wavelengths, weighted oscillator strengths, transition probabilities for the $E1, E2, M1$ and $M2$ radiations have been computed. Accurate interpretation of stellar spectra requires the knowledge not only of weighted oscillator strengths, but also of isotope shifts and hyperfine structures, since they cause an asymmetry and splitting of atomic transitions. So, hyperfine structures, Landé g_j factors and isotope shifts are also presented in this work.

We employ the FAC code [17] to compare some of these atomic data. The present MCDHF and FAC results are compared with each other and previous experimental and theoretical results, where available.

The configurations $1s^2$ and $1snl\,(n = 2\text{–}7, l \leq n-1)$ are included in this calculation. Breit interactions and quantum electrodynamics (QED) effects have been added. This computational approach enables us to present a consistent and improved data set of all important transitions of the *Xe LIII* spectrum, which are useful for identifying transition lines in further investigations.

2. Theoretical method

2.1. MCDHF/RCI approach

Our calculations are performed by means of two numerical Codes. First, we employ the GRASP2K code. This is a fully relativistic code based on the Multiconfiguration Dirac–Hartree–Fock (MCDHF) method in *jj*-coupling. This method is fully described in detail by Grant [18]. Therefore, we only introduce the essential features here.

The atom is represented by an atomic state functions (ASF), which is a linear combination of configuration state functions (CSFs),

$$\psi(\gamma PJM) = \sum_{j=1}^{N_{CSF}} c_j \Phi(\gamma_j PJM), \tag{1}$$

where c_j are the mixing coefficients for the configuration j, J and M are the angular quantum numbers and P is the parity. The label γ_j denotes appropriate information about the configuration state function j, such as parity, orbital occupancy and angular coupling scheme.

For the CSF, as $\Phi(\gamma_j PJM)$, it is an antisymmetrized linear combination of products of relativistic orbitals. One relativistic orbital can be expressed as,

$$\Phi(r) = \frac{1}{r}\begin{pmatrix} P_{n\kappa}(r) & \chi_{\kappa m}(r) \\ iQ_{n\kappa}(r) & \chi_{-\kappa m}(r) \end{pmatrix}, \tag{2}$$

where κ is the relativistic spherical symmetry quantum number, m is the magnetic quantum number, n is the principal quantum number, $P_{n\kappa}(r)$ and $Q_{n\kappa}(r)$ are the large and small component radial wavefunctions, and $\chi_{\kappa m}(r)$ is the spinor spherical harmonic in the *lsj* coupling scheme.

These relativistic orbitals can be generated by using an appropriate Hamiltonian. In our MCDHF calculations, the Dirac–Coulomb Hamiltonian can be described as,

$$H_{DC} = \sum_{i=1}^{N}(c\alpha_{\mathbf{i}}.\mathbf{p_i} + (\beta_i - 1)c^2 + V(r_i)) + \sum_{i>j}^{N}\frac{1}{r_{ij}}, \tag{3}$$

where $V(r_i)$ is the nuclear potential at radius r, α and β are the 4×4 Dirac matrices, $\mathbf{p_i}$ is the momentum operator of the electron i and c is the speed of light in atomic units. The first term describes the electron kinetic energy and the electron–nucleus interaction, and the second term is the two-body Coulomb interactions between the electrons.

Once a set of radial orbitals like $P_{n\kappa}(r)$ and $Q_{n\kappa}(r)$ has been obtained by self-consistent field procedure, they are used to determine the expansion coefficients of the CSFs by diagonalizing the Hamiltonian matrix.

The transverse interaction in the low-frequency limit, or the Breit interaction [19],

$$H_{Breit} = -\sum_{i<j}^{N}\frac{1}{2r_{ij}}[\alpha_i.\alpha_j + \frac{(\alpha_i.r_{ij})(\alpha_j.r_{ij})}{r_{ij}^2}], \tag{4}$$

and leading quantum electrodynamic (QED) effects (vacuum polarization and self-energy) have been included in subsequent configuration interaction (RCI) calculations, where optimization is on a weighted sum of energies. At the end, a transformation from *jj*- to *LS*-coupling [20] can be done for practical purposes.

2.2. Transition parameters

Transition parameters, such as transition rates or weighted oscillator strengths, between two states γPJ and $\gamma' P'J'$ can be described in terms of the reduced transition matrix element,

$$\langle \psi(\gamma PJ) \| Q_k^{(\lambda)} \| \psi(\gamma' P'J') \rangle, \tag{5}$$

where $Q_k^{(\lambda)}$ is the electromagnetic multipole operator of order k in Coulomb or Babushkin gauges [21]. The superscript designates the type of multipole: $\lambda = 1$ for electric multipoles and $\lambda = 0$ for magnetic multipoles. In cases where the wave functions of the two states $\gamma' P'J'$ and γPJ have been separately determined, the radial orbitals are not orthogonal. To deal with this complication, a transformation to a biorthonormal orbital basis was applied [22]. In the new representation, the evaluation of the matrix element has been done using standard Racah algebra techniques.

In order to ensure a rigorous accuracy assessment of results of energy levels and transition probabilities, we have performed another calculation with the widely used FAC code of Gu [17]. It is also a fully relativistic code which has higher efficiency. It enables user to carry out large-scale computations and allows finding various atomic parameters. It uses a modified Dirac–Fock–Slater central-field potential that includes an approximate treatment of the exchange interaction.

2.3. Hyperfine structure and Landé g_j factors

The hyperfine interaction is caused by the interaction between the electrons and the electromagnetic multipole moments of the nucleus, and its Hamiltonian can be represented using the spherical tensor operators $\boldsymbol{T}^{(k)}$ and $\boldsymbol{M}^{(k)}$ [23],

$$H_{\rm hfs} = \sum_{k\geq 1} \boldsymbol{T}^{(k)} \cdot \boldsymbol{M}^{(k)}. \tag{6}$$

Here, $k = 1$ and $k = 2$ represent the magnetic dipole and electric quadrupole interactions, respectively. For a N-electron atom, the electronic tensor operators $\boldsymbol{T}^{(1)}$ and $\boldsymbol{T}^{(2)}$ are the sums of the one-electron operators $t^{(k)}$,

$$\boldsymbol{T}^{(1)} = \sum_{j=1}^{N} \boldsymbol{t}^{(1)}(j) = \sum_{j=1}^{N} -i\alpha\left(\boldsymbol{\alpha}_j \cdot \mathbf{l}_j \mathbf{C}^{(1)}(j)\right) r_j^{-2} \tag{7}$$

and

$$\boldsymbol{T}^{(2)} = \sum_{j=1}^{N} \boldsymbol{t}^{(2)}(j) = \sum_{j=1}^{N} -\mathbf{C}^{(2)}(j) r_j^{-3}. \tag{8}$$

Here, i is the imaginary unit, α is the fine-structure constant, $\boldsymbol{C}^{(1)}$ and $\boldsymbol{C}^{(2)}$ are spherical tensor operators, and $\mathbf{l}$ is the orbital angular momentum operator. The nuclear tensor operators $\boldsymbol{M}^{(1)}$ and $\boldsymbol{M}^{(2)}$ are related to magnetic dipole moment μ_I and electronic quadrupole moment Q_I of the nucleus with spin I through [24]

$$\mu_I = \langle IM_I(=I)|\boldsymbol{M}_0^{(1)}|IM_I(=I)\rangle \tag{9}$$

and

$$Q_I = \langle IM_I(=I)|\boldsymbol{M}_0^{(2)}|IM_I(=I)\rangle. \tag{10}$$

The nuclear magnetic dipole moments μ_I and the nuclear quadrupole moments Q_I for the different isotopes have been taken from a compilation by Stone [25].

According to perturbation theory, the magnetic dipole and the electric quadrupole A_J and B_J are [24]

$$A_J = \frac{\mu_I}{I}\frac{1}{[J(J+1)]^{1/2}}\langle\Psi(PJ)\|\boldsymbol{T}^{(1)}\|\Psi(PJ)\rangle \tag{11}$$

and

$$B_J = 2Q\left[\frac{J(2J-1)}{(J+1)(2J+3)}\right]^{1/2}\langle\Psi(PJ)\|\boldsymbol{T}^{(2)}\|\Psi(PJ)\rangle. \tag{12}$$

The Landé g_j factors are given by

$$g_J = \frac{2}{\sqrt{J(J+1)}}\langle\gamma J\|\sum_{j=1}^{N} -i\frac{\sqrt{2}}{2\alpha^2}r_j(\boldsymbol{\alpha}_j\mathbf{C}_j^{(1)})^{(1)} + \frac{g_s-2}{2}\beta_j\Sigma_j\|\gamma J\rangle, \tag{13}$$

where i is the imaginary unit, Σ the relativistic spin-matrix and $g_s = 2.00232$ the g-factor of the electron spin corrected for QED effects. The Landé g_j factors determine the splitting of magnetic sub-levels in external magnetic fields. In addition they give information about the coupling conditions in the system [26].

2.4. Isotope shift

The isotope shift (IS) for an atomic energy level is composed of the field shift (FS) and the mass shift (MS). The field shift, arising from the difference in the charge distribution between two isotopes with mass number A and A' ($A > A'$), is given in the approximation of the first-order perturbation theory by [27,28]

$$\Delta E_{FS}^{A,A'} = \langle\Psi(PJM)|\sum_i \delta V_i^{N,AA'}|\Psi(PJM)\rangle. \tag{14}$$

Here, $\delta V^{N,AA'} = V^{N,A} - V^{N,A'}$ and the nuclear potential V^N for each isotope is produced by a two-parameter Fermi nuclear model [29,30]. Neglecting the higher-order nuclear moments [31], Eq. (14) is further simplified to

$$\Delta E_{FS}^{A,A'} = F\delta\langle r^2\rangle^{A,A'}, \tag{15}$$

where

$$F_k = \frac{2\pi}{3}\left(\frac{Ze^2}{4\pi\epsilon_0}\right)\Delta|\Psi(\mathbf{0})|_k^2 \tag{16}$$

is the field-shift factor proportional to the total electron probability density at the origin between the levels l and u,

$$\Delta|\Psi(\mathbf{0})|_k^2 = \Delta\rho_k^e(0) = \rho_u^e(0) - \rho_l^e(0) \tag{17}$$

and $\delta\langle r^2\rangle^{A,A'}$ is the difference of the nuclear charge mean square radius between these two isotopes.

The mass shift between two isotopes A and A', caused by the motion of nucleus with the finite mass, is expressed as [32,33]

$$\Delta E_{MS}^{A,A'} = \frac{M'-M}{MM'}K_{MS}. \tag{18}$$

Here, M and M' are the nuclear masses for isotopes A and A', respectively. The electronic factor K_{MS} is defined by

$$\frac{K_{MS}}{M} \equiv \langle\Psi(PJM)|H_{MS}|\Psi(PJM)\rangle, \tag{19}$$

where

$$H_{MS} = \frac{1}{2M}\sum_{i,j}\boldsymbol{p}_i\cdot\boldsymbol{p}_j. \tag{20}$$

The mass shift operator (Eq. (20)) can be split into two parts, that is, the one-body and the two-body mass shift operators

$$H_{NMS} = \frac{1}{2M}\sum_i p_i^2 \tag{21}$$

$$H_{SMS} = \frac{1}{2M}\sum_{i\neq j}\boldsymbol{p}_i\cdot\boldsymbol{p}_j, \tag{22}$$

which are also called the normal mass shift (NMS) and the specific mass shift (SMS) operator, respectively.

3. Method of calculations

The MCDHF/RCI calculations have been performed in the extended optimal level (EOL) scheme for each group of atomic states using configuration expansions including all lower states of the same parity and symmetry. For the optimization of the orbitals, Dirac–Coulomb version has been used, including Breit corrections in a final configuration interaction calculation.

To build a CSF expansion, the restrictive active space methods have been also used. The idea of the active space methods is to consider only electrons from the active space and to excite them from the occupied orbitals to unoccupied ones. The orbital has been increased systematically in order to monitor the convergence of the calculation. Since the orbitals with the same principal quantum number n often have similar energies, the active set is usually enlarged in steps of orbital layers. It is convenient to refer to the $\{1s, 2s, 2p, 3s, 3p, 3d, 4s, 4p, 4d, 4f\}$ set of orbitals as the $n = 4$ orbital layer, $\{1s, 2s, 2p, \ldots, 5s, 5p, 5d, 5f, 5g\}$ as the $n = 5$ layer, etc. We increase the AS in a systematic way to ensure the convergence of the atomic parameters under consideration. Only the outermost nl-orbitals are optimized while the inside ones are fixed. For example, the total number of CSF in the active set of $n = 8$ is 3896 for even configurations and 3560 for odd configurations. For the active set of $n = 9$, the number of CSF increases to 6104 and 5490 for even and odd, respectively. For the last active set of consideration $n = 10$, the number will be 8824 and 7854 for even and odd, respectively. So, we can deduce that larger orbital sets can result in a considerable increase of computational time required for the problem, and appropriate restrictions may be necessary.

We have divided up the calculations into two parts, one where we optimized a set of orbitals for the even states and one for the odd states, i.e. the upper and lower states have been described by two independently optimized sets of orbitals. Because of this, we have to use biorthogonal transformation of the atomic state functions ASF to calculate the transition parameters. Radiative transition characteristics have been calculated for $E1$, $M1$, $E2$ and $M2$ transitions, following the relativistic configuration-interaction RCI calculation in which both the Breit interaction and the other corrections to the DC Hamiltonian are included.

4. Results and data evaluation

In the following subsections, the results of the calculations are presented, and compared with values available from the literature. The identification of the levels is based on the LS composition obtained by transforming from $jj-$ to $LS-$coupling schemes using the *jj2lsj* tool integrated in the new release of GRASP2K [16].

4.1. Energy levels

The calculated energy levels of $1s^2$, $1s2l$, $1s3l$, $1s4l$, $1s5l$, $1s6l$ and $1s7l$ configurations for the He-like xenon have been tabulated in Table 1, which generate up to 97 levels. These calculations are performed by means of two codes FAC and GRASP2K. The first column of results show the results from the FAC code. The other columns of GRASP1, GRASP2 and GRASP3 show the results from the GRASP2K code. The former results are calculated as function of increasing active sets with single excitations. All the calculated energy levels have been compared with experimental values. It is obvious that, when the active space is expanded to $n = 8$ (GRASP1) and $n = 9$ (GRASP2), the energy levels deviate very largely from experimental values taken from the National Institute of Standards and Technology NIST compilation [6], which is entirely based on the data listed by Ref [5]. When the active space set is expanded to $n = 10$ (GRASP3), the calculated energy levels are substantially improved. So, we can clearly find that, with the increasing of active space set, the calculated energy levels are closer to experimental values.

The average difference between the GRASP3 values and NIST is 0.002% for the 8 states listed in the NIST database. The average difference between the calculated FAC and GRASP3 level energies is within 0.006% for all 97 states in *Xe LIII* while the average difference between the calculated FAC and NIST database level energies is 0.007%. Small discrepancies can be observed in the GRASP and FAC energies mainly arise due to the different ways of calculations of electron wave-functions for radial orbitals and recoupling schemes of angular parts. Since some of energy levels are not available on NIST, our energy levels GRASP3 should be adopted in modelling applications. We may state that overall there is no discrepancy between theory and experiment and the results of GRASP3 are in good agreement with the experimental values for the energy levels of *Xe LIII*.

We compare also the lifetimes from the two calculations from the FAC and GRASP2K codes. Some large discrepancies have found for some levels like $1s\,2s\ ^1S_0$, $1s\,2p\ ^3P^o_2$, $1s\,2p\ ^1P^o_1$ when the differences are 14.54%, 6.62% and 7.00% respectively. For the others values the percentage do not exceed 2% for the almost levels.

We list in Table 2, the *LSJ* coupling percentage compositions for all levels of interest. The level composition in LSJ coupling values show that, the major contributions to the total wave function of a given level are those coming from the same configuration.

4.2. Radiative rates

The weighted oscillator strengths g_if_{ij} are related to the transition probabilities A_{ji} for a transition from i to j by the following expression

$$g_if_{ij} = \frac{mc}{8\pi^2e^2}\lambda_{ji}^2 g_jA_{ji} = 1.49\times10^{-16}\lambda_{ji}^2 g_jA_{ji}, \tag{23}$$

where m and e are the electron mass and charge, respectively, c is the velocity of light, λ_{ji} is the wavelength in Å, g_i and g_j are the statistical weights of the lower (i) and upper (j) levels, respectively. Similarly, the weighted oscillator strength g_if_{ij} and the line strength S are related by the standard equation for the electric dipole $E1$-transitions,

$$A_{ji} = \frac{2.0261\times10^{18}}{g_j\lambda_{ji}^3}S^{E1} \quad and \quad g_if_{ij} = \frac{303.75}{\lambda_{ji}}S^{E1} \tag{24}$$

for the magnetic dipole $M1$-transitions,

$$A_{ji} = \frac{2.6974\times10^{13}}{g_j\lambda_{ji}^3}S^{M1} \quad and \quad g_if_{ij} = \frac{4.044\times10^{-3}}{\lambda_{ji}}S^{M1} \tag{25}$$

for the electric quadrupole $E2$-transitions,

$$A_{ji} = \frac{1.1199\times10^{18}}{g_j\lambda_{ji}^5}S^{E2} \quad and \quad g_if_{ij} = \frac{167.89}{\lambda_{ji}^3}S^{E2} \tag{26}$$

and for the magnetic quadrupole $M2$-transitions,

$$A_{ji} = \frac{1.4910\times10^{13}}{g_j\lambda_{ji}^5}S^{M2} \quad and \quad g_if_{ij} = \frac{2.236\times10^{-3}}{\lambda_{ji}^3}S^{M2}. \tag{27}$$

Below, we present and discuss our determined gf-values and A-values for transitions in *Xe LIII* for all types of transitions $E1$, $E2$, $M1$ and $M2$ of all levels of energies in interest $1s^2$ and $1snl$ (n = 2–7). The effects of Breit and QED corrections are assessed by our calculations. We should mention that for the GRASP2K calculation, the active set is expanded to $n = 10$ (GRASP3) and only the length form for transition probabilities has tabulated in Tables 3–6. We present in these tables the wavelengths, weighted oscillator strengths g_if_{ij} and radiative rates A_{ji} for 1054 electric dipole $E1$, 1389 electric quadrupole $E2$, 1012 magnetic dipole $M1$ and 1430 magnetic quadrupole $M2$ transitions among the 97 levels of *Xe LIII* calculated with GRASP2K and FAC codes. However, for these transitions only the gf-values and A-values are listed and the corresponding results for S-values can be easily obtained. We also present the uncertainty of the electric transitions dT to provide an additional indicator of the accuracy of our GRAPS2K results in Tables 3 and 4.

We compare our calculated transition energy of the $1s\,2s\ ^3S_1$–$1s\,2p\ ^3P^o_2$ (3756964 cm^{-1}) transition with the experimental value measured by S. Martin [34] (3750 937 cm^{-1}) and other theoretical results elaborated by Indelicato [35] (3752 138 cm^{-1}) and Drake [9] (3751 576 cm^{-1}). Moreover, the calculated wavelength of the former transition is 26.617 Å where the experimental value is 26.66 Å. We state that the differences are minor. Furthermore, our calculated wavelengths compared to the data from the NIST database shows a good agreement such as the case of transitions $1s^2\ ^1S_0$–$1s\,2p\ ^3P^o_1$ (0.4104 Å) and $1s^2\ ^1S_0$–$1s\,2p\ ^1P^o_1$ (0.4047 Å).

For almost, all strong transitions (those with $gf \geq 0.01$), the gf values and A-values from GRASP2K agree to better than 10% with those of FAC, which is satisfactory. Moreover, for many strong transitions, the difference between both velocity and length forms, does not exceed 2%, giving its credit to the accuracy of calculations of wave functions from GRASP2K. To confirm that, we have plotted in Fig. 1, the uncertainty dT as a function of transition rates of type $E1$.

We remind that the uncertainty dT is generated by only the GRASP2K code and it is expressed by

$$dT = \frac{|A_l - A_v|}{max(A_l, A_v)}, \tag{28}$$

where A_l and A_v are the transition rates calculated in length and velocity gauges, respectively.

However, for some weak transitions ($gf < 0.01$), the situation is more unclear such as the $1s\,2s\ ^3S_1$–$1s\,4f\ ^3F^o_2$ transition (gf = 3.265 × 10^{-09}) for the transition of type $E1$, the difference between two sets of A-values is large. We note also that we have large difference in some transitions because their transition energy is very small, such as $1s\,3p\ ^3P^o_1$–$1s\,3s\ ^1S_0$, $1s\,4p\ ^3P^o_1$–$1s\,4s\ ^1S_0$ and $1s\,5p\ ^3P^o_1$–$1s\,5s\ ^1S_0$ for the type of $E1$ transitions and the same case for $E2$, $M1$ and $M2$ transitions. Hence, a slight variation in $\triangle E$ has a considerable effect on the values of A. Moreover, the contribution of the A-values for weak transitions that required in modelling applications is (generally) small in comparison to the stronger transitions.

Therefore, on the basis of these comparisons and the above discussion, we may state that for a majority of strong $E1$, $E2$, $M1$ and $M2$ transitions, our radiative rates are accurate to better than 10%. However, for the weak transitions, this assessment of accuracy is not applied.

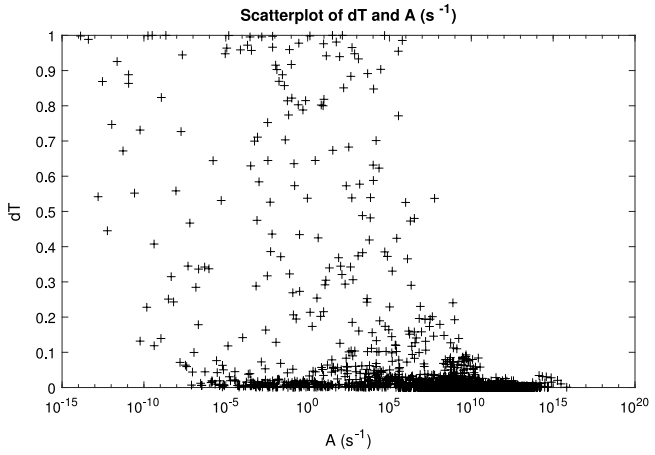

Fig. 1. The uncertainty dT by the GRASP2K code between the velocity and length forms of E1 transition rates as function of E1 transition rates A.

4.3. Lifetimes

The lifetime τ for a level j is defined as follows

$$\tau_j = \frac{1}{\sum_i A_{ji}}. \quad (29)$$

Since this is a measurable parameter. It provides a check on the accuracy of the calculations. Therefore, in Table 1 we have also listed our calculated lifetimes from the GRASP2K code, which include the contributions from four types of transitions: $E1, E2, M1$ and $M2$. To our knowledge, neither calculations nor measurements were determined for *Xe LIII* ion. We hope the present results will be useful for future comparisons and may encourage experimentalists to measure their lifetimes.

4.4. Hyperfine structure and Landé g_j factors

The calculation of the hyperfine interaction constants and Landé g_j factors have been performed only with the GRASP2K code. In the case of our ion *Xe LIII*, the constants for the spin I, magnetic dipole moments μ_I and the nuclear quadrupole moment Q_I were taken $1.5, 0.691 \times \mu_N$ and -0.1 barn, respectively. μ_N is the nuclear magneton.

The active set (AS) is considered up to $n = 10$ and $l = 7$ for all the configurations of interest $1snl$ ($n = 1$–7). We list in Table A some of results of calculation of the magnetic dipole A and electric quadrupole B hyperfine interaction constants and Landé g_j factors for the four lowest states $1s\,2s\ ^3S_1$, $1s\,2p\ ^3P^o_1$, $1s\,2p\ ^3P^o_2$ and $1s\,2p\ ^1P^o_1$ to study the effect of increasing the AS in the hyperfine structure and the Landé g_j factors. We observe that the variation is minor. We can state that no influence of increasing set in the calculation of these hyperfine interaction constants.

In Table 7, we tabulate the hyperfine structure and Landé g_j factors for all levels of interest.

We have been unable to compare our predicted results of the hyperfine structure and Landé g_j factors with any other experimental or theoretical results because the required results are missing. However, our accurate values of Landé g_j factors and hyperfine structure constants are of great interest for atomic spectroscopy researchers.

4.5. Isotope shifts

The isotope shift and the electron densities at the nucleus parameters are calculated in a first-order perturbation theory using the MCDHF/RCI atomic state functions as the zero-order wavefunctions. In Table B, we start by studying the effect of increasing the active set (AS) up to $n = 10$. For that, seven lowest levels $1s^2\ ^1S_0$, $1s\,2s\ ^3S_1$, $1s\,2p\ ^3P^o_1$, $1s\,2p\ ^3P^o_0$, $1s\,2s\ ^1S_0$, $1s\,2p\ ^3P^o_2$ and $1s\,2p\ ^1P^o_1$ are chosen for consideration. No major effect is observed with increasing the active set. All calculations are performed with increasing the reference configurations up to $n = 7$ when the active set AS is enlarged step by step up to $n = 10$ and $l = 7$. Moreover, all these parameters are displayed in Table 8 for all the known levels belonging to the configurations $1s^2$ and $1snl$ with $n = 2$–7, $l \leq 6$.

We plot the calculated specific mass shifts (SMS) using the GRASP2K code, only for the ground state $1s^2$ with increasing the active set AS up to $n = 10$ in Fig. 2. The result is compared with previous works, MCDF [36], MCHF [36] and Drake [9]. Our result matches well with the result of the MCDF work which proves the reliability of results. The difference with the other results can be explained by the different ways of calculation of codes. The GRASP2K and MCDF are considered as a relativistic codes while MCHF is a non relativistic one. The difference between the results of the two relativistic codes does not exceed 2.2% but the differences with the MCHF and Drake are approximately 15%.

Table A
Calculated values using the GRASP2K code of magnetic dipole A, electric quadrupole B and Landé g-factors with increasing the active set to $n = 10$ (GRASP3).

AS	$1s\,2s\ ^3S_1$	$1s\,2p\ ^3P^o_1$	$1s\,2p\ ^3P^o_2$	$1s\,2p\ ^1P^o_1$
Magnetic dipole A (in MHz)				
$n = 3$	1.328E7	1.218E7	5.963E6	−5.633E6
$n = 4$	1.328E7	1.218E7	5.963E6	−5.633E6
$n = 5$	1.328E7	1.218E7	5.963E6	−5.633E6
$n = 6$	1.328E7	1.218E7	5.963E6	−5.633E6
$n = 7$	1.328E7	1.218E7	5.963E6	−5.633E6
$n = 8$	1.328E7	1.218E7	5.964E6	−5.629E6
$n = 9$	1.328E7	1.218E7	5.965E6	−5.633E6
$n = 10$	1.329E7	1.218E7	5.965E6	−5.636E6
Electric quadrupole B (in MHz)				
$n = 3$	−2.062	4603	−64830	−34880
$n = 4$	−1.8	4614	−64830	−34820
$n = 5$	−1.048	4615	−64830	−34810
$n = 6$	−0.7197	4550	−64810	−34820
$n = 7$	−0.5684	4561	−64810	−34820
$n = 8$	−0.4849	4475	−65310	−35650
$n = 9$	5.223	4480	−64910	−35320
$n = 10$	1.941	4527	−64660	−34880
Landé g-factors				
$n = 3$	1.93514	1.28539	1.459	1.15044
$n = 4$	1.93515	1.28538	1.45899	1.15047
$n = 5$	1.93515	1.28538	1.45899	1.15047
$n = 6$	1.93515	1.28539	1.45899	1.15047
$n = 7$	1.93515	1.28539	1.45899	1.15047
$n = 8$	1.93515	1.28532	1.45904	1.15036
$n = 9$	1.93516	1.28523	1.45905	1.15054
$n = 10$	1.93517	1.28519	1.45897	1.15063

5. Conclusion

In the present study, fine structure energy levels, wavelengths, weighted oscillator strengths, transition probabilities for $E1$, $E2$, $M1$ and $M2$ transitions among 97 energy levels belonging to He-like xenon are presented. Additionally, lifetimes, hyperfine structure constants, Landé g_j factors and isotope shifts have been reported, although no measurements or other theoretical results are available for comparison except one work treating the calculation of only the ground state $1s^2\ ^1S_0$. The self-consistent field approximation and the Breit interaction Hamiltonian as well as QED effects have been included in the calculations to improve the generated wave functions. The calculated energy levels, weighted

Table B
Calculated values using the GRASP2K code of normal, specific mass shifts and electron densities at the nucleus for the seven lowest levels with increasing active set AS up to $n = 10$.

AS	$1s^2\ ^1S_0$	$1s\,2s\ ^3S_1$	$1s\,2p\ ^3P^o_1$	$1s\,2p\ ^3P^o_0$	$1s\,2s\ ^1S_0$	$1s\,2p\ ^3P^o_2$	$1s\,2p\ ^1P^o_1$
Normal mass shift NMS (a.u.)							
$n = 3$	2862.371	1818.908	1816.760	1815.086	1816.736	1803.102	1802.086
$n = 4$	2862.365	1819.197	1816.720	1815.010	1815.793	1803.182	1801.819
$n = 5$	2862.337	1819.261	1816.695	1814.981	1815.592	1803.179	1801.750
$n = 6$	2862.332	1819.284	1816.689	1814.974	1815.522	1803.185	1801.726
$n = 7$	2862.328	1819.295	1816.686	1814.971	1815.488	1803.186	1801.717
$n = 8$	2862.349	1819.317	1818.194	1816.601	1815.483	1804.312	1803.566
$n = 9$	2862.115	1819.47	1817.501	1815.864	1815.214	1803.816	1802.661
$n = 10$	2862.115	1819.58	1817	1815.49	1815.192	1803.659	1802.099
Specific mass shift SMS (a.u.)							
$n = 3$	8.717903	0.5995701	−80.16853	−195.2675	2.357866	−205.907	83.54837
$n = 4$	8.70804	0.6207144	−80.2113	−195.2448	2.119602	−205.9269	83.36892
$n = 5$	8.680987	0.6271347	−80.20777	−195.2282	2.042898	−205.9166	83.34515
$n = 6$	8.663317	0.6302334	−80.15193	−195.1577	2.007405	−205.89	83.36138
$n = 7$	8.65289	0.6318741	−80.15315	−195.1561	1.988378	−205.8906	83.35634
$n = 8$	8.651809	0.6336825	−80.89982	−197.0734	1.980105	−207.2639	84.04787
$n = 9$	8.580615	0.65771	−80.56291	−196.2107	1.67668	−206.4653	83.54352
$n = 10$	8.37281	0.65445	−80.2194	−195.3285	1.61861	−205.8238	83.21168
Electron densities at the nucleus (a.u.)							
$n = 3$	235656.3	136365.8	120103	119991.8	136038.1	119543.4	119715.1
$n = 4$	235660.7	136377.1	120099.6	119989.3	136019.9	119540.7	119710.3
$n = 5$	235658.2	136379.7	120096.3	119986.4	136016	119537.7	119706.4
$n = 6$	235657.7	136380.8	120095.9	119986	136015.2	119537.4	119705.8
$n = 7$	235657.2	136381.3	120095.5	119985.7	136014.9	119537	119705.2
$n = 8$	235659.3	136382.9	120102.9	119998	136016.1	119534.3	119697.6
$n = 9$	235598.7	136395.2	120130	120023.1	136025.1	119570.9	119733.3
$n = 10$	235581.5	136426.2	120162.2	120117.3	136014.9	119664.2	119832.8

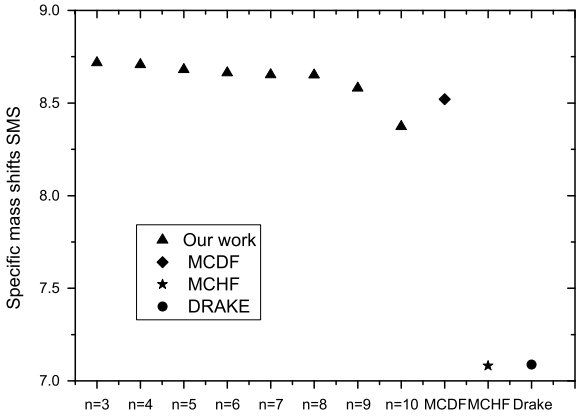

Fig. 2. Comparison of specific mass shifts (in a.u.) for the ground state $1s^2\ ^1S_0$ with previous works MCDF [36], MCHF [36], Drake [9].

oscillator strengths and all radiative transitions show a good agreement with other published results from the literature. In addition, we have obtained some new data for the hyperfine structure constants, Landé g_j factors and isotope shifts for this ion. The present data sets are believed to be the most comprehensive and accurate ones to date for *Xe LIII*. Our results are expected to be useful for many applications such as controlled thermonuclear fusion, laser and plasma physics as well as astrophysics.

Acknowledgements

PQ is Research Director of the Belgian National Fund for Scientific Research F.R.S.-FNRS (FC 49142). Financial support from this organization is gratefully acknowledged. Also, this work has been realized with the financial support of the Tunisian Ministry of Higher Education and Scientific Research (LR16CNSTN02).

References

[1] E. Landi, P.R. Young, K.P. Dere, G. Del Zanna, H.E. Mason, Astrophys. J. 109 (2013) 86.
[2] F.P. Keenan, S.M. McCann, Solar Phys. 109 (1987) 01.
[3] K.J.H. Phillips, F.P. Keenan, L.K. Harra, S.M. McCann, E. Rachlew-Kallne, J.E. Rice, M. Wilson, J. Phys. B: At. Mol. Opt. Phys. 27 (1994) 10.
[4] A.J.H. Donne, et al., Nucl. Fusion 47 (2007) S337.
[5] E.B. Saloman, J. Phys. Chem. Ref. Data 33 (2004) 765.
[6] A. Kramida, Yu. Ralchenko, J. Reader, NIST ASD Team, NIST Atomic Spectra Database (ver. 5.5.2), National Institute of Standards and Technology, Gaithersburg, MD, 2018. [Online]. Available: https://physics.nist.gov/asd [2018, February 20].
[7] K.T. Cheng, M.H. Chen, W.R. Johnson, J. Sapirstein, Phys. Rev. A 50 (1994) 247.
[8] D.R. Plante, W.R. Johnson, J. Sapiretein, Phys. Rev. A 49 (1994) 3519.
[9] G.W.F. Drake, Can. J. Phys. 66 (1988) 586.
[10] P. Indelicato, Nucl. Instrum. Methods Phys. Res. B 31 (1988) 14.
[11] L. Natarajan, A. Natarajan, Phy. Rev. A 79 (2009) 062513.
[12] K.P. Dere, Astrophys. J. 221 (1978) 1062.
[13] D.E. Salhi, H. Jelassi, Procedings of the 13th Arab Conference on the Peaceful Uses of Atomic Energy, 18–22 December 2016, Hammamet, Tunisia.
[14] D.E. Salhi, H. Jelassi, Can. J. Phys. 96 (3) (2018) 343–352.
[15] D.E. Salhi, H. Jelassi, Orient. J. Phys. Sci. 2 (2) (2017).
[16] P. Jönsson, G. Gaigalas, J. Bieron, C. Froese Fischer, I.P. Grant, Comput. Phys. Comm. 184 (2013) 2197.
[17] M.F. Gu, Can. J. Phys. 86 (2008) 5.
[18] I.P. Grant, Relativistic Quantum Theory of Atoms and Molecules, Springer, New York, 2007.
[19] B.J. McKenzie, I.P. Grant, P.H. Norrington, Comput. Phys. Comm. 21 (1980) 02.
[20] G. Gaigalas, T. Zalandauskas, Z. Rudzikas, Data Nucl. Data Tables 84 (2003) 02.
[21] I.P. Grant, J. Phys. B 7 (1974) 1458.
[22] J. Olsen, M.R. Godefroid, P. Jönsson, P.A. Malmqvist, C. Froese Fischer, Phys. Rev. E 52 (1995) 4499.
[23] C. Schwartz, Phys. Rev. 97 (1955) 380.
[24] P. Jönsson, F.A. Parpia, C.F. Fischer, Comput. Phys. Comm. 96 (1996) 301.
[25] N.J. Stone, At. Data Nucl. Data Tables 90 (2005) 75.
[26] C. Froese Fischer, P. Jönsson, J. Mol. Struct.: Theochem. 537 (2001) 55.
[27] S.A. Blundell, P.E.G. Baird, C.W.P. Palmer, D.N. Stacey, G.K. Woodgate, J. Phys. B: At. Mol. Phys. 20 (1987) 3663.
[28] G. Torbohm, B. Fricke, A. Rosén, Phys. Rev. A 31 (1985) 2038.
[29] F.A. Parpia, A.K. Mohanty, Phys. Rev. A 46 (1992) 3735.

[30] J.G. Li, C. Nazé, M. Godefroid, S. Fritzsche, G. Gaigalas, P. Indelicato, P. Jönsson, Phys. Rev. A 86 (2012) 022518.
[31] E.C. Seltzer, Phys. Rev. 188 (1969) 1916.
[32] C.W.P. Palmer, J. Phys. B: At. Mol. Phys. 20 (1987) 5987.
[33] E. Gaidamauskas, C. Nazé, P. Rynkun, G. Gaigalas, P. Jönsson, G. Gaigalas, J. Phys. B: At. Mol. Opt. Phys. 44 (2011) 175003.
[34] S. Martin, J.P. Buchet, M.C. Buchet-Poulizac, A. Denis, J. Desesquelles, M. Druetta, J.P. Grandin, D. Hennecart, X. Husson, D. Lecler, Europhys. Lett. 10 (7) (1989) 645–649.
[35] P. Indelicato, D. Gorceix, J.P. Desclaux, J. Phys. B 20 (1987) 651.
[36] M.I. Bhatti, M. Bucardo, W.F. Perger, J. Phys. B: At. Mol. Opt. Phys. 34 (2001) 223–231.

Explanation of Tables

Table 1. **Energies (E in cm^{-1}) relative to the ground state for the lowest 97 levels arising from the $1s^2$ and $1snl$ with $n = 2$–7 configurations of *Xe LIII*. Two calculations are performed using FAC and GRASP2K and compared with data from NIST database. The GRASP1, GRASP2 and GRASP3 are determined respectively with increasing the active set (AS) up to $n = 8$, $n = 9$ and $n = 10$. The last two columns denote the lifetimes (in s^{-1}) obtained from our FAC and GRASP2K calculations.**

Configuration	Configuration of energy level
Level	Configuration of energy level
FAC	Energy levels calculated with the FAC code
GRASP1	Energy levels calculated with the GASP2K code up to $n = 8$
GRASP2	Energy levels calculated with the GASP2K code up to $n = 9$
GRASP3	Energy levels calculated with the GASP2K code up to $n = 10$
NIST	Energy levels compiled by the NIST database
Lifetimes (GRASP2K)	compilation or from current literature
Lifetimes (FAC)	Lifetimes calculated with the FAC code
Lifetimes (GRASP2K)	Lifetimes calculated with the GRASP2K code

Table 2. **Calculated values using the GRASP2K code of the composition in LSJ coupling for all levels of interest with increasing the active set to $n = 10$ (GRASP3).**

Level	Configuration of the level of energy
Composition in LSJ coupling	Composition in LSJ coupling for each level of energy

Table 3. **Electric dipole transitions $E1$ calculated with GRASP2K and FAC for all $n = 1$–7 configurations. For the GRASP2K calculation, the active set is expanded to $n = 10$ (GRASP3) and only the length form is considered. A comparaison between the wavelengths, weighted oscillator strengths and transition probabilities is given. The relative difference between transition rates in the velocity and length gauge is given in the last column by dT.**

Lower	Lower state of energy
Upper	Upper state of energy
λ (Å)	Wavelengths calculated with the GRASP2K and FAC codes
gf	Weighted oscillator strengths calculated with the GRASP2K and FAC codes
A (s^{-1})	Electric dipole transitions $E1$ calculated with the GRASP2K and FAC codes
dT	Uncertainty between the transition rates in the velocity and length gauge

Table 4. **Electric quadrupole transitions $E2$ calculated with GRASP2K and FAC for all $n = 1$–7 configurations. For the GRASP2K calculation, the active set is expanded to $n = 10$ (GRASP3) and only the length form is considered. A comparaison between the wavelengths, weighted oscillator strengths and transition probabilities is given. The relative difference between transition probabilities in the velocity and length gauge is given in the last column by dT.**

Lower	Lower state of energy
Upper	Upper state of energy
λ (Å)	Wavelengths calculated with the GRASP2K and FAC codes
gf	Weighted oscillator strengths calculated with the GRASP2K and FAC codes
A (s^{-1})	Electric dipole transitions $E2$ calculated with the GRASP2K and FAC codes
dT	Uncertainty between the transition rates in the velocity and length gauge

Table 5. **Magnetic dipole transitions M1 calculated with GRASP2K and FAC for all $n = 1$–7 configurations. For the GRASP2K calculation, the active set is expanded to $n = 10$ (GRASP3) and only the length form is considered. A comparaison between the wavelengths, weighted oscillator strengths and transition probabilities is given.**

Lower	Lower state of energy
Upper	Upper state of energy
λ (Å)	Wavelengths calculated with the GRASP2K and FAC codes
gf	Weighted oscillator strengths calculated with the GRASP2K and FAC codes
A (s^{-1})	Electric dipole transitions $E1$ calculated with the GRASP2K and FAC codes

Table 6. **Magnetic quadrupole transitions $M2$ calculated with GRASP2K and FAC for all $n = 1$–7 configurations. For the GRASP2K calculation, the active set is expanded to $n = 10$ (GRASP3) and only the length form is considered. A comparaison between the wavelengths, weighted oscillator strengths and transition probabilities is given.**

Lower	Lower state of energy
Upper	Upper state of energy
λ (Å)	Wavelengths calculated with the GRASP2K and FAC codes
gf	Weighted oscillator strengths calculated with the GRASP2K and FAC codes
A (s^{-1})	Electric dipole transitions $E1$ calculated with the GRASP2K and FAC codes

Table 7. **Calculated values using the GRASP2K code of the magnetic dipole A, electric quadrupole B and Landé g-factors for all levels of interest. For this calculation, the active set expanded to $n = 10$ (GRASP3) has been considered.**

Configuration	Configuration of the level of energy
A (MHz)	Magnetic dipole A
B (MHz)	Electric quadrupole B
g_J	Landé g-factors

Table 8. **Calculated values using the GRASP2K code of normal, specific mass shifts and electron densities at the nucleus for the all singly excited levels up to $n = 7$ with inceasing the active set to $n = 10$ (GRASP3).**

Index	Index of the level of energy
Configuration	Configuration of the level of energy
K_{NMS}	Normal mass shifts
K_{SMS}	Specific mass shifts
Electron densities at the nucleus	Electron densities at the nucleus

Table 1
Energies (E in cm^{-1}) relative to the ground state for the lowest 97 levels arising from the $1s^2$ and $1snl$ with $n = 2$–7 configurations of *Xe LIII*. Two calculations are performed using FAC and GRASP2K and compared with data from NIST database. The GRASP1, GRASP2 and GRASP3 are determined respectively with increasing the active set (AS) up to $n = 8$, $n = 9$ and $n = 10$. The last two columns denote the lifetimes (in s^{-1}) obtained from our FAC and GRASP2K calculations.

Configuration	Level	FAC	GRASP1	GRASP2	GRASP3	NIST	Lifetimes (FAC)	Lifetimes (GRASP2K)
$1s^2$	$^1S_0$	0	0	0	0	0		
$1s\,2s$	$^3S_1$	242981032	242992840	242996188	242999633	243004900	2.6569E−12	2.6101E−12
$1s\,2p$	$^3P^o_1$	243610281	243619151	243620649	243622562	243626600	3.3975E−16	3.3084E−16
$1s\,2p$	$^3P^o_0$	243656320	243667841	243669210	243670879	243674700	5.7419E−10	5.8607E−10
$1s\,2s$	$^1S_0$	243677020	243680822	243683119	243685687	243691200	6.5427E−07	7.6560E−07
$1s\,2p$	$^3P^o_2$	246740070	246751551	246753838	246756598	246756600	3.2404E−13	3.4703E−13
$1s\,2p$	$^1P^o_1$	247026227	247036525	247037250	247038566	247044900	1.3777E−16	1.4814E−16
$1s\,3s$	$^3S_1$	288924950	288935786	288939203	288942662		1.4006E−14	1.3954E−14
$1s\,3p$	$^3P^o_1$	289095210	289106563	289109120	289112287		1.0612E−15	1.0241E−15
$1s\,3s$	$^1S_0$	289108182	289117871	289120773	289123953		1.4184E−14	1.4470E−14
$1s\,3p$	$^3P^o_0$	289107415	289119367	289121868	289124969		4.9927E−15	5.1073E−15
$1s\,3p$	$^3P^o_2$	290026737	290038530	290041366	290044705		5.7548E−15	5.9395E−15
$1s\,3d$	$^3D_2$	290093250	290105217	290108667	290112135		1.8090E−15	1.8193E−15
$1s\,3d$	$^3D_1$	290105192	290117231	290120677	290124145		1.8379E−15	1.8516E−15
$1s\,3p$	$^1P^o_1$	290107569	290119473	290121577	290124581		4.6643E−16	4.9660E−16
$1s\,3d$	$^3D_3$	290385275	290397902	290401352	290404821	290413200	1.9104E−15	1.9570E−15
$1s\,3d$	$^1D_2$	290396539	290409015	290412465	290415933		1.8837E−15	1.9162E−15
$1s\,4s$	$^3S_1$	304797684	304810015	304813454	304816918		2.0732E−14	2.0635E−14
$1s\,4p$	$^3P^o_1$	304866150	304879429	304882766	304886176		2.4379E−15	2.3464E−15
$1s\,4s$	$^1S_0$	304871588	304883666	304886805	304890134		2.0958E−14	2.1245E−14
$1s\,4p$	$^3P^o_0$	304871052	304884541	304887868	304891257		8.6891E−15	8.7915E−15
$1s\,4p$	$^3P^o_2$	305258024	305271468	305274839	305278274		9.7044E−15	9.9498E−15
$1s\,4d$	$^3D_2$	305287622	305299503	305302961	305306431		4.1830E−15	4.1928E−15
$1s\,4d$	$^3D_1$	305292454	305304374	305307831	305311301		4.2748E−15	4.2838E−15
$1s\,4p$	$^1P^o_1$	305291458	305304769	305307957	305311348		1.1013E−15	1.1689E−15
$1s\,4d$	$^3D_3$	305410833	305423127	305426585	305430056		4.4651E−15	4.5484E−15
$1s\,4f$	$^3F^o_3$	305411941	305425949	305428640	305431982		8.8845E−15	8.9144E−15
$1s\,4f$	$^3F^o_2$	305414511	305428553	305431218	305434552		8.8976E−15	8.9207E−15
$1s\,4d$	$^1D_2$	305415952	305428167	305431625	305435095		4.3461E−15	4.4234E−15
$1s\,4f$	$^3F^o_4$	305472935	305486462	305489675	305493125		9.0070E−15	9.0807E−15
$1s\,4f$	$^1F^o_3$	305474843	305488377	305491581	305495030		9.0252E−15	9.0870E−15
$1s\,5s$	$^3S_1$	312072452	312085468	312088918	312092385		3.2951E−14	3.2811E−14
$1s\,5p$	$^3P^o_1$	312106783	312120509	312123852	312127291		4.6828E−15	4.5019E−15
$1s\,5s$	$^1S_0$	312109421	312122408	312125671	312129058		3.3281E−14	3.3582E−14
$1s\,5p$	$^3P^o_0$	312109229	312123048	312126394	312129823		1.4960E−14	1.5067E−14
$1s\,5p$	$^3P^o_2$	312306662	312320496	312323875	312327320		1.6453E−14	1.6819E−14
$1s\,5d$	$^3D_2$	312322459	312334715	312338177	312341649		8.0273E−15	8.0351E−15
$1s\,5p$	$^1P^o_1$	312323602	312337225	312340644	312344087		2.1439E−15	2.2719E−15
$1s\,5d$	$^3D_1$	312324883	312337162	312340623	312344095		8.2220E−15	8.2189E−15
$1s\,5d$	$^3D_3$	312385482	312397978	312401440	312404912		8.6074E−15	8.7460E−15
$1s\,5f$	$^3F^o_3$	312385818	312400664	312402591	312405985		1.7108E−14	1.7138E−14
$1s\,5f$	$^3F^o_2$	312387134	312402027	312403912	312407300		1.7127E−14	1.7149E−14
$1s\,5d$	$^1D_2$	312388183	312400635	312404097	312407568		8.3320E−15	8.4797E−15
$1s\,5f$	$^3F^o_4$	312417093	312430652	312433874	312437344		1.7355E−14	1.7476E−14
$1s\,5g$	$^3G_4$	312417177	312430463	312433929	312437402		2.9246E−14	2.9310E−14
$1s\,5g$	$^3G_3$	312417930	312431215	312434682	312438155		2.9267E−14	2.9320E−14
$1s\,5f$	$^1F^o_3$	312418079	312431645	312434859	312438328		1.7385E−14	1.7489E−14
$1s\,5g$	$^3G_5$	312435809	312449135	312452602	312456074		2.9431E−14	2.9553E−14
$1s\,5g$	$^1G_4$	312436404	312449730	312453197	312456669		2.9447E−14	2.9560E−14
$1s\,6s$	$^3S_1$	315993781	316009270	316012725	316016194		5.0842E−14	5.0676E−14
$1s\,6p$	$^3P^o_1$	316015359	316030311	316032803	316036253		8.2030E−15	7.6967E−15
$1s\,6s$	$^1S_0$	316011643	316030412	316033745	316037162		5.1360E−14	5.1446E−14
$1s\,6p$	$^3P^o_0$	316011594	316031770	316034252	316037693		2.4183E−14	2.4286E−14
$1s\,6p$	$^3P^o_2$	316130593	316145514	316148194	316151654		2.6341E−14	2.6886E−14
$1s\,6d$	$^3D_2$	316140922	316152973	316156437	316159909		1.4049E−14	1.3705E−14
$1s\,6p$	$^1P^o_1$	316139182	316155139	316157859	316161294		3.6568E−15	3.9123E−15
$1s\,6d$	$^3D_1$	316140582	316154374	316157837	316161309		1.3703E−14	1.4021E−14
$1s\,6d$	$^3D_3$	316177189	316189550	316193014	316196486		1.4721E−14	1.4943E−14
$1s\,6f$	$^3F^o_3$	316177224	316192482	316193664	316197135		2.9214E−14	2.9210E−14
$1s\,6f$	$^3F^o_2$	316177216	316193297	316194426	316197896		2.9180E−14	2.9224E−14
$1s\,6d$	$^1D_2$	316177743	316191110	316194574	316198045		1.4208E−14	1.4457E−14
$1s\,6f$	$^3F^o_4$	316195254	316208405	316211819	316215291		2.9614E−14	2.9805E−14
$1s\,6g$	$^3G_4$	316195229	316208388	316211855	316215327		5.0068E−14	5.0144E−14
$1s\,6g$	$^3G_3$	316195229	316208825	316212291	316215764		5.0109E−14	5.0158E−14
$1s\,6f$	$^1F^o_3$	316195267	316208980	316212392	316215864		2.9665E−14	2.9824E−14
$1s\,6g$	$^3G_5$	316205987	316219204	316222671	316226143		5.0397E−14	5.0581E−14
$1s\,6h$	$^3H^o_5$	316205987	316219251	316222682	316226155		7.6145E−14	7.6271E−14
$1s\,6h$	$^3H^o_4$	316205987	316219534	316222964	316226437		7.6189E−14	7.6284E−14
$1s\,6g$	$^1G_4$	316205987	316219549	316223016	316226488		5.0429E−14	5.0591E−14
$1s\,6h$	$^3H^o_6$	316213134	316226435	316229866	316233339		7.6403E−14	7.6606E−14

(*continued on next page*)

Table 1 (*continued*)

Configuration	Level	FAC	GRASP1	GRASP2	GRASP3	NIST	Lifetimes (FAC)	Lifetimes (GRASP2K)
$1s\,6h$	$^1H^o_5$	316213134	316226670	316230099	316233572		7.6438E−14	7.6616E−14
$1s\,7s$	$^3S_1$	318347824	318362488	318365947	318369417		7.5196E−14	7.5428E−14
$1s\,7p$	$^3P^o_1$	318361378	318379168	318379301	318382488		1.2935E−14	1.2034E−14
$1s\,7s$	$^1S_0$	318358961	318375742	318379117	318382551		7.5936E−14	7.4869E−14
$1s\,7p$	$^3P^o_0$	318359030	318380144	318380220	318383393		3.6841E−14	3.6655E−14
$1s\,7p$	$^3P^o_2$	318433740	318451061	318451711	318454952		3.9905E−14	4.0394E−14
$1s\,7d$	$^3D_2$	318440253	318452794	318456259	318459731		2.1567E−14	2.1568E−14
$1s\,7d$	$^3D_1$	318440035	318453670	318457135	318460607		2.2119E−14	2.2062E−14
$1s\,7p$	$^1P^o_1$	318439121	318457447	318457914	318461036		5.7984E−15	6.1365E−15
$1s\,7d$	$^3D_3$	318463080	318475804	318479269	318482741		2.3193E−14	2.3579E−14
$1s\,7f$	$^3F^o_3$	318463096	318479601	318479839	318483171		4.5885E−14	4.5872E−14
$1s\,7f$	$^3F^o_2$	318463090	318480145	318480317	318483651		4.5848E−14	4.5866E−14
$1s\,7d$	$^1D_2$	318463439	318476795	318480260	318483731		2.2348E−14	2.2705E−14
$1s\,7f$	$^3F^o_4$	318474448	318487999	318491154	318494599		4.6540E−14	4.6813E−14
$1s\,7g$	$^3G_4$	318474415	318487681	318491148	318494620		7.8748E−14	7.8818E−14
$1s\,7g$	$^3G_3$	318474415	318487956	318491423	318494895		7.8784E−14	7.8824E−14
$1s\,7f$	$^1F^o_3$	318474457	318488359	318491517	318494961		4.6606E−14	4.6830E−14
$1s\,7g$	$^3G_5$	318481193	318494494	318497961	318501433		7.9274E−14	7.9533E−14
$1s\,7h$	$^3H^o_5$	318481193	318494511	318497969	318501442		1.2015E−13	1.2028E−13
$1s\,7h$	$^3H^o_4$	318481192	318494689	318498147	318501620		1.2018E−13	1.2030E−13
$1s\,7g$	$^1G_4$	318481192	318494712	318498178	318501651		7.9303E−14	7.9537E−14
$1s\,7h$	$^3H^o_6$	318485697	318499038	318502496	318505969		1.2057E−13	1.2083E−13
$1s\,7i$	$^3I_6$	318485696	318499030	318502497	318505969		1.6971E−13	1.6989E−13
$1s\,7i$	$^3I_5$	318485696	318499155	318502621	318506094		1.6971E−13	1.6990E−13
$1s\,7h$	$^1H^o_5$	318485697	318499185	318502643	318506116		1.2059E−13	1.2084E−13
$1s\,7i$	$^3I_7$	318488907	318502254	318505721	318509193		1.7004E−13	1.7033E−13
$1s\,7i$	$^1I_6$	318488907	318502361	318505827	318509300		1.7004E−13	1.7034E−13

Table 2
Calculated values using the GRASP2K code of the composition in LSJ coupling for all levels of interest with increasing the active set to $n = 10$ (GRASP3).

Level	Composition in LSJ coupling
$1s^2\ ^1S_0$	$1s^2\ ^1S_0$ 99.98%
$1s\,2s\ ^3S_1$	$1s\,2s\ ^3S_1$ 99.98%
$1s\,2s\ ^1S_0$	$1s\,2s\ ^1S_0$ 99.94%
$1s\,2p\ ^3P^o_1$	$1s\,2p\ ^3P^o_1$ 70.31% + $1s\,2p\ ^1P^o_1$ 29.64%
$1s\,2p\ ^3P^o_2$	$1s\,2p\ ^3P^o_2$ 99.97%
$1s\,2p\ ^3P^o_0$	$1s\,2p\ ^3P^o_0$ 99.96%
$1s\,2p\ ^1P^o_1$	$1s\,2p\ ^1P^o_1$ 70.29% + $1s\,2p\ ^3P^o_1$ 29.65%
$1s\,3s\ ^3S_1$	$1s\,3s\ ^3S_1$ 99.95%
$1s\,3s\ ^1S_0$	$1s\,3s\ ^1S_0$ 99.88%
$1s\,3p\ ^3P^o_1$	$1s\,3p\ ^3P^o_1$ 70.04% + $1s\,3p\ ^1P^o_1$ 29.84%
$1s\,3p\ ^3P^o_2$	$1s\,3p\ ^3P^o_2$ 99.90%
$1s\,3p\ ^3P^o_0$	$1s\,3p\ ^3P^o_0$ 99.88%
$1s\,3d\ ^3D_2$	$1s\,3d\ ^3D_2$ 60.30% + $1s\,3d\ ^1D_2$ 39.67%
$1s\,3d\ ^3D_1$	$1s\,3d\ ^3D_1$ 99.97%
$1s\,3p\ ^1P^o_1$	$1s\,3p\ ^1P^o_1$ 70.01% + $1s\,3p\ ^3P^o_1$ 29.85%
$1s\,3d\ ^3D_3$	$1s\,3d\ ^3D_3$ 99.90%
$1s\,3d\ ^1D_2$	$1s\,3d\ ^1D_2$ 60.26% + $1s\,3d\ ^3D_2$ 39.64%
$1s\,4s\ ^3S_1$	$1s\,4s\ ^3S_1$ 99.90%
$1s\,4s\ ^1S_0$	$1s\,4s\ ^1S_0$ 99.81%
$1s\,4p\ ^3P^o_1$	$1s\,4p\ ^3P^o_1$ 69.90% + $1s\,4p\ ^1P^o_1$ 29.88%
$1s\,4p\ ^3P^o_0$	$1s\,4p\ ^3P^o_0$ 99.77% + $1s\,5p\ ^3P^o_0$ 00.10%
$1s\,4p\ ^3P^o_2$	$1s\,4p\ ^3P^o_2$ 99.81%
$1s\,4d\ ^3D_2$	$1s\,4d\ ^3D_2$ 60.45% + $1s\,4d\ ^1D_2$ 39.45%
$1s\,4d\ ^3D_1$	$1s\,4d\ ^3D_1$ 99.90%
$1s\,4p\ ^1P^o_1$	$1s\,4p\ ^1P^o_1$ 69.86% + $1s\,4p\ ^3P^o_1$ 29.89%
$1s\,4d\ ^3D_3$	$1s\,4d\ ^3D_3$ 99.82%
$1s\,4d\ ^3D_1$	$1s\,4d\ ^3D_1$ 99.90%
$1s\,4f\ ^3F^o_3$	$1s\,4f\ ^3F^o_3$ 56.88% + $1s\,4f\ ^1F^o_3$ 43.04%
$1s\,4f\ ^3F^o_2$	$1s\,4f\ ^3F^o_2$ 99.93%
$1s\,4d\ ^1D_2$	$1s\,4d\ ^1D_2$ 60.39% + $1s\,4d\ ^3D_2$ 39.42%
$1s\,4f\ ^3F^o_4$	$1s\,4f\ ^3F^o_4$ 99.93%
$1s\,4f\ ^1F^o_3$	$1s\,4f\ ^1F^o_3$ 56.88% + $1s\,4f\ ^3F^o_3$ 43.04%
$1s\,5s\ ^3S_1$	$1s\,5s\ ^3S_1$ 99.84%
$1s\,5s\ ^1S_0$	$1s\,5s\ ^1S_0$ 99.74% + $1s\,6s\ ^1S^o_0$ 00.13%
$1s\,5p\ ^3P^o_1$	$1s\,5p\ ^3P^o_1$ 69.79% + $1s\,5p\ ^1P^o_1$ 29.87%
$1s\,5p\ ^3P^o_2$	$1s\,5p\ ^3P^o_2$ 99.71% + $1s\,6p\ ^3P^o_2$ 00.13%
$1s\,5d\ ^3D_2$	$1s\,5d\ ^3D_2$ 60.48% + $1s\,5d\ ^1D_2$ 39.34%
$1s\,5p\ ^1P^o_1$	$1s\,5p\ ^1P^o_1$ 69.74% + $1s\,5p\ ^3P^o_1$ 29.89% + $1s\,6p\ ^1P^o_1$ 00.11%
$1s\,5p\ ^3P^o_0$	$1s\,5p\ ^3P^o_0$ 99.66% + $1s\,6p\ ^3P^o_0$ 00.15%
$1s\,5d\ ^3D_1$	$1s\,5d\ ^3D_1$ 99.82%
$1s\,5d\ ^3D_3$	$1s\,5d\ ^3D_3$ 99.79%
$1s\,5f\ ^3F^o_3$	$1s\,5f\ ^3F^o_3$ 56.83% + $1s\,5f\ ^1F^o_3$ 42.98%
$1s\,5f\ ^3F^o_2$	$1s\,5f\ ^3F^o_2$ 99.81% + $1s\,6f\ ^3F^o_2$ 00.10%
$1s\,5d\ ^1D_2$	$1s\,5d\ ^1D_2$ 60.45% + $1s\,5d\ ^3D_2$ 39.32%
$1s\,5f\ ^3F^o_4$	$1s\,5f\ ^3F^o_4$ 99.82%
$1s\,5g\ ^3G_4$	$1s\,5g\ ^3G_4$ 55.34% + $1s\,5g\ ^1G_4$ 44.61%
$1s\,5g\ ^3G_3$	$1s\,5g\ ^3G_3$ 99.95%
$1s\,5f\ ^1F^o_3$	$1s\,5f\ ^1F^o_3$ 56.83% + $1s\,5f\ ^3F^o_3$ 42.98%
$1s\,5g\ ^3G_5$	$1s\,5g\ ^3G_5$ 99.90%
$1s\,5g\ ^1G_4$	$1s\,5g\ ^1G_4$ 55.31% + $1s\,5g\ ^3G_4$ 44.59%
$1s\,6s\ ^3S_1$	$1s\,6s\ ^3S_1$ 99.79% + $1s\,7s\ ^3S_1$ 00.11%
$1s\,6s\ ^1S_0$	$1s\,6s\ ^1S_0$ 99.68% + $1s\,7s\ ^1S_0$ 00.16% + $1s\,5s\ ^1S_0$ 00.12%
$1s\,6p\ ^3P^o_1$	$1s\,6p\ ^3P^o_1$ 69.70% + $1s\,6p\ ^1P^o_1$ 29.85% + $1s\,7p\ ^3P^o_1$ 00.12%
$1s\,6p\ ^3P^o_0$	$1s\,6p\ ^3P^o_0$ 99.54% + $1s\,7p\ ^3P^o_0$ 00.19 + $1s\,5p\ ^3P^o_0$ 00.13%
$1s\,6p\ ^3P^o_2$	$1s\,6p\ ^3P^o_2$ 99.60% + $1s\,7p\ ^3P^o_2$ 00.17% + $1s\,5p\ ^3P^o_2$ 00.12%
$1s\,6d\ ^3D_2$	$1s\,6d\ ^3D_2$ 60.48% + $1s\,6d\ ^1D_2$ 39.27%
$1s\,6p\ ^1P^o_1$	$1s\,6p\ ^1P^o_1$ 69.64% + $1s\,6p\ ^3P^o_1$ 29.88% + $1s\,7p\ ^1P^o_1$ 00.15% + $1s\,5p\ ^1P^o_1$ 00.10%
$1s\,6d\ ^3D_1$	$1s\,6d\ ^3D_1$ 99.75% + $1s\,7d\ ^3D_1$ 00.13%
$1s\,6d\ ^3D_3$	$1s\,6d\ ^3D_3$ 99.76% + $1s\,7d\ ^3D_3$ 00.12%
$1s\,6f\ ^3F^o_3$	$1s\,6f\ ^3F^o_3$ 56.77% + $1s\,6f\ ^1F^o_3$ 42.92%
$1s\,6f\ ^3F^o_2$	$1s\,6f\ ^3F^o_2$ 99.69% + $1s\,7f\ ^3F^o_2$ 00.14%
$1s\,6d\ ^1D_2$	$1s\,6d\ ^1D_2$ 60.48% + $1s\,6d\ ^3D_2$ 39.27%
$1s\,6f\ ^3F^o_4$	$1s\,6f\ ^3F^o_4$ 99.70% + $1s\,7f\ ^3F^o_4$ 00.14%
$1s\,6g\ ^3G_4$	$1s\,6g\ ^3G_4$ 55.29% + $1s\,6g\ ^1G_4$ 44.57%
$1s\,6g\ ^3G_3$	$1s\,6g\ ^3G_3$ 99.87%
$1s\,6f\ ^1F^o_3$	$1s\,6f\ ^1F^o_3$ 56.77% + $1s\,6f\ ^3F^o_3$ 42.92%
$1s\,6g\ ^3G_5$	$1s\,6g\ ^3G_5$ 99.84%
$1s\,6h\ ^3H^o_5$	$1s\,6h\ ^3H^o_5$ 54.35% + $1s\,6h\ ^1H^o_5$ 45.57%
$1s\,6h\ ^3H^o_4$	$1s\,6h\ ^3H^o_4$ 99.93%
$1s\,6g\ ^1G_4$	$1s\,6g\ ^1G_4$ 55.28% + $1s\,6g\ ^3G_4$ 44.56%
$1s\,6h\ ^3H^o_6$	$1s\,6h\ ^3H^o_6$ 99.93%

(*continued on next page*)

Table 2 (*continued*)

Level	Composition in LSJ coupling
$1s\,6h\ ^1H^o_5$	$1s\,6h\ ^1H^o_5$ 54.35% + $1s\,6h\ ^3H^o_5$ 45.57%
$1s\,7s\ ^3S_1$	$1s\,7s\ ^3S_1$ 99.86% + $1s\,6s\ ^3S_1$ 00.10%
$1s\,7s\ ^1S_0$	$1s\,7s\ ^1S_0$ 99.80% + $1s\,6s\ ^1S_0$ 00.15%
$1s\,7p\ ^3P^o_1$	$1s\,7p\ ^3P^o_1$ 69.68% + $1s\,7p\ ^1P^o_1$ 29.83% + $1s\,6p\ ^3P^o_1$ 00.11%
$1s\,7p\ ^3P^o_2$	$1s\,7p\ ^3P^o_2$ 99.57% + $1s\,6p\ ^3P^o_2$ 00.15%
$1s\,7p\ ^3P^o_0$	$1s\,7p\ ^3P^o_0$ 99.51% + $1s\,6p\ ^3P^o_0$ 00.17%
$1s\,7d\ ^3D_2$	$1s\,7d\ ^3D_2$ 60.56% + $1s\,7d\ ^1D_2$ 39.28%
$1s\,7d\ ^3D_1$	$1s\,7d\ ^3D_1$ 99.84% + $1s\,6d\ ^3D_1$ 00.13%
$1s\,7p\ ^1P^o_1$	$1s\,7p\ ^1P^o_1$ 69.63% + $1s\,7p\ ^3P^o_1$ 29.86% + $1s\,6p\ ^1P^o_1$ 00.13%
$1s\,7d\ ^3D_3$	$1s\,7d\ ^3D_3$ 99.84% + $1s\,6d\ ^3D_3$ 00.12%
$1s\,7f\ ^3F^o_3$	$1s\,7f\ ^3F^o_3$ 56.72% + $1s\,7f\ ^1F^o_3$ 42.87%
$1s\,7f\ ^3F^o_2$	$1s\,7f\ ^3F^o_2$ 99.58% + $1s\,6f\ ^3F^o_2$ 00.13%
$1s\,7d\ ^1D_2$	$1s\,7d\ ^1D_2$ 60.56% + $1s\,7d\ ^3D_2$ 39.28%
$1s\,7f\ ^3F^o_4$	$1s\,7f\ ^3F^o_4$ 99.59% + $1s\,6f\ ^3F^o_4$ 00.13%
$1s\,7g\ ^3G_4$	$1s\,7g\ ^3G_4$ 55.31% + $1s\,7g\ ^1G_4$ 44.59%
$1s\,7g\ ^3G_3$	$1s\,7g\ ^3G_3$ 99.91%
$1s\,7f\ ^1F^o_3$	$1s\,7f\ ^1F^o_3$ 56.72% + $1s\,7f\ ^3F^o_3$ 42.87%
$1s\,7g\ ^3G_5$	$1s\,7g\ ^3G_5$ 99.91%
$1s\,7h\ ^3H^o_5$	$1s\,7h\ ^3H^o_5$ 54.29% + $1s\,7h\ ^1H^o_5$ 45.52%
$1s\,7h\ ^3H^o_4$	$1s\,7h\ ^3H^o_4$ 99.81%
$1s\,7g\ ^1G_4$	$1s\,7g\ ^1G_4$ 55.32% + $1s\,7g\ ^3G_4$ 44.59%
$1s\,7h\ ^3H^o_6$	$1s\,7h\ ^3H^o_6$ 99.81%
$1s\,7i\ ^3I_6$	$1s\,7i\ ^3I_6$ 53.71% + $1s\,7i\ ^1I_6$ 46.28%
$1s\,7i\ ^3I_5$	$1s\,7i\ ^3I_5$ 99.99%
$1s\,7h\ ^1H^o_5$	$1s\,7h\ ^1H^o_5$ 54.29% + $1s\,7h\ ^3H^o_5$ 45.52%
$1s\,7i\ ^3I_7$	$1s\,7i\ ^3I_7$ 99.99%
$1s\,7i\ ^1I_6$	$1s\,7i\ ^1I_6$ 53.71% + $1s\,7i\ ^3I_6$ 46.28%

Table 3
Electric dipole transitions $E1$ calculated with GRASP2K and FAC for all $n = 1$–7 configurations. For the GRASP2K calculation, the active set is expanded to $n = 10$ (GRASP3) and only the length form is considered. A comparison between the wavelengths, weighted oscillator strengths and transition probabilities is given. The relative difference between transition rates in the velocity and length gauge is given in the last column by dT.

Lower	Upper	GRASP2K			FAC			dT
		λ (Å)	gf	A (s^{-1})	λ (Å)	gf	A (s^{-1})	
$1s^2\ ^1S_0$	$1s\,2p\ ^3P^o_1$	4.1040E−01	2.290E−01	3.023E+15	4.0874E−01	2.230E−01	2.943E+15	0.010
$1s\,2s\ ^3S_1$	$1s\,2p\ ^3P^o_1$	1.6053E+02	1.112E−02	9.593E+08	1.5824E+02	1.129E−02	9.944E+08	0.193
$1s\,2s\ ^3S_1$	$1s\,2p\ ^3P^o_0$	1.4898E+02	5.677E−03	1.706E+09	1.4745E+02	5.725E−03	1.741E+09	0.139
$1s\,2p\ ^3P^o_1$	$1s\,2s\ ^1S_0$	1.5842E+03	4.752E−04	1.263E+06	1.4920E+03	4.997E−04	1.484E+06	0.365
$1s\,2s\ ^3S_1$	$1s\,2p\ ^3P^o_2$	2.6617E+01	1.713E−01	3.226E+11	2.6489E+01	1.725E−01	3.252E+11	0.028
$1s^2\ ^1S_0$	$1s\,2p\ ^1P^o_1$	4.0470E−01	4.975E−01	6.750E+15	4.0309E−01	5.349E−01	7.257E+15	0.001
$1s\,2s\ ^3S_1$	$1s\,2p\ ^1P^o_1$	2.4759E+01	3.299E−02	1.196E+11	2.4615E+01	3.310E−02	1.204E+11	0.014
$1s\,2s\ ^1S_0$	$1s\,2p\ ^1P^o_1$	2.9825E+01	6.507E−02	1.626E+11	2.9731E+01	6.480E−02	1.616E+11	0.019
$1s\,2p\ ^3P^o_1$	$1s\,3s\ ^3S_1$	2.2065E+00	3.037E−02	1.387E+13	2.1974E+00	3.067E−02	1.400E+13	0.001
$1s\,2p\ ^3P^o_0$	$1s\,3s\ ^3S_1$	2.2089E+00	1.488E−02	6.779E+12	2.1996E+00	1.466E−02	6.681E+12	0.001
$1s\,2p\ ^3P^o_2$	$1s\,3s\ ^3S_1$	2.3705E+00	1.089E−01	4.309E+13	2.3604E+00	1.085E−01	4.294E+13	0.000
$1s\,2p\ ^1P^o_1$	$1s\,3s\ ^3S_1$	2.3864E+00	1.988E−02	7.761E+12	2.3765E+00	1.946E−02	7.596E+12	0.002
$1s^2\ ^1S_0$	$1s\,3p\ ^3P^o_1$	3.4580E−01	4.196E−02	7.798E+14	3.4443E−01	4.008E−02	7.449E+14	0.015
$1s\,2s\ ^3S_1$	$1s\,3p\ ^3P^o_1$	2.1686E+00	2.902E−01	1.372E+14	2.1593E+00	2.946E−01	1.393E+14	0.003
$1s\,2s\ ^1S_0$	$1s\,3p\ ^3P^o_1$	2.2014E+00	1.285E−01	5.894E+13	2.1924E+00	1.253E−01	5.750E+13	0.006
$1s\,3s\ ^3S_1$	$1s\,3p\ ^3P^o_1$	5.8954E+02	1.889E−02	1.208E+08	5.8484E+02	1.901E−02	1.225E+08	0.179
$1s\,2p\ ^3P^o_1$	$1s\,3s\ ^1S_0$	2.1977E+00	1.194E−02	1.649E+13	2.1885E+00	1.243E−02	1.717E+13	0.005
$1s\,2p\ ^1P^o_1$	$1s\,3s\ ^1S_0$	2.3761E+00	4.454E−02	5.262E+13	2.3662E+00	4.514E−02	5.332E+13	0.002
$1s\,3p\ ^3P^o_1$	$1s\,3s\ ^1S_0$	8.5719E+03	5.545E−04	5.034E+04	7.6765E+03	6.142E−04	6.893E+04	1.000
$1s\,2s\ ^3S_1$	$1s\,3p\ ^3P^o_0$	2.1680E+00	1.376E−01	1.953E+14	2.1587E+00	1.407E−01	1.997E+14	0.003
$1s\,3s\ ^3S_1$	$1s\,3p\ ^3P^o_0$	5.4853E+02	9.695E−03	2.149E+08	5.4572E+02	9.712E−03	2.156E+08	0.148
$1s\,2s\ ^3S_1$	$1s\,3p\ ^3P^o_2$	2.1256E+00	5.650E−01	1.668E+14	2.1165E+00	5.828E−01	1.721E+14	0.003
$1s\,3s\ ^3S_1$	$1s\,3p\ ^3P^o_2$	9.0741E+01	3.059E−01	4.957E+10	9.0375E+01	3.069E−01	4.970E+10	0.026
$1s\,2p\ ^3P^o_1$	$1s\,3d\ ^3D_2$	2.1510E+00	1.556E+00	4.485E+14	2.1422E+00	1.568E+00	4.520E+14	0.001
$1s\,2p\ ^3P^o_2$	$1s\,3d\ ^3D_2$	2.3065E+00	3.054E−01	7.659E+13	2.2968E+00	3.049E−01	7.645E+13	0.001
$1s\,2p\ ^1P^o_1$	$1s\,3d\ ^3D_2$	2.3216E+00	5.348E−02	1.324E+13	2.3121E+00	5.146E−02	1.273E+13	0.002
$1s\,3p\ ^3P^o_1$	$1s\,3d\ ^3D_2$	1.0002E+02	1.760E−01	2.348E+10	9.9770E+01	1.757E−01	2.335E+10	0.002
$1s\,3p\ ^3P^o_2$	$1s\,3d\ ^3D_2$	1.4830E+03	2.141E−03	1.298E+06				0.003
$1s\,2p\ ^3P^o_1$	$1s\,3d\ ^3D_1$	2.1505E+00	3.325E−01	1.598E+14	2.1416E+00	3.373E−01	1.621E+14	0.001
$1s\,2p\ ^3P^o_0$	$1s\,3d\ ^3D_1$	2.1527E+00	6.302E−01	3.024E+14	2.1437E+00	6.350E−01	3.046E+14	0.001
$1s\,2p\ ^3P^o_2$	$1s\,3d\ ^3D_1$	2.3059E+00	3.362E−02	1.406E+13	2.2962E+00	3.352E−02	1.401E+13	0.001
$1s\,2p\ ^1P^o_1$	$1s\,3d\ ^3D_1$	2.3210E+00	1.511E−01	6.236E+13	2.3114E+00	1.497E−01	6.179E+13	0.002
$1s\,3p\ ^3P^o_1$	$1s\,3d\ ^3D_1$	9.8828E+01	3.812E−02	8.679E+09	9.8590E+01	3.804E−02	8.628E+09	0.006
$1s\,3p\ ^3P^o_0$	$1s\,3d\ ^3D_1$	1.0008E+02	7.109E−02	1.578E+10	9.9796E+01	7.095E−02	1.570E+10	0.006
$1s\,3p\ ^3P^o_2$	$1s\,3d\ ^3D_1$	1.2588E+03	2.725E−04	3.823E+05				0.053
$1s^2\ ^1S_0$	$1s\,3p\ ^1P^o_1$	3.4460E−01	9.869E−02	1.847E+15	3.4323E−01	1.055E−01	1.975E+15	0.020
$1s\,2s\ ^3S_1$	$1s\,3p\ ^1P^o_1$	2.1220E+00	9.943E−02	4.910E+13	2.1129E+00	1.031E−01	5.095E+13	0.004
$1s\,2s\ ^1S_0$	$1s\,3p\ ^1P^o_1$	2.1534E+00	2.439E−01	1.170E+14	2.1446E+00	2.435E−01	1.167E+14	0.004
$1s\,3s\ ^3S_1$	$1s\,3p\ ^1P^o_1$	8.4608E+01	5.893E−02	1.830E+10	8.4198E+01	5.901E−02	1.835E+10	0.020
$1s\,3s\ ^1S_0$	$1s\,3p\ ^1P^o_1$	9.9937E+01	1.175E−01	2.616E+10	9.9635E+01	1.170E−01	2.599E+10	0.026
$1s\,3d\ ^3D_2$	$1s\,3p\ ^1P^o_1$	8.0349E+03	6.680E−05	2.301E+03				0.383
$1s\,3d\ ^3D_1$	$1s\,3p\ ^1P^o_1$	2.2947E+05	6.878E−06	2.904E−01				0.978
$1s\,2p\ ^3P^o_2$	$1s\,3d\ ^3D_3$	2.2910E+00	2.807E+00	5.095E+14	2.2814E+00	2.875E+00	5.219E+14	0.001
$1s\,3p\ ^3P^o_2$	$1s\,3d\ ^3D_3$	2.7769E+02	1.088E−01	1.345E+09	2.7772E+02	1.082E−01	1.326E+09	0.004
$1s\,2p\ ^3P^o_1$	$1s\,3d\ ^1D_2$	2.1371E+00	2.237E−03	6.534E+11	2.1283E+00	2.733E−03	7.982E+11	0.001
$1s\,2p\ ^3P^o_2$	$1s\,3d\ ^1D_2$	2.2905E+00	1.988E−01	5.056E+13	2.2809E+00	2.036E−01	5.177E+13	0.001
$1s\,2p\ ^1P^o_1$	$1s\,3d\ ^1D_2$	2.3053E+00	1.814E+00	4.553E+14	2.2959E+00	1.836E+00	4.607E+14	0.001
$1s\,3p\ ^3P^o_1$	$1s\,3d\ ^1D_2$	7.6708E+01	2.981E−04	6.759E+07	7.6517E+01	2.967E−04	6.704E+07	0.000
$1s\,3p\ ^3P^o_2$	$1s\,3d\ ^1D_2$	2.6938E+02	7.955E−03	1.463E+08	2.6926E+02	7.908E−03	1.442E+08	0.018
$1s\,3p\ ^1P^o_1$	$1s\,3d\ ^1D_2$	3.4323E+02	5.654E−02	6.403E+08	3.4458E+02	5.610E−02	6.249E+08	0.015
$1s\,2p\ ^3P^o_1$	$1s\,4s\ ^3S_1$	1.6341E+00	6.721E−03	5.596E+12	1.6274E+00	6.812E−03	5.671E+12	0.003
$1s\,2p\ ^3P^o_0$	$1s\,4s\ ^3S_1$	1.6354E+00	3.290E−03	2.735E+12	1.6286E+00	3.273E−03	2.721E+12	0.000
$1s\,2p\ ^3P^o_2$	$1s\,4s\ ^3S_1$	1.7223E+00	2.273E−02	1.703E+13	1.7151E+00	2.261E−02	1.694E+13	0.001
$1s\,2p\ ^1P^o_1$	$1s\,4s\ ^3S_1$	1.7308E+00	4.129E−03	3.065E+12	1.7236E+00	4.044E−03	3.001E+12	0.002
$1s\,3p\ ^3P^o_1$	$1s\,4s\ ^3S_1$	6.3675E+00	7.121E−02	3.905E+12	6.3413E+00	7.108E−02	3.897E+12	0.000
$1s\,3p\ ^3P^o_0$	$1s\,4s\ ^3S_1$	6.3727E+00	3.469E−02	1.899E+12	6.3462E+00	3.391E−02	1.856E+12	0.001
$1s\,3p\ ^3P^o_2$	$1s\,4s\ ^3S_1$	6.7695E+00	2.464E−01	1.195E+13	6.7412E+00	2.453E−01	1.190E+13	0.001
$1s\,3p\ ^1P^o_1$	$1s\,4s\ ^3S_1$	6.8063E+00	4.518E−02	2.169E+12	6.7783E+00	4.436E−02	2.128E+12	0.001
$1s^2\ ^1S_0$	$1s\,4p\ ^3P^o_1$	3.2790E−01	1.510E−02	3.121E+14	3.2662E−01	1.433E−02	2.962E+14	0.013
$1s\,2s\ ^3S_1$	$1s\,4p\ ^3P^o_1$	1.6159E+00	6.856E−02	5.839E+13	1.6090E+00	6.888E−02	5.866E+13	0.002
$1s\,2s\ ^1S_0$	$1s\,4p\ ^3P^o_1$	1.6340E+00	2.993E−02	2.492E+13	1.6273E+00	2.929E−02	2.438E+13	0.006
$1s\,3s\ ^3S_1$	$1s\,4p\ ^3P^o_1$	6.2721E+00	3.224E−01	1.822E+13	6.2463E+00	3.272E−01	1.849E+13	0.002
$1s\,3s\ ^1S_0$	$1s\,4p\ ^3P^o_1$	6.3443E+00	1.439E−01	7.951E+12	6.3190E+00	1.408E−01	7.778E+12	0.003
$1s\,3d\ ^3D_2$	$1s\,4p\ ^3P^o_1$	6.7686E+00	7.309E−02	3.547E+12	6.7403E+00	7.330E−02	3.557E+12	0.000
$1s\,3d\ ^3D_1$	$1s\,4p\ ^3P^o_1$	6.7741E+00	1.585E−02	7.680E+11	6.7458E+00	1.555E−02	7.537E+11	0.002
$1s\,3d\ ^1D_2$	$1s\,4p\ ^3P^o_1$	6.9107E+00	1.013E−04	4.717E+09				0.003
$1s\,4s\ ^3S_1$	$1s\,4p\ ^3P^o_1$	1.4439E+03	2.625E−02	2.800E+07	1.4544E+03	2.601E−02	2.711E+07	0.173
$1s\,2p\ ^3P^o_1$	$1s\,4s\ ^1S_0$	1.6322E+00	2.684E−03	6.721E+12	1.6254E+00	2.783E−03	6.967E+12	0.005

(*continued on next page*)

Table 3 (*continued*)

Lower	Upper	GRASP2K			FAC			*dT*
		λ (Å)	*gf*	A (s^{-1})	λ (Å)	*gf*	A (s^{-1})	
$1s\,2p\ ^1P^o_1$	$1s\,4s\ ^1S_0$	1.7286E+00	9.390E−03	2.096E+13	1.7214E+00	9.412E−03	2.100E+13	0.002
$1s\,3p\ ^3P^o_1$	$1s\,4s\ ^1S_0$	6.3380E+00	2.847E−02	4.727E+12	6.3116E+00	2.931E−02	4.867E+12	0.002
$1s\,3p\ ^1P^o_1$	$1s\,4s\ ^1S_0$	6.7725E+00	1.006E−01	1.463E+13	6.7444E+00	1.020E−01	1.484E+13	0.001
$1s\,4p\ ^3P^o_1$	$1s\,4s\ ^1S_0$	2.5265E+04	6.429E−04	6.718E+03	1.8312E+04	8.806E−04	1.736E+04	0.482
$1s\,2s\ ^3S_1$	$1s\,4p\ ^3P^o_0$	1.6157E+00	3.257E−02	8.322E+13	1.6089E+00	3.284E−02	8.391E+13	0.003
$1s\,3s\ ^3S_1$	$1s\,4p\ ^3P^o_0$	6.2701E+00	1.531E−01	2.598E+13	6.2444E+00	1.569E−01	2.661E+13	0.003
$1s\,3d\ ^3D_1$	$1s\,4p\ ^3P^o_0$	6.7718E+00	2.941E−02	4.278E+12	6.7435E+00	2.941E−02	4.277E+12	0.002
$1s\,4s\ ^3S_1$	$1s\,4p\ ^3P^o_0$	1.3452E+03	1.349E−02	4.973E+07	1.3572E+03	1.332E−02	4.783E+07	0.146
$1s\,2s\ ^3S_1$	$1s\,4p\ ^3P^o_2$	1.6057E+00	1.450E−01	7.505E+13	1.5989E+00	1.491E−01	7.718E+13	0.003
$1s\,3s\ ^3S_1$	$1s\,4p\ ^3P^o_2$	6.1216E+00	6.028E−01	2.146E+13	6.0965E+00	6.147E−01	2.187E+13	0.003
$1s\,3d\ ^3D_2$	$1s\,4p\ ^3P^o_2$	6.5936E+00	8.587E−03	2.635E+11	6.5661E+00	8.500E−03	2.607E+11	0.000
$1s\,3d\ ^3D_1$	$1s\,4p\ ^3P^o_2$	6.5989E+00	9.266E−04	2.839E+10	6.5713E+00	9.191E−04	2.815E+10	0.003
$1s\,3d\ ^3D_3$	$1s\,4p\ ^3P^o_2$	6.7234E+00	9.374E−02	2.766E+12	6.6951E+00	9.195E−02	2.713E+12	0.001
$1s\,3d\ ^1D_2$	$1s\,4p\ ^3P^o_2$	6.7284E+00	6.658E−03	1.962E+11	6.7001E+00	6.480E−03	1.909E+11	0.003
$1s\,4s\ ^3S_1$	$1s\,4p\ ^3P^o_2$	2.1675E+02	4.308E−01	1.223E+10	2.1631E+02	4.309E−01	1.218E+10	0.025
$1s\,2p\ ^3P^o_1$	$1s\,4d\ ^3D_2$	1.6212E+00	2.941E−01	1.493E+14	1.6144E+00	2.954E−01	1.499E+14	0.001
$1s\,2p\ ^3P^o_2$	$1s\,4d\ ^3D_2$	1.7079E+00	5.276E−02	2.413E+13	1.7007E+00	5.191E−02	2.374E+13	0.001
$1s\,2p\ ^1P^o_1$	$1s\,4d\ ^3D_2$	1.7162E+00	8.902E−03	4.032E+12	1.7091E+00	8.758E−03	3.966E+12	0.002
$1s\,3p\ ^3P^o_1$	$1s\,4d\ ^3D_2$	6.1751E+00	1.295E+00	4.531E+13	6.1494E+00	1.301E+00	4.554E+13	0.001
$1s\,3p\ ^3P^o_2$	$1s\,4d\ ^3D_2$	6.5523E+00	2.758E−01	8.571E+12	6.5248E+00	2.781E−01	8.643E+12	0.001
$1s\,3p\ ^1P^o_1$	$1s\,4d\ ^3D_2$	6.5868E+00	4.612E−02	1.418E+12	6.5595E+00	4.379E−02	1.346E+12	0.001
$1s\,4p\ ^3P^o_1$	$1s\,4d\ ^3D_2$	2.3795E+02	3.169E−01	7.465E+09	2.3625E+02	3.177E−01	7.531E+09	0.000
$1s\,4p\ ^3P^o_2$	$1s\,4d\ ^3D_2$	3.5515E+03	3.857E−03	4.079E+05				0.046
$1s\,2p\ ^3P^o_1$	$1s\,4d\ ^3D_1$	1.6210E+00	6.298E−02	5.329E+13	1.6143E+00	6.329E−02	5.354E+13	0.001
$1s\,2p\ ^3P^o_0$	$1s\,4d\ ^3D_1$	1.6223E+00	1.192E−01	1.007E+14	1.6155E+00	1.195E−01	1.009E+14	0.001
$1s\,2p\ ^3P^o_2$	$1s\,4d\ ^3D_1$	1.7078E+00	5.792E−03	4.416E+12	1.7006E+00	5.679E−03	4.329E+12	0.001
$1s\,2p\ ^1P^o_1$	$1s\,4d\ ^3D_1$	1.7161E+00	2.583E−02	1.950E+13	1.7090E+00	2.527E−02	1.907E+13	0.002
$1s\,3p\ ^3P^o_1$	$1s\,4d\ ^3D_1$	6.1732E+00	2.754E−01	1.607E+13	6.1476E+00	2.797E−01	1.631E+13	0.001
$1s\,3p\ ^3P^o_0$	$1s\,4d\ ^3D_1$	6.1781E+00	5.239E−01	3.052E+13	6.1522E+00	5.268E−01	3.068E+13	0.001
$1s\,3p\ ^3P^o_2$	$1s\,4d\ ^3D_1$	6.5502E+00	3.014E−02	1.562E+12	6.5227E+00	3.037E−02	1.573E+12	0.001
$1s\,3p\ ^1P^o_1$	$1s\,4d\ ^3D_1$	6.5847E+00	1.379E−01	7.069E+12	6.5574E+00	1.381E−01	7.082E+12	0.001
$1s\,4p\ ^3P^o_1$	$1s\,4d\ ^3D_1$	2.3523E+02	6.848E−02	2.752E+09	2.3358E+02	6.867E−02	2.774E+09	0.006
$1s\,4p\ ^3P^o_0$	$1s\,4d\ ^3D_1$	2.3807E+02	1.279E−01	5.016E+09	2.3629E+02	1.282E−01	5.063E+09	0.005
$1s\,4p\ ^3P^o_2$	$1s\,4d\ ^3D_1$	3.0279E+03	4.889E−04	1.186E+05				0.032
$1s^2\ ^1S_0$	$1s\,4p\ ^1P^o_1$	3.2750E−01	3.647E−02	7.559E+14	3.2616E−01	3.896E−02	8.074E+14	0.028
$1s\,2s\ ^3S_1$	$1s\,4p\ ^1P^o_1$	1.6048E+00	2.578E−02	2.226E+13	1.5980E+00	2.662E−02	2.298E+13	0.003
$1s\,2s\ ^1S_0$	$1s\,4p\ ^1P^o_1$	1.6227E+00	6.199E−02	5.234E+13	1.6161E+00	6.223E−02	5.253E+13	0.004
$1s\,3s\ ^3S_1$	$1s\,4p\ ^1P^o_1$	6.1092E+00	1.059E−01	6.309E+12	6.0840E+00	1.087E−01	6.475E+12	0.003
$1s\,3s\ ^1S_0$	$1s\,4p\ ^1P^o_1$	6.1776E+00	2.605E−01	1.518E+13	6.1529E+00	2.580E−01	1.502E+13	0.002
$1s\,3d\ ^3D_2$	$1s\,4p\ ^1P^o_1$	6.5793E+00	1.389E−03	7.134E+10	6.5517E+00	1.599E−03	8.215E+10	0.004
$1s\,3d\ ^3D_1$	$1s\,4p\ ^1P^o_1$	6.5845E+00	4.203E−03	2.156E+11	6.5569E+00	4.162E−03	2.134E+11	0.003
$1s\,3d\ ^1D_2$	$1s\,4p\ ^1P^o_1$	6.7135E+00	5.832E−02	2.877E+12	6.6851E+00	5.917E−02	2.918E+12	0.003
$1s\,4s\ ^3S_1$	$1s\,4p\ ^1P^o_1$	2.0225E+02	8.298E−02	4.510E+09	2.0166E+02	8.289E−02	4.493E+09	0.022
$1s\,4s\ ^1S_0$	$1s\,4p\ ^1P^o_1$	2.3741E+02	1.660E−01	6.547E+09	2.3715E+02	1.651E−01	6.471E+09	0.032
$1s\,4d\ ^3D_2$	$1s\,4p\ ^1P^o_1$	2.0339E+04	1.101E−04	5.916E+02				0.306
$1s\,4d\ ^3D_1$	$1s\,4p\ ^1P^o_1$	2.1218E+06	3.210E−06	1.585E−03				0.996
$1s\,2p\ ^3P^o_2$	$1s\,4d\ ^3D_3$	1.7043E+00	5.008E−01	1.643E+14	1.6972E+00	5.104E−01	1.674E+14	0.001
$1s\,3p\ ^3P^o_2$	$1s\,4d\ ^3D_3$	6.4997E+00	2.449E+00	5.523E+13	6.4725E+00	2.491E+00	5.619E+13	0.001
$1s\,4p\ ^3P^o_2$	$1s\,4d\ ^3D_3$	6.5884E+02	1.960E−01	4.302E+08	6.5162E+02	1.972E−01	4.388E+08	0.008
$1s\,3d\ ^3D_2$	$1s\,4f\ ^3F^o_3$	6.5275E+00	4.625E+00	1.034E+14	6.5002E+00	4.642E+00	1.038E+14	0.001
$1s\,3d\ ^3D_3$	$1s\,4f\ ^3F^o_3$	6.6546E+00	3.174E−01	6.829E+12	6.6265E+00	3.157E−01	6.793E+12	0.001
$1s\,3d\ ^1D_2$	$1s\,4f\ ^3F^o_3$	6.6595E+00	1.909E−02	4.102E+11	6.6315E+00	1.914E−02	4.113E+11	0.001
$1s\,4d\ ^3D_2$	$1s\,4f\ ^3F^o_3$	7.9649E+02	9.484E−02	1.425E+08	8.0096E+02	9.391E−02	1.383E+08	0.017
$1s\,4d\ ^3D_3$	$1s\,4f\ ^3F^o_3$	5.1914E+04	9.767E−05	3.453E+01				0.674
$1s\,2s\ ^3S_1$	$1s\,4f\ ^3F^o_2$	1.6017E+00	3.265E−09	1.698E+06	1.5949E+00	1.924E−08	1.000E+07	0.151
$1s\,3s\ ^3S_1$	$1s\,4f\ ^3F^o_2$	6.0636E+00	3.445E−06	1.250E+08				0.008
$1s\,3d\ ^3D_2$	$1s\,4f\ ^3F^o_2$	6.5264E+00	3.322E−01	1.040E+13	6.4991E+00	3.338E−01	1.045E+13	0.000
$1s\,3d\ ^3D_1$	$1s\,4f\ ^3F^o_2$	6.5315E+00	2.975E+00	9.304E+13	6.5041E+00	2.983E+00	9.330E+13	0.000
$1s\,3d\ ^3D_3$	$1s\,4f\ ^3F^o_2$	6.6535E+00	1.590E−02	4.793E+11	6.6254E+00	1.582E−02	4.767E+11	0.000
$1s\,3d\ ^1D_2$	$1s\,4f\ ^3F^o_2$	6.6584E+00	2.213E−01	6.660E+12	6.6303E+00	2.198E−01	6.613E+12	0.001
$1s\,4s\ ^3S_1$	$1s\,4f\ ^3F^o_2$	1.6191E+02	3.320E−07	1.689E+04	1.6143E+02	3.195E−07	1.622E+04	0.102
$1s\,4d\ ^3D_2$	$1s\,4f\ ^3F^o_2$	7.8052E+02	6.988E−03	1.530E+07	7.8473E+02	6.922E−03	1.486E+07	0.012
$1s\,4d\ ^3D_1$	$1s\,4f\ ^3F^o_2$	8.1135E+02	5.989E−02	1.214E+08	8.1580E+02	5.930E−02	1.178E+08	0.014
$1s\,4d\ ^3D_3$	$1s\,4f\ ^3F^o_2$	2.2242E+04	1.126E−05	3.037E+01				0.079
$1s\,2p\ ^3P^o_1$	$1s\,4d\ ^1D_2$	1.6178E+00	3.977E−04	2.027E+11	1.6111E+00	4.270E−04	2.176E+11	0.002
$1s\,2p\ ^3P^o_2$	$1s\,4d\ ^1D_2$	1.7042E+00	3.537E−02	1.625E+13	1.6970E+00	3.597E−02	1.652E+13	0.001
$1s\,2p\ ^1P^o_1$	$1s\,4d\ ^1D_2$	1.7124E+00	3.214E−01	1.462E+14	1.7053E+00	3.266E−01	1.485E+14	0.001
$1s\,3p\ ^3P^o_1$	$1s\,4d\ ^1D_2$	6.1264E+00	1.393E−03	4.950E+10	6.1011E+00	1.823E−03	6.480E+10	0.001
$1s\,3p\ ^3P^o_2$	$1s\,4d\ ^1D_2$	6.4976E+00	1.724E−01	5.448E+12	6.4704E+00	1.755E−01	5.545E+12	0.001
$1s\,3p\ ^1P^o_1$	$1s\,4d\ ^1D_2$	6.5315E+00	1.593E+00	4.980E+13	6.5045E+00	1.594E+00	4.985E+13	0.001
$1s\,4p\ ^3P^o_1$	$1s\,4d\ ^1D_2$	1.8218E+02	4.542E−04	1.826E+07	1.8111E+02	4.521E−04	1.823E+07	0.010

(*continued on next page*)

Table 3 (*continued*)

Lower	Upper	GRASP2K			FAC			*dT*
		λ (Å)	*gf*	A (s^{-1})	λ (Å)	*gf*	A (s^{-1})	
$1s\,4p\ ^3P^o_2$	$1s\,4d\ ^1D_2$	6.3767E+02	1.428E−02	4.685E+07	6.3050E+02	1.435E−02	4.775E+07	0.013
$1s\,4p\ ^1P^o_1$	$1s\,4d\ ^1D_2$	8.0810E+02	1.027E−01	2.098E+08	7.9983E+02	1.033E−01	2.136E+08	0.014
$1s\,4f\ ^3F^o_3$	$1s\,4d\ ^1D_2$	3.2125E+04	1.005E−05	1.300E+01				0.305
$1s\,4f\ ^3F^o_2$	$1s\,4d\ ^1D_2$	1.8409E+05	1.913E−05	7.530E−01				0.815
$1s\,3d\ ^3D_3$	$1s\,4f\ ^3F^o_4$	6.6276E+00	6.440E+00	1.087E+14	6.5997E+00	6.489E+00	1.094E+14	0.000
$1s\,4d\ ^3D_3$	$1s\,4f\ ^3F^o_4$	1.5856E+03	6.582E−02	1.940E+07	1.6034E+03	6.481E−02	1.852E+07	0.023
$1s\,3d\ ^3D_2$	$1s\,4f\ ^1F^o_3$	6.5007E+00	1.376E−04	3.102E+09				0.001
$1s\,3d\ ^3D_3$	$1s\,4f\ ^1F^o_3$	6.6268E+00	2.397E−01	5.202E+12	6.5989E+00	2.415E−01	5.241E+12	0.000
$1s\,3d\ ^1D_2$	$1s\,4f\ ^1F^o_3$	6.6317E+00	4.771E+00	1.034E+14	6.6038E+00	4.802E+00	1.040E+14	0.000
$1s\,4d\ ^3D_2$	$1s\,4f\ ^1F^o_3$	5.3023E+02	7.960E−06	2.698E+04	5.3185E+02	8.835E−06	2.951E+04	0.047
$1s\,4d\ ^3D_3$	$1s\,4f\ ^1F^o_3$	1.5391E+03	2.525E−03	1.016E+06	1.5556E+03	2.486E−03	9.708E+05	0.009
$1s\,4d\ ^1D_2$	$1s\,4f\ ^1F^o_3$	1.6685E+03	4.632E−02	1.585E+07	1.6908E+03	4.551E−02	1.504E+07	0.015
$1s\,2p\ ^3P^o_1$	$1s\,5s\ ^3S_1$	1.4605E+00	2.662E−03	2.774E+12	1.4544E+00	2.703E−03	2.817E+12	0.002
$1s\,2p\ ^3P^o_0$	$1s\,5s\ ^3S_1$	1.4615E+00	1.303E−03	1.356E+12	1.4554E+00	1.301E−03	1.354E+12	0.001
$1s\,2p\ ^3P^o_2$	$1s\,5s\ ^3S_1$	1.5306E+00	8.845E−03	8.395E+12	1.5241E+00	8.802E−03	8.353E+12	0.002
$1s\,2p\ ^1P^o_1$	$1s\,5s\ ^3S_1$	1.5372E+00	1.606E−03	1.511E+12	1.5308E+00	1.572E−03	1.479E+12	0.002
$1s\,3p\ ^3P^o_1$	$1s\,5s\ ^3S_1$	4.3516E+00	1.619E−02	1.901E+12	4.3336E+00	1.622E−02	1.904E+12	0.001
$1s\,3p\ ^3P^o_0$	$1s\,5s\ ^3S_1$	4.3540E+00	7.886E−03	9.249E+11	4.3359E+00	7.777E−03	9.119E+11	0.001
$1s\,3p\ ^3P^o_2$	$1s\,5s\ ^3S_1$	4.5356E+00	5.271E−02	5.697E+12	4.5167E+00	5.254E−02	5.678E+12	0.000
$1s\,3p\ ^1P^o_1$	$1s\,5s\ ^3S_1$	4.5521E+00	9.615E−03	1.032E+12	4.5333E+00	9.475E−03	1.016E+12	0.001
$1s\,4p\ ^3P^o_1$	$1s\,5s\ ^3S_1$	1.3877E+01	1.166E−01	1.346E+12	1.3818E+01	1.159E−01	1.339E+12	0.001
$1s\,4p\ ^3P^o_0$	$1s\,5s\ ^3S_1$	1.3887E+01	5.665E−02	6.532E+11	1.3827E+01	5.525E−02	6.371E+11	0.002
$1s\,4p\ ^3P^o_2$	$1s\,5s\ ^3S_1$	1.4675E+01	3.952E−01	4.080E+12	1.4612E+01	3.932E−01	4.060E+12	0.001
$1s\,4p\ ^1P^o_1$	$1s\,5s\ ^3S_1$	1.4747E+01	7.255E−02	7.417E+11	1.4684E+01	7.130E−02	7.289E+11	0.001
$1s\,4f\ ^3F^o_2$	$1s\,5s\ ^3S_1$	1.5020E+01	4.244E−08	4.183E+05				0.057
$1s^2\ ^1S_0$	$1s\,5p\ ^3P^o_1$	3.2030E−01	7.183E−03	1.556E+14	3.1904E−01	6.799E−03	1.472E+14	0.011
$1s\,2s\ ^3S_1$	$1s\,5p\ ^3P^o_1$	1.4466E+00	2.787E−02	2.961E+13	1.4405E+00	2.788E−02	2.962E+13	0.002
$1s\,2s\ ^1S_0$	$1s\,5p\ ^3P^o_1$	1.4611E+00	1.211E−02	1.261E+13	1.4551E+00	1.185E−02	1.234E+13	0.006
$1s\,3s\ ^3S_1$	$1s\,5p\ ^3P^o_1$	4.3132E+00	8.123E−02	9.709E+12	4.2953E+00	8.191E−02	9.788E+12	0.002
$1s\,3s\ ^1S_0$	$1s\,5p\ ^3P^o_1$	4.3472E+00	3.579E−02	4.210E+12	4.3296E+00	3.517E−02	4.136E+12	0.002
$1s\,3d\ ^3D_2$	$1s\,5p\ ^3P^o_1$	4.5423E+00	1.400E−02	1.509E+12	4.5233E+00	1.405E−02	1.514E+12	0.001
$1s\,3d\ ^3D_1$	$1s\,5p\ ^3P^o_1$	4.5448E+00	3.044E−03	3.276E+11	4.5258E+00	2.992E−03	3.221E+11	0.004
$1s\,3d\ ^1D_2$	$1s\,5p\ ^3P^o_1$	4.6059E+00	1.856E−05	1.945E+09				0.012
$1s\,4s\ ^3S_1$	$1s\,5p\ ^3P^o_1$	1.3679E+01	3.607E−01	4.285E+12	1.3623E+01	3.658E−01	4.346E+12	0.002
$1s\,4s\ ^1S_0$	$1s\,5p\ ^3P^o_1$	1.3818E+01	1.618E−01	1.884E+12	1.3762E+01	1.583E−01	1.843E+12	0.001
$1s\,4d\ ^3D_2$	$1s\,5p\ ^3P^o_1$	1.4661E+01	1.771E−01	1.832E+12	1.4602E+01	1.772E−01	1.832E+12	0.000
$1s\,4d\ ^3D_1$	$1s\,5p\ ^3P^o_1$	1.4671E+01	3.825E−02	3.951E+11	1.4612E+01	3.753E−02	3.875E+11	0.002
$1s\,4d\ ^1D_2$	$1s\,5p\ ^3P^o_1$	1.4943E+01	2.115E−04	2.106E+09	1.4882E+01	1.298E−04	1.292E+09	0.007
$1s\,5s\ ^3S_1$	$1s\,5p\ ^3P^o_1$	2.8648E+03	3.352E−02	9.081E+06	2.9004E+03	3.303E−02	8.656E+06	0.158
$1s\,2p\ ^3P^o_1$	$1s\,5s\ ^1S_0$	1.4597E+00	1.072E−03	3.357E+12	1.4537E+00	1.107E−03	3.465E+12	0.007
$1s\,2p\ ^1P^o_1$	$1s\,5s\ ^1S_0$	1.5363E+00	3.681E−03	1.040E+13	1.5300E+00	3.664E−03	1.035E+13	0.003
$1s\,3p\ ^3P^o_1$	$1s\,5s\ ^1S_0$	4.3447E+00	6.572E−03	2.322E+12	4.3266E+00	6.732E−03	2.378E+12	0.001
$1s\,3p\ ^1P^o_1$	$1s\,5s\ ^1S_0$	4.5445E+00	2.173E−02	7.020E+12	4.5257E+00	2.187E−02	7.061E+12	0.000
$1s\,4p\ ^3P^o_1$	$1s\,5s\ ^1S_0$	1.3807E+01	4.696E−02	1.643E+12	1.3747E+01	4.812E−02	1.684E+12	0.000
$1s\,4p\ ^1P^o_1$	$1s\,5s\ ^1S_0$	1.4668E+01	1.615E−01	5.008E+12	1.4605E+01	1.637E−01	5.077E+12	0.000
$1s\,5p\ ^3P^o_1$	$1s\,5s\ ^1S_0$	5.6589E+04	7.282E−04	1.517E+03	3.7737E+04	1.084E−03	5.038E+03	0.577
$1s\,2s\ ^3S_1$	$1s\,5p\ ^3P^o_0$	1.4465E+00	1.324E−02	4.222E+13	1.4404E+00	1.328E−02	4.235E+13	0.003
$1s\,3s\ ^3S_1$	$1s\,5p\ ^3P^o_0$	4.3127E+00	3.863E−02	1.385E+13	4.2949E+00	3.919E−02	1.405E+13	0.003
$1s\,3d\ ^3D_1$	$1s\,5p\ ^3P^o_0$	4.5443E+00	5.643E−03	1.823E+12	4.5253E+00	5.635E−03	1.819E+12	0.004
$1s\,4s\ ^3S_1$	$1s\,5p\ ^3P^o_0$	1.3675E+01	1.715E−01	6.118E+12	1.3619E+01	1.758E−01	6.271E+12	0.003
$1s\,4d\ ^3D_1$	$1s\,5p\ ^3P^o_0$	1.4666E+01	7.131E−02	2.212E+12	1.4607E+01	7.119E−02	2.206E+12	0.002
$1s\,5s\ ^3S_1$	$1s\,5p\ ^3P^o_0$	2.6711E+03	1.723E−02	1.611E+07	2.7075E+03	1.693E−02	1.527E+07	0.131
$1s\,2s\ ^3S_1$	$1s\,5p\ ^3P^o_2$	1.4424E+00	6.070E−02	3.892E+13	1.4363E+00	6.235E−02	3.998E+13	0.002
$1s\,3s\ ^3S_1$	$1s\,5p\ ^3P^o_2$	4.2763E+00	1.651E−01	1.205E+13	4.2586E+00	1.679E−01	1.225E+13	0.003
$1s\,3d\ ^3D_2$	$1s\,5p\ ^3P^o_2$	4.5014E+00	1.723E−03	1.135E+11	4.4826E+00	1.717E−03	1.130E+11	0.002
$1s\,3d\ ^3D_1$	$1s\,5p\ ^3P^o_2$	4.5039E+00	1.857E−04	1.222E+10	4.4850E+00	1.847E−04	1.214E+10	0.005
$1s\,3d\ ^3D_3$	$1s\,5p\ ^3P^o_2$	4.5615E+00	1.853E−02	1.188E+12	4.5423E+00	1.822E−02	1.168E+12	0.002
$1s\,3d\ ^1D_2$	$1s\,5p\ ^3P^o_2$	4.5638E+00	1.318E−03	8.443E+10	4.5447E+00	1.283E−03	8.220E+10	0.005
$1s\,4s\ ^3S_1$	$1s\,5p\ ^3P^o_2$	1.3315E+01	6.598E−01	4.965E+12	1.3261E+01	6.702E−01	5.041E+12	0.003
$1s\,4d\ ^3D_2$	$1s\,5p\ ^3P^o_2$	1.4243E+01	2.163E−02	1.422E+11	1.4186E+01	2.133E−02	1.402E+11	0.001
$1s\,4d\ ^3D_1$	$1s\,5p\ ^3P^o_2$	1.4253E+01	2.338E−03	1.535E+10	1.4196E+01	2.306E−03	1.513E+10	0.002
$1s\,4d\ ^3D_3$	$1s\,5p\ ^3P^o_2$	1.4499E+01	2.318E−01	1.471E+12	1.4440E+01	2.276E−01	1.444E+12	0.001
$1s\,4d\ ^1D_2$	$1s\,5p\ ^3P^o_2$	1.4509E+01	1.640E−02	1.039E+11	1.4450E+01	1.598E−02	1.012E+11	0.002
$1s\,5s\ ^3S_1$	$1s\,5p\ ^3P^o_2$	4.2565E+02	5.519E−01	4.064E+09	4.2515E+02	5.512E−01	4.033E+09	0.022
$1s\,2p\ ^3P^o_1$	$1s\,5d\ ^3D_2$	1.4552E+00	1.097E−01	6.914E+13	1.4491E+00	1.101E−01	6.935E+13	0.001
$1s\,2p\ ^3P^o_2$	$1s\,5d\ ^3D_2$	1.5247E+00	1.907E−02	1.094E+13	1.5183E+00	1.865E−02	1.070E+13	0.002
$1s\,2p\ ^1P^o_1$	$1s\,5d\ ^3D_2$	1.5313E+00	3.170E−03	1.803E+12	1.5250E+00	3.140E−03	1.786E+12	0.002
$1s\,3p\ ^3P^o_1$	$1s\,5d\ ^3D_2$	4.3049E+00	3.188E−01	2.295E+13	4.2870E+00	3.199E−01	2.302E+13	0.001
$1s\,3p\ ^3P^o_2$	$1s\,5d\ ^3D_2$	4.4849E+00	6.198E−02	4.111E+12	4.4661E+00	6.194E−02	4.107E+12	0.001
$1s\,3p\ ^1P^o_1$	$1s\,5d\ ^3D_2$	4.5010E+00	1.016E−02	6.693E+11	4.4823E+00	9.871E−03	6.499E+11	0.002
$1s\,4p\ ^3P^o_1$	$1s\,5d\ ^3D_2$	1.3413E+01	1.225E+00	9.083E+12	1.3354E+01	1.230E+00	9.125E+12	0.000

(*continued on next page*)

Table 3 (*continued*)

Lower	Upper	GRASP2K			FAC			*dT*
		λ (Å)	*gf*	A (s^{-1})	λ (Å)	*gf*	A (s^{-1})	
$1s\,4p\ ^3P^o_2$	$1s\,5d\ ^3D_2$	1.4158E+01	2.724E−01	1.813E+12	1.4095E+01	2.756E−01	1.835E+12	0.001
$1s\,4p\ ^1P^o_1$	$1s\,5d\ ^3D_2$	1.4224E+01	4.478E−02	2.952E+11	1.4162E+01	4.221E−02	2.784E+11	0.001
$1s\,4f\ ^3F^o_3$	$1s\,5d\ ^3D_2$	1.4473E+01	6.876E−02	4.380E+11	1.4409E+01	6.894E−02	4.392E+11	0.001
$1s\,4f\ ^3F^o_2$	$1s\,5d\ ^3D_2$	1.4478E+01	5.008E−03	3.187E+10	1.4414E+01	5.000E−03	3.183E+10	0.000
$1s\,4f\ ^1F^o_3$	$1s\,5d\ ^3D_2$	1.4606E+01	5.098E−06	3.188E+07				0.008
$1s\,5p\ ^3P^o_1$	$1s\,5d\ ^3D_2$	4.6651E+02	4.431E−01	2.716E+09	4.6168E+02	4.458E−01	2.766E+09	0.001
$1s\,5p\ ^3P^o_2$	$1s\,5d\ ^3D_2$	6.9791E+03	5.402E−03	1.480E+05				0.074
$1s^2\ ^1S_0$	$1s\,5p\ ^1P^o_1$	3.2010E−01	1.758E−02	3.812E+14	3.1882E−01	1.876E−02	4.069E+14	0.030
$1s\,2s\ ^3S_1$	$1s\,5p\ ^1P^o_1$	1.4421E+00	1.083E−02	1.158E+13	1.4360E+00	1.116E−02	1.193E+13	0.002
$1s\,2s\ ^1S_0$	$1s\,5p\ ^1P^o_1$	1.4565E+00	2.585E−02	2.709E+13	1.4505E+00	2.600E−02	2.724E+13	0.003
$1s\,3s\ ^3S_1$	$1s\,5p\ ^1P^o_1$	4.2732E+00	2.926E−02	3.563E+12	4.2555E+00	2.990E−02	3.640E+12	0.003
$1s\,3s\ ^1S_0$	$1s\,5p\ ^1P^o_1$	4.3066E+00	7.083E−02	8.491E+12	4.2891E+00	7.040E−02	8.437E+12	0.001
$1s\,3d\ ^3D_2$	$1s\,5p\ ^1P^o_1$	4.4980E+00	2.798E−04	3.075E+10	4.4792E+00	3.159E−04	3.471E+10	0.006
$1s\,3d\ ^3D_1$	$1s\,5p\ ^1P^o_1$	4.5005E+00	8.523E−04	9.356E+10	4.4816E+00	8.478E−04	9.306E+10	0.006
$1s\,3d\ ^1D_2$	$1s\,5p\ ^1P^o_1$	4.5603E+00	1.161E−02	1.241E+12	4.5411E+00	1.171E−02	1.251E+12	0.006
$1s\,4s\ ^3S_1$	$1s\,5p\ ^1P^o_1$	1.3285E+01	1.158E−01	1.458E+12	1.3231E+01	1.184E−01	1.491E+12	0.003
$1s\,4s\ ^1S_0$	$1s\,5p\ ^1P^o_1$	1.3416E+01	2.856E−01	3.528E+12	1.3362E+01	2.818E−01	3.479E+12	0.000
$1s\,4d\ ^3D_2$	$1s\,5p\ ^1P^o_1$	1.4209E+01	3.407E−03	3.752E+10	1.4152E+01	3.849E−03	4.237E+10	0.003
$1s\,4d\ ^3D_1$	$1s\,5p\ ^1P^o_1$	1.4219E+01	1.055E−02	1.160E+11	1.4162E+01	1.040E−02	1.144E+11	0.003
$1s\,4d\ ^1D_2$	$1s\,5p\ ^1P^o_1$	1.4474E+01	1.448E−01	1.537E+12	1.4415E+01	1.466E−01	1.555E+12	0.003
$1s\,5s\ ^3S_1$	$1s\,5p\ ^1P^o_1$	3.9729E+02	1.063E−01	1.497E+09	3.9647E+02	1.060E−01	1.487E+09	0.020
$1s\,5s\ ^1S_0$	$1s\,5p\ ^1P^o_1$	4.6505E+02	2.128E−01	2.188E+09	4.6491E+02	2.116E−01	2.159E+09	0.040
$1s\,5d\ ^3D_2$	$1s\,5p\ ^1P^o_1$	4.1006E+04	1.481E−04	1.958E+02				0.294
$1s\,2p\ ^3P^o_1$	$1s\,5d\ ^3D_1$	1.4551E+00	2.353E−02	2.470E+13	1.4491E+00	2.355E−02	2.472E+13	0.001
$1s\,2p\ ^3P^o_0$	$1s\,5d\ ^3D_1$	1.4562E+00	4.450E−02	4.666E+13	1.4501E+00	4.454E−02	4.669E+13	0.001
$1s\,2p\ ^3P^o_2$	$1s\,5d\ ^3D_1$	1.5247E+00	2.091E−03	2.000E+12	1.5182E+00	2.036E−03	1.947E+12	0.002
$1s\,2p\ ^1P^o_1$	$1s\,5d\ ^3D_1$	1.5313E+00	9.303E−03	8.822E+12	1.5249E+00	9.050E−03	8.580E+12	0.002
$1s\,3p\ ^3P^o_1$	$1s\,5d\ ^3D_1$	4.3044E+00	6.792E−02	8.151E+12	4.2865E+00	6.846E−02	8.213E+12	0.001
$1s\,3p\ ^3P^o_0$	$1s\,5d\ ^3D_1$	4.3068E+00	1.290E−01	1.546E+13	4.2888E+00	1.293E−01	1.550E+13	0.001
$1s\,3p\ ^3P^o_2$	$1s\,5d\ ^3D_1$	4.4844E+00	6.769E−03	7.484E+11	4.4656E+00	6.748E−03	7.460E+11	0.002
$1s\,3p\ ^1P^o_1$	$1s\,5d\ ^3D_1$	4.5005E+00	3.073E−02	3.374E+12	4.4818E+00	3.056E−02	3.354E+12	0.002
$1s\,4p\ ^3P^o_1$	$1s\,5d\ ^3D_1$	1.3409E+01	2.602E−01	3.218E+12	1.3350E+01	2.644E−01	3.271E+12	0.001
$1s\,4p\ ^3P^o_0$	$1s\,5d\ ^3D_1$	1.3418E+01	4.953E−01	6.116E+12	1.3359E+01	4.977E−01	6.148E+12	0.001
$1s\,4p\ ^3P^o_2$	$1s\,5d\ ^3D_1$	1.4153E+01	2.966E−02	3.292E+11	1.4090E+01	2.999E−02	3.330E+11	0.001
$1s\,4p\ ^1P^o_1$	$1s\,5d\ ^3D_1$	1.4219E+01	1.367E−01	1.504E+12	1.4157E+01	1.374E−01	1.512E+12	0.001
$1s\,4f\ ^3F^o_2$	$1s\,5d\ ^3D_1$	1.4473E+01	4.410E−02	4.681E+11	1.4409E+01	4.432E−02	4.706E+11	0.000
$1s\,5p\ ^3P^o_1$	$1s\,5d\ ^3D_1$	4.6125E+02	9.567E−02	9.998E+08	4.5655E+02	9.626E−02	1.018E+09	0.006
$1s\,5p\ ^3P^o_0$	$1s\,5d\ ^3D_1$	4.6670E+02	1.788E−01	1.825E+09	4.6173E+02	1.798E−01	1.860E+09	0.005
$1s\,5p\ ^3P^o_2$	$1s\,5d\ ^3D_1$	5.9615E+03	6.837E−04	4.277E+04				0.014
$1s\,5p\ ^1P^o_1$	$1s\,5d\ ^3D_1$	1.4006E+07	1.340E−06	1.521E−05				0.999
$1s\,2p\ ^3P^o_2$	$1s\,5d\ ^3D_3$	1.5233E+00	1.832E−01	7.522E+13	1.5168E+00	1.864E−01	7.654E+13	0.000
$1s\,3p\ ^3P^o_2$	$1s\,5d\ ^3D_3$	4.4722E+00	5.674E−01	2.703E+13	4.4535E+00	5.745E−01	2.737E+13	0.001
$1s\,4p\ ^3P^o_2$	$1s\,5d\ ^3D_3$	1.4032E+01	2.380E+00	1.152E+13	1.3970E+01	2.417E+00	1.170E+13	0.000
$1s\,4f\ ^3F^o_3$	$1s\,5d\ ^3D_3$	1.4341E+01	3.955E−03	1.833E+10	1.4279E+01	3.981E−03	1.844E+10	0.001
$1s\,4f\ ^3F^o_2$	$1s\,5d\ ^3D_3$	1.4347E+01	1.850E−04	8.566E+08				0.000
$1s\,4f\ ^3F^o_4$	$1s\,5d\ ^3D_3$	1.4468E+01	8.764E−02	3.990E+11	1.4405E+01	8.760E−02	3.988E+11	0.001
$1s\,4f\ ^1F^o_3$	$1s\,5d\ ^3D_3$	1.4472E+01	3.270E−03	1.488E+10	1.4409E+01	3.258E−03	1.482E+10	0.000
$1s\,5p\ ^3P^o_2$	$1s\,5d\ ^3D_3$	1.2888E+03	2.743E−01	1.574E+08	1.2633E+03	2.786E−01	1.649E+08	0.012
$1s\,3d\ ^3D_2$	$1s\,5f\ ^3F^o_3$	4.4855E+00	7.286E−01	3.451E+13	4.4667E+00	7.301E−01	3.457E+13	0.001
$1s\,3d\ ^3D_3$	$1s\,5f\ ^3F^o_3$	4.5452E+00	4.817E−02	2.222E+12	4.5260E+00	4.762E−02	2.196E+12	0.001
$1s\,3d\ ^1D_2$	$1s\,5f\ ^3F^o_3$	4.5475E+00	2.879E−03	1.327E+11	4.5283E+00	2.884E−03	1.329E+11	0.001
$1s\,4d\ ^3D_2$	$1s\,5f\ ^3F^o_3$	1.4085E+01	3.989E+00	1.916E+13	1.4028E+01	3.999E+00	1.920E+13	0.000
$1s\,4d\ ^3D_3$	$1s\,5f\ ^3F^o_3$	1.4335E+01	2.801E−01	1.299E+12	1.4276E+01	2.797E−01	1.296E+12	0.001
$1s\,4d\ ^1D_2$	$1s\,5f\ ^3F^o_3$	1.4345E+01	1.780E−02	8.244E+10	1.4286E+01	1.789E−02	8.283E+10	0.001
$1s\,5d\ ^3D_2$	$1s\,5f\ ^3F^o_3$	1.5543E+03	1.737E−01	6.852E+07	1.5716E+03	1.710E−01	6.544E+07	0.010
$1s\,5d\ ^3D_3$	$1s\,5f\ ^3F^o_3$	9.3195E+04	1.950E−04	2.140E+01				0.340
$1s\,2s\ ^3S_1$	$1s\,5f\ ^3F^o_2$	1.4408E+00	3.299E−09	2.120E+06	1.4347E+00	1.307E−08	8.404E+06	0.290
$1s\,3s\ ^3S_1$	$1s\,5f\ ^3F^o_2$	4.2617E+00	5.278E−07	3.876E+07				0.035
$1s\,3d\ ^3D_2$	$1s\,5f\ ^3F^o_2$	4.4853E+00	5.238E−02	3.474E+12	4.4664E+00	5.249E−02	3.480E+12	0.000
$1s\,3d\ ^3D_1$	$1s\,5f\ ^3F^o_2$	4.4877E+00	4.685E−01	3.103E+13	4.4688E+00	4.693E−01	3.108E+13	0.000
$1s\,3d\ ^3D_3$	$1s\,5f\ ^3F^o_2$	4.5449E+00	2.415E−03	1.560E+11	4.5257E+00	2.384E−03	1.539E+11	0.001
$1s\,3d\ ^1D_2$	$1s\,5f\ ^3F^o_2$	4.5472E+00	3.357E−02	2.166E+12	4.5280E+00	3.314E−02	2.138E+12	0.001
$1s\,4s\ ^3S_1$	$1s\,5f\ ^3F^o_2$	1.3175E+01	3.531E−06	2.714E+07				0.018
$1s\,4d\ ^3D_2$	$1s\,5f\ ^3F^o_2$	1.4083E+01	2.874E−01	1.933E+12	1.4025E+01	2.887E−01	1.941E+12	0.000
$1s\,4d\ ^3D_1$	$1s\,5f\ ^3F^o_2$	1.4092E+01	2.568E+00	1.725E+13	1.4035E+01	2.571E+00	1.726E+13	0.000
$1s\,4d\ ^3D_3$	$1s\,5f\ ^3F^o_2$	1.4332E+01	1.400E−02	9.090E+10	1.4273E+01	1.398E−02	9.080E+10	0.000
$1s\,4d\ ^1D_2$	$1s\,5f\ ^3F^o_2$	1.4343E+01	1.944E−01	1.261E+12	1.4284E+01	1.937E−01	1.256E+12	0.000
$1s\,5s\ ^3S_1$	$1s\,5f\ ^3F^o_2$	3.1755E+02	6.658E−07	8.808E+03	3.1643E+02	6.490E−07	8.574E+03	0.156
$1s\,5d\ ^3D_2$	$1s\,5f\ ^3F^o_2$	1.5232E+03	1.282E−02	7.370E+06	1.5396E+03	1.263E−02	7.049E+06	0.006
$1s\,5d\ ^3D_1$	$1s\,5f\ ^3F^o_2$	1.5821E+03	1.098E−01	5.852E+07	1.5996E+03	1.081E−01	5.590E+07	0.005
$1s\,5d\ ^3D_3$	$1s\,5f\ ^3F^o_2$	4.1865E+04	2.141E−05	1.630E+01				0.064

(*continued on next page*)

Table 3 (*continued*)

Lower	Upper	GRASP2K			FAC			*dT*
		λ (Å)	*gf*	A (s^{-1})	λ (Å)	*gf*	A (s^{-1})	
$1s\,2p\ ^3P^o_1$	$1s\,5d\ ^1D_2$	1.4538E+00	1.438E−04	9.078E+10	1.4478E+00	1.474E−04	9.306E+10	0.001
$1s\,2p\ ^3P^o_2$	$1s\,5d\ ^1D_2$	1.5232E+00	1.293E−02	7.432E+12	1.5168E+00	1.311E−02	7.537E+12	0.000
$1s\,2p\ ^1P^o_1$	$1s\,5d\ ^1D_2$	1.5298E+00	1.173E−01	6.689E+13	1.5234E+00	1.193E−01	6.803E+13	0.000
$1s\,3p\ ^3P^o_1$	$1s\,5d\ ^1D_2$	4.2927E+00	3.366E−04	2.437E+10	4.2749E+00	3.884E−04	2.811E+10	0.001
$1s\,3p\ ^3P^o_2$	$1s\,5d\ ^1D_2$	4.4717E+00	3.994E−02	2.665E+12	4.4529E+00	4.038E−02	2.694E+12	0.001
$1s\,3p\ ^1P^o_1$	$1s\,5d\ ^1D_2$	4.4877E+00	3.668E−01	2.429E+13	4.4691E+00	3.683E−01	2.439E+13	0.001
$1s\,4p\ ^3P^o_1$	$1s\,5d\ ^1D_2$	1.3295E+01	1.171E−03	8.835E+09	1.3238E+01	1.596E−03	1.204E+10	0.001
$1s\,4p\ ^3P^o_2$	$1s\,5d\ ^1D_2$	1.4027E+01	1.671E−01	1.133E+12	1.3965E+01	1.698E−01	1.152E+12	0.001
$1s\,4p\ ^1P^o_1$	$1s\,5d\ ^1D_2$	1.4092E+01	1.553E+00	1.043E+13	1.4031E+01	1.548E+00	1.040E+13	0.001
$1s\,4f\ ^3F^o_3$	$1s\,5d\ ^1D_2$	1.4336E+01	2.568E−04	1.667E+09	1.4273E+01	2.695E−04	1.750E+09	0.000
$1s\,4f\ ^3F^o_2$	$1s\,5d\ ^1D_2$	1.4341E+01	2.746E−03	1.781E+10	1.4279E+01	2.764E−03	1.793E+10	0.001
$1s\,4f\ ^1F^o_3$	$1s\,5d\ ^1D_2$	1.4467E+01	6.463E−02	4.120E+11	1.4403E+01	6.487E−02	4.136E+11	0.000
$1s\,5p\ ^3P^o_1$	$1s\,5d\ ^1D_2$	3.5679E+02	5.880E−04	6.162E+06	3.5385E+02	5.862E−04	6.193E+06	0.019
$1s\,5p\ ^3P^o_2$	$1s\,5d\ ^1D_2$	1.2461E+03	1.996E−02	1.715E+07	1.2214E+03	2.024E−02	1.794E+07	0.011
$1s\,5p\ ^1P^o_1$	$1s\,5d\ ^1D_2$	1.5753E+03	1.443E−01	7.759E+07	1.5418E+03	1.468E−01	8.171E+07	0.014
$1s\,5f\ ^3F^o_3$	$1s\,5d\ ^1D_2$	6.3169E+04	1.871E−05	6.254E+00				0.202
$1s\,5f\ ^3F^o_2$	$1s\,5d\ ^1D_2$	3.7392E+05	3.369E−05	3.214E−01				0.434
$1s\,3d\ ^3D_3$	$1s\,5f\ ^3F^o_4$	4.5387E+00	9.978E−01	3.590E+13	4.5196E+00	1.005E+00	3.616E+13	0.001
$1s\,4d\ ^3D_3$	$1s\,5f\ ^3F^o_4$	1.4271E+01	5.607E+00	2.040E+13	1.4212E+01	5.633E+00	2.049E+13	0.000
$1s\,5d\ ^3D_3$	$1s\,5f\ ^3F^o_4$	3.0834E+03	1.209E−01	9.428E+06	3.1501E+03	1.178E−01	8.729E+06	0.017
$1s\,4f\ ^3F^o_3$	$1s\,5g\ ^3G_4$	1.4275E+01	8.976E+00	3.265E+13	1.4214E+01	8.998E+00	3.272E+13	0.000
$1s\,4f\ ^3F^o_4$	$1s\,5g\ ^3G_4$	1.4400E+01	3.232E−01	1.155E+12	1.4339E+01	3.220E−01	1.150E+12	0.000
$1s\,4f\ ^1F^o_3$	$1s\,5g\ ^3G_4$	1.4404E+01	9.104E−03	3.252E+10	1.4343E+01	9.083E−03	3.244E+10	0.000
$1s\,5f\ ^3F^o_3$	$1s\,5g\ ^3G_4$	3.1830E+03	6.601E−02	4.829E+06	3.1753E+03	6.588E−02	4.802E+06	0.007
$1s\,5f\ ^3F^o_4$	$1s\,5g\ ^3G_4$	1.7265E+06	4.338E−06	1.079E−03				0.584
$1s\,2p\ ^3P^o_2$	$1s\,5g\ ^3G_3$	1.5225E+00	1.816E−10	7.464E+04	1.5161E+00	8.545E−11	3.512E+04	0.372
$1s\,3p\ ^3P^o_2$	$1s\,5g\ ^3G_3$	4.4656E+00	2.805E−11	1.340E+03	4.4470E+00	2.636E−10	1.259E+04	0.160
$1s\,4p\ ^3P^o_2$	$1s\,5g\ ^3G_3$	1.3967E+01	7.568E−07	3.697E+06				0.002
$1s\,4f\ ^3F^o_3$	$1s\,5g\ ^3G_3$	1.4273E+01	3.312E−01	1.549E+12	1.4213E+01	3.319E−01	1.552E+12	0.000
$1s\,4f\ ^3F^o_2$	$1s\,5g\ ^3G_3$	1.4278E+01	6.649E+00	3.108E+13	1.4218E+01	6.662E+00	3.113E+13	0.000
$1s\,4f\ ^3F^o_4$	$1s\,5g\ ^3G_3$	1.4399E+01	9.264E−03	4.258E+10	1.4338E+01	9.232E−03	4.243E+10	0.001
$1s\,4f\ ^1F^o_3$	$1s\,5g\ ^3G_3$	1.4403E+01	2.515E−01	1.155E+12	1.4341E+01	2.504E−01	1.150E+12	0.000
$1s\,5p\ ^3P^o_2$	$1s\,5g\ ^3G_3$	9.0225E+02	3.193E−08	3.737E+01				0.058
$1s\,5f\ ^3F^o_3$	$1s\,5g\ ^3G_3$	3.1085E+03	2.495E−03	2.460E+05	3.1008E+03	2.490E−03	2.446E+05	0.029
$1s\,5f\ ^3F^o_2$	$1s\,5g\ ^3G_3$	3.2410E+03	4.801E−02	4.356E+06	3.2333E+03	4.792E−02	4.331E+06	0.023
$1s\,5f\ ^3F^o_4$	$1s\,5g\ ^3G_3$	1.2333E+05	1.738E−06	1.089E−01				0.822
$1s\,3d\ ^3D_2$	$1s\,5f\ ^1F^o_3$	4.4790E+00	2.109E−05	1.002E+09				0.005
$1s\,3d\ ^3D_3$	$1s\,5f\ ^1F^o_3$	4.5385E+00	3.715E−02	1.719E+12	4.5194E+00	3.740E−02	1.730E+12	0.000
$1s\,3d\ ^1D_2$	$1s\,5f\ ^1F^o_3$	4.5408E+00	7.388E−01	3.414E+13	4.5217E+00	7.440E−01	3.438E+13	0.000
$1s\,4d\ ^3D_2$	$1s\,5f\ ^1F^o_3$	1.4022E+01	2.073E−04	1.005E+09				0.003
$1s\,4d\ ^3D_3$	$1s\,5f\ ^1F^o_3$	1.4269E+01	2.086E−01	9.761E+11	1.4210E+01	2.096E−01	9.810E+11	0.000
$1s\,4d\ ^1D_2$	$1s\,5f\ ^1F^o_3$	1.4279E+01	4.156E+00	1.943E+13	1.4221E+01	4.169E+00	1.948E+13	0.000
$1s\,5d\ ^3D_2$	$1s\,5f\ ^1F^o_3$	1.0343E+03	1.740E−05	1.550E+04	1.0413E+03	1.923E−05	1.675E+04	0.068
$1s\,5d\ ^3D_3$	$1s\,5f\ ^1F^o_3$	2.9925E+03	4.638E−03	4.936E+05	3.0547E+03	4.522E−03	4.579E+05	0.007
$1s\,5d\ ^1D_2$	$1s\,5f\ ^1F^o_3$	3.2509E+03	8.494E−02	7.658E+06	3.3306E+03	8.255E−02	7.031E+06	0.005
$1s\,5g\ ^3G_4$	$1s\,5f\ ^1F^o_3$	1.0795E+05	1.971E−06	1.612E−01				0.573
$1s\,5g\ ^3G_3$	$1s\,5f\ ^1F^o_3$	5.7657E+05	1.010E−05	2.896E−02				0.888
$1s\,4f\ ^3F^o_4$	$1s\,5g\ ^3G_5$	1.4362E+01	1.142E+01	3.356E+13	1.4301E+01	1.146E+01	3.369E+13	0.000
$1s\,5f\ ^3F^o_4$	$1s\,5g\ ^3G_5$	5.3388E+03	4.992E−02	1.062E+06	5.3203E+03	4.988E−02	1.059E+06	0.007
$1s\,4f\ ^3F^o_3$	$1s\,5g\ ^1G_4$	1.4236E+01	8.057E−07	2.947E+06				0.006
$1s\,4f\ ^3F^o_4$	$1s\,5g\ ^1G_4$	1.4361E+01	2.606E−01	9.364E+11	1.4299E+01	2.616E−01	9.402E+11	0.000
$1s\,4f\ ^1F^o_3$	$1s\,5g\ ^1G_4$	1.4364E+01	9.081E+00	3.262E+13	1.4303E+01	9.114E+00	3.273E+13	0.000
$1s\,5f\ ^3F^o_3$	$1s\,5g\ ^1G_4$	1.9730E+03	2.721E−09	5.180E−01				0.788
$1s\,5f\ ^3F^o_4$	$1s\,5g\ ^1G_4$	5.1744E+03	1.176E−03	3.255E+04	5.1563E+03	1.174E−03	3.246E+04	0.043
$1s\,5f\ ^1F^o_3$	$1s\,5g\ ^1G_4$	5.4521E+03	3.888E−02	9.694E+05	5.4339E+03	3.884E−02	9.667E+05	0.028
$1s\,2p\ ^3P^o_1$	$1s\,6s\ ^3S_1$	1.3813E+00	1.347E−03	1.569E+12	1.3756E+00	1.386E−03	1.615E+12	0.002
$1s\,2p\ ^3P^o_0$	$1s\,6s\ ^3S_1$	1.3823E+00	6.594E−04	7.674E+11	1.3765E+00	6.489E−04	7.550E+11	0.002
$1s\,2p\ ^3P^o_2$	$1s\,6s\ ^3S_1$	1.4438E+00	4.439E−03	4.734E+12	1.4378E+00	4.423E−03	4.716E+12	0.004
$1s\,2p\ ^1P^o_1$	$1s\,6s\ ^3S_1$	1.4497E+00	8.068E−04	8.535E+11	1.4438E+00	7.972E−04	8.432E+11	0.002
$1s\,3p\ ^3P^o_1$	$1s\,6s\ ^3S_1$	3.7169E+00	6.581E−03	1.059E+12	3.7018E+00	6.645E−03	1.069E+12	0.001
$1s\,3p\ ^3P^o_0$	$1s\,6s\ ^3S_1$	3.7187E+00	3.203E−03	5.150E+11	3.7035E+00	3.126E−03	5.024E+11	0.002
$1s\,3p\ ^3P^o_2$	$1s\,6s\ ^3S_1$	3.8504E+00	2.103E−02	3.154E+12	3.8346E+00	2.093E−02	3.139E+12	0.000
$1s\,3p\ ^1P^o_1$	$1s\,6s\ ^3S_1$	3.8623E+00	3.830E−03	5.708E+11	3.8466E+00	3.799E−03	5.660E+11	0.001
$1s\,4p\ ^3P^o_1$	$1s\,6s\ ^3S_1$	8.9847E+00	2.684E−02	7.392E+11	8.9484E+00	2.691E−02	7.410E+11	0.001
$1s\,4p\ ^3P^o_0$	$1s\,6s\ ^3S_1$	8.9888E+00	1.303E−02	3.586E+11	8.9523E+00	1.267E−02	3.487E+11	0.002
$1s\,4p\ ^3P^o_2$	$1s\,6s\ ^3S_1$	9.3128E+00	8.539E−02	2.189E+12	9.2750E+00	8.504E−02	2.179E+12	0.001
$1s\,4p\ ^1P^o_1$	$1s\,6s\ ^3S_1$	9.3416E+00	1.559E−02	3.972E+11	9.3040E+00	1.546E−02	3.938E+11	0.001
$1s\,4f\ ^3F^o_2$	$1s\,6s\ ^3S_1$	9.4503E+00	5.582E−09	1.390E+05				0.099
$1s\,5p\ ^3P^o_1$	$1s\,6s\ ^3S_1$	2.5714E+01	1.642E−01	5.522E+11	2.5617E+01	1.636E−01	5.499E+11	0.001
$1s\,5p\ ^3P^o_0$	$1s\,6s\ ^3S_1$	2.5731E+01	7.964E−02	2.675E+11	2.5633E+01	7.696E−02	2.582E+11	0.002
$1s\,5p\ ^3P^o_2$	$1s\,6s\ ^3S_1$	2.7109E+01	5.492E−01	1.662E+12	2.7006E+01	5.457E−01	1.649E+12	0.002

(*continued on next page*)

Table 3 (*continued*)

Lower	Upper	GRASP2K			FAC			*dT*
		λ (Å)	*gf*	A (s^{-1})	λ (Å)	*gf*	A (s^{-1})	
$1s\,5p\ ^1P^o_1$	$1s\,6s\ ^3S_1$	2.7232E+01	1.009E−01	3.024E+11	2.7131E+01	9.952E−02	2.980E+11	0.002
$1s\,5f\ ^3F^o_2$	$1s\,6s\ ^3S_1$	2.7709E+01	1.281E−07	3.709E+05				0.078
$1s^2\ ^1S_0$	$1s\,6p\ ^3P^o_1$	3.1640E−01	3.992E−03	8.865E+13	3.1509E−01	3.640E−03	8.082E+13	0.009
$1s\,2s\ ^3S_1$	$1s\,6p\ ^3P^o_1$	1.3692E+00	1.433E−02	1.699E+13	1.3634E+00	1.449E−02	1.718E+13	0.002
$1s\,2s\ ^1S_0$	$1s\,6p\ ^3P^o_1$	1.3822E+00	6.212E−03	7.230E+12	1.3765E+00	5.890E−03	6.853E+12	0.006
$1s\,3s\ ^3S_1$	$1s\,6p\ ^3P^o_1$	3.6909E+00	3.452E−02	5.634E+12	3.6756E+00	3.517E−02	5.739E+12	0.002
$1s\,3s\ ^1S_0$	$1s\,6p\ ^3P^o_1$	3.7158E+00	1.517E−02	2.443E+12	3.7007E+00	1.445E−02	2.326E+12	0.000
$1s\,3d\ ^3D_2$	$1s\,6p\ ^3P^o_1$	3.8574E+00	5.268E−03	7.872E+11	3.8413E+00	5.279E−03	7.887E+11	0.003
$1s\,3d\ ^3D_1$	$1s\,6p\ ^3P^o_1$	3.8592E+00	1.151E−03	1.719E+11	3.8431E+00	1.141E−03	1.704E+11	0.008
$1s\,3d\ ^1D_2$	$1s\,6p\ ^3P^o_1$	3.9032E+00	6.779E−06	9.894E+08	3.8868E+00	8.128E−06	1.186E+09	0.029
$1s\,4s\ ^3S_1$	$1s\,6p\ ^3P^o_1$	8.9132E+00	9.266E−02	2.593E+12	8.8765E+00	9.472E−02	2.650E+12	0.003
$1s\,4s\ ^1S_0$	$1s\,6p\ ^3P^o_1$	8.9717E+00	4.111E−02	1.136E+12	8.9354E+00	3.919E−02	1.082E+12	0.003
$1s\,4d\ ^3D_2$	$1s\,6p\ ^3P^o_1$	9.3198E+00	3.518E−02	9.005E+11	9.2819E+00	3.513E−02	8.989E+11	0.001
$1s\,4d\ ^3D_1$	$1s\,6p\ ^3P^o_1$	9.3241E+00	7.616E−03	1.948E+11	9.2861E+00	7.573E−03	1.936E+11	0.004
$1s\,4d\ ^1D_2$	$1s\,6p\ ^3P^o_1$	9.4329E+00	4.037E−05	1.009E+09	9.3943E+00	4.947E−05	1.235E+09	0.020
$1s\,5s\ ^3S_1$	$1s\,6p\ ^3P^o_1$	2.5356E+01	4.018E−01	1.390E+12	2.5254E+01	4.122E−01	1.425E+12	0.003
$1s\,5s\ ^1S_0$	$1s\,6p\ ^3P^o_1$	2.5594E+01	1.810E−01	6.145E+11	2.5493E+01	1.720E−01	5.836E+11	0.002
$1s\,5d\ ^3D_2$	$1s\,6p\ ^3P^o_1$	2.7067E+01	2.978E−01	9.037E+11	2.6964E+01	2.966E−01	8.996E+11	0.001
$1s\,5d\ ^3D_1$	$1s\,6p\ ^3P^o_1$	2.7084E+01	6.418E−02	1.945E+11	2.6981E+01	6.366E−02	1.927E+11	0.002
$1s\,5d\ ^1D_2$	$1s\,6p\ ^3P^o_1$	2.7558E+01	3.306E−04	9.680E+08	2.7452E+01	3.795E−04	1.110E+09	0.010
$1s\,6s\ ^3S_1$	$1s\,6p\ ^3P^o_1$	4.9854E+03	4.082E−02	3.652E+06	4.6146E+03	4.469E−02	4.627E+06	0.127
$1s\,2p\ ^3P^o_1$	$1s\,6s\ ^1S_0$	1.3809E+00	5.496E−04	1.922E+12	1.3753E+00	5.629E−04	1.968E+12	0.010
$1s\,2p\ ^1P^o_1$	$1s\,6s\ ^1S_0$	1.4493E+00	1.870E−03	5.937E+12	1.4434E+00	1.844E−03	5.856E+12	0.004
$1s\,3p\ ^3P^o_1$	$1s\,6s\ ^1S_0$	3.7140E+00	2.696E−03	1.304E+12	3.6994E+00	2.744E−03	1.326E+12	0.003
$1s\,3p\ ^1P^o_1$	$1s\,6s\ ^1S_0$	3.8591E+00	8.737E−03	3.913E+12	3.8440E+00	8.725E−03	3.905E+12	0.000
$1s\,4p\ ^3P^o_1$	$1s\,6s\ ^1S_0$	8.9678E+00	1.099E−02	9.117E+11	8.9340E+00	1.117E−02	9.258E+11	0.001
$1s\,4p\ ^1P^o_1$	$1s\,6s\ ^1S_0$	9.3233E+00	3.529E−02	2.708E+12	9.2885E+00	3.544E−02	2.716E+12	0.002
$1s\,5p\ ^3P^o_1$	$1s\,6s\ ^1S_0$	2.5576E+01	6.646E−02	6.777E+11	2.5500E+01	6.781E−02	6.897E+11	0.002
$1s\,5p\ ^1P^o_1$	$1s\,6s\ ^1S_0$	2.7078E+01	2.249E−01	2.046E+12	2.6999E+01	2.273E−01	2.063E+12	0.002
$1s\,6p\ ^3P^o_1$	$1s\,6s\ ^1S_0$	1.0994E+05	7.948E−04	4.387E+02				0.884
$1s\,2s\ ^3S_1$	$1s\,6p\ ^3P^o_0$	1.3691E+00	6.808E−03	2.423E+13	1.3635E+00	6.812E−03	2.423E+13	0.003
$1s\,3s\ ^3S_1$	$1s\,6p\ ^3P^o_0$	3.6907E+00	1.641E−02	8.037E+12	3.6761E+00	1.659E−02	8.122E+12	0.004
$1s\,3d\ ^3D_1$	$1s\,6p\ ^3P^o_0$	3.8590E+00	2.133E−03	9.554E+11	3.8436E+00	2.122E−03	9.501E+11	0.008
$1s\,4s\ ^3S_1$	$1s\,6p\ ^3P^o_0$	8.9120E+00	4.409E−02	3.703E+12	8.8795E+00	4.483E−02	3.760E+12	0.004
$1s\,4d\ ^3D_1$	$1s\,6p\ ^3P^o_0$	9.3228E+00	1.419E−02	1.089E+12	9.2894E+00	1.414E−02	1.084E+12	0.004
$1s\,5s\ ^3S_1$	$1s\,6p\ ^3P^o_0$	2.5347E+01	1.912E−01	1.986E+12	2.5278E+01	1.959E−01	2.028E+12	0.004
$1s\,5d\ ^3D_1$	$1s\,6p\ ^3P^o_0$	2.7074E+01	1.200E−01	1.092E+12	2.7009E+01	1.194E−01	1.083E+12	0.002
$1s\,6s\ ^3S_1$	$1s\,6p\ ^3P^o_0$	4.6513E+03	2.098E−02	6.469E+06	5.5898E+03	1.731E−02	3.664E+06	0.099
$1s\,2s\ ^3S_1$	$1s\,6p\ ^3P^o_2$	1.3670E+00	3.166E−02	2.260E+13	1.3612E+00	3.251E−02	2.320E+13	0.002
$1s\,3s\ ^3S_1$	$1s\,6p\ ^3P^o_2$	3.6753E+00	7.231E−02	7.141E+12	3.6601E+00	7.353E−02	7.261E+12	0.003
$1s\,3d\ ^3D_2$	$1s\,6p\ ^3P^o_2$	3.8403E+00	6.550E−04	5.925E+10	3.8243E+00	6.596E−04	5.965E+10	0.005
$1s\,3d\ ^3D_1$	$1s\,6p\ ^3P^o_2$	3.8421E+00	7.089E−05	6.406E+09	3.8260E+00	6.699E−05	6.053E+09	0.009
$1s\,3d\ ^3D_3$	$1s\,6p\ ^3P^o_2$	3.8840E+00	7.016E−03	6.205E+11	3.8677E+00	6.917E−03	6.116E+11	0.006
$1s\,3d\ ^1D_2$	$1s\,6p\ ^3P^o_2$	3.8856E+00	5.021E−04	4.437E+10	3.8694E+00	4.897E−04	4.326E+10	0.008
$1s\,4s\ ^3S_1$	$1s\,6p\ ^3P^o_2$	8.8224E+00	1.843E−01	3.158E+12	8.7863E+00	1.868E−01	3.201E+12	0.004
$1s\,4d\ ^3D_2$	$1s\,6p\ ^3P^o_2$	9.2206E+00	4.521E−03	7.093E+10	9.1833E+00	4.502E−03	7.061E+10	0.003
$1s\,4d\ ^3D_1$	$1s\,6p\ ^3P^o_2$	9.2248E+00	4.885E−04	7.658E+09	9.1874E+00	4.667E−04	7.314E+09	0.004
$1s\,4d\ ^3D_3$	$1s\,6p\ ^3P^o_2$	9.3270E+00	4.766E−02	7.308E+11	9.2888E+00	4.696E−02	7.199E+11	0.003
$1s\,4d\ ^1D_2$	$1s\,6p\ ^3P^o_2$	9.3314E+00	3.377E−03	5.174E+10	9.2933E+00	3.309E−03	5.068E+10	0.004
$1s\,5s\ ^3S_1$	$1s\,6p\ ^3P^o_2$	2.4635E+01	7.249E−01	1.594E+12	2.4537E+01	7.351E−01	1.615E+12	0.003
$1s\,5d\ ^3D_2$	$1s\,6p\ ^3P^o_2$	2.6247E+01	3.725E−02	7.213E+10	2.6148E+01	3.678E−02	7.116E+10	0.001
$1s\,5d\ ^3D_1$	$1s\,6p\ ^3P^o_2$	2.6264E+01	4.030E−03	7.794E+09	2.6164E+01	3.868E−03	7.475E+09	0.002
$1s\,5d\ ^3D_3$	$1s\,6p\ ^3P^o_2$	2.6690E+01	3.948E−01	7.394E+11	2.6588E+01	3.879E−01	7.258E+11	0.001
$1s\,5d\ ^1D_2$	$1s\,6p\ ^3P^o_2$	2.6709E+01	2.789E−02	5.215E+10	2.6607E+01	2.727E−02	5.096E+10	0.002
$1s\,5g\ ^3G_3$	$1s\,6p\ ^3P^o_2$	2.6929E+01	1.344E−08	2.472E+04				0.016
$1s\,6s\ ^3S_1$	$1s\,6p\ ^3P^o_2$	7.3822E+02	6.713E−01	1.643E+09	7.2782E+02	6.786E−01	1.694E+09	0.015
$1s\,2p\ ^3P^o_1$	$1s\,6d\ ^3D_2$	1.3786E+00	5.406E−02	3.795E+13	1.3729E+00	5.423E−02	3.806E+13	0.001
$1s\,2p\ ^3P^o_2$	$1s\,6d\ ^3D_2$	1.4409E+00	9.245E−03	5.941E+12	1.4348E+00	9.097E−03	5.845E+12	0.003
$1s\,2p\ ^1P^o_1$	$1s\,6d\ ^3D_2$	1.4467E+00	1.528E−03	9.741E+11	1.4407E+00	1.426E−03	9.093E+11	0.001
$1s\,3p\ ^3P^o_1$	$1s\,6d\ ^3D_2$	3.6972E+00	1.326E−01	1.294E+13	3.6817E+00	1.329E−01	1.297E+13	0.000
$1s\,3p\ ^3P^o_2$	$1s\,6d\ ^3D_2$	3.8292E+00	2.492E−02	2.268E+12	3.8130E+00	2.499E−02	2.274E+12	0.001
$1s\,3p\ ^1P^o_1$	$1s\,6d\ ^3D_2$	3.8409E+00	4.051E−03	3.663E+11	3.8249E+00	3.732E−03	3.374E+11	0.002
$1s\,4p\ ^3P^o_1$	$1s\,6d\ ^3D_2$	8.8702E+00	3.276E−01	5.555E+12	8.8316E+00	3.287E−01	5.575E+12	0.000
$1s\,4p\ ^3P^o_2$	$1s\,6d\ ^3D_2$	9.1898E+00	6.652E−02	1.051E+12	9.1496E+00	6.733E−02	1.063E+12	0.000
$1s\,4p\ ^1P^o_1$	$1s\,6d\ ^3D_2$	9.2178E+00	1.079E−02	1.693E+11	9.1778E+00	9.804E−03	1.539E+11	0.001
$1s\,4f\ ^3F^o_3$	$1s\,6d\ ^3D_2$	9.3215E+00	1.216E−02	1.867E+11	9.2809E+00	1.219E−02	1.871E+11	0.001
$1s\,4f\ ^3F^o_2$	$1s\,6d\ ^3D_2$	9.3237E+00	8.868E−04	1.361E+10	9.2831E+00	8.928E−04	1.370E+10	0.000
$1s\,4f\ ^1F^o_3$	$1s\,6d\ ^3D_2$	9.3766E+00	9.857E−07	1.496E+07				0.011
$1s\,5p\ ^3P^o_1$	$1s\,6d\ ^3D_2$	2.4798E+01	1.222E+00	2.651E+12	2.4683E+01	1.227E+00	2.664E+12	0.000
$1s\,5p\ ^3P^o_2$	$1s\,6d\ ^3D_2$	2.6092E+01	2.792E−01	5.472E+11	2.5970E+01	2.851E−01	5.591E+11	0.000
$1s\,5p\ ^1P^o_1$	$1s\,6d\ ^3D_2$	2.6207E+01	4.553E−02	8.843E+10	2.6085E+01	4.028E−02	7.831E+10	0.001

(*continued on next page*)

Table 3 (*continued*)

Lower	Upper	GRASP2K			FAC			*dT*
		λ (Å)	*gf*	A (s^{-1})	λ (Å)	*gf*	A (s^{-1})	
$1s\,5f\ ^3F^o_3$	$1s\,6d\ ^3D_2$	2.6639E+01	1.774E−01	3.335E+11	2.6517E+01	1.775E−01	3.339E+11	0.001
$1s\,5f\ ^3F^o_2$	$1s\,6d\ ^3D_2$	2.6648E+01	1.291E−02	2.426E+10	2.6526E+01	1.297E−02	2.439E+10	0.000
$1s\,5f\ ^1F^o_3$	$1s\,6d\ ^3D_2$	2.6870E+01	1.399E−05	2.585E+07				0.010
$1s\,6p\ ^3P^o_1$	$1s\,6d\ ^3D_2$	8.0869E+02	5.619E−01	1.146E+09	7.9302E+02	5.686E−01	1.196E+09	0.003
$1s\,6p\ ^3P^o_2$	$1s\,6d\ ^3D_2$	1.2110E−01	6.859E−03	6.234E+04	9.6399E+03	8.661E−03	1.232E+05	0.102
$1s^2\ ^1S_0$	$1s\,6p\ ^1P^o_1$	3.1620E−01	9.840E−03	2.187E+14	3.1497E−01	1.063E−02	2.362E+14	0.031
$1s\,2s\ ^3S_1$	$1s\,6p\ ^1P^o_1$	1.3668E+00	5.663E−03	6.739E+12	1.3611E+00	5.637E−03	6.708E+12	0.001
$1s\,2s\ ^1S_0$	$1s\,6p\ ^1P^o_1$	1.3798E+00	1.346E−02	1.572E+13	1.3742E+00	1.374E−02	1.604E+13	0.003
$1s\,3s\ ^3S_1$	$1s\,6p\ ^1P^o_1$	3.6740E+00	1.286E−02	2.118E+12	3.6589E+00	1.267E−02	2.087E+12	0.003
$1s\,3s\ ^1S_0$	$1s\,6p\ ^1P^o_1$	3.6986E+00	3.101E−02	5.041E+12	3.6837E+00	3.125E−02	5.077E+12	0.002
$1s\,3d\ ^3D_2$	$1s\,6p\ ^1P^o_1$	3.8389E+00	1.069E−04	1.613E+10	3.8230E+00	1.372E−04	2.069E+10	0.011
$1s\,3d\ ^3D_1$	$1s\,6p\ ^1P^o_1$	3.8407E+00	3.272E−04	4.932E+10	3.8248E+00	3.122E−04	4.705E+10	0.011
$1s\,3d\ ^1D_2$	$1s\,6p\ ^1P^o_1$	3.8842E+00	4.432E−03	6.532E+11	3.8681E+00	4.442E−03	6.545E+11	0.010
$1s\,4s\ ^3S_1$	$1s\,6p\ ^1P^o_1$	8.8149E+00	3.260E−02	9.327E+11	8.7796E+00	3.204E−02	9.164E+11	0.003
$1s\,4s\ ^1S_0$	$1s\,6p\ ^1P^o_1$	8.8722E+00	7.942E−02	2.243E+12	8.8372E+00	7.964E−02	2.248E+12	0.004
$1s\,4d\ ^3D_2$	$1s\,6p\ ^1P^o_1$	9.2125E+00	7.164E−04	1.877E+10	9.1760E+00	9.080E−04	2.377E+10	0.007
$1s\,4d\ ^3D_1$	$1s\,6p\ ^1P^o_1$	9.2166E+00	2.227E−03	5.828E+10	9.1801E+00	2.117E−03	5.539E+10	0.006
$1s\,4d\ ^1D_2$	$1s\,6p\ ^1P^o_1$	9.3230E+00	2.999E−02	7.671E+11	9.2858E+00	3.019E−02	7.720E+11	0.005
$1s\,5s\ ^3S_1$	$1s\,6p\ ^1P^o_1$	2.4577E+01	1.271E−01	4.677E+11	2.4485E+01	1.249E−01	4.593E+11	0.003
$1s\,5s\ ^1S_0$	$1s\,6p\ ^1P^o_1$	2.4800E+01	3.145E−01	1.137E+12	2.4710E+01	3.143E−01	1.134E+12	0.004
$1s\,5d\ ^3D_2$	$1s\,6p\ ^1P^o_1$	2.6180E+01	5.800E−03	1.881E+10	2.6089E+01	7.458E−03	2.415E+10	0.003
$1s\,5d\ ^3D_1$	$1s\,6p\ ^1P^o_1$	2.6197E+01	1.815E−02	5.882E+10	2.6105E+01	1.715E−02	5.550E+10	0.003
$1s\,5d\ ^1D_2$	$1s\,6p\ ^1P^o_1$	2.6640E+01	2.473E−01	7.746E+11	2.6546E+01	2.497E−01	7.814E+11	0.003
$1s\,6s\ ^3S_1$	$1s\,6p\ ^1P^o_1$	6.8918E+02	1.292E−01	6.050E+08	6.8482E+02	1.256E−01	5.907E+08	0.015
$1s\,6s\ ^1S_0$	$1s\,6p\ ^1P^o_1$	8.0559E+02	2.588E−01	8.867E+08	7.8073E+02	2.693E−01	9.741E+08	0.057
$1s\,6d\ ^3D_2$	$1s\,6p\ ^1P^o_1$	7.2196E+04	1.839E−04	7.843E+01				0.369
$1s\,2p\ ^3P^o_1$	$1s\,6d\ ^3D_1$	1.3786E+00	1.160E−02	1.357E+13	1.3729E+00	1.157E−02	1.354E+13	0.001
$1s\,2p\ ^3P^o_0$	$1s\,6d\ ^3D_1$	1.3795E+00	2.193E−02	2.563E+13	1.3737E+00	2.194E−02	2.563E+13	0.001
$1s\,2p\ ^3P^o_2$	$1s\,6d\ ^3D_1$	1.4408E+00	1.013E−03	1.085E+12	1.4348E+00	9.908E−04	1.061E+12	0.004
$1s\,2p\ ^1P^o_1$	$1s\,6d\ ^3D_1$	1.4467E+00	4.506E−03	4.787E+12	1.4407E+00	4.362E−03	4.633E+12	0.003
$1s\,3p\ ^3P^o_1$	$1s\,6d\ ^3D_1$	3.6970E+00	2.828E−02	4.600E+12	3.6817E+00	2.835E−02	4.611E+12	0.001
$1s\,3p\ ^3P^o_0$	$1s\,6d\ ^3D_1$	3.6987E+00	5.368E−02	8.725E+12	3.6834E+00	5.377E−02	8.738E+12	0.001
$1s\,3p\ ^3P^o_2$	$1s\,6d\ ^3D_1$	3.8290E+00	2.722E−03	4.128E+11	3.8131E+00	2.724E−03	4.131E+11	0.002
$1s\,3p\ ^1P^o_1$	$1s\,6d\ ^3D_1$	3.8407E+00	1.233E−02	1.858E+12	3.8249E+00	1.218E−02	1.836E+12	0.002
$1s\,4p\ ^3P^o_1$	$1s\,6d\ ^3D_1$	8.8691E+00	6.971E−02	1.970E+12	8.8318E+00	7.019E−02	1.983E+12	0.001
$1s\,4p\ ^3P^o_0$	$1s\,6d\ ^3D_1$	8.8731E+00	1.325E−01	3.743E+12	8.8357E+00	1.329E−01	3.755E+12	0.001
$1s\,4p\ ^3P^o_2$	$1s\,6d\ ^3D_1$	9.1886E+00	7.247E−03	1.908E+11	9.1499E+00	7.347E−03	1.934E+11	0.001
$1s\,4p\ ^1P^o_1$	$1s\,6d\ ^3D_1$	9.2166E+00	3.316E−02	8.679E+11	9.1781E+00	3.306E−02	8.654E+11	0.001
$1s\,4f\ ^3F^o_2$	$1s\,6d\ ^3D_1$	9.3225E+00	7.803E−03	1.996E+11	9.2834E+00	7.840E−03	2.005E+11	0.000
$1s\,5p\ ^3P^o_1$	$1s\,6d\ ^3D_1$	2.4789E+01	2.595E−01	9.388E+11	2.4685E+01	2.631E−01	9.519E+11	0.001
$1s\,5p\ ^3P^o_0$	$1s\,6d\ ^3D_1$	2.4805E+01	4.939E−01	1.785E+12	2.4700E+01	4.967E−01	1.794E+12	0.001
$1s\,5p\ ^3P^o_2$	$1s\,6d\ ^3D_1$	2.6083E+01	3.034E−02	9.915E+10	2.5972E+01	3.115E−02	1.018E+11	0.001
$1s\,5p\ ^1P^o_1$	$1s\,6d\ ^3D_1$	2.6197E+01	1.405E−01	4.553E+11	2.6087E+01	1.410E−01	4.568E+11	0.001
$1s\,5f\ ^3F^o_2$	$1s\,6d\ ^3D_1$	2.6638E+01	1.138E−01	3.567E+11	2.6529E+01	1.142E−01	3.577E+11	0.000
$1s\,6p\ ^3P^o_1$	$1s\,6d\ ^3D_1$	7.9964E+02	1.213E−01	4.217E+08	7.9517E+02	1.225E−01	4.272E+08	0.006
$1s\,6p\ ^3P^o_0$	$1s\,6d\ ^3D_1$	8.0896E+02	2.267E−01	7.701E+08	7.7196E+02	2.370E−01	8.770E+08	0.005
$1s\,6p\ ^3P^o_2$	$1s\,6d\ ^3D_1$	1.0358E+04	8.674E−04	1.798E+04				0.007
$1s\,6p\ ^1P^o_1$	$1s\,6d\ ^3D_1$	6.7159E+06	6.153E−06	3.033E−04				0.995
$1s\,2p\ ^3P^o_2$	$1s\,6d\ ^3D_3$	1.4401E+00	8.934E−02	4.105E+13	1.4340E+00	9.091E−02	4.176E+13	0.000
$1s\,3p\ ^3P^o_2$	$1s\,6d\ ^3D_3$	3.8238E+00	2.308E−01	1.504E+13	3.8077E+00	2.333E−01	1.520E+13	0.000
$1s\,4p\ ^3P^o_2$	$1s\,6d\ ^3D_3$	9.1590E+00	5.989E−01	6.802E+12	9.1192E+00	6.053E−01	6.877E+12	0.000
$1s\,4f\ ^3F^o_3$	$1s\,6d\ ^3D_3$	9.2898E+00	7.076E−04	7.813E+09	9.2496E+00	7.143E−04	7.889E+09	0.001
$1s\,4f\ ^3F^o_2$	$1s\,6d\ ^3D_3$	9.2920E+00	3.269E−05	3.608E+08				0.001
$1s\,4f\ ^3F^o_4$	$1s\,6d\ ^3D_3$	9.3429E+00	1.559E−02	1.702E+11	9.3023E+00	1.557E−02	1.700E+11	0.001
$1s\,4f\ ^1F^o_3$	$1s\,6d\ ^3D_3$	9.3445E+00	5.815E−04	6.346E+09	9.3039E+00	5.794E−04	6.324E+09	0.000
$1s\,5p\ ^3P^o_2$	$1s\,6d\ ^3D_3$	2.5845E+01	2.417E+00	3.448E+12	2.5726E+01	2.453E+00	3.503E+12	0.000
$1s\,5f\ ^3F^o_3$	$1s\,6d\ ^3D_3$	2.6382E+01	1.034E−02	1.416E+10	2.6263E+01	1.037E−02	1.421E+10	0.001
$1s\,5f\ ^3F^o_2$	$1s\,6d\ ^3D_3$	2.6391E+01	4.907E−04	6.713E+08	2.6272E+01	4.885E−04	6.687E+08	0.000
$1s\,5f\ ^3F^o_4$	$1s\,6d\ ^3D_3$	2.6602E+01	2.275E−01	3.063E+11	2.6482E+01	2.272E−01	3.062E+11	0.001
$1s\,5f\ ^1F^o_3$	$1s\,6d\ ^3D_3$	2.6609E+01	8.482E−03	1.142E+10	2.6489E+01	8.453E−03	1.138E+10	0.000
$1s\,6p\ ^3P^o_2$	$1s\,6d\ ^3D_3$	2.2306E+03	3.482E−01	6.669E+07	2.1370E+03	3.618E−01	7.486E+07	0.018
$1s\,3d\ ^3D_2$	$1s\,6f\ ^3F^o_3$	3.8336E+00	2.524E−01	1.637E+13	3.8174E+00	2.527E−01	1.638E+13	0.001
$1s\,3d\ ^3D_3$	$1s\,6f\ ^3F^o_3$	3.8771E+00	1.644E−02	1.042E+12	3.8607E+00	1.627E−02	1.031E+12	0.002
$1s\,3d\ ^1D_2$	$1s\,6f\ ^3F^o_3$	3.8788E+00	9.798E−04	6.205E+10	3.8624E+00	9.022E−04	5.714E+10	0.001
$1s\,4d\ ^3D_2$	$1s\,6f\ ^3F^o_3$	9.1821E+00	8.572E−01	9.689E+12	9.1440E+00	8.586E−01	9.702E+12	0.001
$1s\,4d\ ^3D_3$	$1s\,6f\ ^3F^o_3$	9.2876E+00	5.814E−02	6.423E+11	9.2486E+00	5.812E−02	6.419E+11	0.001
$1s\,4d\ ^1D_2$	$1s\,6f\ ^3F^o_3$	9.2919E+00	3.683E−03	4.065E+10	9.2530E+00	3.427E−03	3.782E+10	0.000
$1s\,5d\ ^3D_2$	$1s\,6f\ ^3F^o_3$	2.5937E+01	3.743E+00	5.302E+12	2.5831E+01	3.751E+00	5.311E+12	0.000
$1s\,5d\ ^3D_3$	$1s\,6f\ ^3F^o_3$	2.6370E+01	2.663E−01	3.649E+11	2.6261E+01	2.675E−01	3.665E+11	0.001
$1s\,5d\ ^1D_2$	$1s\,6f\ ^3F^o_3$	2.6388E+01	1.732E−02	2.370E+10	2.6279E+01	1.612E−02	2.205E+10	0.000
$1s\,5g\ ^3G_4$	$1s\,6f\ ^3F^o_3$	2.6598E+01	7.014E−02	9.448E+10	2.6482E+01	7.027E−02	9.468E+10	0.001

(*continued on next page*)

Table 3 (*continued*)

Lower	Upper	GRASP2K			FAC			*dT*
		λ (Å)	*gf*	A (s^{-1})	λ (Å)	*gf*	A (s^{-1})	
$1s\,5g\ ^3G_3$	$1s\,6f\ ^3F^o_3$	2.6603E+01	2.597E−03	3.497E+09	2.6487E+01	2.606E−03	3.509E+09	0.002
$1s\,5g\ ^1G_4$	$1s\,6f\ ^3F^o_3$	2.6735E+01	2.453E−10	3.270E+02				0.683
$1s\,6d\ ^3D_2$	$1s\,6f\ ^3F^o_3$	2.6863E+03	2.445E−01	3.228E+07	2.7429E+03	2.382E−01	2.991E+07	0.009
$1s\,6d\ ^3D_3$	$1s\,6f\ ^3F^o_3$	1.5394E+05	2.876E−04	1.156E+01				0.292
$1s\,2s\ ^3S_1$	$1s\,6f\ ^3F^o_2$	1.3662E+00	2.099E−09	1.500E+06				0.160
$1s\,3s\ ^3S_1$	$1s\,6f\ ^3F^o_2$	3.6690E+00	1.653E−07	1.638E+07				0.106
$1s\,3d\ ^3D_2$	$1s\,6f\ ^3F^o_2$	3.8335E+00	1.815E−02	1.648E+12	3.8174E+00	1.816E−02	1.648E+12	0.000
$1s\,3d\ ^3D_1$	$1s\,6f\ ^3F^o_2$	3.8353E+00	1.623E−01	1.472E+13	3.8192E+00	1.624E−01	1.473E+13	0.000
$1s\,3d\ ^3D_3$	$1s\,6f\ ^3F^o_2$	3.8770E+00	8.259E−04	7.330E+10	3.8607E+00	8.130E−04	7.215E+10	0.004
$1s\,3d\ ^1D_2$	$1s\,6f\ ^3F^o_2$	3.8787E+00	1.146E−02	1.016E+12	3.8624E+00	1.127E−02	9.996E+11	0.001
$1s\,4s\ ^3S_1$	$1s\,6f\ ^3F^o_2$	8.7866E+00	7.760E−07	1.341E+07				0.060
$1s\,4d\ ^3D_2$	$1s\,6f\ ^3F^o_2$	9.1815E+00	6.181E−02	9.781E+11	9.1440E+00	6.194E−02	9.799E+11	0.000
$1s\,4d\ ^3D_1$	$1s\,6f\ ^3F^o_2$	9.1856E+00	5.516E−01	8.722E+12	9.1480E+00	5.521E−01	8.727E+12	0.000
$1s\,4d\ ^3D_3$	$1s\,6f\ ^3F^o_2$	9.2869E+00	2.907E−03	4.496E+10	9.2486E+00	2.903E−03	4.489E+10	0.000
$1s\,4d\ ^1D_2$	$1s\,6f\ ^3F^o_2$	9.2913E+00	4.034E−02	6.234E+11	9.2530E+00	4.006E−02	6.189E+11	0.001
$1s\,5s\ ^3S_1$	$1s\,6f\ ^3F^o_2$	2.4358E+01	3.345E−06	7.522E+06				0.037
$1s\,5d\ ^3D_2$	$1s\,6f\ ^3F^o_2$	2.5932E+01	2.700E−01	5.357E+11	2.5831E+01	2.711E−01	5.374E+11	0.000
$1s\,5d\ ^3D_1$	$1s\,6f\ ^3F^o_2$	2.5948E+01	2.411E+00	4.776E+12	2.5848E+01	2.411E+00	4.775E+12	0.000
$1s\,5d\ ^3D_3$	$1s\,6f\ ^3F^o_2$	2.6365E+01	1.328E−02	2.549E+10	2.6261E+01	1.336E−02	2.563E+10	0.000
$1s\,5d\ ^1D_2$	$1s\,6f\ ^3F^o_2$	2.6383E+01	1.846E−01	3.537E+11	2.6280E+01	1.840E−01	3.525E+11	0.000
$1s\,5g\ ^3G_3$	$1s\,6f\ ^3F^o_2$	2.6598E+01	5.191E−02	9.789E+10	2.6488E+01	5.205E−02	9.813E+10	0.002
$1s\,6s\ ^3S_1$	$1s\,6f\ ^3F^o_2$	5.5035E+02	9.794E−07	4.314E+03				0.252
$1s\,6d\ ^3D_2$	$1s\,6f\ ^3F^o_2$	2.6325E+03	1.805E−02	3.475E+06	2.7436E+03	1.736E−02	3.051E+06	0.007
$1s\,6d\ ^3D_1$	$1s\,6f\ ^3F^o_2$	2.7332E+03	1.546E−01	2.760E+07	2.7182E+03	1.547E−01	2.770E+07	0.001
$1s\,6d\ ^3D_3$	$1s\,6f\ ^3F^o_2$	7.0900E+04	3.077E−05	8.167E+00				0.051
$1s\,2p\ ^3P^o_1$	$1s\,6d\ ^1D_2$	1.3779E+00	6.889E−05	4.840E+10	1.3722E+00	5.228E−05	3.673E+10	0.008
$1s\,2p\ ^3P^o_2$	$1s\,6d\ ^1D_2$	1.4401E+00	6.303E−03	4.055E+12	1.4340E+00	6.314E−03	4.061E+12	0.000
$1s\,2p\ ^1P^o_1$	$1s\,6d\ ^1D_2$	1.4459E+00	5.724E−02	3.652E+13	1.4399E+00	5.833E−02	3.721E+13	0.000
$1s\,3p\ ^3P^o_1$	$1s\,6d\ ^1D_2$	3.6920E+00	1.380E−04	1.350E+10	3.6767E+00	1.115E−04	1.091E+10	0.003
$1s\,3p\ ^3P^o_2$	$1s\,6d\ ^1D_2$	3.8236E+00	1.625E−02	1.483E+12	3.8077E+00	1.618E−02	1.476E+12	0.001
$1s\,3p\ ^1P^o_1$	$1s\,6d\ ^1D_2$	3.8353E+00	1.489E−01	1.351E+13	3.8195E+00	1.498E−01	1.359E+13	0.001
$1s\,4p\ ^3P^o_1$	$1s\,6d\ ^1D_2$	8.8403E+00	3.141E−04	5.361E+09	8.8028E+00	2.765E−04	4.721E+09	0.003
$1s\,4p\ ^3P^o_2$	$1s\,6d\ ^1D_2$	9.1577E+00	4.208E−02	6.694E+11	9.1187E+00	4.197E−02	6.676E+11	0.001
$1s\,4p\ ^1P^o_1$	$1s\,6d\ ^1D_2$	9.1855E+00	3.883E−01	6.139E+12	9.1467E+00	3.889E−01	6.149E+12	0.001
$1s\,4f\ ^3F^o_3$	$1s\,6d\ ^1D_2$	9.2884E+00	4.663E−05	7.211E+08	9.2491E+00	5.670E−05	8.767E+08	0.000
$1s\,4f\ ^3F^o_2$	$1s\,6d\ ^1D_2$	9.2907E+00	4.915E−04	7.596E+09	9.2513E+00	4.896E−04	7.566E+09	0.000
$1s\,4f\ ^1F^o_3$	$1s\,6d\ ^1D_2$	9.3432E+00	1.150E−02	1.758E+11	9.3035E+00	1.152E−02	1.761E+11	0.000
$1s\,5p\ ^3P^o_1$	$1s\,6d\ ^1D_2$	2.4566E+01	1.099E−03	2.430E+09	2.4460E+01	1.147E−03	2.538E+09	0.003
$1s\,5p\ ^3P^o_2$	$1s\,6d\ ^1D_2$	2.5835E+01	1.695E−01	3.387E+11	2.5723E+01	1.700E−01	3.399E+11	0.001
$1s\,5p\ ^1P^o_1$	$1s\,6d\ ^1D_2$	2.5947E+01	1.579E+00	3.130E+12	2.5836E+01	1.574E+00	3.121E+12	0.001
$1s\,5f\ ^3F^o_3$	$1s\,6d\ ^1D_2$	2.6371E+01	6.778E−04	1.300E+09	2.6259E+01	8.212E−04	1.575E+09	0.001
$1s\,5f\ ^3F^o_2$	$1s\,6d\ ^1D_2$	2.6380E+01	7.165E−03	1.373E+10	2.6269E+01	7.091E−03	1.359E+10	0.000
$1s\,5f\ ^1F^o_3$	$1s\,6d\ ^1D_2$	2.6598E+01	1.678E−01	3.164E+11	2.6485E+01	1.682E−01	3.173E+11	0.000
$1s\,6p\ ^3P^o_1$	$1s\,6d\ ^1D_2$	6.1807E+02	7.142E−04	2.494E+06	6.1320E+02	1.025E−03	3.607E+06	0.033
$1s\,6p\ ^3P^o_2$	$1s\,6d\ ^1D_2$	2.1556E+03	2.532E−02	7.269E+06	2.1118E+03	2.540E−02	7.534E+06	0.009
$1s\,6p\ ^1P^o_1$	$1s\,6d\ ^1D_2$	2.7210E+03	1.836E−01	3.308E+07	2.5822E+03	1.928E−01	3.826E+07	0.017
$1s\,6f\ ^3F^o_3$	$1s\,6d\ ^1D_2$	1.0989E+05	2.647E−05	2.924E+00				0.645
$1s\,6f\ ^3F^o_2$	$1s\,6d\ ^1D_2$	6.7056E+05	4.571E−05	1.356E−01				0.206
$1s\,3d\ ^3D_3$	$1s\,6f\ ^3F^o_4$	3.8744E+00	3.435E−01	1.696E+13	3.8580E+00	3.460E−01	1.708E+13	0.001
$1s\,4d\ ^3D_3$	$1s\,6f\ ^3F^o_4$	9.2719E+00	1.185E+00	1.022E+13	9.2331E+00	1.190E+00	1.026E+13	0.001
$1s\,5d\ ^3D_3$	$1s\,6f\ ^3F^o_4$	2.6244E+01	5.292E+00	5.695E+12	2.6136E+01	5.311E+00	5.713E+12	0.000
$1s\,5g\ ^3G_4$	$1s\,6f\ ^3F^o_4$	2.6470E+01	2.307E−03	2.440E+09	2.6356E+01	2.319E−03	2.453E+09	0.000
$1s\,5g\ ^3G_3$	$1s\,6f\ ^3F^o_4$	2.6475E+01	6.552E−05	6.928E+07				0.002
$1s\,5g\ ^3G_5$	$1s\,6f\ ^3F^o_4$	2.6601E+01	8.595E−02	9.002E+10	2.6486E+01	8.606E−02	9.015E+10	0.000
$1s\,5g\ ^1G_4$	$1s\,6f\ ^3F^o_4$	2.6606E+01	1.966E−03	2.059E+09	2.6491E+01	1.963E−03	2.056E+09	0.002
$1s\,6d\ ^3D_3$	$1s\,6f\ ^3F^o_4$	5.3175E+03	1.705E−01	4.469E+06	5.5117E+03	1.637E−01	3.962E+06	0.017
$1s\,4f\ ^3F^o_3$	$1s\,6g\ ^3G_4$	9.2736E+00	1.229E+00	1.060E+13	9.2341E+00	1.231E+00	1.061E+13	0.000
$1s\,4f\ ^3F^o_4$	$1s\,6g\ ^3G_4$	9.3264E+00	4.335E−02	3.694E+11	9.2866E+00	4.316E−02	3.678E+11	0.000
$1s\,4f\ ^1F^o_3$	$1s\,6g\ ^3G_4$	9.3281E+00	1.220E−03	1.039E+10	9.2883E+00	1.070E−03	9.114E+09	0.000
$1s\,5f\ ^3F^o_3$	$1s\,6g\ ^3G_4$	2.6251E+01	7.866E+00	8.460E+12	2.6139E+01	7.880E+00	8.475E+12	0.000
$1s\,5f\ ^3F^o_4$	$1s\,6g\ ^3G_4$	2.6469E+01	2.860E−01	3.026E+11	2.6355E+01	2.865E−01	3.031E+11	0.000
$1s\,5f\ ^1F^o_3$	$1s\,6g\ ^3G_4$	2.6476E+01	8.129E−03	8.594E+09	2.6362E+01	7.195E−03	7.608E+09	0.000
$1s\,6f\ ^3F^o_3$	$1s\,6g\ ^3G_4$	5.4970E+03	1.224E−01	3.001E+06	5.5303E+03	1.210E−01	2.909E+06	0.000
$1s\,6f\ ^3F^o_4$	$1s\,6g\ ^3G_4$	2.7996E+06	8.576E−06	8.111E−04				0.475
$1s\,2p\ ^3P^o_2$	$1s\,6g\ ^3G_3$	1.4397E+00	2.240E−10	1.030E+05				0.229
$1s\,3p\ ^3P^o_2$	$1s\,6g\ ^3G_3$	3.8210E+00	1.594E−12	1.041E+02				0.345
$1s\,4p\ ^3P^o_2$	$1s\,6g\ ^3G_3$	9.1429E+00	1.067E−07	1.217E+06				0.002
$1s\,4f\ ^3F^o_3$	$1s\,6g\ ^3G_3$	9.2732E+00	4.539E−02	5.029E+11	9.2341E+00	4.543E−02	5.033E+11	0.000
$1s\,4f\ ^3F^o_2$	$1s\,6g\ ^3G_3$	9.2754E+00	9.106E−01	1.009E+13	9.2363E+00	9.117E−01	1.009E+13	0.000
$1s\,4f\ ^3F^o_4$	$1s\,6g\ ^3G_3$	9.3261E+00	1.243E−03	1.362E+10	9.2866E+00	1.233E−03	1.351E+10	0.001
$1s\,4f\ ^1F^o_3$	$1s\,6g\ ^3G_3$	9.3277E+00	3.373E−02	3.694E+11	9.2883E+00	3.346E−02	3.664E+11	0.001

(*continued on next page*)

Table 3 (*continued*)

Lower	Upper	GRASP2K			FAC			*dT*
		λ (Å)	*gf*	A (s^{-1})	λ (Å)	*gf*	A (s^{-1})	
$1s\,5p\ ^3P^o_2$	$1s\,6g\ ^3G_3$	2.5717E+01	1.070E−06	1.542E+06				0.001
$1s\,5f\ ^3F^o_3$	$1s\,6g\ ^3G_3$	2.6248E+01	2.902E−01	4.014E+11	2.6139E+01	2.908E−01	4.021E+11	0.000
$1s\,5f\ ^3F^o_2$	$1s\,6g\ ^3G_3$	2.6257E+01	5.828E+00	8.055E+12	2.6148E+01	5.834E+00	8.062E+12	0.000
$1s\,5f\ ^3F^o_4$	$1s\,6g\ ^3G_3$	2.6466E+01	8.195E−03	1.115E+10	2.6355E+01	8.187E−03	1.113E+10	0.001
$1s\,5f\ ^1F^o_3$	$1s\,6g\ ^3G_3$	2.6473E+01	2.225E−01	3.025E+11	2.6362E+01	2.220E−01	3.018E+11	0.000
$1s\,6p\ ^3P^o_2$	$1s\,6g\ ^3G_3$	1.5598E+03	7.276E−08	2.849E+01				0.044
$1s\,6f\ ^3F^o_3$	$1s\,6g\ ^3G_3$	5.3682E+03	4.626E−03	1.530E+05	5.5303E+03	4.489E−03	1.386E+05	0.028
$1s\,6f\ ^3F^o_2$	$1s\,6g\ ^3G_3$	5.5968E+03	8.901E−02	2.708E+06	5.5277E+03	8.974E−02	2.774E+06	0.024
$1s\,6f\ ^3F^o_4$	$1s\,6g\ ^3G_3$	2.1175E+05	3.244E−06	6.894E−02				0.774
$1s\,3d\ ^3D_2$	$1s\,6f\ ^1F^o_3$	3.8309E+00	7.118E−06	4.622E+08				0.014
$1s\,3d\ ^3D_3$	$1s\,6f\ ^1F^o_3$	3.8743E+00	1.279E−02	8.119E+11	3.8580E+00	1.279E−02	8.125E+11	0.000
$1s\,3d\ ^1D_2$	$1s\,6f\ ^1F^o_3$	3.8760E+00	2.543E−01	1.613E+13	3.8597E+00	2.562E−01	1.625E+13	0.000
$1s\,4d\ ^3D_2$	$1s\,6f\ ^1F^o_3$	9.1664E+00	4.419E−05	5.012E+08				0.009
$1s\,4d\ ^3D_3$	$1s\,6f\ ^1F^o_3$	9.2714E+00	4.411E−02	4.890E+11	9.2331E+00	4.404E−02	4.880E+11	0.000
$1s\,4d\ ^1D_2$	$1s\,6f\ ^1F^o_3$	9.2758E+00	8.782E−01	9.726E+12	9.2375E+00	8.816E−01	9.761E+12	0.000
$1s\,5d\ ^3D_2$	$1s\,6f\ ^1F^o_3$	2.5812E+01	2.352E−04	3.364E+08				0.006
$1s\,5d\ ^3D_3$	$1s\,6f\ ^1F^o_3$	2.6240E+01	1.968E−01	2.723E+11	2.6136E+01	1.964E−01	2.716E+11	0.000
$1s\,5d\ ^1D_2$	$1s\,6f\ ^1F^o_3$	2.6259E+01	3.925E+00	5.424E+12	2.6155E+01	3.931E+00	5.429E+12	0.000
$1s\,5g\ ^3G_4$	$1s\,6f\ ^1F^o_3$	2.6466E+01	6.562E−05	8.927E+07				0.004
$1s\,5g\ ^3G_3$	$1s\,6f\ ^1F^o_3$	2.6471E+01	1.795E−03	2.440E+09	2.6361E+01	1.792E−03	2.437E+09	0.002
$1s\,5g\ ^1G_4$	$1s\,6f\ ^1F^o_3$	2.6601E+01	6.833E−02	9.201E+10	2.6490E+01	6.844E−02	9.214E+10	0.001
$1s\,6d\ ^3D_2$	$1s\,6f\ ^1F^o_3$	1.7871E+03	2.665E−05	7.950E+03	1.8323E+03	4.615E−05	1.298E+04	0.111
$1s\,6d\ ^3D_3$	$1s\,6f\ ^1F^o_3$	5.1604E+03	6.538E−03	2.340E+05	5.5079E+03	6.062E−03	1.888E+05	0.009
$1s\,6d\ ^1D_2$	$1s\,6f\ ^1F^o_3$	5.6121E+03	1.196E−01	3.619E+06	5.6823E+03	1.176E−01	3.443E+06	0.002
$1s\,6g\ ^3G_4$	$1s\,6f\ ^1F^o_3$	1.8628E+05	3.680E−06	1.011E−01				0.917
$1s\,6g\ ^3G_3$	$1s\,6f\ ^1F^o_3$	9.9701E+05	1.872E−05	1.795E−02				0.869
$1s\,4f\ ^3F^o_4$	$1s\,6g\ ^3G_5$	9.3170E+00	1.552E+00	1.084E+13	9.2773E+00	1.558E+00	1.088E+13	0.000
$1s\,5f\ ^3F^o_4$	$1s\,6g\ ^3G_5$	2.6394E+01	1.003E+01	8.734E+12	2.6281E+01	1.006E+01	8.758E+12	0.000
$1s\,6f\ ^3F^o_4$	$1s\,6g\ ^3G_5$	9.2152E+03	9.257E−02	6.610E+05	9.2775E+03	9.155E−02	6.395E+05	0.002
$1s\,5g\ ^3G_4$	$1s\,6h\ ^3H^o_5$	2.6394E+01	1.465E+01	1.275E+13	2.6281E+01	1.467E+01	1.277E+13	0.000
$1s\,5g\ ^3G_5$	$1s\,6h\ ^3H^o_5$	2.6525E+01	3.263E−01	2.812E+11	2.6411E+01	3.264E−01	2.813E+11	0.000
$1s\,5g\ ^1G_4$	$1s\,6h\ ^3H^o_5$	2.6529E+01	5.862E−03	5.051E+09	2.6415E+01	4.968E−03	4.281E+09	0.001
$1s\,6g\ ^3G_4$	$1s\,6h\ ^3H^o_5$	9.2359E+03	5.084E−02	3.614E+05	9.2564E+03	5.050E−02	3.544E+05	0.018
$1s\,6g\ ^3G_5$	$1s\,6h\ ^3H^o_5$	8.7873E+06	1.183E−06	9.290E−06				0.948
$1s\,3d\ ^3D_3$	$1s\,6h\ ^3H^o_4$	3.8727E+00	3.209E−12	1.586E+02				0.851
$1s\,4d\ ^3D_3$	$1s\,6h\ ^3H^o_4$	9.2624E+00	6.140E−11	5.305E+02				0.185
$1s\,5d\ ^3D_3$	$1s\,6h\ ^3H^o_4$	2.6168E+01	4.788E−09	5.183E+03				0.002
$1s\,5g\ ^3G_4$	$1s\,6h\ ^3H^o_4$	2.6392E+01	3.318E−01	3.530E+11	2.6281E+01	3.323E−01	3.536E+11	0.000
$1s\,5g\ ^3G_3$	$1s\,6h\ ^3H^o_4$	2.6397E+01	1.165E+01	1.239E+13	2.6286E+01	1.166E+01	1.241E+13	0.000
$1s\,5g\ ^3G_5$	$1s\,6h\ ^3H^o_4$	2.6523E+01	6.061E−03	6.385E+09	2.6411E+01	6.044E−03	6.367E+09	0.001
$1s\,5g\ ^1G_4$	$1s\,6h\ ^3H^o_4$	2.6527E+01	2.678E−01	2.820E+11	2.6415E+01	2.670E−01	2.812E+11	0.000
$1s\,6d\ ^3D_3$	$1s\,6h\ ^3H^o_4$	3.3388E+03	1.016E−10	6.754E−03				0.436
$1s\,6g\ ^3G_4$	$1s\,6h\ ^3H^o_4$	9.0013E+03	1.182E−03	1.081E+04	9.2564E+03	1.147E−03	9.845E+03	0.004
$1s\,6g\ ^3G_3$	$1s\,6h\ ^3H^o_4$	9.3695E+03	3.986E−02	3.365E+05	9.2564E+03	4.017E−02	3.445E+05	0.012
$1s\,6g\ ^3G_5$	$1s\,6h\ ^3H^o_4$	3.4069E+05	5.670E−07	3.620E−03				0.752
$1s\,4f\ ^3F^o_3$	$1s\,6g\ ^1G_4$	9.2640E+00	1.114E−07	9.625E+05				0.014
$1s\,4f\ ^3F^o_4$	$1s\,6g\ ^1G_4$	9.3167E+00	3.545E−02	3.027E+11	9.2773E+00	3.542E−02	3.024E+11	0.000
$1s\,4f\ ^1F^o_3$	$1s\,6g\ ^1G_4$	9.3184E+00	1.235E+00	1.054E+13	9.2790E+00	1.239E+00	1.057E+13	0.000
$1s\,5f\ ^3F^o_3$	$1s\,6g\ ^1G_4$	2.6175E+01	1.994E−07	2.157E+05				0.031
$1s\,5f\ ^3F^o_4$	$1s\,6g\ ^1G_4$	2.6391E+01	2.290E−01	2.437E+11	2.6281E+01	2.286E−01	2.432E+11	0.000
$1s\,5f\ ^1F^o_3$	$1s\,6g\ ^1G_4$	2.6398E+01	7.983E+00	8.490E+12	2.6287E+01	8.001E+00	8.508E+12	0.000
$1s\,6f\ ^3F^o_3$	$1s\,6g\ ^1G_4$	3.4068E+03	1.222E−09	7.804E−02				0.960
$1s\,6f\ ^3F^o_4$	$1s\,6g\ ^1G_4$	8.9311E+03	2.180E−03	2.026E+04	9.2773E+03	2.080E−03	1.776E+04	0.042
$1s\,6f\ ^1F^o_3$	$1s\,6g\ ^1G_4$	9.4124E+03	7.208E−02	6.030E+05	9.2882E+03	7.274E−02	6.196E+05	0.031
$1s\,6h\ ^3H^o_5$	$1s\,6g\ ^1G_4$	2.9962E+05	6.236E−07	5.149E−03				0.526
$1s\,6h\ ^3H^o_4$	$1s\,6g\ ^1G_4$	1.9372E+06	4.406E−06	8.701E−04				0.711
$1s\,5g\ ^3G_5$	$1s\,6h\ ^3H^o_6$	2.6474E+01	1.773E+01	1.298E+13	2.6361E+01	1.777E+01	1.301E+13	0.000
$1s\,6g\ ^3G_5$	$1s\,6h\ ^3H^o_6$	1.3897E+04	4.086E−02	1.085E+05	1.3933E+04	4.057E−02	1.063E+05	0.026
$1s\,5g\ ^3G_4$	$1s\,6h\ ^1H^o_5$	2.6342E+01	1.711E−06	1.496E+06				0.001
$1s\,5g\ ^3G_5$	$1s\,6h\ ^1H^o_5$	2.6473E+01	2.737E−01	2.369E+11	2.6361E+01	2.735E−01	2.366E+11	0.000
$1s\,5g\ ^1G_4$	$1s\,6h\ ^1H^o_5$	2.6477E+01	1.473E+01	1.274E+13	2.6365E+01	1.476E+01	1.277E+13	0.000
$1s\,6g\ ^3G_4$	$1s\,6h\ ^1H^o_5$	5.4809E+03	9.930E−09	2.004E−01				0.195
$1s\,6g\ ^3G_5$	$1s\,6h\ ^1H^o_5$	1.3461E+04	6.513E−04	2.180E+03	1.3933E+04	6.242E−04	1.933E+03	0.002
$1s\,6g\ ^1G_4$	$1s\,6h\ ^1H^o_5$	1.4116E+04	3.341E−02	1.017E+05	1.3934E+04	3.370E−02	1.043E+05	0.019
$1s\,2p\ ^3P^o_1$	$1s\,7s\ ^3S_1$	1.3378E+00	7.720E−04	9.590E+11	1.3323E+00	8.087E−04	1.004E+12	0.015
$1s\,2p\ ^3P^o_0$	$1s\,7s\ ^3S_1$	1.3387E+00	3.810E−04	4.727E+11	1.3331E+00	3.785E−04	4.696E+11	0.001
$1s\,2p\ ^3P^o_2$	$1s\,7s\ ^3S_1$	1.3964E+00	2.525E−03	2.879E+12	1.3905E+00	2.566E−03	2.926E+12	0.019
$1s\,2p\ ^1P^o_1$	$1s\,7s\ ^3S_1$	1.4019E+00	4.638E−04	5.247E+11	1.3961E+00	4.626E−04	5.232E+11	0.004
$1s\,3p\ ^3P^o_1$	$1s\,7s\ ^3S_1$	3.4180E+00	3.432E−03	6.531E+11	3.4039E+00	3.453E−03	6.570E+11	0.006
$1s\,3p\ ^3P^o_0$	$1s\,7s\ ^3S_1$	3.4195E+00	1.667E−03	3.171E+11	3.4054E+00	1.625E−03	3.089E+11	0.006
$1s\,3p\ ^3P^o_2$	$1s\,7s\ ^3S_1$	3.5305E+00	1.085E−02	1.935E+12	3.5159E+00	1.077E−02	1.922E+12	0.004

(*continued on next page*)

Table 3 (*continued*)

Lower	Upper	GRASP2K			FAC			*dT*
		λ (Å)	*gf*	A (s^{-1})	λ (Å)	*gf*	A (s^{-1})	
$1s\,3p\ ^1P^o_1$	$1s\,7s\ ^3S_1$	3.5405E+00	1.974E−03	3.501E+11	3.5260E+00	1.955E−03	3.467E+11	0.005
$1s\,4p\ ^3P^o_1$	$1s\,7s\ ^3S_1$	7.4166E+00	1.104E−02	4.464E+11	7.3859E+00	1.108E−02	4.478E+11	0.004
$1s\,4p\ ^3P^o_0$	$1s\,7s\ ^3S_1$	7.4194E+00	5.355E−03	2.163E+11	7.3886E+00	5.225E−03	2.110E+11	0.004
$1s\,4p\ ^3P^o_2$	$1s\,7s\ ^3S_1$	7.6388E+00	3.445E−02	1.313E+12	7.6070E+00	3.431E−02	1.307E+12	0.004
$1s\,4p\ ^1P^o_1$	$1s\,7s\ ^3S_1$	7.6581E+00	6.277E−03	2.380E+11	7.6265E+00	6.235E−03	2.363E+11	0.004
$1s\,4f\ ^3F^o_2$	$1s\,7s\ ^3S_1$	7.7310E+00	1.468E−09	5.461E+04				0.174
$1s\,5p\ ^3P^o_1$	$1s\,7s\ ^3S_1$	1.6020E+01	3.789E−02	3.283E+11	1.5955E+01	3.806E−02	3.296E+11	0.001
$1s\,5p\ ^3P^o_0$	$1s\,7s\ ^3S_1$	1.6027E+01	1.835E−02	1.589E+11	1.5961E+01	1.794E−02	1.553E+11	0.001
$1s\,5p\ ^3P^o_2$	$1s\,7s\ ^3S_1$	1.6551E+01	1.189E−01	9.653E+11	1.6483E+01	1.187E−01	9.639E+11	0.001
$1s\,5p\ ^1P^o_1$	$1s\,7s\ ^3S_1$	1.6597E+01	2.172E−02	1.753E+11	1.6529E+01	2.161E−02	1.744E+11	0.000
$1s\,5f\ ^3F^o_2$	$1s\,7s\ ^3S_1$	1.6773E+01	1.742E−08	1.377E+05				0.145
$1s\,6p\ ^3P^o_1$	$1s\,7s\ ^3S_1$	4.2860E+01	2.134E−01	2.582E+11	4.2690E+01	2.157E−01	2.610E+11	0.005
$1s\,6p\ ^3P^o_0$	$1s\,7s\ ^3S_1$	4.2887E+01	1.033E−01	1.249E+11	4.2622E+01	1.000E−01	1.214E+11	0.006
$1s\,6p\ ^3P^o_2$	$1s\,7s\ ^3S_1$	4.5091E+01	7.068E−01	7.730E+11	4.4909E+01	7.019E−01	7.672E+11	0.005
$1s\,6p\ ^1P^o_1$	$1s\,7s\ ^3S_1$	4.5287E+01	1.298E−01	1.408E+11	4.5084E+01	1.247E−01	1.352E+11	0.004
$1s\,6f\ ^3F^o_2$	$1s\,7s\ ^3S_1$	4.6051E+01	2.376E−07	2.491E+05				0.119
$1s^2\ ^1S_0$	$1s\,7p\ ^3P^o_1$ 8	3.1400E−01	2.473E−03	5.575E+13	3.1277E−01	2.233E−03	5.033E+13	0.014
$1s\,2s\ ^3S_1$	$1s\,7p\ ^3P^o_1$	1.3266E+00	8.485E−03	1.072E+13	1.3210E+00	8.499E−03	1.073E+13	0.001
$1s\,2s\ ^1S_0$	$1s\,7p\ ^3P^o_1$	1.3387E+00	3.675E−03	4.559E+12	1.3333E+00	3.455E−03	4.285E+12	0.005
$1s\,3s\ ^3S_1$	$1s\,7p\ ^3P^o_1$	3.3968E+00	1.851E−02	3.568E+12	3.3827E+00	1.869E−02	3.601E+12	0.003
$1s\,3s\ ^1S_0$	$1s\,7p\ ^3P^o_1$	3.4178E+00	8.150E−03	1.551E+12	3.4039E+00	7.676E−03	1.460E+12	0.004
$1s\,3d\ ^3D_2$	$1s\,7p\ ^3P^o_1$	3.5373E+00	2.636E−03	4.685E+11	3.5225E+00	2.629E−03	4.672E+11	0.007
$1s\,3d\ ^3D_1$	$1s\,7p\ ^3P^o_1$	3.5388E+00	5.820E−04	1.033E+11	3.5240E+00	5.690E−04	1.010E+11	0.014
$1s\,3d\ ^1D_2$	$1s\,7p\ ^3P^o_1$	3.5757E+00	3.300E−06	5.739E+08	3.5607E+00	4.032E−06	7.011E+08	0.058
$1s\,4s\ ^3S_1$	$1s\,7p\ ^3P^o_1$	7.3716E+00	4.040E−02	1.653E+12	7.3412E+00	4.095E−02	1.675E+12	0.005
$1s\,4s\ ^1S_0$	$1s\,7p\ ^3P^o_1$	7.4116E+00	1.804E−02	7.300E+11	7.3814E+00	1.691E−02	6.845E+11	0.013
$1s\,4d\ ^3D_2$	$1s\,7p\ ^3P^o_1$	7.6476E+00	1.361E−02	5.173E+11	7.6163E+00	1.350E−02	5.132E+11	0.004
$1s\,4d\ ^3D_1$	$1s\,7p\ ^3P^o_1$	7.6504E+00	2.969E−03	1.128E+11	7.6191E+00	2.915E−03	1.106E+11	0.011
$1s\,4d\ ^1D_2$	$1s\,7p\ ^3P^o_1$	7.7236E+00	1.514E−05	5.643E+08	7.6918E+00	1.914E−05	7.134E+08	0.050
$1s\,5s\ ^3S_1$	$1s\,7p\ ^3P^o_1$	1.5898E+01	1.045E−01	9.197E+11	1.5833E+01	1.061E−01	9.332E+11	0.005
$1s\,5s\ ^1S_0$	$1s\,7p\ ^3P^o_1$	1.5991E+01	4.695E−02	4.082E+11	1.5927E+01	4.406E−02	3.829E+11	0.014
$1s\,5d\ ^3D_2$	$1s\,7p\ ^3P^o_1$	1.6554E+01	6.096E−02	4.946E+11	1.6489E+01	6.030E−02	4.890E+11	0.002
$1s\,5d\ ^3D_1$	$1s\,7p\ ^3P^o_1$	1.6561E+01	1.320E−02	1.070E+11	1.6495E+01	1.298E−02	1.052E+11	0.007
$1s\,5d\ ^1D_2$	$1s\,7p\ ^3P^o_1$	1.6737E+01	6.527E−05	5.181E+08	1.6670E+01	8.178E−05	6.487E+08	0.033
$1s\,6s\ ^3S_1$	$1s\,7p\ ^3P^o_1$	4.2260E+01	4.475E−01	5.571E+11	4.2057E+01	4.571E−01	5.697E+11	0.006
$1s\,6s\ ^1S_0$	$1s\,7p\ ^3P^o_1$	4.2638E+01	2.029E−01	2.482E+11	4.2377E+01	1.912E−01	2.347E+11	0.009
$1s\,6d\ ^3D_2$	$1s\,7p\ ^3P^o_1$	4.4993E+01	4.312E−01	4.736E+11	4.4844E+01	4.266E−01	4.677E+11	0.002
$1s\,6d\ ^3D_1$	$1s\,7p\ ^3P^o_1$	4.5021E+01	9.291E−02	1.019E+11	4.4837E+01	9.088E−02	9.966E+10	0.002
$1s\,6d\ ^1D_2$	$1s\,7p\ ^3P^o_1$	4.5778E+01	4.619E−04	4.901E+08	4.5600E+01	3.977E−04	4.217E+08	0.019
$1s\,7s\ ^3S_1$	$1s\,7p\ ^3P^o_1$	7.6504E+03	4.971E−02	1.888E+06	7.3461E+03	5.274E−02	2.154E+06	0.473
$1s\,2p\ ^3P^o_1$	$1s\,7s\ ^1S_0$	1.3376E+00	3.292E−04	1.227E+12	1.3321E+00	3.285E−04	1.224E+12	0.026
$1s\,2p\ ^1P^o_1$	$1s\,7s\ ^1S_0$	1.4017E+00	1.114E−03	3.782E+12	1.3959E+00	1.070E−03	3.634E+12	0.019
$1s\,3p\ ^3P^o_1$	$1s\,7s\ ^1S_0$	3.4164E+00	1.425E−03	8.144E+11	3.4026E+00	1.427E−03	8.155E+11	0.006
$1s\,3p\ ^1P^o_1$	$1s\,7s\ ^1S_0$	3.5388E+00	4.562E−03	2.430E+12	3.5246E+00	4.493E−03	2.392E+12	0.001
$1s\,4p\ ^3P^o_1$	$1s\,7s\ ^1S_0$	7.4094E+00	4.589E−03	5.575E+11	7.3798E+00	4.609E−03	5.597E+11	0.001
$1s\,4p\ ^1P^o_1$	$1s\,7s\ ^1S_0$	7.6504E+00	1.442E−02	1.643E+12	7.6200E+00	1.430E−02	1.629E+12	0.002
$1s\,5p\ ^3P^o_1$	$1s\,7s\ ^1S_0$	1.5987E+01	1.568E−02	4.091E+11	1.5926E+01	1.585E−02	4.135E+11	0.008
$1s\,5p\ ^1P^o_1$	$1s\,7s\ ^1S_0$	1.6561E+01	4.949E−02	1.204E+12	1.6498E+01	4.952E−02	1.203E+12	0.007
$1s\,6p\ ^3P^o_1$	$1s\,7s\ ^1S_0$	4.2620E+01	8.694E−02	3.193E+11	4.2488E+01	8.468E−02	3.102E+11	0.004
$1s\,6p\ ^1P^o_1$	$1s\,7s\ ^1S_0$	4.5020E+01	2.908E−01	9.571E+11	4.4858E+01	2.959E−01	9.728E+11	0.004
$1s\,7p\ ^3P^o_1$	$1s\,7s\ ^1S_0$	1.5939E+06	1.021E−04	2.681E−01				0.803
$1s\,2s\ ^3S_1$	$1s\,7p\ ^3P^o_0$	1.3265E+00	4.036E−03	1.530E+13	1.3210E+00	3.995E−03	1.514E+13	0.003
$1s\,3s\ ^3S_1$	$1s\,7p\ ^3P^o_0$	3.3967E+00	8.794E−03	5.084E+12	3.3830E+00	8.817E−03	5.095E+12	0.006
$1s\,3d\ ^3D_1$	$1s\,7p\ ^3P^o_0$	3.5387E+00	1.077E−03	5.739E+11	3.5243E+00	1.057E−03	5.628E+11	0.014
$1s\,4s\ ^3S_1$	$1s\,7p\ ^3P^o_0$	7.3711E+00	1.921E−02	2.358E+12	7.3425E+00	1.936E−02	2.376E+12	0.007
$1s\,4d\ ^3D_1$	$1s\,7p\ ^3P^o_0$	7.6499E+00	5.527E−03	6.300E+11	7.6205E+00	5.438E−03	6.193E+11	0.010
$1s\,5s\ ^3S_1$	$1s\,7p\ ^3P^o_0$	1.5896E+01	4.976E−02	1.314E+12	1.5839E+01	5.030E−02	1.326E+12	0.007
$1s\,5d\ ^3D_1$	$1s\,7p\ ^3P^o_0$	1.6558E+01	2.465E−02	5.997E+11	1.6502E+01	2.430E−02	5.902E+11	0.006
$1s\,6s\ ^3S_1$	$1s\,7p\ ^3P^o_0$	4.2244E+01	2.130E−01	7.963E+11	4.2099E+01	2.165E−01	8.080E+11	0.007
$1s\,6d\ ^3D_1$	$1s\,7p\ ^3P^o_0$	4.5003E+01	1.739E−01	5.729E+11	4.4885E+01	1.725E−01	5.665E+11	0.001
$1s\,7s\ ^3S_1$	$1s\,7p\ ^3P^o_0$	7.1550E+03	2.549E−02	3.321E+06	8.8861E+03	2.046E−02	1.714E+06	0.480
$1s\,2s\ ^3S_1$	$1s\,7p\ ^3P^o_2$	1.3253E+00	1.891E−02	1.437E+13	1.3197E+00	1.925E−02	1.462E+13	0.001
$1s\,3s\ ^3S_1$	$1s\,7p\ ^3P^o_2$	3.3884E+00	3.934E−02	4.571E+12	3.3744E+00	3.973E−02	4.615E+12	0.005
$1s\,3d\ ^3D_2$	$1s\,7p\ ^3P^o_2$	3.5282E+00	3.283E−04	3.518E+10	3.5135E+00	3.304E−04	3.541E+10	0.010
$1s\,3d\ ^3D_1$	$1s\,7p\ ^3P^o_2$	3.5297E+00	3.595E−05	3.849E+09	3.5150E+00	3.345E−05	3.581E+09	0.017
$1s\,3d\ ^3D_3$	$1s\,7p\ ^3P^o_2$	3.5650E+00	3.513E−03	3.687E+11	3.5501E+00	3.455E−03	3.626E+11	0.013
$1s\,3d\ ^1D_2$	$1s\,7p\ ^3P^o_2$	3.5665E+00	2.544E−04	2.668E+10	3.5515E+00	2.446E−04	2.565E+10	0.013
$1s\,4s\ ^3S_1$	$1s\,7p\ ^3P^o_2$	7.3324E+00	8.272E−02	2.052E+12	7.3023E+00	8.341E−02	2.069E+12	0.007
$1s\,4d\ ^3D_2$	$1s\,7p\ ^3P^o_2$	7.6054E+00	1.768E−03	4.077E+10	7.5744E+00	1.757E−03	4.050E+10	0.006
$1s\,4d\ ^3D_1$	$1s\,7p\ ^3P^o_2$	7.6082E+00	1.921E−04	4.428E+09	7.5772E+00	1.813E−04	4.178E+09	0.008
$1s\,4d\ ^3D_3$	$1s\,7p\ ^3P^o_2$	7.6776E+00	1.856E−02	4.201E+11	7.6461E+00	1.822E−02	4.122E+11	0.008

(*continued on next page*)

Table 3 (*continued*)

Lower	Upper	GRASP2K			FAC			*dT*
		λ (Å)	*gf*	A (s^{-1})	λ (Å)	*gf*	A (s^{-1})	
$1s\,4d\ ^1D_2$	$1s\,7p\ ^3P^o_2$	7.6806E+00	1.326E−03	2.999E+10	7.6491E+00	1.284E−03	2.903E+10	0.009
$1s\,5s\ ^3S_1$	$1s\,7p\ ^3P^o_2$	1.5717E+01	2.047E−01	1.106E+12	1.5653E+01	2.060E−01	1.112E+12	0.007
$1s\,5d\ ^3D_2$	$1s\,7p\ ^3P^o_2$	1.6358E+01	8.043E−03	4.010E+10	1.6293E+01	7.930E−03	3.951E+10	0.003
$1s\,5d\ ^3D_1$	$1s\,7p\ ^3P^o_2$	1.6364E+01	8.712E−04	4.340E+09	1.6300E+01	8.288E−04	4.126E+09	0.004
$1s\,5d\ ^3D_3$	$1s\,7p\ ^3P^o_2$	1.6529E+01	8.380E−02	4.092E+11	1.6463E+01	8.203E−02	4.003E+11	0.004
$1s\,5d\ ^1D_2$	$1s\,7p\ ^3P^o_2$	1.6536E+01	5.940E−03	2.898E+10	1.6471E+01	5.769E−03	2.812E+10	0.005
$1s\,5g\ ^3G_3$	$1s\,7p\ ^3P^o_2$	1.6620E+01	2.424E−09	1.171E+04				0.041
$1s\,6s\ ^3S_1$	$1s\,7p\ ^3P^o_2$	4.1005E+01	7.989E−01	6.339E+11	4.0810E+01	8.054E−01	6.397E+11	0.007
$1s\,6d\ ^3D_2$	$1s\,7p\ ^3P^o_2$	4.3572E+01	5.481E−02	3.851E+10	4.3429E+01	5.418E−02	3.800E+10	0.003
$1s\,6d\ ^3D_1$	$1s\,7p\ ^3P^o_2$	4.3599E+01	5.937E−03	4.167E+09	4.3422E+01	5.899E−03	4.138E+09	0.000
$1s\,6d\ ^3D_3$	$1s\,7p\ ^3P^o_2$	4.4278E+01	5.768E−01	3.925E+11	4.4127E+01	5.633E−01	3.826E+11	0.003
$1s\,6d\ ^1D_2$	$1s\,7p\ ^3P^o_2$	4.4308E+01	4.074E−02	2.768E+10	4.4138E+01	3.914E−02	2.657E+10	0.001
$1s\,6g\ ^3G_3$	$1s\,7p\ ^3P^o_2$	4.4659E+01	4.072E−08	2.724E+04				0.013
$1s\,7s\ ^3S_1$	$1s\,7p\ ^3P^o_2$	1.1691E+03	7.901E−01	7.712E+08	1.1590E+03	7.980E−01	7.858E+08	0.072
$1s\,2p\ ^3P^o_1$	$1s\,7d\ ^3D_2$	1.3362E+00	3.096E−02	2.313E+13	1.3307E+00	3.108E−02	2.321E+13	0.001
$1s\,2p\ ^3P^o_2$	$1s\,7d\ ^3D_2$	1.3946E+00	5.230E−03	3.587E+12	1.3888E+00	5.160E−03	3.539E+12	0.008
$1s\,2p\ ^1P^o_1$	$1s\,7d\ ^3D_2$	1.4001E+00	8.791E−04	5.983E+11	1.3943E+00	8.081E−04	5.498E+11	0.013
$1s\,3p\ ^3P^o_1$	$1s\,7d\ ^3D_2$	3.4075E+00	6.964E−02	8.001E+12	3.3932E+00	6.971E−02	8.008E+12	0.001
$1s\,3p\ ^3P^o_2$	$1s\,7d\ ^3D_2$	3.5193E+00	1.286E−02	1.385E+12	3.5045E+00	1.286E−02	1.385E+12	0.001
$1s\,3p\ ^1P^o_1$	$1s\,7d\ ^3D_2$	3.5292E+00	2.078E−03	2.225E+11	3.5145E+00	1.921E−03	2.057E+11	0.003
$1s\,4p\ ^3P^o_1$	$1s\,7d\ ^3D_2$	7.3673E+00	1.429E−01	3.511E+12	7.3356E+00	1.431E−01	3.519E+12	0.001
$1s\,4p\ ^3P^o_2$	$1s\,7d\ ^3D_2$	7.5864E+00	2.803E−02	6.498E+11	7.5537E+00	2.826E−02	6.552E+11	0.001
$1s\,4p\ ^1P^o_1$	$1s\,7d\ ^3D_2$	7.6055E+00	4.508E−03	1.040E+11	7.5729E+00	4.133E−03	9.533E+10	0.003
$1s\,4f\ ^3F^o_3$	$1s\,7d\ ^3D_2$	7.6759E+00	4.363E−03	9.879E+10	7.6429E+00	4.349E−03	9.848E+10	0.006
$1s\,4f\ ^3F^o_2$	$1s\,7d\ ^3D_2$	7.6774E+00	3.185E−04	7.208E+09	7.6444E+00	3.188E−04	7.218E+09	0.006
$1s\,4f\ ^1F^o_3$	$1s\,7d\ ^3D_2$	7.7133E+00	3.659E−07	8.205E+06				0.014
$1s\,5p\ ^3P^o_1$	$1s\,7d\ ^3D_2$	1.5792E+01	3.371E−01	1.803E+12	1.5722E+01	3.385E−01	1.811E+12	0.001
$1s\,5p\ ^3P^o_2$	$1s\,7d\ ^3D_2$	1.6307E+01	7.040E−02	3.532E+11	1.6234E+01	7.148E−02	3.587E+11	0.001
$1s\,5p\ ^1P^o_1$	$1s\,7d\ ^3D_2$	1.6352E+01	1.134E−02	5.658E+10	1.6279E+01	1.027E−02	5.130E+10	0.004
$1s\,5f\ ^3F^o_3$	$1s\,7d\ ^3D_2$	1.6519E+01	3.339E−02	1.633E+11	1.6446E+01	3.340E−02	1.633E+11	0.001
$1s\,5f\ ^3F^o_2$	$1s\,7d\ ^3D_2$	1.6522E+01	2.432E−03	1.189E+10	1.6450E+01	2.444E−03	1.195E+10	0.001
$1s\,5f\ ^1F^o_3$	$1s\,7d\ ^3D_2$	1.6607E+01	2.729E−06	1.320E+07				0.014
$1s\,6p\ ^3P^o_1$	$1s\,7d\ ^3D_2$	4.1263E+01	1.251E+00	9.802E+11	4.1063E+01	1.250E+00	9.806E+11	0.001
$1s\,6p\ ^3P^o_2$	$1s\,7d\ ^3D_2$	4.3326E+01	2.912E−01	2.069E+11	4.3112E+01	2.974E−01	2.116E+11	0.001
$1s\,6p\ ^1P^o_1$	$1s\,7d\ ^3D_2$	4.3508E+01	4.727E−02	3.331E+10	4.3273E+01	4.648E−02	3.283E+10	0.001
$1s\,6f\ ^3F^o_3$	$1s\,7d\ ^3D_2$	4.4197E+01	3.118E−01	2.129E+11	4.4000E+01	3.118E−01	2.130E+11	0.000
$1s\,6f\ ^3F^o_2$	$1s\,7d\ ^3D_2$	4.4212E+01	2.269E−02	1.548E+10	4.4000E+01	2.271E−02	1.552E+10	0.000
$1s\,6f\ ^1F^o_3$	$1s\,7d\ ^3D_2$	4.4566E+01	2.533E−05	1.702E+07				0.015
$1s\,7p\ ^3P^o_1$	$1s\,7d\ ^3D_2$	1.2946E+03	6.694E−01	5.328E+08	1.2624E+03	6.847E−01	5.683E+08	0.085
$1s\,7p\ ^3P^o_2$	$1s\,7d\ ^3D_2$	2.0924E+04	7.595E−03	2.314E+04	1.5290E+04	1.048E−02	5.933E+04	0.623
$1s\,2p\ ^3P^o_1$	$1s\,7d\ ^3D_1$	1.3362E+00	6.637E−03	8.265E+12	1.3307E+00	6.631E−03	8.256E+12	0.004
$1s\,2p\ ^3P^o_0$	$1s\,7d\ ^3D_1$	1.3371E+00	1.257E−02	1.564E+13	1.3315E+00	1.257E−02	1.563E+13	0.002
$1s\,2p\ ^3P^o_2$	$1s\,7d\ ^3D_1$	1.3946E+00	5.723E−04	6.542E+11	1.3888E+00	5.618E−04	6.421E+11	0.010
$1s\,2p\ ^1P^o_1$	$1s\,7d\ ^3D_1$	1.4001E+00	2.555E−03	2.898E+12	1.3943E+00	2.472E−03	2.803E+12	0.006
$1s\,3p\ ^3P^o_1$	$1s\,7d\ ^3D_1$	3.4074E+00	1.488E−02	2.849E+12	3.3932E+00	1.485E−02	2.844E+12	0.000
$1s\,3p\ ^3P^o_0$	$1s\,7d\ ^3D_1$	3.4088E+00	2.822E−02	5.400E+12	3.3947E+00	2.819E−02	5.393E+12	0.000
$1s\,3p\ ^3P^o_2$	$1s\,7d\ ^3D_1$	3.5192E+00	1.406E−03	2.523E+11	3.5045E+00	1.401E−03	2.515E+11	0.000
$1s\,3p\ ^1P^o_1$	$1s\,7d\ ^3D_1$	3.5291E+00	6.358E−03	1.135E+12	3.5145E+00	6.259E−03	1.117E+12	0.000
$1s\,4p\ ^3P^o_1$	$1s\,7d\ ^3D_1$	7.3668E+00	3.045E−02	1.248E+12	7.3357E+00	3.052E−02	1.250E+12	0.000
$1s\,4p\ ^3P^o_0$	$1s\,7d\ ^3D_1$	7.3695E+00	5.785E−02	2.368E+12	7.3384E+00	5.791E−02	2.370E+12	0.000
$1s\,4p\ ^3P^o_2$	$1s\,7d\ ^3D_1$	7.5859E+00	3.056E−03	1.181E+11	7.5538E+00	3.082E−03	1.190E+11	0.000
$1s\,4p\ ^1P^o_1$	$1s\,7d\ ^3D_1$	7.6050E+00	1.395E−02	5.361E+11	7.5730E+00	1.384E−02	5.323E+11	0.000
$1s\,4f\ ^3F^o_2$	$1s\,7d\ ^3D_1$	7.6769E+00	2.803E−03	1.058E+11	7.6445E+00	2.797E−03	1.055E+11	0.006
$1s\,5p\ ^3P^o_1$	$1s\,7d\ ^3D_1$	1.5790E+01	7.173E−02	6.397E+11	1.5722E+01	7.230E−02	6.448E+11	0.002
$1s\,5p\ ^3P^o_0$	$1s\,7d\ ^3D_1$	1.5796E+01	1.364E−01	1.215E+12	1.5728E+01	1.369E−01	1.220E+12	0.002
$1s\,5p\ ^3P^o_2$	$1s\,7d\ ^3D_1$	1.6305E+01	7.659E−03	6.406E+10	1.6235E+01	7.804E−03	6.528E+10	0.001
$1s\,5p\ ^1P^o_1$	$1s\,7d\ ^3D_1$	1.6349E+01	3.522E−02	2.929E+11	1.6280E+01	3.519E−02	2.927E+11	0.002
$1s\,5f\ ^3F^o_2$	$1s\,7d\ ^3D_1$	1.6520E+01	2.145E−02	1.748E+11	1.6451E+01	2.148E−02	1.750E+11	0.001
$1s\,6p\ ^3P^o_1$	$1s\,7d\ ^3D_1$	4.1248E+01	2.657E−01	3.472E+11	4.1067E+01	2.734E−01	3.574E+11	0.000
$1s\,6p\ ^3P^o_0$	$1s\,7d\ ^3D_1$	4.1273E+01	5.057E−01	6.601E+11	4.1003E+01	5.090E−01	6.675E+11	0.000
$1s\,6p\ ^3P^o_2$	$1s\,7d\ ^3D_1$	4.3310E+01	3.160E−02	3.746E+10	4.3116E+01	3.243E−02	3.846E+10	0.000
$1s\,6p\ ^1P^o_1$	$1s\,7d\ ^3D_1$	4.3491E+01	1.469E−01	1.726E+11	4.3277E+01	1.432E−01	1.686E+11	0.000
$1s\,6f\ ^3F^o_2$	$1s\,7d\ ^3D_1$	4.4195E+01	2.002E−01	2.279E+11	4.4004E+01	2.007E−01	2.285E+11	0.000
$1s\,7p\ ^3P^o_1$	$1s\,7d\ ^3D_1$	1.2801E+03	1.445E−01	1.960E+08	1.2659E+03	1.475E−01	2.029E+08	0.069
$1s\,7p\ ^3P^o_0$	$1s\,7d\ ^3D_1$	1.2951E+03	2.699E−01	3.578E+08	1.2292E+03	2.853E−01	4.163E+08	0.073
$1s\,7p\ ^3P^o_2$	$1s\,7d\ ^3D_1$	1.7684E+04	9.719E−04	6.910E+03				0.539
$1s^2\ ^1S_0$	$1s\,7p\ ^1P^o_1$	3.1400E−01	6.133E−03	1.383E+14	3.1269E−01	6.558E−03	1.478E+14	0.034
$1s\,2s\ ^3S_1$	$1s\,7p\ ^1P^o_1$	1.3252E+00	3.384E−03	4.284E+12	1.3196E+00	3.343E−03	4.232E+12	0.001
$1s\,2s\ ^1S_0$	$1s\,7p\ ^1P^o_1$	1.3373E+00	8.044E−03	1.000E+13	1.3319E+00	8.135E−03	1.011E+13	0.002
$1s\,3s\ ^3S_1$	$1s\,7p\ ^1P^o_1$	3.3877E+00	7.007E−03	1.358E+12	3.3738E+00	6.862E−03	1.329E+12	0.004
$1s\,3s\ ^1S_0$	$1s\,7p\ ^1P^o_1$	3.4087E+00	1.698E−02	3.249E+12	3.3948E+00	1.687E−02	3.228E+12	0.007

(*continued on next page*)

Table 3 (*continued*)

Lower	Upper	GRASP2K			FAC			*dT*
		λ (Å)	*gf*	*A* (s^{-1})	λ (Å)	*gf*	*A* (s^{-1})	
$1s\,3d\ ^3D_2$	$1s\,7p\ ^1P^o_1$	3.5275E+00	5.455E−05	9.748E+09	3.5128E+00	6.841E−05	1.222E+10	0.020
$1s\,3d\ ^3D_1$	$1s\,7p\ ^1P^o_1$	3.5290E+00	1.667E−04	2.975E+10	3.5143E+00	1.567E−04	2.797E+10	0.023
$1s\,3d\ ^1D_2$	$1s\,7p\ ^1P^o_1$	3.5657E+00	2.254E−03	3.941E+11	3.5508E+00	2.218E−03	3.879E+11	0.018
$1s\,4s\ ^3S_1$	$1s\,7p\ ^1P^o_1$	7.3292E+00	1.467E−02	6.074E+11	7.2994E+00	1.435E−02	5.938E+11	0.006
$1s\,4s\ ^1S_0$	$1s\,7p\ ^1P^o_1$	7.3687E+00	3.615E−02	1.480E+12	7.3391E+00	3.552E−02	1.453E+12	0.018
$1s\,4d\ ^3D_2$	$1s\,7p\ ^1P^o_1$	7.6019E+00	2.848E−04	1.096E+10	7.5713E+00	3.513E−04	1.351E+10	0.015
$1s\,4d\ ^3D_1$	$1s\,7p\ ^1P^o_1$	7.6047E+00	8.821E−04	3.391E+10	7.5741E+00	8.289E−04	3.185E+10	0.015
$1s\,4d\ ^1D_2$	$1s\,7p\ ^1P^o_1$	7.6770E+00	1.182E−02	4.460E+11	7.6459E+00	1.171E−02	4.416E+11	0.012
$1s\,5s\ ^3S_1$	$1s\,7p\ ^1P^o_1$	1.5702E+01	3.615E−02	3.260E+11	1.5640E+01	3.530E−02	3.181E+11	0.006
$1s\,5s\ ^1S_0$	$1s\,7p\ ^1P^o_1$	1.5793E+01	8.962E−02	7.989E+11	1.5731E+01	8.793E−02	7.833E+11	0.020
$1s\,5d\ ^3D_2$	$1s\,7p\ ^1P^o_1$	1.6342E+01	1.272E−03	1.059E+10	1.6279E+01	1.567E−03	1.303E+10	0.010
$1s\,5d\ ^3D_1$	$1s\,7p\ ^1P^o_1$	1.6348E+01	3.965E−03	3.299E+10	1.6286E+01	3.728E−03	3.099E+10	0.009
$1s\,5d\ ^1D_2$	$1s\,7p\ ^1P^o_1$	1.6520E+01	5.302E−02	4.320E+11	1.6456E+01	5.276E−02	4.295E+11	0.008
$1s\,6s\ ^3S_1$	$1s\,7p\ ^1P^o_1$	4.0902E+01	1.398E−01	1.858E+11	4.0720E+01	1.370E−01	1.821E+11	0.007
$1s\,6s\ ^1S_0$	$1s\,7p\ ^1P^o_1$	4.1256E+01	3.498E−01	4.569E+11	4.1020E+01	3.451E−01	4.522E+11	0.014
$1s\,6d\ ^3D_2$	$1s\,7p\ ^1P^o_1$	4.3457E+01	8.540E−03	1.005E+10	4.3327E+01	1.016E−02	1.193E+10	0.003
$1s\,6d\ ^3D_1$	$1s\,7p\ ^1P^o_1$	4.3483E+01	2.672E−02	3.142E+10	4.3321E+01	2.490E−02	2.926E+10	0.003
$1s\,6d\ ^1D_2$	$1s\,7p\ ^1P^o_1$	4.4189E+01	3.623E−01	4.126E+11	4.4032E+01	3.636E−01	4.134E+11	0.002
$1s\,7s\ ^3S_1$	$1s\,7p\ ^1P^o_1$	1.0915E+03	1.520E−01	2.837E+08	1.0907E+03	1.478E−01	2.739E+08	0.066
$1s\,7s\ ^1S_0$	$1s\,7p\ ^1P^o_1$	1.2741E+03	3.038E−01	4.162E+08	1.2422E+03	3.169E−01	4.528E+08	0.028
$1s\,7d\ ^3D_2$	$1s\,7p\ ^1P^o_1$	7.6625E+04	3.302E−04	1.250E+02				0.321
$1s\,7d\ ^3D_1$	$1s\,7p\ ^1P^o_1$	2.3287E+05	3.390E−04	1.390E+01				0.942
$1s\,2p\ ^3P^o_2$	$1s\,7d\ ^3D_3$	1.3942E+00	5.071E−02	2.486E+13	1.3883E+00	5.182E−02	2.540E+13	0.003
$1s\,3p\ ^3P^o_2$	$1s\,7d\ ^3D_3$	3.5164E+00	1.199E−01	9.238E+12	3.5016E+00	1.209E−01	9.318E+12	0.001
$1s\,4p\ ^3P^o_2$	$1s\,7d\ ^3D_3$	7.5732E+00	2.553E−01	4.241E+12	7.5406E+00	2.573E−01	4.276E+12	0.001
$1s\,4f\ ^3F^o_3$	$1s\,7d\ ^3D_3$	7.6624E+00	2.543E−04	4.128E+09	7.6295E+00	2.555E−04	4.148E+09	0.002
$1s\,4f\ ^3F^o_2$	$1s\,7d\ ^3D_3$	7.6639E+00	1.167E−05	1.894E+08				0.001
$1s\,4f\ ^3F^o_4$	$1s\,7d\ ^3D_3$	7.6985E+00	5.558E−03	8.936E+10	7.6654E+00	5.556E−03	8.934E+10	0.000
$1s\,4f\ ^1F^o_3$	$1s\,7d\ ^3D_3$	7.6996E+00	2.073E−04	3.331E+09	7.6665E+00	2.067E−04	3.323E+09	0.001
$1s\,5p\ ^3P^o_2$	$1s\,7d\ ^3D_3$	1.6246E+01	6.275E−01	2.266E+12	1.6174E+01	6.344E−01	2.291E+12	0.001
$1s\,5f\ ^3F^o_3$	$1s\,7d\ ^3D_3$	1.6456E+01	1.973E−03	6.943E+09	1.6385E+01	1.981E−03	6.974E+09	0.002
$1s\,5f\ ^3F^o_2$	$1s\,7d\ ^3D_3$	1.6460E+01	9.278E−05	3.263E+08	1.6388E+01	9.234E−05	3.248E+08	0.001
$1s\,5f\ ^3F^o_4$	$1s\,7d\ ^3D_3$	1.6542E+01	4.307E−02	1.500E+11	1.6469E+01	4.303E−02	1.498E+11	0.001
$1s\,5f\ ^1F^o_3$	$1s\,7d\ ^3D_3$	1.6544E+01	1.605E−03	5.589E+09	1.6472E+01	1.600E−03	5.573E+09	0.000
$1s\,6p\ ^3P^o_2$	$1s\,7d\ ^3D_3$	4.2898E+01	2.505E+00	1.297E+12	4.2690E+01	2.541E+00	1.317E+12	0.001
$1s\,6f\ ^3F^o_3$	$1s\,7d\ ^3D_3$	4.3752E+01	1.834E−02	9.130E+09	4.3561E+01	1.845E−02	9.187E+09	0.001
$1s\,6f\ ^3F^o_2$	$1s\,7d\ ^3D_3$	4.3767E+01	8.773E−04	4.364E+08	4.3561E+01	9.216E−04	4.589E+08	0.000
$1s\,6f\ ^3F^o_4$	$1s\,7d\ ^3D_3$	4.4102E+01	4.014E−01	1.966E+11	4.3907E+01	4.009E−01	1.965E+11	0.001
$1s\,6f\ ^1F^o_3$	$1s\,7d\ ^3D_3$	4.4114E+01	1.496E−02	7.327E+09	4.3908E+01	1.483E−02	7.268E+09	0.000
$1s\,6h\ ^3H^o_4$	$1s\,7d\ ^3D_3$	4.4320E+01	7.374E−11	3.577E+01				0.055
$1s\,7p\ ^3P^o_2$	$1s\,7d\ ^3D_3$	3.5985E+03	4.118E−01	3.031E+07	3.3938E+03	4.365E−01	3.581E+07	0.194
$1s\,3d\ ^3D_2$	$1s\,7f\ ^3F^o_3$	3.5247E+00	1.202E−01	9.218E+12	3.5099E+00	1.203E−01	9.226E+12	0.001
$1s\,3d\ ^3D_3$	$1s\,7f\ ^3F^o_3$	3.5615E+00	7.764E−03	5.832E+11	3.5464E+00	7.675E−03	5.766E+11	0.002
$1s\,3d\ ^1D_2$	$1s\,7f\ ^3F^o_3$	3.5629E+00	4.626E−04	3.472E+10	3.5478E+00	4.247E−04	3.188E+10	0.001
$1s\,4d\ ^3D_2$	$1s\,7f\ ^3F^o_3$	7.5891E+00	3.358E−01	5.555E+12	7.5575E+00	3.361E−01	5.561E+12	0.001
$1s\,4d\ ^3D_3$	$1s\,7f\ ^3F^o_3$	7.6610E+00	2.246E−02	3.646E+11	7.6289E+00	2.240E−02	3.637E+11	0.002
$1s\,4d\ ^1D_2$	$1s\,7f\ ^3F^o_3$	7.6640E+00	1.423E−03	2.309E+10	7.6319E+00	1.320E−03	2.142E+10	0.002
$1s\,5d\ ^3D_2$	$1s\,7f\ ^3F^o_3$	1.6283E+01	8.980E−01	3.228E+12	1.6216E+01	8.992E−01	3.231E+12	0.001
$1s\,5d\ ^3D_3$	$1s\,7f\ ^3F^o_3$	1.6452E+01	6.182E−02	2.176E+11	1.6384E+01	6.195E−02	2.180E+11	0.001
$1s\,5d\ ^1D_2$	$1s\,7f\ ^3F^o_3$	1.6459E+01	4.017E−03	1.413E+10	1.6391E+01	3.740E−03	1.315E+10	0.002
$1s\,5g\ ^3G_4$	$1s\,7f\ ^3F^o_3$	1.6541E+01	1.113E−02	3.876E+10	1.6470E+01	1.117E−02	3.890E+10	0.003
$1s\,5g\ ^3G_3$	$1s\,7f\ ^3F^o_3$	1.6543E+01	4.140E−04	1.442E+09	1.6472E+01	4.143E−04	1.442E+09	0.005
$1s\,5g\ ^1G_4$	$1s\,7f\ ^3F^o_3$	1.6593E+01	1.212E−10	4.195E+02				0.342
$1s\,6d\ ^3D_2$	$1s\,7f\ ^3F^o_3$	4.3043E+01	3.664E+00	1.885E+12	4.2880E+01	3.666E+00	1.884E+12	0.000
$1s\,6d\ ^3D_3$	$1s\,7f\ ^3F^o_3$	4.3731E+01	2.630E−01	1.310E+11	4.3560E+01	2.642E−01	1.315E+11	0.001
$1s\,6d\ ^1D_2$	$1s\,7f\ ^3F^o_3$	4.3761E+01	1.732E−02	8.618E+09	4.3571E+01	1.851E−02	9.214E+09	0.002
$1s\,6g\ ^3G_4$	$1s\,7f\ ^3F^o_3$	4.4095E+01	1.866E−01	9.147E+10	4.3907E+01	1.868E−01	9.159E+10	0.001
$1s\,6g\ ^3G_3$	$1s\,7f\ ^3F^o_3$	4.4103E+01	6.915E−03	3.388E+09	4.3907E+01	6.929E−03	3.396E+09	0.002
$1s\,6g\ ^1G_4$	$1s\,7f\ ^3F^o_3$	4.4313E+01	1.954E−11	9.481E+00				0.976
$1s\,7d\ ^3D_2$	$1s\,7f\ ^3F^o_3$	4.2661E+03	3.105E−01	1.626E+07	4.3591E+03	3.024E−01	1.504E+07	0.021
$1s\,7d\ ^3D_3$	$1s\,7f\ ^3F^o_3$	2.3237E+05	3.848E−04	6.791E+00				0.802
$1s\,2s\ ^3S_1$	$1s\,7f\ ^3F^o_2$	1.3248E+00	4.328E−14	3.290E+01				1.000
$1s\,3s\ ^3S_1$	$1s\,7f\ ^3F^o_2$	3.3851E+00	6.587E−08	7.668E+06				0.230
$1s\,3d\ ^3D_2$	$1s\,7f\ ^3F^o_2$	3.5247E+00	8.645E−03	9.283E+11	3.5099E+00	8.646E−03	9.283E+11	0.001
$1s\,3d\ ^3D_1$	$1s\,7f\ ^3F^o_2$	3.5262E+00	7.731E−02	8.295E+12	3.5113E+00	7.733E−02	8.296E+12	0.000
$1s\,3d\ ^3D_3$	$1s\,7f\ ^3F^o_2$	3.5614E+00	3.920E−04	4.123E+10	3.5464E+00	3.833E−04	4.031E+10	0.009
$1s\,3d\ ^1D_2$	$1s\,7f\ ^3F^o_2$	3.5628E+00	5.413E−03	5.689E+11	3.5478E+00	5.315E−03	5.586E+11	0.001
$1s\,4s\ ^3S_1$	$1s\,7f\ ^3F^o_2$	7.3170E+00	2.637E−07	6.571E+06				0.196
$1s\,4d\ ^3D_2$	$1s\,7f\ ^3F^o_2$	7.5889E+00	2.421E−02	5.609E+11	7.5575E+00	2.425E−02	5.616E+11	0.001
$1s\,4d\ ^3D_1$	$1s\,7f\ ^3F^o_2$	7.5917E+00	2.162E−01	5.004E+12	7.5603E+00	2.161E−01	5.003E+12	0.000
$1s\,4d\ ^3D_3$	$1s\,7f\ ^3F^o_2$	7.6607E+00	1.123E−03	2.554E+10	7.6289E+00	1.119E−03	2.543E+10	0.001

(*continued on next page*)

Table 3 (*continued*)

Lower	Upper	GRASP2K			FAC			*dT*
		λ (Å)	*gf*	A (s^{-1})	λ (Å)	*gf*	A (s^{-1})	
$1s\,4d\ ^1D_2$	$1s\,7f\ ^3F^o_2$	7.6637E+00	1.559E−02	3.541E+11	7.6319E+00	1.544E−02	3.507E+11	0.000
$1s\,5s\ ^3S_1$	$1s\,7f\ ^3F^o_2$	1.5646E+01	7.887E−07	4.298E+06				0.141
$1s\,5d\ ^3D_2$	$1s\,7f\ ^3F^o_2$	1.6281E+01	6.482E−02	3.262E+11	1.6216E+01	6.497E−02	3.268E+11	0.001
$1s\,5d\ ^3D_1$	$1s\,7f\ ^3F^o_2$	1.6288E+01	5.783E−01	2.908E+12	1.6222E+01	5.783E−01	2.906E+12	0.000
$1s\,5d\ ^3D_3$	$1s\,7f\ ^3F^o_2$	1.6451E+01	3.084E−03	1.520E+10	1.6384E+01	3.094E−03	1.524E+10	0.001
$1s\,5d\ ^1D_2$	$1s\,7f\ ^3F^o_2$	1.6458E+01	4.283E−02	2.110E+11	1.6391E+01	4.261E−02	2.098E+11	0.000
$1s\,5g\ ^3G_3$	$1s\,7f\ ^3F^o_2$	1.6541E+01	8.275E−03	4.035E+10	1.6472E+01	8.273E−03	4.033E+10	0.005
$1s\,6s\ ^3S_1$	$1s\,7f\ ^3F^o_2$	4.0528E+01	3.074E−06	2.497E+06				0.094
$1s\,6d\ ^3D_2$	$1s\,7f\ ^3F^o_2$	4.3034E+01	2.645E−01	1.905E+11	4.2880E+01	2.675E−01	1.924E+11	0.000
$1s\,6d\ ^3D_1$	$1s\,7f\ ^3F^o_2$	4.3060E+01	2.361E+00	1.698E+12	4.2874E+01	2.361E+00	1.699E+12	0.000
$1s\,6d\ ^3D_3$	$1s\,7f\ ^3F^o_2$	4.3722E+01	1.309E−02	9.135E+09	4.3560E+01	1.319E−02	9.200E+09	0.000
$1s\,6d\ ^1D_2$	$1s\,7f\ ^3F^o_2$	4.3752E+01	1.821E−01	1.269E+11	4.3571E+01	1.795E−01	1.251E+11	0.000
$1s\,6g\ ^3G_3$	$1s\,7f\ ^3F^o_2$	4.4094E+01	1.383E−01	9.486E+10	4.3907E+01	1.384E−01	9.499E+10	0.002
$1s\,7s\ ^3S_1$	$1s\,7f\ ^3F^o_2$	8.7540E+02	1.283E−06	2.234E+03				0.488
$1s\,7d\ ^3D_2$	$1s\,7f\ ^3F^o_2$	4.1806E+03	2.294E−02	1.751E+06	4.3602E+03	2.205E−02	1.534E+06	0.022
$1s\,7d\ ^3D_1$	$1s\,7f\ ^3F^o_2$	4.3395E+03	1.964E−01	1.391E+07	4.3189E+03	1.965E−01	1.393E+07	0.003
$1s\,7d\ ^3D_3$	$1s\,7f\ ^3F^o_2$	1.0992E+05	4.006E−05	4.423E+00				0.425
$1s\,2p\ ^3P^o_1$	$1s\,7d\ ^1D_2$	1.3358E+00	3.593E−05	2.686E+10	1.3303E+00	2.913E−05	2.177E+10	0.084
$1s\,2p\ ^3P^o_2$	$1s\,7d\ ^1D_2$	1.3942E+00	3.581E−03	2.458E+12	1.3883E+00	3.597E−03	2.468E+12	0.003
$1s\,2p\ ^1P^o_1$	$1s\,7d\ ^1D_2$	1.3997E+00	3.271E−02	2.227E+13	1.3939E+00	3.326E−02	2.264E+13	0.003
$1s\,3p\ ^3P^o_1$	$1s\,7d\ ^1D_2$	3.4047E+00	7.199E−05	8.285E+09	3.3905E+00	5.619E−05	6.465E+09	0.008
$1s\,3p\ ^3P^o_2$	$1s\,7d\ ^1D_2$	3.5163E+00	8.443E−03	9.110E+11	3.5016E+00	8.386E−03	9.046E+11	0.000
$1s\,3p\ ^1P^o_1$	$1s\,7d\ ^1D_2$	3.5262E+00	7.729E−02	8.293E+12	3.5116E+00	7.772E−02	8.336E+12	0.000
$1s\,4p\ ^3P^o_1$	$1s\,7d\ ^1D_2$	7.3543E+00	1.374E−04	3.390E+09	7.3231E+00	1.131E−04	2.791E+09	0.017
$1s\,4p\ ^3P^o_2$	$1s\,7d\ ^1D_2$	7.5726E+00	1.795E−02	4.176E+11	7.5404E+00	1.783E−02	4.149E+11	0.000
$1s\,4p\ ^1P^o_1$	$1s\,7d\ ^1D_2$	7.5916E+00	1.652E−01	3.823E+12	7.5595E+00	1.654E−01	3.829E+12	0.001
$1s\,4f\ ^3F^o_3$	$1s\,7d\ ^1D_2$	7.6618E+00	1.695E−05	3.852E+08	7.6293E+00	2.044E−05	4.644E+08	0.001
$1s\,4f\ ^3F^o_2$	$1s\,7d\ ^1D_2$	7.6633E+00	1.769E−04	4.018E+09	7.6308E+00	1.751E−04	3.978E+09	0.001
$1s\,4f\ ^1F^o_3$	$1s\,7d\ ^1D_2$	7.6990E+00	4.105E−03	9.239E+10	7.6663E+00	4.113E−03	9.258E+10	0.001
$1s\,5p\ ^3P^o_1$	$1s\,7d\ ^1D_2$	1.5732E+01	3.089E−04	1.665E+09	1.5665E+01	2.767E−04	1.492E+09	0.013
$1s\,5p\ ^3P^o_2$	$1s\,7d\ ^1D_2$	1.6243E+01	4.406E−02	2.228E+11	1.6173E+01	4.394E−02	2.222E+11	0.002
$1s\,5p\ ^1P^o_1$	$1s\,7d\ ^1D_2$	1.6288E+01	4.077E−01	2.050E+12	1.6218E+01	4.078E−01	2.051E+12	0.002
$1s\,5f\ ^3F^o_3$	$1s\,7d\ ^1D_2$	1.6454E+01	1.308E−04	6.446E+08	1.6384E+01	1.575E−04	7.764E+08	0.001
$1s\,5f\ ^3F^o_2$	$1s\,7d\ ^1D_2$	1.6457E+01	1.369E−03	6.741E+09	1.6387E+01	1.355E−03	6.674E+09	0.001
$1s\,5f\ ^1F^o_3$	$1s\,7d\ ^1D_2$	1.6542E+01	3.181E−02	1.551E+11	1.6471E+01	3.185E−02	1.553E+11	0.000
$1s\,6p\ ^3P^o_1$	$1s\,7d\ ^1D_2$	4.0858E+01	1.084E−03	8.665E+08	4.0674E+01	2.276E−03	1.819E+09	0.010
$1s\,6p\ ^3P^o_2$	$1s\,7d\ ^1D_2$	4.2880E+01	1.755E−01	1.273E+11	4.2684E+01	1.759E−01	1.277E+11	0.000
$1s\,6p\ ^1P^o_1$	$1s\,7d\ ^1D_2$	4.3058E+01	1.639E+00	1.180E+12	4.2841E+01	1.631E+00	1.175E+12	0.000
$1s\,6f\ ^3F^o_3$	$1s\,7d\ ^1D_2$	4.3733E+01	1.210E−03	8.439E+08	4.3554E+01	1.357E−03	9.465E+08	0.002
$1s\,6f\ ^3F^o_2$	$1s\,7d\ ^1D_2$	4.3748E+01	1.269E−02	8.846E+09	4.3554E+01	1.249E−02	8.711E+09	0.000
$1s\,6f\ ^1F^o_3$	$1s\,7d\ ^1D_2$	4.4094E+01	2.963E−01	2.033E+11	4.3901E+01	2.970E−01	2.038E+11	0.000
$1s\,7p\ ^3P^o_1$	$1s\,7d\ ^1D_2$	9.8772E+02	8.471E−04	1.158E+06	9.7564E+02	1.201E−03	1.670E+06	0.072
$1s\,7p\ ^3P^o_2$	$1s\,7d\ ^1D_2$	3.4747E+03	2.994E−02	3.308E+06	3.3529E+03	3.063E−02	3.604E+06	0.158
$1s\,7p\ ^1P^o_1$	$1s\,7d\ ^1D_2$	4.4062E+03	2.162E−01	1.486E+07	4.0947E+03	2.330E−01	1.838E+07	0.194
$1s\,7f\ ^3F^o_3$	$1s\,7d\ ^1D_2$	1.7858E+05	3.308E−05	1.384E+00				0.998
$1s\,7f\ ^3F^o_2$	$1s\,7d\ ^1D_2$	1.2412E+06	4.984E−05	4.316E−02				0.703
$1s\,3d\ ^3D_3$	$1s\,7f\ ^3F^o_4$	3.5600E+00	1.630E−01	9.533E+12	3.5449E+00	1.642E−01	9.604E+12	0.001
$1s\,4d\ ^3D_3$	$1s\,7f\ ^3F^o_4$	7.6543E+00	4.614E−01	5.836E+12	7.6222E+00	4.634E−01	5.861E+12	0.001
$1s\,5d\ ^3D_3$	$1s\,7f\ ^3F^o_4$	1.6421E+01	1.249E+00	3.434E+12	1.6353E+01	1.253E+00	3.444E+12	0.001
$1s\,5g\ ^3G_4$	$1s\,7f\ ^3F^o_4$	1.6509E+01	3.674E−04	9.991E+08	1.6439E+01	3.709E−04	1.008E+09	0.002
$1s\,5g\ ^3G_3$	$1s\,7f\ ^3F^o_4$	1.6511E+01	1.046E−05	2.843E+07				0.007
$1s\,5g\ ^3G_5$	$1s\,7f\ ^3F^o_4$	1.6560E+01	1.366E−02	3.691E+10	1.6489E+01	1.369E−02	3.700E+10	0.003
$1s\,5g\ ^1G_4$	$1s\,7f\ ^3F^o_4$	1.6562E+01	3.137E−04	8.476E+08	1.6491E+01	3.124E−04	8.442E+08	0.005
$1s\,6d\ ^3D_3$	$1s\,7f\ ^3F^o_4$	4.3514E+01	5.201E+00	2.036E+12	4.3345E+01	5.214E+00	2.039E+12	0.001
$1s\,6g\ ^3G_4$	$1s\,7f\ ^3F^o_4$	4.3874E+01	6.176E−03	2.378E+09	4.3688E+01	6.221E−03	2.395E+09	0.001
$1s\,6g\ ^3G_3$	$1s\,7f\ ^3F^o_4$	4.3882E+01	1.758E−04	6.767E+07				0.003
$1s\,6g\ ^3G_5$	$1s\,7f\ ^3F^o_4$	4.4083E+01	2.292E−01	8.743E+10	4.3895E+01	2.295E−01	8.752E+10	0.001
$1s\,6g\ ^1G_4$	$1s\,7f\ ^3F^o_4$	4.4090E+01	5.247E−03	2.001E+09	4.3895E+01	5.215E−03	1.989E+09	0.002
$1s\,7d\ ^3D_3$	$1s\,7f\ ^3F^o_4$	8.4332E+03	2.169E−01	2.260E+06	8.7593E+03	2.079E−01	1.991E+06	0.031
$1s\,4f\ ^3F^o_3$	$1s\,7g\ ^3G_4$	7.6554E+00	3.948E−01	4.993E+12	7.6229E+00	3.951E−01	4.997E+12	0.000
$1s\,4f\ ^3F^o_4$	$1s\,7g\ ^3G_4$	7.6914E+00	1.379E−02	1.728E+11	7.6587E+00	1.370E−02	1.716E+11	0.001
$1s\,4f\ ^1F^o_3$	$1s\,7g\ ^3G_4$	7.6926E+00	3.877E−04	4.856E+09	7.6598E+00	3.390E−04	4.246E+09	0.000
$1s\,5f\ ^3F^o_3$	$1s\,7g\ ^3G_4$	1.6424E+01	1.538E+00	4.224E+12	1.6354E+01	1.539E+00	4.229E+12	0.000
$1s\,5f\ ^3F^o_4$	$1s\,7g\ ^3G_4$	1.6509E+01	5.485E−02	1.492E+11	1.6439E+01	5.482E−02	1.490E+11	0.000
$1s\,5f\ ^1F^o_3$	$1s\,7g\ ^3G_4$	1.6512E+01	1.557E−03	4.233E+09	1.6441E+01	1.373E−03	3.733E+09	0.000
$1s\,6f\ ^3F^o_3$	$1s\,7g\ ^3G_4$	4.3526E+01	7.332E+00	2.868E+12	4.3346E+01	7.341E+00	2.871E+12	0.000
$1s\,6f\ ^3F^o_4$	$1s\,7g\ ^3G_4$	4.3873E+01	2.683E−01	1.033E+11	4.3689E+01	2.690E−01	1.035E+11	0.000
$1s\,6f\ ^1F^o_3$	$1s\,7g\ ^3G_4$	4.3884E+01	7.664E−03	2.949E+09	4.3689E+01	7.956E−03	3.063E+09	0.000
$1s\,6h\ ^3H^o_5$	$1s\,7g\ ^3G_4$	4.4083E+01	7.172E−02	2.735E+10	4.3896E+01	7.180E−02	2.738E+10	0.001
$1s\,6h\ ^3H^o_4$	$1s\,7g\ ^3G_4$	4.4088E+01	1.627E−03	6.203E+08	4.3896E+01	1.632E−03	6.224E+08	0.000
$1s\,6h\ ^1H^o_5$	$1s\,7g\ ^3G_4$	4.4227E+01	8.330E−09	3.156E+03				0.017

(*continued on next page*)

Table 3 (*continued*)

Lower	Upper	GRASP2K			FAC			*dT*
		λ (Å)	*gf*	*A* (s^{-1})	λ (Å)	*gf*	*A* (s^{-1})	
$1s\,7f\ ^3F^o_3$	$1s\,7g\ ^3G_4$	8.7347E+03	1.730E−01	1.681E+06	8.7974E+03	1.710E−01	1.623E+06	0.020
$1s\,7f\ ^3F^o_4$	$1s\,7g\ ^3G_4$	4.7642E+06	1.133E−05	3.699E−04				0.957
$1s\,2p\ ^3P^o_2$	$1s\,7g\ ^3G_3$	1.3940E+00	7.262E−10	3.561E+05				0.771
$1s\,3p\ ^3P^o_2$	$1s\,7g\ ^3G_3$	3.5149E+00	7.323E−13	5.648E+01				0.981
$1s\,4p\ ^3P^o_2$	$1s\,7g\ ^3G_3$	7.5662E+00	3.484E−08	5.800E+05				0.013
$1s\,4f\ ^3F^o_3$	$1s\,7g\ ^3G_3$	7.6553E+00	1.458E−02	2.371E+11	7.6229E+00	1.457E−02	2.370E+11	0.000
$1s\,4f\ ^3F^o_2$	$1s\,7g\ ^3G_3$	7.6568E+00	2.925E−01	4.754E+12	7.6244E+00	2.926E−01	4.755E+12	0.000
$1s\,4f\ ^3F^o_4$	$1s\,7g\ ^3G_3$	7.6913E+00	3.956E−04	6.373E+09	7.6587E+00	3.914E−04	6.305E+09	0.001
$1s\,4f\ ^1F^o_3$	$1s\,7g\ ^3G_3$	7.6924E+00	1.073E−02	1.728E+11	7.6598E+00	1.062E−02	1.710E+11	0.001
$1s\,5p\ ^3P^o_2$	$1s\,7g\ ^3G_3$	1.6214E+01	2.161E−07	7.833E+05				0.004
$1s\,5f\ ^3F^o_3$	$1s\,7g\ ^3G_3$	1.6423E+01	5.677E−02	2.005E+11	1.6354E+01	5.681E−02	2.006E+11	0.000
$1s\,5f\ ^3F^o_2$	$1s\,7g\ ^3G_3$	1.6427E+01	1.139E+00	4.023E+12	1.6358E+01	1.139E+00	4.025E+12	0.000
$1s\,5f\ ^3F^o_4$	$1s\,7g\ ^3G_3$	1.6508E+01	1.573E−03	5.499E+09	1.6439E+01	1.566E−03	5.476E+09	0.001
$1s\,5f\ ^1F^o_3$	$1s\,7g\ ^3G_3$	1.6511E+01	4.267E−02	1.491E+11	1.6441E+01	4.248E−02	1.484E+11	0.001
$1s\,6p\ ^3P^o_2$	$1s\,7g\ ^3G_3$	4.2676E+01	1.217E−06	6.370E+05				0.001
$1s\,6f\ ^3F^o_3$	$1s\,7g\ ^3G_3$	4.3521E+01	2.705E−01	1.361E+11	4.3346E+01	2.721E−01	1.368E+11	0.000
$1s\,6f\ ^3F^o_2$	$1s\,7g\ ^3G_3$	4.3535E+01	5.434E+00	2.732E+12	4.3346E+01	5.438E+00	2.734E+12	0.000
$1s\,6f\ ^3F^o_4$	$1s\,7g\ ^3G_3$	4.3867E+01	7.685E−03	3.806E+09	4.3689E+01	7.686E−03	3.804E+09	0.000
$1s\,6f\ ^1F^o_3$	$1s\,7g\ ^3G_3$	4.3878E+01	2.087E−01	1.033E+11	4.3689E+01	2.072E−01	1.025E+11	0.000
$1s\,6h\ ^3H^o_4$	$1s\,7g\ ^3G_3$	4.4083E+01	5.701E−02	2.796E+10	4.3896E+01	5.711E−02	2.800E+10	0.000
$1s\,7p\ ^3P^o_2$	$1s\,7g\ ^3G_3$	2.5035E+03	1.166E−07	1.772E+01				0.002
$1s\,7f\ ^3F^o_3$	$1s\,7g\ ^3G_3$	8.5297E+03	6.540E−03	8.565E+04	8.7975E+03	6.341E−03	7.740E+04	0.028
$1s\,7f\ ^3F^o_2$	$1s\,7g\ ^3G_3$	8.8934E+03	1.258E−01	1.516E+06	8.7928E+03	1.267E−01	1.548E+06	0.024
$1s\,7f\ ^3F^o_4$	$1s\,7g\ ^3G_3$	3.3768E+05	4.572E−06	3.820E−02				0.857
$1s\,3d\ ^3D_2$	$1s\,7f\ ^1F^o_3$	3.5233E+00	3.298E−06	2.531E+08				0.031
$1s\,3d\ ^3D_3$	$1s\,7f\ ^1F^o_3$	3.5600E+00	6.068E−03	4.563E+11	3.5449E+00	6.074E−03	4.567E+11	0.001
$1s\,3d\ ^1D_2$	$1s\,7f\ ^1F^o_3$	3.5614E+00	1.207E−01	9.071E+12	3.5463E+00	1.216E−01	9.136E+12	0.000
$1s\,4d\ ^3D_2$	$1s\,7f\ ^1F^o_3$	7.5823E+00	1.691E−05	2.802E+08				0.029
$1s\,4d\ ^3D_3$	$1s\,7f\ ^1F^o_3$	7.6541E+00	1.717E−02	2.792E+11	7.6222E+00	1.713E−02	2.787E+11	0.001
$1s\,4d\ ^1D_2$	$1s\,7f\ ^1F^o_3$	7.6570E+00	3.420E−01	5.558E+12	7.6252E+00	3.431E−01	5.576E+12	0.001
$1s\,5d\ ^3D_2$	$1s\,7f\ ^1F^o_3$	1.6251E+01	5.598E−05	2.020E+08				0.022
$1s\,5d\ ^3D_3$	$1s\,7f\ ^1F^o_3$	1.6420E+01	4.647E−02	1.642E+11	1.6353E+01	4.635E−02	1.637E+11	0.000
$1s\,5d\ ^1D_2$	$1s\,7f\ ^1F^o_3$	1.6427E+01	9.263E−01	3.271E+12	1.6360E+01	9.280E−01	3.275E+12	0.000
$1s\,5g\ ^3G_4$	$1s\,7f\ ^1F^o_3$	1.6508E+01	1.041E−05	3.639E+07				0.015
$1s\,5g\ ^3G_3$	$1s\,7f\ ^1F^o_3$	1.6510E+01	2.872E−04	1.004E+09	1.6441E+01	2.866E−04	1.002E+09	0.006
$1s\,5g\ ^1G_4$	$1s\,7f\ ^1F^o_3$	1.6561E+01	1.090E−02	3.787E+10	1.6491E+01	1.088E−02	3.782E+10	0.004
$1s\,6d\ ^3D_2$	$1s\,7f\ ^1F^o_3$	4.2826E+01	2.508E−04	1.303E+08	4.2671E+01	4.916E−04	2.551E+08	0.014
$1s\,6d\ ^3D_3$	$1s\,7f\ ^1F^o_3$	4.3507E+01	1.933E−01	9.731E+10	4.3345E+01	1.928E−01	9.698E+10	0.000
$1s\,6d\ ^1D_2$	$1s\,7f\ ^1F^o_3$	4.3537E+01	3.859E+00	1.940E+12	4.3355E+01	3.861E+00	1.941E+12	0.000
$1s\,6g\ ^3G_4$	$1s\,7f\ ^1F^o_3$	4.3867E+01	1.761E−04	8.718E+07				0.006
$1s\,6g\ ^3G_3$	$1s\,7f\ ^1F^o_3$	4.3875E+01	4.808E−03	2.380E+09	4.3688E+01	4.791E−03	2.372E+09	0.003
$1s\,6g\ ^1G_4$	$1s\,7f\ ^1F^o_3$	4.4083E+01	1.824E−01	8.943E+10	4.3895E+01	1.825E−01	8.952E+10	0.002
$1s\,7d\ ^3D_2$	$1s\,7f\ ^1F^o_3$	2.8385E+03	3.561E−05	4.211E+03	2.9112E+03	6.098E−05	6.798E+03	0.242
$1s\,7d\ ^3D_3$	$1s\,7f\ ^1F^o_3$	8.1837E+03	8.316E−03	1.183E+05	8.7525E+03	7.695E−03	9.491E+04	0.023
$1s\,7d\ ^1D_2$	$1s\,7f\ ^1F^o_3$	8.9054E+03	1.521E−01	1.827E+06	9.0373E+03	1.492E−01	1.726E+06	0.011
$1s\,7g\ ^3G_4$	$1s\,7f\ ^1F^o_3$	2.9370E+05	5.267E−06	5.818E−02				0.814
$1s\,7g\ ^3G_3$	$1s\,7f\ ^1F^o_3$	1.5307E+06	2.742E−05	1.115E−02				0.915
$1s\,4f\ ^3F^o_4$	$1s\,7g\ ^3G_5$	7.6874E+00	4.969E−01	5.098E+12	7.6547E+00	4.989E−01	5.120E+12	0.000
$1s\,5f\ ^3F^o_4$	$1s\,7g\ ^3G_5$	1.6491E+01	1.948E+00	4.343E+12	1.6420E+01	1.952E+00	4.354E+12	0.000
$1s\,6f\ ^3F^o_4$	$1s\,7g\ ^3G_5$	4.3742E+01	9.373E+00	2.970E+12	4.3559E+01	9.390E+00	2.975E+12	0.000
$1s\,6h\ ^3H^o_5$	$1s\,7g\ ^3G_5$	4.3951E+01	1.512E−03	4.745E+08	4.3765E+01	1.522E−03	4.777E+08	0.001
$1s\,6h\ ^3H^o_4$	$1s\,7g\ ^3G_5$	4.3956E+01	2.810E−05	8.818E+06				0.001
$1s\,6h\ ^3H^o_6$	$1s\,7g\ ^3G_5$	4.4090E+01	8.517E−02	2.657E+10	4.3903E+01	8.525E−02	2.659E+10	0.000
$1s\,6h\ ^1H^o_5$	$1s\,7g\ ^3G_5$	4.4094E+01	1.316E−03	4.106E+08	4.3903E+01	1.311E−03	4.091E+08	0.000
$1s\,7f\ ^3F^o_4$	$1s\,7g\ ^3G_5$	1.4632E+04	1.310E−01	3.709E+05	1.4765E+04	1.292E−01	3.564E+05	0.023
$1s\,5g\ ^3G_4$	$1s\,7h\ ^3H^o_5$	1.6491E+01	1.774E+00	3.956E+12	1.6420E+01	1.776E+00	3.960E+12	0.000
$1s\,5g\ ^3G_5$	$1s\,7h\ ^3H^o_5$	1.6542E+01	3.898E−02	8.638E+10	1.6471E+01	3.887E−02	8.615E+10	0.001
$1s\,5g\ ^1G_4$	$1s\,7h\ ^3H^o_5$	1.6543E+01	6.999E−04	1.551E+09	1.6473E+01	5.907E−04	1.308E+09	0.001
$1s\,6g\ ^3G_4$	$1s\,7h\ ^3H^o_5$	4.3742E+01	1.301E+01	4.123E+12	4.3559E+01	1.302E+01	4.126E+12	0.000
$1s\,6g\ ^3G_5$	$1s\,7h\ ^3H^o_5$	4.3950E+01	2.913E−01	9.143E+10	4.3765E+01	2.917E−01	9.156E+10	0.000
$1s\,6g\ ^1G_4$	$1s\,7h\ ^3H^o_5$	4.3957E+01	5.234E−03	1.643E+09	4.3765E+01	5.401E−03	1.695E+09	0.001
$1s\,7g\ ^3G_4$	$1s\,7h\ ^3H^o_5$	1.4659E+04	9.514E−02	2.685E+05	1.4689E+04	9.453E−02	2.634E+05	0.021
$1s\,7g\ ^3G_5$	$1s\,7h\ ^3H^o_5$	1.1751E+07	2.630E−06	1.154E−05				0.964
$1s\,3d\ ^3D_3$	$1s\,7h\ ^3H^o_4$	3.5591E+00	1.547E−12	9.050E+01				0.940
$1s\,4d\ ^3D_3$	$1s\,7h\ ^3H^o_4$	7.6502E+00	3.959E−11	5.014E+02				0.538
$1s\,5d\ ^3D_3$	$1s\,7h\ ^3H^o_4$	1.6402E+01	7.418E−10	2.043E+03				0.061
$1s\,5g\ ^3G_4$	$1s\,7h\ ^3H^o_4$	1.6490E+01	4.020E−02	1.096E+11	1.6420E+01	4.022E−02	1.096E+11	0.000
$1s\,5g\ ^3G_3$	$1s\,7h\ ^3H^o_4$	1.6492E+01	1.411E+00	3.845E+12	1.6423E+01	1.412E+00	3.848E+12	0.000
$1s\,5g\ ^3G_5$	$1s\,7h\ ^3H^o_4$	1.6541E+01	7.259E−04	1.966E+09	1.6471E+01	7.199E−04	1.950E+09	0.004
$1s\,5g\ ^1G_4$	$1s\,7h\ ^3H^o_4$	1.6543E+01	3.199E−02	8.663E+10	1.6473E+01	3.181E−02	8.614E+10	0.000
$1s\,6d\ ^3D_3$	$1s\,7h\ ^3H^o_4$	4.3381E+01	8.687E−09	3.421E+03				0.040

(*continued on next page*)

Table 3 (*continued*)

Lower	Upper	GRASP2K			FAC			*dT*
		λ (Å)	*gf*	A (s^{-1})	λ (Å)	*gf*	A (s^{-1})	
$1s\,6g\ ^3G_4$	$1s\,7h\ ^3H^o_4$	4.3739E+01	2.946E−01	1.141E+11	4.3559E+01	2.959E−01	1.146E+11	0.000
$1s\,6g\ ^3G_3$	$1s\,7h\ ^3H^o_4$	4.3747E+01	1.035E+01	4.007E+12	4.3559E+01	1.035E+01	4.012E+12	0.000
$1s\,6g\ ^3G_5$	$1s\,7h\ ^3H^o_4$	4.3947E+01	5.409E−03	2.076E+09	4.3765E+01	5.401E−03	2.072E+09	0.001
$1s\,6g\ ^1G_4$	$1s\,7h\ ^3H^o_4$	4.3954E+01	2.390E−01	9.169E+10	4.3765E+01	2.376E−01	9.119E+10	0.000
$1s\,7d\ ^3D_3$	$1s\,7h\ ^3H^o_4$	5.2970E+03	2.748E−10	7.259E−03				0.966
$1s\,7g\ ^3G_4$	$1s\,7h\ ^3H^o_4$	1.4287E+04	2.211E−03	8.030E+03	1.4689E+04	2.148E−03	7.317E+03	0.009
$1s\,7g\ ^3G_3$	$1s\,7h\ ^3H^o_4$	1.4871E+04	7.459E−02	2.500E+05	1.4689E+04	7.520E−02	2.561E+05	0.009
$1s\,7g\ ^3G_5$	$1s\,7h\ ^3H^o_4$	5.3648E+05	1.070E−06	2.756E−03				0.163
$1s\,4f\ ^3F^o_3$	$1s\,7g\ ^1G_4$	7.6513E+00	3.467E−08	4.389E+05				0.018
$1s\,4f\ ^3F^o_4$	$1s\,7g\ ^1G_4$	7.6873E+00	1.135E−02	1.424E+11	7.6547E+00	1.134E−02	1.422E+11	0.000
$1s\,4f\ ^1F^o_3$	$1s\,7g\ ^1G_4$	7.6884E+00	3.952E−01	4.955E+12	7.6558E+00	3.968E−01	4.975E+12	0.000
$1s\,5f\ ^3F^o_3$	$1s\,7g\ ^1G_4$	1.6405E+01	3.735E−08	1.029E+05				0.050
$1s\,5f\ ^3F^o_4$	$1s\,7g\ ^1G_4$	1.6490E+01	4.447E−02	1.212E+11	1.6420E+01	4.438E−02	1.209E+11	0.000
$1s\,5f\ ^1F^o_3$	$1s\,7g\ ^1G_4$	1.6493E+01	1.549E+00	4.222E+12	1.6423E+01	1.553E+00	4.231E+12	0.000
$1s\,6f\ ^3F^o_3$	$1s\,7g\ ^1G_4$	4.3393E+01	4.042E−08	1.591E+04				0.133
$1s\,6f\ ^3F^o_4$	$1s\,7g\ ^1G_4$	4.3738E+01	2.139E−01	8.286E+10	4.3559E+01	2.134E−01	8.265E+10	0.000
$1s\,6f\ ^1F^o_3$	$1s\,7g\ ^1G_4$	4.3749E+01	7.458E+00	2.888E+12	4.3560E+01	7.469E+00	2.892E+12	0.000
$1s\,6h\ ^3H^o_5$	$1s\,7g\ ^1G_4$	4.3947E+01	2.711E−05	1.041E+07				0.001
$1s\,6h\ ^3H^o_4$	$1s\,7g\ ^1G_4$	4.3952E+01	1.240E−03	4.758E+08	4.3765E+01	1.240E−03	4.757E+08	0.000
$1s\,6h\ ^1H^o_5$	$1s\,7g\ ^1G_4$	4.4090E+01	7.073E−02	2.696E+10	4.3903E+01	7.082E−02	2.700E+10	0.000
$1s\,7f\ ^3F^o_3$	$1s\,7g\ ^1G_4$	5.4114E+03	2.878E−10	7.284E−03				0.998
$1s\,7f\ ^3F^o_4$	$1s\,7g\ ^1G_4$	1.4181E+04	3.084E−03	1.137E+04	1.4765E+04	2.937E−03	9.900E+03	0.048
$1s\,7f\ ^1F^o_3$	$1s\,7g\ ^1G_4$	1.4947E+04	1.020E−01	3.382E+05	1.4784E+04	1.026E−01	3.451E+05	0.037
$1s\,7h\ ^3H^o_5$	$1s\,7g\ ^1G_4$	4.7824E+05	1.162E−06	3.764E−03				0.645
$1s\,7h\ ^3H^o_4$	$1s\,7g\ ^1G_4$	3.2051E+06	7.916E−06	5.712E−04				0.700
$1s\,5g\ ^3G_5$	$1s\,7h\ ^3H^o_6$	1.6529E+01	2.139E+00	4.017E+12	1.6459E+01	2.144E+00	4.027E+12	0.000
$1s\,6g\ ^3G_5$	$1s\,7h\ ^3H^o_6$	4.3863E+01	1.577E+01	4.205E+12	4.3678E+01	1.579E+01	4.211E+12	0.000
$1s\,7g\ ^3G_5$	$1s\,7h\ ^3H^o_6$	2.2048E+04	7.648E−02	8.073E+04	2.2104E+04	7.596E−02	7.910E+04	0.025
$1s\,6h\ ^3H^o_5$	$1s\,7i\ ^3I_6$	4.3863E+01	2.165E+01	5.775E+12	4.3678E+01	2.167E+01	5.780E+12	0.000
$1s\,6h\ ^3H^o_6$	$1s\,7i\ ^3I_6$	4.4002E+01	3.281E−01	8.695E+10	4.3816E+01	3.283E−01	8.699E+10	0.000
$1s\,6h\ ^1H^o_5$	$1s\,7i\ ^3I_6$	4.4006E+01	4.130E−03	1.094E+09	4.3816E+01	4.263E−03	1.129E+09	0.000
$1s\,7h\ ^3H^o_5$	$1s\,7i\ ^3I_6$	2.2088E+04	4.138E−02	4.352E+04	2.2113E+04	4.114E−02	4.281E+04	0.010
$1s\,7h\ ^3H^o_6$	$1s\,7i\ ^3I_6$	2.7778E+08	4.919E−08	3.208E−10				1.000
$1s\,4f\ ^3F^o_4$	$1s\,7i\ ^3I_5$	7.6846E+00	6.513E−12	6.688E+01				0.024
$1s\,5f\ ^3F^o_4$	$1s\,7i\ ^3I_5$	1.6478E+01	2.181E−11	4.870E+01				0.047
$1s\,6f\ ^3F^o_4$	$1s\,7i\ ^3I_5$	4.3653E+01	1.093E−14	3.479E−03				0.317
$1s\,6h\ ^3H^o_5$	$1s\,7i\ ^3I_5$	4.3861E+01	3.322E−01	1.047E+11	4.3678E+01	3.335E−01	1.051E+11	0.000
$1s\,6h\ ^3H^o_4$	$1s\,7i\ ^3I_5$	4.3866E+01	1.799E+01	5.669E+12	4.3678E+01	1.800E+01	5.675E+12	0.000
$1s\,6h\ ^3H^o_6$	$1s\,7i\ ^3I_5$	4.4000E+01	4.274E−03	1.339E+09	4.3816E+01	4.263E−03	1.335E+09	0.001
$1s\,6h\ ^1H^o_5$	$1s\,7i\ ^3I_5$	4.4004E+01	2.786E−01	8.725E+10	4.3816E+01	2.771E−01	8.679E+10	0.000
$1s\,7f\ ^3F^o_4$	$1s\,7i\ ^3I_5$	8.6997E+03	2.746E−16	2.200E−09				1.000
$1s\,7h\ ^3H^o_5$	$1s\,7i\ ^3I_5$	2.1496E+04	6.522E−04	8.558E+02	2.2113E+04	6.330E−04	7.784E+02	0.060
$1s\,7h\ ^3H^o_4$	$1s\,7i\ ^3I_5$	2.2351E+04	3.396E−02	4.123E+04	2.2113E+04	3.418E−02	4.203E+04	0.048
$1s\,7h\ ^3H^o_6$	$1s\,7i\ ^3I_5$	8.0038E+05	2.245E−07	2.125E−04				0.972
$1s\,5g\ ^3G_4$	$1s\,7h\ ^1H^o_5$	1.6478E+01	2.072E−07	4.628E+05				0.011
$1s\,5g\ ^3G_5$	$1s\,7h\ ^1H^o_5$	1.6529E+01	3.303E−02	7.332E+10	1.6459E+01	3.299E−02	7.323E+10	0.000
$1s\,5g\ ^1G_4$	$1s\,7h\ ^1H^o_5$	1.6530E+01	1.777E+00	3.943E+12	1.6460E+01	1.781E+00	3.953E+12	0.000
$1s\,6g\ ^3G_4$	$1s\,7h\ ^1H^o_5$	4.3653E+01	1.484E−06	4.723E+05				0.007
$1s\,6g\ ^3G_5$	$1s\,7h\ ^1H^o_5$	4.3860E+01	2.434E−01	7.671E+10	4.3678E+01	2.429E−01	7.657E+10	0.000
$1s\,6g\ ^1G_4$	$1s\,7h\ ^1H^o_5$	4.3867E+01	1.310E+01	4.128E+12	4.3678E+01	1.312E+01	4.135E+12	0.000
$1s\,7g\ ^3G_4$	$1s\,7h\ ^1H^o_5$	8.6987E+03	1.842E−08	1.476E−01				0.636
$1s\,7g\ ^3G_5$	$1s\,7h\ ^1H^o_5$	2.1355E+04	1.219E−03	1.621E+03	2.2104E+04	1.168E−03	1.438E+03	0.005
$1s\,7g\ ^1G_4$	$1s\,7h\ ^1H^o_5$	2.2395E+04	6.255E−02	7.562E+04	2.2104E+04	6.310E−02	7.765E+04	0.011
$1s\,7i\ ^3I_6$	$1s\,7h\ ^1H^o_5$	6.8074E+05	2.552E−07	3.340E−04				0.629
$1s\,7i\ ^3I_5$	$1s\,7h\ ^1H^o_5$	4.4823E+06	2.614E−06	7.893E−05				0.959
$1s\,6h\ ^3H^o_6$	$1s\,7i\ ^3I_7$	4.3940E+01	2.539E+01	5.847E+12	4.3754E+01	2.543E+01	5.857E+12	0.000
$1s\,7h\ ^3H^o_6$	$1s\,7i\ ^3I_7$	3.1010E+04	3.454E−02	1.597E+04	3.1022E+04	3.437E−02	1.574E+04	0.010
$1s\,6h\ ^3H^o_5$	$1s\,7i\ ^1I_6$	4.3799E+01	1.223E−06	3.271E+05				0.004
$1s\,6h\ ^3H^o_6$	$1s\,7i\ ^1I_6$	4.3938E+01	2.829E−01	7.519E+10	4.3754E+01	2.825E−01	7.509E+10	0.000
$1s\,6h\ ^1H^o_5$	$1s\,7i\ ^1I_6$	4.3942E+01	2.172E+01	5.772E+12	4.3754E+01	2.175E+01	5.782E+12	0.000
$1s\,7h\ ^3H^o_5$	$1s\,7i\ ^1I_6$	1.2726E+04	4.183E−09	1.325E−02				0.903
$1s\,7h\ ^3H^o_6$	$1s\,7i\ ^1I_6$	3.0020E+04	3.975E−04	2.263E+02	3.1022E+04	3.819E−04	2.019E+02	0.083
$1s\,7h\ ^1H^o_5$	$1s\,7i\ ^1I_6$	3.1409E+04	2.917E−02	1.517E+04	3.1022E+04	2.940E−02	1.554E+04	0.060

Table 4
Electric quadrupole transitions $E2$ calculated with GRASP2K and FAC for all $n = 1$–7 configurations. For the GRASP2K calculation, the active set is expanded to $n = 10$ (GRASP3) and only the length form is considered. A comparison between the wavelengths, weighted oscillator strengths and transition probabilities is given. The relative difference between transition probabilities in the velocity and length gauge is given in the last column by dT.

Lower	Upper	GRASP2K			FAC			dT
		λ (Å)	gf	A (s^{-1})	λ (Å)	gf	A (s^{-1})	
$1s\,2p\ ^3P^o_1$	$1s\,2p\ ^3P^o_2$	3.1908E+01	3.112E−07	4.078E+05	3.1815E+01	3.135E−07	4.098E+05	0.006
$1s\,2p\ ^3P^o_0$	$1s\,2p\ ^3P^o_2$	3.2407E+01	1.878E−07	2.386E+05	3.2290E+01	1.887E−07	2.394E+05	0.019
$1s\,2p\ ^3P^o_1$	$1s\,2p\ ^1P^o_1$	2.9274E+01	3.608E−07	9.361E+05	2.9150E+01	3.594E−07	9.325E+05	0.011
$1s\,2p\ ^3P^o_2$	$1s\,2p\ ^1P^o_1$	3.5465E+02	1.078E−10	1.905E+00				0.174
$1s\,2s\ ^3S_1$	$1s\,3s\ ^3S_1$	2.1766E+00	4.067E−09	1.909E+06	2.1673E+00	4.604E−09	2.161E+06	0.026
$1s\,2p\ ^3P^o_1$	$1s\,3p\ ^3P^o_1$	2.1983E+00	3.696E−06	1.700E+09	2.1892E+00	4.175E−06	1.920E+09	0.009
$1s\,2p\ ^3P^o_2$	$1s\,3p\ ^3P^o_1$	2.3610E+00	7.133E−04	2.845E+11	2.3509E+00	7.174E−04	2.861E+11	0.002
$1s\,2p\ ^1P^o_1$	$1s\,3p\ ^3P^o_1$	2.3768E+00	6.407E−04	2.522E+11	2.3669E+00	6.330E−04	2.491E+11	0.001
$1s\,2p\ ^3P^o_2$	$1s\,3p\ ^3P^o_0$	2.3603E+00	4.510E−04	5.400E+11	2.3503E+00	4.561E−04	5.461E+11	0.000
$1s\,2p\ ^3P^o_1$	$1s\,3p\ ^3P^o_2$	2.1541E+00	6.263E−04	1.800E+11	2.1452E+00	6.425E−04	1.846E+11	0.002
$1s\,2p\ ^3P^o_0$	$1s\,3p\ ^3P^o_2$	2.1564E+00	3.953E−04	1.134E+11	2.1474E+00	4.009E−04	1.150E+11	0.001
$1s\,2p\ ^3P^o_2$	$1s\,3p\ ^3P^o_2$	2.3101E+00	7.422E−04	1.855E+11	2.3003E+00	7.550E−04	1.887E+11	0.000
$1s\,2p\ ^1P^o_1$	$1s\,3p\ ^3P^o_2$	2.3252E+00	2.840E−04	7.006E+10	2.3156E+00	2.859E−04	7.054E+10	0.002
$1s\,3p\ ^3P^o_1$	$1s\,3p\ ^3P^o_2$	1.0725E+02	3.088E−07	3.581E+04	1.0689E+02	3.098E−07	3.587E+04	0.001
$1s\,3p\ ^3P^o_0$	$1s\,3p\ ^3P^o_2$	1.0873E+02	1.880E−07	2.121E+04	1.0831E+02	1.883E−07	2.123E+04	0.002
$1s^2\ ^1S_0$	$1s\,3d\ ^3D_2$	3.4460E−01	8.826E−04	9.910E+12	3.4325E−01	9.055E−04	1.016E+13	0.003
$1s\,2s\ ^3S_1$	$1s\,3d\ ^3D_2$	2.1226E+00	2.875E−03	8.513E+11	2.1136E+00	2.919E−03	8.644E+11	0.003
$1s\,2s\ ^1S_0$	$1s\,3d\ ^3D_2$	2.1539E+00	1.869E−03	5.374E+11	2.1452E+00	1.833E−03	5.270E+11	0.003
$1s\,3s\ ^3S_1$	$1s\,3d\ ^3D_2$	8.5509E+01	3.819E−07	6.968E+04	8.5230E+01	3.815E−07	6.947E+04	0.030
$1s\,3s\ ^1S_0$	$1s\,3d\ ^3D_2$	1.0120E+02	1.521E−07	1.982E+04	1.0108E+02	1.504E−07	1.947E+04	0.037
$1s\,2s\ ^3S_1$	$1s\,3d\ ^3D_1$	2.1220E+00	2.860E−03	1.412E+12	2.1130E+00	2.904E−03	1.434E+12	0.002
$1s\,3s\ ^3S_1$	$1s\,3d\ ^3D_1$	8.4639E+01	3.934E−07	1.221E+05	8.4368E+01	3.922E−07	1.214E+05	0.027
$1s\,3d\ ^3D_2$	$1s\,3d\ ^3D_1$	8.3264E+03	1.645E−13	5.276E−06				0.531
$1s\,2p\ ^3P^o_1$	$1s\,3p\ ^1P^o_1$	2.1504E+00	5.523E−04	2.655E+11	2.1415E+00	5.632E−04	2.707E+11	0.000
$1s\,2p\ ^3P^o_2$	$1s\,3p\ ^1P^o_1$	2.3058E+00	2.829E−04	1.183E+11	2.2961E+00	2.891E−04	1.209E+11	0.002
$1s\,2p\ ^1P^o_1$	$1s\,3p\ ^1P^o_1$	2.3209E+00	3.899E−04	1.610E+11	2.3113E+00	3.893E−04	1.606E+11	0.000
$1s\,3p\ ^3P^o_1$	$1s\,3p\ ^1P^o_1$	9.8786E+01	3.556E−07	8.103E+04	9.8358E+01	3.546E−07	8.082E+04	0.005
$1s\,3p\ ^3P^o_2$	$1s\,3p\ ^1P^o_1$	1.2519E+03	8.846E−11	1.255E−01				0.052
$1s\,2s\ ^3S_1$	$1s\,3d\ ^3D_3$	2.1095E+00	6.734E−03	1.442E+12	2.1005E+00	6.967E−03	1.492E+12	0.003
$1s\,3s\ ^3S_1$	$1s\,3d\ ^3D_3$	6.8392E+01	1.793E−06	3.652E+05	6.8186E+01	1.790E−06	3.637E+05	0.024
$1s\,3d\ ^3D_2$	$1s\,3d\ ^3D_3$	3.4166E+02	2.752E−09	2.246E+01				0.004
$1s\,3d\ ^3D_1$	$1s\,3d\ ^3D_3$	3.5628E+02	3.967E−10	2.978E+00				0.044
$1s^2\ ^1S_0$	$1s\,3d\ ^1D_2$	3.4430E−01	1.235E−03	1.389E+13	3.4289E−01	1.431E−03	1.610E+13	0.003
$1s\,2s\ ^3S_1$	$1s\,3d\ ^1D_2$	2.1090E+00	1.910E−03	5.729E+11	2.1000E+00	1.974E−03	5.922E+11	0.002
$1s\,2s\ ^1S_0$	$1s\,3d\ ^1D_2$	2.1399E+00	2.871E−03	8.364E+11	2.1313E+00	2.875E−03	8.373E+11	0.002
$1s\,3s\ ^3S_1$	$1s\,3d\ ^1D_2$	6.7876E+01	5.194E−07	1.504E+05	6.7664E+01	5.176E−07	1.495E+05	0.021
$1s\,3s\ ^1S_0$	$1s\,3d\ ^1D_2$	7.7401E+01	5.347E−07	1.191E+05	7.7288E+01	5.296E−07	1.172E+05	0.025
$1s\,3d\ ^3D_2$	$1s\,3d\ ^1D_2$	3.2917E+02	7.638E−10	9.405E+00				0.034
$1s\,3d\ ^3D_1$	$1s\,3d\ ^1D_2$	3.4272E+02	1.578E−09	1.792E+01				0.011
$1s\,3d\ ^3D_3$	$1s\,3d\ ^1D_2$	8.9990E+03	1.023E−13	1.685E−06				0.644
$1s\,2s\ ^3S_1$	$1s\,4s\ ^3S_1$	1.6177E+00	1.741E−10	1.480E+05	1.6108E+00	4.748E−10	4.034E+05	0.331
$1s\,3s\ ^3S_1$	$1s\,4s\ ^3S_1$	6.2995E+00	5.359E−09	3.003E+05				0.020
$1s\,3d\ ^3D_2$	$1s\,4s\ ^3S_1$	6.8005E+00	1.094E−04	5.261E+09	6.7717E+00	1.086E−04	5.221E+09	0.001
$1s\,3d\ ^3D_1$	$1s\,4s\ ^3S_1$	6.8061E+00	1.100E−04	5.277E+09	6.7772E+00	1.084E−04	5.207E+09	0.002
$1s\,3d\ ^3D_3$	$1s\,4s\ ^3S_1$	6.9386E+00	2.664E−04	1.230E+10	6.9089E+00	2.627E−04	1.213E+10	0.001
$1s\,3d\ ^1D_2$	$1s\,4s\ ^3S_1$	6.9440E+00	7.527E−05	3.471E+09	6.9143E+00	7.389E−05	3.407E+09	0.001
$1s\,2p\ ^3P^o_1$	$1s\,4p\ ^3P^o_1$	1.6323E+00	8.176E−07	6.823E+08	1.6255E+00	9.043E−07	7.545E+08	0.004
$1s\,2p\ ^3P^o_2$	$1s\,4p\ ^3P^o_1$	1.7203E+00	1.481E−04	1.113E+11	1.7131E+00	1.462E−04	1.099E+11	0.004
$1s\,2p\ ^1P^o_1$	$1s\,4p\ ^3P^o_1$	1.7287E+00	1.320E−04	9.819E+10	1.7215E+00	1.289E−04	9.594E+10	0.002
$1s\,3p\ ^3P^o_1$	$1s\,4p\ ^3P^o_1$	6.3396E+00	2.991E−06	1.655E+08	6.3138E+00	3.265E−06	1.806E+08	0.000
$1s\,3p\ ^3P^o_2$	$1s\,4p\ ^3P^o_1$	6.7379E+00	6.333E−04	3.101E+10	6.7101E+00	6.376E−04	3.122E+10	0.000
$1s\,3p\ ^1P^o_1$	$1s\,4p\ ^3P^o_1$	6.7743E+00	5.713E−04	2.768E+10	6.7469E+00	5.671E−04	2.746E+10	0.000
$1s\,3d\ ^3D_2$	$1s\,4s\ ^1S_0$	6.7668E+00	7.055E−05	1.028E+10	6.7378E+00	7.263E−05	1.058E+10	0.001
$1s\,3d\ ^1D_2$	$1s\,4s\ ^1S_0$	6.9088E+00	1.123E−04	1.569E+10	6.8790E+00	1.145E−04	1.601E+10	0.001
$1s\,2p\ ^3P^o_2$	$1s\,4p\ ^3P^o_0$	1.7201E+00	9.380E−05	2.115E+11	1.7129E+00	9.268E−05	2.089E+11	0.000
$1s\,3p\ ^3P^o_2$	$1s\,4p\ ^3P^o_0$	6.7356E+00	4.014E−04	5.902E+10	6.7079E+00	4.061E−04	5.970E+10	0.000
$1s\,2p\ ^3P^o_1$	$1s\,4p\ ^3P^o_2$	1.6219E+00	1.580E−04	8.014E+10	1.6152E+00	1.612E−04	8.177E+10	0.002
$1s\,2p\ ^3P^o_0$	$1s\,4p\ ^3P^o_2$	1.6232E+00	9.919E−05	5.022E+10	1.6164E+00	1.007E−04	5.101E+10	0.001
$1s\,2p\ ^3P^o_2$	$1s\,4p\ ^3P^o_2$	1.7088E+00	1.710E−04	7.811E+10	1.7016E+00	1.722E−04	7.870E+10	0.001
$1s\,2p\ ^1P^o_1$	$1s\,4p\ ^3P^o_2$	1.7170E+00	6.489E−05	2.936E+10	1.7100E+00	6.523E−05	2.950E+10	0.004
$1s\,3p\ ^3P^o_1$	$1s\,4p\ ^3P^o_2$	6.1858E+00	5.474E−04	1.909E+10	6.1607E+00	5.538E−04	1.930E+10	0.000
$1s\,3p\ ^3P^o_0$	$1s\,4p\ ^3P^o_2$	6.1907E+00	3.483E−04	1.212E+10	6.1653E+00	3.485E−04	1.212E+10	0.000
$1s\,3p\ ^3P^o_2$	$1s\,4p\ ^3P^o_2$	6.5644E+00	6.573E−04	2.035E+10	6.5375E+00	6.633E−04	2.052E+10	0.000
$1s\,3p\ ^1P^o_1$	$1s\,4p\ ^3P^o_2$	6.5991E+00	2.535E−04	7.766E+09	6.5723E+00	2.534E−04	7.759E+09	0.000
$1s\,4p\ ^3P^o_1$	$1s\,4p\ ^3P^o_2$	2.5504E+02	2.619E−07	5.371E+03	2.5410E+02	2.626E−07	5.380E+03	0.002
$1s\,4p\ ^3P^o_0$	$1s\,4p\ ^3P^o_2$	2.5839E+02	1.600E−07	3.197E+03	2.5732E+02	1.603E−07	3.202E+03	0.001
$1s^2\ ^1S_0$	$1s\,4d\ ^3D_2$	3.2750E−01	4.379E−04	5.445E+12	3.2616E−01	4.466E−04	5.553E+12	0.003
$1s\,2s\ ^3S_1$	$1s\,4d\ ^3D_2$	1.6050E+00	2.179E−04	1.128E+11	1.5981E+00	2.096E−04	1.085E+11	0.002

(*continued on next page*)

Table 4 (*continued*)

Lower	Upper	GRASP2K			FAC			*dT*
		λ (Å)	*gf*	*A* (s^{-1})	λ (Å)	*gf*	*A* (s^{-1})	
$1s\,2s\ ^1S_0$	$1s\,4d\ ^3D_2$	1.6228E+00	1.321E−04	6.689E+10	1.6162E+00	1.318E−04	6.677E+10	0.003
$1s\,3s\ ^3S_1$	$1s\,4d\ ^3D_2$	6.1111E+00	1.685E−03	6.018E+10	6.0854E+00	1.711E−03	6.113E+10	0.002
$1s\,3s\ ^1S_0$	$1s\,4d\ ^3D_2$	6.1795E+00	1.100E−03	3.842E+10	6.1544E+00	1.079E−03	3.768E+10	0.002
$1s\,3d\ ^3D_2$	$1s\,4d\ ^3D_2$	6.5814E+00	4.239E−04	1.306E+10	6.5534E+00	4.253E−04	1.310E+10	0.000
$1s\,3d\ ^3D_1$	$1s\,4d\ ^3D_2$	6.5866E+00	1.859E−04	5.715E+09	6.5585E+00	1.860E−04	5.720E+09	0.000
$1s\,3d\ ^3D_3$	$1s\,4d\ ^3D_2$	6.7107E+00	2.138E−04	6.333E+09	6.6818E+00	2.135E−04	6.326E+09	0.000
$1s\,3d\ ^1D_2$	$1s\,4d\ ^3D_2$	6.7157E+00	5.225E−05	1.545E+09	6.6868E+00	5.192E−05	1.536E+09	0.000
$1s\,4s\ ^3S_1$	$1s\,4d\ ^3D_2$	2.0428E+02	4.053E−07	1.296E+04	2.0324E+02	4.072E−07	1.304E+04	0.029
$1s\,4s\ ^1S_0$	$1s\,4d\ ^3D_2$	2.4021E+02	1.633E−07	3.776E+03	2.3934E+02	1.627E−07	3.756E+03	0.039
$1s\,2s\ ^3S_1$	$1s\,4d\ ^3D_1$	1.6048E+00	2.169E−04	1.872E+11	1.5980E+00	2.076E−04	1.792E+11	0.002
$1s\,3s\ ^3S_1$	$1s\,4d\ ^3D_1$	6.1092E+00	1.673E−03	9.967E+10	6.0836E+00	1.700E−03	1.013E+11	0.002
$1s\,3d\ ^3D_2$	$1s\,4d\ ^3D_1$	6.5793E+00	1.840E−04	9.451E+09	6.5513E+00	1.852E−04	9.515E+09	0.000
$1s\,3d\ ^3D_1$	$1s\,4d\ ^3D_1$	6.5845E+00	1.810E−04	9.280E+09	6.5564E+00	1.814E−04	9.306E+09	0.000
$1s\,3d\ ^3D_3$	$1s\,4d\ ^3D_1$	6.7085E+00	3.503E−05	1.731E+09	6.6796E+00	3.499E−05	1.729E+09	0.001
$1s\,3d\ ^1D_2$	$1s\,4d\ ^3D_1$	6.7135E+00	1.229E−04	6.065E+09	6.6847E+00	1.225E−04	6.044E+09	0.000
$1s\,4s\ ^3S_1$	$1s\,4d\ ^3D_1$	2.0227E+02	4.160E−07	2.261E+04	2.0125E+02	4.171E−07	2.270E+04	0.026
$1s\,4d\ ^3D_2$	$1s\,4d\ ^3D_1$	2.0536E+04	1.788E−13	9.425E−07				0.337
$1s\,2p\ ^3P^o_1$	$1s\,4p\ ^1P^o_1$	1.6210E+00	1.402E−04	1.186E+11	1.6143E+00	1.421E−04	1.202E+11	0.001
$1s\,2p\ ^3P^o_2$	$1s\,4p\ ^1P^o_1$	1.7078E+00	6.574E−05	5.012E+10	1.7006E+00	6.655E−05	5.072E+10	0.006
$1s\,2p\ ^1P^o_1$	$1s\,4p\ ^1P^o_1$	1.7161E+00	8.979E−05	6.779E+10	1.7090E+00	8.874E−05	6.699E+10	0.000
$1s\,3p\ ^3P^o_1$	$1s\,4p\ ^1P^o_1$	6.1732E+00	4.872E−04	2.843E+10	6.1480E+00	4.916E−04	2.867E+10	0.000
$1s\,3p\ ^3P^o_2$	$1s\,4p\ ^1P^o_1$	6.5502E+00	2.512E−04	1.302E+10	6.5232E+00	2.544E−04	1.318E+10	0.001
$1s\,3p\ ^1P^o_1$	$1s\,4p\ ^1P^o_1$	6.5847E+00	3.422E−04	1.755E+10	6.5579E+00	3.415E−04	1.750E+10	0.000
$1s\,4p\ ^3P^o_1$	$1s\,4p\ ^1P^o_1$	2.3520E+02	3.010E−07	1.210E+04	2.3412E+02	3.005E−07	1.208E+04	0.004
$1s\,4p\ ^3P^o_2$	$1s\,4p\ ^1P^o_1$	3.0236E+03	7.051E−11	1.715E−02				0.024
$1s\,2s\ ^3S_1$	$1s\,4d\ ^3D_3$	1.6018E+00	5.612E−04	2.084E+11	1.5950E+00	5.556E−04	2.063E+11	0.002
$1s\,3s\ ^3S_1$	$1s\,4d\ ^3D_3$	6.0652E+00	3.882E−03	1.005E+11	6.0400E+00	3.968E−03	1.027E+11	0.002
$1s\,3d\ ^3D_2$	$1s\,4d\ ^3D_3$	6.5283E+00	2.062E−04	4.610E+09	6.5006E+00	2.084E−04	4.660E+09	0.000
$1s\,3d\ ^3D_1$	$1s\,4d\ ^3D_3$	6.5334E+00	3.327E−05	7.427E+08	6.5057E+00	3.358E−05	7.497E+08	0.001
$1s\,3d\ ^3D_3$	$1s\,4d\ ^3D_3$	6.6555E+00	8.341E−04	1.794E+10	6.6270E+00	8.375E−04	1.801E+10	0.000
$1s\,3d\ ^1D_2$	$1s\,4d\ ^3D_3$	6.6604E+00	1.380E−04	2.964E+09	6.6320E+00	1.380E−04	2.966E+09	0.000
$1s\,4s\ ^3S_1$	$1s\,4d\ ^3D_3$	1.6310E+02	1.890E−06	6.771E+04	1.6240E+02	1.893E−06	6.783E+04	0.022
$1s\,4d\ ^3D_2$	$1s\,4d\ ^3D_3$	8.0890E+02	3.369E−09	4.906E+00				0.003
$1s\,4d\ ^3D_1$	$1s\,4d\ ^3D_3$	8.4207E+02	4.858E−10	6.529E−01				0.015
$1s\,2p\ ^3P^o_1$	$1s\,4f\ ^3F^o_3$	1.6179E+00	2.847E−03	1.036E+12	1.6112E+00	2.908E−03	1.058E+12	0.001
$1s\,2p\ ^3P^o_2$	$1s\,4f\ ^3F^o_3$	1.7043E+00	7.811E−04	2.562E+11	1.6971E+00	7.937E−04	2.603E+11	0.001
$1s\,2p\ ^1P^o_1$	$1s\,4f\ ^3F^o_3$	1.7125E+00	1.912E−04	6.213E+10	1.7055E+00	1.844E−04	5.990E+10	0.003
$1s\,3p\ ^3P^o_1$	$1s\,4f\ ^3F^o_3$	6.1276E+00	4.973E−03	1.262E+11	6.1026E+00	4.989E−03	1.265E+11	0.000
$1s\,3p\ ^3P^o_2$	$1s\,4f\ ^3F^o_3$	6.4989E+00	1.148E−03	2.591E+10	6.4721E+00	1.153E−03	2.601E+10	0.000
$1s\,3p\ ^1P^o_1$	$1s\,4f\ ^3F^o_3$	6.5328E+00	2.725E−04	6.084E+09	6.5062E+00	2.680E−04	5.982E+09	0.000
$1s\,4p\ ^3P^o_1$	$1s\,4f\ ^3F^o_3$	1.8322E+02	6.325E−07	1.795E+04	1.8244E+02	6.324E−07	1.795E+04	0.003
$1s\,4p\ ^3P^o_2$	$1s\,4f\ ^3F^o_3$	6.5059E+02	3.452E−09	7.771E+00	6.4694E+02	3.463E−09	7.818E+00	0.016
$1s\,4p\ ^1P^o_1$	$1s\,4f\ ^3F^o_3$	8.2895E+02	3.954E−10	5.482E−01				0.020
$1s\,2p\ ^3P^o_1$	$1s\,4f\ ^3F^o_2$	1.6178E+00	8.729E−04	4.449E+11	1.6111E+00	9.021E−04	4.597E+11	0.001
$1s\,2p\ ^3P^o_0$	$1s\,4f\ ^3F^o_2$	1.6191E+00	1.244E−03	6.329E+11	1.6123E+00	1.269E−03	6.460E+11	0.000
$1s\,2p\ ^3P^o_2$	$1s\,4f\ ^3F^o_2$	1.7042E+00	1.959E−04	8.998E+10	1.6971E+00	1.993E−04	9.155E+10	0.000
$1s\,2p\ ^1P^o_1$	$1s\,4f\ ^3F^o_2$	1.7124E+00	4.103E−04	1.867E+11	1.7054E+00	4.121E−04	1.874E+11	0.002
$1s\,3p\ ^3P^o_1$	$1s\,4f\ ^3F^o_2$	6.1266E+00	1.521E−03	5.406E+10	6.1016E+00	1.533E−03	5.447E+10	0.000
$1s\,3p\ ^3P^o_0$	$1s\,4f\ ^3F^o_2$	6.1314E+00	2.165E−03	7.684E+10	6.1062E+00	2.172E−03	7.706E+10	0.000
$1s\,3p\ ^3P^o_2$	$1s\,4f\ ^3F^o_2$	6.4978E+00	2.880E−04	9.101E+09	6.4710E+00	2.892E−04	9.137E+09	0.000
$1s\,3p\ ^1P^o_1$	$1s\,4f\ ^3F^o_2$	6.5317E+00	5.991E−04	1.874E+10	6.5052E+00	5.988E−04	1.871E+10	0.000
$1s\,4p\ ^3P^o_1$	$1s\,4f\ ^3F^o_2$	1.8236E+02	1.962E−07	7.869E+03	1.8158E+02	1.960E−07	7.865E+03	0.002
$1s\,4p\ ^3P^o_0$	$1s\,4f\ ^3F^o_2$	1.8406E+02	2.716E−07	1.070E+04	1.8322E+02	2.717E−07	1.070E+04	0.003
$1s\,4p\ ^3P^o_2$	$1s\,4f\ ^3F^o_2$	6.3989E+02	9.105E−10	2.967E+00	6.3631E+02	9.130E−10	2.982E+00	0.014
$1s\,4p\ ^1P^o_1$	$1s\,4f\ ^3F^o_2$	8.1166E+02	9.363E−10	1.896E+00	8.0920E+02	9.307E−10	1.880E+00	0.020
$1s\,4f\ ^3F^o_3$	$1s\,4f\ ^3F^o_2$	3.8916E+04	1.030E−14	9.073E−09				0.558
$1s^2\ ^1S_0$	$1s\,4d\ ^1D_2$	3.2740E−01	6.231E−04	7.755E+12	3.2603E−01	7.226E−04	8.992E+12	0.002
$1s\,2s\ ^3S_1$	$1s\,4d\ ^1D_2$	1.6017E+00	1.591E−04	8.273E+10	1.5948E+00	1.567E−04	8.150E+10	0.001
$1s\,2s\ ^1S_0$	$1s\,4d\ ^1D_2$	1.6194E+00	2.277E−04	1.158E+11	1.6128E+00	2.323E−04	1.181E+11	0.002
$1s\,3s\ ^3S_1$	$1s\,4d\ ^1D_2$	6.0634E+00	1.094E−03	3.969E+10	6.0381E+00	1.117E−03	4.054E+10	0.002
$1s\,3s\ ^1S_0$	$1s\,4d\ ^1D_2$	6.1308E+00	1.677E−03	5.953E+10	6.1059E+00	1.661E−03	5.893E+10	0.002
$1s\,3d\ ^3D_2$	$1s\,4d\ ^1D_2$	6.5262E+00	5.168E−05	1.619E+09	6.4985E+00	5.227E−05	1.637E+09	0.000
$1s\,3d\ ^3D_1$	$1s\,4d\ ^1D_2$	6.5313E+00	1.191E−04	3.724E+09	6.5035E+00	1.198E−04	3.747E+09	0.000
$1s\,3d\ ^3D_3$	$1s\,4d\ ^1D_2$	6.6532E+00	1.372E−04	4.134E+09	6.6247E+00	1.377E−04	4.152E+09	0.000
$1s\,3d\ ^1D_2$	$1s\,4d\ ^1D_2$	6.6582E+00	5.591E−04	1.683E+10	6.6297E+00	5.608E−04	1.687E+10	0.000
$1s\,4s\ ^3S_1$	$1s\,4d\ ^1D_2$	1.6177E+02	5.455E−07	2.781E+04	1.6105E+02	5.455E−07	2.782E+04	0.020
$1s\,4s\ ^1S_0$	$1s\,4d\ ^1D_2$	1.8350E+02	5.750E−07	2.278E+04	1.8292E+02	5.727E−07	2.264E+04	0.027
$1s\,4d\ ^3D_2$	$1s\,4d\ ^1D_2$	7.7722E+02	9.379E−10	2.071E+00				0.018
$1s\,4d\ ^3D_1$	$1s\,4d\ ^1D_2$	8.0779E+02	1.943E−09	3.972E+00				0.005
$1s\,4d\ ^3D_3$	$1s\,4d\ ^1D_2$	1.9845E+04	1.515E−13	5.133E−07				0.342
$1s\,2p\ ^3P^o_2$	$1s\,4f\ ^3F^o_4$	1.7025E+00	5.177E−03	1.324E+12	1.6954E+00	5.446E−03	1.392E+12	0.000

(*continued on next page*)

Table 4 (*continued*)

Lower	Upper	GRASP2K			FAC			*dT*
		λ (Å)	*gf*	A (s^{-1})	λ (Å)	*gf*	A (s^{-1})	
$1s\,3p\ ^3P^o_2$	$1s\,4f\ ^3F^o_4$	6.4732E+00	7.864E−03	1.391E+11	6.4465E+00	7.967E−03	1.408E+11	0.000
$1s\,4p\ ^3P^o_2$	$1s\,4f\ ^3F^o_4$	4.6544E+02	6.500E−08	2.224E+02	4.6333E+02	6.501E−08	2.225E+02	0.009
$1s\,4f\ ^3F^o_3$	$1s\,4f\ ^3F^o_4$	1.6355E+03	1.450E−10	4.017E−02	1.6325E+03	1.439E−10	3.970E−02	0.016
$1s\,4f\ ^3F^o_2$	$1s\,4f\ ^3F^o_4$	1.7073E+03	1.015E−11	2.582E−03				0.053
$1s\,2p\ ^3P^o_1$	$1s\,4f\ ^1F^o_3$	1.6162E+00	5.484E−06	2.001E+09	1.6095E+00	7.555E−06	2.755E+09	0.014
$1s\,2p\ ^3P^o_2$	$1s\,4f\ ^1F^o_3$	1.7025E+00	5.783E−04	1.901E+11	1.6953E+00	6.082E−04	1.999E+11	0.000
$1s\,2p\ ^1P^o_1$	$1s\,4f\ ^1F^o_3$	1.7107E+00	3.470E−03	1.130E+12	1.7036E+00	3.569E−03	1.161E+12	0.001
$1s\,3p\ ^3P^o_1$	$1s\,4f\ ^1F^o_3$	6.1040E+00	8.647E−06	2.211E+08	6.0791E+00	9.972E−06	2.549E+08	0.003
$1s\,3p\ ^3P^o_2$	$1s\,4f\ ^1F^o_3$	6.4724E+00	8.785E−04	1.998E+10	6.4457E+00	8.900E−04	2.023E+10	0.000
$1s\,3p\ ^1P^o_1$	$1s\,4f\ ^1F^o_3$	6.5060E+00	5.198E−03	1.170E+11	6.4796E+00	5.218E−03	1.174E+11	0.000
$1s\,4p\ ^3P^o_1$	$1s\,4f\ ^1F^o_3$	1.6424E+02	1.482E−09	5.234E+01	1.6359E+02	1.492E−09	5.269E+01	0.001
$1s\,4p\ ^3P^o_2$	$1s\,4f\ ^1F^o_3$	4.6135E+02	7.452E−09	3.336E+01	4.5925E+02	7.450E−09	3.337E+01	0.006
$1s\,4p\ ^1P^o_1$	$1s\,4f\ ^1F^o_3$	5.4442E+02	2.699E−08	8.676E+01	5.4298E+02	2.686E−08	8.609E+01	0.009
$1s\,4f\ ^3F^o_3$	$1s\,4f\ ^1F^o_3$	1.5861E+03	1.917E−11	7.263E−03				0.019
$1s\,4f\ ^3F^o_2$	$1s\,4f\ ^1F^o_3$	1.6535E+03	1.021E−10	3.557E−02	1.6504E+03	1.013E−10	3.513E−02	0.007
$1s\,4f\ ^3F^o_4$	$1s\,4f\ ^1F^o_3$	5.2510E+04	3.365E−15	1.163E−09				0.824
$1s\,2s\ ^3S_1$	$1s\,5s\ ^3S_1$	1.4473E+00	4.378E−12	4.647E+03	1.4412E+00	1.023E−10	1.086E+05	0.891
$1s\,3s\ ^3S_1$	$1s\,5s\ ^3S_1$	4.3197E+00	7.655E−10	9.121E+04				0.164
$1s\,3d\ ^3D_2$	$1s\,5s\ ^3S_1$	4.5495E+00	2.933E−05	3.150E+09	4.5304E+00	2.931E−05	3.148E+09	0.001
$1s\,3d\ ^3D_1$	$1s\,5s\ ^3S_1$	4.5520E+00	2.949E−05	3.165E+09	4.5328E+00	2.930E−05	3.144E+09	0.003
$1s\,3d\ ^3D_3$	$1s\,5s\ ^3S_1$	4.6109E+00	7.001E−05	7.322E+09	4.5914E+00	6.937E−05	7.254E+09	0.001
$1s\,3d\ ^1D_2$	$1s\,5s\ ^3S_1$	4.6133E+00	1.982E−05	2.071E+09	4.5938E+00	1.952E−05	2.039E+09	0.003
$1s\,4s\ ^3S_1$	$1s\,5s\ ^3S_1$	1.3745E+01	5.045E−09	5.937E+04				0.022
$1s\,4d\ ^3D_2$	$1s\,5s\ ^3S_1$	1.4736E+01	1.591E−04	1.629E+09	1.4676E+01	1.575E−04	1.612E+09	0.001
$1s\,4d\ ^3D_1$	$1s\,5s\ ^3S_1$	1.4747E+01	1.592E−04	1.628E+09	1.4686E+01	1.567E−04	1.602E+09	0.002
$1s\,4d\ ^3D_3$	$1s\,5s\ ^3S_1$	1.5010E+01	3.835E−04	3.785E+09	1.4947E+01	3.784E−04	3.734E+09	0.001
$1s\,4d\ ^1D_2$	$1s\,5s\ ^3S_1$	1.5021E+01	1.079E−04	1.063E+09	1.4959E+01	1.059E−04	1.044E+09	0.002
$1s\,2p\ ^3P^o_1$	$1s\,5p\ ^3P^o_1$	1.4598E+00	3.294E−07	3.437E+08	1.4537E+00	3.558E−07	3.711E+08	0.007
$1s\,2p\ ^3P^o_2$	$1s\,5p\ ^3P^o_1$	1.5297E+00	5.743E−05	5.456E+10	1.5233E+00	5.632E−05	5.350E+10	0.003
$1s\,2p\ ^1P^o_1$	$1s\,5p\ ^3P^o_1$	1.5364E+00	5.106E−05	4.809E+10	1.5300E+00	4.964E−05	4.674E+10	0.002
$1s\,3p\ ^3P^o_1$	$1s\,5p\ ^3P^o_1$	4.3450E+00	7.585E−07	8.933E+07	4.3271E+00	8.116E−07	9.556E+07	0.006
$1s\,3p\ ^3P^o_2$	$1s\,5p\ ^3P^o_1$	4.5285E+00	1.479E−04	1.603E+10	4.5097E+00	1.475E−04	1.598E+10	0.000
$1s\,3p\ ^1P^o_1$	$1s\,5p\ ^3P^o_1$	4.5449E+00	1.323E−04	1.424E+10	4.5263E+00	1.309E−04	1.408E+10	0.000
$1s\,4p\ ^3P^o_1$	$1s\,5p\ ^3P^o_1$	1.3810E+01	2.420E−06	2.821E+07	1.3752E+01	2.598E−06	3.028E+07	0.001
$1s\,4p\ ^3P^o_2$	$1s\,5p\ ^3P^o_1$	1.4601E+01	5.296E−04	5.524E+09	1.4539E+01	5.330E−04	5.559E+09	0.000
$1s\,4p\ ^1P^o_1$	$1s\,5p\ ^3P^o_1$	1.4672E+01	4.785E−04	4.943E+09	1.4610E+01	4.758E−04	4.914E+09	0.000
$1s\,4f\ ^3F^o_3$	$1s\,5p\ ^3P^o_1$	1.4936E+01	9.431E−05	9.400E+08	1.4873E+01	9.437E−05	9.404E+08	0.000
$1s\,4f\ ^3F^o_2$	$1s\,5p\ ^3P^o_1$	1.4942E+01	2.888E−05	2.876E+08	1.4879E+01	2.862E−05	2.850E+08	0.001
$1s\,4f\ ^1F^o_3$	$1s\,5p\ ^3P^o_1$	1.5078E+01	1.573E−07	1.538E+06	1.5014E+01	1.253E−07	1.225E+06	0.002
$1s\,3d\ ^3D_2$	$1s\,5s\ ^1S_0$	4.5420E+00	1.917E−05	6.199E+09	4.5228E+00	1.941E−05	6.277E+09	0.001
$1s\,3d\ ^1D_2$	$1s\,5s\ ^1S_0$	4.6055E+00	2.999E−05	9.431E+09	4.5859E+00	2.997E−05	9.427E+09	0.002
$1s\,4d\ ^3D_2$	$1s\,5s\ ^1S_0$	1.4657E+01	1.021E−04	3.171E+09	1.4596E+01	1.045E−04	3.246E+09	0.000
$1s\,4d\ ^1D_2$	$1s\,5s\ ^1S_0$	1.4939E+01	1.627E−04	4.864E+09	1.4876E+01	1.658E−04	4.956E+09	0.001
$1s\,2p\ ^3P^o_2$	$1s\,5p\ ^3P^o_0$	1.5297E+00	3.640E−05	1.038E+11	1.5233E+00	3.564E−05	1.015E+11	0.000
$1s\,3p\ ^3P^o_2$	$1s\,5p\ ^3P^o_0$	4.5279E+00	9.388E−05	3.054E+10	4.5092E+00	9.356E−05	3.043E+10	0.000
$1s\,4p\ ^3P^o_2$	$1s\,5p\ ^3P^o_0$	1.4595E+01	3.360E−04	1.052E+10	1.4534E+01	3.399E−04	1.064E+10	0.000
$1s\,4f\ ^3F^o_2$	$1s\,5p\ ^3P^o_0$	1.4936E+01	4.095E−05	1.225E+09	1.4874E+01	4.095E−05	1.224E+09	0.001
$1s\,2p\ ^3P^o_1$	$1s\,5p\ ^3P^o_2$	1.4555E+00	6.570E−05	4.138E+10	1.4495E+00	6.694E−05	4.214E+10	0.002
$1s\,2p\ ^3P^o_0$	$1s\,5p\ ^3P^o_2$	1.4565E+00	4.114E−05	2.587E+10	1.4505E+00	4.181E−05	2.628E+10	0.001
$1s\,2p\ ^3P^o_2$	$1s\,5p\ ^3P^o_2$	1.5251E+00	6.889E−05	3.951E+10	1.5187E+00	6.910E−05	3.963E+10	0.001
$1s\,2p\ ^1P^o_1$	$1s\,5p\ ^3P^o_2$	1.5317E+00	2.611E−05	1.485E+10	1.5253E+00	2.616E−05	1.487E+10	0.004
$1s\,3p\ ^3P^o_1$	$1s\,5p\ ^3P^o_2$	4.3076E+00	1.546E−04	1.112E+10	4.2899E+00	1.560E−04	1.121E+10	0.000
$1s\,3p\ ^3P^o_0$	$1s\,5p\ ^3P^o_2$	4.3099E+00	9.802E−05	7.040E+09	4.2921E+00	9.847E−05	7.070E+09	0.000
$1s\,3p\ ^3P^o_2$	$1s\,5p\ ^3P^o_2$	4.4878E+00	1.697E−04	1.124E+10	4.4692E+00	1.704E−04	1.128E+10	0.000
$1s\,3p\ ^1P^o_1$	$1s\,5p\ ^3P^o_2$	4.5039E+00	6.500E−05	4.275E+09	4.4855E+00	6.502E−05	4.274E+09	0.001
$1s\,4p\ ^3P^o_1$	$1s\,5p\ ^3P^o_2$	1.3439E+01	4.552E−04	3.363E+09	1.3383E+01	4.582E−04	3.384E+09	0.000
$1s\,4p\ ^3P^o_0$	$1s\,5p\ ^3P^o_2$	1.3448E+01	2.902E−04	2.140E+09	1.3392E+01	2.890E−04	2.131E+09	0.000
$1s\,4p\ ^3P^o_2$	$1s\,5p\ ^3P^o_2$	1.4186E+01	5.493E−04	3.641E+09	1.4127E+01	5.527E−04	3.663E+09	0.000
$1s\,4p\ ^1P^o_1$	$1s\,5p\ ^3P^o_2$	1.4253E+01	2.123E−04	1.394E+09	1.4194E+01	2.117E−04	1.390E+09	0.000
$1s\,4f\ ^3F^o_3$	$1s\,5p\ ^3P^o_2$	1.4503E+01	1.980E−05	1.256E+08	1.4442E+01	1.963E−05	1.245E+08	0.001
$1s\,4f\ ^3F^o_2$	$1s\,5p\ ^3P^o_2$	1.4508E+01	4.987E−06	3.161E+07	1.4447E+01	4.933E−06	3.126E+07	0.000
$1s\,4f\ ^3F^o_4$	$1s\,5p\ ^3P^o_2$	1.4632E+01	1.385E−04	8.628E+08	1.4571E+01	1.367E−04	8.519E+08	0.000
$1s\,4f\ ^1F^o_3$	$1s\,5p\ ^3P^o_2$	1.4636E+01	1.545E−05	9.618E+07	1.4575E+01	1.522E−05	9.479E+07	0.000
$1s\,5p\ ^3P^o_1$	$1s\,5p\ ^3P^o_2$	4.9993E+02	2.211E−07	1.180E+03	4.9817E+02	2.213E−07	1.179E+03	0.003
$1s\,5p\ ^3P^o_0$	$1s\,5p\ ^3P^o_2$	5.0634E+02	1.353E−07	7.042E+02	5.0434E+02	1.354E−07	7.042E+02	0.002
$1s^2\ ^1S_0$	$1s\,5d\ ^3D_2$	3.2010E−01	2.358E−04	3.069E+12	3.1882E−01	2.397E−04	3.120E+12	0.002
$1s\,2s\ ^3S_1$	$1s\,5d\ ^3D_2$	1.4421E+00	4.328E−05	2.776E+10	1.4360E+00	3.977E−05	2.551E+10	0.000
$1s\,2s\ ^1S_0$	$1s\,5d\ ^3D_2$	1.4565E+00	2.475E−05	1.556E+10	1.4506E+00	2.497E−05	1.569E+10	0.003
$1s\,3s\ ^3S_1$	$1s\,5d\ ^3D_2$	4.2737E+00	2.788E−04	2.036E+10	4.2558E+00	2.762E−04	2.017E+10	0.002
$1s\,3s\ ^1S_0$	$1s\,5d\ ^3D_2$	4.3071E+00	1.759E−04	1.265E+10	4.2893E+00	1.752E−04	1.259E+10	0.001
$1s\,3d\ ^3D_2$	$1s\,5d\ ^3D_2$	4.4985E+00	9.377E−05	6.182E+09	4.4794E+00	9.361E−05	6.171E+09	0.001

(*continued on next page*)

Table 4 (*continued*)

Lower	Upper	GRASP2K			FAC			*dT*
		λ (Å)	*gf*	*A* (s^{-1})	λ (Å)	*gf*	*A* (s^{-1})	
$1s\,3d\ ^3D_1$	$1s\,5d\ ^3D_2$	4.5010E+00	4.110E−05	2.707E+09	4.4818E+00	4.103E−05	2.702E+09	0.002
$1s\,3d\ ^3D_3$	$1s\,5d\ ^3D_2$	4.5585E+00	4.574E−05	2.936E+09	4.5391E+00	4.533E−05	2.910E+09	0.001
$1s\,3d\ ^1D_2$	$1s\,5d\ ^3D_2$	4.5609E+00	1.111E−05	7.124E+08	4.5414E+00	1.094E−05	7.020E+08	0.002
$1s\,4s\ ^3S_1$	$1s\,5d\ ^3D_2$	1.3290E+01	1.104E−03	8.339E+09	1.3233E+01	1.121E−03	8.472E+09	0.002
$1s\,4s\ ^1S_0$	$1s\,5d\ ^3D_2$	1.3420E+01	7.221E−04	5.349E+09	1.3364E+01	7.080E−04	5.244E+09	0.001
$1s\,4d\ ^3D_2$	$1s\,5d\ ^3D_2$	1.4214E+01	4.446E−04	2.936E+09	1.4154E+01	4.454E−04	2.940E+09	0.000
$1s\,4d\ ^3D_1$	$1s\,5d\ ^3D_2$	1.4224E+01	1.955E−04	1.289E+09	1.4164E+01	1.954E−04	1.288E+09	0.000
$1s\,4d\ ^3D_3$	$1s\,5d\ ^3D_2$	1.4468E+01	2.257E−04	1.438E+09	1.4407E+01	2.258E−04	1.439E+09	0.000
$1s\,4d\ ^1D_2$	$1s\,5d\ ^3D_2$	1.4479E+01	5.540E−05	3.525E+08	1.4417E+01	5.517E−05	3.511E+08	0.000
$1s\,5s\ ^3S_1$	$1s\,5d\ ^3D_2$	4.0118E+02	3.701E−07	3.067E+03	3.9828E+02	3.741E−07	3.119E+03	0.027
$1s\,5s\ ^1S_0$	$1s\,5d\ ^3D_2$	4.7039E+02	1.499E−07	9.037E+02	4.6740E+02	1.505E−07	9.114E+02	0.045
$1s\,2p\ ^3P^o_1$	$1s\,5p\ ^1P^o_1$	1.4551E+00	5.848E−05	6.140E+10	1.4491E+00	5.907E−05	6.201E+10	0.000
$1s\,2p\ ^3P^o_2$	$1s\,5p\ ^1P^o_1$	1.5247E+00	2.653E−05	2.538E+10	1.5183E+00	2.678E−05	2.561E+10	0.008
$1s\,2p\ ^1P^o_1$	$1s\,5p\ ^1P^o_1$	1.5313E+00	3.621E−05	3.434E+10	1.5249E+00	3.560E−05	3.375E+10	0.002
$1s\,3p\ ^3P^o_1$	$1s\,5p\ ^1P^o_1$	4.3044E+00	1.385E−04	1.662E+10	4.2867E+00	1.391E−04	1.669E+10	0.000
$1s\,3p\ ^3P^o_2$	$1s\,5p\ ^1P^o_1$	4.4844E+00	6.547E−05	7.239E+09	4.4658E+00	6.579E−05	7.272E+09	0.001
$1s\,3p\ ^1P^o_1$	$1s\,5p\ ^1P^o_1$	4.5006E+00	8.834E−05	9.697E+09	4.4821E+00	8.767E−05	9.621E+09	0.000
$1s\,4p\ ^3P^o_1$	$1s\,5p\ ^1P^o_1$	1.3409E+01	4.062E−04	5.023E+09	1.3352E+01	4.085E−04	5.051E+09	0.000
$1s\,4p\ ^3P^o_2$	$1s\,5p\ ^1P^o_1$	1.4153E+01	2.101E−04	2.332E+09	1.4093E+01	2.121E−04	2.355E+09	0.000
$1s\,4p\ ^1P^o_1$	$1s\,5p\ ^1P^o_1$	1.4219E+01	2.851E−04	3.135E+09	1.4160E+01	2.846E−04	3.130E+09	0.000
$1s\,4f\ ^3F^o_3$	$1s\,5p\ ^1P^o_1$	1.4467E+01	4.625E−06	4.913E+07	1.4407E+01	4.908E−06	5.213E+07	0.000
$1s\,4f\ ^3F^o_2$	$1s\,5p\ ^1P^o_1$	1.4473E+01	1.034E−05	1.097E+08	1.4412E+01	1.028E−05	1.091E+08	0.001
$1s\,4f\ ^1F^o_3$	$1s\,5p\ ^1P^o_1$	1.4601E+01	9.082E−05	9.472E+08	1.4539E+01	9.153E−05	9.546E+08	0.000
$1s\,5p\ ^3P^o_1$	$1s\,5p\ ^1P^o_1$	4.6126E+02	2.539E−07	2.653E+03	4.5925E+02	2.534E−07	2.649E+03	0.004
$1s\,5p\ ^3P^o_2$	$1s\,5p\ ^1P^o_1$	5.9640E+03	5.793E−11	3.621E−03				0.013
$1s\,2s\ ^3S_1$	$1s\,5d\ ^3D_1$	1.4421E+00	4.306E−05	4.604E+10	1.4359E+00	3.931E−05	4.203E+10	0.002
$1s\,3s\ ^3S_1$	$1s\,5d\ ^3D_1$	4.2732E+00	2.771E−04	3.375E+10	4.2553E+00	2.739E−04	3.335E+10	0.002
$1s\,3d\ ^3D_2$	$1s\,5d\ ^3D_1$	4.4980E+00	4.080E−05	4.484E+09	4.4789E+00	4.078E−05	4.481E+09	0.001
$1s\,3d\ ^3D_1$	$1s\,5d\ ^3D_1$	4.5005E+00	4.016E−05	4.408E+09	4.4813E+00	3.999E−05	4.390E+09	0.001
$1s\,3d\ ^3D_3$	$1s\,5d\ ^3D_1$	4.5580E+00	7.478E−06	8.003E+08	4.5386E+00	7.403E−06	7.923E+08	0.003
$1s\,3d\ ^1D_2$	$1s\,5d\ ^3D_1$	4.5603E+00	2.632E−05	2.814E+09	4.5409E+00	2.597E−05	2.777E+09	0.001
$1s\,4s\ ^3S_1$	$1s\,5d\ ^3D_1$	1.3285E+01	1.095E−03	1.380E+10	1.3229E+01	1.114E−03	1.403E+10	0.002
$1s\,4d\ ^3D_2$	$1s\,5d\ ^3D_1$	1.4209E+01	1.940E−04	2.137E+09	1.4150E+01	1.951E−04	2.149E+09	0.000
$1s\,4d\ ^3D_1$	$1s\,5d\ ^3D_1$	1.4219E+01	1.902E−04	2.091E+09	1.4159E+01	1.904E−04	2.094E+09	0.000
$1s\,4d\ ^3D_3$	$1s\,5d\ ^3D_1$	1.4463E+01	3.687E−05	3.919E+08	1.4402E+01	3.689E−05	3.921E+08	0.001
$1s\,4d\ ^1D_2$	$1s\,5d\ ^3D_1$	1.4474E+01	1.291E−04	1.370E+09	1.4412E+01	1.289E−04	1.368E+09	0.000
$1s\,5s\ ^3S_1$	$1s\,5d\ ^3D_1$	3.9728E+02	3.792E−07	5.342E+03	3.9446E+02	3.826E−07	5.421E+03	0.023
$1s\,5d\ ^3D_2$	$1s\,5d\ ^3D_1$	4.0886E+04	1.644E−13	2.186E−07				0.336
$1s\,2s\ ^3S_1$	$1s\,5d\ ^3D_3$	1.4408E+00	1.204E−04	5.525E+10	1.4347E+00	1.149E−04	5.277E+10	0.002
$1s\,3s\ ^3S_1$	$1s\,5d\ ^3D_3$	4.2622E+00	6.786E−04	3.560E+10	4.2443E+00	6.795E−04	3.563E+10	0.002
$1s\,3d\ ^3D_2$	$1s\,5d\ ^3D_3$	4.4858E+00	4.726E−05	2.238E+09	4.4668E+00	4.769E−05	2.258E+09	0.001
$1s\,3d\ ^3D_1$	$1s\,5d\ ^3D_3$	4.4882E+00	7.661E−06	3.624E+08	4.4692E+00	7.705E−06	3.644E+08	0.002
$1s\,3d\ ^3D_3$	$1s\,5d\ ^3D_3$	4.5454E+00	1.848E−04	8.523E+09	4.5261E+00	1.847E−04	8.521E+09	0.001
$1s\,3d\ ^1D_2$	$1s\,5d\ ^3D_3$	4.5477E+00	3.058E−05	1.409E+09	4.5284E+00	3.047E−05	1.404E+09	0.001
$1s\,4s\ ^3S_1$	$1s\,5d\ ^3D_3$	1.3179E+01	2.524E−03	1.385E+10	1.3123E+01	2.570E−03	1.410E+10	0.002
$1s\,4d\ ^3D_2$	$1s\,5d\ ^3D_3$	1.4088E+01	2.165E−04	1.040E+09	1.4029E+01	2.178E−04	1.046E+09	0.000
$1s\,4d\ ^3D_1$	$1s\,5d\ ^3D_3$	1.4097E+01	3.491E−05	1.674E+08	1.4038E+01	3.507E−05	1.681E+08	0.000
$1s\,4d\ ^3D_3$	$1s\,5d\ ^3D_3$	1.4337E+01	8.763E−04	4.062E+09	1.4277E+01	8.786E−04	4.072E+09	0.000
$1s\,4d\ ^1D_2$	$1s\,5d\ ^3D_3$	1.4348E+01	1.443E−04	6.680E+08	1.4287E+01	1.441E−04	6.672E+08	0.000
$1s\,5s\ ^3S_1$	$1s\,5d\ ^3D_3$	3.1997E+02	1.720E−06	1.600E+04	3.1810E+02	1.730E−06	1.615E+04	0.020
$1s\,5d\ ^3D_2$	$1s\,5d\ ^3D_3$	1.5807E+03	3.267E−09	1.246E+00				0.003
$1s\,5d\ ^3D_1$	$1s\,5d\ ^3D_3$	1.6443E+03	4.714E−10	1.661E−01				0.008
$1s\,2p\ ^3P^o_1$	$1s\,5f\ ^3F^o_3$	1.4538E+00	1.563E−03	7.049E+11	1.4478E+00	1.594E−03	7.186E+11	0.001
$1s\,2p\ ^3P^o_2$	$1s\,5f\ ^3F^o_3$	1.5232E+00	4.174E−04	1.714E+11	1.5168E+00	4.215E−04	1.730E+11	0.001
$1s\,2p\ ^1P^o_1$	$1s\,5f\ ^3F^o_3$	1.5298E+00	1.017E−04	4.140E+10	1.5235E+00	9.866E−05	4.016E+10	0.003
$1s\,3p\ ^3P^o_1$	$1s\,5f\ ^3F^o_3$	4.2930E+00	6.727E−05	3.478E+09	4.2753E+00	6.478E−05	3.348E+09	0.001
$1s\,3p\ ^3P^o_2$	$1s\,5f\ ^3F^o_3$	4.4720E+00	4.140E−06	1.972E+08	4.4534E+00	3.472E−06	1.654E+08	0.002
$1s\,3p\ ^1P^o_1$	$1s\,5f\ ^3F^o_3$	4.4880E+00	8.259E−07	3.907E+07	4.4696E+00	1.108E−06	5.240E+07	0.012
$1s\,4p\ ^3P^o_1$	$1s\,5f\ ^3F^o_3$	1.3298E+01	3.606E−03	1.943E+10	1.3242E+01	3.616E−03	1.948E+10	0.000
$1s\,4p\ ^3P^o_2$	$1s\,5f\ ^3F^o_3$	1.4030E+01	8.664E−04	4.194E+09	1.3970E+01	8.723E−04	4.223E+09	0.000
$1s\,4p\ ^1P^o_1$	$1s\,5f\ ^3F^o_3$	1.4095E+01	2.047E−04	9.816E+08	1.4036E+01	2.005E−04	9.620E+08	0.000
$1s\,4f\ ^3F^o_3$	$1s\,5f\ ^3F^o_3$	1.4339E+01	5.397E−04	2.501E+09	1.4278E+01	5.406E−04	2.505E+09	0.000
$1s\,4f\ ^3F^o_2$	$1s\,5f\ ^3F^o_3$	1.4344E+01	8.972E−05	4.155E+08	1.4283E+01	8.978E−05	4.157E+08	0.000
$1s\,4f\ ^3F^o_4$	$1s\,5f\ ^3F^o_3$	1.4466E+01	9.385E−05	4.274E+08	1.4404E+01	9.364E−05	4.264E+08	0.000
$1s\,4f\ ^1F^o_3$	$1s\,5f\ ^3F^o_3$	1.4470E+01	1.130E−05	5.141E+07	1.4408E+01	1.125E−05	5.124E+07	0.000
$1s\,5p\ ^3P^o_1$	$1s\,5f\ ^3F^o_3$	3.5882E+02	8.216E−07	6.081E+03	3.5685E+02	8.246E−07	6.118E+03	0.001
$1s\,5p\ ^3P^o_2$	$1s\,5f\ ^3F^o_3$	1.2712E+03	4.533E−09	2.673E+00	1.2579E+03	4.615E−09	2.756E+00	0.010
$1s\,5p\ ^1P^o_1$	$1s\,5f\ ^3F^o_3$	1.6156E+03	5.213E−10	1.903E−01				0.012
$1s\,2p\ ^3P^o_1$	$1s\,5f\ ^3F^o_2$	1.4538E+00	4.796E−04	3.027E+11	1.4478E+00	4.936E−04	3.115E+11	0.001
$1s\,2p\ ^3P^o_0$	$1s\,5f\ ^3F^o_2$	1.4548E+00	6.831E−04	4.305E+11	1.4488E+00	6.959E−04	4.385E+11	0.000
$1s\,2p\ ^3P^o_2$	$1s\,5f\ ^3F^o_2$	1.5232E+00	1.045E−04	6.006E+10	1.5168E+00	1.058E−04	6.085E+10	0.001

(*continued on next page*)

Table 4 (*continued*)

Lower	Upper	GRASP2K			FAC			*dT*
		λ (Å)	*gf*	A (s^{-1})	λ (Å)	*gf*	A (s^{-1})	
$1s\,2p\ ^1P^o_1$	$1s\,5f\ ^3F^o_2$	1.5298E+00	2.187E−04	1.247E+11	1.5234E+00	2.185E−04	1.245E+11	0.002
$1s\,3p\ ^3P^o_1$	$1s\,5f\ ^3F^o_2$	4.2928E+00	2.075E−05	1.502E+09	4.2750E+00	1.920E−05	1.389E+09	0.002
$1s\,3p\ ^3P^o_0$	$1s\,5f\ ^3F^o_2$	4.2951E+00	2.908E−05	2.103E+09	4.2773E+00	2.793E−05	2.019E+09	0.001
$1s\,3p\ ^3P^o_2$	$1s\,5f\ ^3F^o_2$	4.4718E+00	1.047E−06	6.984E+07	4.4531E+00	8.606E−07	5.740E+07	0.005
$1s\,3p\ ^1P^o_1$	$1s\,5f\ ^3F^o_2$	4.4878E+00	1.836E−06	1.216E+08	4.4693E+00	1.609E−06	1.065E+08	0.004
$1s\,4p\ ^3P^o_1$	$1s\,5f\ ^3F^o_2$	1.3296E+01	1.101E−03	8.310E+09	1.3240E+01	1.110E−03	8.382E+09	0.000
$1s\,4p\ ^3P^o_0$	$1s\,5f\ ^3F^o_2$	1.3305E+01	1.570E−03	1.183E+10	1.3248E+01	1.574E−03	1.186E+10	0.000
$1s\,4p\ ^3P^o_2$	$1s\,5f\ ^3F^o_2$	1.4027E+01	2.174E−04	1.474E+09	1.3967E+01	2.189E−04	1.484E+09	0.000
$1s\,4p\ ^1P^o_1$	$1s\,5f\ ^3F^o_2$	1.4093E+01	4.547E−04	3.054E+09	1.4033E+01	4.555E−04	3.059E+09	0.000
$1s\,4f\ ^3F^o_3$	$1s\,5f\ ^3F^o_2$	1.4336E+01	8.950E−05	5.809E+08	1.4275E+01	8.974E−05	5.825E+08	0.000
$1s\,4f\ ^3F^o_2$	$1s\,5f\ ^3F^o_2$	1.4342E+01	3.591E−04	2.329E+09	1.4281E+01	3.595E−04	2.332E+09	0.000
$1s\,4f\ ^3F^o_4$	$1s\,5f\ ^3F^o_2$	1.4463E+01	7.505E−06	4.786E+07	1.4401E+01	7.492E−06	4.778E+07	0.000
$1s\,4f\ ^1F^o_3$	$1s\,5f\ ^3F^o_2$	1.4467E+01	6.818E−05	4.346E+08	1.4405E+01	6.800E−05	4.334E+08	0.000
$1s\,5p\ ^3P^o_1$	$1s\,5f\ ^3F^o_2$	3.5713E+02	2.546E−07	2.663E+03	3.5518E+02	2.555E−07	2.679E+03	0.001
$1s\,5p\ ^3P^o_0$	$1s\,5f\ ^3F^o_2$	3.6039E+02	3.530E−07	3.626E+03	3.5830E+02	3.545E−07	3.652E+03	0.001
$1s\,5p\ ^3P^o_2$	$1s\,5f\ ^3F^o_2$	1.2503E+03	1.196E−09	1.021E+00	1.2374E+03	1.217E−09	1.051E+00	0.009
$1s\,5p\ ^1P^o_1$	$1s\,5f\ ^3F^o_2$	1.5820E+03	1.240E−09	6.612E−01	1.5673E+03	1.256E−09	6.767E−01	0.013
$1s\,5f\ ^3F^o_3$	$1s\,5f\ ^3F^o_2$	7.6009E+04	1.358E−14	3.135E−09				0.251
$1s^2\ ^1S_0$	$1s\,5d\ ^1D_2$	3.2000E−01	3.384E−04	4.406E+12	3.1875E−01	3.920E−04	5.103E+12	0.001
$1s\,2s\ ^3S_1$	$1s\,5d\ ^1D_2$	1.4408E+00	3.421E−05	2.199E+10	1.4346E+00	3.238E−05	2.081E+10	0.001
$1s\,2s\ ^1S_0$	$1s\,5d\ ^1D_2$	1.4551E+00	4.690E−05	2.955E+10	1.4492E+00	4.826E−05	3.040E+10	0.002
$1s\,3s\ ^3S_1$	$1s\,5d\ ^1D_2$	4.2617E+00	1.913E−04	1.405E+10	4.2438E+00	1.909E−04	1.402E+10	0.002
$1s\,3s\ ^1S_0$	$1s\,5d\ ^1D_2$	4.2949E+00	2.860E−04	2.068E+10	4.2772E+00	2.874E−04	2.078E+10	0.001
$1s\,3d\ ^3D_2$	$1s\,5d\ ^1D_2$	4.4852E+00	1.193E−05	7.912E+08	4.4662E+00	1.201E−05	7.964E+08	0.000
$1s\,3d\ ^3D_1$	$1s\,5d\ ^1D_2$	4.4876E+00	2.723E−05	1.804E+09	4.4686E+00	2.736E−05	1.812E+09	0.001
$1s\,3d\ ^3D_3$	$1s\,5d\ ^1D_2$	4.5449E+00	3.039E−05	1.963E+09	4.5255E+00	3.031E−05	1.958E+09	0.001
$1s\,3d\ ^1D_2$	$1s\,5d\ ^1D_2$	4.5472E+00	1.242E−04	8.013E+09	4.5278E+00	1.237E−04	7.986E+09	0.001
$1s\,4s\ ^3S_1$	$1s\,5d\ ^1D_2$	1.3174E+01	7.090E−04	5.450E+09	1.3118E+01	7.220E−04	5.550E+09	0.002
$1s\,4s\ ^1S_0$	$1s\,5d\ ^1D_2$	1.3302E+01	1.097E−03	8.271E+09	1.3247E+01	1.082E−03	8.157E+09	0.001
$1s\,4d\ ^3D_2$	$1s\,5d\ ^1D_2$	1.4082E+01	5.367E−05	3.610E+08	1.4023E+01	5.400E−05	3.632E+08	0.000
$1s\,4d\ ^3D_1$	$1s\,5d\ ^1D_2$	1.4092E+01	1.243E−04	8.352E+08	1.4033E+01	1.245E−04	8.366E+08	0.000
$1s\,4d\ ^3D_3$	$1s\,5d\ ^1D_2$	1.4332E+01	1.438E−04	9.338E+08	1.4271E+01	1.442E−04	9.366E+08	0.000
$1s\,4d\ ^1D_2$	$1s\,5d\ ^1D_2$	1.4342E+01	5.883E−04	3.816E+09	1.4282E+01	5.895E−04	3.823E+09	0.000
$1s\,5s\ ^3S_1$	$1s\,5d\ ^1D_2$	3.1728E+02	4.955E−07	6.566E+03	3.1538E+02	4.978E−07	6.620E+03	0.018
$1s\,5s\ ^1S_0$	$1s\,5d\ ^1D_2$	3.5905E+02	5.277E−07	5.460E+03	3.5720E+02	5.289E−07	5.482E+03	0.031
$1s\,5d\ ^3D_2$	$1s\,5d\ ^1D_2$	1.5170E+03	9.109E−10	5.280E−01				0.016
$1s\,5d\ ^3D_1$	$1s\,5d\ ^1D_2$	1.5755E+03	1.889E−09	1.015E+00				0.003
$1s\,5d\ ^3D_3$	$1s\,5d\ ^1D_2$	3.7649E+04	1.593E−13	1.499E−07				0.285
$1s\,2p\ ^3P^o_2$	$1s\,5f\ ^3F^o_4$	1.5225E+00	2.780E−03	8.890E+11	1.5161E+00	2.919E−03	9.332E+11	0.000
$1s\,3p\ ^3P^o_2$	$1s\,5f\ ^3F^o_4$	4.4658E+00	3.882E−05	1.443E+09	4.4472E+00	3.385E−05	1.257E+09	0.001
$1s\,4p\ ^3P^o_2$	$1s\,5f\ ^3F^o_4$	1.3968E+01	5.895E−03	2.239E+10	1.3909E+01	5.959E−03	2.263E+10	0.000
$1s\,4f\ ^3F^o_3$	$1s\,5f\ ^3F^o_4$	1.4275E+01	9.254E−05	3.366E+08	1.4214E+01	9.308E−05	3.385E+08	0.000
$1s\,4f\ ^3F^o_2$	$1s\,5f\ ^3F^o_4$	1.4280E+01	7.287E−06	2.648E+07	1.4220E+01	7.321E−06	2.660E+07	0.000
$1s\,4f\ ^3F^o_4$	$1s\,5f\ ^3F^o_4$	1.4401E+01	7.716E−04	2.758E+09	1.4339E+01	7.730E−04	2.762E+09	0.000
$1s\,4f\ ^1F^o_3$	$1s\,5f\ ^3F^o_4$	1.4404E+01	7.051E−05	2.519E+08	1.4343E+01	7.056E−05	2.520E+08	0.000
$1s\,5p\ ^3P^o_2$	$1s\,5f\ ^3F^o_4$	9.0890E+02	8.517E−08	7.641E+01	9.0168E+02	8.608E−08	7.780E+01	0.007
$1s\,5f\ ^3F^o_3$	$1s\,5f\ ^3F^o_4$	3.1889E+03	1.921E−10	1.400E−02	3.1838E+03	1.906E−10	1.382E−02	0.001
$1s\,5f\ ^3F^o_2$	$1s\,5f\ ^3F^o_4$	3.3285E+03	1.343E−11	8.982E−04				0.017
$1s\,3d\ ^3D_2$	$1s\,5g\ ^3G_4$	4.4792E+00	6.254E−03	2.310E+11	4.4604E+00	6.315E−03	2.332E+11	0.000
$1s\,3d\ ^3D_3$	$1s\,5g\ ^3G_4$	4.5387E+00	6.548E−04	2.356E+10	4.5195E+00	6.553E−04	2.357E+10	0.000
$1s\,3d\ ^1D_2$	$1s\,5g\ ^3G_4$	4.5410E+00	5.882E−05	2.114E+09	4.5219E+00	5.907E−05	2.122E+09	0.000
$1s\,4d\ ^3D_2$	$1s\,5g\ ^3G_4$	1.4023E+01	5.755E−03	2.169E+10	1.3966E+01	5.765E−03	2.172E+10	0.000
$1s\,4d\ ^3D_3$	$1s\,5g\ ^3G_4$	1.4271E+01	5.740E−04	2.089E+09	1.4212E+01	5.735E−04	2.086E+09	0.000
$1s\,4d\ ^1D_2$	$1s\,5g\ ^3G_4$	1.4281E+01	5.352E−05	1.945E+08	1.4222E+01	5.388E−05	1.957E+08	0.000
$1s\,5d\ ^3D_2$	$1s\,5g\ ^3G_4$	1.0444E+03	2.420E−08	1.645E+01	1.0513E+03	2.342E−08	1.557E+01	0.002
$1s\,5d\ ^3D_3$	$1s\,5g\ ^3G_4$	3.0779E+03	9.602E−11	7.512E−03	3.1417E+03	8.912E−11	6.635E−03	0.001
$1s\,5d\ ^1D_2$	$1s\,5g\ ^3G_4$	3.3519E+03	7.054E−12	4.653E−04				0.014
$1s\,2s\ ^3S_1$	$1s\,5g\ ^3G_3$	1.4401E+00	2.205E−11	1.013E+04	1.4340E+00	5.275E−14	2.423E+01	0.632
$1s\,3s\ ^3S_1$	$1s\,5g\ ^3G_3$	4.2561E+00	6.131E−09	3.225E+05				0.019
$1s\,3d\ ^3D_2$	$1s\,5g\ ^3G_3$	4.4791E+00	6.989E−04	3.319E+10	4.4603E+00	7.065E−04	3.355E+10	0.000
$1s\,3d\ ^3D_1$	$1s\,5g\ ^3G_3$	4.4815E+00	4.174E−03	1.980E+11	4.4627E+00	4.206E−03	1.995E+11	0.000
$1s\,3d\ ^3D_3$	$1s\,5g\ ^3G_3$	4.5386E+00	7.882E−05	3.646E+09	4.5194E+00	7.892E−05	3.651E+09	0.000
$1s\,3d\ ^1D_2$	$1s\,5g\ ^3G_3$	4.5409E+00	4.695E−04	2.170E+10	4.5217E+00	4.687E−04	2.165E+10	0.000
$1s\,4s\ ^3S_1$	$1s\,5g\ ^3G_3$	1.3121E+01	9.510E−09	5.263E+04				0.006
$1s\,4d\ ^3D_2$	$1s\,5g\ ^3G_3$	1.4022E+01	6.457E−04	3.129E+09	1.3965E+01	6.475E−04	3.137E+09	0.000
$1s\,4d\ ^3D_1$	$1s\,5g\ ^3G_3$	1.4031E+01	3.837E−03	1.857E+10	1.3974E+01	3.841E−03	1.858E+10	0.000
$1s\,4d\ ^3D_3$	$1s\,5g\ ^3G_3$	1.4269E+01	6.912E−05	3.235E+08	1.4210E+01	6.907E−05	3.231E+08	0.000
$1s\,4d\ ^1D_2$	$1s\,5g\ ^3G_3$	1.4280E+01	4.090E−04	1.912E+09	1.4221E+01	4.079E−04	1.905E+09	0.000
$1s\,5s\ ^3S_1$	$1s\,5g\ ^3G_3$	2.8921E+02	1.975E−12	2.250E−02	2.8822E+02	1.905E−12	2.167E−02	0.069
$1s\,5d\ ^3D_2$	$1s\,5g\ ^3G_3$	1.0362E+03	2.785E−09	2.471E+00	1.0430E+03	2.697E−09	2.342E+00	0.001
$1s\,5d\ ^3D_1$	$1s\,5g\ ^3G_3$	1.0632E+03	1.531E−08	1.291E+01	1.0701E+03	1.482E−08	1.222E+01	0.002

(*continued on next page*)

Table 4 (*continued*)

Lower	Upper	GRASP2K			FAC			*dT*
		λ (Å)	*gf*	*A* (s^{-1})	λ (Å)	*gf*	*A* (s^{-1})	
$1s\,5d\ ^3D_3$	$1s\,5g\ ^3G_3$	3.0082E+03	1.239E−11	1.304E−03				0.004
$1s\,5d\ ^1D_2$	$1s\,5g\ ^3G_3$	3.2694E+03	5.703E−11	5.084E−03	3.3474E+03	5.238E−11	4.417E−03	0.014
$1s\,5g\ ^3G_4$	$1s\,5g\ ^3G_3$	1.3281E+05	1.079E−15	5.826E−11				0.731
$1s\,2p\ ^3P^o_1$	$1s\,5f\ ^1F^o_3$	1.4532E+00	3.021E−06	1.363E+09	1.4471E+00	3.966E−06	1.789E+09	0.017
$1s\,2p\ ^3P^o_2$	$1s\,5f\ ^1F^o_3$	1.5225E+00	3.106E−04	1.277E+11	1.5161E+00	3.258E−04	1.339E+11	0.001
$1s\,2p\ ^1P^o_1$	$1s\,5f\ ^1F^o_3$	1.5291E+00	1.859E−03	7.576E+11	1.5227E+00	1.916E−03	7.807E+11	0.001
$1s\,3p\ ^3P^o_1$	$1s\,5f\ ^1F^o_3$	4.2871E+00	1.345E−07	6.974E+06	4.2694E+00	4.281E−08	2.219E+06	0.026
$1s\,3p\ ^3P^o_2$	$1s\,5f\ ^1F^o_3$	4.4656E+00	4.376E−06	2.091E+08	4.4470E+00	3.777E−06	1.804E+08	0.001
$1s\,3p\ ^1P^o_1$	$1s\,5f\ ^1F^o_3$	4.4815E+00	2.232E−05	1.059E+09	4.4631E+00	2.227E−05	1.056E+09	0.002
$1s\,4p\ ^3P^o_1$	$1s\,5f\ ^1F^o_3$	1.3241E+01	5.944E−06	3.231E+07	1.3185E+01	6.974E−06	3.790E+07	0.001
$1s\,4p\ ^3P^o_2$	$1s\,5f\ ^1F^o_3$	1.3966E+01	6.580E−04	3.215E+09	1.3907E+01	6.653E−04	3.250E+09	0.000
$1s\,4p\ ^1P^o_1$	$1s\,5f\ ^1F^o_3$	1.4031E+01	3.910E−03	1.892E+10	1.3972E+01	3.910E−03	1.892E+10	0.000
$1s\,4f\ ^3F^o_3$	$1s\,5f\ ^1F^o_3$	1.4273E+01	1.118E−05	5.231E+07	1.4212E+01	1.125E−05	5.265E+07	0.000
$1s\,4f\ ^3F^o_2$	$1s\,5f\ ^1F^o_3$	1.4278E+01	6.735E−05	3.148E+08	1.4218E+01	6.769E−05	3.163E+08	0.000
$1s\,4f\ ^3F^o_4$	$1s\,5f\ ^1F^o_3$	1.4398E+01	7.046E−05	3.239E+08	1.4337E+01	7.063E−05	3.246E+08	0.000
$1s\,4f\ ^1F^o_3$	$1s\,5f\ ^1F^o_3$	1.4402E+01	5.838E−04	2.682E+09	1.4341E+01	5.847E−04	2.686E+09	0.000
$1s\,5p\ ^3P^o_1$	$1s\,5f\ ^1F^o_3$	3.2151E+02	1.870E−09	1.724E+01	3.1987E+02	1.897E−09	1.752E+01	0.002
$1s\,5p\ ^3P^o_2$	$1s\,5f\ ^1F^o_3$	9.0084E+02	9.762E−09	1.146E+01	8.9370E+02	9.861E−09	1.166E+01	0.005
$1s\,5p\ ^1P^o_1$	$1s\,5f\ ^1F^o_3$	1.0611E+03	3.558E−08	3.011E+01	1.0539E+03	3.585E−08	3.049E+01	0.007
$1s\,5f\ ^3F^o_3$	$1s\,5f\ ^1F^o_3$	3.0918E+03	2.542E−11	2.534E−03				0.013
$1s\,5f\ ^3F^o_2$	$1s\,5f\ ^1F^o_3$	3.2229E+03	1.353E−10	1.241E−02	3.2177E+03	1.342E−10	1.224E−02	0.002
$1s\,5f\ ^3F^o_4$	$1s\,5f\ ^1F^o_3$	1.0160E+05	4.530E−15	4.182E−10				0.407
$1s\,3d\ ^3D_3$	$1s\,5g\ ^3G_5$	4.5349E+00	8.603E−03	2.537E+11	4.5157E+00	8.751E−03	2.580E+11	0.000
$1s\,4d\ ^3D_3$	$1s\,5g\ ^3G_5$	1.4233E+01	7.663E−03	2.294E+10	1.4174E+01	7.697E−03	2.303E+10	0.000
$1s\,5d\ ^3D_3$	$1s\,5g\ ^3G_5$	1.9545E+03	5.017E−09	7.964E−01	1.9786E+03	4.774E−09	7.332E−01	0.001
$1s\,5g\ ^3G_4$	$1s\,5g\ ^3G_5$	5.3554E+03	1.676E−11	3.544E−04	5.3442E+03	1.665E−11	3.506E−04	0.005
$1s\,5g\ ^3G_3$	$1s\,5g\ ^3G_5$	5.5804E+03	7.076E−13	1.378E−05				0.118
$1s\,3d\ ^3D_2$	$1s\,5g\ ^1G_4$	4.4754E+00	1.669E−07	6.178E+06				0.002
$1s\,3d\ ^3D_3$	$1s\,5g\ ^1G_4$	4.5348E+00	5.236E−04	1.887E+10	4.5156E+00	5.326E−04	1.919E+10	0.000
$1s\,3d\ ^1D_2$	$1s\,5g\ ^1G_4$	4.5371E+00	6.519E−03	2.347E+11	4.5179E+00	6.617E−03	2.382E+11	0.000
$1s\,4d\ ^3D_2$	$1s\,5g\ ^1G_4$	1.3986E+01	2.967E−07	1.124E+06				0.001
$1s\,4d\ ^3D_3$	$1s\,5g\ ^1G_4$	1.4232E+01	4.665E−04	1.707E+09	1.4173E+01	4.686E−04	1.714E+09	0.000
$1s\,4d\ ^1D_2$	$1s\,5g\ ^1G_4$	1.4242E+01	5.798E−03	2.119E+10	1.4183E+01	5.817E−03	2.125E+10	0.000
$1s\,5d\ ^3D_2$	$1s\,5g\ ^1G_4$	8.6941E+02	2.714E−12	2.661E−03	8.7388E+02	2.967E−12	2.855E−03	0.022
$1s\,5d\ ^3D_3$	$1s\,5g\ ^1G_4$	1.9321E+03	3.162E−10	6.278E−02	1.9554E+03	3.010E−10	5.784E−02	0.001
$1s\,5d\ ^1D_2$	$1s\,5g\ ^1G_4$	2.0366E+03	3.358E−09	6.000E−01	2.0649E+03	3.180E−09	5.481E−01	0.007
$1s\,5g\ ^3G_4$	$1s\,5g\ ^1G_4$	5.1900E+03	1.321E−12	3.636E−05				0.045
$1s\,5g\ ^3G_3$	$1s\,5g\ ^1G_4$	5.4011E+03	1.294E−11	3.288E−04	5.3899E+03	1.285E−11	3.251E−04	0.008
$1s\,5g\ ^3G_5$	$1s\,5g\ ^1G_4$	1.6804E+05	4.412E−16	1.158E−11				0.888
$1s\,2s\ ^3S_1$	$1s\,6s\ ^3S_1$	1.3696E+00	2.953E−10	3.501E+05				0.955
$1s\,3s\ ^3S_1$	$1s\,6s\ ^3S_1$	3.6936E+00	9.398E−11	1.532E+04				0.701
$1s\,3d\ ^3D_2$	$1s\,6s\ ^3S_1$	3.8604E+00	1.286E−05	1.919E+09	3.8445E+00	1.300E−05	1.939E+09	0.008
$1s\,3d\ ^3D_1$	$1s\,6s\ ^3S_1$	3.8622E+00	1.310E−05	1.952E+09	3.8463E+00	1.290E−05	1.923E+09	0.012
$1s\,3d\ ^3D_3$	$1s\,6s\ ^3S_1$	3.9045E+00	3.054E−05	4.453E+09	3.8883E+00	3.041E−05	4.435E+09	0.008
$1s\,3d\ ^1D_2$	$1s\,6s\ ^3S_1$	3.9062E+00	8.750E−06	1.275E+09	3.8900E+00	8.603E−06	1.253E+09	0.010
$1s\,4s\ ^3S_1$	$1s\,6s\ ^3S_1$	8.9291E+00	9.105E−10	2.539E+04				0.189
$1s\,4d\ ^3D_2$	$1s\,6s\ ^3S_1$	9.3373E+00	4.394E−05	1.121E+09	9.3006E+00	4.402E−05	1.122E+09	0.001
$1s\,4d\ ^3D_1$	$1s\,6s\ ^3S_1$	9.3415E+00	4.405E−05	1.122E+09	9.3048E+00	4.355E−05	1.109E+09	0.004
$1s\,4d\ ^3D_3$	$1s\,6s\ ^3S_1$	9.4463E+00	1.037E−04	2.583E+09	9.4089E+00	1.029E−04	2.563E+09	0.002
$1s\,4d\ ^1D_2$	$1s\,6s\ ^3S_1$	9.4508E+00	2.923E−05	7.276E+08	9.4135E+00	2.897E−05	7.208E+08	0.003
$1s\,5s\ ^3S_1$	$1s\,6s\ ^3S_1$	2.5485E+01	4.451E−09	1.524E+04				0.034
$1s\,5d\ ^3D_2$	$1s\,6s\ ^3S_1$	2.7214E+01	1.771E−04	5.316E+08	2.7122E+01	1.754E−04	5.256E+08	0.001
$1s\,5d\ ^3D_1$	$1s\,6s\ ^3S_1$	2.7232E+01	1.769E−04	5.303E+08	2.7140E+01	1.731E−04	5.181E+08	0.002
$1s\,5d\ ^3D_3$	$1s\,6s\ ^3S_1$	2.7691E+01	4.244E−04	1.231E+09	2.7596E+01	4.178E−04	1.209E+09	0.001
$1s\,5d\ ^1D_2$	$1s\,6s\ ^3S_1$	2.7711E+01	1.192E−04	3.450E+08	2.7617E+01	1.172E−04	3.389E+08	0.002
$1s\,5g\ ^3G_3$	$1s\,6s\ ^3S_1$	2.7948E+01	1.280E−10	3.644E+02				0.022
$1s\,2p\ ^3P^o_1$	$1s\,6p\ ^3P^o_1$	1.3810E+00	1.717E−07	2.002E+08	1.3752E+00	2.325E−07	2.710E+08	0.030
$1s\,2p\ ^3P^o_2$	$1s\,6p\ ^3P^o_1$	1.4434E+00	2.896E−05	3.090E+10	1.4374E+00	2.858E−05	3.050E+10	0.007
$1s\,2p\ ^1P^o_1$	$1s\,6p\ ^3P^o_1$	1.4493E+00	2.557E−05	2.706E+10	1.4433E+00	2.438E−05	2.580E+10	0.000
$1s\,3p\ ^3P^o_1$	$1s\,6p\ ^3P^o_1$	3.7142E+00	3.248E−07	5.236E+07	3.6989E+00	4.474E−07	7.210E+07	0.004
$1s\,3p\ ^3P^o_2$	$1s\,6p\ ^3P^o_1$	3.8474E+00	6.170E−05	9.267E+09	3.8314E+00	6.176E−05	9.275E+09	0.006
$1s\,3p\ ^1P^o_1$	$1s\,6p\ ^3P^o_1$	3.8593E+00	5.498E−05	8.208E+09	3.8434E+00	5.307E−05	7.920E+09	0.005
$1s\,4p\ ^3P^o_1$	$1s\,6p\ ^3P^o_1$	8.9685E+00	6.588E−07	1.821E+07	8.9310E+00	8.937E−07	2.470E+07	0.001
$1s\,4p\ ^3P^o_2$	$1s\,6p\ ^3P^o_1$	9.2954E+00	1.314E−04	3.381E+09	9.2564E+00	1.331E−04	3.424E+09	0.001
$1s\,4p\ ^1P^o_1$	$1s\,6p\ ^3P^o_1$	9.3241E+00	1.177E−04	3.010E+09	9.2853E+00	1.149E−04	2.939E+09	0.000
$1s\,4f\ ^3F^o_3$	$1s\,6p\ ^3P^o_1$	9.4302E+00	2.483E−05	6.209E+08	9.3908E+00	2.464E−05	6.161E+08	0.001
$1s\,4f\ ^3F^o_2$	$1s\,6p\ ^3P^o_1$	9.4324E+00	7.599E−06	1.899E+08	9.3930E+00	7.633E−06	1.907E+08	0.001
$1s\,4f\ ^1F^o_3$	$1s\,6p\ ^3P^o_1$	9.4866E+00	4.042E−08	9.986E+05	9.4468E+00	5.810E−08	1.435E+06	0.005
$1s\,5p\ ^3P^o_1$	$1s\,6p\ ^3P^o_1$	2.5582E+01	2.016E−06	6.850E+06	2.5476E+01	2.721E−06	9.243E+06	0.000
$1s\,5p\ ^3P^o_2$	$1s\,6p\ ^3P^o_1$	2.6962E+01	4.480E−04	1.370E+09	2.6849E+01	4.561E−04	1.395E+09	0.000
$1s\,5p\ ^1P^o_1$	$1s\,6p\ ^3P^o_1$	2.7084E+01	4.051E−04	1.228E+09	2.6972E+01	3.966E−04	1.202E+09	0.000

(*continued on next page*)

Table 4 (*continued*)

Lower	Upper	GRASP2K			FAC			*dT*
		λ (Å)	*gf*	A (s^{-1})	λ (Å)	*gf*	A (s^{-1})	
$1s\,5f\ ^3F^o_3$	$1s\,6p\ ^3P^o_2$	2.7546E+01	1.673E−04	4.903E+08	2.7434E+01	1.664E−04	4.875E+08	0.000
$1s\,5f\ ^3F^o_2$	$1s\,6p\ ^3P^o_1$	2.7556E+01	5.120E−05	1.499E+08	2.7444E+01	5.132E−05	1.502E+08	0.000
$1s\,5f\ ^1F^o_3$	$1s\,6p\ ^3P^o_1$	2.7794E+01	2.736E−07	7.876E+05	2.7680E+01	3.570E−07	1.027E+06	0.000
$1s\,3d\ ^3D_2$	$1s\,6s\ ^1S_0$	3.8573E+00	8.512E−06	3.816E+09	3.8418E+00	8.554E−06	3.833E+09	0.004
$1s\,3d\ ^1D_2$	$1s\,6s\ ^1S_0$	3.9030E+00	1.339E−05	5.863E+09	3.8873E+00	1.312E−05	5.742E+09	0.012
$1s\,4d\ ^3D_2$	$1s\,6s\ ^1S_0$	9.3190E+00	2.867E−05	2.202E+09	9.2851E+00	2.880E−05	2.209E+09	0.002
$1s\,4d\ ^1D_2$	$1s\,6s\ ^1S_0$	9.4321E+00	4.483E−05	3.361E+09	9.3976E+00	4.468E−05	3.346E+09	0.002
$1s\,5d\ ^3D_2$	$1s\,6s\ ^1S_0$	2.7060E+01	1.136E−04	1.034E+09	2.6991E+01	1.153E−04	1.047E+09	0.001
$1s\,5d\ ^1D_2$	$1s\,6s\ ^1S_0$	2.7551E+01	1.808E−04	1.589E+09	2.7480E+01	1.831E−04	1.604E+09	0.000
$1s\,2p\ ^3P^o_2$	$1s\,6p\ ^3P^o_0$	1.4434E+00	1.839E−05	5.887E+10	1.4374E+00	1.782E−05	5.703E+10	0.005
$1s\,3p\ ^3P^o_2$	$1s\,6p\ ^3P^o_0$	3.8472E+00	3.921E−05	1.767E+10	3.8320E+00	3.856E−05	1.736E+10	0.006
$1s\,4p\ ^3P^o_2$	$1s\,6p\ ^3P^o_0$	9.2942E+00	8.350E−05	6.448E+09	9.2596E+00	8.326E−05	6.422E+09	0.001
$1s\,4f\ ^3F^o_2$	$1s\,6p\ ^3P^o_0$	9.4312E+00	1.079E−05	8.090E+08	9.3964E+00	1.073E−05	8.042E+08	0.001
$1s\,5p\ ^3P^o_2$	$1s\,6p\ ^3P^o_0$	2.6952E+01	2.844E−04	2.612E+09	2.6876E+01	2.863E−04	2.621E+09	0.000
$1s\,5f\ ^3F^o_2$	$1s\,6p\ ^3P^o_0$	2.7545E+01	7.268E−05	6.390E+08	2.7473E+01	7.228E−05	6.334E+08	0.000
$1s\,2p\ ^3P^o_1$	$1s\,6p\ ^3P^o_2$	1.3788E+00	3.430E−05	2.407E+10	1.3731E+00	3.466E−05	2.432E+10	0.006
$1s\,2p\ ^3P^o_0$	$1s\,6p\ ^3P^o_2$	1.3797E+00	2.139E−05	1.499E+10	1.3739E+00	2.180E−05	1.528E+10	0.002
$1s\,2p\ ^3P^o_2$	$1s\,6p\ ^3P^o_2$	1.4410E+00	3.551E−05	2.281E+10	1.4350E+00	3.534E−05	2.270E+10	0.006
$1s\,2p\ ^1P^o_1$	$1s\,6p\ ^3P^o_2$	1.4469E+00	1.342E−05	8.551E+09	1.4409E+00	1.332E−05	8.486E+09	0.000
$1s\,3p\ ^3P^o_1$	$1s\,6p\ ^3P^o_2$	3.6983E+00	6.924E−05	6.753E+09	3.6831E+00	6.933E−05	6.760E+09	0.007
$1s\,3p\ ^3P^o_0$	$1s\,6p\ ^3P^o_2$	3.7000E+00	4.378E−05	4.266E+09	3.6848E+00	4.378E−05	4.265E+09	0.006
$1s\,3p\ ^3P^o_2$	$1s\,6p\ ^3P^o_2$	3.8304E+00	7.355E−05	6.688E+09	3.8145E+00	7.319E−05	6.653E+09	0.007
$1s\,3p\ ^1P^o_1$	$1s\,6p\ ^3P^o_2$	3.8422E+00	2.807E−05	2.536E+09	3.8264E+00	2.789E−05	2.520E+09	0.005
$1s\,4p\ ^3P^o_1$	$1s\,6p\ ^3P^o_2$	8.8767E+00	1.362E−04	2.306E+09	8.8397E+00	1.369E−04	2.318E+09	0.001
$1s\,4p\ ^3P^o_0$	$1s\,6p\ ^3P^o_2$	8.8807E+00	8.658E−05	1.465E+09	8.8435E+00	8.652E−05	1.463E+09	0.001
$1s\,4p\ ^3P^o_2$	$1s\,6p\ ^3P^o_2$	9.1968E+00	1.504E−04	2.372E+09	9.1583E+00	1.507E−04	2.376E+09	0.001
$1s\,4p\ ^1P^o_1$	$1s\,6p\ ^3P^o_2$	9.2248E+00	5.772E−05	9.049E+08	9.1865E+00	5.772E−05	9.047E+08	0.000
$1s\,4f\ ^3F^o_3$	$1s\,6p\ ^3P^o_2$	9.3286E+00	5.477E−06	8.396E+07	9.2898E+00	5.452E−06	8.357E+07	0.001
$1s\,4f\ ^3F^o_2$	$1s\,6p\ ^3P^o_2$	9.3309E+00	1.379E−06	2.113E+07	9.2920E+00	1.357E−06	2.079E+07	0.002
$1s\,4f\ ^3F^o_4$	$1s\,6p\ ^3P^o_2$	9.3822E+00	3.795E−05	5.752E+08	9.3430E+00	3.754E−05	5.688E+08	0.000
$1s\,4f\ ^1F^o_3$	$1s\,6p\ ^3P^o_2$	9.3838E+00	4.233E−06	6.413E+07	9.3446E+00	4.189E−06	6.346E+07	0.000
$1s\,5p\ ^3P^o_1$	$1s\,6p\ ^3P^o_2$	2.4849E+01	3.840E−04	8.296E+08	2.4746E+01	3.860E−04	8.339E+08	0.000
$1s\,5p\ ^3P^o_0$	$1s\,6p\ ^3P^o_2$	2.4864E+01	2.449E−04	5.284E+08	2.4761E+01	2.428E−04	5.240E+08	0.000
$1s\,5p\ ^3P^o_2$	$1s\,6p\ ^3P^o_2$	2.6148E+01	4.645E−04	9.063E+08	2.6040E+01	4.663E−04	9.096E+08	0.000
$1s\,5p\ ^1P^o_1$	$1s\,6p\ ^3P^o_2$	2.6264E+01	1.798E−04	3.477E+08	2.6156E+01	1.793E−04	3.466E+08	0.000
$1s\,5f\ ^3F^o_3$	$1s\,6p\ ^3P^o_2$	2.6698E+01	3.580E−05	6.700E+07	2.6590E+01	3.549E−05	6.640E+07	0.000
$1s\,5f\ ^3F^o_2$	$1s\,6p\ ^3P^o_2$	2.6707E+01	9.011E−06	1.685E+07	2.6599E+01	8.838E−06	1.652E+07	0.000
$1s\,5f\ ^3F^o_4$	$1s\,6p\ ^3P^o_2$	2.6923E+01	2.493E−04	4.588E+08	2.6814E+01	2.461E−04	4.528E+08	0.000
$1s\,5f\ ^1F^o_3$	$1s\,6p\ ^3P^o_2$	2.6930E+01	2.780E−05	5.113E+07	2.6821E+01	2.745E−05	5.048E+07	0.000
$1s\,6p\ ^3P^o_1$	$1s\,6p\ ^3P^o_2$	8.6654E+02	1.895E−07	3.367E+02	8.6410E+02	1.920E−07	3.402E+02	0.003
$1s\,6p\ ^3P^o_0$	$1s\,6p\ ^3P^o_2$	8.7749E+02	1.161E−07	2.012E+02	8.3677E+02	1.322E−07	2.498E+02	0.003
$1s^2\ ^1S_0$	$1s\,6d\ ^3D_2$	3.1620E−01	1.394E−04	1.859E+12	3.1497E−01	1.398E−04	1.864E+12	0.002
$1s\,2s\ ^3S_1$	$1s\,6d\ ^3D_2$	1.3669E+00	1.366E−05	9.753E+09	1.3610E+00	1.209E−05	8.637E+09	0.007
$1s\,2s\ ^1S_0$	$1s\,6d\ ^3D_2$	1.3798E+00	7.380E−06	5.171E+09	1.3741E+00	7.407E−06	5.189E+09	0.004
$1s\,3s\ ^3S_1$	$1s\,6d\ ^3D_2$	3.6741E+00	8.920E−05	8.815E+09	3.6587E+00	8.805E−05	8.701E+09	0.004
$1s\,3s\ ^1S_0$	$1s\,6d\ ^3D_2$	3.6988E+00	5.586E−05	5.447E+09	3.6835E+00	5.475E−05	5.337E+09	0.013
$1s\,3d\ ^3D_2$	$1s\,6d\ ^3D_2$	3.8391E+00	3.737E−05	3.382E+09	3.8228E+00	3.713E−05	3.361E+09	0.003
$1s\,3d\ ^3D_1$	$1s\,6d\ ^3D_2$	3.8409E+00	1.647E−05	1.489E+09	3.8245E+00	1.647E−05	1.490E+09	0.007
$1s\,3d\ ^3D_3$	$1s\,6d\ ^3D_2$	3.8827E+00	1.797E−05	1.590E+09	3.8661E+00	1.793E−05	1.587E+09	0.004
$1s\,3d\ ^1D_2$	$1s\,6d\ ^3D_2$	3.8844E+00	4.392E−06	3.883E+08	3.8678E+00	4.140E−06	3.661E+08	0.010
$1s\,4s\ ^3S_1$	$1s\,6d\ ^3D_2$	8.8160E+00	2.394E−04	4.109E+09	8.7783E+00	2.410E−04	4.138E+09	0.003
$1s\,4s\ ^1S_0$	$1s\,6d\ ^3D_2$	8.8733E+00	1.533E−04	2.598E+09	8.8358E+00	1.502E−04	2.545E+09	0.007
$1s\,4d\ ^3D_2$	$1s\,6d\ ^3D_2$	9.2136E+00	1.112E−04	1.748E+09	9.1745E+00	1.107E−04	1.740E+09	0.001
$1s\,4d\ ^3D_1$	$1s\,6d\ ^3D_2$	9.2178E+00	4.892E−05	7.682E+08	9.1786E+00	4.923E−05	7.730E+08	0.002
$1s\,4d\ ^3D_3$	$1s\,6d\ ^3D_2$	9.3198E+00	5.465E−05	8.393E+08	9.2799E+00	5.491E−05	8.435E+08	0.001
$1s\,4d\ ^1D_2$	$1s\,6d\ ^3D_2$	9.3242E+00	1.339E−05	2.054E+08	9.2843E+00	1.284E−05	1.970E+08	0.003
$1s\,5s\ ^3S_1$	$1s\,6d\ ^3D_2$	2.4585E+01	7.948E−04	1.754E+09	2.4475E+01	8.142E−04	1.798E+09	0.002
$1s\,5s\ ^1S_0$	$1s\,6d\ ^3D_2$	2.4809E+01	5.211E−04	1.130E+09	2.4699E+01	5.045E−04	1.094E+09	0.001
$1s\,5d\ ^3D_2$	$1s\,6d\ ^3D_2$	2.6190E+01	4.075E−04	7.925E+08	2.6077E+01	4.066E−04	7.910E+08	0.000
$1s\,5d\ ^3D_1$	$1s\,6d\ ^3D_2$	2.6207E+01	1.795E−04	3.486E+08	2.6094E+01	1.806E−04	3.509E+08	0.001
$1s\,5d\ ^3D_3$	$1s\,6d\ ^3D_2$	2.6631E+01	2.076E−04	3.904E+08	2.6515E+01	2.095E−04	3.941E+08	0.000
$1s\,5d\ ^1D_2$	$1s\,6d\ ^3D_2$	2.6650E+01	5.102E−05	9.582E+07	2.6534E+01	4.929E−05	9.260E+07	0.001
$1s\,5g\ ^3G_4$	$1s\,6d\ ^3D_2$	2.6864E+01	6.067E−05	1.121E+08	2.6740E+01	6.071E−05	1.123E+08	0.000
$1s\,5g\ ^3G_3$	$1s\,6d\ ^3D_2$	2.6869E+01	6.827E−06	1.262E+07	2.6746E+01	6.882E−06	1.272E+07	0.000
$1s\,5g\ ^1G_4$	$1s\,6d\ ^3D_2$	2.7003E+01	4.401E−09	8.052E+03				0.005
$1s\,6s\ ^3S_1$	$1s\,6d\ ^3D_2$	6.9582E+02	3.295E−07	9.080E+02	6.7673E+02	3.578E−07	1.033E+03	0.023
$1s\,6s\ ^1S_0$	$1s\,6d\ ^3D_2$	8.1469E+02	1.337E−07	2.688E+02	7.7023E+02	1.541E−07	3.436E+02	0.058
$1s\,2p\ ^3P^o_1$	$1s\,6p\ ^1P^o_1$	1.3786E+00	3.042E−05	3.559E+10	1.3729E+00	3.065E−05	3.585E+10	0.000
$1s\,2p\ ^3P^o_2$	$1s\,6p\ ^1P^o_1$	1.4408E+00	1.370E−05	1.468E+10	1.4348E+00	1.329E−05	1.423E+10	0.002
$1s\,2p\ ^1P^o_1$	$1s\,6p\ ^1P^o_1$	1.4467E+00	1.838E−05	1.952E+10	1.4407E+00	1.863E−05	1.979E+10	0.007
$1s\,3p\ ^3P^o_1$	$1s\,6p\ ^1P^o_1$	3.6970E+00	6.212E−05	1.010E+10	3.6819E+00	6.180E−05	1.005E+10	0.006

(*continued on next page*)

Table 4 (*continued*)

Lower	Upper	GRASP2K			FAC			*dT*
		λ (Å)	*gf*	*A* (s^{-1})	λ (Å)	*gf*	*A* (s^{-1})	
$1s\,3p\ ^3P^o_2$	$1s\,6p\ ^1P^o_1$	3.8290E+00	2.847E−05	4.318E+09	3.8133E+00	2.744E−05	4.160E+09	0.005
$1s\,3p\ ^1P^o_1$	$1s\,6p\ ^1P^o_1$	3.8407E+00	3.813E−05	5.747E+09	3.8251E+00	3.860E−05	5.816E+09	0.003
$1s\,4p\ ^3P^o_1$	$1s\,6p\ ^1P^o_1$	8.8691E+00	1.223E−04	3.458E+09	8.8329E+00	1.223E−04	3.455E+09	0.001
$1s\,4p\ ^3P^o_2$	$1s\,6p\ ^1P^o_1$	9.1886E+00	5.804E−05	1.529E+09	9.1511E+00	5.631E−05	1.482E+09	0.001
$1s\,4p\ ^1P^o_1$	$1s\,6p\ ^1P^o_1$	9.2166E+00	7.802E−05	2.042E+09	9.1793E+00	7.959E−05	2.082E+09	0.000
$1s\,4f\ ^3F^o_3$	$1s\,6p\ ^1P^o_1$	9.3203E+00	1.284E−06	3.286E+07	9.2824E+00	1.452E−06	3.715E+07	0.003
$1s\,4f\ ^3F^o_2$	$1s\,6p\ ^1P^o_1$	9.3225E+00	2.872E−06	7.347E+07	9.2846E+00	2.760E−06	7.058E+07	0.001
$1s\,4f\ ^1F^o_3$	$1s\,6p\ ^1P^o_1$	9.3754E+00	2.499E−05	6.322E+08	9.3371E+00	2.499E−05	6.319E+08	0.001
$1s\,5p\ ^3P^o_1$	$1s\,6p\ ^1P^o_1$	2.4789E+01	3.429E−04	1.241E+09	2.4694E+01	3.435E−04	1.241E+09	0.000
$1s\,5p\ ^3P^o_2$	$1s\,6p\ ^1P^o_1$	2.6083E+01	1.778E−04	5.810E+08	2.5981E+01	1.727E−04	5.643E+08	0.000
$1s\,5p\ ^1P^o_1$	$1s\,6p\ ^1P^o_1$	2.6197E+01	2.407E−04	7.798E+08	2.6097E+01	2.471E−04	8.000E+08	0.000
$1s\,5f\ ^3F^o_3$	$1s\,6p\ ^1P^o_1$	2.6629E+01	8.342E−06	2.616E+07	2.6529E+01	9.671E−06	3.029E+07	0.000
$1s\,5f\ ^3F^o_2$	$1s\,6p\ ^1P^o_1$	2.6638E+01	1.871E−05	5.863E+07	2.6539E+01	1.789E−05	5.600E+07	0.000
$1s\,5f\ ^1F^o_3$	$1s\,6p\ ^1P^o_1$	2.6860E+01	1.637E−04	5.046E+08	2.6759E+01	1.646E−04	5.067E+08	0.000
$1s\,6p\ ^3P^o_1$	$1s\,6p\ ^1P^o_1$	7.9973E+02	2.175E−07	7.560E+02	8.0416E+02	2.068E−07	7.051E+02	0.003
$1s\,6p\ ^3P^o_2$	$1s\,6p\ ^1P^o_1$	1.0374E+04	4.887E−11	1.010E−03				0.005
$1s\,2s\ ^3S_1$	$1s\,6d\ ^3D_1$	1.3668E+00	1.350E−05	1.607E+10	1.3611E+00	1.183E−05	1.408E+10	0.004
$1s\,3s\ ^3S_1$	$1s\,6d\ ^3D_1$	3.6740E+00	8.868E−05	1.461E+10	3.6587E+00	8.652E−05	1.424E+10	0.006
$1s\,3d\ ^3D_2$	$1s\,6d\ ^3D_1$	3.8389E+00	1.627E−05	2.454E+09	3.8228E+00	1.618E−05	2.441E+09	0.005
$1s\,3d\ ^3D_1$	$1s\,6d\ ^3D_1$	3.8407E+00	1.611E−05	2.429E+09	3.8246E+00	1.597E−05	2.408E+09	0.005
$1s\,3d\ ^3D_3$	$1s\,6d\ ^3D_1$	3.8825E+00	2.940E−06	4.336E+08	3.8662E+00	2.932E−06	4.324E+08	0.006
$1s\,3d\ ^1D_2$	$1s\,6d\ ^3D_1$	3.8842E+00	1.041E−05	1.534E+09	3.8678E+00	1.015E−05	1.496E+09	0.005
$1s\,4s\ ^3S_1$	$1s\,6d\ ^3D_1$	8.8149E+00	2.379E−04	6.807E+09	8.7785E+00	2.371E−04	6.783E+09	0.004
$1s\,4d\ ^3D_2$	$1s\,6d\ ^3D_1$	9.2124E+00	4.864E−05	1.274E+09	9.1748E+00	4.850E−05	1.270E+09	0.002
$1s\,4d\ ^3D_1$	$1s\,6d\ ^3D_1$	9.2166E+00	4.770E−05	1.249E+09	9.1789E+00	4.769E−05	1.247E+09	0.002
$1s\,4d\ ^3D_3$	$1s\,6d\ ^3D_1$	9.3186E+00	8.922E−06	2.284E+08	9.2802E+00	8.978E−06	2.298E+08	0.002
$1s\,4d\ ^1D_2$	$1s\,6d\ ^3D_1$	9.3230E+00	3.131E−05	8.010E+08	9.2846E+00	3.094E−05	7.914E+08	0.001
$1s\,5s\ ^3S_1$	$1s\,6d\ ^3D_1$	2.4577E+01	7.884E−04	2.902E+09	2.4477E+01	8.016E−04	2.949E+09	0.003
$1s\,5d\ ^3D_2$	$1s\,6d\ ^3D_1$	2.6180E+01	1.783E−04	5.784E+08	2.6079E+01	1.784E−04	5.784E+08	0.001
$1s\,5d\ ^3D_1$	$1s\,6d\ ^3D_1$	2.6197E+01	1.744E−04	5.652E+08	2.6096E+01	1.750E−04	5.667E+08	0.000
$1s\,5d\ ^3D_3$	$1s\,6d\ ^3D_1$	2.6621E+01	3.384E−05	1.062E+08	2.6517E+01	3.426E−05	1.074E+08	0.001
$1s\,5d\ ^1D_2$	$1s\,6d\ ^3D_1$	2.6640E+01	1.185E−04	3.712E+08	2.6536E+01	1.178E−04	3.688E+08	0.000
$1s\,5g\ ^3G_3$	$1s\,6d\ ^3D_1$	2.6859E+01	4.044E−05	1.246E+08	2.6748E+01	4.053E−05	1.248E+08	0.000
$1s\,6s\ ^3S_1$	$1s\,6d\ ^3D_1$	6.8911E+02	3.374E−07	1.580E+03	6.7829E+02	3.486E−07	1.670E+03	0.016
$1s\,6d\ ^3D_2$	$1s\,6d\ ^3D_1$	7.1428E+04	1.468E−13	6.396E−08				0.467
$1s\,2s\ ^3S_1$	$1s\,6d\ ^3D_3$	1.3662E+00	4.040E−05	2.062E+10	1.3604E+00	3.740E−05	1.909E+10	0.001
$1s\,3s\ ^3S_1$	$1s\,6d\ ^3D_3$	3.6692E+00	2.239E−04	1.585E+10	3.6538E+00	2.222E−04	1.572E+10	0.005
$1s\,3d\ ^3D_2$	$1s\,6d\ ^3D_3$	3.8337E+00	1.908E−05	1.237E+09	3.8174E+00	1.928E−05	1.250E+09	0.004
$1s\,3d\ ^3D_1$	$1s\,6d\ ^3D_3$	3.8355E+00	3.117E−06	2.019E+08	3.8192E+00	3.126E−06	2.025E+08	0.005
$1s\,3d\ ^3D_3$	$1s\,6d\ ^3D_3$	3.8772E+00	7.363E−05	4.667E+09	3.8607E+00	7.364E−05	4.668E+09	0.004
$1s\,3d\ ^1D_2$	$1s\,6d\ ^3D_3$	3.8789E+00	1.225E−05	7.761E+08	3.8624E+00	1.214E−05	7.694E+08	0.005
$1s\,4s\ ^3S_1$	$1s\,6d\ ^3D_3$	8.7877E+00	5.723E−04	7.062E+09	8.7503E+00	5.746E−04	7.090E+09	0.004
$1s\,4d\ ^3D_2$	$1s\,6d\ ^3D_3$	9.1827E+00	5.597E−05	6.325E+08	9.1440E+00	5.630E−05	6.362E+08	0.001
$1s\,4d\ ^3D_1$	$1s\,6d\ ^3D_3$	9.1868E+00	9.054E−06	1.022E+08	9.1480E+00	9.077E−06	1.024E+08	0.001
$1s\,4d\ ^3D_3$	$1s\,6d\ ^3D_3$	9.2881E+00	2.193E−04	2.423E+09	9.2486E+00	2.195E−04	2.424E+09	0.001
$1s\,4d\ ^1D_2$	$1s\,6d\ ^3D_3$	9.2925E+00	3.614E−05	3.988E+08	9.2530E+00	3.603E−05	3.976E+08	0.002
$1s\,5s\ ^3S_1$	$1s\,6d\ ^3D_3$	2.4366E+01	1.808E−03	2.903E+09	2.4258E+01	1.840E−03	2.955E+09	0.002
$1s\,5d\ ^3D_2$	$1s\,6d\ ^3D_3$	2.5941E+01	1.985E−04	2.811E+08	2.5832E+01	1.994E−04	2.823E+08	0.000
$1s\,5d\ ^3D_1$	$1s\,6d\ ^3D_3$	2.5958E+01	3.202E−05	4.528E+07	2.5848E+01	3.209E−05	4.538E+07	0.000
$1s\,5d\ ^3D_3$	$1s\,6d\ ^3D_3$	2.6374E+01	8.038E−04	1.101E+09	2.6261E+01	8.056E−04	1.103E+09	0.000
$1s\,5d\ ^1D_2$	$1s\,6d\ ^3D_3$	2.6393E+01	1.321E−04	1.808E+08	2.6280E+01	1.319E−04	1.804E+08	0.000
$1s\,5g\ ^3G_4$	$1s\,6d\ ^3D_3$	2.6602E+01	5.844E−06	7.869E+06	2.6482E+01	5.860E−06	7.894E+06	0.000
$1s\,5g\ ^3G_3$	$1s\,6d\ ^3D_3$	2.6608E+01	7.044E−07	9.481E+05	2.6488E+01	7.042E−07	9.483E+05	0.000
$1s\,5g\ ^3G_5$	$1s\,6d\ ^3D_3$	2.6735E+01	7.898E−05	1.053E+08	2.6614E+01	7.896E−05	1.053E+08	0.000
$1s\,5g\ ^1G_4$	$1s\,6d\ ^3D_3$	2.6739E+01	4.809E−06	6.409E+06	2.6619E+01	4.803E−06	6.404E+06	0.000
$1s\,6s\ ^3S_1$	$1s\,6d\ ^3D_3$	5.5466E+02	1.528E−06	4.732E+03	5.4291E+02	1.608E−06	5.157E+03	0.017
$1s\,6d\ ^3D_2$	$1s\,6d\ ^3D_3$	2.7340E+03	3.001E−09	3.826E−01				0.003
$1s\,6d\ ^3D_1$	$1s\,6d\ ^3D_3$	2.8428E+03	4.330E−10	5.106E−02				0.008
$1s\,2p\ ^3P^o_1$	$1s\,6f\ ^3F^o_3$	1.3779E+00	9.054E−04	4.544E+11	1.3722E+00	9.227E−04	4.630E+11	0.001
$1s\,2p\ ^3P^o_2$	$1s\,6f\ ^3F^o_3$	1.4401E+00	2.384E−04	1.095E+11	1.4340E+00	2.412E−04	1.108E+11	0.001
$1s\,2p\ ^1P^o_1$	$1s\,6f\ ^3F^o_3$	1.4460E+00	5.807E−05	2.646E+10	1.4400E+00	5.515E−05	2.513E+10	0.001
$1s\,3p\ ^3P^o_1$	$1s\,6f\ ^3F^o_3$	3.6921E+00	3.684E−06	2.575E+08	3.6768E+00	4.342E−06	3.035E+08	0.024
$1s\,3p\ ^3P^o_2$	$1s\,6f\ ^3F^o_3$	3.8237E+00	6.010E−06	3.917E+08	3.8077E+00	6.772E−06	4.413E+08	0.007
$1s\,3p\ ^1P^o_1$	$1s\,6f\ ^3F^o_3$	3.8355E+00	1.590E−06	1.030E+08	3.8195E+00	1.275E−06	8.258E+07	0.008
$1s\,4p\ ^3P^o_1$	$1s\,6f\ ^3F^o_3$	8.8410E+00	3.538E−04	4.314E+09	8.8032E+00	3.517E−04	4.288E+09	0.000
$1s\,4p\ ^3P^o_2$	$1s\,6f\ ^3F^o_3$	9.1585E+00	6.227E−05	7.074E+08	9.1192E+00	6.110E−05	6.942E+08	0.000
$1s\,4p\ ^1P^o_1$	$1s\,6f\ ^3F^o_3$	9.1863E+00	1.425E−05	1.609E+08	9.1472E+00	1.460E−05	1.649E+08	0.000
$1s\,4f\ ^3F^o_3$	$1s\,6f\ ^3F^o_3$	9.2892E+00	1.116E−04	1.233E+09	9.2496E+00	1.113E−04	1.229E+09	0.001
$1s\,4f\ ^3F^o_2$	$1s\,6f\ ^3F^o_3$	9.2914E+00	1.854E−05	2.047E+08	9.2518E+00	1.857E−05	2.050E+08	0.001
$1s\,4f\ ^3F^o_4$	$1s\,6f\ ^3F^o_3$	9.3423E+00	1.905E−05	2.080E+08	9.3023E+00	1.898E−05	2.072E+08	0.001
$1s\,4f\ ^1F^o_3$	$1s\,6f\ ^3F^o_3$	9.3440E+00	2.289E−06	2.499E+07	9.3039E+00	2.187E−06	2.387E+07	0.001

(*continued on next page*)

Table 4 (*continued*)

Lower	Upper	GRASP2K			FAC			*dT*
		λ (Å)	*gf*	A (s^{-1})	λ (Å)	*gf*	A (s^{-1})	
$1s\,5p\ ^3P^o_1$	$1s\,6f\ ^3F^o_3$	2.4571E+01	2.580E−03	4.072E+09	2.4463E+01	2.587E−03	4.085E+09	0.000
$1s\,5p\ ^3P^o_2$	$1s\,6f\ ^3F^o_3$	2.5841E+01	6.351E−04	9.063E+08	2.5726E+01	6.431E−04	9.181E+08	0.000
$1s\,5p\ ^1P^o_1$	$1s\,6f\ ^3F^o_3$	2.5954E+01	1.498E−04	2.119E+08	2.5839E+01	1.432E−04	2.027E+08	0.000
$1s\,5f\ ^3F^o_3$	$1s\,6f\ ^3F^o_3$	2.6377E+01	6.346E−04	8.692E+08	2.6263E+01	6.351E−04	8.700E+08	0.000
$1s\,5f\ ^3F^o_2$	$1s\,6f\ ^3F^o_3$	2.6386E+01	1.056E−04	1.445E+08	2.6272E+01	1.060E−04	1.451E+08	0.000
$1s\,5f\ ^3F^o_4$	$1s\,6f\ ^3F^o_3$	2.6597E+01	1.106E−04	1.490E+08	2.6482E+01	1.110E−04	1.495E+08	0.000
$1s\,5f\ ^1F^o_3$	$1s\,6f\ ^3F^o_3$	2.6604E+01	1.332E−05	1.793E+07	2.6488E+01	1.282E−05	1.727E+07	0.000
$1s\,6p\ ^3P^o_1$	$1s\,6f\ ^3F^o_3$	6.2157E+02	8.428E−07	2.079E+03	6.1517E+02	8.540E−07	2.132E+03	0.002
$1s\,6p\ ^3P^o_2$	$1s\,6f\ ^3F^o_3$	2.1987E+03	4.683E−09	9.231E−01	2.1353E+03	5.072E−09	1.051E+00	0.014
$1s\,6p\ ^1P^o_1$	$1s\,6f\ ^3F^o_3$	2.7901E+03	5.400E−10	6.610E−02				0.014
$1s\,2p\ ^3P^o_1$	$1s\,6f\ ^3F^o_2$	1.3779E+00	2.777E−04	1.951E+11	1.3722E+00	2.854E−04	2.005E+11	0.001
$1s\,2p\ ^3P^o_0$	$1s\,6f\ ^3F^o_2$	1.3788E+00	3.955E−04	2.775E+11	1.3730E+00	4.024E−04	2.823E+11	0.000
$1s\,2p\ ^3P^o_2$	$1s\,6f\ ^3F^o_2$	1.4401E+00	5.965E−05	3.838E+10	1.4340E+00	6.023E−05	3.874E+10	0.002
$1s\,2p\ ^1P^o_1$	$1s\,6f\ ^3F^o_2$	1.4459E+00	1.248E−04	7.961E+10	1.4400E+00	1.244E−04	7.940E+10	0.002
$1s\,3p\ ^3P^o_1$	$1s\,6f\ ^3F^o_2$	3.6920E+00	1.087E−06	1.064E+08	3.6768E+00	1.477E−06	1.445E+08	0.029
$1s\,3p\ ^3P^o_0$	$1s\,6f\ ^3F^o_2$	3.6937E+00	1.645E−06	1.609E+08	3.6784E+00	1.937E−06	1.893E+08	0.023
$1s\,3p\ ^3P^o_2$	$1s\,6f\ ^3F^o_2$	3.8236E+00	1.498E−06	1.367E+08	3.8077E+00	1.691E−06	1.543E+08	0.012
$1s\,3p\ ^1P^o_1$	$1s\,6f\ ^3F^o_2$	3.8353E+00	3.469E−06	3.146E+08	3.8195E+00	3.746E−06	3.396E+08	0.003
$1s\,4p\ ^3P^o_1$	$1s\,6f\ ^3F^o_2$	8.8404E+00	1.083E−04	1.849E+09	8.8032E+00	1.065E−04	1.819E+09	0.001
$1s\,4p\ ^3P^o_0$	$1s\,6f\ ^3F^o_2$	8.8444E+00	1.537E−04	2.622E+09	8.8071E+00	1.527E−04	2.605E+09	0.000
$1s\,4p\ ^3P^o_2$	$1s\,6f\ ^3F^o_2$	9.1578E+00	1.565E−05	2.489E+08	9.1192E+00	1.529E−05	2.432E+08	0.001
$1s\,4p\ ^1P^o_1$	$1s\,6f\ ^3F^o_2$	9.1856E+00	3.180E−05	5.028E+08	9.1472E+00	3.119E−05	4.931E+08	0.000
$1s\,4f\ ^3F^o_3$	$1s\,6f\ ^3F^o_2$	9.2886E+00	1.855E−05	2.868E+08	9.2496E+00	1.847E−05	2.856E+08	0.001
$1s\,4f\ ^3F^o_2$	$1s\,6f\ ^3F^o_2$	9.2908E+00	7.429E−05	1.148E+09	9.2518E+00	7.409E−05	1.145E+09	0.000
$1s\,4f\ ^3F^o_4$	$1s\,6f\ ^3F^o_2$	9.3416E+00	1.524E−06	2.329E+07	9.3023E+00	1.517E−06	2.318E+07	0.001
$1s\,4f\ ^1F^o_3$	$1s\,6f\ ^3F^o_2$	9.3433E+00	1.384E−05	2.116E+08	9.3039E+00	1.371E−05	2.095E+08	0.001
$1s\,5p\ ^3P^o_1$	$1s\,6f\ ^3F^o_2$	2.4566E+01	7.873E−04	1.740E+09	2.4463E+01	7.936E−04	1.754E+09	0.000
$1s\,5p\ ^3P^o_0$	$1s\,6f\ ^3F^o_2$	2.4582E+01	1.123E−03	2.479E+09	2.4477E+01	1.126E−03	2.486E+09	0.000
$1s\,5p\ ^3P^o_2$	$1s\,6f\ ^3F^o_2$	2.5836E+01	1.593E−04	3.185E+08	2.5726E+01	1.609E−04	3.216E+08	0.000
$1s\,5p\ ^1P^o_1$	$1s\,6f\ ^3F^o_2$	2.5948E+01	3.343E−04	6.624E+08	2.5839E+01	3.349E−04	6.635E+08	0.000
$1s\,5f\ ^3F^o_3$	$1s\,6f\ ^3F^o_2$	2.6372E+01	1.053E−04	2.020E+08	2.6263E+01	1.054E−04	2.022E+08	0.000
$1s\,5f\ ^3F^o_2$	$1s\,6f\ ^3F^o_2$	2.6381E+01	4.223E−04	8.094E+08	2.6272E+01	4.226E−04	8.098E+08	0.000
$1s\,5f\ ^3F^o_4$	$1s\,6f\ ^3F^o_2$	2.6592E+01	8.828E−06	1.665E+07	2.6482E+01	8.872E−06	1.673E+07	0.000
$1s\,5f\ ^1F^o_3$	$1s\,6f\ ^3F^o_2$	2.6599E+01	8.031E−05	1.514E+08	2.6489E+01	8.015E−05	1.511E+08	0.000
$1s\,6p\ ^3P^o_1$	$1s\,6f\ ^3F^o_2$	6.1864E+02	2.611E−07	9.100E+02	6.1520E+02	2.653E−07	9.272E+02	0.001
$1s\,6p\ ^3P^o_0$	$1s\,6f\ ^3F^o_2$	6.2421E+02	3.621E−07	1.240E+03	6.0122E+02	4.004E−07	1.465E+03	0.001
$1s\,6p\ ^3P^o_2$	$1s\,6f\ ^3F^o_2$	2.1625E+03	1.236E−09	3.526E−01	2.1357E+03	1.266E−09	3.671E−01	0.013
$1s\,6p\ ^1P^o_1$	$1s\,6f\ ^3F^o_2$	2.7321E+03	1.288E−09	2.302E−01	2.6181E+03	1.394E−09	2.690E−01	0.017
$1s\,6f\ ^3F^o_3$	$1s\,6f\ ^3F^o_2$	1.3144E+05	1.419E−14	1.096E−09				0.139
$1s^2\ ^1S_0$	$1s\,6d\ ^1D_2$	3.1620E−01	2.010E−04	2.681E+12	3.1493E−01	2.346E−04	3.129E+12	0.002
$1s\,2s\ ^3S_1$	$1s\,6d\ ^1D_2$	1.3661E+00	1.156E−05	8.265E+09	1.3604E+00	1.042E−05	7.448E+09	0.008
$1s\,2s\ ^1S_0$	$1s\,6d\ ^1D_2$	1.3791E+00	1.520E−05	1.066E+10	1.3734E+00	1.583E−05	1.110E+10	0.002
$1s\,3s\ ^3S_1$	$1s\,6d\ ^1D_2$	3.6690E+00	6.320E−05	6.263E+09	3.6537E+00	6.164E−05	6.108E+09	0.004
$1s\,3s\ ^1S_0$	$1s\,6d\ ^1D_2$	3.6936E+00	9.420E−05	9.212E+09	3.6785E+00	9.501E−05	9.288E+09	0.013
$1s\,3d\ ^3D_2$	$1s\,6d\ ^1D_2$	3.8335E+00	4.853E−06	4.406E+08	3.8174E+00	4.999E−06	4.537E+08	0.001
$1s\,3d\ ^3D_1$	$1s\,6d\ ^1D_2$	3.8353E+00	1.105E−05	1.002E+09	3.8191E+00	1.091E−05	9.901E+08	0.006
$1s\,3d\ ^3D_3$	$1s\,6d\ ^1D_2$	3.8770E+00	1.211E−05	1.075E+09	3.8606E+00	1.192E−05	1.058E+09	0.005
$1s\,3d\ ^1D_2$	$1s\,6d\ ^1D_2$	3.8787E+00	4.990E−05	4.425E+09	3.8623E+00	4.949E−05	4.388E+09	0.006
$1s\,4s\ ^3S_1$	$1s\,6d\ ^1D_2$	8.7865E+00	1.610E−04	2.782E+09	8.7499E+00	1.592E−04	2.751E+09	0.003
$1s\,4s\ ^1S_0$	$1s\,6d\ ^1D_2$	8.8434E+00	2.451E−04	4.180E+09	8.8071E+00	2.460E−04	4.195E+09	0.007
$1s\,4d\ ^3D_2$	$1s\,6d\ ^1D_2$	9.1814E+00	1.395E−05	2.208E+08	9.1435E+00	1.436E−05	2.272E+08	0.000
$1s\,4d\ ^3D_1$	$1s\,6d\ ^1D_2$	9.1855E+00	3.215E−05	5.084E+08	9.1476E+00	3.177E−05	5.021E+08	0.002
$1s\,4d\ ^3D_3$	$1s\,6d\ ^1D_2$	9.2868E+00	3.602E−05	5.571E+08	9.2482E+00	3.553E−05	5.496E+08	0.002
$1s\,4d\ ^1D_2$	$1s\,6d\ ^1D_2$	9.2911E+00	1.477E−04	2.282E+09	9.2526E+00	1.477E−04	2.282E+09	0.002
$1s\,5s\ ^3S_1$	$1s\,6d\ ^1D_2$	2.4357E+01	5.073E−04	1.141E+09	2.4255E+01	5.096E−04	1.145E+09	0.003
$1s\,5s\ ^1S_0$	$1s\,6d\ ^1D_2$	2.4576E+01	7.897E−04	1.744E+09	2.4475E+01	7.829E−04	1.728E+09	0.001
$1s\,5d\ ^3D_2$	$1s\,6d\ ^1D_2$	2.5931E+01	4.900E−05	9.721E+07	2.5828E+01	5.056E−05	1.002E+08	0.000
$1s\,5d\ ^3D_1$	$1s\,6d\ ^1D_2$	2.5947E+01	1.137E−04	2.253E+08	2.5844E+01	1.121E−04	2.221E+08	0.000
$1s\,5d\ ^3D_3$	$1s\,6d\ ^1D_2$	2.6363E+01	1.317E−04	2.529E+08	2.6257E+01	1.303E−04	2.501E+08	0.000
$1s\,5d\ ^1D_2$	$1s\,6d\ ^1D_2$	2.6382E+01	5.402E−04	1.035E+09	2.6276E+01	5.422E−04	1.038E+09	0.000
$1s\,5g\ ^3G_4$	$1s\,6d\ ^1D_2$	2.6591E+01	5.584E−07	1.054E+06	2.6478E+01	6.309E−07	1.190E+06	0.000
$1s\,5g\ ^3G_3$	$1s\,6d\ ^1D_2$	2.6597E+01	4.150E−06	7.826E+06	2.6484E+01	4.105E−06	7.742E+06	0.000
$1s\,5g\ ^1G_4$	$1s\,6d\ ^1D_2$	2.6728E+01	5.969E−05	1.115E+08	2.6615E+01	5.978E−05	1.116E+08	0.000
$1s\,6s\ ^3S_1$	$1s\,6d\ ^1D_2$	5.4990E+02	4.398E−07	1.940E+03	5.4127E+02	4.505E−07	2.034E+03	0.014
$1s\,6s\ ^1S_0$	$1s\,6d\ ^1D_2$	6.2157E+02	4.706E−07	1.625E+03	5.9948E+02	5.219E−07	1.921E+03	0.040
$1s\,6d\ ^3D_2$	$1s\,6d\ ^1D_2$	2.6222E+03	8.371E−10	1.624E−01				0.019
$1s\,6d\ ^3D_1$	$1s\,6d\ ^1D_2$	2.7221E+03	1.737E−09	3.127E−01				0.001
$1s\,6d\ ^3D_3$	$1s\,6d\ ^1D_2$	6.4120E+04	1.525E−13	4.950E−08				0.345
$1s\,2p\ ^3P^o_2$	$1s\,6f\ ^3F^o_4$	1.4397E+00	1.592E−03	5.693E+11	1.4336E+00	1.671E−03	5.974E+11	0.001
$1s\,3p\ ^3P^o_2$	$1s\,6f\ ^3F^o_4$	3.8211E+00	3.236E−05	1.643E+09	3.8051E+00	3.745E−05	1.901E+09	0.010
$1s\,4p\ ^3P^o_2$	$1s\,6f\ ^3F^o_4$	9.1433E+00	4.491E−04	3.981E+09	9.1041E+00	4.417E−04	3.916E+09	0.000

(*continued on next page*)

Table 4 (*continued*)

Lower	Upper	GRASP2K			FAC			*dT*
		λ (Å)	*gf*	*A* (s^{-1})	λ (Å)	*gf*	*A* (s^{-1})	
$1s\,4f\ ^3F^o_3$	$1s\,6f\ ^3F^o_4$	9.2736E+00	1.951E−05	1.681E+08	9.2341E+00	1.958E−05	1.688E+08	0.001
$1s\,4f\ ^3F^o_2$	$1s\,6f\ ^3F^o_4$	9.2758E+00	1.549E−06	1.335E+07	9.2363E+00	1.553E−06	1.338E+07	0.001
$1s\,4f\ ^3F^o_4$	$1s\,6f\ ^3F^o_4$	9.3265E+00	1.596E−04	1.360E+09	9.2866E+00	1.593E−04	1.358E+09	0.000
$1s\,4f\ ^1F^o_3$	$1s\,6f\ ^3F^o_4$	9.3281E+00	1.458E−05	1.242E+08	9.2883E+00	1.455E−05	1.239E+08	0.000
$1s\,5p\ ^3P^o_2$	$1s\,6f\ ^3F^o_4$	2.5720E+01	4.305E−03	4.823E+09	2.5607E+01	4.350E−03	4.875E+09	0.000
$1s\,5f\ ^3F^o_3$	$1s\,6f\ ^3F^o_4$	2.6252E+01	1.086E−04	1.168E+08	2.6139E+01	1.090E−04	1.172E+08	0.000
$1s\,5f\ ^3F^o_2$	$1s\,6f\ ^3F^o_4$	2.6261E+01	8.548E−06	9.187E+06	2.6148E+01	8.573E−06	9.214E+06	0.000
$1s\,5f\ ^3F^o_4$	$1s\,6f\ ^3F^o_4$	2.6469E+01	9.072E−04	9.597E+08	2.6355E+01	9.087E−04	9.613E+08	0.000
$1s\,5f\ ^1F^o_3$	$1s\,6f\ ^3F^o_4$	2.6476E+01	8.289E−05	8.763E+07	2.6362E+01	8.292E−05	8.768E+07	0.000
$1s\,6p\ ^3P^o_2$	$1s\,6f\ ^3F^o_4$	1.5714E+03	8.788E−08	2.638E+01	1.5399E+03	9.216E−08	2.856E+01	0.009
$1s\,6f\ ^3F^o_3$	$1s\,6f\ ^3F^o_4$	5.5078E+03	2.014E−10	4.921E−03	5.5226E+03	1.981E−10	4.774E−03	0.002
$1s\,6f\ ^3F^o_2$	$1s\,6f\ ^3F^o_4$	5.7487E+03	1.406E−11	3.153E−04				0.005
$1s\,3d\ ^3D_2$	$1s\,6g\ ^3G_4$	3.8309E+00	3.357E−03	1.695E+11	3.8148E+00	3.386E−03	1.709E+11	0.000
$1s\,3d\ ^3D_3$	$1s\,6g\ ^3G_4$	3.8744E+00	3.474E−04	1.715E+10	3.8580E+00	3.479E−04	1.717E+10	0.000
$1s\,3d\ ^1D_2$	$1s\,6g\ ^3G_4$	3.8761E+00	3.116E−05	1.537E+09	3.8597E+00	3.004E−05	1.481E+09	0.001
$1s\,4d\ ^3D_2$	$1s\,6g\ ^3G_4$	9.1668E+00	7.908E−05	6.975E+08	9.1289E+00	8.154E−05	7.190E+08	0.001
$1s\,4d\ ^3D_3$	$1s\,6g\ ^3G_4$	9.2719E+00	1.137E−05	9.800E+07	9.2332E+00	1.167E−05	1.006E+08	0.001
$1s\,4d\ ^1D_2$	$1s\,6g\ ^3G_4$	9.2762E+00	1.073E−06	9.238E+06	9.2375E+00	1.032E−06	8.892E+06	0.003
$1s\,5d\ ^3D_2$	$1s\,6g\ ^3G_4$	2.5815E+01	5.070E−03	5.639E+09	2.5711E+01	5.076E−03	5.642E+09	0.000
$1s\,5d\ ^3D_3$	$1s\,6g\ ^3G_4$	2.6244E+01	5.114E−04	5.504E+08	2.6137E+01	5.132E−04	5.520E+08	0.000
$1s\,5d\ ^1D_2$	$1s\,6g\ ^3G_4$	2.6262E+01	4.852E−05	5.214E+07	2.6155E+01	4.698E−05	5.047E+07	0.000
$1s\,5g\ ^3G_4$	$1s\,6g\ ^3G_4$	2.6470E+01	5.388E−04	5.699E+08	2.6356E+01	5.393E−04	5.705E+08	0.000
$1s\,5g\ ^3G_3$	$1s\,6g\ ^3G_4$	2.6475E+01	4.880E−05	5.160E+07	2.6361E+01	4.899E−05	5.180E+07	0.000
$1s\,5g\ ^3G_5$	$1s\,6g\ ^3G_4$	2.6601E+01	4.984E−05	5.220E+07	2.6487E+01	4.993E−05	5.231E+07	0.000
$1s\,5g\ ^1G_4$	$1s\,6g\ ^3G_4$	2.6605E+01	3.575E−06	3.744E+06	2.6491E+01	3.402E−06	3.562E+06	0.000
$1s\,6d\ ^3D_2$	$1s\,6g\ ^3G_4$	1.8045E+03	3.645E−08	8.298E+00	1.8335E+03	3.427E−08	7.491E+00	0.002
$1s\,6d\ ^3D_3$	$1s\,6g\ ^3G_4$	5.3075E+03	1.458E−10	3.836E−03	5.5194E+03	1.284E−10	3.097E−03	0.000
$1s\,6d\ ^1D_2$	$1s\,6g\ ^3G_4$	5.7864E+03	1.077E−11	2.384E−04				0.038
$1s\,2s\ ^3S_1$	$1s\,6g\ ^3G_3$	1.3658E+00	5.739E−11	2.931E+04				0.903
$1s\,3s\ ^3S_1$	$1s\,6g\ ^3G_3$	3.6666E+00	3.747E−09	2.656E+05				0.102
$1s\,3d\ ^3D_2$	$1s\,6g\ ^3G_3$	3.8309E+00	3.753E−04	2.437E+10	3.8148E+00	3.787E−04	2.459E+10	0.000
$1s\,3d\ ^3D_1$	$1s\,6g\ ^3G_3$	3.8326E+00	2.240E−03	1.453E+11	3.8166E+00	2.255E−03	1.463E+11	0.000
$1s\,3d\ ^3D_3$	$1s\,6g\ ^3G_3$	3.8743E+00	4.181E−05	2.654E+09	3.8580E+00	4.175E−05	2.650E+09	0.000
$1s\,3d\ ^1D_2$	$1s\,6g\ ^3G_3$	3.8760E+00	2.490E−04	1.579E+10	3.8597E+00	2.479E−04	1.572E+10	0.000
$1s\,4s\ ^3S_1$	$1s\,6g\ ^3G_3$	8.7728E+00	1.855E−11	2.297E+02				0.573
$1s\,4d\ ^3D_2$	$1s\,6g\ ^3G_3$	9.1665E+00	8.833E−06	1.002E+08	9.1289E+00	9.173E−06	1.039E+08	0.000
$1s\,4d\ ^3D_1$	$1s\,6g\ ^3G_3$	9.1706E+00	5.325E−05	6.034E+08	9.1329E+00	5.436E−05	6.157E+08	0.002
$1s\,4d\ ^3D_3$	$1s\,6g\ ^3G_3$	9.2715E+00	1.365E−06	1.513E+07	9.2332E+00	1.401E−06	1.553E+07	0.000
$1s\,4d\ ^1D_2$	$1s\,6g\ ^3G_3$	9.2759E+00	8.174E−06	9.052E+07	9.2375E+00	8.299E−06	9.189E+07	0.001
$1s\,5s\ ^3S_1$	$1s\,6g\ ^3G_3$	2.4252E+01	9.019E−09	1.461E+04				0.014
$1s\,5d\ ^3D_2$	$1s\,6g\ ^3G_3$	2.5812E+01	5.697E−04	8.147E+08	2.5711E+01	5.708E−04	8.158E+08	0.000
$1s\,5d\ ^3D_1$	$1s\,6g\ ^3G_3$	2.5829E+01	3.383E−03	4.832E+09	2.5727E+01	3.382E−03	4.827E+09	0.000
$1s\,5d\ ^3D_3$	$1s\,6g\ ^3G_3$	2.6241E+01	6.159E−05	8.523E+07	2.6137E+01	6.159E−05	8.518E+07	0.000
$1s\,5d\ ^1D_2$	$1s\,6g\ ^3G_3$	2.6259E+01	3.639E−04	5.028E+08	2.6155E+01	3.629E−04	5.012E+08	0.000
$1s\,5g\ ^3G_4$	$1s\,6g\ ^3G_3$	2.6467E+01	4.878E−05	6.636E+07	2.6356E+01	4.884E−05	6.644E+07	0.000
$1s\,5g\ ^3G_3$	$1s\,6g\ ^3G_3$	2.6472E+01	4.079E−04	5.547E+08	2.6361E+01	4.082E−04	5.550E+08	0.000
$1s\,5g\ ^3G_5$	$1s\,6g\ ^3G_3$	2.6598E+01	2.379E−06	3.205E+06	2.6487E+01	2.378E−06	3.202E+06	0.001
$1s\,5g\ ^1G_4$	$1s\,6g\ ^3G_3$	2.6602E+01	3.946E−05	5.314E+07	2.6491E+01	3.938E−05	5.302E+07	0.000
$1s\,6s\ ^3S_1$	$1s\,6g\ ^3G_3$	5.0108E+02	3.106E−12	1.179E−02				0.128
$1s\,6d\ ^3D_2$	$1s\,6g\ ^3G_3$	1.7904E+03	4.198E−09	1.248E+00	1.8335E+03	3.889E−09	1.093E+00	0.003
$1s\,6d\ ^3D_1$	$1s\,6g\ ^3G_3$	1.8364E+03	2.308E−08	6.523E+00	1.8221E+03	2.333E−08	6.639E+00	0.002
$1s\,6d\ ^3D_3$	$1s\,6g\ ^3G_3$	5.1873E+03	1.881E−11	6.661E−04				0.003
$1s\,6d\ ^1D_2$	$1s\,6g\ ^3G_3$	5.6439E+03	8.622E−11	2.579E−03	5.6946E+03	8.174E−11	2.381E−03	0.011
$1s\,6g\ ^3G_4$	$1s\,6g\ ^3G_3$	2.2908E+05	1.468E−15	2.666E−11				0.552
$1s\,2p\ ^3P^o_1$	$1s\,6f\ ^1F^o_3$	1.3775E+00	1.744E−06	8.756E+08	1.3718E+00	2.023E−06	1.016E+09	0.014
$1s\,2p\ ^3P^o_2$	$1s\,6f\ ^1F^o_3$	1.4397E+00	1.779E−04	8.177E+10	1.4336E+00	1.854E−04	8.523E+10	0.000
$1s\,2p\ ^1P^o_1$	$1s\,6f\ ^1F^o_3$	1.4456E+00	1.064E−03	4.851E+11	1.4396E+00	1.098E−03	5.009E+11	0.001
$1s\,3p\ ^3P^o_1$	$1s\,6f\ ^1F^o_3$	3.6895E+00	3.092E−09	2.165E+05	3.6743E+00	3.901E−08	2.730E+06	0.011
$1s\,3p\ ^3P^o_2$	$1s\,6f\ ^1F^o_3$	3.8210E+00	3.586E−06	2.340E+08	3.8051E+00	4.156E−06	2.711E+08	0.011
$1s\,3p\ ^1P^o_1$	$1s\,6f\ ^1F^o_3$	3.8327E+00	2.406E−05	1.561E+09	3.8169E+00	2.471E−05	1.602E+09	0.008
$1s\,4p\ ^3P^o_1$	$1s\,6f\ ^1F^o_3$	8.8264E+00	6.111E−07	7.475E+06	8.7892E+00	4.307E−07	5.268E+06	0.001
$1s\,4p\ ^3P^o_2$	$1s\,6f\ ^1F^o_3$	9.1428E+00	5.020E−05	5.723E+08	9.1041E+00	4.900E−05	5.585E+08	0.001
$1s\,4p\ ^1P^o_1$	$1s\,6f\ ^1F^o_3$	9.1705E+00	2.897E−04	3.283E+09	9.1320E+00	2.914E−04	3.302E+09	0.000
$1s\,4f\ ^3F^o_3$	$1s\,6f\ ^1F^o_3$	9.2731E+00	2.362E−06	2.618E+07	9.2341E+00	2.453E−06	2.718E+07	0.001
$1s\,4f\ ^3F^o_2$	$1s\,6f\ ^1F^o_3$	9.2753E+00	1.418E−05	1.571E+08	9.2363E+00	1.414E−05	1.566E+08	0.001
$1s\,4f\ ^3F^o_4$	$1s\,6f\ ^1F^o_3$	9.3260E+00	1.458E−05	1.598E+08	9.2866E+00	1.446E−05	1.585E+08	0.000
$1s\,4f\ ^1F^o_3$	$1s\,6f\ ^1F^o_3$	9.3276E+00	1.208E−04	1.323E+09	9.2883E+00	1.206E−04	1.320E+09	0.000
$1s\,5p\ ^3P^o_1$	$1s\,6f\ ^1F^o_3$	2.4458E+01	4.144E−06	6.601E+06	2.4355E+01	4.367E−06	6.957E+06	0.000
$1s\,5p\ ^3P^o_2$	$1s\,6f\ ^1F^o_3$	2.5717E+01	4.804E−04	6.921E+08	2.5607E+01	4.825E−04	6.952E+08	0.000
$1s\,5p\ ^1P^o_1$	$1s\,6f\ ^1F^o_3$	2.5828E+01	2.861E−03	4.087E+09	2.5719E+01	2.859E−03	4.084E+09	0.000
$1s\,5f\ ^3F^o_3$	$1s\,6f\ ^1F^o_3$	2.6248E+01	1.311E−05	1.813E+07	2.6139E+01	1.363E−05	1.885E+07	0.000

(*continued on next page*)

Table 4 (*continued*)

Lower	Upper	GRASP2K			FAC			*dT*
		λ (Å)	*gf*	A (s^{-1})	λ (Å)	*gf*	A (s^{-1})	
$1s\,5f\ ^3F^o_2$	$1s\,6f\ ^1F^o_3$	2.6257E+01	7.903E−05	1.092E+08	2.6148E+01	7.877E−05	1.088E+08	0.000
$1s\,5f\ ^3F^o_4$	$1s\,6f\ ^1F^o_3$	2.6465E+01	8.283E−05	1.127E+08	2.6355E+01	8.250E−05	1.122E+08	0.000
$1s\,5f\ ^1F^o_3$	$1s\,6f\ ^1F^o_3$	2.6472E+01	6.865E−04	9.335E+08	2.6362E+01	6.876E−04	9.348E+08	0.000
$1s\,6p\ ^3P^o_1$	$1s\,6f\ ^1F^o_3$	5.5676E+02	1.886E−09	5.797E+00	5.5347E+02	2.833E−09	8.739E+00	0.006
$1s\,6p\ ^3P^o_2$	$1s\,6f\ ^1F^o_3$	1.5574E+03	1.007E−08	3.956E+00	1.5396E+03	1.023E−08	4.078E+00	0.008
$1s\,6p\ ^1P^o_1$	$1s\,6f\ ^1F^o_3$	1.8325E+03	3.684E−08	1.045E+01	1.7754E+03	4.001E−08	1.199E+01	0.009
$1s\,6f\ ^3F^o_3$	$1s\,6f\ ^1F^o_3$	5.3394E+03	2.665E−11	8.908E−04				0.009
$1s\,6f\ ^3F^o_2$	$1s\,6f\ ^1F^o_3$	5.5655E+03	1.419E−10	4.365E−03	5.5161E+03	1.428E−10	4.435E−03	0.004
$1s\,6f\ ^3F^o_4$	$1s\,6f\ ^1F^o_3$	1.7466E+05	4.802E−15	1.500E−10				0.228
$1s\,3d\ ^3D_3$	$1s\,6g\ ^3G_5$	3.8728E+00	4.582E−03	1.853E+11	3.8564E+00	4.660E−03	1.884E+11	0.000
$1s\,4d\ ^3D_3$	$1s\,6g\ ^3G_5$	9.2626E+00	1.359E−04	9.604E+08	9.2240E+00	1.404E−04	9.926E+08	0.001
$1s\,5d\ ^3D_3$	$1s\,6g\ ^3G_5$	2.6170E+01	6.805E−03	6.026E+09	2.6063E+01	6.824E−03	6.040E+09	0.000
$1s\,5g\ ^3G_4$	$1s\,6g\ ^3G_5$	2.6394E+01	4.948E−05	4.307E+07	2.6281E+01	4.968E−05	4.325E+07	0.000
$1s\,5g\ ^3G_3$	$1s\,6g\ ^3G_5$	2.6399E+01	2.359E−06	2.053E+06	2.6286E+01	2.367E−06	2.059E+06	0.000
$1s\,5g\ ^3G_5$	$1s\,6g\ ^3G_5$	2.6525E+01	6.910E−04	5.955E+08	2.6411E+01	6.918E−04	5.963E+08	0.000
$1s\,5g\ ^1G_4$	$1s\,6g\ ^3G_5$	2.6529E+01	4.004E−05	3.450E+07	2.6415E+01	4.006E−05	3.452E+07	0.000
$1s\,6d\ ^3D_3$	$1s\,6g\ ^3G_5$	3.3718E+03	7.594E−09	4.050E−01	3.4576E+03	6.952E−09	3.496E−01	0.001
$1s\,6g\ ^3G_4$	$1s\,6g\ ^3G_5$	9.2456E+03	2.278E−11	1.616E−04	9.2559E+03	2.249E−11	1.578E−04	0.004
$1s\,6g\ ^3G_3$	$1s\,6g\ ^3G_5$	9.6344E+03	9.609E−13	6.277E−06				0.063
$1s\,4f\ ^3F^o_3$	$1s\,6h\ ^3H^o_5$	9.2643E+00	9.005E−03	6.362E+10	9.2249E+00	9.057E−03	6.399E+10	0.000
$1s\,4f\ ^3F^o_4$	$1s\,6h\ ^3H^o_5$	9.3170E+00	5.230E−04	3.653E+09	9.2773E+00	5.243E−04	3.662E+09	0.000
$1s\,4f\ ^1F^o_3$	$1s\,6h\ ^3H^o_5$	9.3187E+00	2.439E−05	1.703E+08	9.2790E+00	2.295E−05	1.602E+08	0.000
$1s\,5f\ ^3F^o_3$	$1s\,6h\ ^3H^o_5$	2.6177E+01	5.783E−03	5.118E+09	2.6065E+01	5.792E−03	5.126E+09	0.000
$1s\,5f\ ^3F^o_4$	$1s\,6h\ ^3H^o_5$	2.6394E+01	3.283E−04	2.858E+08	2.6281E+01	3.291E−04	2.864E+08	0.000
$1s\,5f\ ^1F^o_3$	$1s\,6h\ ^3H^o_5$	2.6400E+01	1.539E−05	1.339E+07	2.6287E+01	1.448E−05	1.259E+07	0.000
$1s\,6f\ ^3F^o_3$	$1s\,6h\ ^3H^o_5$	3.4460E+03	2.908E−09	1.485E−01	3.4619E+03	2.830E−09	1.420E−01	0.000
$1s\,6f\ ^3F^o_4$	$1s\,6h\ ^3H^o_5$	9.2055E+03	8.735E−12	6.251E−05	9.2780E+03	8.447E−12	5.900E−05	0.006
$1s\,6f\ ^1F^o_3$	$1s\,6h\ ^3H^o_5$	9.7177E+03	3.492E−13	2.242E−06				0.010
$1s\,2p\ ^3P^o_2$	$1s\,6h\ ^3H^o_4$	1.4395E+00	2.079E−12	7.436E+02				0.948
$1s\,3p\ ^3P^o_2$	$1s\,6h\ ^3H^o_4$	3.8195E+00	1.741E−13	8.847E+00				0.800
$1s\,4p\ ^3P^o_2$	$1s\,6h\ ^3H^o_4$	9.1340E+00	7.955E−10	7.067E+03				0.008
$1s\,4f\ ^3F^o_3$	$1s\,6h\ ^3H^o_4$	9.2640E+00	5.435E−04	4.694E+09	9.2249E+00	5.467E−04	4.721E+09	0.000
$1s\,4f\ ^3F^o_2$	$1s\,6h\ ^3H^o_4$	9.2662E+00	6.821E−03	5.888E+10	9.2271E+00	6.855E−03	5.917E+10	0.000
$1s\,4f\ ^3F^o_4$	$1s\,6h\ ^3H^o_4$	9.3168E+00	3.746E−05	3.198E+08	9.2773E+00	3.745E−05	3.197E+08	0.000
$1s\,4f\ ^1F^o_3$	$1s\,6h\ ^3H^o_4$	9.3184E+00	4.142E−04	3.535E+09	9.2790E+00	4.138E−04	3.531E+09	0.000
$1s\,5p\ ^3P^o_2$	$1s\,6h\ ^3H^o_4$	2.5647E+01	9.502E−10	1.071E+03				0.001
$1s\,5f\ ^3F^o_3$	$1s\,6h\ ^3H^o_4$	2.6175E+01	3.493E−04	3.778E+08	2.6065E+01	3.497E−04	3.783E+08	0.000
$1s\,5f\ ^3F^o_2$	$1s\,6h\ ^3H^o_4$	2.6184E+01	4.378E−03	4.733E+09	2.6074E+01	4.383E−03	4.737E+09	0.000
$1s\,5f\ ^3F^o_4$	$1s\,6h\ ^3H^o_4$	2.6392E+01	2.352E−05	2.503E+07	2.6281E+01	2.350E−05	2.501E+07	0.000
$1s\,5f\ ^1F^o_3$	$1s\,6h\ ^3H^o_4$	2.6398E+01	2.598E−04	2.763E+08	2.6287E+01	2.595E−04	2.760E+08	0.000
$1s\,6p\ ^3P^o_2$	$1s\,6h\ ^3H^o_4$	1.3372E+03	1.003E−14	4.157E−06				0.006
$1s\,6f\ ^3F^o_3$	$1s\,6h\ ^3H^o_4$	3.4128E+03	1.808E−10	1.151E−02	3.4619E+03	1.717E−10	1.053E−02	0.001
$1s\,6f\ ^3F^o_2$	$1s\,6h\ ^3H^o_4$	3.5038E+03	2.095E−09	1.265E−01	3.4609E+03	2.146E−09	1.317E−01	0.000
$1s\,6f\ ^3F^o_4$	$1s\,6h\ ^3H^o_4$	8.9725E+03	6.759E−13	6.222E−06				0.002
$1s\,6f\ ^1F^o_3$	$1s\,6h\ ^3H^o_4$	9.4584E+03	6.374E−12	5.281E−05	9.2889E+03	6.605E−12	5.625E−05	0.006
$1s\,6h\ ^3H^o_5$	$1s\,6h\ ^3H^o_4$	3.5443E+05	1.836E−16	1.083E−12				0.747
$1s\,3d\ ^3D_2$	$1s\,6g\ ^1G_4$	3.8293E+00	9.113E−08	4.606E+06				0.015
$1s\,3d\ ^3D_3$	$1s\,6g\ ^1G_4$	3.8727E+00	2.790E−04	1.379E+10	3.8564E+00	2.824E−04	1.395E+10	0.000
$1s\,3d\ ^1D_2$	$1s\,6g\ ^1G_4$	3.8744E+00	3.470E−03	1.713E+11	3.8580E+00	3.526E−03	1.740E+11	0.000
$1s\,4d\ ^3D_2$	$1s\,6g\ ^1G_4$	9.1575E+00	3.631E−09	3.209E+04				0.043
$1s\,4d\ ^3D_3$	$1s\,6g\ ^1G_4$	9.2623E+00	8.247E−06	7.125E+07	9.2240E+00	8.512E−06	7.352E+07	0.000
$1s\,4d\ ^1D_2$	$1s\,6g\ ^1G_4$	9.2666E+00	1.039E−04	8.965E+08	9.2283E+00	1.062E−04	9.168E+08	0.001
$1s\,5d\ ^3D_2$	$1s\,6g\ ^1G_4$	2.5741E+01	3.250E−07	3.635E+05				0.002
$1s\,5d\ ^3D_3$	$1s\,6g\ ^1G_4$	2.6167E+01	4.142E−04	4.484E+08	2.6063E+01	4.135E−04	4.474E+08	0.000
$1s\,5d\ ^1D_2$	$1s\,6g\ ^1G_4$	2.6185E+01	5.151E−03	5.567E+09	2.6082E+01	5.158E−03	5.572E+09	0.000
$1s\,5g\ ^3G_4$	$1s\,6g\ ^1G_4$	2.6392E+01	3.549E−06	3.777E+06	2.6281E+01	3.733E−06	3.972E+06	0.000
$1s\,5g\ ^3G_3$	$1s\,6g\ ^1G_4$	2.6397E+01	3.919E−05	4.168E+07	2.6286E+01	3.914E−05	4.163E+07	0.000
$1s\,5g\ ^3G_5$	$1s\,6g\ ^1G_4$	2.6522E+01	4.003E−05	4.218E+07	2.6411E+01	3.991E−05	4.205E+07	0.000
$1s\,5g\ ^1G_4$	$1s\,6g\ ^1G_4$	2.6527E+01	5.578E−04	5.875E+08	2.6415E+01	5.583E−04	5.880E+08	0.000
$1s\,6d\ ^3D_2$	$1s\,6g\ ^1G_4$	1.5020E+03	4.543E−12	1.492E−03	1.5304E+03	8.482E−12	2.661E−03	0.073
$1s\,6d\ ^3D_3$	$1s\,6g\ ^1G_4$	3.3331E+03	4.786E−10	3.193E−02	3.4576E+03	4.213E−10	2.590E−02	0.003
$1s\,6d\ ^1D_2$	$1s\,6g\ ^1G_4$	3.5158E+03	5.072E−09	3.041E−01	3.5255E+03	4.967E−09	2.936E−01	0.007
$1s\,6g\ ^3G_4$	$1s\,6g\ ^1G_4$	8.9597E+03	1.796E−12	1.658E−05				0.031
$1s\,6g\ ^3G_3$	$1s\,6g\ ^1G_4$	9.3244E+03	1.758E−11	1.499E−04	9.2557E+03	1.767E−11	1.515E−04	0.005
$1s\,6g\ ^3G_5$	$1s\,6g\ ^1G_4$	2.8974E+05	5.995E−16	5.293E−12				0.672
$1s\,4f\ ^3F^o_4$	$1s\,6h\ ^3H^o_6$	9.3108E+00	1.132E−02	6.701E+10	9.2712E+00	1.142E−02	6.763E+10	0.000
$1s\,5f\ ^3F^o_4$	$1s\,6h\ ^3H^o_6$	2.6344E+01	7.177E−03	5.306E+09	2.6231E+01	7.197E−03	5.321E+09	0.000
$1s\,6f\ ^3F^o_4$	$1s\,6h\ ^3H^o_6$	5.5410E+03	8.762E−10	1.464E−02	5.5692E+03	8.520E−10	1.397E−02	0.003
$1s\,6h\ ^3H^o_5$	$1s\,6h\ ^3H^o_6$	1.3919E+04	3.060E−12	8.104E−06	1.3932E+04	3.021E−12	7.919E−06	0.005
$1s\,6h\ ^3H^o_4$	$1s\,6h\ ^3H^o_6$	1.4488E+04	8.641E−14	2.112E−07				0.178
$1s\,4f\ ^3F^o_3$	$1s\,6h\ ^1H^o_5$	9.2579E+00	3.678E−09	2.602E+04				0.007

(*continued on next page*)

Table 4 (*continued*)

Lower	Upper	GRASP2K			FAC			*dT*
		λ (Å)	*gf*	*A* (s^{-1})	λ (Å)	*gf*	*A* (s^{-1})	
$1s\,4f\ ^3F^o_4$	$1s\,6h\ ^1H^o_5$	9.3106E+00	4.369E−04	3.056E+09	9.2712E+00	4.395E−04	3.074E+09	0.000
$1s\,4f\ ^1F^o_3$	$1s\,6h\ ^1H^o_5$	9.3123E+00	9.144E−03	6.394E+10	9.2728E+00	9.224E−03	6.450E+10	0.000
$1s\,5f\ ^3F^o_3$	$1s\,6h\ ^1H^o_5$	2.6126E+01	1.462E−09	1.299E+03				0.002
$1s\,5f\ ^3F^o_4$	$1s\,6h\ ^1H^o_5$	2.6342E+01	2.770E−04	2.421E+08	2.6231E+01	2.768E−04	2.419E+08	0.000
$1s\,5f\ ^1F^o_3$	$1s\,6h\ ^1H^o_5$	2.6349E+01	5.794E−03	5.061E+09	2.6238E+01	5.809E−03	5.073E+09	0.000
$1s\,6f\ ^3F^o_3$	$1s\,6h\ ^1H^o_5$	2.7445E+03	1.003E−15	8.072E−08				0.007
$1s\,6f\ ^3F^o_4$	$1s\,6h\ ^1H^o_5$	5.4702E+03	3.515E−11	7.124E−04	5.5692E+03	3.276E−11	6.352E−04	0.001
$1s\,6f\ ^1F^o_3$	$1s\,6h\ ^1H^o_5$	5.6471E+03	6.685E−10	1.271E−02	5.5731E+03	6.867E−10	1.329E−02	0.002
$1s\,6h\ ^3H^o_5$	$1s\,6h\ ^1H^o_5$	1.3481E+04	1.610E−13	5.370E−07				0.045
$1s\,6h\ ^3H^o_4$	$1s\,6h\ ^1H^o_5$	1.4014E+04	2.491E−12	7.690E−06	1.3932E+04	2.494E−12	7.725E−06	0.008
$1s\,6h\ ^3H^o_6$	$1s\,6h\ ^1H^o_5$	4.2819E+05	8.864E−17	2.932E−13				0.869
$1s\,2s\ ^3S_1$	$1s\,7s\ ^3S_1$	1.3268E+00	4.817E−10	6.084E+05				0.985
$1s\,3s\ ^3S_1$	$1s\,7s\ ^3S_1$	3.3983E+00	2.685E−10	5.170E+04				0.385
$1s\,3d\ ^3D_2$	$1s\,7s\ ^3S_1$	3.5389E+00	6.769E−06	1.202E+09	3.5242E+00	7.076E−06	1.256E+09	0.040
$1s\,3d\ ^3D_1$	$1s\,7s\ ^3S_1$	3.5404E+00	7.411E−06	1.315E+09	3.5257E+00	7.024E−06	1.245E+09	0.056
$1s\,3d\ ^3D_3$	$1s\,7s\ ^3S_1$	3.5760E+00	1.602E−05	2.785E+09	3.5610E+00	1.650E−05	2.868E+09	0.040
$1s\,3d\ ^1D_2$	$1s\,7s\ ^3S_1$	3.5774E+00	4.893E−06	8.502E+08	3.5624E+00	4.667E−06	8.108E+08	0.044
$1s\,4s\ ^3S_1$	$1s\,7s\ ^3S_1$	7.3787E+00	3.123E−11	1.275E+03				0.933
$1s\,4d\ ^3D_2$	$1s\,7s\ ^3S_1$	7.6552E+00	1.969E−05	7.471E+08	7.6242E+00	2.005E−05	7.606E+08	0.015
$1s\,4d\ ^3D_1$	$1s\,7s\ ^3S_1$	7.6581E+00	2.030E−05	7.698E+08	7.6271E+00	1.984E−05	7.521E+08	0.023
$1s\,4d\ ^3D_3$	$1s\,7s\ ^3S_1$	7.7284E+00	4.617E−05	1.719E+09	7.6969E+00	4.658E−05	1.733E+09	0.015
$1s\,4d\ ^1D_2$	$1s\,7s\ ^3S_1$	7.7314E+00	1.334E−05	4.961E+08	7.6999E+00	1.311E−05	4.876E+08	0.017
$1s\,5s\ ^3S_1$	$1s\,7s\ ^3S_1$	1.5931E+01	6.722E−10	5.889E+03				0.419
$1s\,5d\ ^3D_2$	$1s\,7s\ ^3S_1$	1.6590E+01	4.953E−05	4.001E+08	1.6526E+01	4.980E−05	4.020E+08	0.004
$1s\,5d\ ^3D_1$	$1s\,7s\ ^3S_1$	1.6597E+01	4.987E−05	4.025E+08	1.6532E+01	4.920E−05	3.968E+08	0.010
$1s\,5d\ ^3D_3$	$1s\,7s\ ^3S_1$	1.6766E+01	1.160E−04	9.178E+08	1.6700E+01	1.158E−04	9.160E+08	0.004
$1s\,5d\ ^1D_2$	$1s\,7s\ ^3S_1$	1.6773E+01	3.281E−05	2.593E+08	1.6708E+01	3.254E−05	2.570E+08	0.007
$1s\,5g\ ^3G_3$	$1s\,7s\ ^3S_1$	1.6860E+01	3.065E−11	2.398E+02				0.060
$1s\,6s\ ^3S_1$	$1s\,7s\ ^3S_1$	4.2495E+01	3.689E−09	4.543E+03				0.102
$1s\,6d\ ^3D_2$	$1s\,7s\ ^3S_1$	4.5259E+01	1.803E−04	1.957E+08	4.5119E+01	1.799E−04	1.949E+08	0.001
$1s\,6d\ ^3D_1$	$1s\,7s\ ^3S_1$	4.5288E+01	1.801E−04	1.952E+08	4.5112E+01	1.765E−04	1.912E+08	0.004
$1s\,6d\ ^3D_3$	$1s\,7s\ ^3S_1$	4.6021E+01	4.306E−04	4.520E+08	4.5873E+01	4.241E−04	4.443E+08	0.001
$1s\,6d\ ^1D_2$	$1s\,7s\ ^3S_1$	4.6054E+01	1.209E−04	1.267E+08	4.5885E+01	1.177E−04	1.232E+08	0.003
$1s\,6g\ ^3G_3$	$1s\,7s\ ^3S_1$	4.6433E+01	2.618E−10	2.700E+02				0.039
$1s\,2p\ ^3P^o_1$	$1s\,7p\ ^3P^o_1$	1.3376E+00	4.582E−08	5.693E+07	1.3321E+00	1.353E−07	1.681E+08	0.537
$1s\,2p\ ^3P^o_2$	$1s\,7p\ ^3P^o_1$	1.3961E+00	1.583E−05	1.805E+10	1.3903E+00	1.652E−05	1.885E+10	0.058
$1s\,2p\ ^1P^o_1$	$1s\,7p\ ^3P^o_1$	1.4017E+00	1.535E−05	1.738E+10	1.3959E+00	1.409E−05	1.595E+10	0.029
$1s\,3p\ ^3P^o_1$	$1s\,7p\ ^3P^o_1$	3.4164E+00	2.188E−07	4.169E+07	3.4024E+00	2.384E−07	4.540E+07	0.201
$1s\,3p\ ^3P^o_2$	$1s\,7p\ ^3P^o_1$	3.5289E+00	3.518E−05	6.282E+09	3.5142E+00	3.240E−05	5.784E+09	0.079
$1s\,3p\ ^1P^o_1$	$1s\,7p\ ^3P^o_1$	3.5388E+00	3.051E−05	5.417E+09	3.5243E+00	2.782E−05	4.939E+09	0.053
$1s\,4p\ ^3P^o_1$	$1s\,7p\ ^3P^o_1$	7.4094E+00	3.166E−07	1.282E+07	7.3785E+00	3.980E−07	1.611E+07	0.067
$1s\,4p\ ^3P^o_2$	$1s\,7p\ ^3P^o_1$	7.6311E+00	5.802E−05	2.215E+09	7.5991E+00	5.725E−05	2.185E+09	0.017
$1s\,4p\ ^1P^o_1$	$1s\,7p\ ^3P^o_1$	7.6504E+00	5.135E−05	1.951E+09	7.6186E+00	4.936E−05	1.874E+09	0.007
$1s\,4f\ ^3F^o_3$	$1s\,7p\ ^3P^o_1$	7.7217E+00	1.128E−05	4.205E+08	7.6895E+00	1.078E−05	4.020E+08	0.032
$1s\,4f\ ^3F^o_2$	$1s\,7p\ ^3P^o_1$	7.7232E+00	3.454E−06	1.288E+08	7.6910E+00	3.342E−06	1.245E+08	0.033
$1s\,4f\ ^1F^o_3$	$1s\,7p\ ^3P^o_1$	7.7595E+00	1.761E−08	6.504E+05	7.7270E+00	2.587E−08	9.555E+05	0.017
$1s\,5p\ ^3P^o_1$	$1s\,7p\ ^3P^o_1$	1.5987E+01	5.833E−07	5.075E+06	1.5920E+01	7.664E−07	6.666E+06	0.015
$1s\,5p\ ^3P^o_2$	$1s\,7p\ ^3P^o_1$	1.6515E+01	1.159E−04	9.447E+08	1.6446E+01	1.167E−04	9.520E+08	0.003
$1s\,5p\ ^1P^o_1$	$1s\,7p\ ^3P^o_1$	1.6561E+01	1.036E−04	8.397E+08	1.6492E+01	1.010E−04	8.193E+08	0.006
$1s\,5f\ ^3F^o_3$	$1s\,7p\ ^3P^o_1$	1.6732E+01	4.609E−05	3.661E+08	1.6664E+01	4.535E−05	3.601E+08	0.002
$1s\,5f\ ^3F^o_2$	$1s\,7p\ ^3P^o_1$	1.6736E+01	1.410E−05	1.119E+08	1.6667E+01	1.404E−05	1.114E+08	0.002
$1s\,5f\ ^1F^o_3$	$1s\,7p\ ^3P^o_1$	1.6823E+01	7.450E−08	5.853E+05	1.6754E+01	1.071E−07	8.412E+05	0.002
$1s\,6p\ ^3P^o_1$	$1s\,7p\ ^3P^o_1$	4.2622E+01	1.744E−06	2.135E+06	4.2444E+01	2.994E−06	3.664E+06	0.005
$1s\,6p\ ^3P^o_2$	$1s\,7p\ ^3P^o_1$	4.4826E+01	3.888E−04	4.302E+08	4.4636E+01	3.931E−04	4.350E+08	0.001
$1s\,6p\ ^1P^o_1$	$1s\,7p\ ^3P^o_1$	4.5021E+01	3.515E−04	3.856E+08	4.4809E+01	3.422E−04	3.757E+08	0.000
$1s\,6f\ ^3F^o_3$	$1s\,7p\ ^3P^o_1$	4.5759E+01	2.138E−04	2.270E+08	4.5589E+01	2.114E−04	2.242E+08	0.002
$1s\,6f\ ^3F^o_2$	$1s\,7p\ ^3P^o_1$	4.5775E+01	6.539E−05	6.939E+07	4.5589E+01	6.507E−05	6.902E+07	0.002
$1s\,6f\ ^1F^o_3$	$1s\,7p\ ^3P^o_1$	4.6155E+01	3.481E−07	3.633E+05	4.5969E+01	4.043E−07	4.218E+05	0.001
$1s\,3d\ ^3D_2$	$1s\,7s\ ^1S_0$	3.5373E+00	4.635E−06	2.471E+09	3.5228E+00	4.652E−06	2.479E+09	0.016
$1s\,3d\ ^1D_2$	$1s\,7s\ ^1S_0$	3.5757E+00	7.727E−06	4.031E+09	3.5610E+00	7.113E−06	3.709E+09	0.063
$1s\,4d\ ^3D_2$	$1s\,7s\ ^1S_0$	7.6475E+00	1.316E−05	1.501E+09	7.6177E+00	1.309E−05	1.492E+09	0.007
$1s\,4d\ ^1D_2$	$1s\,7s\ ^1S_0$	7.7235E+00	2.094E−05	2.341E+09	7.6933E+00	2.017E−05	2.254E+09	0.024
$1s\,5d\ ^3D_2$	$1s\,7s\ ^1S_0$	1.6554E+01	3.255E−05	7.924E+08	1.6495E+01	3.248E−05	7.896E+08	0.005
$1s\,5d\ ^1D_2$	$1s\,7s\ ^1S_0$	1.6736E+01	5.105E−05	1.216E+09	1.6677E+01	5.040E−05	1.198E+09	0.006
$1s\,6d\ ^3D_2$	$1s\,7s\ ^1S_0$	4.4992E+01	1.160E−04	3.821E+08	4.4893E+01	1.158E−04	3.801E+08	0.003
$1s\,6d\ ^1D_2$	$1s\,7s\ ^1S_0$	4.5777E+01	1.847E−04	5.878E+08	4.5651E+01	1.878E−04	5.962E+08	0.000
$1s\,2p\ ^3P^o_2$	$1s\,7p\ ^3P^o_0$	1.3961E+00	1.007E−05	3.447E+10	1.3903E+00	1.030E−05	3.524E+10	0.058
$1s\,3p\ ^3P^o_2$	$1s\,7p\ ^3P^o_0$	3.5287E+00	2.240E−05	1.200E+10	3.5145E+00	2.021E−05	1.082E+10	0.080
$1s\,4p\ ^3P^o_2$	$1s\,7p\ ^3P^o_0$	7.6306E+00	3.690E−05	4.228E+09	7.6005E+00	3.577E−05	4.096E+09	0.017
$1s\,4f\ ^3F^o_2$	$1s\,7p\ ^3P^o_0$	7.7227E+00	4.908E−06	5.489E+08	7.6924E+00	4.701E−06	5.254E+08	0.033
$1s\,5p\ ^3P^o_2$	$1s\,7p\ ^3P^o_0$	1.6512E+01	7.368E−05	1.802E+09	1.6452E+01	7.311E−05	1.786E+09	0.003

(*continued on next page*)

Table 4 (*continued*)

Lower	Upper	GRASP2K			FAC			*dT*
		λ (Å)	*gf*	A (s^{-1})	λ (Å)	*gf*	A (s^{-1})	
$1s\,5f\ ^3F^o_2$	$1s\,7p\ ^3P^o_0$	1.6733E+01	2.004E−05	4.773E+08	1.6674E+01	1.976E−05	4.701E+08	0.002
$1s\,6p\ ^3P^o_2$	$1s\,7p\ ^3P^o_0$	4.4808E+01	2.469E−04	8.203E+08	4.4683E+01	2.466E−04	8.170E+08	0.001
$1s\,6f\ ^3F^o_2$	$1s\,7p\ ^3P^o_0$	4.5756E+01	9.289E−05	2.959E+08	4.5638E+01	9.204E−05	2.922E+08	0.002
$1s\,2p\ ^3P^o_1$	$1s\,7p\ ^3P^o_2$	1.3363E+00	1.951E−05	1.457E+10	1.3308E+00	2.048E−05	1.529E+10	0.042
$1s\,2p\ ^3P^o_0$	$1s\,7p\ ^3P^o_2$	1.3372E+00	1.256E−05	9.370E+09	1.3316E+00	1.289E−05	9.615E+09	0.014
$1s\,2p\ ^3P^o_2$	$1s\,7p\ ^3P^o_2$	1.3947E+00	1.980E−05	1.358E+10	1.3889E+00	2.069E−05	1.419E+10	0.052
$1s\,2p\ ^1P^o_1$	$1s\,7p\ ^3P^o_2$	1.4002E+00	7.809E−06	5.313E+09	1.3944E+00	7.795E−06	5.303E+09	0.015
$1s\,3p\ ^3P^o_1$	$1s\,7p\ ^3P^o_2$	3.4080E+00	4.148E−05	4.764E+09	3.3940E+00	3.776E−05	4.336E+09	0.093
$1s\,3p\ ^3P^o_0$	$1s\,7p\ ^3P^o_2$	3.4095E+00	2.597E−05	2.980E+09	3.3954E+00	2.386E−05	2.738E+09	0.083
$1s\,3p\ ^3P^o_2$	$1s\,7p\ ^3P^o_2$	3.5199E+00	4.316E−05	4.648E+09	3.5053E+00	3.919E−05	4.219E+09	0.088
$1s\,3p\ ^1P^o_1$	$1s\,7p\ ^3P^o_2$	3.5298E+00	1.624E−05	1.739E+09	3.5153E+00	1.492E−05	1.597E+09	0.074
$1s\,4p\ ^3P^o_1$	$1s\,7p\ ^3P^o_2$	7.3699E+00	6.450E−05	1.584E+09	7.3391E+00	6.330E−05	1.554E+09	0.017
$1s\,4p\ ^3P^o_0$	$1s\,7p\ ^3P^o_2$	7.3726E+00	4.081E−05	1.002E+09	7.3418E+00	4.004E−05	9.826E+08	0.013
$1s\,4p\ ^3P^o_2$	$1s\,7p\ ^3P^o_2$	7.5892E+00	6.902E−05	1.599E+09	7.5574E+00	6.734E−05	1.559E+09	0.019
$1s\,4p\ ^1P^o_1$	$1s\,7p\ ^3P^o_2$	7.6083E+00	2.631E−05	6.063E+08	7.5766E+00	2.576E−05	5.936E+08	0.014
$1s\,4f\ ^3F^o_3$	$1s\,7p\ ^3P^o_2$	7.6787E+00	2.525E−06	5.713E+07	7.6467E+00	2.419E−06	5.473E+07	0.035
$1s\,4f\ ^3F^o_2$	$1s\,7p\ ^3P^o_2$	7.6803E+00	6.368E−07	1.440E+07	7.6482E+00	6.023E−07	1.362E+07	0.038
$1s\,4f\ ^3F^o_4$	$1s\,7p\ ^3P^o_2$	7.7150E+00	1.674E−05	3.753E+08	7.6827E+00	1.660E−05	3.721E+08	0.011
$1s\,4f\ ^1F^o_3$	$1s\,7p\ ^3P^o_2$	7.7161E+00	1.866E−06	4.181E+07	7.6838E+00	1.853E−06	4.152E+07	0.012
$1s\,5p\ ^3P^o_1$	$1s\,7p\ ^3P^o_2$	1.5804E+01	1.192E−04	6.370E+08	1.5738E+01	1.193E−04	6.376E+08	0.006
$1s\,5p\ ^3P^o_0$	$1s\,7p\ ^3P^o_2$	1.5810E+01	7.580E−05	4.046E+08	1.5744E+01	7.546E−05	4.027E+08	0.007
$1s\,5p\ ^3P^o_2$	$1s\,7p\ ^3P^o_2$	1.6320E+01	1.324E−04	6.632E+08	1.6251E+01	1.318E−04	6.605E+08	0.003
$1s\,5p\ ^1P^o_1$	$1s\,7p\ ^3P^o_2$	1.6364E+01	5.081E−05	2.531E+08	1.6297E+01	5.059E−05	2.519E+08	0.005
$1s\,5f\ ^3F^o_3$	$1s\,7p\ ^3P^o_2$	1.6532E+01	1.040E−05	5.079E+07	1.6464E+01	1.026E−05	5.006E+07	0.002
$1s\,5f\ ^3F^o_2$	$1s\,7p\ ^3P^o_2$	1.6535E+01	2.619E−06	1.278E+07	1.6468E+01	2.556E−06	1.246E+07	0.003
$1s\,5f\ ^3F^o_4$	$1s\,7p\ ^3P^o_2$	1.6618E+01	7.173E−05	3.465E+08	1.6550E+01	7.050E−05	3.404E+08	0.000
$1s\,5f\ ^1F^o_3$	$1s\,7p\ ^3P^o_2$	1.6621E+01	7.995E−06	3.861E+07	1.6552E+01	7.865E−06	3.797E+07	0.000
$1s\,6p\ ^3P^o_1$	$1s\,7p\ ^3P^o_2$	4.1345E+01	3.330E−04	2.599E+08	4.1174E+01	3.369E−04	2.629E+08	0.002
$1s\,6p\ ^3P^o_0$	$1s\,7p\ ^3P^o_2$	4.1369E+01	2.124E−04	1.656E+08	4.1110E+01	2.102E−04	1.645E+08	0.002
$1s\,6p\ ^3P^o_2$	$1s\,7p\ ^3P^o_2$	4.3416E+01	4.033E−04	2.854E+08	4.3234E+01	4.015E−04	2.841E+08	0.002
$1s\,6p\ ^1P^o_1$	$1s\,7p\ ^3P^o_2$	4.3599E+01	1.561E−04	1.096E+08	4.3396E+01	1.504E−04	1.056E+08	0.001
$1s\,6f\ ^3F^o_3$	$1s\,7p\ ^3P^o_2$	4.4291E+01	4.633E−05	3.151E+07	4.4127E+01	4.585E−05	3.114E+07	0.002
$1s\,6f\ ^3F^o_2$	$1s\,7p\ ^3P^o_2$	4.4306E+01	1.166E−05	7.924E+06	4.4127E+01	1.145E−05	7.778E+06	0.002
$1s\,6f\ ^3F^o_4$	$1s\,7p\ ^3P^o_2$	4.4650E+01	3.218E−04	2.154E+08	4.4483E+01	3.160E−04	2.112E+08	0.002
$1s\,6f\ ^1F^o_3$	$1s\,7p\ ^3P^o_2$	4.4661E+01	3.588E−05	2.400E+07	4.4483E+01	3.507E−05	2.344E+07	0.002
$1s\,6h\ ^3H^o_4$	$1s\,7p\ ^3P^o_2$	4.4873E+01	1.000E−11	6.626E+00				0.004
$1s\,7p\ ^3P^o_1$	$1s\,7p\ ^3P^o_2$	1.3800E+03	1.615E−07	1.131E+02	1.3760E+03	1.671E−07	1.167E+02	0.050
$1s\,7p\ ^3P^o_0$	$1s\,7p\ ^3P^o_2$	1.3975E+03	9.892E−08	6.757E+01	1.3328E+03	1.150E−07	8.569E+01	0.056
$1s^2\ ^1S_0$	$1s\,7d\ ^3D_2$	3.1400E−01	8.874E−05	1.201E+12	3.1269E−01	8.899E−05	1.203E+12	0.003
$1s\,2s\ ^3S_1$	$1s\,7d\ ^3D_2$	1.3252E+00	5.634E−06	4.280E+09	1.3196E+00	4.807E−06	3.652E+09	0.011
$1s\,2s\ ^1S_0$	$1s\,7d\ ^3D_2$	1.3374E+00	2.905E−06	2.166E+09	1.3319E+00	2.936E−06	2.189E+09	0.005
$1s\,3s\ ^3S_1$	$1s\,7d\ ^3D_2$	3.3879E+00	3.868E−05	4.496E+09	3.3736E+00	3.838E−05	4.460E+09	0.019
$1s\,3s\ ^1S_0$	$1s\,7d\ ^3D_2$	3.4088E+00	2.598E−05	2.982E+09	3.3947E+00	2.385E−05	2.738E+09	0.083
$1s\,3d\ ^3D_2$	$1s\,7d\ ^3D_2$	3.5276E+00	1.899E−05	2.036E+09	3.5127E+00	1.903E−05	2.040E+09	0.014
$1s\,3d\ ^3D_1$	$1s\,7d\ ^3D_2$	3.5291E+00	8.666E−06	9.282E+08	3.5142E+00	8.452E−06	9.053E+08	0.033
$1s\,3d\ ^3D_3$	$1s\,7d\ ^3D_2$	3.5644E+00	8.974E−06	9.422E+08	3.5492E+00	9.129E−06	9.585E+08	0.026
$1s\,3d\ ^1D_2$	$1s\,7d\ ^3D_2$	3.5659E+00	2.321E−06	2.435E+08	3.5507E+00	2.101E−06	2.204E+08	0.049
$1s\,4s\ ^3S_1$	$1s\,7d\ ^3D_2$	7.3299E+00	8.891E−05	2.208E+09	7.2988E+00	8.993E−05	2.233E+09	0.018
$1s\,4s\ ^1S_0$	$1s\,7d\ ^3D_2$	7.3694E+00	6.004E−05	1.475E+09	7.3385E+00	5.614E−05	1.378E+09	0.065
$1s\,4d\ ^3D_2$	$1s\,7d\ ^3D_2$	7.6027E+00	4.717E−05	1.089E+09	7.5707E+00	4.709E−05	1.086E+09	0.005
$1s\,4d\ ^3D_1$	$1s\,7d\ ^3D_2$	7.6055E+00	2.106E−05	4.857E+08	7.5734E+00	2.095E−05	4.831E+08	0.015
$1s\,4d\ ^3D_3$	$1s\,7d\ ^3D_2$	7.6748E+00	2.282E−05	5.168E+08	7.6422E+00	2.304E−05	5.219E+08	0.009
$1s\,4d\ ^1D_2$	$1s\,7d\ ^3D_2$	7.6778E+00	5.714E−06	1.293E+08	7.6453E+00	5.373E−06	1.216E+08	0.022
$1s\,5s\ ^3S_1$	$1s\,7d\ ^3D_2$	1.5705E+01	1.967E−04	1.064E+09	1.5637E+01	1.998E−04	1.080E+09	0.010
$1s\,5s\ ^1S_0$	$1s\,7d\ ^3D_2$	1.5796E+01	1.300E−04	6.949E+08	1.5728E+01	1.247E−04	6.669E+08	0.032
$1s\,5d\ ^3D_2$	$1s\,7d\ ^3D_2$	1.6345E+01	1.087E−04	5.426E+08	1.6276E+01	1.083E−04	5.410E+08	0.002
$1s\,5d\ ^3D_1$	$1s\,7d\ ^3D_2$	1.6352E+01	4.805E−05	2.397E+08	1.6283E+01	4.822E−05	2.406E+08	0.006
$1s\,5d\ ^3D_3$	$1s\,7d\ ^3D_2$	1.6516E+01	5.357E−05	2.620E+08	1.6446E+01	5.404E−05	2.643E+08	0.003
$1s\,5d\ ^1D_2$	$1s\,7d\ ^3D_2$	1.6523E+01	1.324E−05	6.468E+07	1.6453E+01	1.267E−05	6.194E+07	0.008
$1s\,5g\ ^3G_4$	$1s\,7d\ ^3D_2$	1.6605E+01	1.575E−05	7.622E+07	1.6532E+01	1.579E−05	7.646E+07	0.004
$1s\,5g\ ^3G_3$	$1s\,7d\ ^3D_2$	1.6607E+01	1.787E−06	8.644E+06	1.6534E+01	1.793E−06	8.675E+06	0.006
$1s\,5g\ ^1G_4$	$1s\,7d\ ^3D_2$	1.6658E+01	1.251E−09	6.016E+03				0.062
$1s\,6s\ ^3S_1$	$1s\,7d\ ^3D_2$	4.0924E+01	6.099E−04	4.858E+08	4.0701E+01	6.286E−04	5.019E+08	0.005
$1s\,6s\ ^1S_0$	$1s\,7d\ ^3D_2$	4.1279E+01	4.030E−04	3.155E+08	4.1000E+01	3.906E−04	3.073E+08	0.010
$1s\,6d\ ^3D_2$	$1s\,7d\ ^3D_2$	4.3482E+01	3.650E−04	2.575E+08	4.3306E+01	3.626E−04	2.557E+08	0.000
$1s\,6d\ ^3D_1$	$1s\,7d\ ^3D_2$	4.3508E+01	1.610E−04	1.134E+08	4.3299E+01	1.611E−04	1.136E+08	0.002
$1s\,6d\ ^3D_3$	$1s\,7d\ ^3D_2$	4.4184E+01	1.862E−04	1.273E+08	4.4000E+01	1.879E−04	1.284E+08	0.001
$1s\,6d\ ^1D_2$	$1s\,7d\ ^3D_2$	4.4215E+01	4.585E−05	3.129E+07	4.4010E+01	4.550E−05	3.107E+07	0.002
$1s\,6g\ ^3G_4$	$1s\,7d\ ^3D_2$	4.4555E+01	1.252E−04	8.413E+07	4.4353E+01	1.252E−04	8.424E+07	0.001
$1s\,6g\ ^3G_3$	$1s\,7d\ ^3D_2$	4.4564E+01	1.411E−05	9.479E+06	4.4353E+01	1.421E−05	9.558E+06	0.001
$1s\,6g\ ^1G_4$	$1s\,7d\ ^3D_2$	4.4778E+01	9.656E−09	6.424E+03				0.020

(*continued on next page*)

Table 4 (*continued*)

Lower	Upper	GRASP2K			FAC			*dT*
		λ (Å)	*gf*	*A* (s^{-1})	λ (Å)	*gf*	*A* (s^{-1})	
$1s\,7s\ ^3S_1$	$1s\,7d\ ^3D_2$	1.1072E+03	2.944E−07	3.203E+02	1.0773E+03	3.188E−07	3.634E+02	0.006
$1s\,7s\ ^1S_0$	$1s\,7d\ ^3D_2$	1.2957E+03	1.189E−07	9.449E+01	1.2249E+03	1.375E−07	1.212E+02	0.126
$1s\,2s\ ^3S_1$	$1s\,7d\ ^3D_1$	1.3252E+00	5.552E−06	7.029E+09	1.3196E+00	4.696E−06	5.945E+09	0.006
$1s\,3s\ ^3S_1$	$1s\,7d\ ^3D_1$	3.3878E+00	3.820E−05	7.401E+09	3.3737E+00	3.769E−05	7.300E+09	0.030
$1s\,3d\ ^3D_2$	$1s\,7d\ ^3D_1$	3.5275E+00	8.231E−06	1.471E+09	3.5127E+00	8.300E−06	1.483E+09	0.022
$1s\,3d\ ^3D_1$	$1s\,7d\ ^3D_1$	3.5290E+00	8.464E−06	1.511E+09	3.5142E+00	8.198E−06	1.463E+09	0.028
$1s\,3d\ ^3D_3$	$1s\,7d\ ^3D_1$	3.5643E+00	1.509E−06	2.641E+08	3.5493E+00	1.491E−06	2.609E+08	0.001
$1s\,3d\ ^1D_2$	$1s\,7d\ ^3D_1$	3.5657E+00	5.413E−06	9.465E+08	3.5507E+00	5.166E−06	9.033E+08	0.024
$1s\,4s\ ^3S_1$	$1s\,7d\ ^3D_1$	7.3294E+00	8.823E−05	3.652E+09	7.2989E+00	8.841E−05	3.658E+09	0.022
$1s\,4d\ ^3D_2$	$1s\,7d\ ^3D_1$	7.6021E+00	2.061E−05	7.929E+08	7.5708E+00	2.062E−05	7.933E+08	0.010
$1s\,4d\ ^3D_1$	$1s\,7d\ ^3D_1$	7.6050E+00	2.052E−05	7.888E+08	7.5736E+00	2.029E−05	7.799E+08	0.011
$1s\,4d\ ^3D_3$	$1s\,7d\ ^3D_1$	7.6743E+00	3.729E−06	1.408E+08	7.6424E+00	3.765E−06	1.421E+08	0.009
$1s\,4d\ ^1D_2$	$1s\,7d\ ^3D_1$	7.6772E+00	1.328E−05	5.009E+08	7.6454E+00	1.298E−05	4.895E+08	0.009
$1s\,5s\ ^3S_1$	$1s\,7d\ ^3D_1$	1.5703E+01	1.954E−04	1.762E+09	1.5638E+01	1.965E−04	1.771E+09	0.012
$1s\,5d\ ^3D_2$	$1s\,7d\ ^3D_1$	1.6343E+01	4.762E−05	3.964E+08	1.6277E+01	4.755E−05	3.957E+08	0.004
$1s\,5d\ ^3D_1$	$1s\,7d\ ^3D_1$	1.6349E+01	4.677E−05	3.891E+08	1.6283E+01	4.670E−05	3.883E+08	0.004
$1s\,5d\ ^3D_3$	$1s\,7d\ ^3D_1$	1.6513E+01	8.732E−06	7.120E+07	1.6446E+01	8.833E−06	7.199E+07	0.004
$1s\,5d\ ^1D_2$	$1s\,7d\ ^3D_1$	1.6521E+01	3.074E−05	2.504E+08	1.6453E+01	3.038E−05	2.474E+08	0.003
$1s\,5g\ ^3G_3$	$1s\,7d\ ^3D_1$	1.6605E+01	1.059E−05	8.544E+07	1.6535E+01	1.055E−05	8.509E+07	0.005
$1s\,6s\ ^3S_1$	$1s\,7d\ ^3D_1$	4.0910E+01	6.049E−04	8.036E+08	4.0705E+01	6.166E−04	8.204E+08	0.005
$1s\,6d\ ^3D_2$	$1s\,7d\ ^3D_1$	4.3465E+01	1.599E−04	1.882E+08	4.3310E+01	1.611E−04	1.893E+08	0.001
$1s\,6d\ ^3D_1$	$1s\,7d\ ^3D_1$	4.3492E+01	1.564E−04	1.839E+08	4.3303E+01	1.580E−04	1.858E+08	0.001
$1s\,6d\ ^3D_3$	$1s\,7d\ ^3D_1$	4.4167E+01	3.032E−05	3.456E+07	4.4004E+01	3.073E−05	3.498E+07	0.001
$1s\,6d\ ^1D_2$	$1s\,7d\ ^3D_1$	4.4198E+01	1.063E−04	1.210E+08	4.4015E+01	1.044E−04	1.188E+08	0.001
$1s\,6g\ ^3G_3$	$1s\,7d\ ^3D_1$	4.4547E+01	8.358E−05	9.365E+07	4.4358E+01	8.369E−05	9.377E+07	0.001
$1s\,7s\ ^3S_1$	$1s\,7d\ ^3D_1$	1.0966E+03	3.011E−07	5.566E+02	1.0799E+03	3.104E−07	5.869E+02	0.012
$1s\,7d\ ^3D_2$	$1s\,7d\ ^3D_1$	1.1420E+05	1.309E−13	2.231E−08				0.944
$1s\,2p\ ^3P^o_1$	$1s\,7p\ ^1P^o_1$	1.3362E+00	1.852E−05	2.307E+10	1.3307E+00	1.812E−05	2.256E+10	0.019
$1s\,2p\ ^3P^o_2$	$1s\,7p\ ^1P^o_1$	1.3946E+00	7.635E−06	8.728E+09	1.3888E+00	7.793E−06	8.907E+09	0.061
$1s\,2p\ ^1P^o_1$	$1s\,7p\ ^1P^o_1$	1.4001E+00	1.156E−05	1.311E+10	1.3943E+00	1.090E−05	1.237E+10	0.054
$1s\,3p\ ^3P^o_1$	$1s\,7p\ ^1P^o_1$	3.4073E+00	3.665E−05	7.020E+09	3.3933E+00	3.370E−05	6.452E+09	0.076
$1s\,3p\ ^3P^o_2$	$1s\,7p\ ^1P^o_1$	3.5191E+00	1.673E−05	3.003E+09	3.5046E+00	1.472E−05	2.642E+09	0.087
$1s\,3p\ ^1P^o_1$	$1s\,7p\ ^1P^o_1$	3.5290E+00	2.143E−05	3.826E+09	3.5146E+00	2.066E−05	3.687E+09	0.042
$1s\,4p\ ^3P^o_1$	$1s\,7p\ ^1P^o_1$	7.3666E+00	5.772E−05	2.365E+09	7.3362E+00	5.662E−05	2.319E+09	0.010
$1s\,4p\ ^3P^o_2$	$1s\,7p\ ^1P^o_1$	7.5857E+00	2.671E−05	1.032E+09	7.5543E+00	2.524E−05	9.753E+08	0.018
$1s\,4p\ ^1P^o_1$	$1s\,7p\ ^1P^o_1$	7.6047E+00	3.529E−05	1.357E+09	7.5735E+00	3.553E−05	1.365E+09	0.001
$1s\,4f\ ^3F^o_3$	$1s\,7p\ ^1P^o_1$	7.6752E+00	5.944E−07	2.244E+07	7.6436E+00	6.387E−07	2.410E+07	0.038
$1s\,4f\ ^3F^o_2$	$1s\,7p\ ^1P^o_1$	7.6767E+00	1.327E−06	5.007E+07	7.6451E+00	1.227E−06	4.628E+07	0.037
$1s\,4f\ ^1F^o_3$	$1s\,7p\ ^1P^o_1$	7.7125E+00	1.103E−05	4.124E+08	7.6807E+00	1.104E−05	4.127E+08	0.012
$1s\,5p\ ^3P^o_1$	$1s\,7p\ ^1P^o_1$	1.5788E+01	1.070E−04	9.547E+08	1.5725E+01	1.067E−04	9.520E+08	0.009
$1s\,5p\ ^3P^o_2$	$1s\,7p\ ^1P^o_1$	1.6303E+01	5.105E−05	4.271E+08	1.6237E+01	4.929E−05	4.121E+08	0.003
$1s\,5p\ ^1P^o_1$	$1s\,7p\ ^1P^o_1$	1.6348E+01	6.835E−05	5.686E+08	1.6282E+01	6.968E−05	5.795E+08	0.009
$1s\,5f\ ^3F^o_3$	$1s\,7p\ ^1P^o_1$	1.6515E+01	2.442E−06	1.991E+07	1.6450E+01	2.714E−06	2.211E+07	0.003
$1s\,5f\ ^3F^o_2$	$1s\,7p\ ^1P^o_1$	1.6519E+01	5.460E−06	4.449E+07	1.6453E+01	5.203E−06	4.237E+07	0.003
$1s\,5f\ ^1F^o_3$	$1s\,7p\ ^1P^o_1$	1.6604E+01	4.732E−05	3.817E+08	1.6538E+01	4.695E−05	3.785E+08	0.000
$1s\,6p\ ^3P^o_1$	$1s\,7p\ ^1P^o_1$	4.1241E+01	2.976E−04	3.891E+08	4.1082E+01	2.898E−04	3.786E+08	0.001
$1s\,6p\ ^3P^o_2$	$1s\,7p\ ^1P^o_1$	4.3302E+01	1.543E−04	1.829E+08	4.3133E+01	1.489E−04	1.764E+08	0.002
$1s\,6p\ ^1P^o_1$	$1s\,7p\ ^1P^o_1$	4.3483E+01	2.090E−04	2.457E+08	4.3294E+01	2.181E−04	2.565E+08	0.001
$1s\,6f\ ^3F^o_3$	$1s\,7p\ ^1P^o_1$	4.4172E+01	1.082E−05	1.233E+07	4.4022E+01	1.212E−05	1.379E+07	0.002
$1s\,6f\ ^3F^o_2$	$1s\,7p\ ^1P^o_1$	4.4186E+01	2.423E−05	2.759E+07	4.4022E+01	2.300E−05	2.617E+07	0.002
$1s\,6f\ ^1F^o_3$	$1s\,7p\ ^1P^o_1$	4.4540E+01	2.117E−04	2.373E+08	4.4376E+01	2.118E−04	2.371E+08	0.002
$1s\,7p\ ^3P^o_1$	$1s\,7p\ ^1P^o_1$	1.2731E+03	1.853E−07	2.541E+02	1.2808E+03	1.800E−07	2.420E+02	0.047
$1s\,7p\ ^3P^o_2$	$1s\,7p\ ^1P^o_1$	1.6436E+04	4.209E−11	3.465E−04				0.021
$1s\,2s\ ^3S_1$	$1s\,7d\ ^3D_3$	1.3248E+00	1.758E−05	9.543E+09	1.3192E+00	1.588E−05	8.622E+09	0.002
$1s\,3s\ ^3S_1$	$1s\,7d\ ^3D_3$	3.3852E+00	9.868E−05	8.205E+09	3.3710E+00	9.907E−05	8.237E+09	0.026
$1s\,3d\ ^3D_2$	$1s\,7d\ ^3D_3$	3.5248E+00	9.707E−06	7.445E+08	3.5099E+00	9.973E−06	7.649E+08	0.021
$1s\,3d\ ^3D_1$	$1s\,7d\ ^3D_3$	3.5263E+00	1.642E−06	1.258E+08	3.5113E+00	1.619E−06	1.240E+08	0.023
$1s\,3d\ ^3D_3$	$1s\,7d\ ^3D_3$	3.5615E+00	3.721E−05	2.795E+09	3.5464E+00	3.778E−05	2.838E+09	0.022
$1s\,3d\ ^1D_2$	$1s\,7d\ ^3D_3$	3.5629E+00	6.409E−06	4.811E+08	3.5478E+00	6.234E−06	4.679E+08	0.024
$1s\,4s\ ^3S_1$	$1s\,7d\ ^3D_3$	7.3175E+00	2.171E−04	3.863E+09	7.2866E+00	2.196E−04	3.908E+09	0.021
$1s\,4d\ ^3D_2$	$1s\,7d\ ^3D_3$	7.5894E+00	2.398E−05	3.967E+08	7.5575E+00	2.428E−05	4.016E+08	0.009
$1s\,4d\ ^3D_1$	$1s\,7d\ ^3D_3$	7.5922E+00	3.931E−06	6.498E+07	7.5603E+00	3.920E−06	6.479E+07	0.007
$1s\,4d\ ^3D_3$	$1s\,7d\ ^3D_3$	7.6613E+00	9.279E−05	1.506E+09	7.6289E+00	9.340E−05	1.516E+09	0.009
$1s\,4d\ ^1D_2$	$1s\,7d\ ^3D_3$	7.6642E+00	1.550E−05	2.515E+08	7.6319E+00	1.533E−05	2.487E+08	0.010
$1s\,5s\ ^3S_1$	$1s\,7d\ ^3D_3$	1.5649E+01	4.656E−04	1.812E+09	1.5581E+01	4.708E−04	1.832E+09	0.011
$1s\,5d\ ^3D_2$	$1s\,7d\ ^3D_3$	1.6284E+01	5.459E−05	1.962E+08	1.6216E+01	5.492E−05	1.973E+08	0.003
$1s\,5d\ ^3D_1$	$1s\,7d\ ^3D_3$	1.6290E+01	8.844E−06	3.176E+07	1.6222E+01	8.848E−06	3.176E+07	0.002
$1s\,5d\ ^3D_3$	$1s\,7d\ ^3D_3$	1.6453E+01	2.142E−04	7.541E+08	1.6384E+01	2.148E−04	7.562E+08	0.003
$1s\,5d\ ^1D_2$	$1s\,7d\ ^3D_3$	1.6460E+01	3.535E−05	1.243E+08	1.6391E+01	3.519E−05	1.237E+08	0.004
$1s\,5g\ ^3G_4$	$1s\,7d\ ^3D_3$	1.6542E+01	1.538E−06	5.355E+06	1.6470E+01	1.547E−06	5.389E+06	0.004
$1s\,5g\ ^3G_3$	$1s\,7d\ ^3D_3$	1.6544E+01	1.868E−07	6.503E+05	1.6472E+01	1.859E−07	6.476E+05	0.006

(*continued on next page*)

Table 4 (*continued*)

Lower	Upper	GRASP2K			FAC			*dT*
		λ (Å)	*gf*	*A* (s^{-1})	λ (Å)	*gf*	*A* (s^{-1})	
$1s\,5g\ ^3G_5$	$1s\,7d\ ^3D_3$	1.6593E+01	2.071E−05	7.169E+07	1.6521E+01	2.073E−05	7.178E+07	0.003
$1s\,5g\ ^1G_4$	$1s\,7d\ ^3D_3$	1.6595E+01	1.270E−06	4.394E+06	1.6522E+01	1.261E−06	4.366E+06	0.005
$1s\,6s\ ^3S_1$	$1s\,7d\ ^3D_3$	4.0543E+01	1.383E−03	8.018E+08	4.0325E+01	1.412E−03	8.208E+08	0.005
$1s\,6d\ ^3D_2$	$1s\,7d\ ^3D_3$	4.3051E+01	1.778E−04	9.140E+07	4.2880E+01	1.798E−04	9.239E+07	0.001
$1s\,6d\ ^3D_1$	$1s\,7d\ ^3D_3$	4.3077E+01	2.870E−05	1.474E+07	4.2874E+01	2.939E−05	1.510E+07	0.001
$1s\,6d\ ^3D_3$	$1s\,7d\ ^3D_3$	4.3740E+01	7.202E−04	3.587E+08	4.3560E+01	7.214E−04	3.592E+08	0.001
$1s\,6d\ ^1D_2$	$1s\,7d\ ^3D_3$	4.3770E+01	1.184E−04	5.887E+07	4.3571E+01	1.168E−04	5.813E+07	0.001
$1s\,6g\ ^3G_4$	$1s\,7d\ ^3D_3$	4.4103E+01	1.214E−05	5.945E+06	4.3907E+01	1.220E−05	5.980E+06	0.001
$1s\,6g\ ^3G_3$	$1s\,7d\ ^3D_3$	4.4112E+01	1.464E−06	7.171E+05	4.3907E+01	1.464E−06	7.176E+05	0.001
$1s\,6g\ ^3G_5$	$1s\,7d\ ^3D_3$	4.4315E+01	1.637E−04	7.941E+07	4.4116E+01	1.636E−04	7.946E+07	0.001
$1s\,6g\ ^1G_4$	$1s\,7d\ ^3D_3$	4.4321E+01	9.975E−06	4.839E+06	4.4116E+01	9.920E−06	4.815E+06	0.001
$1s\,7s\ ^3S_1$	$1s\,7d\ ^3D_3$	8.8243E+02	1.362E−06	1.667E+03	8.6393E+02	1.431E−06	1.811E+03	0.002
$1s\,7d\ ^3D_2$	$1s\,7d\ ^3D_3$	4.3459E+03	2.721E−09	1.373E−01				0.004
$1s\,7d\ ^3D_1$	$1s\,7d\ ^3D_3$	4.5178E+03	3.927E−10	1.833E−02				0.021
$1s\,2p\ ^3P^o_1$	$1s\,7f\ ^3F^o_3$	1.3358E+00	5.669E−04	3.027E+11	1.3303E+00	5.764E−04	3.077E+11	0.000
$1s\,2p\ ^3P^o_2$	$1s\,7f\ ^3F^o_3$	1.3942E+00	1.500E−04	7.354E+10	1.3883E+00	1.493E−04	7.322E+10	0.014
$1s\,2p\ ^1P^o_1$	$1s\,7f\ ^3F^o_3$	1.3997E+00	3.473E−05	1.689E+10	1.3939E+00	3.421E−05	1.663E+10	0.036
$1s\,3p\ ^3P^o_1$	$1s\,7f\ ^3F^o_3$	3.4047E+00	1.597E−05	1.313E+09	3.3906E+00	1.883E−05	1.547E+09	0.110
$1s\,3p\ ^3P^o_2$	$1s\,7f\ ^3F^o_3$	3.5164E+00	9.649E−06	7.436E+08	3.5016E+00	1.109E−05	8.551E+08	0.073
$1s\,3p\ ^1P^o_1$	$1s\,7f\ ^3F^o_3$	3.5263E+00	2.608E−06	1.999E+08	3.5116E+00	2.267E−06	1.737E+08	0.007
$1s\,4p\ ^3P^o_1$	$1s\,7f\ ^3F^o_3$	7.3546E+00	6.464E−05	1.139E+09	7.3233E+00	6.291E−05	1.108E+09	0.012
$1s\,4p\ ^3P^o_2$	$1s\,7f\ ^3F^o_3$	7.5729E+00	7.761E−06	1.290E+08	7.5406E+00	7.141E−06	1.186E+08	0.023
$1s\,4p\ ^1P^o_1$	$1s\,7f\ ^3F^o_3$	7.5920E+00	1.634E−06	2.702E+07	7.5597E+00	1.856E−06	3.069E+07	0.016
$1s\,4f\ ^3F^o_3$	$1s\,7f\ ^3F^o_3$	7.6621E+00	4.344E−05	7.051E+08	7.6295E+00	4.280E−05	6.948E+08	0.011
$1s\,4f\ ^3F^o_2$	$1s\,7f\ ^3F^o_3$	7.6636E+00	7.207E−06	1.169E+08	7.6310E+00	7.140E−06	1.158E+08	0.011
$1s\,4f\ ^3F^o_4$	$1s\,7f\ ^3F^o_3$	7.6982E+00	7.258E−06	1.167E+08	7.6653E+00	7.235E−06	1.163E+08	0.004
$1s\,4f\ ^1F^o_3$	$1s\,7f\ ^3F^o_3$	7.6993E+00	8.713E−07	1.401E+07	7.6665E+00	8.328E−07	1.338E+07	0.003
$1s\,5p\ ^3P^o_1$	$1s\,7f\ ^3F^o_3$	1.5734E+01	4.148E−04	1.597E+09	1.5665E+01	4.152E−04	1.598E+09	0.004
$1s\,5p\ ^3P^o_2$	$1s\,7f\ ^3F^o_3$	1.6245E+01	8.271E−05	2.987E+08	1.6174E+01	8.226E−05	2.971E+08	0.002
$1s\,5p\ ^1P^o_1$	$1s\,7f\ ^3F^o_3$	1.6289E+01	1.901E−05	6.828E+07	1.6219E+01	1.921E−05	6.900E+07	0.008
$1s\,5f\ ^3F^o_3$	$1s\,7f\ ^3F^o_3$	1.6455E+01	1.515E−04	5.333E+08	1.6385E+01	1.511E−04	5.319E+08	0.001
$1s\,5f\ ^3F^o_2$	$1s\,7f\ ^3F^o_3$	1.6459E+01	2.517E−05	8.855E+07	1.6388E+01	2.523E−05	8.877E+07	0.001
$1s\,5f\ ^3F^o_4$	$1s\,7f\ ^3F^o_3$	1.6540E+01	2.593E−05	9.030E+07	1.6469E+01	2.592E−05	9.031E+07	0.000
$1s\,5f\ ^1F^o_3$	$1s\,7f\ ^3F^o_3$	1.6543E+01	3.118E−06	1.086E+07	1.6472E+01	2.991E−06	1.041E+07	0.000
$1s\,6p\ ^3P^o_1$	$1s\,7f\ ^3F^o_3$	4.0868E+01	1.936E−03	1.105E+09	4.0680E+01	1.929E−03	1.101E+09	0.001
$1s\,6p\ ^3P^o_2$	$1s\,7f\ ^3F^o_3$	4.2891E+01	4.845E−04	2.510E+08	4.2690E+01	4.909E−04	2.545E+08	0.001
$1s\,6p\ ^1P^o_1$	$1s\,7f\ ^3F^o_3$	4.3069E+01	1.141E−04	5.864E+07	4.2848E+01	1.182E−04	6.086E+07	0.000
$1s\,6f\ ^3F^o_3$	$1s\,7f\ ^3F^o_3$	4.3744E+01	6.234E−04	3.104E+08	4.3561E+01	6.229E−04	3.101E+08	0.000
$1s\,6f\ ^3F^o_2$	$1s\,7f\ ^3F^o_3$	4.3758E+01	1.037E−04	5.161E+07	4.3560E+01	1.039E−04	5.177E+07	0.000
$1s\,6f\ ^3F^o_4$	$1s\,7f\ ^3F^o_3$	4.4094E+01	1.088E−04	5.331E+07	4.3907E+01	1.091E−04	5.351E+07	0.000
$1s\,6f\ ^1F^o_3$	$1s\,7f\ ^3F^o_3$	4.4105E+01	1.310E−05	6.419E+06	4.3907E+01	1.307E−05	6.406E+06	0.000
$1s\,6h\ ^3H^o_5$	$1s\,7f\ ^3F^o_3$	4.4306E+01	4.016E−05	1.949E+07	4.4116E+01	4.014E−05	1.949E+07	0.001
$1s\,6h\ ^3H^o_4$	$1s\,7f\ ^3F^o_3$	4.4312E+01	2.427E−06	1.178E+06	4.4116E+01	2.436E−06	1.182E+06	0.001
$1s\,6h\ ^1H^o_5$	$1s\,7f\ ^3F^o_3$	4.4452E+01	5.514E−12	2.659E+00				0.017
$1s\,7p\ ^3P^o_1$	$1s\,7f\ ^3F^o_3$	9.9322E+02	7.907E−07	7.638E+02	9.7893E+02	8.183E−07	8.067E+02	0.104
$1s\,7p\ ^3P^o_2$	$1s\,7f\ ^3F^o_3$	3.5436E+03	4.295E−09	3.259E−01	3.3920E+03	4.895E−09	4.019E−01	0.273
$1s\,7p\ ^1P^o_1$	$1s\,7f\ ^3F^o_3$	4.5177E+03	4.880E−10	2.279E−02				0.371
$1s\,2p\ ^3P^o_1$	$1s\,7f\ ^3F^o_2$	1.3358E+00	1.757E−04	1.314E+11	1.3303E+00	1.782E−04	1.332E+11	0.010
$1s\,2p\ ^3P^o_0$	$1s\,7f\ ^3F^o_2$	1.3367E+00	2.481E−04	1.852E+11	1.3311E+00	2.514E−04	1.876E+11	0.002
$1s\,2p\ ^3P^o_2$	$1s\,7f\ ^3F^o_2$	1.3942E+00	3.754E−05	2.577E+10	1.3883E+00	3.730E−05	2.559E+10	0.012
$1s\,2p\ ^1P^o_1$	$1s\,7f\ ^3F^o_2$	1.3997E+00	7.771E−05	5.292E+10	1.3939E+00	7.705E−05	5.245E+10	0.006
$1s\,3p\ ^3P^o_1$	$1s\,7f\ ^3F^o_2$	3.4047E+00	4.739E−06	5.454E+08	3.3906E+00	5.997E−06	6.900E+08	0.127
$1s\,3p\ ^3P^o_0$	$1s\,7f\ ^3F^o_2$	3.4061E+00	6.996E−06	8.044E+08	3.3920E+00	8.272E−06	9.510E+08	0.112
$1s\,3p\ ^3P^o_2$	$1s\,7f\ ^3F^o_2$	3.5163E+00	2.405E−06	2.595E+08	3.5016E+00	2.771E−06	2.990E+08	0.079
$1s\,3p\ ^1P^o_1$	$1s\,7f\ ^3F^o_2$	3.5262E+00	5.409E−06	5.803E+08	3.5116E+00	5.984E−06	6.419E+08	0.060
$1s\,4p\ ^3P^o_1$	$1s\,7f\ ^3F^o_2$	7.3543E+00	1.993E−05	4.916E+08	7.3233E+00	1.884E−05	4.647E+08	0.016
$1s\,4p\ ^3P^o_0$	$1s\,7f\ ^3F^o_2$	7.3571E+00	2.804E−05	6.912E+08	7.3259E+00	2.725E−05	6.717E+08	0.013
$1s\,4p\ ^3P^o_2$	$1s\,7f\ ^3F^o_2$	7.5727E+00	1.956E−06	4.550E+07	7.5406E+00	1.789E−06	4.163E+07	0.025
$1s\,4p\ ^1P^o_1$	$1s\,7f\ ^3F^o_2$	7.5917E+00	3.790E−06	8.772E+07	7.5597E+00	3.539E−06	8.193E+07	0.018
$1s\,4f\ ^3F^o_3$	$1s\,7f\ ^3F^o_2$	7.6619E+00	7.214E−06	1.639E+08	7.6295E+00	7.104E−06	1.614E+08	0.010
$1s\,4f\ ^3F^o_2$	$1s\,7f\ ^3F^o_2$	7.6634E+00	2.888E−05	6.561E+08	7.6310E+00	2.850E−05	6.474E+08	0.010
$1s\,4f\ ^3F^o_4$	$1s\,7f\ ^3F^o_2$	7.6979E+00	5.832E−07	1.313E+07	7.6653E+00	5.781E−07	1.301E+07	0.001
$1s\,4f\ ^1F^o_3$	$1s\,7f\ ^3F^o_2$	7.6990E+00	5.275E−06	1.187E+08	7.6665E+00	5.227E−06	1.176E+08	0.004
$1s\,5p\ ^3P^o_1$	$1s\,7f\ ^3F^o_2$	1.5732E+01	1.269E−04	6.840E+08	1.5665E+01	1.261E−04	6.801E+08	0.003
$1s\,5p\ ^3P^o_0$	$1s\,7f\ ^3F^o_2$	1.5739E+01	1.803E−04	9.713E+08	1.5671E+01	1.804E−04	9.720E+08	0.004
$1s\,5p\ ^3P^o_2$	$1s\,7f\ ^3F^o_2$	1.6243E+01	2.078E−05	1.051E+08	1.6174E+01	2.059E−05	1.041E+08	0.002
$1s\,5p\ ^1P^o_1$	$1s\,7f\ ^3F^o_2$	1.6288E+01	4.275E−05	2.150E+08	1.6219E+01	4.240E−05	2.132E+08	0.003
$1s\,5f\ ^3F^o_3$	$1s\,7f\ ^3F^o_2$	1.6454E+01	2.516E−05	1.240E+08	1.6385E+01	2.509E−05	1.236E+08	0.001
$1s\,5f\ ^3F^o_2$	$1s\,7f\ ^3F^o_2$	1.6457E+01	1.008E−04	4.967E+08	1.6388E+01	1.006E−04	4.955E+08	0.001
$1s\,5f\ ^3F^o_4$	$1s\,7f\ ^3F^o_2$	1.6539E+01	2.071E−06	1.010E+07	1.6469E+01	2.072E−06	1.010E+07	0.001
$1s\,5f\ ^1F^o_3$	$1s\,7f\ ^3F^o_2$	1.6542E+01	1.883E−05	9.182E+07	1.6472E+01	1.872E−05	9.128E+07	0.000

(*continued on next page*)

Table 4 (*continued*)

Lower	Upper	GRASP2K			FAC			*dT*
		λ (Å)	*gf*	A (s^{-1})	λ (Å)	*gf*	A (s^{-1})	
$1s\,6p\ ^3P^o_1$	$1s\,7f\ ^3F^o_2$	4.0860E+01	5.906E−04	4.719E+08	4.0680E+01	6.038E−04	4.826E+08	0.001
$1s\,6p\ ^3P^o_0$	$1s\,7f\ ^3F^o_2$	4.0884E+01	8.426E−04	6.725E+08	4.0618E+01	8.498E−04	6.814E+08	0.001
$1s\,6p\ ^3P^o_2$	$1s\,7f\ ^3F^o_2$	4.2882E+01	1.216E−04	8.820E+07	4.2690E+01	1.225E−04	8.897E+07	0.001
$1s\,6p\ ^1P^o_1$	$1s\,7f\ ^3F^o_2$	4.3060E+01	2.556E−04	1.839E+08	4.2848E+01	2.487E−04	1.792E+08	0.001
$1s\,6f\ ^3F^o_3$	$1s\,7f\ ^3F^o_2$	4.3735E+01	1.035E−04	7.216E+07	4.3561E+01	1.039E−04	7.247E+07	0.000
$1s\,6f\ ^3F^o_2$	$1s\,7f\ ^3F^o_2$	4.3749E+01	4.148E−04	2.891E+08	4.3561E+01	4.154E−04	2.896E+08	0.000
$1s\,6f\ ^3F^o_4$	$1s\,7f\ ^3F^o_2$	4.4085E+01	8.672E−06	5.953E+06	4.3907E+01	8.726E−06	5.987E+06	0.000
$1s\,6f\ ^1F^o_3$	$1s\,7f\ ^3F^o_2$	4.4096E+01	7.898E−05	5.418E+07	4.3907E+01	7.843E−05	5.381E+07	0.000
$1s\,6h\ ^3H^o_4$	$1s\,7f\ ^3F^o_2$	4.4302E+01	3.039E−05	2.066E+07	4.4116E+01	3.041E−05	2.067E+07	0.001
$1s\,7p\ ^3P^o_1$	$1s\,7f\ ^3F^o_2$	9.8851E+02	2.450E−07	3.345E+02	9.7899E+02	2.541E−07	3.507E+02	0.101
$1s\,7p\ ^3P^o_0$	$1s\,7f\ ^3F^o_2$	9.9743E+02	3.397E−07	4.556E+02	9.5689E+02	3.834E−07	5.539E+02	0.104
$1s\,7p\ ^3P^o_2$	$1s\,7f\ ^3F^o_2$	3.4844E+03	1.135E−09	1.247E−01	3.3927E+03	1.221E−09	1.403E−01	0.269
$1s\,7p\ ^1P^o_1$	$1s\,7f\ ^3F^o_2$	4.4219E+03	1.166E−09	7.956E−02	4.1543E+03	1.350E−09	1.035E−01	0.323
$1s\,7f\ ^3F^o_3$	$1s\,7f\ ^3F^o_2$	2.0860E+05	1.383E−14	4.240E−10				0.119
$1s^2\ ^1S_0$	$1s\,7d\ ^1D_2$	3.1390E−01	1.285E−04	1.738E+12	3.1267E−01	1.498E−04	2.027E+12	0.002
$1s\,2s\ ^3S_1$	$1s\,7d\ ^1D_2$	1.3248E+00	5.060E−06	3.847E+09	1.3192E+00	4.425E−06	3.363E+09	0.012
$1s\,2s\ ^1S_0$	$1s\,7d\ ^1D_2$	1.3369E+00	6.434E−06	4.802E+09	1.3314E+00	6.727E−06	5.019E+09	0.002
$1s\,3s\ ^3S_1$	$1s\,7d\ ^1D_2$	3.3851E+00	2.803E−05	3.263E+09	3.3710E+00	2.747E−05	3.197E+09	0.019
$1s\,3s\ ^1S_0$	$1s\,7d\ ^1D_2$	3.4060E+00	4.485E−05	5.158E+09	3.3920E+00	4.243E−05	4.878E+09	0.081
$1s\,3d\ ^3D_2$	$1s\,7d\ ^1D_2$	3.5247E+00	2.531E−06	2.717E+08	3.5098E+00	2.588E−06	2.779E+08	0.006
$1s\,3d\ ^3D_1$	$1s\,7d\ ^1D_2$	3.5261E+00	5.861E−06	6.288E+08	3.5113E+00	5.640E−06	6.051E+08	0.033
$1s\,3d\ ^3D_3$	$1s\,7d\ ^1D_2$	3.5614E+00	6.094E−06	6.409E+08	3.5463E+00	6.116E−06	6.433E+08	0.027
$1s\,3d\ ^1D_2$	$1s\,7d\ ^1D_2$	3.5628E+00	2.633E−05	2.767E+09	3.5477E+00	2.540E−05	2.669E+09	0.033
$1s\,4s\ ^3S_1$	$1s\,7d\ ^1D_2$	7.3170E+00	6.124E−05	1.526E+09	7.2864E+00	6.084E−05	1.515E+09	0.018
$1s\,4s\ ^1S_0$	$1s\,7d\ ^1D_2$	7.3564E+00	9.856E−05	2.430E+09	7.3260E+00	9.436E−05	2.325E+09	0.064
$1s\,4d\ ^3D_2$	$1s\,7d\ ^1D_2$	7.5888E+00	6.059E−06	1.403E+08	7.5573E+00	6.203E−06	1.436E+08	0.003
$1s\,4d\ ^3D_1$	$1s\,7d\ ^1D_2$	7.5916E+00	1.403E−05	3.247E+08	7.5601E+00	1.369E−05	3.169E+08	0.015
$1s\,4d\ ^3D_3$	$1s\,7d\ ^1D_2$	7.6607E+00	1.525E−05	3.466E+08	7.6287E+00	1.511E−05	3.435E+08	0.010
$1s\,4d\ ^1D_2$	$1s\,7d\ ^1D_2$	7.6636E+00	6.371E−05	1.447E+09	7.6317E+00	6.287E−05	1.427E+09	0.014
$1s\,5s\ ^3S_1$	$1s\,7d\ ^1D_2$	1.5646E+01	1.309E−04	7.133E+08	1.5580E+01	1.303E−04	7.100E+08	0.010
$1s\,5s\ ^1S_0$	$1s\,7d\ ^1D_2$	1.5737E+01	2.061E−04	1.110E+09	1.5671E+01	2.021E−04	1.088E+09	0.033
$1s\,5d\ ^3D_2$	$1s\,7d\ ^1D_2$	1.6281E+01	1.358E−05	6.833E+07	1.6215E+01	1.394E−05	7.013E+07	0.001
$1s\,5d\ ^3D_1$	$1s\,7d\ ^1D_2$	1.6288E+01	3.146E−05	1.582E+08	1.6221E+01	3.092E−05	1.554E+08	0.006
$1s\,5d\ ^3D_3$	$1s\,7d\ ^1D_2$	1.6451E+01	3.517E−05	1.734E+08	1.6383E+01	3.475E−05	1.712E+08	0.004
$1s\,5d\ ^1D_2$	$1s\,7d\ ^1D_2$	1.6458E+01	1.450E−04	7.144E+08	1.6390E+01	1.447E−04	7.124E+08	0.005
$1s\,5g\ ^3G_4$	$1s\,7d\ ^1D_2$	1.6539E+01	1.475E−07	7.192E+05	1.6469E+01	1.668E−07	8.136E+05	0.010
$1s\,5g\ ^3G_3$	$1s\,7d\ ^1D_2$	1.6541E+01	1.101E−06	5.368E+06	1.6471E+01	1.083E−06	5.283E+06	0.005
$1s\,5g\ ^1G_4$	$1s\,7d\ ^1D_2$	1.6592E+01	1.578E−05	7.645E+07	1.6521E+01	1.569E−05	7.608E+07	0.004
$1s\,6s\ ^3S_1$	$1s\,7d\ ^1D_2$	4.0526E+01	3.877E−04	3.150E+08	4.0319E+01	3.915E−04	3.186E+08	0.005
$1s\,6s\ ^1S_0$	$1s\,7d\ ^1D_2$	4.0874E+01	6.098E−04	4.870E+08	4.0613E+01	6.046E−04	4.848E+08	0.010
$1s\,6d\ ^3D_2$	$1s\,7d\ ^1D_2$	4.3033E+01	4.383E−05	3.157E+07	4.2873E+01	4.367E−05	3.143E+07	0.000
$1s\,6d\ ^3D_1$	$1s\,7d\ ^1D_2$	4.3059E+01	1.018E−04	7.325E+07	4.2867E+01	9.979E−05	7.183E+07	0.002
$1s\,6d\ ^3D_3$	$1s\,7d\ ^1D_2$	4.3721E+01	1.180E−04	8.234E+07	4.3553E+01	1.166E−04	8.133E+07	0.001
$1s\,6d\ ^1D_2$	$1s\,7d\ ^1D_2$	4.3751E+01	4.848E−04	3.379E+08	4.3564E+01	4.878E−04	3.400E+08	0.001
$1s\,6g\ ^3G_4$	$1s\,7d\ ^1D_2$	4.4084E+01	1.166E−06	8.003E+05	4.3900E+01	1.267E−06	8.701E+05	0.003
$1s\,6g\ ^3G_3$	$1s\,7d\ ^1D_2$	4.4092E+01	8.625E−06	5.918E+06	4.3900E+01	8.518E−06	5.846E+06	0.001
$1s\,6g\ ^1G_4$	$1s\,7d\ ^1D_2$	4.4302E+01	1.239E−04	8.420E+07	4.4109E+01	1.240E−04	8.433E+07	0.001
$1s\,7s\ ^3S_1$	$1s\,7d\ ^1D_2$	8.7478E+02	3.916E−07	6.827E+02	8.6126E+02	4.005E−07	7.142E+02	0.006
$1s\,7s\ ^1S_0$	$1s\,7d\ ^1D_2$	9.8833E+02	4.178E−07	5.706E+02	9.5307E+02	4.657E−07	6.782E+02	0.090
$1s\,7d\ ^3D_2$	$1s\,7d\ ^1D_2$	4.1666E+03	7.586E−10	5.829E−02				0.042
$1s\,7d\ ^3D_1$	$1s\,7d\ ^1D_2$	4.3244E+03	1.574E−09	1.123E−01				0.014
$1s\,7d\ ^3D_3$	$1s\,7d\ ^1D_2$	1.0098E+05	1.418E−13	1.855E−08				0.727
$1s\,2p\ ^3P^o_2$	$1s\,7f\ ^3F^o_4$	1.3940E+00	1.003E−03	3.825E+11	1.3881E+00	1.037E−03	3.957E+11	0.013
$1s\,3p\ ^3P^o_2$	$1s\,7f\ ^3F^o_4$	3.5150E+00	5.714E−05	3.428E+09	3.5002E+00	6.732E−05	4.038E+09	0.079
$1s\,4p\ ^3P^o_2$	$1s\,7f\ ^3F^o_4$	7.5664E+00	6.079E−05	7.869E+08	7.5341E+00	5.644E−05	7.306E+08	0.021
$1s\,4f\ ^3F^o_3$	$1s\,7f\ ^3F^o_4$	7.6554E+00	7.647E−06	9.670E+07	7.6229E+00	7.602E−06	9.614E+07	0.010
$1s\,4f\ ^3F^o_2$	$1s\,7f\ ^3F^o_4$	7.6569E+00	6.110E−07	7.724E+06	7.6244E+00	6.060E−07	7.660E+06	0.012
$1s\,4f\ ^3F^o_4$	$1s\,7f\ ^3F^o_4$	7.6914E+00	6.132E−05	7.682E+08	7.6587E+00	6.131E−05	7.682E+08	0.004
$1s\,4f\ ^1F^o_3$	$1s\,7f\ ^3F^o_4$	7.6926E+00	5.597E−06	7.009E+07	7.6598E+00	5.600E−06	7.013E+07	0.004
$1s\,5p\ ^3P^o_2$	$1s\,7f\ ^3F^o_4$	1.6215E+01	5.823E−04	1.642E+09	1.6144E+01	5.789E−04	1.632E+09	0.002
$1s\,5f\ ^3F^o_3$	$1s\,7f\ ^3F^o_4$	1.6424E+01	2.639E−05	7.251E+07	1.6354E+01	2.644E−05	7.266E+07	0.001
$1s\,5f\ ^3F^o_2$	$1s\,7f\ ^3F^o_4$	1.6428E+01	2.088E−06	5.735E+06	1.6358E+01	2.090E−06	5.741E+06	0.001
$1s\,5f\ ^3F^o_4$	$1s\,7f\ ^3F^o_4$	1.6509E+01	2.165E−04	5.887E+08	1.6439E+01	2.163E−04	5.883E+08	0.000
$1s\,5f\ ^1F^o_3$	$1s\,7f\ ^3F^o_4$	1.6512E+01	1.977E−05	5.373E+07	1.6441E+01	1.975E−05	5.369E+07	0.000
$1s\,6p\ ^3P^o_2$	$1s\,7f\ ^3F^o_4$	4.2681E+01	3.276E−03	1.333E+09	4.2483E+01	3.308E−03	1.346E+09	0.001
$1s\,6f\ ^3F^o_3$	$1s\,7f\ ^3F^o_4$	4.3526E+01	1.066E−04	4.170E+07	4.3345E+01	1.073E−04	4.197E+07	0.000
$1s\,6f\ ^3F^o_2$	$1s\,7f\ ^3F^o_4$	4.3541E+01	8.390E−06	3.280E+06	4.3345E+01	8.576E−06	3.354E+06	0.000
$1s\,6f\ ^3F^o_4$	$1s\,7f\ ^3F^o_4$	4.3873E+01	8.912E−04	3.432E+08	4.3688E+01	8.920E−04	3.434E+08	0.000
$1s\,6f\ ^1F^o_3$	$1s\,7f\ ^3F^o_4$	4.3884E+01	8.141E−05	3.133E+07	4.3689E+01	8.098E−05	3.118E+07	0.000
$1s\,6h\ ^3H^o_5$	$1s\,7f\ ^3F^o_4$	4.4083E+01	2.238E−06	8.534E+05	4.3895E+01	2.247E−06	8.571E+05	0.001
$1s\,6h\ ^3H^o_4$	$1s\,7f\ ^3F^o_4$	4.4089E+01	1.604E−07	6.116E+04				0.001

(*continued on next page*)

Table 4 (*continued*)

Lower	Upper	GRASP2K			FAC			*dT*
		λ (Å)	*gf*	A (s^{-1})	λ (Å)	*gf*	A (s^{-1})	
$1s\,6h\ ^3H_6^o$	$1s\,7f\ ^3F_4^o$	4.4223E+01	4.928E−05	1.868E+07	4.4034E+01	4.929E−05	1.868E+07	0.000
$1s\,6h\ ^1H_5^o$	$1s\,7f\ ^3F_4^o$	4.4228E+01	1.903E−06	7.210E+05	4.4034E+01	1.895E−06	7.184E+05	0.000
$1s\,7p\ ^3P_2^o$	$1s\,7f\ ^3F_4^o$	2.5222E+03	8.144E−08	9.488E+00	2.4461E+03	8.879E−08	1.090E+01	0.215
$1s\,7f\ ^3F_3^o$	$1s\,7f\ ^3F_4^o$	8.7508E+03	1.956E−10	1.893E−03	8.7713E+03	1.926E−10	1.840E−03	0.012
$1s\,7f\ ^3F_2^o$	$1s\,7f\ ^3F_4^o$	9.1339E+03	1.364E−11	1.211E−04				0.004
$1s\,3d\ ^3D_2$	$1s\,7g\ ^3G_4$	3.5233E+00	1.943E−03	1.160E+11	3.5085E+00	1.957E−03	1.168E+11	0.001
$1s\,3d\ ^3D_3$	$1s\,7g\ ^3G_4$	3.5600E+00	2.000E−04	1.170E+10	3.5449E+00	1.996E−04	1.167E+10	0.002
$1s\,3d\ ^1D_2$	$1s\,7g\ ^3G_4$	3.5614E+00	1.781E−05	1.041E+09	3.5464E+00	1.724E−05	1.007E+09	0.006
$1s\,4d\ ^3D_2$	$1s\,7g\ ^3G_4$	7.5825E+00	3.212E−04	4.141E+09	7.5510E+00	3.252E−04	4.191E+09	0.002
$1s\,4d\ ^3D_3$	$1s\,7g\ ^3G_4$	7.6543E+00	3.711E−05	4.695E+08	7.6223E+00	3.748E−05	4.741E+08	0.003
$1s\,4d\ ^1D_2$	$1s\,7g\ ^3G_4$	7.6572E+00	3.439E−06	4.347E+07	7.6253E+00	3.353E−06	4.237E+07	0.011
$1s\,5d\ ^3D_2$	$1s\,7g\ ^3G_4$	1.6252E+01	1.272E−04	3.569E+08	1.6186E+01	1.258E−04	3.529E+08	0.002
$1s\,5d\ ^3D_3$	$1s\,7g\ ^3G_4$	1.6421E+01	1.005E−05	2.763E+07	1.6353E+01	9.930E−06	2.728E+07	0.003
$1s\,5d\ ^1D_2$	$1s\,7g\ ^3G_4$	1.6428E+01	9.544E−07	2.621E+06	1.6361E+01	9.268E−07	2.544E+06	0.013
$1s\,5g\ ^3G_4$	$1s\,7g\ ^3G_4$	1.6509E+01	1.030E−04	2.801E+08	1.6439E+01	1.029E−04	2.799E+08	0.001
$1s\,5g\ ^3G_3$	$1s\,7g\ ^3G_4$	1.6511E+01	9.340E−06	2.539E+07	1.6441E+01	9.352E−06	2.542E+07	0.001
$1s\,5g\ ^3G_5$	$1s\,7g\ ^3G_4$	1.6560E+01	9.418E−06	2.545E+07	1.6490E+01	9.404E−06	2.541E+07	0.001
$1s\,5g\ ^1G_4$	$1s\,7g\ ^3G_4$	1.6562E+01	6.755E−07	1.825E+06	1.6491E+01	6.402E−07	1.730E+06	0.000
$1s\,6d\ ^3D_2$	$1s\,7g\ ^3G_4$	4.2832E+01	4.032E−03	1.629E+09	4.2672E+01	4.028E−03	1.625E+09	0.000
$1s\,6d\ ^3D_3$	$1s\,7g\ ^3G_4$	4.3514E+01	4.098E−04	1.604E+08	4.3345E+01	4.110E−04	1.607E+08	0.000
$1s\,6d\ ^1D_2$	$1s\,7g\ ^3G_4$	4.3543E+01	3.925E−05	1.534E+07	4.3356E+01	4.179E−05	1.633E+07	0.001
$1s\,6g\ ^3G_4$	$1s\,7g\ ^3G_4$	4.3873E+01	6.859E−04	2.641E+08	4.3688E+01	6.861E−04	2.641E+08	0.000
$1s\,6g\ ^3G_3$	$1s\,7g\ ^3G_4$	4.3882E+01	6.214E−05	2.392E+07	4.3688E+01	6.237E−05	2.401E+07	0.000
$1s\,6g\ ^3G_5$	$1s\,7g\ ^3G_4$	4.4082E+01	6.352E−05	2.423E+07	4.3896E+01	6.369E−05	2.429E+07	0.000
$1s\,6g\ ^1G_4$	$1s\,7g\ ^3G_4$	4.4089E+01	4.557E−06	1.737E+06	4.3896E+01	4.548E−06	1.734E+06	0.000
$1s\,7d\ ^3D_2$	$1s\,7g\ ^3G_4$	2.8662E+03	4.119E−08	3.716E+00	2.9148E+03	3.861E−08	3.339E+00	0.001
$1s\,7d\ ^3D_3$	$1s\,7g\ ^3G_4$	8.4183E+03	1.657E−10	1.733E−03	8.7854E+03	1.443E−10	1.374E−03	0.001
$1s\,7d\ ^1D_2$	$1s\,7g\ ^3G_4$	9.1839E+03	1.227E−11	1.078E−04				0.142
$1s\,2s\ ^3S_1$	$1s\,7g\ ^3G_3$	1.3246E+00	1.973E−11	1.072E+04				0.848
$1s\,3s\ ^3S_1$	$1s\,7g\ ^3G_3$	3.3838E+00	3.349E−09	2.787E+05				0.424
$1s\,3d\ ^3D_2$	$1s\,7g\ ^3G_3$	3.5233E+00	2.174E−04	1.669E+10	3.5085E+00	2.189E−04	1.680E+10	0.002
$1s\,3d\ ^3D_1$	$1s\,7g\ ^3G_3$	3.5248E+00	1.293E−03	9.919E+10	3.5099E+00	1.304E−03	1.000E+11	0.002
$1s\,3d\ ^3D_3$	$1s\,7g\ ^3G_3$	3.5600E+00	2.399E−05	1.804E+09	3.5449E+00	2.396E−05	1.801E+09	0.003
$1s\,3d\ ^1D_2$	$1s\,7g\ ^3G_3$	3.5614E+00	1.430E−04	1.074E+10	3.5464E+00	1.423E−04	1.069E+10	0.002
$1s\,4s\ ^3S_1$	$1s\,7g\ ^3G_3$	7.3110E+00	5.849E−10	1.043E+04				0.588
$1s\,4d\ ^3D_2$	$1s\,7g\ ^3G_3$	7.5824E+00	3.602E−05	5.970E+08	7.5510E+00	3.653E−05	6.054E+08	0.002
$1s\,4d\ ^3D_1$	$1s\,7g\ ^3G_3$	7.5852E+00	2.142E−04	3.547E+09	7.5538E+00	2.168E−04	3.590E+09	0.004
$1s\,4d\ ^3D_3$	$1s\,7g\ ^3G_3$	7.6541E+00	4.463E−06	7.260E+07	7.6223E+00	4.498E−06	7.314E+07	0.001
$1s\,4d\ ^1D_2$	$1s\,7g\ ^3G_3$	7.6571E+00	2.646E−05	4.300E+08	7.6253E+00	2.660E−05	4.323E+08	0.003
$1s\,5s\ ^3S_1$	$1s\,7g\ ^3G_3$	1.5619E+01	3.106E−10	1.213E+03				0.374
$1s\,5d\ ^3D_2$	$1s\,7g\ ^3G_3$	1.6252E+01	1.432E−05	5.167E+07	1.6186E+01	1.412E−05	5.095E+07	0.002
$1s\,5d\ ^3D_1$	$1s\,7g\ ^3G_3$	1.6258E+01	8.465E−05	3.052E+08	1.6192E+01	8.387E−05	3.022E+08	0.004
$1s\,5d\ ^3D_3$	$1s\,7g\ ^3G_3$	1.6420E+01	1.213E−06	4.288E+06	1.6353E+01	1.192E−06	4.211E+06	0.003
$1s\,5d\ ^1D_2$	$1s\,7g\ ^3G_3$	1.6428E+01	7.124E−06	2.515E+07	1.6361E+01	7.012E−06	2.475E+07	0.003
$1s\,5g\ ^3G_4$	$1s\,7g\ ^3G_3$	1.6509E+01	9.333E−06	3.263E+07	1.6439E+01	9.323E−06	3.259E+07	0.001
$1s\,5g\ ^3G_3$	$1s\,7g\ ^3G_3$	1.6511E+01	7.814E−05	2.732E+08	1.6441E+01	7.792E−05	2.723E+08	0.001
$1s\,5g\ ^3G_5$	$1s\,7g\ ^3G_3$	1.6560E+01	4.513E−07	1.568E+06	1.6490E+01	4.478E−07	1.556E+06	0.001
$1s\,5g\ ^1G_4$	$1s\,7g\ ^3G_3$	1.6561E+01	7.471E−06	2.595E+07	1.6491E+01	7.418E−06	2.577E+07	0.001
$1s\,6s\ ^3S_1$	$1s\,7g\ ^3G_3$	4.0344E+01	7.208E−09	4.220E+03				0.052
$1s\,6d\ ^3D_2$	$1s\,7g\ ^3G_3$	4.2827E+01	4.534E−04	2.355E+08	4.2672E+01	4.574E−04	2.373E+08	0.000
$1s\,6d\ ^3D_1$	$1s\,7g\ ^3G_3$	4.2853E+01	2.691E−03	1.397E+09	4.2665E+01	2.693E−03	1.397E+09	0.000
$1s\,6d\ ^3D_3$	$1s\,7g\ ^3G_3$	4.3508E+01	4.934E−05	2.484E+07	4.3345E+01	4.933E−05	2.480E+07	0.000
$1s\,6d\ ^1D_2$	$1s\,7g\ ^3G_3$	4.3538E+01	2.913E−04	1.465E+08	4.3356E+01	2.873E−04	1.444E+08	0.000
$1s\,6g\ ^3G_4$	$1s\,7g\ ^3G_3$	4.3868E+01	6.210E−05	3.075E+07	4.3688E+01	6.237E−05	3.087E+07	0.000
$1s\,6g\ ^3G_3$	$1s\,7g\ ^3G_3$	4.3876E+01	5.195E−04	2.571E+08	4.3688E+01	5.197E−04	2.573E+08	0.000
$1s\,6g\ ^3G_5$	$1s\,7g\ ^3G_3$	4.4077E+01	3.033E−06	1.488E+06	4.3896E+01	3.033E−06	1.487E+06	0.001
$1s\,6g\ ^1G_4$	$1s\,7g\ ^3G_3$	4.4084E+01	5.031E−05	2.467E+07	4.3896E+01	5.004E−05	2.453E+07	0.000
$1s\,7s\ ^3S_1$	$1s\,7g\ ^3G_3$	7.9695E+02	3.661E−12	5.493E−03				0.386
$1s\,7d\ ^3D_2$	$1s\,7g\ ^3G_3$	2.8438E+03	4.743E−09	5.589E−01	2.9148E+03	4.385E−09	4.876E−01	0.015
$1s\,7d\ ^3D_1$	$1s\,7g\ ^3G_3$	2.9164E+03	2.608E−08	2.922E+00	2.8963E+03	2.630E−08	2.962E+00	0.002
$1s\,7d\ ^3D_3$	$1s\,7g\ ^3G_3$	8.2277E+03	2.137E−11	3.008E−04				0.039
$1s\,7d\ ^1D_2$	$1s\,7g\ ^3G_3$	8.9575E+03	9.768E−11	1.160E−03	9.0724E+03	9.158E−11	1.051E−03	0.002
$1s\,7g\ ^3G_4$	$1s\,7g\ ^3G_3$	3.6344E+05	1.613E−15	1.163E−11				0.864
$1s\,2p\ ^3P_1^o$	$1s\,7f\ ^1F_3^o$	1.3356E+00	1.408E−06	7.519E+08	1.3301E+00	1.248E−06	6.667E+08	0.241
$1s\,2p\ ^3P_2^o$	$1s\,7f\ ^1F_3^o$	1.3940E+00	1.120E−04	5.494E+10	1.3881E+00	1.151E−04	5.645E+10	0.014
$1s\,2p\ ^1P_1^o$	$1s\,7f\ ^1F_3^o$	1.3995E+00	6.566E−04	3.195E+11	1.3937E+00	6.826E−04	3.320E+11	0.007
$1s\,3p\ ^3P_1^o$	$1s\,7f\ ^1F_3^o$	3.4034E+00	1.180E−08	9.704E+05	3.3893E+00	6.892E−08	5.669E+06	0.526
$1s\,3p\ ^3P_2^o$	$1s\,7f\ ^1F_3^o$	3.5149E+00	6.355E−06	4.902E+08	3.5002E+00	7.469E−06	5.759E+08	0.079
$1s\,3p\ ^1P_1^o$	$1s\,7f\ ^1F_3^o$	3.5248E+00	4.161E−05	3.192E+09	3.5102E+00	4.445E−05	3.408E+09	0.049
$1s\,4p\ ^3P_1^o$	$1s\,7f\ ^1F_3^o$	7.3482E+00	1.302E−07	2.298E+06	7.3172E+00	5.346E−08	9.435E+05	0.117
$1s\,4p\ ^3P_2^o$	$1s\,7f\ ^1F_3^o$	7.5662E+00	6.809E−06	1.133E+08	7.5341E+00	6.257E−06	1.041E+08	0.022

(*continued on next page*)

Table 4 (*continued*)

Lower	Upper	GRASP2K			FAC			*dT*
		λ (Å)	*gf*	*A* (s^{-1})	λ (Å)	*gf*	*A* (s^{-1})	
1s 4p $^1P^o_1$	1s 7f $^1F^o_3$	7.5852E+00	3.726E−05	6.171E+08	7.5532E+00	3.730E−05	6.177E+08	0.008
1s 4f $^3F^o_3$	1s 7f $^1F^o_3$	7.6552E+00	9.269E−07	1.507E+07	7.6229E+00	9.527E−07	1.549E+07	0.010
1s 4f $^3F^o_2$	1s 7f $^1F^o_3$	7.6567E+00	5.558E−06	9.034E+07	7.6244E+00	5.487E−06	8.918E+07	0.011
1s 4f $^3F^o_4$	1s 7f $^1F^o_3$	7.6912E+00	5.600E−06	9.020E+07	7.6586E+00	5.566E−06	8.966E+07	0.005
1s 4f $^1F^o_3$	1s 7f $^1F^o_3$	7.6923E+00	4.638E−05	7.469E+08	7.6598E+00	4.641E−05	7.473E+08	0.004
1s 5p $^3P^o_1$	1s 7f $^1F^o_3$	1.5704E+01	7.014E−07	2.710E+06	1.5637E+01	5.464E−07	2.111E+06	0.020
1s 5p $^3P^o_2$	1s 7f $^1F^o_3$	1.6214E+01	6.503E−05	2.357E+08	1.6144E+01	6.420E−05	2.327E+08	0.002
1s 5p $^1P^o_1$	1s 7f $^1F^o_3$	1.6258E+01	3.793E−04	1.367E+09	1.6189E+01	3.824E−04	1.378E+09	0.004
1s 5f $^3F^o_3$	1s 7f $^1F^o_3$	1.6423E+01	3.189E−06	1.127E+07	1.6354E+01	3.307E−06	1.168E+07	0.001
1s 5f $^3F^o_2$	1s 7f $^1F^o_3$	1.6427E+01	1.919E−05	6.775E+07	1.6358E+01	1.910E−05	6.744E+07	0.001
1s 5f $^3F^o_4$	1s 7f $^1F^o_3$	1.6508E+01	1.977E−05	6.914E+07	1.6439E+01	1.963E−05	6.866E+07	0.000
1s 5f $^1F^o_3$	1s 7f $^1F^o_3$	1.6511E+01	1.638E−04	5.726E+08	1.6441E+01	1.637E−04	5.723E+08	0.000
1s 6p $^3P^o_1$	1s 7f $^1F^o_3$	4.0672E+01	3.065E−06	1.766E+06	4.0492E+01	5.449E−06	3.139E+06	0.004
1s 6p $^3P^o_2$	1s 7f $^1F^o_3$	4.2675E+01	3.654E−04	1.912E+08	4.2483E+01	3.670E−04	1.921E+08	0.001
1s 6p $^1P^o_1$	1s 7f $^1F^o_3$	4.2851E+01	2.180E−03	1.131E+09	4.2639E+01	2.177E−03	1.131E+09	0.001
1s 6f $^3F^o_3$	1s 7f $^1F^o_3$	4.3519E+01	1.285E−05	6.468E+06	4.3345E+01	1.287E−05	6.472E+06	0.000
1s 6f $^3F^o_2$	1s 7f $^1F^o_3$	4.3534E+01	7.753E−05	3.898E+07	4.3345E+01	7.707E−05	3.875E+07	0.000
1s 6f $^3F^o_4$	1s 7f $^1F^o_3$	4.3866E+01	8.135E−05	4.029E+07	4.3688E+01	8.097E−05	4.008E+07	0.000
1s 6f $^1F^o_3$	1s 7f $^1F^o_3$	4.3877E+01	6.744E−04	3.338E+08	4.3688E+01	6.760E−04	3.346E+08	0.000
1s 6h $^3H^o_5$	1s 7f $^1F^o_3$	4.4076E+01	1.054E−07	5.168E+04				0.001
1s 6h $^3H^o_4$	1s 7f $^1F^o_3$	4.4082E+01	1.770E−06	8.681E+05	4.3895E+01	1.763E−06	8.646E+05	0.001
1s 6h $^1H^o_5$	1s 7f $^1F^o_3$	4.4221E+01	3.978E−05	1.938E+07	4.4034E+01	3.981E−05	1.939E+07	0.000
1s 7p $^3P^o_1$	1s 7f $^1F^o_3$	8.8911E+02	1.783E−09	2.149E+00	8.8057E+02	2.686E−09	3.273E+00	0.046
1s 7p $^3P^o_2$	1s 7f $^1F^o_3$	2.4995E+03	9.333E−09	1.424E+00	2.4456E+03	9.858E−09	1.557E+00	0.214
1s 7p $^1P^o_1$	1s 7f $^1F^o_3$	2.9477E+03	3.391E−08	3.719E+00	2.8179E+03	3.864E−08	4.598E+00	0.254
1s 7f $^3F^o_3$	1s 7f $^1F^o_3$	8.4824E+03	2.588E−11	3.428E−04				0.007
1s 7f $^3F^o_2$	1s 7f $^1F^o_3$	8.8420E+03	1.378E−10	1.679E−03	8.7598E+03	1.389E−10	1.710E−03	0.012
1s 7f $^3F^o_4$	1s 7f $^1F^o_3$	2.7665E+05	4.698E−15	5.850E−11				0.132
1s 3d $^3D_3$	1s 7g $^3G_5$	3.5591E+00	2.642E−03	1.265E+11	3.5441E+00	2.685E−03	1.285E+11	0.001
1s 4d $^3D_3$	1s 7g $^3G_5$	7.6503E+00	4.732E−04	4.903E+09	7.6183E+00	4.810E−04	4.983E+09	0.003
1s 5d $^3D_3$	1s 7g $^3G_5$	1.6403E+01	1.449E−04	3.266E+08	1.6335E+01	1.433E−04	3.230E+08	0.003
1s 5g $^3G_4$	1s 7g $^3G_5$	1.6491E+01	9.575E−06	2.135E+07	1.6420E+01	9.612E−06	2.143E+07	0.001
1s 5g $^3G_3$	1s 7g $^3G_5$	1.6493E+01	4.578E−07	1.021E+06	1.6423E+01	4.587E−07	1.022E+06	0.002
1s 5g $^3G_5$	1s 7g $^3G_5$	1.6542E+01	1.322E−04	2.929E+08	1.6471E+01	1.320E−04	2.927E+08	0.001
1s 5g $^1G_4$	1s 7g $^3G_5$	1.6543E+01	7.667E−06	1.699E+07	1.6473E+01	7.651E−06	1.695E+07	0.001
1s 6d $^3D_3$	1s 7g $^3G_5$	4.3385E+01	5.440E−03	1.753E+09	4.3218E+01	5.448E−03	1.753E+09	0.000
1s 6g $^3G_4$	1s 7g $^3G_5$	4.3743E+01	6.292E−05	1.994E+07	4.3559E+01	6.329E−05	2.005E+07	0.000
1s 6g $^3G_3$	1s 7g $^3G_5$	4.3751E+01	3.000E−06	9.504E+05	4.3559E+01	3.014E−06	9.551E+05	0.001
1s 6g $^3G_5$	1s 7g $^3G_5$	4.3950E+01	8.795E−04	2.761E+08	4.3765E+01	8.804E−04	2.763E+08	0.000
1s 6g $^1G_4$	1s 7g $^3G_5$	4.3957E+01	5.098E−05	1.600E+07	4.3765E+01	5.079E−05	1.594E+07	0.000
1s 7d $^3D_3$	1s 7g $^3G_5$	5.3499E+03	8.610E−09	1.824E−01	5.4978E+03	7.830E−09	1.557E−01	0.002
1s 7g $^3G_4$	1s 7g $^3G_5$	1.4677E+04	2.497E−11	7.029E−05	1.4692E+04	2.466E−11	6.870E−05	0.006
1s 7g $^3G_3$	1s 7g $^3G_5$	1.5295E+04	1.053E−12	2.729E−06				0.076
1s 4f $^3F^o_3$	1s 7h $^3H^o_5$	7.6514E+00	4.645E−03	4.811E+10	7.6190E+00	4.671E−03	4.838E+10	0.000
1s 4f $^3F^o_4$	1s 7h $^3H^o_5$	7.6874E+00	2.681E−04	2.751E+09	7.6547E+00	2.682E−04	2.752E+09	0.000
1s 4f $^1F^o_3$	1s 7h $^3H^o_5$	7.6885E+00	1.250E−05	1.282E+08	7.6558E+00	1.173E−05	1.203E+08	0.000
1s 5f $^3F^o_3$	1s 7h $^3H^o_5$	1.6406E+01	5.665E−04	1.276E+09	1.6336E+01	5.720E−04	1.288E+09	0.000
1s 5f $^3F^o_4$	1s 7h $^3H^o_5$	1.6491E+01	3.505E−05	7.816E+07	1.6420E+01	3.535E−05	7.882E+07	0.000
1s 5f $^1F^o_3$	1s 7h $^3H^o_5$	1.6493E+01	1.647E−06	3.671E+06	1.6423E+01	1.560E−06	3.478E+06	0.000
1s 6f $^3F^o_3$	1s 7h $^3H^o_5$	4.3397E+01	5.768E−03	1.857E+09	4.3218E+01	5.771E−03	1.857E+09	0.000
1s 6f $^3F^o_4$	1s 7h $^3H^o_5$	4.3742E+01	3.291E−04	1.043E+08	4.3559E+01	3.298E−04	1.045E+08	0.000
1s 6f $^1F^o_3$	1s 7h $^3H^o_5$	4.3753E+01	1.547E−05	4.902E+06	4.3560E+01	1.605E−05	5.087E+06	0.000
1s 6h $^3H^o_5$	1s 7h $^3H^o_5$	4.3951E+01	5.094E−04	1.599E+08	4.3765E+01	5.095E−04	1.599E+08	0.000
1s 6h $^3H^o_4$	1s 7h $^3H^o_5$	4.3956E+01	2.930E−05	9.194E+06	4.3765E+01	2.939E−05	9.227E+06	0.000
1s 6h $^3H^o_6$	1s 7h $^3H^o_5$	4.4090E+01	2.964E−05	9.245E+06	4.3903E+01	2.968E−05	9.258E+06	0.000
1s 6h $^1H^o_5$	1s 7h $^3H^o_5$	4.4094E+01	1.416E−06	4.417E+05	4.3903E+01	1.413E−06	4.408E+05	0.000
1s 7f $^3F^o_3$	1s 7h $^3H^o_5$	5.4734E+03	4.836E−09	9.789E−02	5.5022E+03	4.700E−09	9.334E−02	0.005
1s 7f $^3F^o_4$	1s 7h $^3H^o_5$	1.4614E+04	1.456E−11	4.135E−05	1.4763E+04	1.399E−11	3.860E−05	0.019
1s 7f $^1F^o_3$	1s 7h $^3H^o_5$	1.5429E+04	5.832E−13	1.485E−06				0.016
1s 2p $^3P^o_2$	1s 7h $^3H^o_4$	1.3938E+00	1.355E−12	5.171E+02				0.965
1s 3p $^3P^o_2$	1s 7h $^3H^o_4$	3.5141E+00	1.656E−13	9.938E+00				0.818
1s 4p $^3P^o_2$	1s 7h $^3H^o_4$	7.5624E+00	4.126E−10	5.348E+03				0.039
1s 4f $^3F^o_3$	1s 7h $^3H^o_4$	7.6513E+00	2.804E−04	3.550E+09	7.6190E+00	2.819E−04	3.569E+09	0.000
1s 4f $^3F^o_2$	1s 7h $^3H^o_4$	7.6528E+00	3.518E−03	4.452E+10	7.6205E+00	3.536E−03	4.474E+10	0.000
1s 4f $^3F^o_4$	1s 7h $^3H^o_4$	7.6873E+00	1.920E−05	2.408E+08	7.6547E+00	1.916E−05	2.403E+08	0.000
1s 4f $^1F^o_3$	1s 7h $^3H^o_4$	7.6884E+00	2.123E−04	2.662E+09	7.6558E+00	2.117E−04	2.654E+09	0.000
1s 5p $^3P^o_2$	1s 7h $^3H^o_4$	1.6196E+01	6.804E−11	1.922E+02				0.031
1s 5f $^3F^o_3$	1s 7h $^3H^o_4$	1.6405E+01	3.416E−05	9.407E+07	1.6336E+01	3.453E−05	9.509E+07	0.000
1s 5f $^3F^o_2$	1s 7h $^3H^o_4$	1.6409E+01	4.298E−04	1.183E+09	1.6340E+01	4.329E−04	1.191E+09	0.000
1s 5f $^3F^o_4$	1s 7h $^3H^o_4$	1.6490E+01	2.507E−06	6.833E+06	1.6420E+01	2.525E−06	6.881E+06	0.001
1s 5f $^1F^o_3$	1s 7h $^3H^o_4$	1.6493E+01	2.778E−05	7.568E+07	1.6423E+01	2.788E−05	7.597E+07	0.000

(*continued on next page*)

Table 4 (*continued*)

Lower	Upper	GRASP2K			FAC			*dT*
		λ (Å)	*gf*	A (s^{-1})	λ (Å)	*gf*	A (s^{-1})	
$1s\,6p\ ^3P^o_2$	$1s\,7h\ ^3H^o_4$	4.2554E+01	1.171E−09	4.791E+02				0.003
$1s\,6f\ ^3F^o_3$	$1s\,7h\ ^3H^o_4$	4.3394E+01	3.484E−04	1.371E+08	4.3218E+01	3.501E−04	1.377E+08	0.000
$1s\,6f\ ^3F^o_2$	$1s\,7h\ ^3H^o_4$	4.3408E+01	4.367E−03	1.718E+09	4.3218E+01	4.372E−03	1.720E+09	0.000
$1s\,6f\ ^3F^o_4$	$1s\,7h\ ^3H^o_4$	4.3738E+01	2.358E−05	9.134E+06	4.3559E+01	2.356E−05	9.125E+06	0.000
$1s\,6f\ ^1F^o_3$	$1s\,7h\ ^3H^o_4$	4.3749E+01	2.604E−04	1.008E+08	4.3560E+01	2.588E−04	1.002E+08	0.000
$1s\,6h\ ^3H^o_5$	$1s\,7h\ ^3H^o_4$	4.3947E+01	2.929E−05	1.124E+07	4.3765E+01	2.939E−05	1.127E+07	0.000
$1s\,6h\ ^3H^o_4$	$1s\,7h\ ^3H^o_4$	4.3953E+01	4.113E−04	1.578E+08	4.3765E+01	4.115E−04	1.578E+08	0.000
$1s\,6h\ ^3H^o_6$	$1s\,7h\ ^3H^o_4$	4.4086E+01	9.436E−07	3.598E+05	4.3903E+01	9.422E−07	3.592E+05	0.000
$1s\,6h\ ^1H^o_5$	$1s\,7h\ ^3H^o_4$	4.4091E+01	2.461E−05	9.384E+06	4.3903E+01	2.449E−05	9.340E+06	0.000
$1s\,7p\ ^3P^o_2$	$1s\,7h\ ^3H^o_4$	2.1428E+03	1.866E−14	3.013E−06				0.042
$1s\,7f\ ^3F^o_3$	$1s\,7h\ ^3H^o_4$	5.4206E+03	3.007E−10	7.586E−03	5.5022E+03	2.852E−10	6.922E−03	0.007
$1s\,7f\ ^3F^o_2$	$1s\,7h\ ^3H^o_4$	5.5652E+03	3.484E−09	8.338E−02	5.5003E+03	3.564E−09	8.658E−02	0.006
$1s\,7f\ ^3F^o_4$	$1s\,7h\ ^3H^o_4$	1.4244E+04	1.127E−12	4.117E−06				0.019
$1s\,7f\ ^1F^o_3$	$1s\,7h\ ^3H^o_4$	1.5017E+04	1.062E−11	3.491E−05	1.4782E+04	1.093E−11	3.677E−05	0.022
$1s\,7h\ ^3H^o_5$	$1s\,7h\ ^3H^o_4$	5.6215E+05	2.508E−16	5.883E−13				0.445
$1s\,3d\ ^3D_2$	$1s\,7g\ ^1G_4$	3.5224E+00	5.663E−08	3.382E+06				0.083
$1s\,3d\ ^3D_3$	$1s\,7g\ ^1G_4$	3.5591E+00	1.610E−04	9.419E+09	3.5441E+00	1.627E−04	9.520E+09	0.002
$1s\,3d\ ^1D_2$	$1s\,7g\ ^1G_4$	3.5605E+00	1.996E−03	1.167E+11	3.5455E+00	2.031E−03	1.187E+11	0.002
$1s\,4d\ ^3D_2$	$1s\,7g\ ^1G_4$	7.5785E+00	1.751E−08	2.260E+05				0.121
$1s\,4d\ ^3D_3$	$1s\,7g\ ^1G_4$	7.6502E+00	2.879E−05	3.646E+08	7.6183E+00	2.915E−05	3.691E+08	0.002
$1s\,4d\ ^1D_2$	$1s\,7g\ ^1G_4$	7.6531E+00	3.580E−04	4.530E+09	7.6213E+00	3.640E−04	4.605E+09	0.004
$1s\,5d\ ^3D_2$	$1s\,7g\ ^1G_4$	1.6234E+01	8.108E−09	2.280E+04				0.102
$1s\,5d\ ^3D_3$	$1s\,7g\ ^1G_4$	1.6402E+01	8.842E−06	2.436E+07	1.6335E+01	8.687E−06	2.392E+07	0.002
$1s\,5d\ ^1D_2$	$1s\,7g\ ^1G_4$	1.6409E+01	1.093E−04	3.008E+08	1.6342E+01	1.084E−04	2.984E+08	0.004
$1s\,5g\ ^3G_4$	$1s\,7g\ ^1G_4$	1.6490E+01	6.864E−07	1.871E+06	1.6420E+01	7.222E−07	1.968E+06	0.003
$1s\,5g\ ^3G_3$	$1s\,7g\ ^1G_4$	1.6492E+01	7.595E−06	2.069E+07	1.6423E+01	7.575E−06	2.064E+07	0.001
$1s\,5g\ ^3G_5$	$1s\,7g\ ^1G_4$	1.6541E+01	7.660E−06	2.075E+07	1.6471E+01	7.620E−06	2.064E+07	0.001
$1s\,5g\ ^1G_4$	$1s\,7g\ ^1G_4$	1.6543E+01	1.069E−04	2.894E+08	1.6473E+01	1.066E−04	2.887E+08	0.001
$1s\,6d\ ^3D_2$	$1s\,7g\ ^1G_4$	4.2703E+01	2.860E−07	1.162E+05	4.2548E+01	6.028E−07	2.447E+05	0.010
$1s\,6d\ ^3D_3$	$1s\,7g\ ^1G_4$	4.3381E+01	3.312E−04	1.304E+08	4.3218E+01	3.302E−04	1.299E+08	0.000
$1s\,6d\ ^1D_2$	$1s\,7g\ ^1G_4$	4.3410E+01	4.120E−03	1.620E+09	4.3228E+01	4.124E−03	1.621E+09	0.000
$1s\,6g\ ^3G_4$	$1s\,7g\ ^1G_4$	4.3738E+01	4.512E−06	1.748E+06	4.3559E+01	4.522E−06	1.751E+06	0.001
$1s\,6g\ ^3G_3$	$1s\,7g\ ^1G_4$	4.3747E+01	4.984E−05	1.930E+07	4.3559E+01	4.973E−05	1.926E+07	0.000
$1s\,6g\ ^3G_5$	$1s\,7g\ ^1G_4$	4.3946E+01	5.095E−05	1.955E+07	4.3765E+01	5.079E−05	1.948E+07	0.000
$1s\,6g\ ^1G_4$	$1s\,7g\ ^1G_4$	4.3953E+01	7.102E−04	2.725E+08	4.3765E+01	7.111E−04	2.728E+08	0.000
$1s\,7d\ ^3D_2$	$1s\,7g\ ^1G_4$	2.3855E+03	5.465E−12	7.117E−04	2.4322E+03	1.002E−11	1.245E−03	0.288
$1s\,7d\ ^3D_3$	$1s\,7g\ ^1G_4$	5.2883E+03	5.425E−10	1.438E−02	5.4978E+03	4.745E−10	1.153E−02	0.023
$1s\,7d\ ^1D_2$	$1s\,7g\ ^1G_4$	5.5805E+03	5.741E−09	1.366E−01	5.6088E+03	5.585E−09	1.304E−01	0.009
$1s\,7g\ ^3G_4$	$1s\,7g\ ^1G_4$	1.4223E+04	1.969E−12	7.213E−06				0.050
$1s\,7g\ ^3G_3$	$1s\,7g\ ^1G_4$	1.4802E+04	1.927E−11	6.519E−05	1.4691E+04	1.938E−11	6.599E−05	0.001
$1s\,7g\ ^3G_5$	$1s\,7g\ ^1G_4$	4.5954E+05	6.580E−16	2.309E−12				0.926
$1s\,4f\ ^3F^o_4$	$1s\,7h\ ^3H^o_6$	7.6847E+00	5.821E−03	5.058E+10	7.6520E+00	5.875E−03	5.104E+10	0.000
$1s\,5f\ ^3F^o_4$	$1s\,7h\ ^3H^o_6$	1.6478E+01	7.392E−04	1.397E+09	1.6408E+01	7.475E−04	1.412E+09	0.000
$1s\,6f\ ^3F^o_4$	$1s\,7h\ ^3H^o_6$	4.3655E+01	7.178E−03	1.933E+09	4.3474E+01	7.190E−03	1.935E+09	0.000
$1s\,6h\ ^3H^o_5$	$1s\,7h\ ^3H^o_6$	4.3863E+01	2.951E−05	7.870E+06	4.3678E+01	2.967E−05	7.912E+06	0.000
$1s\,6h\ ^3H^o_4$	$1s\,7h\ ^3H^o_6$	4.3869E+01	9.395E−07	2.505E+05	4.3678E+01	9.419E−07	2.511E+05	0.000
$1s\,6h\ ^3H^o_6$	$1s\,7h\ ^3H^o_6$	4.4002E+01	6.178E−04	1.637E+08	4.3816E+01	6.182E−04	1.638E+08	0.000
$1s\,6h\ ^1H^o_5$	$1s\,7h\ ^3H^o_6$	4.4006E+01	2.480E−05	6.570E+06	4.3816E+01	2.473E−05	6.553E+06	0.000
$1s\,7f\ ^3F^o_4$	$1s\,7h\ ^3H^o_6$	8.7953E+03	1.460E−09	9.686E−03	8.8520E+03	1.414E−09	9.182E−03	0.009
$1s\,7h\ ^3H^o_5$	$1s\,7h\ ^3H^o_6$	2.2090E+04	4.176E−12	4.392E−06	2.2109E+04	4.124E−12	4.292E−06	0.008
$1s\,7h\ ^3H^o_4$	$1s\,7h\ ^3H^o_6$	2.2993E+04	1.179E−13	1.144E−07				0.100
$1s\,5g\ ^3G_4$	$1s\,7i\ ^3I_6$	1.6478E+01	1.124E−02	2.123E+10	1.6408E+01	1.128E−02	2.131E+10	0.000
$1s\,5g\ ^3G_5$	$1s\,7i\ ^3I_6$	1.6529E+01	4.191E−04	7.871E+08	1.6459E+01	4.199E−04	7.886E+08	0.000
$1s\,5g\ ^1G_4$	$1s\,7i\ ^3I_6$	1.6531E+01	1.290E−05	2.422E+07	1.6460E+01	1.190E−05	2.234E+07	0.000
$1s\,6g\ ^3G_4$	$1s\,7i\ ^3I_6$	4.3656E+01	5.574E−03	1.501E+09	4.3473E+01	5.578E−03	1.501E+09	0.000
$1s\,6g\ ^3G_5$	$1s\,7i\ ^3I_6$	4.3863E+01	2.052E−04	5.471E+07	4.3678E+01	2.055E−04	5.481E+07	0.000
$1s\,6g\ ^1G_4$	$1s\,7i\ ^3I_6$	4.3870E+01	6.313E−06	1.683E+06	4.3678E+01	6.525E−06	1.740E+06	0.000
$1s\,7g\ ^3G_4$	$1s\,7i\ ^3I_6$	8.8113E+03	5.733E−10	3.789E−03	8.8262E+03	5.630E−10	3.677E−03	0.006
$1s\,7g\ ^3G_5$	$1s\,7i\ ^3I_6$	2.2046E+04	1.354E−12	1.429E−06	2.2108E+04	1.328E−12	1.383E−06	0.019
$1s\,7g\ ^1G_4$	$1s\,7i\ ^3I_6$	2.3157E+04	3.597E−14	3.442E−08				0.064
$1s\,3d\ ^3D_3$	$1s\,7i\ ^3I_5$	3.5586E+00	2.773E−12	1.328E+02				1.000
$1s\,4d\ ^3D_3$	$1s\,7i\ ^3I_5$	7.6476E+00	9.356E−14	9.701E−01				0.538
$1s\,5d\ ^3D_3$	$1s\,7i\ ^3I_5$	1.6390E+01	3.142E−12	7.092E+00				0.057
$1s\,5g\ ^3G_4$	$1s\,7i\ ^3I_5$	1.6478E+01	4.307E−04	9.619E+08	1.6408E+01	4.324E−04	9.656E+08	0.000
$1s\,5g\ ^3G_3$	$1s\,7i\ ^3I_5$	1.6480E+01	9.076E−03	2.026E+10	1.6410E+01	9.108E−03	2.033E+10	0.000
$1s\,5g\ ^3G_5$	$1s\,7i\ ^3I_5$	1.6529E+01	2.000E−05	4.439E+07	1.6459E+01	1.999E−05	4.438E+07	0.000
$1s\,5g\ ^1G_4$	$1s\,7i\ ^3I_5$	1.6531E+01	3.483E−04	7.728E+08	1.6460E+01	3.479E−04	7.721E+08	0.000
$1s\,6d\ ^3D_3$	$1s\,7i\ ^3I_5$	4.3297E+01	3.945E−12	1.276E+00				0.033
$1s\,6g\ ^3G_4$	$1s\,7i\ ^3I_5$	4.3654E+01	2.137E−04	6.799E+07	4.3473E+01	2.145E−04	6.825E+07	0.000
$1s\,6g\ ^3G_3$	$1s\,7i\ ^3I_5$	4.3662E+01	4.500E−03	1.431E+09	4.3473E+01	4.505E−03	1.433E+09	0.000
$1s\,6g\ ^3G_5$	$1s\,7i\ ^3I_5$	4.3861E+01	9.795E−06	3.088E+06	4.3678E+01	9.787E−06	3.084E+06	0.000

(*continued on next page*)

Table 4 (*continued*)

Lower	Upper	GRASP2K			FAC			*dT*
		λ (Å)	*gf*	*A* (s^{-1})	λ (Å)	*gf*	*A* (s^{-1})	
$1s\,6g\ ^1G_4$	$1s\,7i\ ^3I_5$	4.3867E+01	1.704E−04	5.371E+07	4.3678E+01	1.696E−04	5.346E+07	0.000
$1s\,7d\ ^3D_3$	$1s\,7i\ ^3I_5$	4.2822E+03	5.348E−18	1.769E−10				0.999
$1s\,7g\ ^3G_4$	$1s\,7i\ ^3I_5$	8.7156E+03	2.271E−11	1.813E−04	8.8262E+03	2.165E−11	1.671E−04	0.016
$1s\,7g\ ^3G_3$	$1s\,7i\ ^3I_5$	8.9298E+03	4.447E−10	3.382E−03	8.8261E+03	4.547E−10	3.510E−03	0.007
$1s\,7g\ ^3G_5$	$1s\,7i\ ^3I_5$	2.1457E+04	7.011E−14	9.234E−08				0.044
$1s\,7g\ ^1G_4$	$1s\,7i\ ^3I_5$	2.2508E+04	1.057E−12	1.265E−06	2.2108E+04	1.096E−12	1.349E−06	0.014
$1s\,7i\ ^3I_6$	$1s\,7i\ ^3I_5$	8.0263E+05	4.303E−17	4.051E−14				0.989
$1s\,4f\ ^3F^o_3$	$1s\,7h\ ^1H^o_5$	7.6487E+00	1.890E−09	1.959E+04				0.012
$1s\,4f\ ^3F^o_4$	$1s\,7h\ ^1H^o_5$	7.6846E+00	2.247E−04	2.307E+09	7.6520E+00	2.259E−04	2.320E+09	0.000
$1s\,4f\ ^1F^o_3$	$1s\,7h\ ^1H^o_5$	7.6858E+00	4.701E−03	4.826E+10	7.6532E+00	4.743E−03	4.868E+10	0.000
$1s\,5f\ ^3F^o_3$	$1s\,7h\ ^1H^o_5$	1.6393E+01	1.359E−10	3.067E+02				0.012
$1s\,5f\ ^3F^o_4$	$1s\,7h\ ^1H^o_5$	1.6478E+01	2.850E−05	6.365E+07	1.6408E+01	2.875E−05	6.420E+07	0.000
$1s\,5f\ ^1F^o_3$	$1s\,7h\ ^1H^o_5$	1.6481E+01	5.977E−04	1.334E+09	1.6411E+01	6.034E−04	1.347E+09	0.000
$1s\,6f\ ^3F^o_3$	$1s\,7h\ ^1H^o_5$	4.3309E+01	1.004E−09	3.246E+02				0.001
$1s\,6f\ ^3F^o_4$	$1s\,7h\ ^1H^o_5$	4.3652E+01	2.771E−04	8.817E+07	4.3474E+01	2.765E−04	8.798E+07	0.000
$1s\,6f\ ^1F^o_3$	$1s\,7h\ ^1H^o_5$	4.3663E+01	5.796E−03	1.843E+09	4.3474E+01	5.807E−03	1.847E+09	0.000
$1s\,6h\ ^3H^o_5$	$1s\,7h\ ^1H^o_5$	4.3860E+01	1.410E−06	4.444E+05	4.3678E+01	1.412E−06	4.452E+05	0.000
$1s\,6h\ ^3H^o_4$	$1s\,7h\ ^1H^o_5$	4.3866E+01	2.451E−05	7.724E+06	4.3678E+01	2.449E−05	7.718E+06	0.000
$1s\,6h\ ^3H^o_6$	$1s\,7h\ ^1H^o_5$	4.3999E+01	2.480E−05	7.767E+06	4.3816E+01	2.473E−05	7.744E+06	0.000
$1s\,6h\ ^1H^o_5$	$1s\,7h\ ^1H^o_5$	4.4004E+01	5.188E−04	1.625E+08	4.3816E+01	5.193E−04	1.626E+08	0.000
$1s\,7f\ ^3F^o_3$	$1s\,7h\ ^1H^o_5$	4.3583E+03	1.278E−15	4.080E−08				0.059
$1s\,7f\ ^3F^o_4$	$1s\,7h\ ^1H^o_5$	8.6829E+03	5.859E−11	4.712E−04	8.8520E+03	5.439E−11	4.174E−04	0.007
$1s\,7f\ ^1F^o_3$	$1s\,7h\ ^1H^o_5$	8.9642E+03	1.114E−09	8.405E−03	8.8589E+03	1.139E−09	8.731E−03	0.008
$1s\,7h\ ^3H^o_5$	$1s\,7h\ ^1H^o_5$	2.1394E+04	2.197E−13	2.911E−07				0.012
$1s\,7h\ ^3H^o_4$	$1s\,7h\ ^1H^o_5$	2.2240E+04	3.399E−12	4.167E−06	2.2109E+04	3.404E−12	4.187E−06	0.007
$1s\,7h\ ^3H^o_6$	$1s\,7h\ ^1H^o_5$	6.7907E+05	1.209E−16	1.590E−13				0.542
$1s\,5g\ ^3G_5$	$1s\,7i\ ^3I_7$	1.6520E+01	1.348E−02	2.196E+10	1.6450E+01	1.355E−02	2.208E+10	0.000
$1s\,6g\ ^3G_5$	$1s\,7i\ ^3I_7$	4.3801E+01	6.642E−03	1.539E+09	4.3617E+01	6.653E−03	1.541E+09	0.000
$1s\,7g\ ^3G_5$	$1s\,7i\ ^3I_7$	1.2886E+04	2.195E−10	5.879E−04	1.2907E+04	2.156E−10	5.708E−04	0.009
$1s\,7i\ ^3I_6$	$1s\,7i\ ^3I_7$	3.1014E+04	7.499E−13	3.467E−07	3.1015E+04	7.421E−13	3.401E−07	0.006
$1s\,7i\ ^3I_5$	$1s\,7i\ ^3I_7$	3.2260E+04	1.518E−14	6.488E−09				0.243
$1s\,5g\ ^3G_4$	$1s\,7i\ ^1I_6$	1.6469E+01	3.770E−09	7.132E+03				0.005
$1s\,5g\ ^3G_5$	$1s\,7i\ ^1I_6$	1.6520E+01	3.605E−04	6.777E+08	1.6450E+01	3.615E−04	6.796E+08	0.000
$1s\,5g\ ^1G_4$	$1s\,7i\ ^1I_6$	1.6522E+01	1.132E−02	2.128E+10	1.6452E+01	1.138E−02	2.139E+10	0.000
$1s\,6g\ ^3G_4$	$1s\,7i\ ^1I_6$	4.3593E+01	1.872E−09	5.054E+02				0.006
$1s\,6g\ ^3G_5$	$1s\,7i\ ^1I_6$	4.3799E+01	1.776E−04	4.751E+07	4.3617E+01	1.774E−04	4.744E+07	0.000
$1s\,6g\ ^1G_4$	$1s\,7i\ ^1I_6$	4.3806E+01	5.577E−03	1.491E+09	4.3617E+01	5.588E−03	1.494E+09	0.000
$1s\,7g\ ^3G_4$	$1s\,7i\ ^1I_6$	6.8121E+03	4.202E−16	4.646E−09				0.315
$1s\,7g\ ^3G_5$	$1s\,7i\ ^1I_6$	1.2712E+04	6.116E−12	1.942E−05	1.2907E+04	5.751E−12	1.756E−05	0.019
$1s\,7g\ ^1G_4$	$1s\,7i\ ^1I_6$	1.3074E+04	1.765E−10	5.300E−04	1.2907E+04	1.811E−10	5.532E−04	0.008
$1s\,7i\ ^3I_6$	$1s\,7i\ ^1I_6$	3.0023E+04	2.826E−14	1.609E−08				0.071
$1s\,7i\ ^3I_5$	$1s\,7i\ ^1I_6$	3.1190E+04	6.317E−13	3.332E−07	3.1015E+04	6.325E−13	3.345E−07	0.006
$1s\,7i\ ^3I_7$	$1s\,7i\ ^1I_6$	9.4020E+05	2.328E−17	1.351E−14			0.998	

Table 5
Magnetic dipole transitions $M1$ calculated with GRASP2K and FAC for all $n = 1$–7 configurations. For the GRASP2K calculation, the active set is expanded to $n = 10$ (GRASP3) and only the length form is considered. A comparison between the wavelengths, weighted oscillator strengths and transition probabilities is given.

Lower	Upper	GRASP2K			FAC		
		λ (Å)	gf	A (s^{-1})	λ (Å)	gf	A (s^{-1})
$1s^2\ ^1S_0$	$1s\,2s\ ^3S_1$	4.1150E−01	2.918E−05	3.831E+11	4.0980E−01	2.867E−05	3.763E+11
$1s\,2p\ ^3P^o_1$	$1s\,2p\ ^3P^o_0$	2.0697E+03	2.433E−06	3.788E+03	2.1628E+03	2.322E−06	3.283E+03
$1s\,2s\ ^3S_1$	$1s\,2s\ ^1S_0$	1.4576E+02	1.373E−07	4.310E+04	1.4307E+02	1.353E−07	4.373E+04
$1s\,2p\ ^3P^o_1$	$1s\,2p\ ^3P^o_2$	3.1908E+01	2.163E−04	2.834E+08	3.1815E+01	2.161E−04	2.824E+08
$1s\,2p\ ^3P^o_1$	$1s\,2p\ ^1P^o_1$	2.9274E+01	4.310E−05	1.118E+08	2.9150E+01	4.314E−05	1.119E+08
$1s\,2p\ ^3P^o_0$	$1s\,2p\ ^1P^o_1$	2.9694E+01	7.934E−05	2.001E+08	2.9548E+01	7.919E−05	1.999E+08
$1s\,2p\ ^3P^o_2$	$1s\,2p\ ^1P^o_1$	3.5465E+02	6.279E−06	1.110E+05	3.4797E+02	6.377E−06	1.161E+05
$1s^2\ ^1S_0$	$1s\,3s\ ^3S_1$	3.4600E−01	8.922E−06	1.656E+11	3.4464E−01	8.819E−06	1.637E+11
$1s\,2s\ ^3S_1$	$1s\,3s\ ^3S_1$	2.1766E+00	6.344E−07	2.977E+08	2.1673E+00	6.310E−07	2.961E+08
$1s\,2s\ ^1S_0$	$1s\,3s\ ^3S_1$	2.2096E+00	3.489E−07	1.589E+08	2.2006E+00	3.195E−07	1.454E+08
$1s\,2p\ ^3P^o_1$	$1s\,3p\ ^3P^o_1$	2.1983E+00	1.490E−07	6.856E+07	2.1892E+00	1.782E−07	8.199E+07
$1s\,2p\ ^3P^o_0$	$1s\,3p\ ^3P^o_1$	2.2006E+00	7.444E−08	3.417E+07	2.1914E+00	1.063E−07	4.884E+07
$1s\,2p\ ^3P^o_2$	$1s\,3p\ ^3P^o_1$	2.3610E+00	5.406E−06	2.156E+09	2.3509E+00	5.520E−06	2.202E+09
$1s\,2p\ ^1P^o_1$	$1s\,3p\ ^3P^o_1$	2.3768E+00	1.276E−06	5.023E+08	2.3669E+00	1.177E−06	4.633E+08
$1s\,2s\ ^3S_1$	$1s\,3s\ ^1S_0$	2.1681E+00	2.934E−07	4.163E+08	2.1587E+00	3.141E−07	4.459E+08
$1s\,3s\ ^3S_1$	$1s\,3s\ ^1S_0$	5.5160E+02	5.089E−08	1.116E+03	5.4343E+02	5.012E−08	1.122E+03
$1s\,2p\ ^3P^o_1$	$1s\,3p\ ^3P^o_0$	2.1977E+00	1.005E−07	1.389E+08	2.1886E+00	5.046E−08	6.967E+07
$1s\,2p\ ^1P^o_1$	$1s\,3p\ ^3P^o_0$	2.3761E+00	2.226E−06	2.630E+09	2.3662E+00	2.267E−06	2.678E+09
$1s\,3p\ ^3P^o_1$	$1s\,3p\ ^3P^o_0$	7.8853E+03	6.217E−07	6.669E+01	8.1583E+03	5.996E−07	5.958E+01
$1s\,2p\ ^3P^o_1$	$1s\,3p\ ^3P^o_2$	2.1541E+00	2.836E−06	8.154E+08	2.1452E+00	2.941E−06	8.454E+08
$1s\,2p\ ^3P^o_2$	$1s\,3p\ ^3P^o_2$	2.3101E+00	2.316E−06	5.790E+08	2.3003E+00	2.323E−06	5.808E+08
$1s\,2p\ ^1P^o_1$	$1s\,3p\ ^3P^o_2$	2.3252E+00	2.020E−07	4.984E+07	2.3156E+00	1.970E−07	4.859E+07
$1s\,3p\ ^3P^o_1$	$1s\,3p\ ^3P^o_2$	1.0725E+02	6.475E−05	7.509E+06	1.0689E+02	6.471E−05	7.491E+06
$1s\,2s\ ^3S_1$	$1s\,3d\ ^3D_2$	2.1226E+00	8.050E−08	2.384E+07	2.1136E+00	8.285E−08	2.453E+07
$1s\,3s\ ^3S_1$	$1s\,3d\ ^3D_2$	8.5509E+01	7.271E−10	1.327E+02	8.5230E+01	7.265E−10	1.322E+02
$1s^2\ ^1S_0$	$1s\,3d\ ^3D_1$	3.4460E−01	9.108E−08	1.705E+09	3.4323E−01	9.156E−08	1.713E+09
$1s\,2s\ ^3S_1$	$1s\,3d\ ^3D_1$	2.1220E+00	2.165E−08	1.069E+07	2.1130E+00	1.630E−08	8.048E+06
$1s\,2s\ ^1S_0$	$1s\,3d\ ^3D_1$	2.1534E+00	3.345E−08	1.604E+07	2.1447E+00	3.438E−08	1.647E+07
$1s\,3s\ ^3S_1$	$1s\,3d\ ^3D_1$	8.4639E+01	6.335E−10	1.966E+02	8.4368E+01	6.521E−10	2.019E+02
$1s\,3s\ ^1S_0$	$1s\,3d\ ^3D_1$	9.9981E+01	7.121E−11	1.584E+01	9.9873E+01	7.246E−11	1.601E+01
$1s\,3d\ ^3D_2$	$1s\,3d\ ^3D_1$	8.3264E+03	1.110E−06	3.561E+01	8.3383E+03	1.107E−06	3.511E+01
$1s\,2p\ ^3P^o_1$	$1s\,3p\ ^1P^o_1$	2.1504E+00	5.477E−07	2.633E+08	2.1415E+00	5.343E−07	2.568E+08
$1s\,2p\ ^3P^o_0$	$1s\,3p\ ^1P^o_1$	2.1527E+00	1.076E−06	5.162E+08	2.1436E+00	1.127E−06	5.408E+08
$1s\,2p\ ^3P^o_2$	$1s\,3p\ ^1P^o_1$	2.3058E+00	4.193E−07	1.754E+08	2.2961E+00	3.571E−07	1.493E+08
$1s\,2p\ ^1P^o_1$	$1s\,3p\ ^1P^o_1$	2.3209E+00	1.288E−06	5.315E+08	2.3113E+00	1.266E−06	5.227E+08
$1s\,3p\ ^3P^o_1$	$1s\,3p\ ^1P^o_1$	9.8786E+01	1.299E−05	2.960E+06	9.8358E+01	1.298E−05	2.959E+06
$1s\,3p\ ^3P^o_0$	$1s\,3p\ ^1P^o_1$	1.0004E+02	2.400E−05	5.332E+06	9.9559E+01	2.397E−05	5.331E+06
$1s\,3p\ ^3P^o_2$	$1s\,3p\ ^1P^o_1$	1.2519E+03	1.718E−06	2.437E+03	1.2319E+03	1.743E−06	2.532E+03
$1s\,3d\ ^3D_2$	$1s\,3d\ ^3D_3$	3.4166E+02	3.300E−05	2.694E+05	3.4098E+02	3.294E−05	2.677E+05
$1s\,2s\ ^3S_1$	$1s\,3d\ ^1D_2$	2.1090E+00	5.714E−11	1.714E+04	2.1000E+00	1.086E−12	3.258E+02
$1s\,3s\ ^3S_1$	$1s\,3d\ ^1D_2$	6.7876E+01	1.745E−10	5.052E+01	6.7664E+01	1.801E−10	5.205E+01
$1s\,3d\ ^3D_2$	$1s\,3d\ ^1D_2$	3.2917E+02	2.437E−06	3.000E+04	3.2831E+02	2.433E−06	2.985E+04
$1s\,3d\ ^3D_1$	$1s\,3d\ ^1D_2$	3.4272E+02	2.090E−05	2.374E+05	3.4177E+02	2.084E−05	2.360E+05
$1s\,3d\ ^3D_3$	$1s\,3d\ ^1D_2$	8.9990E+03	6.377E−07	1.050E+01			
$1s^2\ ^1S_0$	$1s\,4s\ ^3S_1$	3.2800E−01	3.766E−06	7.780E+10	3.2669E−01	3.731E−06	7.706E+10
$1s\,2s\ ^3S_1$	$1s\,4s\ ^3S_1$	1.6177E+00	2.937E−07	2.495E+08	1.6108E+00	2.937E−07	2.495E+08
$1s\,2s\ ^1S_0$	$1s\,4s\ ^3S_1$	1.6358E+00	1.581E−07	1.313E+08	1.6291E+00	1.481E−07	1.230E+08
$1s\,3s\ ^3S_1$	$1s\,4s\ ^3S_1$	6.2995E+00	5.467E−08	3.063E+06	6.2733E+00	5.451E−08	3.053E+06
$1s\,3s\ ^1S_0$	$1s\,4s\ ^3S_1$	6.3723E+00	3.304E−08	1.809E+06	6.3465E+00	2.752E−08	1.506E+06
$1s\,3d\ ^3D_2$	$1s\,4s\ ^3S_1$	6.8005E+00	7.832E−12	3.766E+02	6.7717E+00	2.642E−11	1.270E+03
$1s\,3d\ ^3D_1$	$1s\,4s\ ^3S_1$	6.8061E+00	5.861E−11	2.813E+03			
$1s\,3d\ ^1D_2$	$1s\,4s\ ^3S_1$	6.9440E+00	7.996E−12	3.687E+02			
$1s\,2p\ ^3P^o_1$	$1s\,4p\ ^3P^o_1$	1.6323E+00	6.280E−08	5.241E+07	1.6255E+00	7.524E−08	6.277E+07
$1s\,2p\ ^3P^o_0$	$1s\,4p\ ^3P^o_1$	1.6336E+00	3.333E−08	2.777E+07	1.6268E+00	4.319E−08	3.598E+07
$1s\,2p\ ^3P^o_2$	$1s\,4p\ ^3P^o_1$	1.7203E+00	1.671E−06	1.255E+09	1.7131E+00	1.700E−06	1.277E+09
$1s\,2p\ ^1P^o_1$	$1s\,4p\ ^3P^o_1$	1.7287E+00	3.958E−07	2.945E+08	1.7215E+00	3.662E−07	2.724E+08
$1s\,3p\ ^3P^o_1$	$1s\,4p\ ^3P^o_1$	6.3396E+00	1.616E−08	8.938E+05	6.3138E+00	1.862E−08	1.029E+06
$1s\,3p\ ^3P^o_0$	$1s\,4p\ ^3P^o_1$	6.3447E+00	6.591E−09	3.640E+05	6.3187E+00	1.409E−08	7.784E+05
$1s\,3p\ ^3P^o_2$	$1s\,4p\ ^3P^o_1$	6.7379E+00	1.885E−06	9.233E+07	6.7101E+00	1.933E−06	9.466E+07
$1s\,3p\ ^1P^o_1$	$1s\,4p\ ^3P^o_1$	6.7743E+00	4.274E−07	2.071E+07	6.7469E+00	4.002E−07	1.938E+07
$1s\,2s\ ^3S_1$	$1s\,4s\ ^1S_0$	1.6158E+00	1.404E−07	3.587E+08	1.6089E+00	1.466E−07	3.746E+08
$1s\,3s\ ^3S_1$	$1s\,4s\ ^1S_0$	6.2706E+00	2.269E−08	3.850E+06	6.2442E+00	2.713E−08	4.602E+06
$1s\,3d\ ^3D_1$	$1s\,4s\ ^1S_0$	6.7723E+00	8.192E−12	1.191E+03	6.7433E+00	9.074E−12	1.319E+03
$1s\,4s\ ^3S_1$	$1s\,4s\ ^1S_0$	1.3658E+03	2.282E−08	8.159E+01	1.3474E+03	2.246E−08	8.184E+01
$1s\,2p\ ^3P^o_1$	$1s\,4p\ ^3P^o_0$	1.6322E+00	4.224E−08	1.058E+08	1.6254E+00	2.329E−08	5.831E+07
$1s\,2p\ ^1P^o_1$	$1s\,4p\ ^3P^o_0$	1.7285E+00	6.899E−07	1.540E+09	1.7214E+00	7.028E−07	1.568E+09
$1s\,3p\ ^3P^o_1$	$1s\,4p\ ^3P^o_0$	6.3375E+00	1.172E−08	1.946E+06	6.3118E+00	3.384E−09	5.619E+05
$1s\,3p\ ^1P^o_1$	$1s\,4p\ ^3P^o_0$	6.7720E+00	7.666E−07	1.115E+08	6.7446E+00	7.828E−07	1.138E+08
$1s\,4p\ ^3P^o_1$	$1s\,4p\ ^3P^o_0$	1.9682E+04	2.467E−07	4.247E+00	2.0312E+04	2.386E−07	3.825E+00

(*continued on next page*)

Table 5 (*continued*)

Lower	Upper	GRASP2K			FAC		
		λ (Å)	*gf*	A (s^{-1})	λ (Å)	*gf*	A (s^{-1})
$1s\,2p\ ^3P^o_1$	$1s\,4p\ ^3P^o_2$	1.6219E+00	8.188E−07	4.153E+08	1.6152E+00	8.517E−07	4.318E+08
$1s\,2p\ ^3P^o_2$	$1s\,4p\ ^3P^o_2$	1.7088E+00	9.864E−07	4.507E+08	1.7016E+00	9.961E−07	4.550E+08
$1s\,2p\ ^1P^o_1$	$1s\,4p\ ^3P^o_2$	1.7170E+00	9.347E−08	4.230E+07	1.7100E+00	8.866E−08	4.010E+07
$1s\,3p\ ^3P^o_1$	$1s\,4p\ ^3P^o_2$	6.1858E+00	1.301E−06	4.535E+07	6.1607E+00	1.338E−06	4.665E+07
$1s\,3p\ ^3P^o_2$	$1s\,4p\ ^3P^o_2$	6.5644E+00	2.489E−07	7.705E+06	6.5375E+00	2.511E−07	7.773E+06
$1s\,3p\ ^1P^o_1$	$1s\,4p\ ^3P^o_2$	6.5991E+00	1.418E−08	4.343E+05	6.5723E+00	1.571E−08	4.812E+05
$1s\,4p\ ^3P^o_1$	$1s\,4p\ ^3P^o_2$	2.5504E+02	2.729E−05	5.597E+05	2.5410E+02	2.728E−05	5.589E+05
$1s\,2s\ ^3S_1$	$1s\,4d\ ^3D_2$	1.6050E+00	2.666E−08	1.380E+07	1.5981E+00	2.759E−08	1.429E+07
$1s\,3s\ ^3S_1$	$1s\,4d\ ^3D_2$	6.1111E+00	2.618E−09	9.352E+04	6.0854E+00	2.952E−09	1.054E+05
$1s\,3d\ ^3D_2$	$1s\,4d\ ^3D_2$	6.5814E+00	9.907E−08	3.051E+06	6.5534E+00	9.901E−08	3.049E+06
$1s\,3d\ ^3D_1$	$1s\,4d\ ^3D_2$	6.5866E+00	7.839E−09	2.410E+05	6.5585E+00	1.134E−08	3.487E+05
$1s\,3d\ ^3D_3$	$1s\,4d\ ^3D_2$	6.7107E+00	3.091E−07	9.158E+06	6.6818E+00	3.090E−07	9.155E+06
$1s\,3d\ ^1D_2$	$1s\,4d\ ^3D_2$	6.7157E+00	2.412E−08	7.136E+05	6.6868E+00	2.277E−08	6.736E+05
$1s\,4s\ ^3S_1$	$1s\,4d\ ^3D_2$	2.0428E+02	2.882E−10	9.211E+00	2.0324E+02	2.883E−10	9.234E+00
$1s^2\ ^1S_0$	$1s\,4d\ ^3D_1$	3.2750E−01	5.115E−08	1.060E+09	3.2616E−01	5.140E−08	1.065E+09
$1s\,2s\ ^3S_1$	$1s\,4d\ ^3D_1$	1.6048E+00	7.191E−09	6.208E+06	1.5980E+00	5.396E−09	4.658E+06
$1s\,2s\ ^1S_0$	$1s\,4d\ ^3D_1$	1.6227E+00	1.101E−08	9.298E+06	1.6161E+00	1.127E−08	9.515E+06
$1s\,3s\ ^3S_1$	$1s\,4d\ ^3D_1$	6.1092E+00	1.076E−09	6.410E+04	6.0836E+00	5.912E−10	3.521E+04
$1s\,3s\ ^1S_0$	$1s\,4d\ ^3D_1$	6.1777E+00	1.224E−09	7.130E+04	6.1525E+00	1.246E−09	7.260E+04
$1s\,3d\ ^3D_2$	$1s\,4d\ ^3D_1$	6.5793E+00	1.479E−08	7.599E+05	6.5513E+00	1.065E−08	5.475E+05
$1s\,3d\ ^3D_1$	$1s\,4d\ ^3D_1$	6.5845E+00	5.503E−08	2.822E+06	6.5564E+00	5.496E−08	2.818E+06
$1s\,3d\ ^1D_2$	$1s\,4d\ ^3D_1$	6.7135E+00	1.969E−07	9.715E+06	6.6847E+00	1.995E−07	9.846E+06
$1s\,4s\ ^3S_1$	$1s\,4d\ ^3D_1$	2.0227E+02	4.243E−10	2.306E+01	2.0125E+02	4.340E−10	2.362E+01
$1s\,4s\ ^1S_0$	$1s\,4d\ ^3D_1$	2.3744E+02	2.003E−11	7.899E−01	2.3659E+02	2.025E−11	7.976E−01
$1s\,4d\ ^3D_2$	$1s\,4d\ ^3D_1$	2.0536E+04	4.486E−07	2.365E+00	2.0610E+04	4.464E−07	2.317E+00
$1s\,2p\ ^3P^o_1$	$1s\,4p\ ^1P^o_1$	1.6210E+00	1.525E−07	1.290E+08	1.6143E+00	1.504E−07	1.272E+08
$1s\,2p\ ^3P^o_0$	$1s\,4p\ ^1P^o_1$	1.6223E+00	3.076E−07	2.598E+08	1.6155E+00	3.230E−07	2.728E+08
$1s\,2p\ ^3P^o_2$	$1s\,4p\ ^1P^o_1$	1.7078E+00	1.729E−07	1.318E+08	1.7006E+00	1.452E−07	1.107E+08
$1s\,2p\ ^1P^o_1$	$1s\,4p\ ^1P^o_1$	1.7161E+00	5.523E−07	4.170E+08	1.7090E+00	5.447E−07	4.112E+08
$1s\,3p\ ^3P^o_1$	$1s\,4p\ ^1P^o_1$	6.1732E+00	2.703E−07	1.577E+07	6.1480E+00	2.570E−07	1.499E+07
$1s\,3p\ ^3P^o_0$	$1s\,4p\ ^1P^o_1$	6.1780E+00	5.068E−07	2.952E+07	6.1526E+00	5.255E−07	3.060E+07
$1s\,3p\ ^3P^o_2$	$1s\,4p\ ^1P^o_1$	6.5502E+00	5.703E−08	2.955E+06	6.5232E+00	4.794E−08	2.483E+06
$1s\,3p\ ^1P^o_1$	$1s\,4p\ ^1P^o_1$	6.5847E+00	1.399E−07	7.175E+06	6.5579E+00	1.361E−07	6.978E+06
$1s\,4p\ ^3P^o_1$	$1s\,4p\ ^1P^o_1$	2.3520E+02	5.486E−06	2.205E+05	2.3412E+02	5.485E−06	2.206E+05
$1s\,4p\ ^3P^o_0$	$1s\,4p\ ^1P^o_1$	2.3804E+02	1.015E−05	3.983E+05	2.3685E+02	1.014E−05	3.986E+05
$1s\,4p\ ^3P^o_2$	$1s\,4p\ ^1P^o_1$	3.0236E+03	7.020E−07	1.707E+02	2.9782E+03	7.124E−07	1.770E+02
$1s\,3d\ ^3D_2$	$1s\,4d\ ^3D_3$	6.5283E+00	1.218E−07	2.724E+06	6.5006E+00	1.221E−07	2.731E+06
$1s\,3d\ ^3D_3$	$1s\,4d\ ^3D_3$	6.6555E+00	4.750E−07	1.022E+07	6.6270E+00	4.735E−07	1.018E+07
$1s\,3d\ ^1D_2$	$1s\,4d\ ^3D_3$	6.6604E+00	2.024E−08	4.348E+05	6.6320E+00	2.330E−08	5.005E+05
$1s\,4d\ ^3D_2$	$1s\,4d\ ^3D_3$	8.0890E+02	1.403E−05	2.043E+04	8.0816E+02	1.399E−05	2.023E+04
$1s\,2p\ ^3P^o_2$	$1s\,4f\ ^3F^o_3$	1.7043E+00	2.513E−08	8.245E+06	1.6971E+00	2.356E−08	7.728E+06
$1s\,3p\ ^3P^o_2$	$1s\,4f\ ^3F^o_3$	6.4989E+00	1.254E−08	2.829E+05	6.4721E+00	1.209E−08	2.729E+05
$1s\,4p\ ^3P^o_2$	$1s\,4f\ ^3F^o_3$	6.5059E+02	1.536E−11	3.458E−02	6.4694E+02	1.460E−11	3.297E−02
$1s\,2p\ ^3P^o_1$	$1s\,4f\ ^3F^o_2$	1.6178E+00	3.126E−11	1.593E+04	1.6111E+00	1.478E−11	7.535E+03
$1s\,2p\ ^3P^o_2$	$1s\,4f\ ^3F^o_2$	1.7042E+00	1.963E−09	9.016E+05	1.6971E+00	1.712E−09	7.863E+05
$1s\,2p\ ^1P^o_1$	$1s\,4f\ ^3F^o_2$	1.7124E+00	1.619E−08	7.364E+06	1.7054E+00	1.552E−08	7.060E+06
$1s\,3p\ ^3P^o_1$	$1s\,4f\ ^3F^o_2$	6.1266E+00	2.174E−11	7.726E+02	6.1016E+00	1.249E−11	4.437E+02
$1s\,3p\ ^3P^o_2$	$1s\,4f\ ^3F^o_2$	6.4978E+00	1.077E−09	3.402E+04	6.4710E+00	8.534E−10	2.696E+04
$1s\,3p\ ^1P^o_1$	$1s\,4f\ ^3F^o_2$	6.5317E+00	8.213E−09	2.568E+05	6.5052E+00	7.853E−09	2.454E+05
$1s\,4p\ ^3P^o_1$	$1s\,4f\ ^3F^o_2$	1.8236E+02	4.207E−12	1.688E−01	1.8158E+02	4.868E−12	1.953E−01
$1s\,4p\ ^3P^o_2$	$1s\,4f\ ^3F^o_2$	6.3989E+02	1.075E−11	3.504E−02	6.3631E+02	1.094E−11	3.574E−02
$1s\,4p\ ^1P^o_1$	$1s\,4f\ ^3F^o_2$	8.1166E+02	1.204E−12	2.438E−03	8.0920E+02	1.035E−12	2.090E−03
$1s\,4f\ ^3F^o_3$	$1s\,4f\ ^3F^o_2$	3.8916E+04	3.280E−07	2.889E−01	3.8737E+04	3.272E−07	2.884E−01
$1s\,2s\ ^3S_1$	$1s\,4d\ ^1D_2$	1.6017E+00	2.260E−11	1.175E+04	1.5948E+00	8.840E−13	4.597E+02
$1s\,3s\ ^3S_1$	$1s\,4d\ ^1D_2$	6.0634E+00	1.398E−11	5.074E+02			
$1s\,3d\ ^3D_2$	$1s\,4d\ ^1D_2$	6.5262E+00	9.491E−09	2.973E+05	6.4985E+00	8.647E−09	2.708E+05
$1s\,3d\ ^3D_1$	$1s\,4d\ ^1D_2$	6.5313E+00	7.615E−08	2.382E+06	6.5035E+00	7.788E−08	2.435E+06
$1s\,3d\ ^3D_3$	$1s\,4d\ ^1D_2$	6.6532E+00	2.818E−08	8.493E+05	6.6247E+00	2.465E−08	7.431E+05
$1s\,3d\ ^1D_2$	$1s\,4d\ ^1D_2$	6.6582E+00	3.320E−07	9.989E+06	6.6297E+00	3.309E−07	9.959E+06
$1s\,4s\ ^3S_1$	$1s\,4d\ ^1D_2$	1.6177E+02	1.007E−10	5.133E+00	1.6105E+02	1.039E−10	5.302E+00
$1s\,4d\ ^3D_2$	$1s\,4d\ ^1D_2$	7.7722E+02	1.036E−06	2.289E+03	7.7592E+02	1.033E−06	2.271E+03
$1s\,4d\ ^3D_1$	$1s\,4d\ ^1D_2$	8.0779E+02	8.860E−06	1.811E+04	8.0628E+02	8.829E−06	1.796E+04
$1s\,4d\ ^3D_3$	$1s\,4d\ ^1D_2$	1.9845E+04	2.845E−07	9.638E−01			
$1s\,4f\ ^3F^o_3$	$1s\,4f\ ^3F^o_4$	1.6355E+03	9.461E−06	2.621E+03	1.6325E+03	9.436E−06	2.602E+03
$1s\,2p\ ^3P^o_2$	$1s\,4f\ ^1F^o_3$	1.7025E+00	1.542E−12	5.069E+02	1.6953E+00	1.104E−13	3.631E+01
$1s\,3p\ ^3P^o_2$	$1s\,4f\ ^1F^o_3$	6.4724E+00	5.423E−13	1.234E+01	6.4457E+00	5.663E−14	1.287E+00
$1s\,4p\ ^3P^o_2$	$1s\,4f\ ^1F^o_3$	4.6135E+02	3.233E−12	1.447E−02			
$1s\,4f\ ^3F^o_3$	$1s\,4f\ ^1F^o_3$	1.5861E+03	3.618E−07	1.371E+02	1.5830E+03	3.609E−07	1.360E+02
$1s\,4f\ ^3F^o_2$	$1s\,4f\ ^1F^o_3$	1.6535E+03	6.987E−06	2.435E+03	1.6504E+03	6.969E−06	2.417E+03
$1s\,4f\ ^3F^o_4$	$1s\,4f\ ^1F^o_3$	5.2510E+04	1.734E−07	5.991E−02			
$1s^2\ ^1S_0$	$1s\,5s\ ^3S_1$	3.2040E−01	1.922E−06	4.161E+10	3.1907E−01	1.905E−06	4.127E+10

(*continued on next page*)

Table 5 (*continued*)

Lower	Upper	GRASP2K			FAC		
		λ (Å)	*gf*	A (s^{-1})	λ (Å)	*gf*	A (s^{-1})
$1s\,2s\ ^3S_1$	$1s\,5s\ ^3S_1$	1.4473E+00	1.544E−07	1.639E+08	1.4412E+00	1.548E−07	1.643E+08
$1s\,2s\ ^1S_0$	$1s\,5s\ ^3S_1$	1.4618E+00	8.255E−08	8.589E+07	1.4559E+00	7.804E−08	8.117E+07
$1s\,3s\ ^3S_1$	$1s\,5s\ ^3S_1$	4.3197E+00	3.183E−08	3.792E+06	4.3017E+00	3.191E−08	3.802E+06
$1s\,3s\ ^1S_0$	$1s\,5s\ ^3S_1$	4.3538E+00	1.834E−08	2.152E+06	4.3360E+00	1.605E−08	1.882E+06
$1s\,3d\ ^3D_2$	$1s\,5s\ ^3S_1$	4.5495E+00	1.900E−12	2.041E+02	4.5304E+00	7.521E−12	8.078E+02
$1s\,3d\ ^3D_1$	$1s\,5s\ ^3S_1$	4.5520E+00	1.815E−11	1.948E+03			
$1s\,3d\ ^1D_2$	$1s\,5s\ ^3S_1$	4.6133E+00	2.661E−12	2.780E+02			
$1s\,4s\ ^3S_1$	$1s\,5s\ ^3S_1$	1.3745E+01	8.945E−09	1.053E+05	1.3688E+01	8.938E−09	1.051E+05
$1s\,4s\ ^1S_0$	$1s\,5s\ ^3S_1$	1.3885E+01	6.095E−09	7.030E+04	1.3828E+01	4.509E−09	5.198E+04
$1s\,4d\ ^3D_2$	$1s\,5s\ ^3S_1$	1.4736E+01	2.859E−12	2.927E+01	1.4676E+01	1.277E−11	1.308E+02
$1s\,4d\ ^3D_1$	$1s\,5s\ ^3S_1$	1.4747E+01	3.595E−11	3.675E+02	1.4686E+01	2.338E−12	2.389E+01
$1s\,4d\ ^1D_2$	$1s\,5s\ ^3S_1$	1.5021E+01	4.998E−12	4.925E+01			
$1s\,2p\ ^3P^o_1$	$1s\,5p\ ^3P^o_1$	1.4598E+00	3.325E−08	3.469E+07	1.4537E+00	3.812E−08	3.977E+07
$1s\,2p\ ^3P^o_0$	$1s\,5p\ ^3P^o_1$	1.4608E+00	1.660E−08	1.729E+07	1.4547E+00	2.159E−08	2.249E+07
$1s\,2p\ ^3P^o_2$	$1s\,5p\ ^3P^o_1$	1.5297E+00	7.583E−07	7.205E+08	1.5233E+00	7.714E−07	7.329E+08
$1s\,2p\ ^1P^o_1$	$1s\,5p\ ^3P^o_1$	1.5364E+00	1.790E−07	1.686E+08	1.5300E+00	1.667E−07	1.570E+08
$1s\,3p\ ^3P^o_1$	$1s\,5p\ ^3P^o_1$	4.3450E+00	9.303E−09	1.096E+06	4.3271E+00	1.018E−08	1.198E+06
$1s\,3p\ ^3P^o_0$	$1s\,5p\ ^3P^o_1$	4.3474E+00	3.783E−09	4.450E+05	4.3294E+00	7.068E−09	8.313E+05
$1s\,3p\ ^3P^o_2$	$1s\,5p\ ^3P^o_1$	4.5285E+00	6.596E−07	7.151E+07	4.5097E+00	6.741E−07	7.307E+07
$1s\,3p\ ^1P^o_1$	$1s\,5p\ ^3P^o_1$	4.5449E+00	1.499E−07	1.613E+07	4.5263E+00	1.410E−07	1.517E+07
$1s\,4p\ ^3P^o_1$	$1s\,5p\ ^3P^o_1$	1.3810E+01	3.141E−09	3.662E+04	1.3752E+01	3.286E−09	3.831E+04
$1s\,4p\ ^3P^o_0$	$1s\,5p\ ^3P^o_1$	1.3820E+01	8.034E−10	9.353E+03	1.3761E+01	3.266E−09	3.803E+04
$1s\,4p\ ^3P^o_2$	$1s\,5p\ ^3P^o_1$	1.4601E+01	8.508E−07	8.874E+06	1.4539E+01	8.744E−07	9.120E+06
$1s\,4p\ ^1P^o_1$	$1s\,5p\ ^3P^o_1$	1.4672E+01	1.898E−07	1.961E+06	1.4610E+01	1.785E−07	1.843E+06
$1s\,4f\ ^3F^o_2$	$1s\,5p\ ^3P^o_1$	1.4942E+01	2.377E−13	2.367E+00			
$1s\,2s\ ^3S_1$	$1s\,5s\ ^1S_0$	1.4466E+00	7.497E−08	2.390E+08	1.4404E+00	7.736E−08	2.466E+08
$1s\,3s\ ^3S_1$	$1s\,5s\ ^1S_0$	4.3129E+00	1.408E−08	5.050E+06	4.2949E+00	1.592E−08	5.711E+06
$1s\,3d\ ^3D_1$	$1s\,5s\ ^1S_0$	4.5444E+00	2.226E−12	7.191E+02	4.5252E+00	2.275E−12	7.347E+02
$1s\,4s\ ^3S_1$	$1s\,5s\ ^1S_0$	1.3676E+01	3.196E−09	1.140E+05	1.3618E+01	4.447E−09	1.585E+05
$1s\,4d\ ^3D_1$	$1s\,5s\ ^1S_0$	1.4668E+01	4.200E−12	1.302E+02	1.4607E+01	4.661E−12	1.445E+02
$1s\,5s\ ^3S_1$	$1s\,5s\ ^1S_0$	2.7268E+03	1.197E−08	1.074E+01	2.6934E+03	1.177E−08	1.073E+01
$1s\,2p\ ^3P^o_1$	$1s\,5p\ ^3P^o_0$	1.4597E+00	2.071E−08	6.482E+07	1.4537E+00	1.212E−08	3.793E+07
$1s\,2p\ ^1P^o_1$	$1s\,5p\ ^3P^o_0$	1.5363E+00	3.127E−07	8.836E+08	1.5300E+00	3.196E−07	9.030E+08
$1s\,3p\ ^3P^o_1$	$1s\,5p\ ^3P^o_0$	4.3445E+00	5.943E−09	2.100E+06	4.3267E+00	2.377E−09	8.397E+05
$1s\,3p\ ^1P^o_1$	$1s\,5p\ ^3P^o_0$	4.5444E+00	2.684E−07	8.670E+07	4.5258E+00	2.745E−07	8.864E+07
$1s\,4p\ ^3P^o_1$	$1s\,5p\ ^3P^o_0$	1.3805E+01	2.173E−09	7.604E+04	1.3747E+01	2.595E−10	9.084E+03
$1s\,4p\ ^1P^o_1$	$1s\,5p\ ^3P^o_0$	1.4666E+01	3.440E−07	1.067E+07	1.4605E+01	3.519E−07	1.091E+07
$1s\,5p\ ^3P^o_1$	$1s\,5p\ ^3P^o_0$	3.9500E+04	1.224E−07	5.231E−01	4.0718E+04	1.185E−07	4.729E−01
$1s\,2p\ ^3P^o_1$	$1s\,5p\ ^3P^o_2$	1.4555E+00	3.625E−07	2.283E+08	1.4495E+00	3.760E−07	2.367E+08
$1s\,2p\ ^3P^o_2$	$1s\,5p\ ^3P^o_2$	1.5251E+00	5.039E−07	2.890E+08	1.5187E+00	5.078E−07	2.912E+08
$1s\,2p\ ^1P^o_1$	$1s\,5p\ ^3P^o_2$	1.5317E+00	4.698E−08	2.672E+07	1.5253E+00	4.591E−08	2.610E+07
$1s\,3p\ ^3P^o_1$	$1s\,5p\ ^3P^o_2$	4.3076E+00	4.374E−07	3.145E+07	4.2899E+00	4.510E−07	3.242E+07
$1s\,3p\ ^3P^o_2$	$1s\,5p\ ^3P^o_2$	4.4878E+00	1.396E−07	9.247E+06	4.4692E+00	1.403E−07	9.293E+06
$1s\,3p\ ^1P^o_1$	$1s\,5p\ ^3P^o_2$	4.5039E+00	9.365E−09	6.158E+05	4.4855E+00	1.008E−08	6.628E+05
$1s\,4p\ ^3P^o_1$	$1s\,5p\ ^3P^o_2$	1.3439E+01	6.586E−07	4.865E+06	1.3383E+01	6.762E−07	4.994E+06
$1s\,4p\ ^3P^o_2$	$1s\,5p\ ^3P^o_2$	1.4186E+01	4.513E−08	2.991E+05	1.4127E+01	4.470E−08	2.963E+05
$1s\,4p\ ^1P^o_1$	$1s\,5p\ ^3P^o_2$	1.4253E+01	1.024E−09	6.726E+03	1.4194E+01	1.700E−09	1.116E+04
$1s\,4f\ ^3F^o_3$	$1s\,5p\ ^3P^o_2$	1.4503E+01	1.154E−12	7.318E+00			
$1s\,4f\ ^3F^o_2$	$1s\,5p\ ^3P^o_2$	1.4508E+01	3.204E−13	2.031E+00			
$1s\,4f\ ^1F^o_3$	$1s\,5p\ ^3P^o_2$	1.4636E+01	4.259E−14	2.652E−01			
$1s\,5p\ ^3P^o_1$	$1s\,5p\ ^3P^o_2$	4.9993E+02	1.394E−05	7.439E+04	4.9817E+02	1.393E−05	7.425E+04
$1s\,2s\ ^3S_1$	$1s\,5d\ ^3D_2$	1.4421E+00	1.207E−08	7.745E+06	1.4360E+00	1.251E−08	8.030E+06
$1s\,3s\ ^3S_1$	$1s\,5d\ ^3D_2$	4.2737E+00	1.741E−09	1.272E+05	4.2558E+00	1.922E−09	1.403E+05
$1s\,3d\ ^3D_2$	$1s\,5d\ ^3D_2$	4.4985E+00	4.750E−08	3.132E+06	4.4794E+00	4.750E−08	3.131E+06
$1s\,3d\ ^3D_1$	$1s\,5d\ ^3D_2$	4.5010E+00	4.030E−09	2.654E+05	4.4818E+00	5.426E−09	3.573E+05
$1s\,3d\ ^3D_3$	$1s\,5d\ ^3D_2$	4.5585E+00	1.063E−07	6.826E+06	4.5391E+00	1.063E−07	6.830E+06
$1s\,3d\ ^1D_2$	$1s\,5d\ ^3D_2$	4.5609E+00	8.379E−09	5.374E+05	4.5414E+00	7.951E−09	5.099E+05
$1s\,4s\ ^3S_1$	$1s\,5d\ ^3D_2$	1.3290E+01	1.420E−10	1.073E+03	1.3233E+01	1.983E−10	1.498E+03
$1s\,4d\ ^3D_2$	$1s\,5d\ ^3D_2$	1.4214E+01	2.217E−08	1.464E+05	1.4154E+01	2.214E−08	1.462E+05
$1s\,4d\ ^3D_1$	$1s\,5d\ ^3D_2$	1.4224E+01	1.417E−09	9.343E+03	1.4164E+01	2.610E−09	1.720E+04
$1s\,4d\ ^3D_3$	$1s\,5d\ ^3D_2$	1.4468E+01	1.506E−07	9.600E+05	1.4407E+01	1.507E−07	9.606E+05
$1s\,4d\ ^1D_2$	$1s\,5d\ ^3D_2$	1.4479E+01	1.171E−08	7.449E+04	1.4417E+01	1.098E−08	6.991E+04
$1s\,5s\ ^3S_1$	$1s\,5d\ ^3D_2$	4.0118E+02	1.290E−10	1.070E+00	3.9828E+02	1.291E−10	1.076E+00
$1s\,2p\ ^3P^o_1$	$1s\,5p\ ^1P^o_1$	1.4551E+00	6.636E−08	6.969E+07	1.4491E+00	6.566E−08	6.893E+07
$1s\,2p\ ^3P^o_0$	$1s\,5p\ ^1P^o_1$	1.4562E+00	1.354E−07	1.420E+08	1.4501E+00	1.420E−07	1.489E+08
$1s\,2p\ ^3P^o_2$	$1s\,5p\ ^1P^o_1$	1.5247E+00	8.556E−08	8.183E+07	1.5183E+00	7.279E−08	6.962E+07
$1s\,2p\ ^1P^o_1$	$1s\,5p\ ^1P^o_1$	1.5313E+00	2.795E−07	2.651E+08	1.5249E+00	2.779E−07	2.635E+08
$1s\,3p\ ^3P^o_1$	$1s\,5p\ ^1P^o_1$	4.3044E+00	8.940E−08	1.073E+07	4.2867E+00	8.521E−08	1.022E+07
$1s\,3p\ ^3P^o_0$	$1s\,5p\ ^1P^o_1$	4.3068E+00	1.695E−07	2.032E+07	4.2890E+00	1.758E−07	2.107E+07
$1s\,3p\ ^3P^o_2$	$1s\,5p\ ^1P^o_1$	4.4844E+00	2.833E−08	3.132E+06	4.4658E+00	2.403E−08	2.656E+06
$1s\,3p\ ^1P^o_1$	$1s\,5p\ ^1P^o_1$	4.5006E+00	7.769E−08	8.528E+06	4.4821E+00	7.651E−08	8.396E+06

(*continued on next page*)

Table 5 (*continued*)

Lower	Upper	GRASP2K			FAC		
		λ (Å)	*gf*	A (s^{-1})	λ (Å)	*gf*	A (s^{-1})
$1s\,4p\ ^3P^o_1$	$1s\,5p\ ^1P^o_1$	1.3409E+01	1.400E−07	1.732E+06	1.3352E+01	1.323E−07	1.636E+06
$1s\,4p\ ^3P^o_0$	$1s\,5p\ ^1P^o_1$	1.3418E+01	2.593E−07	3.202E+06	1.3361E+01	2.678E−07	3.307E+06
$1s\,4p\ ^3P^o_2$	$1s\,5p\ ^1P^o_1$	1.4153E+01	1.282E−08	1.423E+05	1.4093E+01	1.104E−08	1.226E+05
$1s\,4p\ ^1P^o_1$	$1s\,5p\ ^1P^o_1$	1.4219E+01	2.450E−08	2.695E+05	1.4160E+01	2.407E−08	2.647E+05
$1s\,4f\ ^3F^o_2$	$1s\,5p\ ^1P^o_1$	1.4473E+01	1.066E−12	1.131E+01			
$1s\,5p\ ^3P^o_1$	$1s\,5p\ ^1P^o_1$	4.6126E+02	2.804E−06	2.931E+04	4.5925E+02	2.803E−06	2.930E+04
$1s\,5p\ ^3P^o_0$	$1s\,5p\ ^1P^o_1$	4.6671E+02	5.192E−06	5.300E+04	4.6449E+02	5.187E−06	5.301E+04
$1s\,5p\ ^3P^o_2$	$1s\,5p\ ^1P^o_1$	5.9640E+03	3.535E−07	2.210E+01	5.8780E+03	3.589E−07	2.290E+01
$1s^2\ ^1S_0$	$1s\,5d\ ^3D_1$	3.2010E−01	2.906E−08	6.303E+08	3.1882E−01	2.923E−08	6.341E+08
$1s\,2s\ ^3S_1$	$1s\,5d\ ^3D_1$	1.4421E+00	3.269E−09	3.496E+06	1.4359E+00	2.440E−09	2.609E+06
$1s\,2s\ ^1S_0$	$1s\,5d\ ^3D_1$	1.4565E+00	4.982E−09	5.221E+06	1.4505E+00	5.091E−09	5.335E+06
$1s\,3s\ ^3S_1$	$1s\,5d\ ^3D_1$	4.2732E+00	6.295E−10	7.664E+04	4.2553E+00	3.832E−10	4.666E+04
$1s\,3s\ ^1S_0$	$1s\,5d\ ^3D_1$	4.3066E+00	7.848E−10	9.408E+04	4.2889E+00	7.962E−10	9.543E+04
$1s\,3d\ ^3D_2$	$1s\,5d\ ^3D_1$	4.4980E+00	6.754E−09	7.423E+05	4.4789E+00	5.140E−09	5.648E+05
$1s\,3d\ ^3D_1$	$1s\,5d\ ^3D_1$	4.5005E+00	2.642E−08	2.900E+06	4.4813E+00	2.637E−08	2.895E+06
$1s\,3d\ ^1D_2$	$1s\,5d\ ^3D_1$	4.5603E+00	6.789E−08	7.258E+06	4.5409E+00	6.881E−08	7.357E+06
$1s\,4s\ ^3S_1$	$1s\,5d\ ^3D_1$	1.3285E+01	1.345E−10	1.694E+03	1.3229E+01	4.034E−11	5.082E+02
$1s\,4s\ ^1S_0$	$1s\,5d\ ^3D_1$	1.3416E+01	8.406E−11	1.038E+03	1.3360E+01	8.608E−11	1.063E+03
$1s\,4d\ ^3D_2$	$1s\,5d\ ^3D_1$	1.4209E+01	3.779E−09	4.162E+04	1.4150E+01	2.284E−09	2.515E+04
$1s\,4d\ ^3D_1$	$1s\,5d\ ^3D_1$	1.4219E+01	1.231E−08	1.354E+05	1.4159E+01	1.228E−08	1.350E+05
$1s\,4d\ ^1D_2$	$1s\,5d\ ^3D_1$	1.4474E+01	9.593E−08	1.018E+06	1.4412E+01	9.728E−08	1.032E+06
$1s\,5s\ ^3S_1$	$1s\,5d\ ^3D_1$	3.9728E+02	2.647E−10	3.728E+00	3.9446E+02	2.698E−10	3.823E+00
$1s\,5s\ ^1S_0$	$1s\,5d\ ^3D_1$	4.6504E+02	6.464E−12	6.646E−02	4.6214E+02	6.512E−12	6.722E−02
$1s\,5d\ ^3D_2$	$1s\,5d\ ^3D_1$	4.0886E+04	2.249E−07	2.991E−01	4.1075E+04	2.236E−07	2.922E−01
$1s\,3d\ ^3D_2$	$1s\,5d\ ^3D_3$	4.4858E+00	3.427E−08	1.623E+06	4.4668E+00	3.435E−08	1.627E+06
$1s\,3d\ ^3D_3$	$1s\,5d\ ^3D_3$	4.5454E+00	2.279E−07	1.051E+07	4.5261E+00	2.277E−07	1.050E+07
$1s\,3d\ ^1D_2$	$1s\,5d\ ^3D_3$	4.5477E+00	1.002E−08	4.616E+05	4.5284E+00	1.125E−08	5.183E+05
$1s\,4d\ ^3D_2$	$1s\,5d\ ^3D_3$	1.4088E+01	8.337E−08	4.003E+05	1.4029E+01	8.359E−08	4.013E+05
$1s\,4d\ ^3D_3$	$1s\,5d\ ^3D_3$	1.4337E+01	1.068E−07	4.952E+05	1.4277E+01	1.064E−07	4.936E+05
$1s\,4d\ ^1D_2$	$1s\,5d\ ^3D_3$	1.4348E+01	4.050E−09	1.875E+04	1.4287E+01	5.092E−09	2.357E+04
$1s\,5d\ ^3D_2$	$1s\,5d\ ^3D_3$	1.5807E+03	7.199E−06	2.745E+03	1.5799E+03	7.177E−06	2.716E+03
$1s\,2p\ ^3P^o_2$	$1s\,5f\ ^3F^o_3$	1.5232E+00	1.777E−08	7.298E+06	1.5168E+00	1.651E−08	6.783E+06
$1s\,3p\ ^3P^o_2$	$1s\,5f\ ^3F^o_3$	4.4720E+00	2.760E−09	1.315E+05	4.4534E+00	2.752E−09	1.311E+05
$1s\,4p\ ^3P^o_2$	$1s\,5f\ ^3F^o_3$	1.4030E+01	1.450E−09	7.019E+03	1.3970E+01	1.413E−09	6.842E+03
$1s\,4f\ ^3F^o_3$	$1s\,5f\ ^3F^o_3$	1.4339E+01	1.073E−08	4.974E+04	1.4278E+01	4.705E−08	2.180E+05
$1s\,4f\ ^3F^o_2$	$1s\,5f\ ^3F^o_3$	1.4344E+01	2.972E−08	1.376E+05	1.4283E+01	2.334E−09	1.081E+04
$1s\,4f\ ^3F^o_4$	$1s\,5f\ ^3F^o_3$	1.4466E+01	4.502E−08	2.050E+05	1.4404E+01	4.477E−08	2.039E+05
$1s\,4f\ ^1F^o_3$	$1s\,5f\ ^3F^o_3$	1.4470E+01	1.697E−09	7.722E+03	1.4408E+01	1.639E−09	7.462E+03
$1s\,5p\ ^3P^o_2$	$1s\,5f\ ^3F^o_3$	1.2712E+03	9.159E−12	5.401E−03	1.2579E+03	8.880E−12	5.302E−03
$1s\,2p\ ^3P^o_1$	$1s\,5f\ ^3F^o_2$	1.4538E+00	2.242E−11	1.415E+04	1.4478E+00	1.093E−11	6.903E+03
$1s\,2p\ ^3P^o_2$	$1s\,5f\ ^3F^o_2$	1.5232E+00	1.262E−09	7.255E+05	1.5168E+00	1.202E−09	6.912E+05
$1s\,2p\ ^1P^o_1$	$1s\,5f\ ^3F^o_2$	1.5298E+00	1.114E−08	6.351E+06	1.5234E+00	1.084E−08	6.179E+06
$1s\,3p\ ^3P^o_1$	$1s\,5f\ ^3F^o_2$	4.2928E+00	5.686E−12	4.116E+02	4.2750E+00	3.642E−12	2.636E+02
$1s\,3p\ ^3P^o_2$	$1s\,5f\ ^3F^o_2$	4.4718E+00	2.443E−10	1.630E+04	4.4531E+00	1.918E−10	1.279E+04
$1s\,3p\ ^1P^o_1$	$1s\,5f\ ^3F^o_2$	4.4878E+00	1.807E−09	1.197E+05	4.4693E+00	1.767E−09	1.170E+05
$1s\,4p\ ^3P^o_1$	$1s\,5f\ ^3F^o_2$	1.3296E+01	3.412E−12	2.575E+01			
$1s\,4p\ ^3P^o_2$	$1s\,5f\ ^3F^o_2$	1.4027E+01	1.361E−10	9.228E+02	1.3967E+01	1.003E−10	6.806E+02
$1s\,4p\ ^1P^o_1$	$1s\,5f\ ^3F^o_2$	1.4093E+01	9.657E−10	6.487E+03	1.4033E+01	9.194E−10	6.175E+03
$1s\,4f\ ^3F^o_3$	$1s\,5f\ ^3F^o_2$	1.4336E+01	3.412E−08	2.215E+05	1.4275E+01	2.392E−09	1.552E+04
$1s\,4f\ ^3F^o_2$	$1s\,5f\ ^3F^o_2$	1.4342E+01	6.360E−08	4.125E+05	1.4281E+01	3.295E−08	2.137E+05
$1s\,4f\ ^1F^o_3$	$1s\,5f\ ^3F^o_2$	1.4467E+01	3.281E−08	2.091E+05	1.4405E+01	3.308E−08	2.109E+05
$1s\,5p\ ^3P^o_1$	$1s\,5f\ ^3F^o_2$	3.5713E+02	3.711E−12	3.882E−02	3.5518E+02	4.170E−12	4.372E−02
$1s\,5p\ ^3P^o_2$	$1s\,5f\ ^3F^o_2$	1.2503E+03	9.975E−12	8.513E−03	1.2374E+03	9.996E−12	8.635E−03
$1s\,5p\ ^1P^o_1$	$1s\,5f\ ^3F^o_2$	1.5820E+03	3.550E−13	1.892E−04	1.5673E+03	3.191E−13	1.718E−04
$1s\,5f\ ^3F^o_3$	$1s\,5f\ ^3F^o_2$	7.6009E+04	1.688E−07	3.897E−02	7.5649E+04	1.670E−07	3.861E−02
$1s\,2s\ ^3S_1$	$1s\,5d\ ^1D_2$	1.4408E+00	1.086E−11	6.980E+03	1.4346E+00	5.345E−13	3.435E+02
$1s\,3s\ ^3S_1$	$1s\,5d\ ^1D_2$	4.2617E+00	6.144E−12	4.513E+02			
$1s\,3d\ ^3D_2$	$1s\,5d\ ^1D_2$	4.4852E+00	2.704E−09	1.793E+05	4.4662E+00	2.441E−09	1.619E+05
$1s\,3d\ ^3D_1$	$1s\,5d\ ^1D_2$	4.4876E+00	2.134E−08	1.413E+06	4.4686E+00	2.183E−08	1.446E+06
$1s\,3d\ ^3D_3$	$1s\,5d\ ^1D_2$	4.5449E+00	1.323E−08	8.542E+05	4.5255E+00	1.184E−08	7.652E+05
$1s\,3d\ ^1D_2$	$1s\,5d\ ^1D_2$	4.5472E+00	1.594E−07	1.028E+07	4.5278E+00	1.591E−07	1.026E+07
$1s\,4s\ ^3S_1$	$1s\,5d\ ^1D_2$	1.3174E+01	5.744E−12	4.415E+01			
$1s\,4d\ ^3D_2$	$1s\,5d\ ^1D_2$	1.4082E+01	6.400E−09	4.306E+04	1.4023E+01	5.870E−09	3.948E+04
$1s\,4d\ ^3D_1$	$1s\,5d\ ^1D_2$	1.4092E+01	5.236E−08	3.517E+05	1.4033E+01	5.341E−08	3.587E+05
$1s\,4d\ ^3D_3$	$1s\,5d\ ^1D_2$	1.4332E+01	6.968E−09	4.525E+04	1.4271E+01	5.701E−09	3.703E+04
$1s\,4d\ ^1D_2$	$1s\,5d\ ^1D_2$	1.4342E+01	7.473E−08	4.847E+05	1.4282E+01	7.441E−08	4.825E+05
$1s\,5s\ ^3S_1$	$1s\,5d\ ^1D_2$	3.1728E+02	5.803E−11	7.691E−01	3.1538E+02	5.834E−11	7.758E−01
$1s\,5d\ ^3D_2$	$1s\,5d\ ^1D_2$	1.5170E+03	5.320E−07	3.084E+02	1.5150E+03	5.304E−07	3.056E+02
$1s\,5d\ ^3D_1$	$1s\,5d\ ^1D_2$	1.5755E+03	4.542E−06	2.441E+03	1.5730E+03	4.524E−06	2.418E+03
$1s\,5d\ ^3D_3$	$1s\,5d\ ^1D_2$	3.7649E+04	1.489E−07	1.401E−01			
$1s\,4f\ ^3F^o_3$	$1s\,5f\ ^3F^o_4$	1.4275E+01	1.498E−08	5.450E+04	1.4214E+01	1.496E−08	5.443E+04

(*continued on next page*)

Table 5 (*continued*)

Lower	Upper	GRASP2K			FAC		
		λ (Å)	*gf*	A (s^{-1})	λ (Å)	*gf*	A (s^{-1})
$1s\,4f\ ^3F^o_4$	$1s\,5f\ ^3F^o_4$	1.4401E+01	1.395E−07	4.986E+05	1.4339E+01	1.440E−07	5.146E+05
$1s\,4f\ ^1F^o_3$	$1s\,5f\ ^3F^o_4$	1.4404E+01	4.779E−09	1.707E+04	1.4343E+01	4.148E−09	1.481E+04
$1s\,5f\ ^3F^o_3$	$1s\,5f\ ^3F^o_4$	3.1889E+03	4.861E−06	3.543E+02	3.1838E+03	4.848E−06	3.514E+02
$1s\,3d\ ^3D_3$	$1s\,5g\ ^3G_4$	4.5387E+00	6.705E−09	2.412E+05	4.5195E+00	6.765E−09	2.433E+05
$1s\,4d\ ^3D_3$	$1s\,5g\ ^3G_4$	1.4271E+01	2.645E−09	9.626E+03	1.4212E+01	2.645E−09	9.624E+03
$1s\,5d\ ^3D_3$	$1s\,5g\ ^3G_4$	3.0779E+03	3.885E−13	3.040E−05	3.1417E+03	4.330E−13	3.223E−05
$1s\,3d\ ^3D_2$	$1s\,5g\ ^3G_3$	4.4791E+00	4.386E−13	2.083E+01			
$1s\,3d\ ^3D_3$	$1s\,5g\ ^3G_3$	4.5386E+00	2.962E−10	1.370E+04	4.5194E+00	2.508E−10	1.160E+04
$1s\,3d\ ^1D_2$	$1s\,5g\ ^3G_3$	4.5409E+00	5.076E−09	2.346E+05	4.5217E+00	5.023E−09	2.321E+05
$1s\,4d\ ^3D_2$	$1s\,5g\ ^3G_3$	1.4022E+01	1.928E−13	9.345E−01			
$1s\,4d\ ^3D_3$	$1s\,5g\ ^3G_3$	1.4269E+01	1.108E−10	5.186E+02	1.4210E+01	9.782E−11	4.576E+02
$1s\,4d\ ^1D_2$	$1s\,5g\ ^3G_3$	1.4280E+01	1.987E−09	9.285E+03	1.4221E+01	1.961E−09	9.165E+03
$1s\,5d\ ^3D_2$	$1s\,5g\ ^3G_3$	1.0362E+03	4.213E−15	3.739E−06	1.0430E+03	4.189E−15	3.638E−06
$1s\,5d\ ^3D_3$	$1s\,5g\ ^3G_3$	3.0082E+03	1.694E−16	1.784E−08			
$1s\,5d\ ^1D_2$	$1s\,5g\ ^3G_3$	3.2694E+03	2.036E−13	1.815E−05	3.3474E+03	1.574E−13	1.327E−05
$1s\,5g\ ^3G_4$	$1s\,5g\ ^3G_3$	1.3281E+05	1.209E−07	6.534E−03	1.3215E+05	1.213E−07	6.564E−03
$1s\,2p\ ^3P^o_2$	$1s\,5f\ ^1F^o_3$	1.5225E+00	1.031E−12	4.240E+02	1.5161E+00	6.722E−14	2.763E+01
$1s\,3p\ ^3P^o_2$	$1s\,5f\ ^1F^o_3$	4.4656E+00	1.185E−13	5.664E+00	4.4470E+00	1.124E−14	5.370E−01
$1s\,4p\ ^3P^o_2$	$1s\,5f\ ^1F^o_3$	1.3966E+01	2.140E−13	1.045E+00			
$1s\,4f\ ^3F^o_3$	$1s\,5f\ ^1F^o_3$	1.4273E+01	6.420E−10	3.003E+03	1.4212E+01	5.692E−10	2.662E+03
$1s\,4f\ ^3F^o_2$	$1s\,5f\ ^1F^o_3$	1.4278E+01	1.100E−08	5.141E+04	1.4218E+01	1.112E−08	5.201E+04
$1s\,4f\ ^3F^o_4$	$1s\,5f\ ^1F^o_3$	1.4398E+01	5.942E−09	2.731E+04	1.4337E+01	4.059E−09	1.866E+04
$1s\,4f\ ^1F^o_3$	$1s\,5f\ ^1F^o_3$	1.4402E+01	1.154E−07	5.300E+05	1.4341E+01	1.111E−07	5.104E+05
$1s\,5p\ ^3P^o_2$	$1s\,5f\ ^1F^o_3$	9.0084E+02	2.726E−12	3.201E−03			
$1s\,5f\ ^3F^o_3$	$1s\,5f\ ^1F^o_3$	3.0918E+03	1.860E−07	1.854E+01	3.0864E+03	1.854E−07	1.839E+01
$1s\,5f\ ^3F^o_2$	$1s\,5f\ ^1F^o_3$	3.2229E+03	3.589E−06	3.293E+02	3.2177E+03	3.579E−06	3.266E+02
$1s\,5f\ ^3F^o_4$	$1s\,5f\ ^1F^o_3$	1.0160E+05	8.920E−08	8.235E−03			
$1s\,5g\ ^3G_4$	$1s\,5g\ ^3G_5$	5.3554E+03	3.669E−06	7.758E+01	5.3442E+03	3.661E−06	7.707E+01
$1s\,3d\ ^3D_3$	$1s\,5g\ ^1G_4$	4.5348E+00	1.337E−13	4.817E+00	4.5156E+00	2.425E−14	8.741E−01
$1s\,4d\ ^3D_3$	$1s\,5g\ ^1G_4$	1.4232E+01	1.748E−14	6.398E−02	1.4173E+01	9.478E−15	3.467E−02
$1s\,5d\ ^3D_3$	$1s\,5g\ ^1G_4$	1.9321E+03	3.849E−15	7.643E−07			
$1s\,5g\ ^3G_4$	$1s\,5g\ ^1G_4$	5.1900E+03	8.607E−08	2.368E+00	5.1787E+03	8.589E−08	2.353E+00
$1s\,5g\ ^3G_3$	$1s\,5g\ ^1G_4$	5.4011E+03	2.914E−06	7.403E+01	5.3899E+03	2.907E−06	7.354E+01
$1s\,5g\ ^3G_5$	$1s\,5g\ ^1G_4$	1.6804E+05	7.357E−08	1.931E−03			
$1s^2\ ^1S_0$	$1s\,6s\ ^3S_1$	3.1640E−01	1.107E−06	2.457E+10	3.1511E−01	1.098E−06	2.438E+10
$1s\,2s\ ^3S_1$	$1s\,6s\ ^3S_1$	1.3696E+00	9.015E−08	1.069E+08	1.3638E+00	9.066E−08	1.074E+08
$1s\,2s\ ^1S_0$	$1s\,6s\ ^3S_1$	1.3825E+00	4.807E−08	5.592E+07	1.3769E+00	4.572E−08	5.317E+07
$1s\,3s\ ^3S_1$	$1s\,6s\ ^3S_1$	3.6936E+00	1.931E−08	3.147E+06	3.6786E+00	1.938E−08	3.157E+06
$1s\,3s\ ^1S_0$	$1s\,6s\ ^3S_1$	3.7185E+00	1.086E−08	1.747E+06	3.7036E+00	9.751E−09	1.567E+06
$1s\,3d\ ^3D_2$	$1s\,6s\ ^3S_1$	3.8604E+00	5.613E−13	8.374E+01			
$1s\,3d\ ^3D_1$	$1s\,6s\ ^3S_1$	3.8622E+00	8.232E−12	1.227E+03			
$1s\,3d\ ^1D_2$	$1s\,6s\ ^3S_1$	3.9062E+00	1.282E−12	1.868E+02			
$1s\,4s\ ^3S_1$	$1s\,6s\ ^3S_1$	8.9291E+00	6.023E−09	1.680E+05	8.8936E+00	6.051E−09	1.686E+05
$1s\,4s\ ^1S_0$	$1s\,6s\ ^3S_1$	8.9879E+00	3.778E−09	1.040E+05	8.9527E+00	3.044E−09	8.374E+04
$1s\,4d\ ^3D_2$	$1s\,6s\ ^3S_1$	9.3373E+00	1.297E−12	3.306E+01	9.3006E+00	4.837E−12	1.232E+02
$1s\,4d\ ^3D_1$	$1s\,6s\ ^3S_1$	9.3415E+00	1.313E−11	3.344E+02	9.3048E+00	1.214E−12	3.092E+01
$1s\,4d\ ^1D_2$	$1s\,6s\ ^3S_1$	9.4508E+00	1.784E−12	4.442E+01			
$1s\,5s\ ^3S_1$	$1s\,6s\ ^3S_1$	2.5485E+01	2.125E−09	7.273E+03	2.5393E+01	2.131E−09	7.285E+03
$1s\,5s\ ^1S_0$	$1s\,6s\ ^3S_1$	2.5726E+01	1.670E−09	5.611E+03	2.5635E+01	1.075E−09	3.606E+03
$1s\,5d\ ^3D_2$	$1s\,6s\ ^3S_1$	2.7214E+01	7.250E−13	2.176E+00	2.7122E+01	5.172E−12	1.550E+01
$1s\,5d\ ^3D_1$	$1s\,6s\ ^3S_1$	2.7232E+01	2.052E−11	6.152E+01	2.7140E+01	1.190E−12	3.562E+00
$1s\,5d\ ^1D_2$	$1s\,6s\ ^3S_1$	2.7711E+01	3.013E−12	8.724E+00			
$1s\,2p\ ^3P^o_1$	$1s\,6p\ ^3P^o_1$	1.3810E+00	2.067E−08	2.410E+07	1.3752E+00	2.129E−08	2.482E+07
$1s\,2p\ ^3P^o_0$	$1s\,6p\ ^3P^o_1$	1.3819E+00	8.740E−09	1.018E+07	1.3761E+00	1.295E−08	1.508E+07
$1s\,2p\ ^3P^o_2$	$1s\,6p\ ^3P^o_1$	1.4434E+00	4.128E−07	4.405E+08	1.4374E+00	4.168E−07	4.448E+08
$1s\,2p\ ^1P^o_1$	$1s\,6p\ ^3P^o_1$	1.4493E+00	9.654E−08	1.022E+08	1.4433E+00	9.341E−08	9.885E+07
$1s\,3p\ ^3P^o_1$	$1s\,6p\ ^3P^o_1$	3.7142E+00	6.133E−09	9.884E+05	3.6989E+00	5.685E−09	9.160E+05
$1s\,3p\ ^3P^o_0$	$1s\,6p\ ^3P^o_1$	3.7159E+00	2.025E−09	3.261E+05	3.7005E+00	4.431E−09	7.134E+05
$1s\,3p\ ^3P^o_2$	$1s\,6p\ ^3P^o_1$	3.8474E+00	3.258E−07	4.893E+07	3.8314E+00	3.312E−07	4.974E+07
$1s\,3p\ ^1P^o_1$	$1s\,6p\ ^3P^o_1$	3.8593E+00	7.372E−08	1.101E+07	3.8434E+00	7.108E−08	1.060E+07
$1s\,4p\ ^3P^o_1$	$1s\,6p\ ^3P^o_1$	8.9685E+00	2.399E−09	6.631E+04	8.9310E+00	1.888E−09	5.218E+04
$1s\,4p\ ^3P^o_0$	$1s\,6p\ ^3P^o_1$	8.9726E+00	4.830E−10	1.334E+04	8.9350E+00	2.091E−09	5.775E+04
$1s\,4p\ ^3P^o_2$	$1s\,6p\ ^3P^o_1$	9.2954E+00	3.183E−07	8.190E+06	9.2564E+00	3.253E−07	8.369E+06
$1s\,4p\ ^1P^o_1$	$1s\,6p\ ^3P^o_1$	9.3241E+00	7.090E−08	1.813E+06	9.2853E+00	6.788E−08	1.735E+06
$1s\,4f\ ^3F^o_2$	$1s\,6p\ ^3P^o_1$	9.4324E+00	7.883E−14	1.970E+00			
$1s\,5p\ ^3P^o_1$	$1s\,6p\ ^3P^o_1$	2.5582E+01	1.080E−09	3.667E+03	2.5476E+01	6.650E−10	2.258E+03
$1s\,5p\ ^3P^o_0$	$1s\,6p\ ^3P^o_1$	2.5599E+01	6.529E−11	2.215E+02	2.5492E+01	1.370E−09	4.650E+03
$1s\,5p\ ^3P^o_2$	$1s\,6p\ ^3P^o_1$	2.6962E+01	4.537E−07	1.388E+06	2.6849E+01	4.659E−07	1.424E+06
$1s\,5p\ ^1P^o_1$	$1s\,6p\ ^3P^o_1$	2.7084E+01	1.005E−07	3.045E+05	2.6972E+01	9.510E−08	2.881E+05
$1s\,5f\ ^3F^o_2$	$1s\,6p\ ^3P^o_1$	2.7556E+01	2.189E−13	6.408E−01			
$1s\,2s\ ^3S_1$	$1s\,6s\ ^1S_0$	1.3692E+00	4.431E−08	1.577E+08	1.3635E+00	4.532E−08	1.612E+08

(*continued on next page*)

Table 5 (*continued*)

Lower	Upper	GRASP2K			FAC		
		λ (Å)	*gf*	A (s^{-1})	λ (Å)	*gf*	A (s^{-1})
$1s\,3s\ ^3S_1$	$1s\,6s\ ^1S_0$	3.6908E+00	8.788E−09	4.303E+06	3.6761E+00	9.684E−09	4.739E+06
$1s\,3d\ ^3D_1$	$1s\,6s\ ^1S_0$	3.8591E+00	9.086E−13	4.070E+02			
$1s\,4s\ ^3S_1$	$1s\,6s\ ^1S_0$	8.9125E+00	2.416E−09	2.029E+05	8.8795E+00	3.021E−09	2.534E+05
$1s\,4d\ ^3D_1$	$1s\,6s\ ^1S_0$	9.3233E+00	1.668E−12	1.280E+02	9.2893E+00	1.732E−12	1.327E+02
$1s\,5s\ ^3S_1$	$1s\,6s\ ^1S_0$	2.5350E+01	6.194E−10	6.429E+03	2.5278E+01	1.061E−09	1.098E+04
$1s\,5d\ ^3D_1$	$1s\,6s\ ^1S_0$	2.7078E+01	1.807E−12	1.644E+01	2.7009E+01	1.992E−12	1.806E+01
$1s\,6s\ ^3S_1$	$1s\,6s\ ^1S_0$	4.7691E+03	7.013E−09	2.057E+00	5.5745E+03	5.830E−09	1.240E+00
$1s\,2p\ ^3P^o_1$	$1s\,6p\ ^3P^o_0$	1.3809E+00	1.094E−08	3.828E+07	1.3753E+00	7.037E−09	2.460E+07
$1s\,2p\ ^1P^o_1$	$1s\,6p\ ^3P^o_0$	1.4493E+00	1.695E−07	5.381E+08	1.4434E+00	1.740E−07	5.525E+08
$1s\,3p\ ^3P^o_1$	$1s\,6p\ ^3P^o_0$	3.7140E+00	3.120E−09	1.509E+06	3.6994E+00	1.511E−09	7.306E+05
$1s\,3p\ ^1P^o_1$	$1s\,6p\ ^3P^o_0$	3.8591E+00	1.323E−07	5.925E+07	3.8440E+00	1.357E−07	6.077E+07
$1s\,4p\ ^3P^o_1$	$1s\,6p\ ^3P^o_0$	8.9674E+00	1.092E−09	9.058E+04	8.9341E+00	3.075E−10	2.548E+04
$1s\,4p\ ^1P^o_1$	$1s\,6p\ ^3P^o_0$	9.3228E+00	1.285E−07	9.865E+06	9.2885E+00	1.318E−07	1.010E+07
$1s\,5p\ ^3P^o_1$	$1s\,6p\ ^3P^o_0$	2.5573E+01	4.594E−10	4.685E+03			
$1s\,5p\ ^1P^o_1$	$1s\,6p\ ^3P^o_0$	2.7074E+01	1.828E−07	1.663E+06	2.7000E+01	1.870E−07	1.697E+06
$1s\,6p\ ^3P^o_1$	$1s\,6p\ ^3P^o_0$	6.9398E+04	6.942E−08	9.614E−02			
$1s\,2p\ ^3P^o_1$	$1s\,6p\ ^3P^o_2$	1.3788E+00	1.951E−07	1.369E+08	1.3731E+00	2.017E−07	1.415E+08
$1s\,2p\ ^3P^o_2$	$1s\,6p\ ^3P^o_2$	1.4410E+00	2.930E−07	1.883E+08	1.4350E+00	2.925E−07	1.878E+08
$1s\,2p\ ^1P^o_1$	$1s\,6p\ ^3P^o_2$	1.4469E+00	2.548E−08	1.624E+07	1.4409E+00	2.662E−08	1.696E+07
$1s\,3p\ ^3P^o_1$	$1s\,6p\ ^3P^o_2$	3.6983E+00	2.115E−07	2.063E+07	3.6831E+00	2.178E−07	2.123E+07
$1s\,3p\ ^3P^o_2$	$1s\,6p\ ^3P^o_2$	3.8304E+00	8.438E−08	7.672E+06	3.8145E+00	8.336E−08	7.578E+06
$1s\,3p\ ^1P^o_1$	$1s\,6p\ ^3P^o_2$	3.8422E+00	5.285E−09	4.776E+05	3.8264E+00	6.273E−09	5.667E+05
$1s\,4p\ ^3P^o_1$	$1s\,6p\ ^3P^o_2$	8.8767E+00	2.421E−07	4.098E+06	8.8397E+00	2.488E−07	4.212E+06
$1s\,4p\ ^3P^o_2$	$1s\,6p\ ^3P^o_2$	9.1968E+00	3.073E−08	4.846E+05	9.1583E+00	2.935E−08	4.630E+05
$1s\,4p\ ^1P^o_1$	$1s\,6p\ ^3P^o_2$	9.2248E+00	8.915E−10	1.398E+04	9.1865E+00	1.536E−09	2.408E+04
$1s\,4f\ ^3F^o_3$	$1s\,6p\ ^3P^o_2$	9.3286E+00	6.451E−14	9.889E−01			
$1s\,4f\ ^3F^o_2$	$1s\,6p\ ^3P^o_2$	9.3309E+00	3.163E−14	4.846E−01			
$1s\,4f\ ^1F^o_3$	$1s\,6p\ ^3P^o_2$	9.3838E+00	1.153E−14	1.747E−01			
$1s\,5p\ ^3P^o_1$	$1s\,6p\ ^3P^o_2$	2.4849E+01	3.725E−07	8.048E+05	2.4746E+01	3.819E−07	8.251E+05
$1s\,5p\ ^3P^o_2$	$1s\,6p\ ^3P^o_2$	2.6148E+01	1.229E−08	2.397E+04	2.6040E+01	1.110E−08	2.166E+04
$1s\,5p\ ^1P^o_1$	$1s\,6p\ ^3P^o_2$	2.6264E+01	4.017E−13	7.770E−01	2.6156E+01	1.763E−10	3.409E+02
$1s\,5f\ ^3F^o_3$	$1s\,6p\ ^3P^o_2$	2.6698E+01	1.051E−12	1.966E+00			
$1s\,5f\ ^3F^o_2$	$1s\,6p\ ^3P^o_2$	2.6707E+01	3.579E−13	6.695E−01			
$1s\,5f\ ^1F^o_3$	$1s\,6p\ ^3P^o_2$	2.6930E+01	4.012E−14	7.380E−02			
$1s\,6p\ ^3P^o_1$	$1s\,6p\ ^3P^o_2$	8.6654E+02	8.046E−06	1.429E+04	8.6410E+02	8.128E−06	1.440E+04
$1s\,2s\ ^3S_1$	$1s\,6d\ ^3D_2$	1.3669E+00	6.514E−09	4.651E+06	1.3610E+00	6.766E−09	4.831E+06
$1s\,3s\ ^3S_1$	$1s\,6d\ ^3D_2$	3.6741E+00	1.083E−09	1.070E+05	3.6587E+00	1.183E−09	1.169E+05
$1s\,3d\ ^3D_2$	$1s\,6d\ ^3D_2$	3.8391E+00	2.622E−08	2.373E+06	3.8228E+00	2.617E−08	2.369E+06
$1s\,3d\ ^3D_1$	$1s\,6d\ ^3D_2$	3.8409E+00	2.274E−09	2.057E+05	3.8245E+00	3.045E−09	2.753E+05
$1s\,3d\ ^3D_3$	$1s\,6d\ ^3D_2$	3.8827E+00	5.188E−08	4.591E+06	3.8661E+00	5.171E−08	4.576E+06
$1s\,3d\ ^1D_2$	$1s\,6d\ ^3D_2$	3.8844E+00	4.104E−09	3.629E+05	3.8678E+00	4.089E−09	3.615E+05
$1s\,4s\ ^3S_1$	$1s\,6d\ ^3D_2$	8.8160E+00	1.556E−10	2.671E+03	8.7783E+00	1.935E−10	3.322E+03
$1s\,4d\ ^3D_2$	$1s\,6d\ ^3D_2$	9.2136E+00	1.330E−08	2.090E+05	9.1745E+00	1.325E−08	2.082E+05
$1s\,4d\ ^3D_1$	$1s\,6d\ ^3D_2$	9.2178E+00	9.779E−10	1.535E+04	9.1786E+00	1.599E−09	2.511E+04
$1s\,4d\ ^3D_3$	$1s\,6d\ ^3D_2$	9.3198E+00	5.775E−08	8.870E+05	9.2799E+00	5.767E−08	8.859E+05
$1s\,4d\ ^1D_2$	$1s\,6d\ ^3D_2$	9.3242E+00	4.505E−09	6.913E+04	9.2843E+00	4.384E−09	6.727E+04
$1s\,5s\ ^3S_1$	$1s\,6d\ ^3D_2$	2.4585E+01	7.247E−12	1.600E+01	2.4475E+01	1.833E−11	4.048E+01
$1s\,5d\ ^3D_2$	$1s\,6d\ ^3D_2$	2.6190E+01	5.971E−09	1.161E+04	2.6077E+01	5.919E−09	1.151E+04
$1s\,5d\ ^3D_1$	$1s\,6d\ ^3D_2$	2.6207E+01	2.824E−10	5.485E+02	2.6094E+01	7.777E−10	1.510E+03
$1s\,5d\ ^3D_3$	$1s\,6d\ ^3D_2$	2.6631E+01	7.999E−08	1.505E+05	2.6515E+01	8.000E−08	1.505E+05
$1s\,5d\ ^1D_2$	$1s\,6d\ ^3D_2$	2.6650E+01	6.203E−09	1.165E+04	2.6534E+01	5.909E−09	1.110E+04
$1s\,5g\ ^3G_3$	$1s\,6d\ ^3D_2$	2.6869E+01	6.611E−17	1.222E−04			
$1s\,6s\ ^3S_1$	$1s\,6d\ ^3D_2$	6.9582E+02	6.652E−11	1.833E−01	6.7673E+02	4.523E−12	1.306E−02
$1s\,2p\ ^3P^o_1$	$1s\,6p\ ^1P^o_1$	1.3786E+00	3.538E−08	4.139E+07	1.3729E+00	3.559E−08	4.163E+07
$1s\,2p\ ^3P^o_0$	$1s\,6p\ ^1P^o_1$	1.3795E+00	7.258E−08	8.481E+07	1.3738E+00	7.541E−08	8.809E+07
$1s\,2p\ ^3P^o_2$	$1s\,6p\ ^1P^o_1$	1.4408E+00	4.726E−08	5.062E+07	1.4348E+00	4.441E−08	4.756E+07
$1s\,2p\ ^1P^o_1$	$1s\,6p\ ^1P^o_1$	1.4467E+00	1.592E−07	1.691E+08	1.4407E+00	1.576E−07	1.674E+08
$1s\,3p\ ^3P^o_1$	$1s\,6p\ ^1P^o_1$	3.6970E+00	4.301E−08	6.997E+06	3.6819E+00	4.116E−08	6.693E+06
$1s\,3p\ ^3P^o_0$	$1s\,6p\ ^1P^o_1$	3.6987E+00	8.169E−08	1.328E+07	3.6836E+00	8.426E−08	1.368E+07
$1s\,3p\ ^3P^o_2$	$1s\,6p\ ^1P^o_1$	3.8290E+00	1.541E−08	2.336E+06	3.8133E+00	1.521E−08	2.307E+06
$1s\,3p\ ^1P^o_1$	$1s\,6p\ ^1P^o_1$	3.8407E+00	4.522E−08	6.817E+06	3.8251E+00	4.434E−08	6.680E+06
$1s\,4p\ ^3P^o_1$	$1s\,6p\ ^1P^o_1$	8.8691E+00	5.110E−08	1.444E+06	8.8329E+00	4.835E−08	1.366E+06
$1s\,4p\ ^3P^o_0$	$1s\,6p\ ^1P^o_1$	8.8731E+00	9.506E−08	2.685E+06	8.8368E+00	9.774E−08	2.759E+06
$1s\,4p\ ^3P^o_2$	$1s\,6p\ ^1P^o_1$	9.1886E+00	6.437E−09	1.695E+05	9.1511E+00	7.060E−09	1.858E+05
$1s\,4p\ ^1P^o_1$	$1s\,6p\ ^1P^o_1$	9.2166E+00	1.567E−08	4.102E+05	9.1793E+00	1.527E−08	3.997E+05
$1s\,4f\ ^3F^o_2$	$1s\,6p\ ^1P^o_1$	9.3225E+00	8.951E−14	2.290E+00			
$1s\,5p\ ^3P^o_1$	$1s\,6p\ ^1P^o_1$	2.4789E+01	7.996E−08	2.893E+05	2.4694E+01	7.555E−08	2.731E+05
$1s\,5p\ ^3P^o_0$	$1s\,6p\ ^1P^o_1$	2.4805E+01	1.475E−07	5.332E+05	2.4708E+01	1.515E−07	5.473E+05
$1s\,5p\ ^3P^o_2$	$1s\,6p\ ^1P^o_1$	2.6083E+01	3.633E−09	1.187E+04	2.5981E+01	4.572E−09	1.493E+04
$1s\,5p\ ^1P^o_1$	$1s\,6p\ ^1P^o_1$	2.6197E+01	5.654E−09	1.832E+04	2.6097E+01	5.441E−09	1.761E+04
$1s\,5f\ ^3F^o_2$	$1s\,6p\ ^1P^o_1$	2.6638E+01	9.179E−13	2.876E+00			

(*continued on next page*)

Table 5 (*continued*)

Lower	Upper	GRASP2K			FAC		
		λ (Å)	*gf*	A (s^{-1})	λ (Å)	*gf*	A (s^{-1})
$1s\,6p\ ^3P^o_1$	$1s\,6p\ ^1P^o_1$	7.9973E+02	1.620E−06	5.631E+03	8.0416E+02	1.584E−06	5.402E+03
$1s\,6p\ ^3P^o_0$	$1s\,6p\ ^1P^o_1$	8.0906E+02	3.000E−06	1.019E+04	7.8043E+02	3.001E−06	1.086E+04
$1s\,6p\ ^3P^o_2$	$1s\,6p\ ^1P^o_1$	1.0374E+04	2.022E−07	4.177E+00	1.1592E+04	1.745E−07	2.864E+00
$1s^2\ ^1S_0$	$1s\,6d\ ^3D_1$	3.1620E−01	1.772E−08	3.939E+08	3.1497E−01	1.829E−08	4.066E+08
$1s\,2s\ ^3S_1$	$1s\,6d\ ^3D_1$	1.3668E+00	1.773E−09	2.110E+06	1.3611E+00	1.353E−09	1.610E+06
$1s\,2s\ ^1S_0$	$1s\,6d\ ^3D_1$	1.3798E+00	2.691E−09	3.142E+06	1.3741E+00	2.709E−09	3.163E+06
$1s\,3s\ ^3S_1$	$1s\,6d\ ^3D_1$	3.6740E+00	3.764E−10	6.199E+04	3.6587E+00	2.428E−10	3.998E+04
$1s\,3s\ ^1S_0$	$1s\,6d\ ^3D_1$	3.6986E+00	4.789E−10	7.785E+04	3.6835E+00	4.807E−10	7.811E+04
$1s\,3d\ ^3D_2$	$1s\,6d\ ^3D_1$	3.8389E+00	3.667E−09	5.532E+05	3.8228E+00	2.842E−09	4.287E+05
$1s\,3d\ ^3D_1$	$1s\,6d\ ^3D_1$	3.8407E+00	1.459E−08	2.199E+06	3.8246E+00	1.456E−08	2.194E+06
$1s\,3d\ ^1D_2$	$1s\,6d\ ^3D_1$	3.8842E+00	3.313E−08	4.882E+06	3.8678E+00	3.359E−08	4.950E+06
$1s\,4s\ ^3S_1$	$1s\,6d\ ^3D_1$	8.8149E+00	9.426E−11	2.697E+03	8.7785E+00	4.075E−11	1.165E+03
$1s\,4s\ ^1S_0$	$1s\,6d\ ^3D_1$	8.8722E+00	8.005E−11	2.261E+03	8.8361E+00	7.985E−11	2.254E+03
$1s\,4d\ ^3D_2$	$1s\,6d\ ^3D_1$	9.2124E+00	2.076E−09	5.438E+04	9.1748E+00	1.393E−09	3.648E+04
$1s\,4d\ ^3D_1$	$1s\,6d\ ^3D_1$	9.2166E+00	7.395E−09	1.936E+05	9.1789E+00	7.377E−09	1.930E+05
$1s\,4d\ ^1D_2$	$1s\,6d\ ^3D_1$	9.3230E+00	3.684E−08	9.425E+05	9.2846E+00	3.736E−08	9.555E+05
$1s\,5s\ ^3S_1$	$1s\,6d\ ^3D_1$	2.4577E+01	3.235E−11	1.191E+02			
$1s\,5s\ ^1S_0$	$1s\,6d\ ^3D_1$	2.4800E+01	7.939E−12	2.870E+01	2.4701E+01	8.057E−12	2.911E+01
$1s\,5d\ ^3D_2$	$1s\,6d\ ^3D_1$	2.6180E+01	1.194E−09	3.875E+03	2.6079E+01	5.867E−10	1.901E+03
$1s\,5d\ ^3D_1$	$1s\,6d\ ^3D_1$	2.6197E+01	3.318E−09	1.075E+04	2.6096E+01	3.305E−09	1.069E+04
$1s\,5d\ ^1D_2$	$1s\,6d\ ^3D_1$	2.6640E+01	5.090E−08	1.595E+05	2.6536E+01	5.164E−08	1.616E+05
$1s\,6s\ ^3S_1$	$1s\,6d\ ^3D_1$	6.8911E+02	1.701E−10	7.963E−01	6.7829E+02	9.027E−13	4.325E−03
$1s\,6s\ ^1S_0$	$1s\,6d\ ^3D_1$	8.0550E+02	2.477E−12	8.489E−03	7.7225E+02	1.588E−12	5.871E−03
$1s\,6d\ ^3D_2$	$1s\,6d\ ^3D_1$	7.1428E+04	1.286E−07	5.604E−02			
$1s\,3d\ ^3D_2$	$1s\,6d\ ^3D_3$	3.8337E+00	1.524E−08	9.880E+05	3.8174E+00	1.528E−08	9.910E+05
$1s\,3d\ ^3D_3$	$1s\,6d\ ^3D_3$	3.8772E+00	1.259E−07	7.984E+06	3.8607E+00	1.258E−07	7.977E+06
$1s\,3d\ ^1D_2$	$1s\,6d\ ^3D_3$	3.8789E+00	5.579E−09	3.533E+05	3.8624E+00	6.223E−09	3.941E+05
$1s\,4d\ ^3D_2$	$1s\,6d\ ^3D_3$	9.1827E+00	2.734E−08	3.090E+05	9.1440E+00	2.741E−08	3.097E+05
$1s\,4d\ ^3D_3$	$1s\,6d\ ^3D_3$	9.2881E+00	6.413E−08	7.083E+05	9.2486E+00	6.411E−08	7.081E+05
$1s\,4d\ ^1D_2$	$1s\,6d\ ^3D_3$	9.2925E+00	2.601E−09	2.870E+04	9.2530E+00	3.101E−09	3.422E+04
$1s\,5d\ ^3D_2$	$1s\,6d\ ^3D_3$	2.5941E+01	5.300E−08	7.505E+04	2.5832E+01	5.314E−08	7.524E+04
$1s\,5d\ ^3D_3$	$1s\,6d\ ^3D_3$	2.6374E+01	2.886E−08	3.954E+04	2.6261E+01	2.878E−08	3.944E+04
$1s\,5d\ ^1D_2$	$1s\,6d\ ^3D_3$	2.6393E+01	9.368E−10	1.281E+03	2.6280E+01	1.329E−09	1.818E+03
$1s\,5g\ ^3G_4$	$1s\,6d\ ^3D_3$	2.6602E+01	1.073E−13	1.445E−01			
$1s\,5g\ ^3G_3$	$1s\,6d\ ^3D_3$	2.6608E+01	3.697E−15	4.976E−03			
$1s\,5g\ ^1G_4$	$1s\,6d\ ^3D_3$	2.6739E+01	2.636E−18	3.513E−06			
$1s\,6d\ ^3D_2$	$1s\,6d\ ^3D_3$	2.7340E+03	4.169E−06	5.314E+02	2.7456E+03	4.164E−06	5.219E+02
$1s\,2p\ ^3P^o_2$	$1s\,6f\ ^3F^o_3$	1.4401E+00	1.195E−08	5.491E+06	1.4340E+00	1.080E−08	4.965E+06
$1s\,3p\ ^3P^o_2$	$1s\,6f\ ^3F^o_3$	3.8237E+00	9.083E−10	5.920E+04	3.8077E+00	9.348E−10	6.092E+04
$1s\,4p\ ^3P^o_2$	$1s\,6f\ ^3F^o_3$	9.1585E+00	7.725E−10	8.776E+03	9.1192E+00	7.636E−10	8.676E+03
$1s\,4f\ ^3F^o_3$	$1s\,6f\ ^3F^o_3$	9.2892E+00	1.742E−09	1.924E+04	9.2496E+00	2.338E−08	2.582E+05
$1s\,4f\ ^3F^o_2$	$1s\,6f\ ^3F^o_3$	9.2914E+00	6.431E−08	7.099E+05	9.2518E+00	1.172E−09	1.294E+04
$1s\,4f\ ^3F^o_4$	$1s\,6f\ ^3F^o_3$	9.3423E+00	1.585E−08	1.731E+05	9.3023E+00	1.577E−08	1.722E+05
$1s\,4f\ ^1F^o_3$	$1s\,6f\ ^3F^o_3$	9.3440E+00	5.753E−10	6.279E+03	9.3039E+00	6.071E−10	6.627E+03
$1s\,5p\ ^3P^o_2$	$1s\,6f\ ^3F^o_3$	2.5841E+01	2.188E−10	3.122E+02	2.5726E+01	2.180E−10	3.112E+02
$1s\,5f\ ^3F^o_3$	$1s\,6f\ ^3F^o_3$	2.6377E+01	2.923E−09	4.004E+03	2.6263E+01	1.627E−08	2.228E+04
$1s\,5f\ ^3F^o_2$	$1s\,6f\ ^3F^o_3$	2.6386E+01	5.326E−08	7.290E+04	2.6272E+01	8.180E−10	1.119E+03
$1s\,5f\ ^3F^o_4$	$1s\,6f\ ^3F^o_3$	2.6597E+01	2.772E−08	3.733E+04	2.6482E+01	2.755E−08	3.712E+04
$1s\,5f\ ^1F^o_3$	$1s\,6f\ ^3F^o_3$	2.6604E+01	1.038E−09	1.397E+03	2.6488E+01	1.044E−09	1.406E+03
$1s\,6p\ ^3P^o_2$	$1s\,6f\ ^3F^o_3$	2.1987E+03	5.085E−12	1.002E−03	2.1353E+03	1.018E−12	2.110E−04
$1s\,2p\ ^3P^o_1$	$1s\,6f\ ^3F^o_2$	1.3779E+00	1.521E−11	1.069E+04	1.3722E+00	8.594E−12	6.038E+03
$1s\,2p\ ^3P^o_2$	$1s\,6f\ ^3F^o_2$	1.4401E+00	7.687E−10	4.945E+05	1.4340E+00	7.719E−10	4.965E+05
$1s\,2p\ ^1P^o_1$	$1s\,6f\ ^3F^o_2$	1.4459E+00	7.214E−09	4.603E+06	1.4400E+00	7.095E−09	4.526E+06
$1s\,3p\ ^3P^o_1$	$1s\,6f\ ^3F^o_2$	3.6920E+00	2.140E−12	2.094E+02	3.6768E+00	9.298E−13	9.098E+01
$1s\,3p\ ^3P^o_2$	$1s\,6f\ ^3F^o_2$	3.8236E+00	8.615E−11	7.861E+03	3.8077E+00	6.677E−11	6.092E+03
$1s\,3p\ ^1P^o_1$	$1s\,6f\ ^3F^o_2$	3.8353E+00	6.057E−10	5.493E+04	3.8195E+00	5.957E−10	5.401E+04
$1s\,4p\ ^3P^o_1$	$1s\,6f\ ^3F^o_2$	8.8404E+00	1.764E−12	3.011E+01			
$1s\,4p\ ^3P^o_2$	$1s\,6f\ ^3F^o_2$	9.1578E+00	7.183E−11	1.143E+03	9.1192E+00	5.527E−11	8.792E+02
$1s\,4p\ ^1P^o_1$	$1s\,6f\ ^3F^o_2$	9.1856E+00	5.112E−10	8.083E+03	9.1472E+00	4.920E−10	7.779E+03
$1s\,4f\ ^3F^o_3$	$1s\,6f\ ^3F^o_2$	9.2886E+00	6.731E−08	1.041E+06	9.2496E+00	1.186E−09	1.833E+04
$1s\,4f\ ^3F^o_2$	$1s\,6f\ ^3F^o_2$	9.2908E+00	6.173E−08	9.540E+05	9.2518E+00	1.637E−08	2.530E+05
$1s\,4f\ ^1F^o_3$	$1s\,6f\ ^3F^o_2$	9.3433E+00	1.148E−08	1.754E+05	9.3039E+00	1.167E−08	1.783E+05
$1s\,5p\ ^3P^o_1$	$1s\,6f\ ^3F^o_2$	2.4566E+01	8.810E−13	1.948E+00			
$1s\,5p\ ^3P^o_2$	$1s\,6f\ ^3F^o_2$	2.5836E+01	2.337E−11	4.672E+01	2.5726E+01	1.599E−11	3.195E+01
$1s\,5p\ ^1P^o_1$	$1s\,6f\ ^3F^o_2$	2.5948E+01	1.502E−10	2.975E+02	2.5839E+01	1.421E−10	2.815E+02
$1s\,5f\ ^3F^o_3$	$1s\,6f\ ^3F^o_2$	2.6372E+01	5.803E−08	1.113E+05	2.6263E+01	8.311E−10	1.593E+03
$1s\,5f\ ^3F^o_2$	$1s\,6f\ ^3F^o_2$	2.6381E+01	4.801E−08	9.203E+04	2.6272E+01	1.140E−08	2.184E+04
$1s\,5f\ ^1F^o_3$	$1s\,6f\ ^3F^o_2$	2.6599E+01	2.011E−08	3.793E+04	2.6489E+01	2.040E−08	3.845E+04
$1s\,6p\ ^3P^o_1$	$1s\,6f\ ^3F^o_2$	6.1864E+02	2.732E−12	9.524E−03	6.1520E+02	4.924E−15	1.721E−05
$1s\,6p\ ^3P^o_2$	$1s\,6f\ ^3F^o_2$	2.1625E+03	7.609E−12	2.171E−03	2.1357E+03	7.272E−14	2.109E−05
$1s\,6p\ ^1P^o_1$	$1s\,6f\ ^3F^o_2$	2.7321E+03	7.961E−14	1.423E−05	2.6181E+03	5.329E−13	1.028E−04

(*continued on next page*)

Table 5 (*continued*)

Lower	Upper	GRASP2K			FAC		
		λ (Å)	*gf*	A (s^{-1})	λ (Å)	*gf*	A (s^{-1})
$1s\,6f\ ^3F^o_3$	$1s\,6f\ ^3F^o_2$	1.3144E+05	9.863E−08	7.617E−03			
$1s\,2s\ ^3S_1$	$1s\,6d\ ^1D_2$	1.3661E+00	5.469E−12	3.909E+03	1.3604E+00	9.449E−13	6.754E+02
$1s\,3s\ ^3S_1$	$1s\,6d\ ^1D_2$	3.6690E+00	3.296E−12	3.266E+02			
$1s\,3d\ ^3D_2$	$1s\,6d\ ^1D_2$	3.8335E+00	1.210E−09	1.098E+05	3.8174E+00	1.142E−09	1.037E+05
$1s\,3d\ ^3D_1$	$1s\,6d\ ^1D_2$	3.8353E+00	9.479E−09	8.597E+05	3.8191E+00	9.644E−09	8.746E+05
$1s\,3d\ ^3D_3$	$1s\,6d\ ^1D_2$	3.8770E+00	7.265E−09	6.447E+05	3.8606E+00	6.726E−09	5.969E+05
$1s\,3d\ ^1D_2$	$1s\,6d\ ^1D_2$	3.8787E+00	8.796E−08	7.800E+06	3.8623E+00	8.773E−08	7.779E+06
$1s\,4s\ ^3S_1$	$1s\,6d\ ^1D_2$	8.7865E+00	2.542E−12	4.392E+01			
$1s\,4d\ ^3D_2$	$1s\,6d\ ^1D_2$	9.1814E+00	2.104E−09	3.330E+04	9.1435E+00	1.965E−09	3.109E+04
$1s\,4d\ ^3D_1$	$1s\,6d\ ^1D_2$	9.1855E+00	1.712E−08	2.707E+05	9.1476E+00	1.742E−08	2.753E+05
$1s\,4d\ ^3D_3$	$1s\,6d\ ^1D_2$	9.2868E+00	3.981E−09	6.158E+04	9.2482E+00	3.535E−09	5.468E+04
$1s\,4d\ ^1D_2$	$1s\,6d\ ^1D_2$	9.2911E+00	4.489E−08	6.938E+05	9.2526E+00	4.466E−08	6.900E+05
$1s\,5s\ ^3S_1$	$1s\,6d\ ^1D_2$	2.4357E+01	3.021E−12	6.793E+00			
$1s\,5d\ ^3D_2$	$1s\,6d\ ^1D_2$	2.5931E+01	4.067E−09	8.068E+03	2.5828E+01	3.787E−09	7.509E+03
$1s\,5d\ ^3D_1$	$1s\,6d\ ^1D_2$	2.5947E+01	3.338E−08	6.614E+04	2.5844E+01	3.395E−08	6.723E+04
$1s\,5d\ ^3D_3$	$1s\,6d\ ^1D_2$	2.6363E+01	2.106E−09	4.043E+03	2.6257E+01	1.705E−09	3.271E+03
$1s\,5d\ ^1D_2$	$1s\,6d\ ^1D_2$	2.6382E+01	2.022E−08	3.875E+04	2.6276E+01	2.001E−08	3.834E+04
$1s\,5g\ ^3G_3$	$1s\,6d\ ^1D_2$	2.6597E+01	7.626E−14	1.438E−01			
$1s\,6s\ ^3S_1$	$1s\,6d\ ^1D_2$	5.4990E+02	3.558E−11	1.570E−01			
$1s\,6d\ ^3D_2$	$1s\,6d\ ^1D_2$	2.6222E+03	3.081E−07	5.978E+01	2.7042E+03	2.977E−07	5.385E+01
$1s\,6d\ ^3D_1$	$1s\,6d\ ^1D_2$	2.7221E+03	2.629E−06	4.733E+02	2.6795E+03	2.626E−06	4.838E+02
$1s\,6d\ ^3D_3$	$1s\,6d\ ^1D_2$	6.4120E+04	8.705E−08	2.825E−02			
$1s\,4f\ ^3F^o_3$	$1s\,6f\ ^3F^o_4$	9.2736E+00	3.992E−09	3.440E+04	9.2341E+00	3.977E−09	3.427E+04
$1s\,4f\ ^3F^o_4$	$1s\,6f\ ^3F^o_4$	9.3265E+00	6.690E−08	5.701E+05	9.2866E+00	7.168E−08	6.107E+05
$1s\,4f\ ^1F^o_3$	$1s\,6f\ ^3F^o_4$	9.3281E+00	2.991E−09	2.548E+04	9.2883E+00	2.060E−09	1.755E+04
$1s\,5f\ ^3F^o_3$	$1s\,6f\ ^3F^o_4$	2.6252E+01	1.288E−08	1.385E+04	2.6139E+01	1.283E−08	1.380E+04
$1s\,5f\ ^3F^o_4$	$1s\,6f\ ^3F^o_4$	2.6469E+01	4.726E−08	4.999E+04	2.6355E+01	4.994E−08	5.283E+04
$1s\,5f\ ^1F^o_3$	$1s\,6f\ ^3F^o_4$	2.6476E+01	1.811E−09	1.915E+03	2.6362E+01	1.444E−09	1.527E+03
$1s\,6f\ ^3F^o_3$	$1s\,6f\ ^3F^o_4$	5.5078E+03	2.817E−06	6.883E+01	5.5226E+03	2.808E−06	6.766E+01
$1s\,3d\ ^3D_3$	$1s\,6g\ ^3G_4$	3.8744E+00	5.198E−09	2.567E+05	3.8580E+00	5.256E−09	2.595E+05
$1s\,4d\ ^3D_3$	$1s\,6g\ ^3G_4$	9.2719E+00	2.896E−10	2.497E+03	9.2332E+00	2.894E−10	2.494E+03
$1s\,5d\ ^3D_3$	$1s\,6g\ ^3G_4$	2.6244E+01	5.638E−10	6.067E+02	2.6137E+01	5.631E−10	6.057E+02
$1s\,5g\ ^3G_4$	$1s\,6g\ ^3G_4$	2.6470E+01	2.319E−08	2.453E+04	2.6356E+01	2.313E−08	2.447E+04
$1s\,5g\ ^3G_3$	$1s\,6g\ ^3G_4$	2.6475E+01	5.258E−10	5.560E+02	2.6361E+01	6.612E−10	6.992E+02
$1s\,5g\ ^3G_5$	$1s\,6g\ ^3G_4$	2.6601E+01	1.013E−08	1.061E+04	2.6487E+01	1.007E−08	1.054E+04
$1s\,5g\ ^1G_4$	$1s\,6g\ ^3G_4$	2.6605E+01	2.379E−10	2.491E+02	2.6491E+01	2.376E−10	2.489E+02
$1s\,6d\ ^3D_3$	$1s\,6g\ ^3G_4$	5.3075E+03	2.734E−13	7.194E−06	5.5194E+03	2.107E−13	5.082E−06
$1s\,3d\ ^3D_2$	$1s\,6g\ ^3G_3$	3.8309E+00	3.305E−13	2.146E+01			
$1s\,3d\ ^3D_3$	$1s\,6g\ ^3G_3$	3.8743E+00	2.294E−10	1.456E+04	3.8580E+00	1.946E−10	1.235E+04
$1s\,3d\ ^1D_2$	$1s\,6g\ ^3G_3$	3.8760E+00	3.937E−09	2.497E+05	3.8597E+00	3.902E−09	2.474E+05
$1s\,4d\ ^3D_2$	$1s\,6g\ ^3G_3$	9.1665E+00	1.291E−14	1.464E−01			
$1s\,4d\ ^3D_3$	$1s\,6g\ ^3G_3$	9.2715E+00	1.119E−11	1.241E+02	9.2332E+00	1.071E−11	1.187E+02
$1s\,4d\ ^1D_2$	$1s\,6g\ ^3G_3$	9.2759E+00	2.148E−10	2.379E+03	9.2375E+00	2.140E−10	2.370E+03
$1s\,5d\ ^3D_2$	$1s\,6g\ ^3G_3$	2.5812E+01	5.221E−14	7.467E−02			
$1s\,5d\ ^3D_3$	$1s\,6g\ ^3G_3$	2.6241E+01	2.382E−11	3.297E+01	2.6137E+01	2.088E−11	2.888E+01
$1s\,5d\ ^1D_2$	$1s\,6g\ ^3G_3$	2.6259E+01	4.243E−10	5.863E+02	2.6155E+01	4.177E−10	5.769E+02
$1s\,5g\ ^3G_4$	$1s\,6g\ ^3G_3$	2.6467E+01	8.195E−10	1.115E+03	2.6356E+01	6.700E−10	9.112E+02
$1s\,5g\ ^3G_3$	$1s\,6g\ ^3G_3$	2.6472E+01	1.789E−08	2.432E+04	2.6361E+01	1.785E−08	2.427E+04
$1s\,5g\ ^1G_4$	$1s\,6g\ ^3G_3$	2.6602E+01	7.974E−09	1.074E+04	2.6491E+01	8.002E−09	1.077E+04
$1s\,6d\ ^3D_2$	$1s\,6g\ ^3G_3$	1.7904E+03	5.103E−15	1.517E−06	1.8335E+03	6.550E−17	1.841E−08
$1s\,6d\ ^3D_3$	$1s\,6g\ ^3G_3$	5.1873E+03	1.899E−15	6.726E−08	5.5194E+03	7.803E−15	2.420E−07
$1s\,6d\ ^1D_2$	$1s\,6g\ ^3G_3$	5.6439E+03	1.309E−13	3.915E−06	5.6946E+03	1.512E−13	4.406E−06
$1s\,6g\ ^3G_4$	$1s\,6g\ ^3G_3$	2.2908E+05	6.999E−08	1.271E−03			
$1s\,2p\ ^3P^o_2$	$1s\,6f\ ^1F^o_3$	1.4397E+00	7.159E−13	3.291E+02	1.4336E+00	3.610E−15	1.659E+00
$1s\,3p\ ^3P^o_2$	$1s\,6f\ ^1F^o_3$	3.8210E+00	4.243E−14	2.769E+00	3.8051E+00	3.132E−16	2.044E−02
$1s\,4p\ ^3P^o_2$	$1s\,6f\ ^1F^o_3$	9.1428E+00	9.110E−14	1.038E+00			
$1s\,4f\ ^3F^o_3$	$1s\,6f\ ^1F^o_3$	9.2731E+00	1.854E−10	2.055E+03	9.2341E+00	1.626E−10	1.802E+03
$1s\,4f\ ^3F^o_2$	$1s\,6f\ ^1F^o_3$	9.2753E+00	2.969E−09	3.289E+04	9.2363E+00	2.951E−09	3.269E+04
$1s\,4f\ ^3F^o_4$	$1s\,6f\ ^1F^o_3$	9.3260E+00	3.495E−09	3.829E+04	9.2866E+00	2.054E−09	2.250E+04
$1s\,4f\ ^1F^o_3$	$1s\,6f\ ^1F^o_3$	9.3276E+00	5.878E−08	6.437E+05	9.2883E+00	5.528E−08	6.054E+05
$1s\,5p\ ^3P^o_2$	$1s\,6f\ ^1F^o_3$	2.5717E+01	9.470E−14	1.365E−01			
$1s\,5f\ ^3F^o_3$	$1s\,6f\ ^1F^o_3$	2.6248E+01	5.478E−10	7.577E+02	2.6139E+01	4.968E−10	6.870E+02
$1s\,5f\ ^3F^o_2$	$1s\,6f\ ^1F^o_3$	2.6257E+01	9.502E−09	1.313E+04	2.6148E+01	9.514E−09	1.314E+04
$1s\,5f\ ^3F^o_4$	$1s\,6f\ ^1F^o_3$	2.6465E+01	2.429E−09	3.305E+03	2.6355E+01	1.434E−09	1.950E+03
$1s\,5f\ ^1F^o_3$	$1s\,6f\ ^1F^o_3$	2.6472E+01	4.062E−08	5.523E+04	2.6362E+01	3.850E−08	5.234E+04
$1s\,6p\ ^3P^o_2$	$1s\,6f\ ^1F^o_3$	1.5574E+03	1.960E−12	7.699E−04			
$1s\,6f\ ^3F^o_3$	$1s\,6f\ ^1F^o_3$	5.3394E+03	1.078E−07	3.603E+00	5.5188E+03	1.040E−07	3.227E+00
$1s\,6f\ ^3F^o_2$	$1s\,6f\ ^1F^o_3$	5.5655E+03	2.080E−06	6.399E+01	5.5161E+03	2.078E−06	6.453E+01
$1s\,6f\ ^3F^o_4$	$1s\,6f\ ^1F^o_3$	1.7466E+05	5.173E−08	1.616E−03			
$1s\,5g\ ^3G_4$	$1s\,6g\ ^3G_5$	2.6394E+01	3.048E−09	2.653E+03	2.6281E+01	3.041E−09	2.647E+03
$1s\,5g\ ^3G_5$	$1s\,6g\ ^3G_5$	2.6525E+01	5.550E−08	4.783E+04	2.6411E+01	5.531E−08	4.767E+04

(*continued on next page*)

Table 5 (*continued*)

Lower	Upper	GRASP2K			FAC		
		λ (Å)	*gf*	A (s^{-1})	λ (Å)	*gf*	A (s^{-1})
$1s\,5g\ ^1G_4$	$1s\,6g\ ^3G_5$	2.6529E+01	9.023E−10	7.774E+02	2.6415E+01	1.031E−09	8.883E+02
$1s\,6g\ ^3G_4$	$1s\,6g\ ^3G_5$	9.2456E+03	2.127E−06	1.509E+01	9.2559E+03	2.122E−06	1.489E+01
$1s\,4f\ ^3F^o_4$	$1s\,6h\ ^3H^o_5$	9.3170E+00	2.422E−09	1.692E+04	9.2773E+00	2.373E−09	1.658E+04
$1s\,5f\ ^3F^o_4$	$1s\,6h\ ^3H^o_5$	2.6394E+01	7.696E−10	6.699E+02	2.6281E+01	7.530E−10	6.555E+02
$1s\,6f\ ^3F^o_4$	$1s\,6h\ ^3H^o_5$	9.2055E+03	4.621E−14	3.307E−07	9.2780E+03	4.284E−14	2.992E−07
$1s\,4f\ ^3F^o_3$	$1s\,6h\ ^3H^o_4$	9.2640E+00	8.889E−15	7.676E−02			
$1s\,4f\ ^3F^o_4$	$1s\,6h\ ^3H^o_4$	9.3168E+00	6.293E−11	5.373E+02	9.2773E+00	5.395E−11	4.606E+02
$1s\,4f\ ^1F^o_3$	$1s\,6h\ ^3H^o_4$	9.3184E+00	1.950E−09	1.664E+04	9.2790E+00	1.890E−09	1.613E+04
$1s\,5f\ ^3F^o_3$	$1s\,6h\ ^3H^o_4$	2.6175E+01	1.242E−15	1.343E−03			
$1s\,5f\ ^3F^o_4$	$1s\,6h\ ^3H^o_4$	2.6392E+01	2.026E−11	2.156E+01	2.6281E+01	1.711E−11	1.820E+01
$1s\,5f\ ^1F^o_3$	$1s\,6h\ ^3H^o_4$	2.6398E+01	6.215E−10	6.610E+02	2.6287E+01	5.992E−10	6.372E+02
$1s\,6f\ ^3F^o_3$	$1s\,6h\ ^3H^o_4$	3.4128E+03	1.701E−18	1.082E−10			
$1s\,6f\ ^3F^o_4$	$1s\,6h\ ^3H^o_4$	8.9725E+03	8.514E−16	7.838E−09	9.2780E+03	9.738E−16	8.313E−09
$1s\,6f\ ^1F^o_3$	$1s\,6h\ ^3H^o_4$	9.4584E+03	3.479E−14	2.882E−07	9.2889E+03	3.404E−14	2.899E−07
$1s\,6h\ ^3H^o_5$	$1s\,6h\ ^3H^o_4$	3.5443E+05	5.462E−08	3.222E−04			
$1s\,3d\ ^3D_3$	$1s\,6g\ ^1G_4$	3.8727E+00	9.494E−14	4.692E+00			
$1s\,4d\ ^3D_3$	$1s\,6g\ ^1G_4$	9.2623E+00	1.894E−17	1.636E−04			
$1s\,5d\ ^3D_3$	$1s\,6g\ ^1G_4$	2.6167E+01	4.856E−15	5.256E−03			
$1s\,5g\ ^3G_4$	$1s\,6g\ ^1G_4$	2.6392E+01	7.790E−11	8.290E+01	2.6281E+01	7.613E−11	8.100E+01
$1s\,5g\ ^3G_3$	$1s\,6g\ ^1G_4$	2.6397E+01	2.401E−09	2.553E+03	2.6286E+01	2.423E−09	2.577E+03
$1s\,5g\ ^3G_5$	$1s\,6g\ ^1G_4$	2.6522E+01	1.155E−09	1.217E+03	2.6411E+01	1.024E−09	1.079E+03
$1s\,5g\ ^1G_4$	$1s\,6g\ ^1G_4$	2.6527E+01	4.522E−08	4.763E+04	2.6415E+01	4.506E−08	4.745E+04
$1s\,6d\ ^3D_3$	$1s\,6g\ ^1G_4$	3.3331E+03	4.467E−15	2.980E−07			
$1s\,6g\ ^3G_4$	$1s\,6g\ ^1G_4$	8.9597E+03	4.990E−08	4.607E−01	9.2558E+03	4.823E−08	4.137E−01
$1s\,6g\ ^3G_3$	$1s\,6g\ ^1G_4$	9.3244E+03	1.689E−06	1.440E+01	9.2557E+03	1.688E−06	1.448E+01
$1s\,6g\ ^3G_5$	$1s\,6g\ ^1G_4$	2.8974E+05	4.257E−08	3.758E−04			
$1s\,6h\ ^3H^o_5$	$1s\,6h\ ^3H^o_6$	1.3919E+04	1.709E−06	4.525E+00	1.3932E+04	1.704E−06	4.466E+00
$1s\,4f\ ^3F^o_4$	$1s\,6h\ ^1H^o_5$	9.3106E+00	2.276E−14	1.592E−01			
$1s\,5f\ ^3F^o_4$	$1s\,6h\ ^1H^o_5$	2.6342E+01	3.217E−15	2.811E−03			
$1s\,6f\ ^3F^o_4$	$1s\,6h\ ^1H^o_5$	5.4702E+03	1.230E−18	2.493E−11			
$1s\,6h\ ^3H^o_5$	$1s\,6h\ ^1H^o_5$	1.3481E+04	2.713E−08	9.052E−02	1.3932E+04	2.621E−08	8.121E−02
$1s\,6h\ ^3H^o_4$	$1s\,6h\ ^1H^o_5$	1.4014E+04	1.418E−06	4.378E+00	1.3932E+04	1.415E−06	4.385E+00
$1s\,6h\ ^3H^o_6$	$1s\,6h\ ^1H^o_5$	4.2819E+05	3.644E−08	1.205E−04			
$1s^2\ ^1S_0$	$1s\,7s\ ^3S_1$	3.1410E−01	6.926E−07	1.561E+10	3.1278E−01	6.900E−07	1.554E+10
$1s\,2s\ ^3S_1$	$1s\,7s\ ^3S_1$	1.3268E+00	5.679E−08	7.173E+07	1.3212E+00	5.741E−08	7.251E+07
$1s\,2s\ ^1S_0$	$1s\,7s\ ^3S_1$	1.3390E+00	3.028E−08	3.755E+07	1.3335E+00	2.894E−08	3.588E+07
$1s\,3s\ ^3S_1$	$1s\,7s\ ^3S_1$	3.3983E+00	1.255E−08	2.417E+06	3.3842E+00	1.249E−08	2.405E+06
$1s\,3s\ ^1S_0$	$1s\,7s\ ^3S_1$	3.4193E+00	6.643E−09	1.263E+06	3.4054E+00	6.283E−09	1.194E+06
$1s\,3d\ ^3D_2$	$1s\,7s\ ^3S_1$	3.5389E+00	1.439E−13	2.554E+01			
$1s\,3d\ ^3D_1$	$1s\,7s\ ^3S_1$	3.5404E+00	4.644E−12	8.237E+02			
$1s\,3d\ ^1D_2$	$1s\,7s\ ^3S_1$	3.5774E+00	7.601E−13	1.321E+02			
$1s\,4s\ ^3S_1$	$1s\,7s\ ^3S_1$	7.3787E+00	4.062E−09	1.659E+05	7.3486E+00	4.055E−09	1.655E+05
$1s\,4s\ ^1S_0$	$1s\,7s\ ^3S_1$	7.4188E+00	2.370E−09	9.573E+04	7.3889E+00	2.038E−09	8.229E+04
$1s\,4d\ ^3D_2$	$1s\,7s\ ^3S_1$	7.6552E+00	5.626E−13	2.135E+01	7.6242E+00	2.363E−12	8.964E+01
$1s\,4d\ ^3D_1$	$1s\,7s\ ^3S_1$	7.6581E+00	6.580E−12	2.495E+02			
$1s\,4d\ ^1D_2$	$1s\,7s\ ^3S_1$	7.7314E+00	9.050E−13	3.366E+01			
$1s\,5s\ ^3S_1$	$1s\,7s\ ^3S_1$	1.5931E+01	1.585E−09	1.389E+04	1.5867E+01	1.594E−09	1.396E+04
$1s\,5s\ ^1S_0$	$1s\,7s\ ^3S_1$	1.6025E+01	1.087E−09	9.413E+03	1.5961E+01	8.018E−10	6.938E+03
$1s\,5d\ ^3D_2$	$1s\,7s\ ^3S_1$	1.6590E+01	5.370E−13	4.338E+00	1.6526E+01	2.554E−12	2.062E+01
$1s\,5d\ ^3D_1$	$1s\,7s\ ^3S_1$	1.6597E+01	8.216E−12	6.632E+01	1.6532E+01	6.071E−13	4.897E+00
$1s\,5d\ ^1D_2$	$1s\,7s\ ^3S_1$	1.6773E+01	1.120E−12	8.850E+00			
$1s\,6s\ ^3S_1$	$1s\,7s\ ^3S_1$	4.2495E+01	6.431E−10	7.918E+02	4.2299E+01	6.487E−10	7.993E+02
$1s\,6s\ ^1S_0$	$1s\,7s\ ^3S_1$	4.2877E+01	5.937E−10	7.180E+02	4.2623E+01	3.267E−10	3.965E+02
$1s\,6d\ ^3D_2$	$1s\,7s\ ^3S_1$	4.5259E+01	1.365E−13	1.482E−01	4.5119E+01	2.252E−12	2.439E+00
$1s\,6d\ ^3D_1$	$1s\,7s\ ^3S_1$	4.5288E+01	1.227E−11	1.330E+01	4.5112E+01	4.512E−13	4.887E−01
$1s\,6d\ ^1D_2$	$1s\,7s\ ^3S_1$	4.6054E+01	1.888E−12	1.980E+00			
$1s\,2p\ ^3P^o_1$	$1s\,7p\ ^3P^o_1$	1.3376E+00	1.508E−08	1.873E+07	1.3321E+00	1.333E−08	1.656E+07
$1s\,2p\ ^3P^o_0$	$1s\,7p\ ^3P^o_1$	1.3385E+00	4.191E−09	5.202E+06	1.3329E+00	8.068E−09	1.001E+07
$1s\,2p\ ^3P^o_2$	$1s\,7p\ ^3P^o_1$	1.3961E+00	2.546E−07	2.904E+08	1.3903E+00	2.530E−07	2.886E+08
$1s\,2p\ ^1P^o_1$	$1s\,7p\ ^3P^o_1$	1.4017E+00	5.769E−08	6.529E+07	1.3959E+00	5.678E−08	6.424E+07
$1s\,3p\ ^3P^o_1$	$1s\,7p\ ^3P^o_1$	3.4164E+00	5.090E−09	9.696E+05	3.4024E+00	3.619E−09	6.892E+05
$1s\,3p\ ^3P^o_0$	$1s\,7p\ ^3P^o_1$	3.4179E+00	9.304E−10	1.771E+05	3.4038E+00	2.752E−09	5.236E+05
$1s\,3p\ ^3P^o_2$	$1s\,7p\ ^3P^o_1$	3.5289E+00	1.888E−07	3.370E+07	3.5142E+00	1.914E−07	3.417E+07
$1s\,3p\ ^1P^o_1$	$1s\,7p\ ^3P^o_1$	3.5388E+00	4.200E−08	7.456E+06	3.5243E+00	4.122E−08	7.316E+06
$1s\,4p\ ^3P^o_1$	$1s\,7p\ ^3P^o_1$	7.4094E+00	2.361E−09	9.563E+04	7.3785E+00	1.251E−09	5.067E+04
$1s\,4p\ ^3P^o_0$	$1s\,7p\ ^3P^o_1$	7.4122E+00	1.525E−10	6.170E+03	7.3811E+00	1.273E−09	5.152E+04
$1s\,4p\ ^3P^o_2$	$1s\,7p\ ^3P^o_1$	7.6311E+00	1.667E−07	6.363E+06	7.5991E+00	1.690E−07	6.451E+06
$1s\,4p\ ^1P^o_1$	$1s\,7p\ ^3P^o_1$	7.6504E+00	3.684E−08	1.400E+06	7.6186E+00	3.546E−08	1.347E+06
$1s\,4f\ ^3F^o_2$	$1s\,7p\ ^3P^o_1$	7.7232E+00	3.851E−14	1.436E+00			
$1s\,5p\ ^3P^o_1$	$1s\,7p\ ^3P^o_1$	1.5987E+01	1.514E−09	1.317E+04	1.5920E+01	4.931E−10	4.289E+03
$1s\,5p\ ^3P^o_0$	$1s\,7p\ ^3P^o_1$	1.5993E+01	6.465E−13	5.620E+00	1.5926E+01	7.581E−10	6.589E+03

(*continued on next page*)

Table 5 (*continued*)

Lower	Upper	GRASP2K			FAC		
		λ (Å)	*gf*	A (s^{-1})	λ (Å)	*gf*	A (s^{-1})
$1s\,5p\ ^3P^o_2$	$1s\,7p\ ^3P^o_1$	1.6515E+01	1.788E−07	1.458E+06	1.6446E+01	1.815E−07	1.480E+06
$1s\,5p\ ^1P^o_1$	$1s\,7p\ ^3P^o_1$	1.6561E+01	3.921E−08	3.179E+05	1.6492E+01	3.741E−08	3.033E+05
$1s\,5f\ ^3F^o_2$	$1s\,7p\ ^3P^o_1$	1.6736E+01	7.663E−14	6.083E−01			
$1s\,6p\ ^3P^o_1$	$1s\,7p\ ^3P^o_1$	4.2622E+01	1.096E−09	1.342E+03	4.2444E+01	2.699E−10	3.304E+02
$1s\,6p\ ^3P^o_0$	$1s\,7p\ ^3P^o_1$	4.2648E+01	5.644E−11	6.899E+01	4.2376E+01	6.084E−10	7.470E+02
$1s\,6p\ ^3P^o_2$	$1s\,7p\ ^3P^o_1$	4.4826E+01	2.721E−07	3.011E+05	4.4636E+01	2.777E−07	3.073E+05
$1s\,6p\ ^1P^o_1$	$1s\,7p\ ^3P^o_1$	4.5021E+01	5.950E−08	6.527E+04	4.4809E+01	5.628E−08	6.180E+04
$1s\,6f\ ^3F^o_2$	$1s\,7p\ ^3P^o_1$	4.5775E+01	1.568E−13	1.663E−01			
$1s\,2s\ ^3S_1$	$1s\,7s\ ^1S_0$	1.3266E+00	2.842E−08	1.077E+08	1.3210E+00	2.870E−08	1.087E+08
$1s\,3s\ ^3S_1$	$1s\,7s\ ^1S_0$	3.3968E+00	5.855E−09	3.385E+06	3.3830E+00	6.245E−09	3.609E+06
$1s\,3d\ ^3D_1$	$1s\,7s\ ^1S_0$	3.5388E+00	6.161E−13	3.281E+02			
$1s\,4s\ ^3S_1$	$1s\,7s\ ^1S_0$	7.3716E+00	1.719E−09	2.110E+05	7.3425E+00	2.026E−09	2.485E+05
$1s\,4d\ ^3D_1$	$1s\,7s\ ^1S_0$	7.6504E+00	8.796E−13	1.002E+02	7.6206E+00	8.205E−13	9.344E+01
$1s\,5s\ ^3S_1$	$1s\,7s\ ^1S_0$	1.5898E+01	5.646E−10	1.490E+04	1.5839E+01	7.961E−10	2.098E+04
$1s\,5d\ ^3D_1$	$1s\,7s\ ^1S_0$	1.6561E+01	9.135E−13	2.222E+01	1.6502E+01	9.451E−13	2.295E+01
$1s\,6s\ ^3S_1$	$1s\,7s\ ^1S_0$	4.2259E+01	1.431E−10	5.345E+02	4.2100E+01	3.228E−10	1.204E+03
$1s\,6d\ ^3D_1$	$1s\,7s\ ^1S_0$	4.5020E+01	8.016E−13	2.638E+00	4.4886E+01	9.411E−13	3.089E+00
$1s\,7s\ ^3S_1$	$1s\,7s\ ^1S_0$	7.6139E+03	4.456E−09	5.128E−01	8.9405E+03	3.689E−09	3.052E−01
$1s\,2p\ ^3P^o_1$	$1s\,7p\ ^3P^o_0$	1.3376E+00	5.365E−09	2.000E+07	1.3321E+00	4.432E−09	1.652E+07
$1s\,2p\ ^1P^o_1$	$1s\,7p\ ^3P^o_0$	1.4016E+00	1.035E−07	3.514E+08	1.3959E+00	1.057E−07	3.589E+08
$1s\,3p\ ^3P^o_1$	$1s\,7p\ ^3P^o_0$	3.4163E+00	1.518E−09	8.674E+05	3.4026E+00	9.937E−10	5.676E+05
$1s\,3p\ ^1P^o_1$	$1s\,7p\ ^3P^o_0$	3.5387E+00	7.620E−08	4.059E+07	3.5246E+00	7.860E−08	4.184E+07
$1s\,4p\ ^3P^o_1$	$1s\,7p\ ^3P^o_0$	7.4089E+00	4.150E−10	5.042E+04	7.3797E+00	2.397E−10	2.912E+04
$1s\,4p\ ^1P^o_1$	$1s\,7p\ ^3P^o_0$	7.6499E+00	6.694E−08	7.630E+06	7.6199E+00	6.869E−08	7.824E+06
$1s\,5p\ ^3P^o_1$	$1s\,7p\ ^3P^o_0$	1.5984E+01	8.383E−11	2.189E+03	1.5926E+01	3.891E−11	1.014E+03
$1s\,5p\ ^1P^o_1$	$1s\,7p\ ^3P^o_0$	1.6558E+01	7.163E−08	1.743E+06	1.6498E+01	7.327E−08	1.780E+06
$1s\,6p\ ^3P^o_1$	$1s\,7p\ ^3P^o_0$	4.2605E+01	7.779E−12	2.859E+01	4.2486E+01	2.961E−11	1.085E+02
$1s\,6p\ ^1P^o_1$	$1s\,7p\ ^3P^o_0$	4.5003E+01	1.090E−07	3.590E+05	4.4856E+01	1.112E−07	3.657E+05
$1s\,7p\ ^3P^o_1$	$1s\,7p\ ^3P^o_0$	1.1050E+05	4.339E−08	2.370E−02			
$1s\,2p\ ^3P^o_1$	$1s\,7p\ ^3P^o_2$	1.3363E+00	1.183E−07	8.840E+07	1.3308E+00	1.215E−07	9.078E+07
$1s\,2p\ ^3P^o_2$	$1s\,7p\ ^3P^o_2$	1.3947E+00	1.912E−07	1.311E+08	1.3889E+00	1.835E−07	1.258E+08
$1s\,2p\ ^1P^o_1$	$1s\,7p\ ^3P^o_2$	1.4002E+00	1.400E−08	9.523E+06	1.3944E+00	1.676E−08	1.140E+07
$1s\,3p\ ^3P^o_1$	$1s\,7p\ ^3P^o_2$	3.4080E+00	1.229E−07	1.412E+07	3.3940E+00	1.242E−07	1.427E+07
$1s\,3p\ ^3P^o_2$	$1s\,7p\ ^3P^o_2$	3.5199E+00	5.498E−08	5.921E+06	3.5053E+00	5.309E−08	5.715E+06
$1s\,3p\ ^1P^o_1$	$1s\,7p\ ^3P^o_2$	3.5298E+00	2.478E−09	2.654E+05	3.5153E+00	4.084E−09	4.372E+05
$1s\,4p\ ^3P^o_1$	$1s\,7p\ ^3P^o_2$	7.3699E+00	1.253E−07	3.077E+06	7.3391E+00	1.273E−07	3.128E+06
$1s\,4p\ ^3P^o_2$	$1s\,7p\ ^3P^o_2$	7.5892E+00	2.251E−08	5.215E+05	7.5574E+00	1.936E−08	4.484E+05
$1s\,4p\ ^1P^o_1$	$1s\,7p\ ^3P^o_2$	7.6083E+00	2.879E−10	6.635E+03	7.5766E+00	1.124E−09	2.590E+04
$1s\,4f\ ^3F^o_3$	$1s\,7p\ ^3P^o_2$	7.6787E+00	4.986E−18	1.128E−04			
$1s\,4f\ ^3F^o_2$	$1s\,7p\ ^3P^o_2$	7.6803E+00	4.502E−16	1.018E−02			
$1s\,4f\ ^1F^o_3$	$1s\,7p\ ^3P^o_2$	7.7161E+00	5.132E−15	1.150E−01			
$1s\,5p\ ^3P^o_1$	$1s\,7p\ ^3P^o_2$	1.5804E+01	1.465E−07	7.824E+05	1.5738E+01	1.489E−07	7.952E+05
$1s\,5p\ ^3P^o_2$	$1s\,7p\ ^3P^o_2$	1.6320E+01	1.116E−08	5.589E+04	1.6251E+01	8.133E−09	4.073E+04
$1s\,5p\ ^1P^o_1$	$1s\,7p\ ^3P^o_2$	1.6364E+01	2.116E−11	1.054E+02	1.6297E+01	2.649E−10	1.319E+03
$1s\,5f\ ^3F^o_3$	$1s\,7p\ ^3P^o_2$	1.6532E+01	1.343E−13	6.555E−01			
$1s\,5f\ ^3F^o_2$	$1s\,7p\ ^3P^o_2$	1.6535E+01	4.833E−14	2.358E−01			
$1s\,5f\ ^1F^o_3$	$1s\,7p\ ^3P^o_2$	1.6621E+01	1.386E−14	6.691E−02			
$1s\,6p\ ^3P^o_1$	$1s\,7p\ ^3P^o_2$	4.1345E+01	2.311E−07	1.803E+05	4.1174E+01	2.351E−07	1.834E+05
$1s\,6p\ ^3P^o_2$	$1s\,7p\ ^3P^o_2$	4.3416E+01	5.959E−09	4.217E+03	4.3234E+01	3.466E−09	2.452E+03
$1s\,6p\ ^1P^o_1$	$1s\,7p\ ^3P^o_2$	4.3599E+01	5.062E−10	3.553E+02			
$1s\,6f\ ^3F^o_3$	$1s\,7p\ ^3P^o_2$	4.4291E+01	5.946E−13	4.044E−01			
$1s\,6f\ ^3F^o_2$	$1s\,7p\ ^3P^o_2$	4.4306E+01	2.356E−13	1.601E−01			
$1s\,6f\ ^1F^o_3$	$1s\,7p\ ^3P^o_2$	4.4661E+01	3.239E−14	2.166E−02			
$1s\,7p\ ^3P^o_1$	$1s\,7p\ ^3P^o_2$	1.3800E+03	5.054E−06	3.541E+03	1.3760E+03	5.105E−06	3.566E+03
$1s\,2s\ ^3S_1$	$1s\,7d\ ^3D_2$	1.3252E+00	3.914E−09	2.974E+06	1.3196E+00	4.084E−09	3.102E+06
$1s\,3s\ ^3S_1$	$1s\,7d\ ^3D_2$	3.3879E+00	7.078E−10	8.227E+04	3.3736E+00	7.633E−10	8.872E+04
$1s\,3d\ ^3D_2$	$1s\,7d\ ^3D_2$	3.5276E+00	1.603E−08	1.718E+06	3.5127E+00	1.599E−08	1.714E+06
$1s\,3d\ ^3D_1$	$1s\,7d\ ^3D_2$	3.5291E+00	1.400E−09	1.499E+05	3.5142E+00	1.857E−09	1.989E+05
$1s\,3d\ ^3D_3$	$1s\,7d\ ^3D_2$	3.5644E+00	2.985E−08	3.134E+06	3.5492E+00	2.966E−08	3.115E+06
$1s\,3d\ ^1D_2$	$1s\,7d\ ^3D_2$	3.5659E+00	2.352E−09	2.468E+05	3.5507E+00	2.360E−09	2.476E+05
$1s\,4s\ ^3S_1$	$1s\,7d\ ^3D_2$	7.3299E+00	1.241E−10	3.081E+03	7.2988E+00	1.467E−10	3.644E+03
$1s\,4d\ ^3D_2$	$1s\,7d\ ^3D_2$	7.6027E+00	8.357E−09	1.929E+05	7.5707E+00	8.334E−09	1.923E+05
$1s\,4d\ ^3D_1$	$1s\,7d\ ^3D_2$	7.6055E+00	6.426E−10	1.482E+04	7.5734E+00	9.979E−10	2.301E+04
$1s\,4d\ ^3D_3$	$1s\,7d\ ^3D_2$	7.6748E+00	3.028E−08	6.858E+05	7.6422E+00	3.021E−08	6.842E+05
$1s\,4d\ ^1D_2$	$1s\,7d\ ^3D_2$	7.6778E+00	2.362E−09	5.346E+04	7.6453E+00	2.315E−09	5.239E+04
$1s\,5s\ ^3S_1$	$1s\,7d\ ^3D_2$	1.5705E+01	1.638E−11	8.860E+01	1.5637E+01	2.578E−11	1.395E+02
$1s\,5d\ ^3D_2$	$1s\,7d\ ^3D_2$	1.6345E+01	4.113E−09	2.054E+04	1.6276E+01	4.090E−09	2.042E+04
$1s\,5d\ ^3D_1$	$1s\,7d\ ^3D_2$	1.6352E+01	2.503E−10	1.249E+03	1.6283E+01	5.152E−10	2.570E+03
$1s\,5d\ ^3D_3$	$1s\,7d\ ^3D_2$	1.6516E+01	3.236E−08	1.583E+05	1.6446E+01	3.234E−08	1.582E+05
$1s\,5d\ ^1D_2$	$1s\,7d\ ^3D_2$	1.6523E+01	2.512E−09	1.227E+04	1.6453E+01	2.418E−09	1.181E+04
$1s\,5g\ ^3G_3$	$1s\,7d\ ^3D_2$	1.6607E+01	9.716E−18	4.700E−05			

(*continued on next page*)

Table 5 (*continued*)

Lower	Upper	GRASP2K			FAC		
		λ (Å)	*gf*	A (s^{-1})	λ (Å)	*gf*	A (s^{-1})
$1s\,6s\ ^3S_1$	$1s\,7d\ ^3D_2$	4.0924E+01	1.212E−14	9.653E−03			
$1s\,6d\ ^3D_2$	$1s\,7d\ ^3D_2$	4.3482E+01	1.940E−09	1.369E+03	4.3306E+01	1.938E−09	1.367E+03
$1s\,6d\ ^3D_1$	$1s\,7d\ ^3D_2$	4.3508E+01	5.943E−11	4.188E+01	4.3299E+01	2.702E−10	1.906E+02
$1s\,6d\ ^3D_3$	$1s\,7d\ ^3D_2$	4.4184E+01	4.703E−08	3.214E+04	4.4000E+01	4.706E−08	3.215E+04
$1s\,6d\ ^1D_2$	$1s\,7d\ ^3D_2$	4.4215E+01	3.640E−09	2.484E+03	4.4010E+01	3.423E−09	2.338E+03
$1s\,6g\ ^3G_3$	$1s\,7d\ ^3D_2$	4.4564E+01	1.069E−16	7.182E−05			
$1s\,7s\ ^3S_1$	$1s\,7d\ ^3D_2$	1.1072E+03	3.819E−11	4.155E−02	1.0773E+03	1.749E−12	1.994E−03
$1s^2\ ^1S_0$	$1s\,7d\ ^3D_1$	3.1400E−01	1.149E−08	2.591E+08	3.1269E−01	1.185E−08	2.673E+08
$1s\,2s\ ^3S_1$	$1s\,7d\ ^3D_1$	1.3252E+00	1.091E−09	1.381E+06	1.3196E+00	8.170E−10	1.034E+06
$1s\,2s\ ^1S_0$	$1s\,7d\ ^3D_1$	1.3373E+00	1.626E−09	2.021E+06	1.3319E+00	1.633E−09	2.029E+06
$1s\,3s\ ^3S_1$	$1s\,7d\ ^3D_1$	3.3878E+00	2.425E−10	4.698E+04	3.3737E+00	1.564E−10	3.030E+04
$1s\,3s\ ^1S_0$	$1s\,7d\ ^3D_1$	3.4087E+00	2.964E−10	5.672E+04	3.3947E+00	3.091E−10	5.914E+04
$1s\,3d\ ^3D_2$	$1s\,7d\ ^3D_1$	3.5275E+00	2.219E−09	3.966E+05	3.5127E+00	1.737E−09	3.104E+05
$1s\,3d\ ^3D_1$	$1s\,7d\ ^3D_1$	3.5290E+00	8.898E−09	1.589E+06	3.5142E+00	8.895E−09	1.587E+06
$1s\,3d\ ^1D_2$	$1s\,7d\ ^3D_1$	3.5657E+00	1.895E−08	3.314E+06	3.5507E+00	1.928E−08	3.371E+06
$1s\,4s\ ^3S_1$	$1s\,7d\ ^3D_1$	7.3294E+00	6.510E−11	2.694E+03	7.2989E+00	3.075E−11	1.272E+03
$1s\,4s\ ^1S_0$	$1s\,7d\ ^3D_1$	7.3689E+00	5.760E−11	2.358E+03	7.3387E+00	6.006E−11	2.458E+03
$1s\,4d\ ^3D_2$	$1s\,7d\ ^3D_1$	7.6021E+00	1.263E−09	4.859E+04	7.5708E+00	8.803E−10	3.385E+04
$1s\,4d\ ^3D_1$	$1s\,7d\ ^3D_1$	7.6050E+00	4.648E−09	1.787E+05	7.5736E+00	4.638E−09	1.782E+05
$1s\,4d\ ^1D_2$	$1s\,7d\ ^3D_1$	7.6772E+00	1.930E−08	7.282E+05	7.6454E+00	1.958E−08	7.388E+05
$1s\,5s\ ^3S_1$	$1s\,7d\ ^3D_1$	1.5703E+01	2.284E−11	2.060E+02	1.5638E+01	5.601E−12	5.049E+01
$1s\,5s\ ^1S_0$	$1s\,7d\ ^3D_1$	1.5794E+01	1.050E−11	9.360E+01	1.5729E+01	1.078E−11	9.608E+01
$1s\,5d\ ^3D_2$	$1s\,7d\ ^3D_1$	1.6343E+01	7.197E−10	5.991E+03	1.6277E+01	4.166E−10	3.466E+03
$1s\,5d\ ^3D_1$	$1s\,7d\ ^3D_1$	1.6349E+01	2.289E−09	1.904E+04	1.6283E+01	2.280E−09	1.895E+04
$1s\,5d\ ^1D_2$	$1s\,7d\ ^3D_1$	1.6521E+01	2.062E−08	1.679E+05	1.6453E+01	2.091E−08	1.703E+05
$1s\,6s\ ^3S_1$	$1s\,7d\ ^3D_1$	4.0910E+01	1.214E−11	1.613E+01			
$1s\,6s\ ^1S_0$	$1s\,7d\ ^3D_1$	4.1264E+01	7.813E−13	1.020E+00			
$1s\,6d\ ^3D_2$	$1s\,7d\ ^3D_1$	4.3465E+01	4.636E−10	5.456E+02	4.3310E+01	1.580E−10	1.857E+02
$1s\,6d\ ^3D_1$	$1s\,7d\ ^3D_1$	4.3492E+01	1.079E−09	1.268E+03	4.3303E+01	1.072E−09	1.260E+03
$1s\,6d\ ^1D_2$	$1s\,7d\ ^3D_1$	4.4198E+01	2.990E−08	3.404E+04	4.4015E+01	3.037E−08	3.456E+04
$1s\,7s\ ^3S_1$	$1s\,7d\ ^3D_1$	1.0966E+03	1.138E−10	2.103E−01	1.0799E+03	3.492E−13	6.601E−04
$1s\,7s\ ^1S_0$	$1s\,7d\ ^3D_1$	1.2811E+03	1.093E−12	1.480E−03	1.2282E+03	6.150E−13	8.988E−04
$1s\,7d\ ^3D_2$	$1s\,7d\ ^3D_1$	1.1420E+05	8.038E−08	1.370E−02			
$1s\,2p\ ^3P^o_1$	$1s\,7p\ ^1P^o_1$	1.3362E+00	2.129E−08	2.651E+07	1.3307E+00	2.137E−08	2.661E+07
$1s\,2p\ ^3P^o_0$	$1s\,7p\ ^1P^o_1$	1.3371E+00	4.382E−08	5.450E+07	1.3315E+00	4.537E−08	5.642E+07
$1s\,2p\ ^3P^o_2$	$1s\,7p\ ^1P^o_1$	1.3946E+00	2.779E−08	3.177E+07	1.3888E+00	2.769E−08	3.166E+07
$1s\,2p\ ^1P^o_1$	$1s\,7p\ ^1P^o_1$	1.4001E+00	9.952E−08	1.129E+08	1.3943E+00	9.895E−08	1.122E+08
$1s\,3p\ ^3P^o_1$	$1s\,7p\ ^1P^o_1$	3.4073E+00	2.514E−08	4.814E+06	3.3933E+00	2.339E−08	4.479E+06
$1s\,3p\ ^3P^o_0$	$1s\,7p\ ^1P^o_1$	3.4088E+00	4.744E−08	9.077E+06	3.3948E+00	4.799E−08	9.180E+06
$1s\,3p\ ^3P^o_2$	$1s\,7p\ ^1P^o_1$	3.5191E+00	8.199E−09	1.472E+06	3.5046E+00	9.472E−09	1.700E+06
$1s\,3p\ ^1P^o_1$	$1s\,7p\ ^1P^o_1$	3.5290E+00	2.701E−08	4.823E+06	3.5146E+00	2.829E−08	5.050E+06
$1s\,4p\ ^3P^o_1$	$1s\,7p\ ^1P^o_1$	7.3666E+00	2.634E−08	1.079E+06	7.3362E+00	2.462E−08	1.008E+06
$1s\,4p\ ^3P^o_0$	$1s\,7p\ ^1P^o_1$	7.3693E+00	4.921E−08	2.015E+06	7.3389E+00	4.990E−08	2.042E+06
$1s\,4p\ ^3P^o_2$	$1s\,7p\ ^1P^o_1$	7.5857E+00	2.994E−09	1.157E+05	7.5543E+00	4.311E−09	1.665E+05
$1s\,4p\ ^1P^o_1$	$1s\,7p\ ^1P^o_1$	7.6047E+00	9.460E−09	3.637E+05	7.5735E+00	1.015E−08	3.903E+05
$1s\,4f\ ^3F^o_2$	$1s\,7p\ ^1P^o_1$	7.6767E+00	6.581E−16	2.483E−02			
$1s\,5p\ ^3P^o_1$	$1s\,7p\ ^1P^o_1$	1.5788E+01	3.150E−08	2.810E+05	1.5725E+01	2.923E−08	2.606E+05
$1s\,5p\ ^3P^o_0$	$1s\,7p\ ^1P^o_1$	1.5795E+01	5.816E−08	5.183E+05	1.5731E+01	5.883E−08	5.241E+05
$1s\,5p\ ^3P^o_2$	$1s\,7p\ ^1P^o_1$	1.6303E+01	1.149E−09	9.614E+03	1.6237E+01	2.508E−09	2.097E+04
$1s\,5p\ ^1P^o_1$	$1s\,7p\ ^1P^o_1$	1.6348E+01	3.464E−09	2.882E+04	1.6282E+01	4.145E−09	3.447E+04
$1s\,5f\ ^3F^o_2$	$1s\,7p\ ^1P^o_1$	1.6519E+01	1.011E−13	8.235E−01			
$1s\,6p\ ^3P^o_1$	$1s\,7p\ ^1P^o_1$	4.1241E+01	5.029E−08	6.574E+04	4.1082E+01	4.653E−08	6.078E+04
$1s\,6p\ ^3P^o_0$	$1s\,7p\ ^1P^o_1$	4.1265E+01	9.222E−08	1.204E+05	4.1019E+01	9.378E−08	1.228E+05
$1s\,6p\ ^3P^o_2$	$1s\,7p\ ^1P^o_1$	4.3302E+01	5.836E−10	6.920E+02	4.3133E+01	1.991E−09	2.359E+03
$1s\,6p\ ^1P^o_1$	$1s\,7p\ ^1P^o_1$	4.3483E+01	1.175E−09	1.382E+03	4.3294E+01	1.809E−09	2.128E+03
$1s\,6f\ ^3F^o_2$	$1s\,7p\ ^1P^o_1$	4.4186E+01	4.893E−13	5.572E−01			
$1s\,7p\ ^3P^o_1$	$1s\,7p\ ^1P^o_1$	1.2731E+03	1.019E−06	1.398E+03	1.2808E+03	9.958E−07	1.338E+03
$1s\,7p\ ^3P^o_0$	$1s\,7p\ ^1P^o_1$	1.2879E+03	1.886E−06	2.528E+03	1.2433E+03	1.886E−06	2.690E+03
$1s\,7p\ ^3P^o_2$	$1s\,7p\ ^1P^o_1$	1.6436E+04	1.261E−07	1.038E+00	1.8507E+04	1.091E−07	7.026E−01
$1s\,3d\ ^3D_2$	$1s\,7d\ ^3D_3$	3.5248E+00	8.286E−09	6.355E+05	3.5099E+00	8.335E−09	6.392E+05
$1s\,3d\ ^3D_3$	$1s\,7d\ ^3D_3$	3.5615E+00	7.741E−08	5.816E+06	3.5464E+00	7.691E−08	5.777E+06
$1s\,3d\ ^1D_2$	$1s\,7d\ ^3D_3$	3.5629E+00	3.385E−09	2.541E+05	3.5478E+00	3.805E−09	2.856E+05
$1s\,4d\ ^3D_2$	$1s\,7d\ ^3D_3$	7.5894E+00	1.320E−08	2.183E+05	7.5575E+00	1.324E−08	2.190E+05
$1s\,4d\ ^3D_3$	$1s\,7d\ ^3D_3$	7.6613E+00	4.040E−08	6.558E+05	7.6289E+00	4.032E−08	6.546E+05
$1s\,4d\ ^1D_2$	$1s\,7d\ ^3D_3$	7.6642E+00	1.665E−09	2.702E+04	7.6319E+00	1.958E−09	3.177E+04
$1s\,5d\ ^3D_2$	$1s\,7d\ ^3D_3$	1.6284E+01	1.901E−08	6.830E+04	1.6216E+01	1.905E−08	6.847E+04
$1s\,5d\ ^3D_3$	$1s\,7d\ ^3D_3$	1.6453E+01	1.990E−08	7.005E+04	1.6384E+01	1.990E−08	7.005E+04
$1s\,5d\ ^1D_2$	$1s\,7d\ ^3D_3$	1.6460E+01	7.283E−10	2.561E+03	1.6391E+01	9.397E−10	3.304E+03
$1s\,5g\ ^3G_4$	$1s\,7d\ ^3D_3$	1.6542E+01	1.731E−16	6.029E−04			
$1s\,5g\ ^3G_3$	$1s\,7d\ ^3D_3$	1.6544E+01	3.024E−18	1.053E−05			
$1s\,5g\ ^1G_4$	$1s\,7d\ ^3D_3$	1.6595E+01	6.733E−20	2.330E−07			

(*continued on next page*)

Table 5 (*continued*)

Lower	Upper	GRASP2K			FAC		
		λ (Å)	*gf*	A (s^{-1})	λ (Å)	*gf*	A (s^{-1})
$1s\,6d\ ^3D_2$	$1s\,7d\ ^3D_3$	4.3051E+01	3.466E−08	1.782E+04	4.2880E+01	3.476E−08	1.786E+04
$1s\,6d\ ^3D_3$	$1s\,7d\ ^3D_3$	4.3740E+01	9.385E−09	4.675E+03	4.3560E+01	9.372E−09	4.666E+03
$1s\,6d\ ^1D_2$	$1s\,7d\ ^3D_3$	4.3770E+01	2.487E−10	1.237E+02	4.3571E+01	3.789E−10	1.886E+02
$1s\,6g\ ^3G_4$	$1s\,7d\ ^3D_3$	4.4103E+01	1.879E−13	9.204E−02			
$1s\,6g\ ^3G_3$	$1s\,7d\ ^3D_3$	4.4112E+01	7.209E−15	3.530E−03			
$1s\,6g\ ^1G_4$	$1s\,7d\ ^3D_3$	4.4321E+01	6.432E−18	3.120E−06			
$1s\,7d\ ^3D_2$	$1s\,7d\ ^3D_3$	4.3459E+03	2.625E−06	1.324E+02	4.3620E+03	2.623E−06	1.302E+02
$1s\,2p\ ^3P^o_2$	$1s\,7f\ ^3F^o_3$	1.3942E+00	8.521E−09	4.177E+06	1.3883E+00	7.247E−09	3.552E+06
$1s\,3p\ ^3P^o_2$	$1s\,7f\ ^3F^o_3$	3.5164E+00	3.762E−10	2.899E+04	3.5016E+00	4.070E−10	3.136E+04
$1s\,4p\ ^3P^o_2$	$1s\,7f\ ^3F^o_3$	7.5729E+00	4.137E−10	6.874E+03	7.5406E+00	4.246E−10	7.056E+03
$1s\,4f\ ^3F^o_3$	$1s\,7f\ ^3F^o_3$	7.6621E+00	4.484E−08	7.279E+05	7.6295E+00	1.331E−08	2.161E+05
$1s\,4f\ ^3F^o_2$	$1s\,7f\ ^3F^o_3$	7.6636E+00	1.593E−07	2.584E+06	7.6310E+00	6.677E−10	1.083E+04
$1s\,4f\ ^3F^o_4$	$1s\,7f\ ^3F^o_3$	7.6982E+00	7.787E−09	1.252E+05	7.6653E+00	7.865E−09	1.264E+05
$1s\,4f\ ^1F^o_3$	$1s\,7f\ ^3F^o_3$	7.6993E+00	2.637E−10	4.239E+03	7.6665E+00	3.040E−10	4.887E+03
$1s\,5p\ ^3P^o_2$	$1s\,7f\ ^3F^o_3$	1.6245E+01	1.679E−10	6.064E+02	1.6174E+01	1.729E−10	6.247E+02
$1s\,5f\ ^3F^o_3$	$1s\,7f\ ^3F^o_3$	1.6455E+01	6.347E−08	2.234E+05	1.6385E+01	1.004E−08	3.533E+04
$1s\,5f\ ^3F^o_2$	$1s\,7f\ ^3F^o_3$	1.6459E+01	1.769E−07	6.224E+05	1.6388E+01	5.043E−10	1.774E+03
$1s\,5f\ ^3F^o_4$	$1s\,7f\ ^3F^o_3$	1.6540E+01	1.096E−08	3.816E+04	1.6469E+01	1.094E−08	3.811E+04
$1s\,5f\ ^1F^o_3$	$1s\,7f\ ^3F^o_3$	1.6543E+01	3.832E−10	1.334E+03	1.6472E+01	4.176E−10	1.454E+03
$1s\,6p\ ^3P^o_2$	$1s\,7f\ ^3F^o_3$	4.2891E+01	4.093E−11	2.120E+01	4.2690E+01	4.269E−11	2.213E+01
$1s\,6f\ ^3F^o_3$	$1s\,7f\ ^3F^o_3$	4.3744E+01	4.845E−08	2.412E+04	4.3561E+01	5.803E−09	2.889E+03
$1s\,6f\ ^3F^o_2$	$1s\,7f\ ^3F^o_3$	4.3758E+01	1.217E−07	6.059E+04	4.3560E+01	2.919E−10	1.453E+02
$1s\,6f\ ^3F^o_4$	$1s\,7f\ ^3F^o_3$	4.4094E+01	1.673E−08	8.197E+03	4.3907E+01	1.663E−08	8.152E+03
$1s\,6f\ ^1F^o_3$	$1s\,7f\ ^3F^o_3$	4.4105E+01	6.132E−10	3.004E+02	4.3907E+01	6.178E−10	3.027E+02
$1s\,6h\ ^3H^o_4$	$1s\,7f\ ^3F^o_3$	4.4312E+01	1.635E−17	7.936E−06			
$1s\,7p\ ^3P^o_2$	$1s\,7f\ ^3F^o_3$	3.5436E+03	2.931E−12	2.224E−04	3.3920E+03	4.564E−13	3.748E−05
$1s\,2p\ ^3P^o_1$	$1s\,7f\ ^3F^o_2$	1.3358E+00	7.084E−12	5.296E+03	1.3303E+00	5.834E−12	4.360E+03
$1s\,2p\ ^3P^o_2$	$1s\,7f\ ^3F^o_2$	1.3942E+00	4.476E−10	3.072E+05	1.3883E+00	5.176E−10	3.552E+05
$1s\,2p\ ^1P^o_1$	$1s\,7f\ ^3F^o_2$	1.3997E+00	4.948E−09	3.370E+06	1.3939E+00	4.754E−09	3.236E+06
$1s\,3p\ ^3P^o_1$	$1s\,7f\ ^3F^o_2$	3.4047E+00	9.120E−13	1.050E+02	3.3906E+00	4.222E−13	4.858E+01
$1s\,3p\ ^3P^o_2$	$1s\,7f\ ^3F^o_2$	3.5163E+00	4.173E−11	4.503E+03	3.5016E+00	2.907E−11	3.136E+03
$1s\,3p\ ^1P^o_1$	$1s\,7f\ ^3F^o_2$	3.5262E+00	2.694E−10	2.890E+04	3.5116E+00	2.584E−10	2.771E+04
$1s\,4p\ ^3P^o_1$	$1s\,7f\ ^3F^o_2$	7.3543E+00	9.639E−13	2.378E+01			
$1s\,4p\ ^3P^o_2$	$1s\,7f\ ^3F^o_2$	7.5727E+00	3.962E−11	9.216E+02	7.5406E+00	3.074E−11	7.151E+02
$1s\,4p\ ^1P^o_1$	$1s\,7f\ ^3F^o_2$	7.5917E+00	2.769E−10	6.409E+03	7.5597E+00	2.729E−10	6.316E+03
$1s\,4f\ ^3F^o_3$	$1s\,7f\ ^3F^o_2$	7.6619E+00	1.605E−07	3.648E+06	7.6295E+00	6.748E−10	1.533E+04
$1s\,4f\ ^3F^o_2$	$1s\,7f\ ^3F^o_2$	7.6634E+00	8.990E−08	2.042E+06	7.6310E+00	9.326E−09	2.118E+05
$1s\,4f\ ^1F^o_3$	$1s\,7f\ ^3F^o_2$	7.6990E+00	5.551E−09	1.249E+05	7.6665E+00	5.820E−09	1.309E+05
$1s\,5p\ ^3P^o_1$	$1s\,7f\ ^3F^o_2$	1.5732E+01	5.384E−13	2.902E+00			
$1s\,5p\ ^3P^o_2$	$1s\,7f\ ^3F^o_2$	1.6243E+01	1.702E−11	8.607E+01	1.6174E+01	1.264E−11	6.394E+01
$1s\,5p\ ^1P^o_1$	$1s\,7f\ ^3F^o_2$	1.6288E+01	1.139E−10	5.729E+02	1.6219E+01	1.117E−10	5.618E+02
$1s\,5f\ ^3F^o_3$	$1s\,7f\ ^3F^o_2$	1.6454E+01	1.805E−07	8.896E+05	1.6385E+01	5.107E−10	2.516E+03
$1s\,5f\ ^3F^o_2$	$1s\,7f\ ^3F^o_2$	1.6457E+01	9.042E−08	4.454E+05	1.6388E+01	7.034E−09	3.464E+04
$1s\,5f\ ^1F^o_3$	$1s\,7f\ ^3F^o_2$	1.6542E+01	7.829E−09	3.817E+04	1.6472E+01	8.100E−09	3.948E+04
$1s\,6p\ ^3P^o_1$	$1s\,7f\ ^3F^o_2$	4.0860E+01	3.480E−13	2.781E−01			
$1s\,6p\ ^3P^o_2$	$1s\,7f\ ^3F^o_2$	4.2882E+01	5.412E−12	3.926E+00	4.2690E+01	3.049E−12	2.213E+00
$1s\,6p\ ^1P^o_1$	$1s\,7f\ ^3F^o_2$	4.3060E+01	2.950E−11	2.123E+01	4.2848E+01	2.777E−11	2.001E+01
$1s\,6f\ ^3F^o_3$	$1s\,7f\ ^3F^o_2$	4.3735E+01	1.272E−07	8.872E+04	4.3561E+01	2.879E−10	2.007E+02
$1s\,6f\ ^3F^o_2$	$1s\,7f\ ^3F^o_2$	4.3749E+01	6.015E−08	4.193E+04	4.3561E+01	4.062E−09	2.831E+03
$1s\,6f\ ^1F^o_3$	$1s\,7f\ ^3F^o_2$	4.4096E+01	1.205E−08	8.267E+03	4.3907E+01	1.232E−08	8.457E+03
$1s\,7p\ ^3P^o_1$	$1s\,7f\ ^3F^o_2$	9.8851E+02	2.009E−12	2.742E−03	9.7899E+02	2.186E−15	3.018E−06
$1s\,7p\ ^3P^o_2$	$1s\,7f\ ^3F^o_2$	3.4844E+03	5.719E−12	6.284E−04	3.3927E+03	3.259E−14	3.745E−06
$1s\,7p\ ^1P^o_1$	$1s\,7f\ ^3F^o_2$	4.4219E+03	9.314E−15	6.355E−07	4.1543E+03	2.391E−13	1.833E−05
$1s\,7f\ ^3F^o_3$	$1s\,7f\ ^3F^o_2$	2.0860E+05	6.413E−08	1.966E−03			
$1s\,2s\ ^3S_1$	$1s\,7d\ ^1D_2$	1.3248E+00	2.700E−12	2.052E+03	1.3192E+00	5.989E−13	4.552E+02
$1s\,3s\ ^3S_1$	$1s\,7d\ ^1D_2$	3.3851E+00	1.746E−12	2.033E+02			
$1s\,3d\ ^3D_2$	$1s\,7d\ ^1D_2$	3.5247E+00	6.496E−10	6.976E+04	3.5098E+00	6.265E−10	6.727E+04
$1s\,3d\ ^3D_1$	$1s\,7d\ ^1D_2$	3.5261E+00	5.200E−09	5.579E+05	3.5113E+00	5.252E−09	5.634E+05
$1s\,3d\ ^3D_3$	$1s\,7d\ ^1D_2$	3.5614E+00	4.462E−09	4.693E+05	3.5463E+00	4.109E−09	4.321E+05
$1s\,3d\ ^1D_2$	$1s\,7d\ ^1D_2$	3.5628E+00	5.333E−08	5.604E+06	3.5477E+00	5.362E−08	5.635E+06
$1s\,4s\ ^3S_1$	$1s\,7d\ ^1D_2$	7.3170E+00	1.395E−12	3.475E+01			
$1s\,4d\ ^3D_2$	$1s\,7d\ ^1D_2$	7.5888E+00	1.014E−09	2.350E+04	7.5573E+00	9.516E−10	2.204E+04
$1s\,4d\ ^3D_1$	$1s\,7d\ ^1D_2$	7.5916E+00	8.270E−09	1.914E+05	7.5601E+00	8.403E−09	1.944E+05
$1s\,4d\ ^3D_3$	$1s\,7d\ ^1D_2$	7.6607E+00	2.469E−09	5.613E+04	7.6287E+00	2.210E−09	5.023E+04
$1s\,4d\ ^1D_2$	$1s\,7d\ ^1D_2$	7.6636E+00	2.816E−08	6.396E+05	7.6317E+00	2.809E−08	6.380E+05
$1s\,5s\ ^3S_1$	$1s\,7d\ ^1D_2$	1.5646E+01	1.343E−12	7.317E+00			
$1s\,5d\ ^3D_2$	$1s\,7d\ ^1D_2$	1.6281E+01	1.459E−09	7.342E+03	1.6215E+01	1.357E−09	6.831E+03
$1s\,5d\ ^3D_1$	$1s\,7d\ ^1D_2$	1.6288E+01	1.195E−08	6.009E+04	1.6221E+01	1.215E−08	6.108E+04
$1s\,5d\ ^3D_3$	$1s\,7d\ ^1D_2$	1.6451E+01	1.339E−09	6.601E+03	1.6383E+01	1.137E−09	5.606E+03
$1s\,5d\ ^1D_2$	$1s\,7d\ ^1D_2$	1.6458E+01	1.394E−08	6.865E+04	1.6390E+01	1.385E−08	6.820E+04
$1s\,5g\ ^3G_3$	$1s\,7d\ ^1D_2$	1.6541E+01	8.041E−17	3.921E−04			

(*continued on next page*)

Table 5 (*continued*)

Lower	Upper	GRASP2K			FAC		
		λ (Å)	*gf*	A (s^{-1})	λ (Å)	*gf*	A (s^{-1})
$1s\,6s\ ^3S_1$	$1s\,7d\ ^1D_2$	4.0526E+01	1.824E−12	1.481E+00			
$1s\,6d\ ^3D_2$	$1s\,7d\ ^1D_2$	4.3033E+01	2.664E−09	1.919E+03	4.2873E+01	2.435E−09	1.752E+03
$1s\,6d\ ^3D_1$	$1s\,7d\ ^1D_2$	4.3059E+01	2.187E−08	1.574E+04	4.2867E+01	2.224E−08	1.601E+04
$1s\,6d\ ^3D_3$	$1s\,7d\ ^1D_2$	4.3721E+01	7.782E−10	5.431E+02	4.3553E+01	5.898E−10	4.112E+02
$1s\,6d\ ^1D_2$	$1s\,7d\ ^1D_2$	4.3751E+01	6.584E−09	4.589E+03	4.3564E+01	6.539E−09	4.558E+03
$1s\,6g\ ^3G_3$	$1s\,7d\ ^1D_2$	4.4092E+01	1.366E−13	9.376E−02			
$1s\,7s\ ^3S_1$	$1s\,7d\ ^1D_2$	8.7478E+02	2.312E−11	4.030E−02			
$1s\,7d\ ^3D_2$	$1s\,7d\ ^1D_2$	4.1666E+03	1.940E−07	1.491E+01	4.2946E+03	1.876E−07	1.345E+01
$1s\,7d\ ^3D_1$	$1s\,7d\ ^1D_2$	4.3244E+03	1.655E−06	1.180E+02	4.2545E+03	1.654E−06	1.208E+02
$1s\,7d\ ^3D_3$	$1s\,7d\ ^1D_2$	1.0098E+05	5.515E−08	7.215E−03			
$1s\,4f\ ^3F^o_3$	$1s\,7f\ ^3F^o_4$	7.6554E+00	1.719E−09	2.174E+04	7.6229E+00	1.729E−09	2.187E+04
$1s\,4f\ ^3F^o_4$	$1s\,7f\ ^3F^o_4$	7.6914E+00	3.672E−08	4.601E+05	7.6587E+00	4.082E−08	5.114E+05
$1s\,4f\ ^1F^o_3$	$1s\,7f\ ^3F^o_4$	7.6926E+00	2.148E−09	2.690E+04	7.6598E+00	1.172E−09	1.468E+04
$1s\,5f\ ^3F^o_3$	$1s\,7f\ ^3F^o_4$	1.6424E+01	4.060E−09	1.116E+04	1.6354E+01	4.039E−09	1.109E+04
$1s\,5f\ ^3F^o_4$	$1s\,7f\ ^3F^o_4$	1.6509E+01	2.875E−08	7.819E+04	1.6439E+01	3.085E−08	8.390E+04
$1s\,5f\ ^1F^o_3$	$1s\,7f\ ^3F^o_4$	1.6512E+01	1.249E−09	3.394E+03	1.6441E+01	8.891E−10	2.417E+03
$1s\,6f\ ^3F^o_3$	$1s\,7f\ ^3F^o_4$	4.3526E+01	9.513E−09	3.722E+03	4.3345E+01	9.476E−09	3.706E+03
$1s\,6f\ ^3F^o_4$	$1s\,7f\ ^3F^o_4$	4.3873E+01	1.853E−08	7.134E+03	4.3688E+01	1.782E−08	6.863E+03
$1s\,6f\ ^1F^o_3$	$1s\,7f\ ^3F^o_4$	4.3884E+01	2.962E−10	1.140E+02	4.3689E+01	5.068E−10	1.951E+02
$1s\,6h\ ^3H^o_5$	$1s\,7f\ ^3F^o_4$	4.4083E+01	8.911E−15	3.399E−03			
$1s\,6h\ ^3H^o_4$	$1s\,7f\ ^3F^o_4$	4.4089E+01	6.179E−16	2.356E−04			
$1s\,6h\ ^1H^o_5$	$1s\,7f\ ^3F^o_4$	4.4228E+01	2.315E−17	8.771E−06			
$1s\,7f\ ^3F^o_3$	$1s\,7f\ ^3F^o_4$	8.7508E+03	1.774E−06	1.717E+01	8.7713E+03	1.769E−06	1.690E+01
$1s\,3d\ ^3D_3$	$1s\,7g\ ^3G_4$	3.5600E+00	3.651E−09	2.135E+05	3.5449E+00	3.702E−09	2.164E+05
$1s\,4d\ ^3D_3$	$1s\,7g\ ^3G_4$	7.6543E+00	2.963E−11	3.748E+02	7.6223E+00	2.880E−11	3.642E+02
$1s\,5d\ ^3D_3$	$1s\,7g\ ^3G_4$	1.6421E+01	2.342E−10	6.438E+02	1.6353E+01	2.341E−10	6.434E+02
$1s\,5g\ ^3G_4$	$1s\,7g\ ^3G_4$	1.6509E+01	1.147E−08	3.119E+04	1.6439E+01	1.146E−08	3.116E+04
$1s\,5g\ ^3G_3$	$1s\,7g\ ^3G_4$	1.6511E+01	2.735E−10	7.434E+02	1.6441E+01	3.276E−10	8.906E+02
$1s\,5g\ ^3G_5$	$1s\,7g\ ^3G_4$	1.6560E+01	3.529E−09	9.536E+03	1.6490E+01	3.511E−09	9.489E+03
$1s\,5g\ ^1G_4$	$1s\,7g\ ^3G_4$	1.6562E+01	8.238E−11	2.226E+02	1.6491E+01	8.350E−11	2.256E+02
$1s\,6d\ ^3D_3$	$1s\,7g\ ^3G_4$	4.3514E+01	1.318E−10	5.160E+01	4.3345E+01	1.315E−10	5.144E+01
$1s\,6g\ ^3G_4$	$1s\,7g\ ^3G_4$	4.3873E+01	1.072E−08	4.127E+03	4.3688E+01	1.069E−08	4.117E+03
$1s\,6g\ ^3G_3$	$1s\,7g\ ^3G_4$	4.3882E+01	2.236E−10	8.608E+01	4.3688E+01	3.056E−10	1.176E+02
$1s\,6g\ ^3G_5$	$1s\,7g\ ^3G_4$	4.4082E+01	7.394E−09	2.820E+03	4.3896E+01	7.356E−09	2.805E+03
$1s\,6g\ ^1G_4$	$1s\,7g\ ^3G_4$	4.4089E+01	1.748E−10	6.664E+01	4.3896E+01	1.672E−10	6.377E+01
$1s\,7d\ ^3D_3$	$1s\,7g\ ^3G_4$	8.4183E+03	1.604E−13	1.677E−06	8.7854E+03	1.162E−13	1.106E−06
$1s\,3d\ ^3D_2$	$1s\,7g\ ^3G_3$	3.5233E+00	2.179E−13	1.673E+01			
$1s\,3d\ ^3D_3$	$1s\,7g\ ^3G_3$	3.5600E+00	1.630E−10	1.225E+04	3.5449E+00	1.371E−10	1.030E+04
$1s\,3d\ ^1D_2$	$1s\,7g\ ^3G_3$	3.5614E+00	2.777E−09	2.086E+05	3.5464E+00	2.747E−09	2.064E+05
$1s\,4d\ ^3D_2$	$1s\,7g\ ^3G_3$	7.5824E+00	3.207E−16	5.316E−03			
$1s\,4d\ ^3D_3$	$1s\,7g\ ^3G_3$	7.6541E+00	9.324E−13	1.517E+01	7.6223E+00	1.066E−12	1.734E+01
$1s\,4d\ ^1D_2$	$1s\,7g\ ^3G_3$	7.6571E+00	2.102E−11	3.417E+02	7.6253E+00	2.121E−11	3.447E+02
$1s\,5d\ ^3D_2$	$1s\,7g\ ^3G_3$	1.6252E+01	1.814E−14	6.543E−02			
$1s\,5d\ ^3D_3$	$1s\,7g\ ^3G_3$	1.6420E+01	9.558E−12	3.378E+01	1.6353E+01	8.684E−12	3.068E+01
$1s\,5d\ ^1D_2$	$1s\,7g\ ^3G_3$	1.6428E+01	1.752E−10	6.185E+02	1.6361E+01	1.734E−10	6.122E+02
$1s\,5g\ ^3G_4$	$1s\,7g\ ^3G_3$	1.6509E+01	3.892E−10	1.361E+03	1.6439E+01	3.312E−10	1.158E+03
$1s\,5g\ ^3G_3$	$1s\,7g\ ^3G_3$	1.6511E+01	8.849E−09	3.093E+04	1.6441E+01	8.844E−09	3.091E+04
$1s\,5g\ ^1G_4$	$1s\,7g\ ^3G_3$	1.6561E+01	2.778E−09	9.652E+03	1.6491E+01	2.789E−09	9.690E+03
$1s\,6d\ ^3D_2$	$1s\,7g\ ^3G_3$	4.2827E+01	1.476E−14	7.669E−03			
$1s\,6d\ ^3D_3$	$1s\,7g\ ^3G_3$	4.3508E+01	5.636E−12	2.837E+00	4.3345E+01	4.871E−12	2.449E+00
$1s\,6d\ ^1D_2$	$1s\,7g\ ^3G_3$	4.3538E+01	9.946E−11	5.000E+01	4.3356E+01	9.747E−11	4.899E+01
$1s\,6g\ ^3G_4$	$1s\,7g\ ^3G_3$	4.3868E+01	4.042E−10	2.002E+02	4.3688E+01	3.055E−10	1.512E+02
$1s\,6g\ ^3G_3$	$1s\,7g\ ^3G_3$	4.3876E+01	8.273E−09	4.095E+03	4.3688E+01	8.251E−09	4.084E+03
$1s\,6g\ ^1G_4$	$1s\,7g\ ^3G_3$	4.4084E+01	5.822E−09	2.855E+03	4.3896E+01	5.851E−09	2.869E+03
$1s\,7d\ ^3D_2$	$1s\,7g\ ^3G_3$	2.8438E+03	4.640E−15	5.467E−07	2.9148E+03	3.797E−17	4.222E−09
$1s\,7d\ ^3D_3$	$1s\,7g\ ^3G_3$	8.2277E+03	3.480E−15	4.899E−08	8.7854E+03	4.304E−15	5.269E−08
$1s\,7d\ ^1D_2$	$1s\,7g\ ^3G_3$	8.9575E+03	6.963E−14	8.269E−07	9.0724E+03	8.336E−14	9.568E−07
$1s\,7g\ ^3G_4$	$1s\,7g\ ^3G_3$	3.6344E+05	4.407E−08	3.179E−04			
$1s\,2p\ ^3P^o_2$	$1s\,7f\ ^1F^o_3$	1.3940E+00	4.032E−13	1.977E+02	1.3881E+00	2.999E−15	1.470E+00
$1s\,3p\ ^3P^o_2$	$1s\,7f\ ^1F^o_3$	3.5149E+00	1.959E−14	1.511E+00	3.5002E+00	1.688E−16	1.302E−02
$1s\,4p\ ^3P^o_2$	$1s\,7f\ ^1F^o_3$	7.5662E+00	4.169E−14	6.939E−01			
$1s\,4f\ ^3F^o_3$	$1s\,7f\ ^1F^o_3$	7.6552E+00	8.991E−11	1.462E+03	7.6229E+00	7.186E−11	1.168E+03
$1s\,4f\ ^3F^o_2$	$1s\,7f\ ^1F^o_3$	7.6567E+00	1.318E−09	2.141E+04	7.6244E+00	1.283E−09	2.086E+04
$1s\,4f\ ^3F^o_4$	$1s\,7f\ ^1F^o_3$	7.6912E+00	2.427E−09	3.910E+04	7.6586E+00	1.170E−09	1.884E+04
$1s\,4f\ ^1F^o_3$	$1s\,7f\ ^1F^o_3$	7.6923E+00	3.464E−08	5.579E+05	7.6598E+00	3.148E−08	5.069E+05
$1s\,5p\ ^3P^o_2$	$1s\,7f\ ^1F^o_3$	1.6214E+01	4.380E−14	1.588E−01			
$1s\,5f\ ^3F^o_3$	$1s\,7f\ ^1F^o_3$	1.6423E+01	1.913E−10	6.757E+02	1.6354E+01	1.592E−10	5.624E+02
$1s\,5f\ ^3F^o_2$	$1s\,7f\ ^1F^o_3$	1.6427E+01	3.067E−09	1.083E+04	1.6358E+01	2.994E−09	1.057E+04
$1s\,5f\ ^3F^o_4$	$1s\,7f\ ^1F^o_3$	1.6508E+01	1.547E−09	5.408E+03	1.6439E+01	8.855E−10	3.096E+03
$1s\,5f\ ^1F^o_3$	$1s\,7f\ ^1F^o_3$	1.6511E+01	2.526E−08	8.829E+04	1.6441E+01	2.379E−08	8.315E+04
$1s\,6p\ ^3P^o_2$	$1s\,7f\ ^1F^o_3$	4.2675E+01	5.245E−14	2.744E−02			

(*continued on next page*)

Table 5 (*continued*)

Lower	Upper	GRASP2K			FAC		
		λ (Å)	*gf*	A (s^{-1})	λ (Å)	*gf*	A (s^{-1})
$1s\,6f\ ^3F^o_3$	$1s\,7f\ ^1F^o_3$	4.3519E+01	4.115E−10	2.070E+02	4.3345E+01	3.501E−10	1.760E+02
$1s\,6f\ ^3F^o_2$	$1s\,7f\ ^1F^o_3$	4.3534E+01	7.076E−09	3.558E+03	4.3345E+01	7.015E−09	3.528E+03
$1s\,6f\ ^3F^o_4$	$1s\,7f\ ^1F^o_3$	4.3866E+01	5.137E−10	2.544E+02	4.3688E+01	5.131E−10	2.540E+02
$1s\,6f\ ^1F^o_3$	$1s\,7f\ ^1F^o_3$	4.3877E+01	1.345E−08	6.659E+03	4.3688E+01	1.375E−08	6.807E+03
$1s\,6h\ ^3H^o_4$	$1s\,7f\ ^1F^o_3$	4.4082E+01	3.010E−15	1.476E−03			
$1s\,7p\ ^3P^o_2$	$1s\,7f\ ^1F^o_3$	2.4995E+03	1.402E−12	2.139E−04			
$1s\,7f\ ^3F^o_3$	$1s\,7f\ ^1F^o_3$	8.4824E+03	6.791E−08	8.993E−01	8.7645E+03	6.556E−08	8.063E−01
$1s\,7f\ ^3F^o_2$	$1s\,7f\ ^1F^o_3$	8.8420E+03	1.310E−06	1.597E+01	8.7598E+03	1.309E−06	1.612E+01
$1s\,7f\ ^3F^o_4$	$1s\,7f\ ^1F^o_3$	2.7665E+05	3.244E−08	4.039E−04			
$1s\,5g\ ^3G_4$	$1s\,7g\ ^3G_5$	1.6491E+01	7.591E−10	1.693E+03	1.6420E+01	7.556E−10	1.685E+03
$1s\,5g\ ^3G_5$	$1s\,7g\ ^3G_5$	1.6542E+01	2.746E−08	6.085E+04	1.6471E+01	2.743E−08	6.079E+04
$1s\,5g\ ^1G_4$	$1s\,7g\ ^3G_5$	1.6543E+01	4.584E−10	1.016E+03	1.6473E+01	5.103E−10	1.130E+03
$1s\,6g\ ^3G_4$	$1s\,7g\ ^3G_5$	4.3743E+01	3.029E−09	9.600E+02	4.3559E+01	3.023E−09	9.580E+02
$1s\,6g\ ^3G_5$	$1s\,7g\ ^3G_5$	4.3950E+01	2.568E−08	8.060E+03	4.3765E+01	2.559E−08	8.033E+03
$1s\,6g\ ^1G_4$	$1s\,7g\ ^3G_5$	4.3957E+01	3.996E−10	1.254E+02	4.3765E+01	4.739E−10	1.487E+02
$1s\,7g\ ^3G_4$	$1s\,7g\ ^3G_5$	1.4677E+04	1.341E−06	3.774E+00	1.4692E+04	1.337E−06	3.726E+00
$1s\,4f\ ^3F^o_4$	$1s\,7h\ ^3H^o_5$	7.6874E+00	1.958E−09	2.009E+04	7.6547E+00	1.933E−09	1.984E+04
$1s\,5f\ ^3F^o_4$	$1s\,7h\ ^3H^o_5$	1.6491E+01	2.258E−11	5.035E+01	1.6420E+01	2.098E−11	4.678E+01
$1s\,6f\ ^3F^o_4$	$1s\,7h\ ^3H^o_5$	4.3742E+01	2.390E−10	7.574E+01	4.3559E+01	2.347E−10	7.437E+01
$1s\,6h\ ^3H^o_5$	$1s\,7h\ ^3H^o_5$	4.3951E+01	1.167E−08	3.663E+03	4.3765E+01	1.215E−08	3.814E+03
$1s\,6h\ ^3H^o_4$	$1s\,7h\ ^3H^o_5$	4.3956E+01	2.729E−10	8.564E+01	4.3765E+01	2.250E−10	7.063E+01
$1s\,6h\ ^3H^o_6$	$1s\,7h\ ^3H^o_5$	4.4090E+01	2.985E−09	9.311E+02	4.3903E+01	2.974E−09	9.277E+02
$1s\,6h\ ^1H^o_5$	$1s\,7h\ ^3H^o_5$	4.4094E+01	4.732E−11	1.476E+01	4.3903E+01	4.575E−11	1.427E+01
$1s\,7f\ ^3F^o_4$	$1s\,7h\ ^3H^o_5$	1.4614E+04	3.511E−14	9.969E−08	1.4763E+04	3.624E−14	1.000E−07
$1s\,4f\ ^3F^o_3$	$1s\,7h\ ^3H^o_4$	7.6513E+00	4.508E−15	5.707E−02			
$1s\,4f\ ^3F^o_4$	$1s\,7h\ ^3H^o_4$	7.6873E+00	5.158E−11	6.470E+02	7.6547E+00	4.394E−11	5.511E+02
$1s\,4f\ ^1F^o_3$	$1s\,7h\ ^3H^o_4$	7.6884E+00	1.583E−09	1.985E+04	7.6558E+00	1.539E−09	1.929E+04
$1s\,5f\ ^3F^o_3$	$1s\,7h\ ^3H^o_4$	1.6405E+01	8.772E−18	2.416E−05			
$1s\,5f\ ^3F^o_4$	$1s\,7h\ ^3H^o_4$	1.6490E+01	5.160E−13	1.406E+00	1.6420E+01	4.768E−13	1.299E+00
$1s\,5f\ ^1F^o_3$	$1s\,7h\ ^3H^o_4$	1.6493E+01	1.767E−11	4.816E+01	1.6423E+01	1.666E−11	4.540E+01
$1s\,6f\ ^3F^o_3$	$1s\,7h\ ^3H^o_4$	4.3394E+01	6.981E−16	2.748E−04			
$1s\,6f\ ^3F^o_4$	$1s\,7h\ ^3H^o_4$	4.3738E+01	6.216E−12	2.408E+00	4.3559E+01	5.334E−12	2.065E+00
$1s\,6f\ ^1F^o_3$	$1s\,7h\ ^3H^o_4$	4.3749E+01	1.922E−10	7.442E+01	4.3560E+01	1.866E−10	7.230E+01
$1s\,6h\ ^3H^o_5$	$1s\,7h\ ^3H^o_4$	4.3947E+01	3.798E−10	1.458E+02	4.3765E+01	2.250E−10	8.632E+01
$1s\,6h\ ^3H^o_4$	$1s\,7h\ ^3H^o_4$	4.3953E+01	1.029E−08	3.949E+03	4.3765E+01	9.900E−09	3.798E+03
$1s\,6h\ ^1H^o_5$	$1s\,7h\ ^3H^o_4$	4.4091E+01	2.459E−09	9.374E+02	4.3903E+01	2.470E−09	9.420E+02
$1s\,7f\ ^3F^o_3$	$1s\,7h\ ^3H^o_4$	5.4206E+03	1.109E−18	2.798E−11			
$1s\,7f\ ^3F^o_4$	$1s\,7h\ ^3H^o_4$	1.4244E+04	7.671E−16	2.802E−09	1.4763E+04	8.238E−16	2.777E−09
$1s\,7f\ ^1F^o_3$	$1s\,7h\ ^3H^o_4$	1.5017E+04	2.719E−14	8.935E−08	1.4782E+04	2.879E−14	9.684E−08
$1s\,7h\ ^3H^o_5$	$1s\,7h\ ^3H^o_4$	5.6215E+05	3.438E−08	8.064E−05			
$1s\,3d\ ^3D_3$	$1s\,7g\ ^1G_4$	3.5591E+00	4.551E−14	2.663E+00	3.5441E+00	5.680E−19	3.323E−05
$1s\,4d\ ^3D_3$	$1s\,7g\ ^1G_4$	7.6502E+00	1.289E−15	1.633E−02	7.6183E+00	4.456E−21	5.642E−08
$1s\,5d\ ^3D_3$	$1s\,7g\ ^1G_4$	1.6402E+01	6.373E−16	1.756E−03			
$1s\,5g\ ^3G_4$	$1s\,7g\ ^1G_4$	1.6490E+01	1.984E−11	5.409E+01	1.6420E+01	1.967E−11	5.362E+01
$1s\,5g\ ^3G_3$	$1s\,7g\ ^1G_4$	1.6492E+01	5.980E−10	1.629E+03	1.6423E+01	6.027E−10	1.642E+03
$1s\,5g\ ^3G_5$	$1s\,7g\ ^1G_4$	1.6541E+01	5.583E−10	1.512E+03	1.6471E+01	5.080E−10	1.376E+03
$1s\,5g\ ^1G_4$	$1s\,7g\ ^1G_4$	1.6543E+01	2.237E−08	6.059E+04	1.6473E+01	2.234E−08	6.052E+04
$1s\,6d\ ^3D_3$	$1s\,7g\ ^1G_4$	4.3381E+01	1.570E−15	6.182E−04			
$1s\,6g\ ^3G_4$	$1s\,7g\ ^1G_4$	4.3738E+01	7.608E−11	2.948E+01	4.3559E+01	6.873E−11	2.662E+01
$1s\,6g\ ^3G_3$	$1s\,7g\ ^1G_4$	4.3747E+01	2.385E−09	9.236E+02	4.3559E+01	2.405E−09	9.314E+02
$1s\,6g\ ^3G_5$	$1s\,7g\ ^1G_4$	4.3946E+01	5.553E−10	2.131E+02	4.3765E+01	4.739E−10	1.818E+02
$1s\,6g\ ^1G_4$	$1s\,7g\ ^1G_4$	4.3953E+01	2.093E−08	8.029E+03	4.3765E+01	2.085E−08	8.000E+03
$1s\,7d\ ^3D_3$	$1s\,7g\ ^1G_4$	5.2883E+03	3.941E−15	1.044E−07			
$1s\,7g\ ^3G_4$	$1s\,7g\ ^1G_4$	1.4223E+04	3.145E−08	1.152E−01	1.4691E+04	3.040E−08	1.035E−01
$1s\,7g\ ^3G_3$	$1s\,7g\ ^1G_4$	1.4802E+04	1.065E−06	3.602E+00	1.4691E+04	1.064E−06	3.623E+00
$1s\,7g\ ^3G_5$	$1s\,7g\ ^1G_4$	4.5954E+05	2.680E−08	9.406E−05			
$1s\,6h\ ^3H^o_5$	$1s\,7h\ ^3H^o_6$	4.3863E+01	8.357E−10	2.229E+02	4.3678E+01	8.370E−10	2.232E+02
$1s\,6h\ ^3H^o_6$	$1s\,7h\ ^3H^o_6$	4.4002E+01	2.409E−08	6.384E+03	4.3816E+01	2.482E−08	6.577E+03
$1s\,6h\ ^1H^o_5$	$1s\,7h\ ^3H^o_6$	4.4006E+01	4.069E−10	1.078E+02	4.3816E+01	3.223E−10	8.541E+01
$1s\,7h\ ^3H^o_5$	$1s\,7h\ ^3H^o_6$	2.2090E+04	1.077E−06	1.133E+00	2.2109E+04	1.074E−06	1.118E+00
$1s\,5g\ ^3G_5$	$1s\,7i\ ^3I_6$	1.6529E+01	9.680E−10	1.818E+03	1.6459E+01	9.718E−10	1.825E+03
$1s\,6g\ ^3G_5$	$1s\,7i\ ^3I_6$	4.3863E+01	2.601E−10	6.937E+01	4.3678E+01	2.590E−10	6.907E+01
$1s\,7g\ ^3G_5$	$1s\,7i\ ^3I_6$	2.2046E+04	8.252E−15	8.712E−09	2.2108E+04	8.218E−15	8.555E−09
$1s\,5g\ ^3G_4$	$1s\,7i\ ^3I_5$	1.6478E+01	2.959E−15	6.609E−03			
$1s\,5g\ ^3G_5$	$1s\,7i\ ^3I_5$	1.6529E+01	1.752E−11	3.888E+01	1.6459E+01	1.495E−11	3.318E+01
$1s\,5g\ ^1G_4$	$1s\,7i\ ^3I_5$	1.6531E+01	8.153E−10	1.809E+03	1.6460E+01	8.077E−10	1.792E+03
$1s\,6g\ ^3G_4$	$1s\,7i\ ^3I_5$	4.3654E+01	1.569E−16	4.993E−05			
$1s\,6g\ ^3G_5$	$1s\,7i\ ^3I_5$	4.3861E+01	4.500E−12	1.418E+00	4.3678E+01	3.985E−12	1.255E+00
$1s\,6g\ ^1G_4$	$1s\,7i\ ^3I_5$	4.3867E+01	2.181E−10	6.873E+01	4.3678E+01	2.152E−10	6.782E+01
$1s\,7g\ ^3G_4$	$1s\,7i\ ^3I_5$	8.7156E+03	3.038E−20	2.425E−13			
$1s\,7g\ ^3G_5$	$1s\,7i\ ^3I_5$	2.1457E+04	1.337E−16	1.761E−10	2.2108E+04	1.264E−16	1.555E−10

(*continued on next page*)

Table 5 (*continued*)

Lower	Upper	GRASP2K			FAC		
		λ (Å)	*gf*	A (s^{-1})	λ (Å)	*gf*	A (s^{-1})
$1s\,7g\ ^1G_4$	$1s\,7i\ ^3I_5$	2.2508E+04	6.722E−15	8.045E−09	2.2108E+04	6.827E−15	8.399E−09
$1s\,7i\ ^3I_6$	$1s\,7i\ ^3I_5$	8.0263E+05	2.820E−08	2.655E−05			
$1s\,4f\ ^3F^o_4$	$1s\,7h\ ^1H^o_5$	7.6846E+00	1.967E−14	2.020E−01			
$1s\,5f\ ^3F^o_4$	$1s\,7h\ ^1H^o_5$	1.6478E+01	2.893E−16	6.462E−04			
$1s\,6f\ ^3F^o_4$	$1s\,7h\ ^1H^o_5$	4.3652E+01	9.188E−16	2.924E−04			
$1s\,6h\ ^3H^o_5$	$1s\,7h\ ^1H^o_5$	4.3860E+01	1.459E−11	4.600E+00	4.3678E+01	1.287E−11	4.058E+00
$1s\,6h\ ^3H^o_4$	$1s\,7h\ ^1H^o_5$	4.3866E+01	6.893E−10	2.172E+02	4.3678E+01	6.953E−10	2.191E+02
$1s\,6h\ ^3H^o_6$	$1s\,7h\ ^1H^o_5$	4.3999E+01	5.006E−10	1.568E+02	4.3816E+01	3.223E−10	1.009E+02
$1s\,6h\ ^1H^o_5$	$1s\,7h\ ^1H^o_5$	4.4004E+01	2.163E−08	6.773E+03	4.3816E+01	2.095E−08	6.561E+03
$1s\,7f\ ^3F^o_4$	$1s\,7h\ ^1H^o_5$	8.6829E+03	2.049E−19	1.648E−12			
$1s\,7h\ ^3H^o_5$	$1s\,7h\ ^1H^o_5$	2.1394E+04	1.710E−08	2.266E−02	2.2109E+04	1.653E−08	2.033E−02
$1s\,7h\ ^3H^o_4$	$1s\,7h\ ^1H^o_5$	2.2240E+04	8.940E−07	1.096E+00	2.2109E+04	8.927E−07	1.098E+00
$1s\,7h\ ^3H^o_6$	$1s\,7h\ ^1H^o_5$	6.7907E+05	2.293E−08	3.015E−05			
$1s\,7i\ ^3I_6$	$1s\,7i\ ^3I_7$	3.1014E+04	8.994E−07	4.158E−01	3.1015E+04	8.974E−07	4.113E−01
$1s\,5g\ ^3G_5$	$1s\,7i\ ^1I_6$	1.6520E+01	6.150E−15	1.156E−02			
$1s\,6g\ ^3G_5$	$1s\,7i\ ^1I_6$	4.3799E+01	5.374E−16	1.437E−04			
$1s\,7g\ ^3G_5$	$1s\,7i\ ^1I_6$	1.2712E+04	7.915E−21	2.513E−14			
$1s\,7i\ ^3I_6$	$1s\,7i\ ^1I_6$	3.0023E+04	1.031E−08	5.869E−03	3.1015E+04	9.971E−09	5.273E−03
$1s\,7i\ ^3I_5$	$1s\,7i\ ^1I_6$	3.1190E+04	7.687E−07	4.055E−01	3.1015E+04	7.678E−07	4.060E−01
$1s\,7i\ ^3I_7$	$1s\,7i\ ^1I_6$	9.4020E+05	2.004E−08	1.163E−05			

Table 6
Magnetic quadrupole transitions $M2$ calculated with GRASP2K and FAC for all $n = 1$–7 configurations. For the GRASP2K calculation, the active set is expanded to $n = 10$ (GRASP3) and only the length form is considered. A comparison between the wavelengths, weighted oscillator strengths and transition probabilities is given.

Lower	Upper	GRASP2K			FAC		
		λ (Å)	gf	A (s^{-1})	λ (Å)	gf	A (s^{-1})
$1s\,2s\ ^3S_1$	$1s\,2p\ ^3P^o_1$	1.6053E+02	1.033E−13	8.911E−03	1.5824E+02	1.235E−13	1.087E−02
$1s^2\ ^1S_0$	$1s\,2p\ ^3P^o_2$	4.0520E−01	3.150E−04	2.559E+12	4.0356E−01	3.398E−04	2.760E+12
$1s\,2s\ ^3S_1$	$1s\,2p\ ^3P^o_2$	2.6617E+01	1.588E−08	2.990E+04	2.6489E+01	1.614E−08	3.043E+04
$1s\,2s\ ^1S_0$	$1s\,2p\ ^3P^o_2$	3.2564E+01	5.805E−09	7.303E+03	3.2508E+01	5.823E−09	7.289E+03
$1s\,2s\ ^3S_1$	$1s\,2p\ ^1P^o_1$	2.4759E+01	1.985E−08	7.200E+04	2.4615E+01	2.008E−08	7.308E+04
$1s\,2p\ ^3P^o_1$	$1s\,3s\ ^3S_1$	2.2065E+00	1.514E−09	6.915E+05	2.1974E+00	2.462E−09	1.124E+06
$1s\,2p\ ^3P^o_2$	$1s\,3s\ ^3S_1$	2.3705E+00	1.311E−06	5.189E+08	2.3604E+00	1.277E−06	5.054E+08
$1s\,2p\ ^1P^o_1$	$1s\,3s\ ^3S_1$	2.3864E+00	1.336E−06	5.217E+08	2.3765E+00	1.249E−06	4.877E+08
$1s\,2s\ ^3S_1$	$1s\,3p\ ^3P^o_1$	2.1686E+00	1.372E−08	6.484E+06	2.1593E+00	1.146E−08	5.418E+06
$1s\,3s\ ^3S_1$	$1s\,3p\ ^3P^o_1$	5.8954E+02	1.165E−14	7.452E−05	5.8484E+02	1.282E−14	8.264E−05
$1s\,2p\ ^3P^o_2$	$1s\,3s\ ^1S_0$	2.3603E+00	8.223E−07	9.845E+08	2.3502E+00	8.627E−07	1.032E+09
$1s^2\ ^1S_0$	$1s\,3p\ ^3P^o_2$	3.4470E−01	8.419E−05	9.448E+11	3.4333E−01	9.334E−05	1.047E+12
$1s\,2s\ ^3S_1$	$1s\,3p\ ^3P^o_2$	2.1256E+00	8.321E−06	2.457E+09	2.1165E+00	8.544E−06	2.522E+09
$1s\,2s\ ^1S_0$	$1s\,3p\ ^3P^o_2$	2.1571E+00	5.628E−06	1.614E+09	2.1483E+00	5.447E−06	1.561E+09
$1s\,3s\ ^3S_1$	$1s\,3p\ ^3P^o_2$	9.0741E+01	2.451E−09	3.972E+02	9.0375E+01	2.466E−09	3.995E+02
$1s\,3s\ ^1S_0$	$1s\,3p\ ^3P^o_2$	1.0861E+02	9.552E−10	1.080E+02	1.0840E+02	9.529E−10	1.072E+02
$1s\,2p\ ^3P^o_1$	$1s\,3d\ ^3D_2$	2.1510E+00	8.811E−07	2.541E+08	2.1422E+00	9.246E−07	2.665E+08
$1s\,2p\ ^3P^o_0$	$1s\,3d\ ^3D_2$	2.1533E+00	5.689E−07	1.637E+08	2.1443E+00	5.905E−07	1.698E+08
$1s\,2p\ ^3P^o_2$	$1s\,3d\ ^3D_2$	2.3065E+00	1.618E−10	4.057E+04	2.2968E+00	2.186E−10	5.482E+04
$1s\,2p\ ^1P^o_1$	$1s\,3d\ ^3D_2$	2.3216E+00	2.587E−10	6.403E+04			
$1s\,3p\ ^3P^o_1$	$1s\,3d\ ^3D_2$	1.0002E+02	4.701E−11	6.269E+00	9.9770E+01	4.770E−11	6.338E+00
$1s\,3p\ ^3P^o_0$	$1s\,3d\ ^3D_2$	1.0130E+02	2.911E−11	3.784E+00	1.0100E+02	2.943E−11	3.815E+00
$1s\,3p\ ^3P^o_2$	$1s\,3d\ ^3D_2$	1.4830E+03	2.920E−18	1.771E−09			
$1s\,2p\ ^3P^o_1$	$1s\,3d\ ^3D_1$	2.1505E+00	8.705E−07	4.185E+08	2.1416E+00	9.091E−07	4.370E+08
$1s\,2p\ ^3P^o_2$	$1s\,3d\ ^3D_1$	2.3059E+00	6.634E−13	2.774E+02			
$1s\,2p\ ^1P^o_1$	$1s\,3d\ ^3D_1$	2.3210E+00	1.204E−09	4.968E+05	2.3114E+00	1.079E−09	4.453E+05
$1s\,3p\ ^3P^o_1$	$1s\,3d\ ^3D_1$	9.8828E+01	4.804E−11	1.094E+01	9.8590E+01	4.859E−11	1.102E+01
$1s\,3p\ ^3P^o_2$	$1s\,3d\ ^3D_1$	1.2588E+03	1.549E−18	2.174E−09			
$1s\,2s\ ^3S_1$	$1s\,3p\ ^1P^o_1$	2.1220E+00	8.175E−06	4.037E+09	2.1129E+00	8.576E−06	4.234E+09
$1s\,3s\ ^3S_1$	$1s\,3p\ ^1P^o_1$	8.4608E+01	3.031E−09	9.414E+02	8.4198E+01	3.046E−09	9.473E+02
$1s\,3d\ ^3D_2$	$1s\,3p\ ^1P^o_1$	8.0349E+03	2.086E−20	7.185E−13			
$1s\,3d\ ^3D_1$	$1s\,3p\ ^1P^o_1$	2.2947E+05	3.151E−24	1.331E−19			
$1s\,2p\ ^3P^o_1$	$1s\,3d\ ^3D_3$	2.1376E+00	1.374E−05	2.865E+09	2.1288E+00	1.394E−05	2.907E+09
$1s\,2p\ ^3P^o_2$	$1s\,3d\ ^3D_3$	2.2910E+00	6.490E−05	1.178E+10	2.2814E+00	6.717E−05	1.219E+10
$1s\,2p\ ^1P^o_1$	$1s\,3d\ ^3D_3$	2.3059E+00	1.173E−05	2.101E+09	2.2965E+00	1.190E−05	2.133E+09
$1s\,3p\ ^3P^o_1$	$1s\,3d\ ^3D_3$	7.7367E+01	1.611E−09	2.565E+02	7.7185E+01	1.597E−09	2.533E+02
$1s\,3p\ ^3P^o_2$	$1s\,3d\ ^3D_3$	2.7769E+02	1.724E−10	2.130E+00	2.7772E+02	1.707E−10	2.091E+00
$1s\,3p\ ^1P^o_1$	$1s\,3d\ ^3D_3$	3.5684E+02	1.466E−11	1.097E−01	3.5856E+02	1.436E−11	1.055E−01
$1s\,2p\ ^3P^o_1$	$1s\,3d\ ^1D_2$	2.1371E+00	5.299E−06	1.548E+09	2.1283E+00	5.541E−06	1.618E+09
$1s\,2p\ ^3P^o_0$	$1s\,3d\ ^1D_2$	2.1393E+00	6.338E−06	1.847E+09	2.1304E+00	6.476E−06	1.887E+09
$1s\,2p\ ^3P^o_2$	$1s\,3d\ ^1D_2$	2.2905E+00	1.624E−05	4.129E+09	2.2809E+00	1.680E−05	4.273E+09
$1s\,2p\ ^1P^o_1$	$1s\,3d\ ^1D_2$	2.3053E+00	3.662E−05	9.192E+09	2.2959E+00	3.746E−05	9.401E+09
$1s\,3p\ ^3P^o_1$	$1s\,3d\ ^1D_2$	7.6708E+01	6.269E−10	1.421E+02	7.6517E+01	6.228E−10	1.407E+02
$1s\,3p\ ^3P^o_0$	$1s\,3d\ ^1D_2$	7.7462E+01	7.386E−10	1.642E+02	7.7242E+01	7.336E−10	1.626E+02
$1s\,3p\ ^3P^o_2$	$1s\,3d\ ^1D_2$	2.6938E+02	4.725E−11	8.687E−01	2.6926E+02	4.683E−11	8.544E−01
$1s\,3p\ ^1P^o_1$	$1s\,3d\ ^1D_2$	3.4323E+02	5.187E−11	5.874E−01	3.4458E+02	5.080E−11	5.659E−01
$1s\,2p\ ^3P^o_1$	$1s\,4s\ ^3S_1$	1.6341E+00	6.171E−10	5.138E+05	1.6274E+00	9.120E−10	7.592E+05
$1s\,2p\ ^3P^o_2$	$1s\,4s\ ^3S_1$	1.7223E+00	5.190E−07	3.890E+08	1.7151E+00	5.041E−07	3.778E+08
$1s\,2p\ ^1P^o_1$	$1s\,4s\ ^3S_1$	1.7308E+00	5.278E−07	3.918E+08	1.7236E+00	4.959E−07	3.680E+08
$1s\,3p\ ^3P^o_1$	$1s\,4s\ ^3S_1$	6.3675E+00	3.701E−10	2.029E+04	6.3413E+00	5.844E−10	3.204E+04
$1s\,3p\ ^3P^o_2$	$1s\,4s\ ^3S_1$	6.7695E+00	3.592E−07	1.743E+07	6.7412E+00	3.541E−07	1.718E+07
$1s\,3p\ ^1P^o_1$	$1s\,4s\ ^3S_1$	6.8063E+00	3.654E−07	1.754E+07	6.7783E+00	3.479E−07	1.669E+07
$1s\,2s\ ^3S_1$	$1s\,4p\ ^3P^o_1$	1.6159E+00	5.547E−09	4.724E+06	1.6090E+00	5.114E−09	4.355E+06
$1s\,3s\ ^3S_1$	$1s\,4p\ ^3P^o_1$	6.2721E+00	1.725E−09	9.747E+04	6.2463E+00	1.366E−09	7.720E+04
$1s\,3d\ ^3D_2$	$1s\,4p\ ^3P^o_1$	6.7686E+00	4.387E−09	2.129E+05	6.7403E+00	4.352E−09	2.111E+05
$1s\,3d\ ^3D_1$	$1s\,4p\ ^3P^o_1$	6.7741E+00	4.345E−09	2.105E+05	6.7458E+00	4.267E−09	2.067E+05
$1s\,3d\ ^3D_3$	$1s\,4p\ ^3P^o_1$	6.9054E+00	7.364E−08	3.434E+06	6.8762E+00	7.351E−08	3.427E+06
$1s\,3d\ ^1D_2$	$1s\,4p\ ^3P^o_1$	6.9107E+00	2.786E−08	1.297E+06	6.8816E+00	2.620E−08	1.219E+06
$1s\,4s\ ^3S_1$	$1s\,4p\ ^3P^o_1$	1.4439E+03	2.589E−15	2.761E−06	1.4544E+03	2.665E−15	2.778E−06
$1s\,2p\ ^3P^o_2$	$1s\,4s\ ^1S_0$	1.7202E+00	3.276E−07	7.385E+08	1.7129E+00	3.373E−07	7.604E+08
$1s\,3p\ ^3P^o_2$	$1s\,4s\ ^1S_0$	6.7361E+00	2.278E−07	3.349E+07	6.7077E+00	2.396E−07	3.523E+07
$1s\,3d\ ^3D_2$	$1s\,4p\ ^3P^o_0$	6.7663E+00	2.811E−09	4.096E+05	6.7381E+00	2.782E−09	4.052E+05
$1s\,3d\ ^1D_2$	$1s\,4p\ ^3P^o_0$	6.9083E+00	3.383E−08	4.728E+06	6.8793E+00	3.327E−08	4.650E+06
$1s^2\ ^1S_0$	$1s\,4p\ ^3P^o_2$	3.2750E−01	3.417E−05	4.249E+11	3.2620E−01	3.824E−05	4.754E+11
$1s\,2s\ ^3S_1$	$1s\,4p\ ^3P^o_2$	1.6057E+00	3.719E−06	1.924E+09	1.5989E+00	3.831E−06	1.982E+09
$1s\,2s\ ^1S_0$	$1s\,4p\ ^3P^o_2$	1.6236E+00	2.491E−06	1.261E+09	1.6170E+00	2.469E−06	1.249E+09
$1s\,3s\ ^3S_1$	$1s\,4p\ ^3P^o_2$	6.1216E+00	1.070E−06	3.810E+07	6.0965E+00	1.086E−06	3.865E+07
$1s\,3s\ ^1S_0$	$1s\,4p\ ^3P^o_2$	6.1903E+00	7.330E−07	2.552E+07	6.1656E+00	6.999E−07	2.435E+07
$1s\,3d\ ^3D_2$	$1s\,4p\ ^3P^o_2$	6.5936E+00	2.191E−13	6.724E+00			

(*continued on next page*)

Table 6 (*continued*)

Lower	Upper	GRASP2K			FAC		
		λ (Å)	*gf*	A (s^{-1})	λ (Å)	*gf*	A (s^{-1})
$1s\,3d\ ^3D_1$	$1s\,4p\ ^3P^o_2$	6.5989E+00	1.089E−12	3.337E+01			
$1s\,3d\ ^3D_3$	$1s\,4p\ ^3P^o_2$	6.7234E+00	2.581E−07	7.616E+06	6.6951E+00	2.493E−07	7.359E+06
$1s\,3d\ ^1D_2$	$1s\,4p\ ^3P^o_2$	6.7284E+00	6.488E−08	1.912E+06	6.7001E+00	6.220E−08	1.832E+06
$1s\,4s\ ^3S_1$	$1s\,4p\ ^3P^o_2$	2.1675E+02	6.059E−10	1.720E+01	2.1631E+02	6.045E−10	1.709E+01
$1s\,4s\ ^1S_0$	$1s\,4p\ ^3P^o_2$	2.5764E+02	2.410E−10	4.843E+00	2.5767E+02	2.384E−10	4.750E+00
$1s\,2p\ ^3P^o_1$	$1s\,4d\ ^3D_2$	1.6212E+00	2.912E−07	1.478E+08	1.6144E+00	3.095E−07	1.571E+08
$1s\,2p\ ^3P^o_0$	$1s\,4d\ ^3D_2$	1.6224E+00	1.846E−07	9.355E+07	1.6156E+00	1.932E−07	9.790E+07
$1s\,2p\ ^3P^o_2$	$1s\,4d\ ^3D_2$	1.7079E+00	1.219E−10	5.573E+04	1.7007E+00	1.718E−10	7.857E+04
$1s\,2p\ ^1P^o_1$	$1s\,4d\ ^3D_2$	1.7162E+00	7.192E−12	3.257E+03			
$1s\,3p\ ^3P^o_1$	$1s\,4d\ ^3D_2$	6.1751E+00	9.219E−08	3.225E+06	6.1494E+00	9.398E−08	3.287E+06
$1s\,3p\ ^3P^o_0$	$1s\,4d\ ^3D_2$	6.1799E+00	5.803E−08	2.027E+06	6.1541E+00	5.875E−08	2.051E+06
$1s\,3p\ ^3P^o_2$	$1s\,4d\ ^3D_2$	6.5523E+00	4.903E−11	1.524E+03	6.5248E+00	5.664E−11	1.760E+03
$1s\,3p\ ^1P^o_1$	$1s\,4d\ ^3D_2$	6.5868E+00	6.167E−13	1.896E+01			
$1s\,4p\ ^3P^o_1$	$1s\,4d\ ^3D_2$	2.3795E+02	1.520E−11	3.582E−01	2.3625E+02	1.552E−11	3.679E−01
$1s\,4p\ ^3P^o_0$	$1s\,4d\ ^3D_2$	2.4086E+02	9.221E−12	2.120E−01	2.3903E+02	9.376E−12	2.170E−01
$1s\,4p\ ^3P^o_2$	$1s\,4d\ ^3D_2$	3.5515E+03	2.231E−18	2.359E−10			
$1s\,2p\ ^3P^o_1$	$1s\,4d\ ^3D_1$	1.6210E+00	2.862E−07	2.422E+08	1.6143E+00	3.012E−07	2.548E+08
$1s\,2p\ ^3P^o_2$	$1s\,4d\ ^3D_1$	1.7078E+00	3.653E−13	2.785E+02			
$1s\,2p\ ^1P^o_1$	$1s\,4d\ ^3D_1$	1.7161E+00	3.609E−10	2.724E+05	1.7090E+00	3.716E−10	2.805E+05
$1s\,3p\ ^3P^o_1$	$1s\,4d\ ^3D_1$	6.1732E+00	8.985E−08	5.242E+06	6.1476E+00	9.158E−08	5.342E+06
$1s\,3p\ ^3P^o_2$	$1s\,4d\ ^3D_1$	6.5502E+00	5.443E−13	2.821E+01			
$1s\,3p\ ^1P^o_1$	$1s\,4d\ ^3D_1$	6.5847E+00	1.129E−10	5.788E+03	6.5574E+00	8.882E−11	4.553E+03
$1s\,4p\ ^3P^o_1$	$1s\,4d\ ^3D_1$	2.3523E+02	1.537E−11	6.175E−01	2.3358E+02	1.564E−11	6.320E−01
$1s\,4p\ ^3P^o_2$	$1s\,4d\ ^3D_1$	3.0279E+03	4.275E−19	1.037E−10			
$1s\,2s\ ^3S_1$	$1s\,4p\ ^1P^o_1$	1.6048E+00	3.673E−06	3.171E+09	1.5980E+00	3.832E−06	3.308E+09
$1s\,3s\ ^3S_1$	$1s\,4p\ ^1P^o_1$	6.1092E+00	1.049E−06	6.249E+07	6.0840E+00	1.091E−06	6.499E+07
$1s\,3d\ ^3D_2$	$1s\,4p\ ^1P^o_1$	6.5793E+00	6.881E−13	3.535E+01			
$1s\,3d\ ^3D_1$	$1s\,4p\ ^1P^o_1$	6.5845E+00	2.464E−13	1.264E+01			
$1s\,3d\ ^3D_3$	$1s\,4p\ ^1P^o_1$	6.7085E+00	4.497E−08	2.222E+06	6.6801E+00	4.629E−08	2.286E+06
$1s\,3d\ ^1D_2$	$1s\,4p\ ^1P^o_1$	6.7135E+00	1.426E−07	7.036E+06	6.6851E+00	1.415E−07	6.984E+06
$1s\,4s\ ^3S_1$	$1s\,4p\ ^1P^o_1$	2.0225E+02	7.466E−10	4.058E+01	2.0166E+02	7.451E−10	4.039E+01
$1s\,4d\ ^3D_2$	$1s\,4p\ ^1P^o_1$	2.0339E+04	7.155E−23	3.846E−16			
$1s\,4d\ ^3D_1$	$1s\,4p\ ^1P^o_1$	2.1218E+06	1.608E−26	7.940E−24			
$1s\,2p\ ^3P^o_1$	$1s\,4d\ ^3D_3$	1.6179E+00	4.628E−06	1.685E+09	1.6112E+00	4.723E−06	1.719E+09
$1s\,2p\ ^3P^o_2$	$1s\,4d\ ^3D_3$	1.7043E+00	2.069E−05	6.788E+09	1.6972E+00	2.154E−05	7.068E+09
$1s\,2p\ ^1P^o_1$	$1s\,4d\ ^3D_3$	1.7126E+00	3.719E−06	1.208E+09	1.7055E+00	3.855E−06	1.252E+09
$1s\,3p\ ^3P^o_1$	$1s\,4d\ ^3D_3$	6.1283E+00	1.363E−06	3.459E+07	6.1030E+00	1.371E−06	3.478E+07
$1s\,3p\ ^3P^o_2$	$1s\,4d\ ^3D_3$	6.4997E+00	7.099E−06	1.601E+08	6.4725E+00	7.232E−06	1.631E+08
$1s\,3p\ ^1P^o_1$	$1s\,4d\ ^3D_3$	6.5336E+00	1.286E−06	2.871E+07	6.5067E+00	1.277E−06	2.850E+07
$1s\,4p\ ^3P^o_1$	$1s\,4d\ ^3D_3$	1.8386E+02	5.115E−10	1.442E+01	1.8281E+02	5.134E−10	1.451E+01
$1s\,4p\ ^3P^o_2$	$1s\,4d\ ^3D_3$	6.5884E+02	5.524E−11	1.213E−01	6.5162E+02	5.648E−11	1.256E−01
$1s\,4p\ ^1P^o_1$	$1s\,4d\ ^3D_3$	8.4240E+02	4.763E−12	6.396E−03	8.3413E+02	4.865E−12	6.606E−03
$1s\,2s\ ^3S_1$	$1s\,4f\ ^3F^o_3$	1.6017E+00	1.411E−10	5.242E+04			
$1s\,3s\ ^3S_1$	$1s\,4f\ ^3F^o_3$	6.0645E+00	6.814E−12	1.765E+02			
$1s\,3d\ ^3D_2$	$1s\,4f\ ^3F^o_3$	6.5275E+00	2.415E−06	5.402E+07	6.5002E+00	2.450E−06	5.479E+07
$1s\,3d\ ^3D_1$	$1s\,4f\ ^3F^o_3$	6.5326E+00	4.080E−07	9.111E+06	6.5052E+00	4.131E−07	9.224E+06
$1s\,3d\ ^3D_3$	$1s\,4f\ ^3F^o_3$	6.6546E+00	1.660E−11	3.572E+02			
$1s\,3d\ ^1D_2$	$1s\,4f\ ^3F^o_3$	6.6595E+00	2.267E−10	4.871E+03			
$1s\,4s\ ^3S_1$	$1s\,4f\ ^3F^o_3$	1.6258E+02	2.126E−19	7.665E−09	1.6211E+02	1.540E−16	5.538E−06
$1s\,4d\ ^3D_2$	$1s\,4f\ ^3F^o_3$	7.9649E+02	3.345E−12	5.024E−03	8.0096E+02	3.264E−12	4.808E−03
$1s\,4d\ ^3D_1$	$1s\,4f\ ^3F^o_3$	8.2863E+02	5.020E−13	6.967E−04	8.3335E+02	4.900E−13	6.666E−04
$1s\,4d\ ^3D_3$	$1s\,4f\ ^3F^o_3$	5.1914E+04	8.399E−23	2.970E−17			
$1s^2\ ^1S_0$	$1s\,4f\ ^3F^o_2$	3.2740E−01	1.149E−10	1.430E+06	3.2603E−01	4.930E−12	6.135E+04
$1s\,2s\ ^3S_1$	$1s\,4f\ ^3F^o_2$	1.6017E+00	4.643E−11	2.414E+04	1.5949E+00	4.969E−13	2.583E+02
$1s\,2s\ ^1S_0$	$1s\,4f\ ^3F^o_2$	1.6195E+00	4.740E−11	2.411E+04	1.6129E+00	3.203E−13	1.628E+02
$1s\,3s\ ^3S_1$	$1s\,4f\ ^3F^o_2$	6.0636E+00	9.483E−12	3.441E+02			
$1s\,3s\ ^1S_0$	$1s\,4f\ ^3F^o_2$	6.1310E+00	6.089E−12	2.161E+02			
$1s\,3d\ ^3D_2$	$1s\,4f\ ^3F^o_2$	6.5264E+00	6.054E−07	1.896E+07	6.4991E+00	6.141E−07	1.923E+07
$1s\,3d\ ^3D_1$	$1s\,4f\ ^3F^o_2$	6.5315E+00	1.411E−06	4.412E+07	6.5041E+00	1.429E−06	4.469E+07
$1s\,3d\ ^3D_3$	$1s\,4f\ ^3F^o_2$	6.6535E+00	1.331E−14	4.010E−01			
$1s\,3d\ ^1D_2$	$1s\,4f\ ^3F^o_2$	6.6584E+00	6.185E−12	1.861E+02			
$1s\,4s\ ^3S_1$	$1s\,4f\ ^3F^o_2$	1.6191E+02	2.730E−16	1.389E−05	1.6143E+02	9.377E−17	4.760E−06
$1s\,4s\ ^1S_0$	$1s\,4f\ ^3F^o_2$	1.8368E+02	2.477E−16	9.794E−06	1.8340E+02	8.510E−17	3.346E−06
$1s\,4d\ ^3D_2$	$1s\,4f\ ^3F^o_2$	7.8052E+02	8.910E−13	1.951E−03	7.8473E+02	8.697E−13	1.868E−03
$1s\,4d\ ^3D_1$	$1s\,4f\ ^3F^o_2$	8.1135E+02	1.850E−12	3.749E−03	8.1580E+02	1.806E−12	3.590E−03
$1s\,4d\ ^3D_3$	$1s\,4f\ ^3F^o_2$	2.2242E+04	1.812E−22	4.886E−16			
$1s\,2p\ ^3P^o_1$	$1s\,4d\ ^1D_2$	1.6178E+00	1.786E−06	9.103E+08	1.6111E+00	1.843E−06	9.395E+08
$1s\,2p\ ^3P^o_0$	$1s\,4d\ ^1D_2$	1.6191E+00	2.139E−06	1.089E+09	1.6123E+00	2.188E−06	1.113E+09
$1s\,2p\ ^3P^o_2$	$1s\,4d\ ^1D_2$	1.7042E+00	5.187E−06	2.383E+09	1.6970E+00	5.388E−06	2.474E+09
$1s\,2p\ ^1P^o_1$	$1s\,4d\ ^1D_2$	1.7124E+00	1.163E−05	5.291E+09	1.7053E+00	1.205E−05	5.484E+09
$1s\,3p\ ^3P^o_1$	$1s\,4d\ ^1D_2$	6.1264E+00	5.148E−07	1.830E+07	6.1011E+00	5.378E−07	1.911E+07

(*continued on next page*)

Table 6 (*continued*)

Lower	Upper	GRASP2K			FAC		
		λ (Å)	*gf*	A (s^{-1})	λ (Å)	*gf*	A (s^{-1})
$1s\,3p\ ^3P^o_0$	$1s\,4d\ ^1D_2$	6.1312E+00	6.270E−07	2.225E+07	6.1056E+00	6.363E−07	2.257E+07
$1s\,3p\ ^3P^o_2$	$1s\,4d\ ^1D_2$	6.4976E+00	1.773E−06	5.603E+07	6.4704E+00	1.809E−06	5.717E+07
$1s\,3p\ ^1P^o_1$	$1s\,4d\ ^1D_2$	6.5315E+00	4.042E−06	1.264E+08	6.5045E+00	4.060E−06	1.269E+08
$1s\,4p\ ^3P^o_1$	$1s\,4d\ ^1D_2$	1.8218E+02	1.978E−10	7.953E+00	1.8111E+02	1.990E−10	8.026E+00
$1s\,4p\ ^3P^o_0$	$1s\,4d\ ^1D_2$	1.8388E+02	2.351E−10	9.278E+00	1.8274E+02	2.365E−10	9.368E+00
$1s\,4p\ ^3P^o_2$	$1s\,4d\ ^1D_2$	6.3767E+02	1.524E−11	5.000E−02	6.3050E+02	1.558E−11	5.186E−02
$1s\,4p\ ^1P^o_1$	$1s\,4d\ ^1D_2$	8.0810E+02	1.703E−11	3.478E−02	7.9983E+02	1.737E−11	3.591E−02
$1s\,4f\ ^3F^o_3$	$1s\,4d\ ^1D_2$	3.2125E+04	6.900E−21	8.919E−15			
$1s\,4f\ ^3F^o_2$	$1s\,4d\ ^1D_2$	1.8409E+05	1.136E−24	4.473E−20			
$1s\,3d\ ^3D_2$	$1s\,4f\ ^3F^o_4$	6.5015E+00	4.667E−06	8.182E+07	6.4744E+00	4.702E−06	8.243E+07
$1s\,3d\ ^3D_3$	$1s\,4f\ ^3F^o_4$	6.6276E+00	2.919E−05	4.925E+08	6.5997E+00	2.959E−05	4.992E+08
$1s\,3d\ ^1D_2$	$1s\,4f\ ^3F^o_4$	6.6325E+00	2.355E−06	3.967E+07	6.6046E+00	2.385E−06	4.019E+07
$1s\,4d\ ^3D_2$	$1s\,4f\ ^3F^o_4$	5.3564E+02	2.134E−11	5.513E−02	5.3733E+02	2.081E−11	5.297E−02
$1s\,4d\ ^3D_3$	$1s\,4f\ ^3F^o_4$	1.5856E+03	5.232E−12	1.542E−03	1.6034E+03	5.007E−12	1.431E−03
$1s\,4d\ ^1D_2$	$1s\,4f\ ^3F^o_4$	1.7232E+03	3.306E−13	8.252E−05	1.7474E+03	3.143E−13	7.566E−05
$1s\,2s\ ^3S_1$	$1s\,4f\ ^1F^o_3$	1.6001E+00	2.058E−13	7.659E+01			
$1s\,3s\ ^3S_1$	$1s\,4f\ ^1F^o_3$	6.0414E+00	5.284E−12	1.380E+02			
$1s\,3d\ ^3D_2$	$1s\,4f\ ^1F^o_3$	6.5007E+00	5.480E−07	1.236E+07	6.4736E+00	5.559E−07	1.253E+07
$1s\,3d\ ^3D_1$	$1s\,4f\ ^1F^o_3$	6.5058E+00	3.118E−06	7.020E+07	6.4786E+00	3.140E−06	7.069E+07
$1s\,3d\ ^3D_3$	$1s\,4f\ ^1F^o_3$	6.6268E+00	3.503E−06	7.602E+07	6.5989E+00	3.552E−06	7.708E+07
$1s\,3d\ ^1D_2$	$1s\,4f\ ^1F^o_3$	6.6317E+00	2.098E−05	4.545E+08	6.6038E+00	2.124E−05	4.602E+08
$1s\,4s\ ^3S_1$	$1s\,4f\ ^1F^o_3$	1.4747E+02	1.639E−15	7.182E−05	1.4705E+02	1.598E−15	6.984E−05
$1s\,4d\ ^3D_2$	$1s\,4f\ ^1F^o_3$	5.3023E+02	2.655E−12	8.999E−03	5.3185E+02	2.605E−12	8.701E−03
$1s\,4d\ ^3D_1$	$1s\,4f\ ^1F^o_3$	5.4428E+02	1.364E−11	4.388E−02	5.4594E+02	1.331E−11	4.220E−02
$1s\,4d\ ^3D_3$	$1s\,4f\ ^1F^o_3$	1.5391E+03	6.867E−13	2.763E−04	1.5556E+03	6.579E−13	2.568E−04
$1s\,4d\ ^1D_2$	$1s\,4f\ ^1F^o_3$	1.6685E+03	3.227E−12	1.105E−03	1.6908E+03	3.068E−12	1.014E−03
$1s\,2p\ ^3P^o_1$	$1s\,5s\ ^3S_1$	1.4605E+00	3.050E−10	3.179E+05	1.4544E+00	4.408E−10	4.594E+05
$1s\,2p\ ^3P^o_2$	$1s\,5s\ ^3S_1$	1.5306E+00	2.559E−07	2.429E+08	1.5241E+00	2.484E−07	2.357E+08
$1s\,2p\ ^1P^o_1$	$1s\,5s\ ^3S_1$	1.5372E+00	2.603E−07	2.449E+08	1.5308E+00	2.448E−07	2.302E+08
$1s\,3p\ ^3P^o_1$	$1s\,5s\ ^3S_1$	4.3516E+00	1.805E−10	2.119E+04	4.3336E+00	2.612E−10	3.066E+04
$1s\,3p\ ^3P^o_2$	$1s\,5s\ ^3S_1$	4.5356E+00	1.712E−07	1.851E+07	4.5167E+00	1.689E−07	1.825E+07
$1s\,3p\ ^1P^o_1$	$1s\,5s\ ^3S_1$	4.5521E+00	1.739E−07	1.866E+07	4.5333E+00	1.668E−07	1.790E+07
$1s\,4p\ ^3P^o_1$	$1s\,5s\ ^3S_1$	1.3877E+01	1.225E−10	1.414E+03	1.3818E+01	1.886E−10	2.178E+03
$1s\,4p\ ^3P^o_2$	$1s\,5s\ ^3S_1$	1.4675E+01	1.220E−07	1.260E+06	1.4612E+01	1.208E−07	1.247E+06
$1s\,4p\ ^1P^o_1$	$1s\,5s\ ^3S_1$	1.4747E+01	1.241E−07	1.268E+06	1.4684E+01	1.189E−07	1.215E+06
$1s\,4f\ ^3F^o_3$	$1s\,5s\ ^3S_1$	1.5014E+01	7.117E−15	7.019E−02			
$1s\,4f\ ^3F^o_2$	$1s\,5s\ ^3S_1$	1.5020E+01	3.744E−18	3.690E−05			
$1s\,4f\ ^1F^o_3$	$1s\,5s\ ^3S_1$	1.5158E+01	4.158E−14	4.024E−01			
$1s\,2s\ ^3S_1$	$1s\,5p\ ^3P^o_1$	1.4466E+00	2.751E−09	2.923E+06	1.4405E+00	2.623E−09	2.787E+06
$1s\,3s\ ^3S_1$	$1s\,5p\ ^3P^o_1$	4.3132E+00	9.001E−10	1.076E+05	4.2953E+00	7.868E−10	9.401E+04
$1s\,3d\ ^3D_2$	$1s\,5p\ ^3P^o_1$	4.5423E+00	1.872E−09	2.018E+05	4.5233E+00	1.852E−09	1.996E+05
$1s\,3d\ ^3D_1$	$1s\,5p\ ^3P^o_1$	4.5448E+00	1.860E−09	2.002E+05	4.5258E+00	1.819E−09	1.957E+05
$1s\,3d\ ^3D_3$	$1s\,5p\ ^3P^o_1$	4.6035E+00	3.130E−08	3.284E+06	4.5841E+00	3.112E−08	3.264E+06
$1s\,3d\ ^1D_2$	$1s\,5p\ ^3P^o_1$	4.6059E+00	1.184E−08	1.241E+06	4.5865E+00	1.116E−08	1.169E+06
$1s\,4s\ ^3S_1$	$1s\,5p\ ^3P^o_1$	1.3679E+01	3.955E−10	4.699E+03	1.3623E+01	3.048E−10	3.621E+03
$1s\,4d\ ^3D_2$	$1s\,5p\ ^3P^o_1$	1.4661E+01	2.272E−09	2.350E+04	1.4602E+01	2.264E−09	2.341E+04
$1s\,4d\ ^3D_1$	$1s\,5p\ ^3P^o_1$	1.4671E+01	2.229E−09	2.302E+04	1.4612E+01	2.198E−09	2.269E+04
$1s\,4d\ ^3D_3$	$1s\,5p\ ^3P^o_1$	1.4932E+01	3.752E−08	3.742E+05	1.4871E+01	3.761E−08	3.749E+05
$1s\,4d\ ^1D_2$	$1s\,5p\ ^3P^o_1$	1.4943E+01	1.413E−08	1.408E+05	1.4882E+01	1.340E−08	1.334E+05
$1s\,5s\ ^3S_1$	$1s\,5p\ ^3P^o_1$	2.8648E+03	8.236E−16	2.231E−07	2.9004E+03	8.265E−16	2.165E−07
$1s\,2p\ ^3P^o_2$	$1s\,5s\ ^1S_0$	1.5297E+00	1.624E−07	4.628E+08	1.5233E+00	1.659E−07	4.728E+08
$1s\,3p\ ^3P^o_2$	$1s\,5s\ ^1S_0$	4.5281E+00	1.095E−07	3.561E+07	4.5091E+00	1.132E−07	3.682E+07
$1s\,4p\ ^3P^o_2$	$1s\,5s\ ^1S_0$	1.4597E+01	7.783E−08	2.437E+06	1.4533E+01	8.188E−08	2.563E+06
$1s\,4f\ ^3F^o_2$	$1s\,5s\ ^1S_0$	1.4938E+01	9.202E−15	2.751E−01			
$1s\,3d\ ^3D_2$	$1s\,5p\ ^3P^o_0$	4.5418E+00	1.202E−09	3.888E+05	4.5228E+00	1.184E−09	3.828E+05
$1s\,3d\ ^1D_2$	$1s\,5p\ ^3P^o_0$	4.6053E+00	1.441E−08	4.531E+06	4.5860E+00	1.410E−08	4.436E+06
$1s\,4d\ ^3D_2$	$1s\,5p\ ^3P^o_0$	1.4656E+01	1.425E−09	4.426E+04	1.4597E+01	1.412E−09	4.385E+04
$1s\,4d\ ^1D_2$	$1s\,5p\ ^3P^o_0$	1.4937E+01	1.725E−08	5.156E+05	1.4877E+01	1.705E−08	5.096E+05
$1s^2\ ^1S_0$	$1s\,5p\ ^3P^o_2$	3.2010E−01	1.717E−05	2.234E+11	3.1883E−01	1.929E−05	2.510E+11
$1s\,2s\ ^3S_1$	$1s\,5p\ ^3P^o_2$	1.4424E+00	1.922E−06	1.232E+09	1.4363E+00	1.984E−06	1.272E+09
$1s\,2s\ ^1S_0$	$1s\,5p\ ^3P^o_2$	1.4568E+00	1.283E−06	8.066E+08	1.4509E+00	1.283E−06	8.066E+08
$1s\,3s\ ^3S_1$	$1s\,5p\ ^3P^o_2$	4.2763E+00	5.990E−07	4.370E+07	4.2586E+00	6.082E−07	4.435E+07
$1s\,3s\ ^1S_0$	$1s\,5p\ ^3P^o_2$	4.3097E+00	4.071E−07	2.924E+07	4.2923E+00	3.960E−07	2.843E+07
$1s\,3d\ ^3D_2$	$1s\,5p\ ^3P^o_2$	4.5014E+00	6.201E−14	4.082E+00			
$1s\,3d\ ^3D_1$	$1s\,5p\ ^3P^o_2$	4.5039E+00	5.894E−13	3.876E+01			
$1s\,3d\ ^3D_3$	$1s\,5p\ ^3P^o_2$	4.5615E+00	1.111E−07	7.123E+06	4.5423E+00	1.073E−07	6.882E+06
$1s\,3d\ ^1D_2$	$1s\,5p\ ^3P^o_2$	4.5638E+00	2.802E−08	1.794E+06	4.5447E+00	2.679E−08	1.716E+06
$1s\,4s\ ^3S_1$	$1s\,5p\ ^3P^o_2$	1.3315E+01	2.473E−07	1.861E+06	1.3261E+01	2.502E−07	1.882E+06
$1s\,4s\ ^1S_0$	$1s\,5p\ ^3P^o_2$	1.3446E+01	1.705E−07	1.258E+06	1.3392E+01	1.619E−07	1.194E+06
$1s\,4d\ ^3D_2$	$1s\,5p\ ^3P^o_2$	1.4243E+01	5.361E−13	3.525E+00			
$1s\,4d\ ^3D_1$	$1s\,5p\ ^3P^o_2$	1.4253E+01	3.646E−13	2.394E+00			

(*continued on next page*)

Table 6 (*continued*)

Lower	Upper	GRASP2K			FAC		
		λ (Å)	*gf*	A (s^{-1})	λ (Å)	*gf*	A (s^{-1})
$1s\,4d\ ^3D_3$	$1s\,5p\ ^3P^o_2$	1.4499E+01	1.363E−07	8.649E+05	1.4440E+01	1.327E−07	8.420E+05
$1s\,4d\ ^1D_2$	$1s\,5p\ ^3P^o_2$	1.4509E+01	3.425E−08	2.170E+05	1.4450E+01	3.310E−08	2.097E+05
$1s\,5s\ ^3S_1$	$1s\,5p\ ^3P^o_2$	4.2565E+02	2.014E−10	1.483E+00	4.2515E+02	2.001E−10	1.464E+00
$1s\,5s\ ^1S_0$	$1s\,5p\ ^3P^o_2$	5.0438E+02	8.081E−11	4.238E−01	5.0484E+02	7.970E−11	4.136E−01
$1s\,2p\ ^3P^o_1$	$1s\,5d\ ^3D_2$	1.4552E+00	1.344E−07	8.464E+07	1.4491E+00	1.437E−07	9.054E+07
$1s\,2p\ ^3P^o_0$	$1s\,5d\ ^3D_2$	1.4562E+00	8.458E−08	5.321E+07	1.4501E+00	8.881E−08	5.586E+07
$1s\,2p\ ^3P^o_2$	$1s\,5d\ ^3D_2$	1.5247E+00	7.189E−11	4.125E+04	1.5183E+00	1.049E−10	6.019E+04
$1s\,2p\ ^1P^o_1$	$1s\,5d\ ^3D_2$	1.5313E+00	7.295E−15	4.150E+00			
$1s\,3p\ ^3P^o_1$	$1s\,5d\ ^3D_2$	4.3049E+00	4.655E−08	3.351E+06	4.2870E+00	4.769E−08	3.433E+06
$1s\,3p\ ^3P^o_0$	$1s\,5d\ ^3D_2$	4.3072E+00	2.903E−08	2.087E+06	4.2892E+00	2.951E−08	2.121E+06
$1s\,3p\ ^3P^o_2$	$1s\,5d\ ^3D_2$	4.4849E+00	3.092E−11	2.051E+03	4.4661E+00	3.730E−11	2.473E+03
$1s\,3p\ ^1P^o_1$	$1s\,5d\ ^3D_2$	4.5010E+00	3.286E−13	2.164E+01			
$1s\,4p\ ^3P^o_1$	$1s\,5d\ ^3D_2$	1.3413E+01	1.867E−08	1.385E+05	1.3354E+01	1.890E−08	1.401E+05
$1s\,4p\ ^3P^o_0$	$1s\,5d\ ^3D_2$	1.3422E+01	1.165E−08	8.628E+04	1.3363E+01	1.171E−08	8.675E+04
$1s\,4p\ ^3P^o_2$	$1s\,5d\ ^3D_2$	1.4158E+01	1.382E−11	9.197E+01	1.4095E+01	1.553E−11	1.034E+02
$1s\,4p\ ^1P^o_1$	$1s\,5d\ ^3D_2$	1.4224E+01	2.600E−13	1.714E+00			
$1s\,4f\ ^3F^o_3$	$1s\,5d\ ^3D_2$	1.4473E+01	7.457E−09	4.750E+04	1.4409E+01	7.405E−09	4.718E+04
$1s\,4f\ ^3F^o_2$	$1s\,5d\ ^3D_2$	1.4478E+01	1.873E−09	1.192E+04	1.4414E+01	1.853E−09	1.179E+04
$1s\,4f\ ^3F^o_4$	$1s\,5d\ ^3D_2$	1.4602E+01	1.516E−08	9.483E+04	1.4537E+01	1.503E−08	9.412E+04
$1s\,4f\ ^1F^o_3$	$1s\,5d\ ^3D_2$	1.4606E+01	1.852E−09	1.158E+04	1.4541E+01	1.832E−09	1.146E+04
$1s\,5p\ ^3P^o_1$	$1s\,5d\ ^3D_2$	4.6651E+02	5.572E−12	3.415E−02	4.6168E+02	5.725E−12	3.553E−02
$1s\,5p\ ^3P^o_0$	$1s\,5d\ ^3D_2$	4.7209E+02	3.350E−12	2.005E−02	4.6698E+02	3.426E−12	2.078E−02
$1s\,5p\ ^3P^o_2$	$1s\,5d\ ^3D_2$	6.9791E+03	1.076E−18	2.947E−11			
$1s\,2s\ ^3S_1$	$1s\,5p\ ^1P^o_1$	1.4421E+00	1.903E−06	2.034E+09	1.4360E+00	1.983E−06	2.120E+09
$1s\,3s\ ^3S_1$	$1s\,5p\ ^1P^o_1$	4.2732E+00	5.899E−07	7.183E+07	4.2555E+00	6.087E−07	7.410E+07
$1s\,3d\ ^3D_2$	$1s\,5p\ ^1P^o_1$	4.4980E+00	3.519E−13	3.867E+01			
$1s\,3d\ ^3D_1$	$1s\,5p\ ^1P^o_1$	4.5005E+00	4.503E−14	4.944E+00			
$1s\,3d\ ^3D_3$	$1s\,5p\ ^1P^o_1$	4.5580E+00	1.937E−08	2.073E+06	4.5388E+00	1.975E−08	2.113E+06
$1s\,3d\ ^1D_2$	$1s\,5p\ ^1P^o_1$	4.5603E+00	6.171E−08	6.598E+06	4.5411E+00	6.080E−08	6.500E+06
$1s\,4s\ ^3S_1$	$1s\,5p\ ^1P^o_1$	1.3285E+01	2.421E−07	3.050E+06	1.3231E+01	2.516E−07	3.168E+06
$1s\,4d\ ^3D_2$	$1s\,5p\ ^1P^o_1$	1.4209E+01	7.511E−15	8.271E−02			
$1s\,4d\ ^3D_1$	$1s\,5p\ ^1P^o_1$	1.4219E+01	3.306E−13	3.636E+00			
$1s\,4d\ ^3D_3$	$1s\,5p\ ^1P^o_1$	1.4463E+01	2.382E−08	2.532E+05	1.4404E+01	2.459E−08	2.612E+05
$1s\,4d\ ^1D_2$	$1s\,5p\ ^1P^o_1$	1.4474E+01	7.561E−08	8.025E+05	1.4415E+01	7.547E−08	8.007E+05
$1s\,5s\ ^3S_1$	$1s\,5p\ ^1P^o_1$	3.9729E+02	2.478E−10	3.491E+00	3.9647E+02	2.465E−10	3.457E+00
$1s\,5d\ ^3D_2$	$1s\,5p\ ^1P^o_1$	4.1006E+04	1.343E−22	1.776E−16			
$1s\,2p\ ^3P^o_1$	$1s\,5d\ ^3D_1$	1.4551E+00	1.319E−07	1.385E+08	1.4491E+00	1.392E−07	1.461E+08
$1s\,2p\ ^3P^o_2$	$1s\,5d\ ^3D_1$	1.5247E+00	2.190E−13	2.095E+02			
$1s\,2p\ ^1P^o_1$	$1s\,5d\ ^3D_1$	1.5313E+00	1.600E−10	1.517E+05	1.5249E+00	1.733E−10	1.643E+05
$1s\,3p\ ^3P^o_1$	$1s\,5d\ ^3D_1$	4.3044E+00	4.527E−08	5.432E+06	4.2865E+00	4.624E−08	5.548E+06
$1s\,3p\ ^3P^o_2$	$1s\,5d\ ^3D_1$	4.4844E+00	3.083E−13	3.408E+01			
$1s\,3p\ ^1P^o_1$	$1s\,5d\ ^3D_1$	4.5005E+00	5.280E−11	5.796E+03	4.4818E+00	4.790E−11	5.257E+03
$1s\,4p\ ^3P^o_1$	$1s\,5d\ ^3D_1$	1.3409E+01	1.812E−08	2.241E+05	1.3350E+01	1.835E−08	2.270E+05
$1s\,4p\ ^3P^o_2$	$1s\,5d\ ^3D_1$	1.4153E+01	2.043E−13	2.268E+00			
$1s\,4p\ ^1P^o_1$	$1s\,5d\ ^3D_1$	1.4219E+01	2.169E−11	2.385E+02	1.4157E+01	1.589E−11	1.748E+02
$1s\,4f\ ^3F^o_3$	$1s\,5d\ ^3D_1$	1.4467E+01	1.254E−09	1.332E+04	1.4404E+01	1.253E−09	1.332E+04
$1s\,4f\ ^3F^o_2$	$1s\,5d\ ^3D_1$	1.4473E+01	4.348E−09	4.616E+04	1.4409E+01	4.329E−09	4.596E+04
$1s\,4f\ ^1F^o_3$	$1s\,5d\ ^3D_1$	1.4601E+01	1.014E−08	1.058E+05	1.4536E+01	1.009E−08	1.053E+05
$1s\,5p\ ^3P^o_1$	$1s\,5d\ ^3D_1$	4.6125E+02	5.605E−12	5.858E−02	4.5655E+02	5.740E−12	6.071E−02
$1s\,5p\ ^3P^o_2$	$1s\,5d\ ^3D_1$	5.9615E+03	1.448E−19	9.058E−12			
$1s\,5p\ ^1P^o_1$	$1s\,5d\ ^3D_1$	1.4006E+07	1.496E−28	1.698E−27			
$1s\,2p\ ^3P^o_1$	$1s\,5d\ ^3D_3$	1.4539E+00	2.153E−06	9.704E+08	1.4478E+00	2.200E−06	9.919E+08
$1s\,2p\ ^3P^o_2$	$1s\,5d\ ^3D_3$	1.5233E+00	9.425E−06	3.871E+09	1.5168E+00	9.852E−06	4.045E+09
$1s\,2p\ ^1P^o_1$	$1s\,5d\ ^3D_3$	1.5298E+00	1.691E−06	6.884E+08	1.5235E+00	1.767E−06	7.196E+08
$1s\,3p\ ^3P^o_1$	$1s\,5d\ ^3D_3$	4.2932E+00	7.013E−07	3.626E+07	4.2754E+00	7.111E−07	3.676E+07
$1s\,3p\ ^3P^o_2$	$1s\,5d\ ^3D_3$	4.4722E+00	3.457E−06	1.647E+08	4.4535E+00	3.522E−06	1.678E+08
$1s\,3p\ ^1P^o_1$	$1s\,5d\ ^3D_3$	4.4883E+00	6.233E−07	2.948E+07	4.4696E+00	6.279E−07	2.969E+07
$1s\,4p\ ^3P^o_1$	$1s\,5d\ ^3D_3$	1.3300E+01	2.701E−07	1.455E+06	1.3242E+01	2.699E−07	1.454E+06
$1s\,4p\ ^3P^o_2$	$1s\,5d\ ^3D_3$	1.4032E+01	1.483E−06	7.178E+06	1.3970E+01	1.506E−06	7.291E+06
$1s\,4p\ ^1P^o_1$	$1s\,5d\ ^3D_3$	1.4097E+01	2.694E−07	1.292E+06	1.4036E+01	2.656E−07	1.274E+06
$1s\,4f\ ^3F^o_3$	$1s\,5d\ ^3D_3$	1.4341E+01	5.108E−14	2.367E−01			
$1s\,4f\ ^3F^o_2$	$1s\,5d\ ^3D_3$	1.4347E+01	1.695E−13	7.849E−01			
$1s\,4f\ ^3F^o_4$	$1s\,5d\ ^3D_3$	1.4468E+01	8.474E−08	3.857E+05	1.4405E+01	8.385E−08	3.818E+05
$1s\,4f\ ^1F^o_3$	$1s\,5d\ ^3D_3$	1.4472E+01	1.019E−08	4.636E+04	1.4409E+01	1.005E−08	4.575E+04
$1s\,5p\ ^3P^o_1$	$1s\,5d\ ^3D_3$	3.6020E+02	1.859E−10	1.366E+00	3.5728E+02	1.880E−10	1.392E+00
$1s\,5p\ ^3P^o_2$	$1s\,5d\ ^3D_3$	1.2888E+03	2.022E−11	1.160E−02	1.2633E+03	2.122E−11	1.256E−02
$1s\,5p\ ^1P^o_1$	$1s\,5d\ ^3D_3$	1.6441E+03	1.755E−12	6.188E−04	1.6091E+03	1.854E−12	6.766E−04
$1s\,2s\ ^3S_1$	$1s\,5f\ ^3F^o_3$	1.4408E+00	9.780E−11	4.489E+04			
$1s\,3s\ ^3S_1$	$1s\,5f\ ^3F^o_3$	4.2620E+00	6.114E−13	3.207E+01			
$1s\,3d\ ^3D_2$	$1s\,5f\ ^3F^o_3$	4.4855E+00	7.993E−07	3.786E+07	4.4667E+00	8.162E−07	3.865E+07
$1s\,3d\ ^3D_1$	$1s\,5f\ ^3F^o_3$	4.4880E+00	1.349E−07	6.380E+06	4.4691E+00	1.376E−07	6.509E+06

(*continued on next page*)

Table 6 (*continued*)

Lower	Upper	GRASP2K			FAC		
		λ (Å)	*gf*	A (s^{-1})	λ (Å)	*gf*	A (s^{-1})
$1s\,3d\ ^3D_3$	$1s\,5f\ ^3F^o_3$	4.5452E+00	4.800E−12	2.214E+02			
$1s\,3d\ ^1D_2$	$1s\,5f\ ^3F^o_3$	4.5475E+00	6.705E−11	3.089E+03			
$1s\,4s\ ^3S_1$	$1s\,5f\ ^3F^o_3$	1.3177E+01	2.554E−13	1.402E+00			
$1s\,4d\ ^3D_2$	$1s\,5f\ ^3F^o_3$	1.4085E+01	4.505E−07	2.164E+06	1.4028E+01	4.534E−07	2.177E+06
$1s\,4d\ ^3D_1$	$1s\,5f\ ^3F^o_3$	1.4095E+01	7.610E−08	3.650E+05	1.4038E+01	7.640E−08	3.663E+05
$1s\,4d\ ^3D_3$	$1s\,5f\ ^3F^o_3$	1.4335E+01	2.763E−12	1.281E+01			
$1s\,4d\ ^1D_2$	$1s\,5f\ ^3F^o_3$	1.4345E+01	5.743E−11	2.659E+02	1.4286E+01	5.957E−11	2.757E+02
$1s\,5s\ ^3S_1$	$1s\,5f\ ^3F^o_3$	3.1888E+02	1.023E−17	9.585E−08	3.1776E+02	8.216E−17	7.688E−07
$1s\,5d\ ^3D_2$	$1s\,5f\ ^3F^o_3$	1.5543E+03	1.612E−12	6.359E−04	1.5716E+03	1.545E−12	5.911E−04
$1s\,5d\ ^3D_1$	$1s\,5f\ ^3F^o_3$	1.6158E+03	2.424E−13	8.846E−05	1.6341E+03	2.321E−13	8.213E−05
$1s\,5d\ ^3D_3$	$1s\,5f\ ^3F^o_3$	9.3195E+04	4.604E−23	5.051E−18			
$1s^2\ ^1S_0$	$1s\,5f\ ^3F^o_2$	3.2000E−01	9.916E−11	1.291E+06	3.1875E−01	4.044E−12	5.265E+04
$1s\,2s\ ^3S_1$	$1s\,5f\ ^3F^o_2$	1.4408E+00	3.316E−11	2.131E+04	1.4347E+00	4.172E−13	2.681E+02
$1s\,2s\ ^1S_0$	$1s\,5f\ ^3F^o_2$	1.4551E+00	3.223E−11	2.030E+04	1.4492E+00	2.698E−13	1.699E+02
$1s\,3s\ ^3S_1$	$1s\,5f\ ^3F^o_2$	4.2617E+00	1.699E−12	1.248E+02			
$1s\,3s\ ^1S_0$	$1s\,5f\ ^3F^o_2$	4.2949E+00	1.182E−12	8.548E+01			
$1s\,3d\ ^3D_2$	$1s\,5f\ ^3F^o_2$	4.4853E+00	2.005E−07	1.330E+07	4.4664E+00	2.044E−07	1.355E+07
$1s\,3d\ ^3D_1$	$1s\,5f\ ^3F^o_2$	4.4877E+00	4.668E−07	3.092E+07	4.4688E+00	4.763E−07	3.155E+07
$1s\,3d\ ^3D_3$	$1s\,5f\ ^3F^o_2$	4.5449E+00	4.501E−15	2.907E−01			
$1s\,3d\ ^1D_2$	$1s\,5f\ ^3F^o_2$	4.5472E+00	1.914E−12	1.235E+02			
$1s\,4s\ ^3S_1$	$1s\,5f\ ^3F^o_2$	1.3175E+01	1.082E−12	8.314E+00			
$1s\,4s\ ^1S_0$	$1s\,5f\ ^3F^o_2$	1.3303E+01	5.809E−13	4.379E+00			
$1s\,4d\ ^3D_2$	$1s\,5f\ ^3F^o_2$	1.4083E+01	1.128E−07	7.589E+05	1.4025E+01	1.136E−07	7.641E+05
$1s\,4d\ ^3D_1$	$1s\,5f\ ^3F^o_2$	1.4092E+01	2.633E−07	1.768E+06	1.4035E+01	2.646E−07	1.776E+06
$1s\,4d\ ^3D_3$	$1s\,5f\ ^3F^o_2$	1.4332E+01	2.202E−14	1.430E−01			
$1s\,4d\ ^1D_2$	$1s\,5f\ ^3F^o_2$	1.4343E+01	2.824E−12	1.832E+01			
$1s\,5s\ ^3S_1$	$1s\,5f\ ^3F^o_2$	3.1755E+02	1.065E−16	1.409E−06	3.1643E+02	4.872E−17	6.436E−07
$1s\,5s\ ^1S_0$	$1s\,5f\ ^3F^o_2$	3.5940E+02	1.023E−16	1.057E−06	3.5855E+02	4.660E−17	4.795E−07
$1s\,5d\ ^3D_2$	$1s\,5f\ ^3F^o_2$	1.5232E+03	4.293E−13	2.469E−04	1.5396E+03	4.117E−13	2.297E−04
$1s\,5d\ ^3D_1$	$1s\,5f\ ^3F^o_2$	1.5821E+03	8.937E−13	4.763E−04	1.5996E+03	8.566E−13	4.428E−04
$1s\,5d\ ^3D_3$	$1s\,5f\ ^3F^o_2$	4.1865E+04	1.183E−22	9.007E−17			
$1s\,2p\ ^3P^o_1$	$1s\,5d\ ^1D_2$	1.4538E+00	8.312E−07	5.247E+08	1.4478E+00	8.539E−07	5.388E+08
$1s\,2p\ ^3P^o_0$	$1s\,5d\ ^1D_2$	1.4548E+00	9.966E−07	6.282E+08	1.4487E+00	1.018E−06	6.420E+08
$1s\,2p\ ^3P^o_2$	$1s\,5d\ ^1D_2$	1.5232E+00	2.366E−06	1.360E+09	1.5168E+00	2.463E−06	1.416E+09
$1s\,2p\ ^1P^o_1$	$1s\,5d\ ^1D_2$	1.5298E+00	5.292E−06	3.017E+09	1.5234E+00	5.518E−06	3.145E+09
$1s\,3p\ ^3P^o_1$	$1s\,5d\ ^1D_2$	4.2927E+00	2.650E−07	1.918E+07	4.2749E+00	2.739E−07	1.982E+07
$1s\,3p\ ^3P^o_0$	$1s\,5d\ ^1D_2$	4.2951E+00	3.229E−07	2.335E+07	4.2771E+00	3.287E−07	2.377E+07
$1s\,3p\ ^3P^o_2$	$1s\,5d\ ^1D_2$	4.4717E+00	8.646E−07	5.768E+07	4.4529E+00	8.809E−07	5.876E+07
$1s\,3p\ ^1P^o_1$	$1s\,5d\ ^1D_2$	4.4877E+00	1.961E−06	1.299E+08	4.4691E+00	1.983E−06	1.313E+08
$1s\,4p\ ^3P^o_1$	$1s\,5d\ ^1D_2$	1.3295E+01	1.013E−07	7.645E+05	1.3238E+01	1.057E−07	7.981E+05
$1s\,4p\ ^3P^o_0$	$1s\,5d\ ^1D_2$	1.3304E+01	1.241E−07	9.356E+05	1.3246E+01	1.253E−07	9.450E+05
$1s\,4p\ ^3P^o_2$	$1s\,5d\ ^1D_2$	1.4027E+01	3.703E−07	2.511E+06	1.3965E+01	3.769E−07	2.556E+06
$1s\,4p\ ^1P^o_1$	$1s\,5d\ ^1D_2$	1.4092E+01	8.483E−07	5.699E+06	1.4031E+01	8.480E−07	5.698E+06
$1s\,4f\ ^3F^o_3$	$1s\,5d\ ^1D_2$	1.4336E+01	1.005E−12	6.522E+00			
$1s\,4f\ ^3F^o_2$	$1s\,5d\ ^1D_2$	1.4341E+01	4.083E−16	2.648E−03			
$1s\,4f\ ^3F^o_4$	$1s\,5d\ ^1D_2$	1.4463E+01	6.852E−09	4.371E+04	1.4399E+01	6.850E−09	4.370E+04
$1s\,4f\ ^1F^o_3$	$1s\,5d\ ^1D_2$	1.4467E+01	6.065E−08	3.866E+05	1.4403E+01	6.025E−08	3.842E+05
$1s\,5p\ ^3P^o_1$	$1s\,5d\ ^1D_2$	3.5679E+02	7.174E−11	7.518E−01	3.5385E+02	7.273E−11	7.683E−01
$1s\,5p\ ^3P^o_0$	$1s\,5d\ ^1D_2$	3.6004E+02	8.559E−11	8.808E−01	3.5695E+02	8.675E−11	9.006E−01
$1s\,5p\ ^3P^o_2$	$1s\,5d\ ^1D_2$	1.2461E+03	5.596E−12	4.807E−03	1.2214E+03	5.871E−12	5.205E−03
$1s\,5p\ ^1P^o_1$	$1s\,5d\ ^1D_2$	1.5753E+03	6.301E−12	3.387E−03	1.5418E+03	6.642E−12	3.695E−03
$1s\,5f\ ^3F^o_3$	$1s\,5d\ ^1D_2$	6.3169E+04	3.487E−21	1.166E−15			
$1s\,5f\ ^3F^o_2$	$1s\,5d\ ^1D_2$	3.7392E+05	6.620E−25	6.316E−21			
$1s\,3d\ ^3D_2$	$1s\,5f\ ^3F^o_4$	4.4792E+00	1.568E−06	5.791E+07	4.4604E+00	1.578E−06	5.829E+07
$1s\,3d\ ^3D_3$	$1s\,5f\ ^3F^o_4$	4.5387E+00	9.572E−06	3.444E+08	4.5196E+00	9.774E−06	3.516E+08
$1s\,3d\ ^1D_2$	$1s\,5f\ ^3F^o_4$	4.5410E+00	7.718E−07	2.774E+07	4.5219E+00	7.887E−07	2.834E+07
$1s\,4d\ ^3D_2$	$1s\,5f\ ^3F^o_4$	1.4024E+01	8.559E−07	3.226E+06	1.3967E+01	8.610E−07	3.243E+06
$1s\,4d\ ^3D_3$	$1s\,5f\ ^3F^o_4$	1.4271E+01	5.505E−06	2.003E+07	1.4212E+01	5.539E−06	2.015E+07
$1s\,4d\ ^1D_2$	$1s\,5f\ ^3F^o_4$	1.4281E+01	4.469E−07	1.624E+06	1.4223E+01	4.490E−07	1.631E+06
$1s\,5d\ ^3D_2$	$1s\,5f\ ^3F^o_4$	1.0450E+03	1.024E−11	6.949E−03	1.0522E+03	9.888E−12	6.563E−03
$1s\,5d\ ^3D_3$	$1s\,5f\ ^3F^o_4$	3.0834E+03	2.544E−12	1.984E−04	3.1501E+03	2.359E−12	1.747E−04
$1s\,5d\ ^1D_2$	$1s\,5f\ ^3F^o_4$	3.3584E+03	1.601E−13	1.052E−05	3.4443E+03	1.470E−13	9.108E−06
$1s\,2p\ ^3P^o_2$	$1s\,5g\ ^3G_4$	1.5225E+00	2.015E−11	6.442E+03			
$1s\,3p\ ^3P^o_2$	$1s\,5g\ ^3G_4$	4.4657E+00	2.464E−11	9.157E+02			
$1s\,4p\ ^3P^o_2$	$1s\,5g\ ^3G_4$	1.3968E+01	1.156E−12	4.392E+00			
$1s\,4f\ ^3F^o_3$	$1s\,5g\ ^3G_4$	1.4275E+01	2.706E−06	9.841E+06	1.4214E+01	2.727E−06	9.920E+06
$1s\,4f\ ^3F^o_2$	$1s\,5g\ ^3G_4$	1.4280E+01	2.186E−07	7.945E+05	1.4219E+01	2.202E−07	8.004E+05
$1s\,4f\ ^3F^o_4$	$1s\,5g\ ^3G_4$	1.4400E+01	4.154E−12	1.485E+01			
$1s\,4f\ ^1F^o_3$	$1s\,5g\ ^3G_4$	1.4404E+01	1.035E−11	3.695E+01			
$1s\,5p\ ^3P^o_2$	$1s\,5g\ ^3G_4$	9.0842E+02	6.390E−20	5.739E−11			
$1s\,5f\ ^3F^o_3$	$1s\,5g\ ^3G_4$	3.1830E+03	4.013E−13	2.936E−05	3.1753E+03	4.002E−13	2.917E−05

(*continued on next page*)

Table 6 (*continued*)

Lower	Upper	GRASP2K			FAC		
		λ (Å)	*gf*	A (s^{-1})	λ (Å)	*gf*	A (s^{-1})
$1s\,5f\ ^3F^o_2$	$1s\,5g\ ^3G_4$	3.3221E+03	2.853E−14	1.916E−06	3.3144E+03	2.845E−14	1.903E−06
$1s\,5f\ ^3F^o_4$	$1s\,5g\ ^3G_4$	1.7265E+06	3.911E−27	9.725E−25			
$1s\,2p\ ^3P^o_1$	$1s\,5g\ ^3G_3$	1.4532E+00	1.974E−14	8.909E+00	1.4471E+00	1.086E−15	4.903E−01
$1s\,2p\ ^3P^o_2$	$1s\,5g\ ^3G_3$	1.5225E+00	2.038E−12	8.377E+02	1.5161E+00	4.521E−15	1.858E+00
$1s\,2p\ ^1P^o_1$	$1s\,5g\ ^3G_3$	1.5291E+00	1.334E−11	5.435E+03			
$1s\,3p\ ^3P^o_1$	$1s\,5g\ ^3G_3$	4.2871E+00	4.526E−14	2.347E+00	4.2694E+00	3.515E−16	1.822E−02
$1s\,3p\ ^3P^o_2$	$1s\,5g\ ^3G_3$	4.4656E+00	2.799E−12	1.337E+02	4.4470E+00	1.621E−15	7.745E−02
$1s\,3p\ ^1P^o_1$	$1s\,5g\ ^3G_3$	4.4816E+00	1.566E−11	7.431E+02			
$1s\,4p\ ^3P^o_1$	$1s\,5g\ ^3G_3$	1.3242E+01	1.450E−15	7.879E−03			
$1s\,4p\ ^3P^o_2$	$1s\,5g\ ^3G_3$	1.3967E+01	7.954E−13	3.886E+00			
$1s\,4p\ ^1P^o_1$	$1s\,5g\ ^3G_3$	1.4032E+01	1.012E−12	4.900E+00			
$1s\,4f\ ^3F^o_3$	$1s\,5g\ ^3G_3$	1.4273E+01	3.250E−07	1.520E+06	1.4213E+01	3.276E−07	1.532E+06
$1s\,4f\ ^3F^o_2$	$1s\,5g\ ^3G_3$	1.4278E+01	1.949E−06	9.109E+06	1.4218E+01	1.963E−06	9.178E+06
$1s\,4f\ ^3F^o_4$	$1s\,5g\ ^3G_3$	1.4399E+01	1.054E−18	4.843E−06			
$1s\,4f\ ^1F^o_3$	$1s\,5g\ ^3G_3$	1.4403E+01	1.506E−12	6.918E+00			
$1s\,5p\ ^3P^o_1$	$1s\,5g\ ^3G_3$	3.2168E+02	4.463E−20	4.110E−10			
$1s\,5p\ ^3P^o_2$	$1s\,5g\ ^3G_3$	9.0225E+02	3.077E−18	3.602E−09			
$1s\,5p\ ^1P^o_1$	$1s\,5g\ ^3G_3$	1.0631E+03	3.176E−19	2.678E−10			
$1s\,5f\ ^3F^o_3$	$1s\,5g\ ^3G_3$	3.1085E+03	5.176E−14	5.104E−06	3.1008E+03	5.161E−14	5.071E−06
$1s\,5f\ ^3F^o_2$	$1s\,5g\ ^3G_3$	3.2410E+03	2.739E−13	2.485E−05	3.2333E+03	2.731E−13	2.468E−05
$1s\,5f\ ^3F^o_4$	$1s\,5g\ ^3G_3$	1.2333E+05	1.693E−26	1.061E−21			
$1s\,2s\ ^3S_1$	$1s\,5f\ ^1F^o_3$	1.4401E+00	1.285E−13	5.904E+01			
$1s\,3s\ ^3S_1$	$1s\,5f\ ^1F^o_3$	4.2561E+00	2.007E−12	1.056E+02			
$1s\,3d\ ^3D_2$	$1s\,5f\ ^1F^o_3$	4.4790E+00	1.841E−07	8.745E+06	4.4602E+00	1.862E−07	8.846E+06
$1s\,3d\ ^3D_1$	$1s\,5f\ ^1F^o_3$	4.4815E+00	1.047E−06	4.968E+07	4.4626E+00	1.054E−06	5.003E+07
$1s\,3d\ ^3D_3$	$1s\,5f\ ^1F^o_3$	4.5385E+00	1.150E−06	5.319E+07	4.5194E+00	1.173E−06	5.426E+07
$1s\,3d\ ^1D_2$	$1s\,5f\ ^1F^o_3$	4.5408E+00	6.878E−06	3.179E+08	4.5217E+00	7.019E−06	3.243E+08
$1s\,4s\ ^3S_1$	$1s\,5f\ ^1F^o_3$	1.3121E+01	1.246E−12	6.899E+00			
$1s\,4d\ ^3D_2$	$1s\,5f\ ^1F^o_3$	1.4022E+01	1.031E−07	4.999E+05	1.3965E+01	1.047E−07	5.074E+05
$1s\,4d\ ^3D_1$	$1s\,5f\ ^1F^o_3$	1.4031E+01	5.739E−07	2.778E+06	1.3974E+01	5.770E−07	2.791E+06
$1s\,4d\ ^3D_3$	$1s\,5f\ ^1F^o_3$	1.4269E+01	6.604E−07	3.091E+06	1.4210E+01	6.650E−07	3.111E+06
$1s\,4d\ ^1D_2$	$1s\,5f\ ^1F^o_3$	1.4279E+01	3.956E−06	1.849E+07	1.4221E+01	3.974E−06	1.856E+07
$1s\,5s\ ^3S_1$	$1s\,5f\ ^1F^o_3$	2.8907E+02	8.703E−16	9.925E−06	2.8810E+02	8.531E−16	9.711E−06
$1s\,5d\ ^3D_2$	$1s\,5f\ ^1F^o_3$	1.0343E+03	1.288E−12	1.147E−03	1.0413E+03	1.252E−12	1.091E−03
$1s\,5d\ ^3D_1$	$1s\,5f\ ^1F^o_3$	1.0612E+03	6.565E−12	5.555E−03	1.0684E+03	6.346E−12	5.252E−03
$1s\,5d\ ^3D_3$	$1s\,5f\ ^1F^o_3$	2.9925E+03	3.341E−13	3.555E−05	3.0547E+03	3.104E−13	3.143E−05
$1s\,5d\ ^1D_2$	$1s\,5f\ ^1F^o_3$	3.2509E+03	1.560E−12	1.406E−04	3.3306E+03	1.434E−12	1.221E−04
$1s\,5g\ ^3G_4$	$1s\,5f\ ^1F^o_3$	1.0795E+05	4.552E−23	3.723E−18			
$1s\,5g\ ^3G_3$	$1s\,5f\ ^1F^o_3$	5.7657E+05	3.514E−26	1.007E−22			
$1s\,4f\ ^3F^o_3$	$1s\,5g\ ^3G_5$	1.4237E+01	1.884E−06	5.637E+06	1.4177E+01	1.892E−06	5.660E+06
$1s\,4f\ ^3F^o_4$	$1s\,5g\ ^3G_5$	1.4362E+01	1.643E−05	4.829E+07	1.4301E+01	1.656E−05	4.868E+07
$1s\,4f\ ^1F^o_3$	$1s\,5g\ ^3G_5$	1.4366E+01	7.767E−07	2.282E+06	1.4305E+01	7.827E−07	2.300E+06
$1s\,5f\ ^3F^o_3$	$1s\,5g\ ^3G_5$	1.9964E+03	1.136E−12	1.728E−04	1.9918E+03	1.127E−12	1.708E−04
$1s\,5f\ ^3F^o_4$	$1s\,5g\ ^3G_5$	5.3388E+03	5.211E−13	1.109E−05	5.3203E+03	5.207E−13	1.106E−05
$1s\,5f\ ^1F^o_3$	$1s\,5g\ ^3G_5$	5.6350E+03	2.097E−14	4.004E−07	5.6164E+03	2.094E−14	3.992E−07
$1s\,2p\ ^3P^o_2$	$1s\,5g\ ^1G_4$	1.5221E+00	4.230E−15	1.353E+00			
$1s\,3p\ ^3P^o_2$	$1s\,5g\ ^1G_4$	4.4619E+00	5.547E−15	2.065E−01			
$1s\,4p\ ^3P^o_2$	$1s\,5g\ ^1G_4$	1.3931E+01	1.748E−13	6.674E−01			
$1s\,4f\ ^3F^o_3$	$1s\,5g\ ^1G_4$	1.4236E+01	1.107E−07	4.048E+05	1.4175E+01	1.111E−07	4.065E+05
$1s\,4f\ ^3F^o_2$	$1s\,5g\ ^1G_4$	1.4241E+01	1.421E−06	5.192E+06	1.4181E+01	1.426E−06	5.211E+06
$1s\,4f\ ^3F^o_4$	$1s\,5g\ ^1G_4$	1.4361E+01	1.174E−06	4.218E+06	1.4299E+01	1.183E−06	4.252E+06
$1s\,4f\ ^1F^o_3$	$1s\,5g\ ^1G_4$	1.4364E+01	1.291E−05	4.637E+07	1.4303E+01	1.301E−05	4.673E+07
$1s\,5p\ ^3P^o_2$	$1s\,5g\ ^1G_4$	7.7310E+02	3.149E−18	3.904E−09			
$1s\,5f\ ^3F^o_3$	$1s\,5g\ ^1G_4$	1.9730E+03	6.937E−14	1.321E−05	1.9684E+03	6.886E−14	1.306E−05
$1s\,5f\ ^3F^o_2$	$1s\,5g\ ^1G_4$	2.0256E+03	8.205E−13	1.482E−04	2.0210E+03	8.142E−13	1.464E−04
$1s\,5f\ ^3F^o_4$	$1s\,5g\ ^1G_4$	5.1744E+03	4.089E−14	1.132E−06	5.1563E+03	4.086E−14	1.129E−06
$1s\,5f\ ^1F^o_3$	$1s\,5g\ ^1G_4$	5.4521E+03	3.846E−13	9.589E−06	5.4339E+03	3.841E−13	9.561E−06
$1s\,2p\ ^3P^o_1$	$1s\,6s\ ^3S_1$	1.3813E+00	1.649E−10	1.922E+05	1.3756E+00	2.617E−10	3.049E+05
$1s\,2p\ ^3P^o_2$	$1s\,6s\ ^3S_1$	1.4438E+00	1.444E−07	1.540E+08	1.4378E+00	1.405E−07	1.498E+08
$1s\,2p\ ^1P^o_1$	$1s\,6s\ ^3S_1$	1.4497E+00	1.473E−07	1.558E+08	1.4438E+00	1.385E−07	1.465E+08
$1s\,3p\ ^3P^o_1$	$1s\,6s\ ^3S_1$	3.7169E+00	1.013E−10	1.630E+04	3.7018E+00	1.480E−10	2.381E+04
$1s\,3p\ ^3P^o_2$	$1s\,6s\ ^3S_1$	3.8504E+00	9.482E−08	1.422E+07	3.8346E+00	9.350E−08	1.401E+07
$1s\,3p\ ^1P^o_1$	$1s\,6s\ ^3S_1$	3.8623E+00	9.621E−08	1.434E+07	3.8466E+00	9.250E−08	1.378E+07
$1s\,4p\ ^3P^o_1$	$1s\,6s\ ^3S_1$	8.9847E+00	6.745E−11	1.858E+03	8.9484E+00	9.833E−11	2.707E+03
$1s\,4p\ ^3P^o_2$	$1s\,6s\ ^3S_1$	9.3128E+00	6.550E−08	1.679E+06	9.2750E+00	6.491E−08	1.663E+06
$1s\,4p\ ^1P^o_1$	$1s\,6s\ ^3S_1$	9.3416E+00	6.643E−08	1.693E+06	9.3040E+00	6.422E−08	1.635E+06
$1s\,4f\ ^3F^o_3$	$1s\,6s\ ^3S_1$	9.4480E+00	3.729E−15	9.287E−02			
$1s\,4f\ ^3F^o_2$	$1s\,6s\ ^3S_1$	9.4503E+00	1.759E−16	4.380E−03			
$1s\,4f\ ^1F^o_3$	$1s\,6s\ ^3S_1$	9.5047E+00	1.805E−14	4.441E−01			
$1s\,5p\ ^3P^o_1$	$1s\,6s\ ^3S_1$	2.5714E+01	4.946E−11	1.663E+02	2.5617E+01	7.675E−11	2.578E+02
$1s\,5p\ ^3P^o_2$	$1s\,6s\ ^3S_1$	2.7109E+01	4.962E−08	1.501E+05	2.7006E+01	4.914E−08	1.485E+05

(*continued on next page*)

Table 6 (*continued*)

Lower	Upper	GRASP2K			FAC		
		λ (Å)	*gf*	A (s^{-1})	λ (Å)	*gf*	A (s^{-1})
$1s\,5p\ ^1P^o_1$	$1s\,6s\ ^3S_1$	2.7232E+01	5.040E−08	1.511E+05	2.7131E+01	4.840E−08	1.449E+05
$1s\,5f\ ^3F^o_3$	$1s\,6s\ ^3S_1$	2.7699E+01	4.652E−15	1.348E−02			
$1s\,5f\ ^3F^o_2$	$1s\,6s\ ^3S_1$	2.7709E+01	7.330E−17	2.123E−04			
$1s\,5f\ ^1F^o_3$	$1s\,6s\ ^3S_1$	2.7950E+01	3.169E−14	9.021E−02			
$1s\,2s\ ^3S_1$	$1s\,6p\ ^3P^o_1$	1.3692E+00	1.564E−09	1.855E+06	1.3634E+00	2.513E−09	2.980E+06
$1s\,3s\ ^3S_1$	$1s\,6p\ ^3P^o_1$	3.6909E+00	5.170E−10	8.438E+04	3.6756E+00	7.777E−10	1.269E+05
$1s\,3d\ ^3D_2$	$1s\,6p\ ^3P^o_1$	3.8574E+00	9.776E−10	1.461E+05	3.8413E+00	9.678E−10	1.445E+05
$1s\,3d\ ^3D_1$	$1s\,6p\ ^3P^o_1$	3.8592E+00	9.778E−10	1.460E+05	3.8431E+00	9.506E−10	1.419E+05
$1s\,3d\ ^3D_3$	$1s\,6p\ ^3P^o_1$	3.9015E+00	1.634E−08	2.387E+06	3.8850E+00	1.597E−08	2.333E+06
$1s\,3d\ ^1D_2$	$1s\,6p\ ^3P^o_1$	3.9032E+00	6.202E−09	9.052E+05	3.8868E+00	6.120E−09	8.930E+05
$1s\,4s\ ^3S_1$	$1s\,6p\ ^3P^o_1$	8.9132E+00	2.368E−10	6.628E+03	8.8765E+00	3.358E−10	9.397E+03
$1s\,4d\ ^3D_2$	$1s\,6p\ ^3P^o_1$	9.3198E+00	1.118E−09	2.863E+04	9.2819E+00	1.114E−09	2.851E+04
$1s\,4d\ ^3D_1$	$1s\,6p\ ^3P^o_1$	9.3241E+00	1.101E−09	2.815E+04	9.2861E+00	1.082E−09	2.767E+04
$1s\,4d\ ^3D_3$	$1s\,6p\ ^3P^o_1$	9.4285E+00	1.839E−08	4.600E+05	9.3898E+00	1.808E−08	4.521E+05
$1s\,4d\ ^1D_2$	$1s\,6p\ ^3P^o_1$	9.4329E+00	6.934E−09	1.733E+05	9.3943E+00	6.934E−09	1.732E+05
$1s\,5s\ ^3S_1$	$1s\,6p\ ^3P^o_1$	2.5356E+01	1.264E−10	4.372E+02	2.5254E+01	1.596E−10	5.519E+02
$1s\,5d\ ^3D_2$	$1s\,6p\ ^3P^o_1$	2.7067E+01	1.122E−09	3.406E+03	2.6964E+01	1.119E−09	3.395E+03
$1s\,5d\ ^3D_1$	$1s\,6p\ ^3P^o_1$	2.7084E+01	1.096E−09	3.323E+03	2.6981E+01	1.082E−09	3.276E+03
$1s\,5d\ ^3D_3$	$1s\,6p\ ^3P^o_1$	2.7538E+01	1.837E−08	5.387E+04	2.7432E+01	1.814E−08	5.314E+04
$1s\,5d\ ^1D_2$	$1s\,6p\ ^3P^o_1$	2.7558E+01	6.906E−09	2.022E+04	2.7452E+01	6.892E−09	2.016E+04
$1s\,5g\ ^3G_3$	$1s\,6p\ ^3P^o_1$	2.7793E+01	9.899E−18	2.850E−05			
$1s\,6s\ ^3S_1$	$1s\,6p\ ^3P^o_1$	4.9854E+03	3.274E−16	2.929E−08	4.6146E+03	7.235E−16	7.490E−08
$1s\,2p\ ^3P^o_2$	$1s\,6s\ ^1S_0$	1.4434E+00	9.229E−08	2.955E+08	1.4374E+00	9.373E−08	3.000E+08
$1s\,3p\ ^3P^o_2$	$1s\,6s\ ^1S_0$	3.8473E+00	6.108E−08	2.753E+07	3.8320E+00	6.246E−08	2.813E+07
$1s\,4p\ ^3P^o_2$	$1s\,6s\ ^1S_0$	9.2946E+00	4.218E−08	3.257E+06	9.2596E+00	4.349E−08	3.354E+06
$1s\,4f\ ^3F^o_2$	$1s\,6s\ ^1S_0$	9.4316E+00	4.585E−15	3.438E−01			
$1s\,5p\ ^3P^o_2$	$1s\,6s\ ^1S_0$	2.6955E+01	3.177E−08	2.917E+05	2.6876E+01	3.323E−08	3.043E+05
$1s\,5f\ ^3F^o_2$	$1s\,6s\ ^1S_0$	2.7549E+01	6.717E−15	5.903E−02			
$1s\,3d\ ^3D_2$	$1s\,6p\ ^3P^o_0$	3.8572E+00	6.303E−10	2.826E+05	3.8418E+00	6.184E−10	2.771E+05
$1s\,3d\ ^1D_2$	$1s\,6p\ ^3P^o_0$	3.9029E+00	7.563E−09	3.312E+06	3.8873E+00	7.362E−09	3.222E+06
$1s\,4d\ ^3D_2$	$1s\,6p\ ^3P^o_0$	9.3186E+00	7.033E−10	5.403E+04	9.2852E+00	6.944E−10	5.327E+04
$1s\,4d\ ^1D_2$	$1s\,6p\ ^3P^o_0$	9.4317E+00	8.476E−09	6.355E+05	9.3976E+00	8.342E−09	6.247E+05
$1s\,5d\ ^3D_2$	$1s\,6p\ ^3P^o_0$	2.7056E+01	6.977E−10	6.357E+03	2.6991E+01	6.888E−10	6.253E+03
$1s\,5d\ ^1D_2$	$1s\,6p\ ^3P^o_0$	2.7547E+01	8.449E−09	7.426E+04	2.7481E+01	8.332E−09	7.297E+04
$1s^2\ ^1S_0$	$1s\,6p\ ^3P^o_2$	3.1630E−01	9.827E−06	1.310E+11	3.1498E−01	1.106E−05	1.475E+11
$1s\,2s\ ^3S_1$	$1s\,6p\ ^3P^o_2$	1.3670E+00	1.115E−06	7.956E+08	1.3612E+00	1.152E−06	8.224E+08
$1s\,2s\ ^1S_0$	$1s\,6p\ ^3P^o_2$	1.3800E+00	7.427E−07	5.203E+08	1.3743E+00	7.463E−07	5.226E+08
$1s\,3s\ ^3S_1$	$1s\,6p\ ^3P^o_2$	3.6753E+00	3.545E−07	3.501E+07	3.6601E+00	3.604E−07	3.559E+07
$1s\,3s\ ^1S_0$	$1s\,6p\ ^3P^o_2$	3.6999E+00	2.408E−07	2.347E+07	3.6849E+00	2.354E−07	2.293E+07
$1s\,3d\ ^3D_2$	$1s\,6p\ ^3P^o_2$	3.8403E+00	1.356E−14	1.227E+00			
$1s\,3d\ ^3D_1$	$1s\,6p\ ^3P^o_2$	3.8421E+00	3.557E−13	3.214E+01			
$1s\,3d\ ^3D_3$	$1s\,6p\ ^3P^o_2$	3.8840E+00	5.812E−08	5.139E+06	3.8677E+00	5.623E−08	4.972E+06
$1s\,3d\ ^1D_2$	$1s\,6p\ ^3P^o_2$	3.8856E+00	1.476E−08	1.304E+06	3.8694E+00	1.403E−08	1.240E+06
$1s\,4s\ ^3S_1$	$1s\,6p\ ^3P^o_2$	8.8224E+00	1.571E−07	2.692E+06	8.7863E+00	1.589E−07	2.723E+06
$1s\,4s\ ^1S_0$	$1s\,6p\ ^3P^o_2$	8.8798E+00	1.078E−07	1.824E+06	8.8440E+00	1.038E−07	1.756E+06
$1s\,4d\ ^3D_2$	$1s\,6p\ ^3P^o_2$	9.2206E+00	2.240E−13	3.514E+00			
$1s\,4d\ ^3D_1$	$1s\,6p\ ^3P^o_2$	9.2248E+00	2.274E−13	3.564E+00			
$1s\,4d\ ^3D_3$	$1s\,6p\ ^3P^o_2$	9.3270E+00	6.780E−08	1.040E+06	9.2888E+00	6.619E−08	1.014E+06
$1s\,4d\ ^1D_2$	$1s\,6p\ ^3P^o_2$	9.3314E+00	1.709E−08	2.619E+05	9.2933E+00	1.652E−08	2.530E+05
$1s\,5s\ ^3S_1$	$1s\,6p\ ^3P^o_2$	2.4635E+01	7.930E−08	1.743E+05	2.4537E+01	8.016E−08	1.761E+05
$1s\,5s\ ^1S_0$	$1s\,6p\ ^3P^o_2$	2.4860E+01	5.498E−08	1.187E+05	2.4762E+01	5.199E−08	1.121E+05
$1s\,5d\ ^3D_2$	$1s\,6p\ ^3P^o_2$	2.6247E+01	4.110E−13	7.959E−01			
$1s\,5d\ ^3D_1$	$1s\,6p\ ^3P^o_2$	2.6264E+01	1.397E−13	2.703E−01			
$1s\,5d\ ^3D_3$	$1s\,6p\ ^3P^o_2$	2.6690E+01	6.829E−08	1.279E+05	2.6588E+01	6.672E−08	1.248E+05
$1s\,5d\ ^1D_2$	$1s\,6p\ ^3P^o_2$	2.6709E+01	1.716E−08	3.210E+04	2.6607E+01	1.664E−08	3.110E+04
$1s\,5g\ ^3G_4$	$1s\,6p\ ^3P^o_2$	2.6923E+01	3.604E−16	6.634E−04			
$1s\,5g\ ^3G_3$	$1s\,6p\ ^3P^o_2$	2.6929E+01	8.766E−16	1.613E−03			
$1s\,5g\ ^1G_4$	$1s\,6p\ ^3P^o_2$	2.7064E+01	1.057E−15	1.924E−03			
$1s\,6s\ ^3S_1$	$1s\,6p\ ^3P^o_2$	7.3822E+02	8.147E−11	1.994E−01	7.2782E+02	8.413E−11	2.100E−01
$1s\,6s\ ^1S_0$	$1s\,6p\ ^3P^o_2$	8.7342E+02	3.282E−11	5.739E−02	8.3711E+02	3.686E−11	6.958E−02
$1s\,2p\ ^3P^o_1$	$1s\,6d\ ^3D_2$	1.3786E+00	7.357E−08	5.164E+07	1.3729E+00	8.090E−08	5.677E+07
$1s\,2p\ ^3P^o_0$	$1s\,6d\ ^3D_2$	1.3795E+00	4.617E−08	3.237E+07	1.3737E+00	4.698E−08	3.293E+07
$1s\,2p\ ^3P^o_2$	$1s\,6d\ ^3D_2$	1.4409E+00	4.355E−11	2.798E+04	1.4348E+00	1.874E−10	1.204E+05
$1s\,2p\ ^1P^o_1$	$1s\,6d\ ^3D_2$	1.4467E+00	3.892E−13	2.481E+02	1.4407E+00	1.020E−10	6.504E+04
$1s\,3p\ ^3P^o_1$	$1s\,6d\ ^3D_2$	3.6972E+00	2.620E−08	2.557E+06	3.6817E+00	2.754E−08	2.688E+06
$1s\,3p\ ^3P^o_0$	$1s\,6d\ ^3D_2$	3.6989E+00	1.627E−08	1.586E+06	3.6834E+00	1.603E−08	1.563E+06
$1s\,3p\ ^3P^o_2$	$1s\,6d\ ^3D_2$	3.8292E+00	1.916E−11	1.744E+03	3.8130E+00	6.803E−11	6.189E+03
$1s\,3p\ ^1P^o_1$	$1s\,6d\ ^3D_2$	3.8409E+00	6.830E−13	6.176E+01	3.8249E+00	4.396E−11	3.974E+03
$1s\,4p\ ^3P^o_1$	$1s\,6d\ ^3D_2$	8.8702E+00	1.140E−08	1.933E+05	8.8316E+00	1.183E−08	2.006E+05
$1s\,4p\ ^3P^o_0$	$1s\,6d\ ^3D_2$	8.8742E+00	7.076E−09	1.199E+05	8.8354E+00	6.901E−09	1.169E+05
$1s\,4p\ ^3P^o_2$	$1s\,6d\ ^3D_2$	9.1898E+00	9.056E−12	1.431E+02	9.1496E+00	3.048E−11	4.816E+02

(*continued on next page*)

Table 6 (*continued*)

Lower	Upper	GRASP2K			FAC		
		λ (Å)	*gf*	A (s^{-1})	λ (Å)	*gf*	A (s^{-1})
$1s\,4p\ ^1P^o_1$	$1s\,6d\ ^3D_2$	9.2178E+00	4.459E−13	7.001E+00	9.1778E+00	2.140E−11	3.361E+02
$1s\,4f\ ^3F^o_3$	$1s\,6d\ ^3D_2$	9.3215E+00	3.189E−09	4.896E+04	9.2809E+00	3.158E−09	4.849E+04
$1s\,4f\ ^3F^o_2$	$1s\,6d\ ^3D_2$	9.3237E+00	8.011E−10	1.229E+04	9.2831E+00	7.907E−10	1.213E+04
$1s\,4f\ ^3F^o_4$	$1s\,6d\ ^3D_2$	9.3749E+00	6.477E−09	9.832E+04	9.3339E+00	6.370E−09	9.671E+04
$1s\,4f\ ^1F^o_3$	$1s\,6d\ ^3D_2$	9.3766E+00	7.961E−10	1.208E+04	9.3356E+00	8.302E−10	1.260E+04
$1s\,5p\ ^3P^o_1$	$1s\,6d\ ^3D_2$	2.4798E+01	5.473E−09	1.187E+04	2.4683E+01	5.652E−09	1.227E+04
$1s\,5p\ ^3P^o_0$	$1s\,6d\ ^3D_2$	2.4813E+01	3.400E−09	7.368E+03	2.4698E+01	3.305E−09	7.167E+03
$1s\,5p\ ^3P^o_2$	$1s\,6d\ ^3D_2$	2.6092E+01	4.739E−12	9.286E+00	2.5970E+01	1.516E−11	2.974E+01
$1s\,5p\ ^1P^o_1$	$1s\,6d\ ^3D_2$	2.6207E+01	2.750E−13	5.341E−01	2.6085E+01	1.163E−11	2.262E+01
$1s\,5f\ ^3F^o_3$	$1s\,6d\ ^3D_2$	2.6639E+01	5.658E−09	1.064E+04	2.6517E+01	5.635E−09	1.060E+04
$1s\,5f\ ^3F^o_2$	$1s\,6d\ ^3D_2$	2.6648E+01	1.421E−09	2.669E+03	2.6526E+01	1.410E−09	2.651E+03
$1s\,5f\ ^3F^o_4$	$1s\,6d\ ^3D_2$	2.6863E+01	1.142E−08	2.112E+04	2.6740E+01	1.129E−08	2.089E+04
$1s\,5f\ ^1F^o_3$	$1s\,6d\ ^3D_2$	2.6870E+01	1.403E−09	2.593E+03	2.6747E+01	1.470E−09	2.718E+03
$1s\,6p\ ^3P^o_1$	$1s\,6d\ ^3D_2$	8.0869E+02	2.361E−12	4.815E−03	7.9302E+02	2.548E−12	5.360E−03
$1s\,6p\ ^3P^o_0$	$1s\,6d\ ^3D_2$	8.1823E+02	1.413E−12	2.816E−03	7.6994E+02	1.621E−12	3.618E−03
$1s\,6p\ ^3P^o_2$	$1s\,6d\ ^3D_2$	1.2115E+04	5.193E−19	4.720E−12			
$1s\,2s\ ^3S_1$	$1s\,6p\ ^1P^o_1$	1.3668E+00	1.105E−06	1.315E+09	1.3611E+00	1.149E−06	1.368E+09
$1s\,3s\ ^3S_1$	$1s\,6p\ ^1P^o_1$	3.6740E+00	3.498E−07	5.762E+07	3.6589E+00	3.600E−07	5.928E+07
$1s\,3d\ ^3D_2$	$1s\,6p\ ^1P^o_1$	3.8389E+00	2.598E−13	3.919E+01			
$1s\,3d\ ^3D_1$	$1s\,6p\ ^1P^o_1$	3.8407E+00	1.055E−14	1.590E+00			
$1s\,3d\ ^3D_3$	$1s\,6p\ ^1P^o_1$	3.8825E+00	1.013E−08	1.494E+06	3.8664E+00	1.059E−08	1.562E+06
$1s\,3d\ ^1D_2$	$1s\,6p\ ^1P^o_1$	3.8842E+00	3.253E−08	4.794E+06	3.8681E+00	3.153E−08	4.646E+06
$1s\,4s\ ^3S_1$	$1s\,6p\ ^1P^o_1$	8.8149E+00	1.545E−07	4.420E+06	8.7796E+00	1.589E−07	4.545E+06
$1s\,4d\ ^3D_2$	$1s\,6p\ ^1P^o_1$	9.2125E+00	1.128E−14	2.955E−01			
$1s\,4d\ ^3D_1$	$1s\,6p\ ^1P^o_1$	9.2166E+00	1.136E−13	2.974E+00			
$1s\,4d\ ^3D_3$	$1s\,6p\ ^1P^o_1$	9.3186E+00	1.187E−08	3.038E+05	9.2814E+00	1.247E−08	3.192E+05
$1s\,4d\ ^1D_2$	$1s\,6p\ ^1P^o_1$	9.3230E+00	3.780E−08	9.670E+05	9.2858E+00	3.718E−08	9.507E+05
$1s\,5s\ ^3S_1$	$1s\,6p\ ^1P^o_1$	2.4577E+01	7.756E−08	2.855E+05	2.4485E+01	8.050E−08	2.960E+05
$1s\,5d\ ^3D_2$	$1s\,6p\ ^1P^o_1$	2.6180E+01	9.174E−15	2.976E−02			
$1s\,5d\ ^3D_1$	$1s\,6p\ ^1P^o_1$	2.6197E+01	2.364E−13	7.658E−01			
$1s\,5d\ ^3D_3$	$1s\,6p\ ^1P^o_1$	2.6621E+01	1.196E−08	3.753E+04	2.6527E+01	1.267E−08	3.970E+04
$1s\,5d\ ^1D_2$	$1s\,6p\ ^1P^o_1$	2.6640E+01	3.799E−08	1.190E+05	2.6546E+01	3.758E−08	1.175E+05
$1s\,5g\ ^3G_3$	$1s\,6p\ ^1P^o_1$	2.6859E+01	8.269E−18	2.548E−05			
$1s\,6s\ ^3S_1$	$1s\,6p\ ^1P^o_1$	6.8918E+02	1.001E−10	4.688E−01	6.8482E+02	1.007E−10	4.737E−01
$1s\,6d\ ^3D_2$	$1s\,6p\ ^1P^o_1$	7.2196E+04	1.674E−22	7.143E−17			
$1s\,2p\ ^3P^o_1$	$1s\,6d\ ^3D_1$	1.3786E+00	7.220E−08	8.447E+07	1.3729E+00	7.636E−08	8.932E+07
$1s\,2p\ ^3P^o_2$	$1s\,6d\ ^3D_1$	1.4408E+00	1.425E−13	1.527E+02			
$1s\,2p\ ^1P^o_1$	$1s\,6d\ ^3D_1$	1.4467E+00	8.401E−11	8.924E+04	1.4407E+00	1.079E−10	1.146E+05
$1s\,3p\ ^3P^o_1$	$1s\,6d\ ^3D_1$	3.6970E+00	2.546E−08	4.142E+06	3.6817E+00	2.602E−08	4.232E+06
$1s\,3p\ ^3P^o_2$	$1s\,6d\ ^3D_1$	3.8290E+00	1.910E−13	2.896E+01			
$1s\,3p\ ^1P^o_1$	$1s\,6d\ ^3D_1$	3.8407E+00	2.859E−11	4.309E+03	3.8249E+00	3.310E−11	4.989E+03
$1s\,4p\ ^3P^o_1$	$1s\,6d\ ^3D_1$	8.8691E+00	1.105E−08	3.125E+05	8.8318E+00	1.118E−08	3.161E+05
$1s\,4p\ ^3P^o_2$	$1s\,6d\ ^3D_1$	9.1886E+00	1.273E−13	3.352E+00			
$1s\,4p\ ^1P^o_1$	$1s\,6d\ ^3D_1$	9.2166E+00	1.238E−11	3.240E+02	9.1781E+00	1.357E−11	3.553E+02
$1s\,4f\ ^3F^o_3$	$1s\,6d\ ^3D_1$	9.3202E+00	5.366E−10	1.374E+04	9.2811E+00	5.341E−10	1.367E+04
$1s\,4f\ ^3F^o_2$	$1s\,6d\ ^3D_1$	9.3225E+00	1.860E−09	4.759E+04	9.2834E+00	1.845E−09	4.719E+04
$1s\,4f\ ^1F^o_3$	$1s\,6d\ ^3D_1$	9.3753E+00	4.340E−09	1.098E+05	9.3359E+00	4.305E−09	1.088E+05
$1s\,5p\ ^3P^o_1$	$1s\,6d\ ^3D_1$	2.4789E+01	5.299E−09	1.917E+04	2.4685E+01	5.349E−09	1.935E+04
$1s\,5p\ ^3P^o_2$	$1s\,6d\ ^3D_1$	2.6083E+01	8.543E−14	2.792E−01			
$1s\,5p\ ^1P^o_1$	$1s\,6d\ ^3D_1$	2.6197E+01	6.135E−12	1.988E+01	2.6087E+01	6.049E−12	1.959E+01
$1s\,5f\ ^3F^o_3$	$1s\,6d\ ^3D_1$	2.6629E+01	9.512E−10	2.983E+03	2.6519E+01	9.521E−10	2.984E+03
$1s\,5f\ ^3F^o_2$	$1s\,6d\ ^3D_1$	2.6638E+01	3.300E−09	1.034E+04	2.6529E+01	3.290E−09	1.030E+04
$1s\,5f\ ^1F^o_3$	$1s\,6d\ ^3D_1$	2.6860E+01	7.654E−09	2.359E+04	2.6749E+01	7.630E−09	2.351E+04
$1s\,6p\ ^3P^o_1$	$1s\,6d\ ^3D_1$	7.9964E+02	2.369E−12	8.238E−03	7.9517E+02	2.385E−12	8.315E−03
$1s\,6p\ ^3P^o_2$	$1s\,6d\ ^3D_1$	1.0358E+04	5.839E−20	1.210E−12			
$1s\,6p\ ^1P^o_1$	$1s\,6d\ ^3D_1$	6.7159E+06	2.936E−27	1.447E−25			
$1s\,2p\ ^3P^o_1$	$1s\,6d\ ^3D_3$	1.3779E+00	1.185E−06	5.945E+08	1.3722E+00	1.211E−06	6.080E+08
$1s\,2p\ ^3P^o_2$	$1s\,6d\ ^3D_3$	1.4401E+00	5.129E−06	2.357E+09	1.4340E+00	5.376E−06	2.470E+09
$1s\,2p\ ^1P^o_1$	$1s\,6d\ ^3D_3$	1.4460E+00	9.200E−07	4.193E+08	1.4400E+00	9.661E−07	4.402E+08
$1s\,3p\ ^3P^o_1$	$1s\,6d\ ^3D_3$	3.6922E+00	3.978E−07	2.780E+07	3.6768E+00	4.047E−07	2.829E+07
$1s\,3p\ ^3P^o_2$	$1s\,6d\ ^3D_3$	3.8238E+00	1.918E−06	1.250E+08	3.8077E+00	1.956E−06	1.275E+08
$1s\,3p\ ^1P^o_1$	$1s\,6d\ ^3D_3$	3.8355E+00	3.451E−07	2.236E+07	3.8195E+00	3.499E−07	2.266E+07
$1s\,4p\ ^3P^o_1$	$1s\,6d\ ^3D_3$	8.8415E+00	1.680E−07	2.047E+06	8.8033E+00	1.690E−07	2.060E+06
$1s\,4p\ ^3P^o_2$	$1s\,6d\ ^3D_3$	9.1590E+00	8.734E−07	9.922E+06	9.1192E+00	8.851E−07	1.005E+07
$1s\,4p\ ^1P^o_1$	$1s\,6d\ ^3D_3$	9.1868E+00	1.579E−07	1.783E+06	9.1472E+00	1.575E−07	1.778E+06
$1s\,4f\ ^3F^o_3$	$1s\,6d\ ^3D_3$	9.2898E+00	2.242E−14	2.476E−01			
$1s\,4f\ ^3F^o_2$	$1s\,6d\ ^3D_3$	9.2920E+00	9.727E−14	1.074E+00			
$1s\,4f\ ^3F^o_4$	$1s\,6d\ ^3D_3$	9.3429E+00	3.624E−08	3.957E+05	9.3023E+00	3.574E−08	3.903E+05
$1s\,4f\ ^1F^o_3$	$1s\,6d\ ^3D_3$	9.3445E+00	4.358E−09	4.756E+04	9.3039E+00	4.287E−09	4.679E+04
$1s\,5p\ ^3P^o_1$	$1s\,6d\ ^3D_3$	2.4575E+01	7.820E−08	1.234E+05	2.4463E+01	7.792E−08	1.230E+05
$1s\,5p\ ^3P^o_2$	$1s\,6d\ ^3D_3$	2.5845E+01	4.441E−07	6.335E+05	2.5726E+01	4.508E−07	6.436E+05

(*continued on next page*)

Table 6 (*continued*)

Lower	Upper	GRASP2K			FAC		
		λ (Å)	*gf*	A (s^{-1})	λ (Å)	*gf*	A (s^{-1})
$1s\,5p\ ^1P^o_1$	$1s\,6d\ ^3D_3$	2.5958E+01	8.083E−08	1.143E+05	2.5839E+01	7.947E−08	1.124E+05
$1s\,5f\ ^3F^o_3$	$1s\,6d\ ^3D_3$	2.6382E+01	3.376E−14	4.622E−02			
$1s\,5f\ ^3F^o_2$	$1s\,6d\ ^3D_3$	2.6391E+01	8.504E−14	1.163E−01			
$1s\,5f\ ^3F^o_4$	$1s\,6d\ ^3D_3$	2.6602E+01	6.478E−08	8.723E+04	2.6482E+01	6.437E−08	8.672E+04
$1s\,5f\ ^1F^o_3$	$1s\,6d\ ^3D_3$	2.6609E+01	7.788E−09	1.048E+04	2.6489E+01	7.718E−09	1.039E+04
$1s\,6p\ ^3P^o_1$	$1s\,6d\ ^3D_3$	6.2409E+02	7.844E−11	1.919E−01	6.1530E+02	7.917E−11	1.975E−01
$1s\,6p\ ^3P^o_2$	$1s\,6d\ ^3D_3$	2.2306E+03	8.574E−12	1.642E−03	2.1370E+03	9.635E−12	1.993E−03
$1s\,6p\ ^1P^o_1$	$1s\,6d\ ^3D_3$	2.8416E+03	7.471E−13	8.817E−05	2.6199E+03	9.643E−13	1.327E−04
$1s\,2s\ ^3S_1$	$1s\,6f\ ^3F^o_3$	1.3662E+00	6.354E−11	3.244E+04			
$1s\,3s\ ^3S_1$	$1s\,6f\ ^3F^o_3$	3.6691E+00	3.991E−14	2.825E+00			
$1s\,3d\ ^3D_2$	$1s\,6f\ ^3F^o_3$	3.8336E+00	3.774E−07	2.447E+07	3.8174E+00	3.877E−07	2.513E+07
$1s\,3d\ ^3D_1$	$1s\,6f\ ^3F^o_3$	3.8354E+00	6.366E−08	4.124E+06	3.8192E+00	6.429E−08	4.164E+06
$1s\,3d\ ^3D_3$	$1s\,6f\ ^3F^o_3$	3.8771E+00	2.152E−12	1.364E+02			
$1s\,3d\ ^1D_2$	$1s\,6f\ ^3F^o_3$	3.8788E+00	2.980E−11	1.887E+03			
$1s\,4s\ ^3S_1$	$1s\,6f\ ^3F^o_3$	8.7872E+00	1.208E−13	1.491E+00			
$1s\,4d\ ^3D_2$	$1s\,6f\ ^3F^o_3$	9.1821E+00	2.268E−07	2.563E+06	9.1440E+00	2.296E−07	2.595E+06
$1s\,4d\ ^3D_1$	$1s\,6f\ ^3F^o_3$	9.1863E+00	3.827E−08	4.321E+05	9.1480E+00	3.808E−08	4.299E+05
$1s\,4d\ ^3D_3$	$1s\,6f\ ^3F^o_3$	9.2876E+00	1.258E−12	1.390E+01			
$1s\,4d\ ^1D_2$	$1s\,6f\ ^3F^o_3$	9.2919E+00	2.710E−11	2.991E+02			
$1s\,5s\ ^3S_1$	$1s\,6f\ ^3F^o_3$	2.4362E+01	5.695E−15	9.143E−03			
$1s\,5d\ ^3D_2$	$1s\,6f\ ^3F^o_3$	2.5937E+01	1.250E−07	1.770E+05	2.5831E+01	1.257E−07	1.780E+05
$1s\,5d\ ^3D_1$	$1s\,6f\ ^3F^o_3$	2.5954E+01	2.111E−08	2.987E+04	2.5848E+01	2.083E−08	2.946E+04
$1s\,5d\ ^3D_3$	$1s\,6f\ ^3F^o_3$	2.6370E+01	7.159E−13	9.810E−01			
$1s\,5d\ ^1D_2$	$1s\,6f\ ^3F^o_3$	2.6388E+01	1.786E−11	2.444E+01			
$1s\,5g\ ^3G_4$	$1s\,6f\ ^3F^o_3$	2.6598E+01	6.169E−09	8.309E+03	2.6482E+01	6.138E−09	8.270E+03
$1s\,5g\ ^3G_3$	$1s\,6f\ ^3F^o_3$	2.6603E+01	7.426E−10	9.999E+02	2.6487E+01	7.367E−10	9.922E+02
$1s\,5g\ ^3G_5$	$1s\,6f\ ^3F^o_3$	2.6730E+01	4.453E−09	5.938E+03	2.6614E+01	4.418E−09	5.893E+03
$1s\,5g\ ^1G_4$	$1s\,6f\ ^3F^o_3$	2.6735E+01	2.634E−10	3.512E+02	2.6618E+01	2.759E−10	3.679E+02
$1s\,6s\ ^3S_1$	$1s\,6f\ ^3F^o_3$	5.5267E+02	1.173E−17	3.658E−08			
$1s\,6d\ ^3D_2$	$1s\,6f\ ^3F^o_3$	2.6863E+03	7.605E−13	1.004E−04	2.7429E+03	7.086E−13	8.898E−05
$1s\,6d\ ^3D_1$	$1s\,6f\ ^3F^o_3$	2.7912E+03	1.144E−13	1.399E−05	2.7175E+03	1.210E−13	1.548E−05
$1s\,6d\ ^3D_3$	$1s\,6f\ ^3F^o_3$	1.5394E+05	2.306E−23	9.272E−19			
$1s^2\ ^1S_0$	$1s\,6f\ ^3F^o_2$	3.1620E−01	6.848E−11	9.134E+05			
$1s\,2s\ ^3S_1$	$1s\,6f\ ^3F^o_2$	1.3662E+00	2.222E−11	1.588E+04			
$1s\,2s\ ^1S_0$	$1s\,6f\ ^3F^o_2$	1.3791E+00	2.075E−11	1.456E+04			
$1s\,3s\ ^3S_1$	$1s\,6f\ ^3F^o_2$	3.6690E+00	4.287E−13	4.249E+01			
$1s\,3s\ ^1S_0$	$1s\,6f\ ^3F^o_2$	3.6936E+00	3.226E−13	3.155E+01			
$1s\,3d\ ^3D_2$	$1s\,6f\ ^3F^o_2$	3.8335E+00	9.471E−08	8.598E+06	3.8174E+00	9.688E−08	8.794E+06
$1s\,3d\ ^3D_1$	$1s\,6f\ ^3F^o_2$	3.8353E+00	2.205E−07	2.000E+07	3.8192E+00	2.257E−07	2.047E+07
$1s\,3d\ ^3D_3$	$1s\,6f\ ^3F^o_2$	3.8770E+00	1.142E−18	1.013E−04			
$1s\,3d\ ^1D_2$	$1s\,6f\ ^3F^o_2$	3.8787E+00	8.803E−13	7.806E+01			
$1s\,4s\ ^3S_1$	$1s\,6f\ ^3F^o_2$	8.7866E+00	5.076E−13	8.772E+00			
$1s\,4s\ ^1S_0$	$1s\,6f\ ^3F^o_2$	8.8435E+00	3.256E−13	5.554E+00			
$1s\,4d\ ^3D_2$	$1s\,6f\ ^3F^o_2$	9.1815E+00	5.683E−08	8.994E+05	9.1440E+00	5.738E−08	9.077E+05
$1s\,4d\ ^3D_1$	$1s\,6f\ ^3F^o_2$	9.1856E+00	1.325E−07	2.095E+06	9.1480E+00	1.337E−07	2.113E+06
$1s\,4d\ ^3D_3$	$1s\,6f\ ^3F^o_2$	9.2869E+00	1.242E−14	1.921E−01			
$1s\,4d\ ^1D_2$	$1s\,6f\ ^3F^o_2$	9.2913E+00	1.382E−12	2.135E+01			
$1s\,5s\ ^3S_1$	$1s\,6f\ ^3F^o_2$	2.4358E+01	1.928E−13	4.335E−01			
$1s\,5s\ ^1S_0$	$1s\,6f\ ^3F^o_2$	2.4577E+01	9.292E−14	2.052E−01			
$1s\,5d\ ^3D_2$	$1s\,6f\ ^3F^o_2$	2.5932E+01	3.129E−08	6.207E+04	2.5831E+01	3.141E−08	6.227E+04
$1s\,5d\ ^3D_1$	$1s\,6f\ ^3F^o_2$	2.5948E+01	7.306E−08	1.447E+05	2.5848E+01	7.316E−08	1.448E+05
$1s\,5d\ ^3D_3$	$1s\,6f\ ^3F^o_2$	2.6365E+01	1.482E−14	2.845E−02			
$1s\,5d\ ^1D_2$	$1s\,6f\ ^3F^o_2$	2.6383E+01	1.033E−12	1.979E+00			
$1s\,5g\ ^3G_4$	$1s\,6f\ ^3F^o_2$	2.6592E+01	4.970E−10	9.377E+02	2.6482E+01	4.963E−10	9.362E+02
$1s\,5g\ ^3G_3$	$1s\,6f\ ^3F^o_2$	2.6598E+01	4.442E−09	8.376E+03	2.6488E+01	4.420E−09	8.334E+03
$1s\,5g\ ^1G_4$	$1s\,6f\ ^3F^o_2$	2.6729E+01	3.356E−09	6.266E+03	2.6618E+01	3.343E−09	6.241E+03
$1s\,6s\ ^3S_1$	$1s\,6f\ ^3F^o_2$	5.5035E+02	4.304E−17	1.896E−07			
$1s\,6s\ ^1S_0$	$1s\,6f\ ^3F^o_2$	6.2215E+02	4.276E−17	1.474E−07			
$1s\,6d\ ^3D_2$	$1s\,6f\ ^3F^o_2$	2.6325E+03	2.025E−13	3.898E−05	2.7436E+03	1.769E−13	3.109E−05
$1s\,6d\ ^3D_1$	$1s\,6f\ ^3F^o_2$	2.7332E+03	4.220E−13	7.536E−05	2.7182E+03	4.245E−13	7.601E−05
$1s\,6d\ ^3D_3$	$1s\,6f\ ^3F^o_2$	7.0900E+04	6.510E−23	1.728E−17			
$1s\,2p\ ^3P^o_1$	$1s\,6d\ ^1D_2$	1.3779E+00	4.573E−07	3.213E+08	1.3722E+00	4.669E−07	3.280E+08
$1s\,2p\ ^3P^o_0$	$1s\,6d\ ^1D_2$	1.3788E+00	5.490E−07	3.852E+08	1.3730E+00	5.623E−07	3.945E+08
$1s\,2p\ ^3P^o_2$	$1s\,6d\ ^1D_2$	1.4401E+00	1.289E−06	8.293E+08	1.4340E+00	1.343E−06	8.644E+08
$1s\,2p\ ^1P^o_1$	$1s\,6d\ ^1D_2$	1.4459E+00	2.881E−06	1.839E+09	1.4399E+00	3.012E−06	1.921E+09
$1s\,3p\ ^3P^o_1$	$1s\,6d\ ^1D_2$	3.6920E+00	1.505E−07	1.472E+07	3.6767E+00	1.542E−07	1.509E+07
$1s\,3p\ ^3P^o_0$	$1s\,6d\ ^1D_2$	3.6937E+00	1.833E−07	1.793E+07	3.6783E+00	1.874E−07	1.832E+07
$1s\,3p\ ^3P^o_2$	$1s\,6d\ ^1D_2$	3.8236E+00	4.803E−07	4.383E+07	3.8077E+00	4.891E−07	4.462E+07
$1s\,3p\ ^1P^o_1$	$1s\,6d\ ^1D_2$	3.8353E+00	1.087E−06	9.861E+07	3.8195E+00	1.102E−06	9.999E+07
$1s\,4p\ ^3P^o_1$	$1s\,6d\ ^1D_2$	8.8403E+00	6.306E−08	1.076E+06	8.8028E+00	6.473E−08	1.104E+06
$1s\,4p\ ^3P^o_0$	$1s\,6d\ ^1D_2$	8.8442E+00	7.726E−08	1.318E+06	8.8066E+00	7.837E−08	1.336E+06

(*continued on next page*)

Table 6 (*continued*)

Lower	Upper	GRASP2K			FAC		
		λ (Å)	*gf*	A (s^{-1})	λ (Å)	*gf*	A (s^{-1})
$1s\,4p\ ^3P^o_2$	$1s\,6d\ ^1D_2$	9.1577E+00	2.183E−07	3.473E+06	9.1187E+00	2.212E−07	3.520E+06
$1s\,4p\ ^1P^o_1$	$1s\,6d\ ^1D_2$	9.1855E+00	4.979E−07	7.872E+06	9.1467E+00	4.996E−07	7.900E+06
$1s\,4f\ ^3F^o_3$	$1s\,6d\ ^1D_2$	9.2884E+00	4.634E−13	7.165E+00			
$1s\,4f\ ^3F^o_2$	$1s\,6d\ ^1D_2$	9.2907E+00	4.578E−18	7.075E−05			
$1s\,4f\ ^3F^o_4$	$1s\,6d\ ^1D_2$	9.3415E+00	2.936E−09	4.489E+04	9.3018E+00	2.962E−09	4.529E+04
$1s\,4f\ ^1F^o_3$	$1s\,6d\ ^1D_2$	9.3432E+00	2.595E−08	3.966E+05	9.3035E+00	2.562E−08	3.915E+05
$1s\,5p\ ^3P^o_1$	$1s\,6d\ ^1D_2$	2.4566E+01	2.924E−08	6.463E+04	2.4460E+01	3.038E−08	6.718E+04
$1s\,5p\ ^3P^o_0$	$1s\,6d\ ^1D_2$	2.4581E+01	3.593E−08	7.934E+04	2.4474E+01	3.629E−08	8.014E+04
$1s\,5p\ ^3P^o_2$	$1s\,6d\ ^1D_2$	2.5835E+01	1.108E−07	2.215E+05	2.5723E+01	1.127E−07	2.254E+05
$1s\,5p\ ^1P^o_1$	$1s\,6d\ ^1D_2$	2.5947E+01	2.547E−07	5.046E+05	2.5836E+01	2.540E−07	5.034E+05
$1s\,5f\ ^3F^o_3$	$1s\,6d\ ^1D_2$	2.6371E+01	7.765E−13	1.490E+00			
$1s\,5f\ ^3F^o_2$	$1s\,6d\ ^1D_2$	2.6380E+01	5.047E−15	9.676E−03			
$1s\,5f\ ^3F^o_4$	$1s\,6d\ ^1D_2$	2.6591E+01	5.248E−09	9.902E+03	2.6478E+01	5.337E−09	1.006E+04
$1s\,5f\ ^1F^o_3$	$1s\,6d\ ^1D_2$	2.6598E+01	4.638E−08	8.747E+04	2.6485E+01	4.613E−08	8.700E+04
$1s\,6p\ ^3P^o_1$	$1s\,6d\ ^1D_2$	6.1807E+02	3.022E−11	1.055E−01	6.1320E+02	3.228E−11	1.135E−01
$1s\,6p\ ^3P^o_0$	$1s\,6d\ ^1D_2$	6.2363E+02	3.613E−11	1.239E−01	5.9930E+02	4.033E−11	1.485E−01
$1s\,6p\ ^3P^o_2$	$1s\,6d\ ^1D_2$	2.1556E+03	2.376E−12	6.821E−04	2.1118E+03	2.495E−12	7.402E−04
$1s\,6p\ ^1P^o_1$	$1s\,6d\ ^1D_2$	2.7210E+03	2.688E−12	4.843E−04	2.5822E+03	3.083E−12	6.116E−04
$1s\,6f\ ^3F^o_3$	$1s\,6d\ ^1D_2$	1.0989E+05	1.664E−21	1.838E−16			
$1s\,6f\ ^3F^o_2$	$1s\,6d\ ^1D_2$	6.7056E+05	3.229E−25	9.582E−22			
$1s\,3d\ ^3D_2$	$1s\,6f\ ^3F^o_4$	3.8310E+00	7.454E−07	3.764E+07	3.8148E+00	7.494E−07	3.784E+07
$1s\,3d\ ^3D_3$	$1s\,6f\ ^3F^o_4$	3.8744E+00	4.504E−06	2.224E+08	3.8580E+00	4.617E−06	2.279E+08
$1s\,3d\ ^1D_2$	$1s\,6f\ ^3F^o_4$	3.8761E+00	3.632E−07	1.792E+07	3.8597E+00	3.727E−07	1.838E+07
$1s\,4d\ ^3D_2$	$1s\,6f\ ^3F^o_4$	9.1669E+00	4.363E−07	3.848E+06	9.1288E+00	4.400E−07	3.879E+06
$1s\,4d\ ^3D_3$	$1s\,6f\ ^3F^o_4$	9.2719E+00	2.746E−06	2.367E+07	9.2331E+00	2.774E−06	2.391E+07
$1s\,4d\ ^1D_2$	$1s\,6f\ ^3F^o_4$	9.2763E+00	2.228E−07	1.919E+06	9.2375E+00	2.251E−07	1.938E+06
$1s\,5d\ ^3D_2$	$1s\,6f\ ^3F^o_4$	2.5816E+01	2.354E−07	2.617E+05	2.5711E+01	2.362E−07	2.625E+05
$1s\,5d\ ^3D_3$	$1s\,6f\ ^3F^o_4$	2.6244E+01	1.538E−06	1.656E+06	2.6136E+01	1.544E−06	1.661E+06
$1s\,5d\ ^1D_2$	$1s\,6f\ ^3F^o_4$	2.6262E+01	1.253E−07	1.346E+05	2.6155E+01	1.254E−07	1.347E+05
$1s\,5g\ ^3G_4$	$1s\,6f\ ^3F^o_4$	2.6470E+01	8.803E−15	9.312E−03			
$1s\,5g\ ^3G_3$	$1s\,6f\ ^3F^o_4$	2.6475E+01	7.111E−16	7.519E−04			
$1s\,5g\ ^3G_5$	$1s\,6f\ ^3F^o_4$	2.6601E+01	3.646E−08	3.819E+04	2.6486E+01	3.625E−08	3.797E+04
$1s\,5g\ ^1G_4$	$1s\,6f\ ^3F^o_4$	2.6606E+01	2.610E−09	2.732E+03	2.6491E+01	2.588E−09	2.710E+03
$1s\,6d\ ^3D_2$	$1s\,6f\ ^3F^o_4$	1.8056E+03	4.817E−12	1.095E−03	1.8327E+03	4.512E−12	9.871E−04
$1s\,6d\ ^3D_3$	$1s\,6f\ ^3F^o_4$	5.3175E+03	1.207E−12	3.163E−05	5.5117E+03	1.070E−12	2.590E−05
$1s\,6d\ ^1D_2$	$1s\,6f\ ^3F^o_4$	5.7984E+03	7.578E−14	1.670E−06	5.6864E+03	8.061E−14	1.832E−06
$1s\,2p\ ^3P^o_2$	$1s\,6g\ ^3G_4$	1.4397E+00	2.007E−11	7.176E+03			
$1s\,3p\ ^3P^o_2$	$1s\,6g\ ^3G_4$	3.8211E+00	1.773E−11	9.000E+02			
$1s\,4p\ ^3P^o_2$	$1s\,6g\ ^3G_4$	9.1432E+00	1.834E−14	1.626E−01			
$1s\,4f\ ^3F^o_3$	$1s\,6g\ ^3G_4$	9.2736E+00	8.732E−07	7.525E+06	9.2341E+00	8.851E−07	7.628E+06
$1s\,4f\ ^3F^o_2$	$1s\,6g\ ^3G_4$	9.2758E+00	7.052E−08	6.074E+05	9.2363E+00	7.076E−08	6.095E+05
$1s\,4f\ ^3F^o_4$	$1s\,6g\ ^3G_4$	9.3264E+00	1.314E−12	1.120E+01			
$1s\,4f\ ^1F^o_3$	$1s\,6g\ ^3G_4$	9.3281E+00	3.260E−12	2.776E+01			
$1s\,5p\ ^3P^o_2$	$1s\,6g\ ^3G_4$	2.5720E+01	1.495E−13	1.675E−01			
$1s\,5f\ ^3F^o_3$	$1s\,6g\ ^3G_4$	2.6251E+01	7.032E−07	7.563E+05	2.6139E+01	7.069E−07	7.603E+05
$1s\,5f\ ^3F^o_2$	$1s\,6g\ ^3G_4$	2.6260E+01	5.684E−08	6.109E+04	2.6148E+01	5.650E−08	6.072E+04
$1s\,5f\ ^3F^o_4$	$1s\,6g\ ^3G_4$	2.6469E+01	1.089E−12	1.152E+00			
$1s\,5f\ ^1F^o_3$	$1s\,6g\ ^3G_4$	2.6476E+01	3.093E−12	3.270E+00			
$1s\,6p\ ^3P^o_2$	$1s\,6g\ ^3G_4$	1.5705E+03	1.699E−21	5.106E−13			
$1s\,6f\ ^3F^o_3$	$1s\,6g\ ^3G_4$	5.4970E+03	2.497E−13	6.123E−06	5.5303E+03	2.427E−13	5.831E−06
$1s\,6f\ ^3F^o_2$	$1s\,6g\ ^3G_4$	5.7369E+03	1.775E−14	3.997E−07	5.5276E+03	1.944E−14	4.676E−07
$1s\,6f\ ^3F^o_4$	$1s\,6g\ ^3G_4$	2.7996E+06	2.940E−27	2.780E−25			
$1s\,2p\ ^3P^o_1$	$1s\,6g\ ^3G_3$	1.3775E+00	8.809E−15	4.423E+00			
$1s\,2p\ ^3P^o_2$	$1s\,6g\ ^3G_3$	1.4397E+00	2.018E−12	9.277E+02			
$1s\,2p\ ^1P^o_1$	$1s\,6g\ ^3G_3$	1.4456E+00	1.399E−11	6.382E+03			
$1s\,3p\ ^3P^o_1$	$1s\,6g\ ^3G_3$	3.6896E+00	3.546E−14	2.482E+00			
$1s\,3p\ ^3P^o_2$	$1s\,6g\ ^3G_3$	3.8210E+00	2.034E−12	1.327E+02			
$1s\,3p\ ^1P^o_1$	$1s\,6g\ ^3G_3$	3.8327E+00	1.119E−11	7.261E+02			
$1s\,4p\ ^3P^o_1$	$1s\,6g\ ^3G_3$	8.8264E+00	1.545E−16	1.889E−03			
$1s\,4p\ ^3P^o_2$	$1s\,6g\ ^3G_3$	9.1429E+00	6.432E−14	7.331E−01			
$1s\,4p\ ^1P^o_1$	$1s\,6g\ ^3G_3$	9.1706E+00	4.170E−16	4.725E−03			
$1s\,4f\ ^3F^o_3$	$1s\,6g\ ^3G_3$	9.2732E+00	1.050E−07	1.163E+06	9.2341E+00	1.062E−07	1.176E+06
$1s\,4f\ ^3F^o_2$	$1s\,6g\ ^3G_3$	9.2754E+00	6.289E−07	6.966E+06	9.2363E+00	6.368E−07	7.053E+06
$1s\,4f\ ^3F^o_4$	$1s\,6g\ ^3G_3$	9.3261E+00	1.641E−18	1.798E−05			
$1s\,4f\ ^1F^o_3$	$1s\,6g\ ^3G_3$	9.3277E+00	4.791E−13	5.247E+00			
$1s\,5p\ ^3P^o_1$	$1s\,6g\ ^3G_3$	2.4459E+01	1.101E−16	1.754E−04			
$1s\,5p\ ^3P^o_2$	$1s\,6g\ ^3G_3$	2.5717E+01	2.230E−13	3.213E−01			
$1s\,5p\ ^1P^o_1$	$1s\,6g\ ^3G_3$	2.5829E+01	1.653E−13	2.361E−01			
$1s\,5f\ ^3F^o_3$	$1s\,6g\ ^3G_3$	2.6248E+01	8.445E−08	1.168E+05	2.6139E+01	8.483E−08	1.173E+05
$1s\,5f\ ^3F^o_2$	$1s\,6g\ ^3G_3$	2.6257E+01	5.067E−07	7.003E+05	2.6148E+01	5.085E−07	7.026E+05
$1s\,5f\ ^3F^o_4$	$1s\,6g\ ^3G_3$	2.6466E+01	3.237E−17	4.403E−05			

(*continued on next page*)

Table 6 (*continued*)

Lower	Upper	GRASP2K			FAC		
		λ (Å)	*gf*	A (s^{-1})	λ (Å)	*gf*	A (s^{-1})
$1s\,5f\ ^1F^o_3$	$1s\,6g\ ^3G_3$	2.6473E+01	3.503E−13	4.762E−01			
$1s\,6p\ ^3P^o_1$	$1s\,6g\ ^3G_3$	5.5707E+02	5.442E−20	1.671E−10			
$1s\,6p\ ^3P^o_2$	$1s\,6g\ ^3G_3$	1.5598E+03	2.160E−18	8.458E−10			
$1s\,6p\ ^1P^o_1$	$1s\,6g\ ^3G_3$	1.8359E+03	1.466E−19	4.146E−11			
$1s\,6f\ ^3F^o_3$	$1s\,6g\ ^3G_3$	5.3682E+03	3.220E−14	1.065E−06	5.5303E+03	2.912E−14	8.997E−07
$1s\,6f\ ^3F^o_2$	$1s\,6g\ ^3G_3$	5.5968E+03	1.704E−13	5.185E−06	5.5277E+03	1.750E−13	5.411E−06
$1s\,6f\ ^3F^o_4$	$1s\,6g\ ^3G_3$	2.1175E+05	1.685E−26	3.580E−22			
$1s\,2s\ ^3S_1$	$1s\,6f\ ^1F^o_3$	1.3658E+00	9.089E−14	4.643E+01			
$1s\,3s\ ^3S_1$	$1s\,6f\ ^1F^o_3$	3.6666E+00	9.718E−13	6.888E+01			
$1s\,3d\ ^3D_2$	$1s\,6f\ ^1F^o_3$	3.8309E+00	8.752E−08	5.683E+06	3.8148E+00	8.744E−08	5.677E+06
$1s\,3d\ ^3D_1$	$1s\,6f\ ^1F^o_3$	3.8326E+00	4.980E−07	3.230E+07	3.8165E+00	5.017E−07	3.254E+07
$1s\,3d\ ^3D_3$	$1s\,6f\ ^1F^o_3$	3.8743E+00	5.411E−07	3.435E+07	3.8580E+00	5.541E−07	3.517E+07
$1s\,3d\ ^1D_2$	$1s\,6f\ ^1F^o_3$	3.8760E+00	3.237E−06	2.053E+08	3.8597E+00	3.316E−06	2.103E+08
$1s\,4s\ ^3S_1$	$1s\,6f\ ^1F^o_3$	8.7727E+00	6.785E−13	8.401E+00			
$1s\,4d\ ^3D_2$	$1s\,6f\ ^1F^o_3$	9.1664E+00	5.257E−08	5.962E+05	9.1288E+00	5.284E−08	5.991E+05
$1s\,4d\ ^3D_1$	$1s\,6f\ ^1F^o_3$	9.1705E+00	2.925E−07	3.314E+06	9.1329E+00	2.954E−07	3.347E+06
$1s\,4d\ ^3D_3$	$1s\,6f\ ^1F^o_3$	9.2714E+00	3.296E−07	3.654E+06	9.2331E+00	3.328E−07	3.689E+06
$1s\,4d\ ^1D_2$	$1s\,6f\ ^1F^o_3$	9.2758E+00	1.973E−06	2.185E+07	9.2375E+00	1.990E−06	2.204E+07
$1s\,5s\ ^3S_1$	$1s\,6f\ ^1F^o_3$	2.4251E+01	3.672E−13	5.949E−01			
$1s\,5d\ ^3D_2$	$1s\,6f\ ^1F^o_3$	2.5812E+01	2.867E−08	4.101E+04	2.5711E+01	2.878E−08	4.113E+04
$1s\,5d\ ^3D_1$	$1s\,6f\ ^1F^o_3$	2.5828E+01	1.581E−07	2.258E+05	2.5727E+01	1.587E−07	2.266E+05
$1s\,5d\ ^3D_3$	$1s\,6f\ ^1F^o_3$	2.6240E+01	1.845E−07	2.554E+05	2.6136E+01	1.853E−07	2.562E+05
$1s\,5d\ ^1D_2$	$1s\,6f\ ^1F^o_3$	2.6259E+01	1.106E−06	1.528E+06	2.6155E+01	1.107E−06	1.529E+06
$1s\,5g\ ^3G_4$	$1s\,6f\ ^1F^o_3$	2.6466E+01	2.632E−14	3.580E−02			
$1s\,5g\ ^3G_3$	$1s\,6f\ ^1F^o_3$	2.6471E+01	3.695E−15	5.025E−03			
$1s\,5g\ ^3G_5$	$1s\,6f\ ^1F^o_3$	2.6597E+01	1.722E−09	2.319E+03	2.6486E+01	1.729E−09	2.329E+03
$1s\,5g\ ^1G_4$	$1s\,6f\ ^1F^o_3$	2.6601E+01	2.865E−08	3.857E+04	2.6490E+01	2.846E−08	3.832E+04
$1s\,6s\ ^3S_1$	$1s\,6f\ ^1F^o_3$	5.0083E+02	4.301E−16	1.634E−06			
$1s\,6d\ ^3D_2$	$1s\,6f\ ^1F^o_3$	1.7871E+03	6.094E−13	1.818E−04	1.8323E+03	5.891E−13	1.658E−04
$1s\,6d\ ^3D_1$	$1s\,6f\ ^1F^o_3$	1.8330E+03	3.093E−12	8.773E−04	1.8209E+03	3.120E−12	8.892E−04
$1s\,6d\ ^3D_3$	$1s\,6f\ ^1F^o_3$	5.1604E+03	1.585E−13	5.671E−06	5.5079E+03	1.287E−13	4.010E−06
$1s\,6d\ ^1D_2$	$1s\,6f\ ^1F^o_3$	5.6121E+03	7.375E−13	2.231E−05	5.6823E+03	7.009E−13	2.051E−05
$1s\,6g\ ^3G_4$	$1s\,6f\ ^1F^o_3$	1.8628E+05	3.059E−23	8.401E−19			
$1s\,6g\ ^3G_3$	$1s\,6f\ ^1F^o_3$	9.9701E+05	2.038E−26	1.953E−23			
$1s\,4f\ ^3F^o_3$	$1s\,6g\ ^3G_5$	9.2643E+00	6.142E−07	4.339E+06	9.2249E+00	6.158E−07	4.350E+06
$1s\,4f\ ^3F^o_4$	$1s\,6g\ ^3G_5$	9.3170E+00	5.280E−06	3.688E+07	9.2773E+00	5.351E−06	3.738E+07
$1s\,4f\ ^1F^o_3$	$1s\,6g\ ^3G_5$	9.3187E+00	2.496E−07	1.743E+06	9.2790E+00	2.529E−07	1.766E+06
$1s\,5f\ ^3F^o_3$	$1s\,6g\ ^3G_5$	2.6177E+01	4.863E−07	4.304E+05	2.6065E+01	4.885E−07	4.323E+05
$1s\,5f\ ^3F^o_4$	$1s\,6g\ ^3G_5$	2.6394E+01	4.285E−06	3.730E+06	2.6281E+01	4.304E−06	3.747E+06
$1s\,5f\ ^1F^o_3$	$1s\,6g\ ^3G_5$	2.6400E+01	2.028E−07	1.764E+05	2.6287E+01	2.035E−07	1.771E+05
$1s\,6f\ ^3F^o_3$	$1s\,6g\ ^3G_5$	3.4474E+03	7.054E−13	3.599E−05	3.4619E+03	6.849E−13	3.436E−05
$1s\,6f\ ^3F^o_4$	$1s\,6g\ ^3G_5$	9.2152E+03	3.245E−13	2.317E−06	9.2775E+03	3.143E−13	2.195E−06
$1s\,6f\ ^1F^o_3$	$1s\,6g\ ^3G_5$	9.7284E+03	1.305E−14	8.363E−08	9.2884E+03	1.494E−14	1.041E−07
$1s\,3d\ ^3D_3$	$1s\,6h\ ^3H^o_5$	3.8728E+00	5.411E−12	2.188E+02			
$1s\,4d\ ^3D_3$	$1s\,6h\ ^3H^o_5$	9.2626E+00	5.290E−12	3.739E+01			
$1s\,5d\ ^3D_3$	$1s\,6h\ ^3H^o_5$	2.6170E+01	2.629E−13	2.328E−01			
$1s\,5g\ ^3G_4$	$1s\,6h\ ^3H^o_5$	2.6394E+01	2.528E−06	2.200E+06	2.6281E+01	2.542E−06	2.212E+06
$1s\,5g\ ^3G_3$	$1s\,6h\ ^3H^o_5$	2.6399E+01	1.213E−07	1.055E+05	2.6286E+01	1.209E−07	1.052E+05
$1s\,5g\ ^3G_5$	$1s\,6h\ ^3H^o_5$	2.6525E+01	1.198E−12	1.032E+00			
$1s\,5g\ ^1G_4$	$1s\,6h\ ^3H^o_5$	2.6529E+01	2.458E−12	2.118E+00			
$1s\,6d\ ^3D_3$	$1s\,6h\ ^3H^o_5$	3.3705E+03	7.804E−21	4.165E−13			
$1s\,6g\ ^3G_4$	$1s\,6h\ ^3H^o_5$	9.2359E+03	7.177E−14	5.102E−07	9.2564E+03	7.054E−14	4.950E−07
$1s\,6g\ ^3G_3$	$1s\,6h\ ^3H^o_5$	9.6239E+03	3.044E−15	1.993E−08	9.2564E+03	3.359E−15	2.357E−08
$1s\,6g\ ^3G_5$	$1s\,6h\ ^3H^o_5$	8.7873E+06	3.968E−29	3.115E−28			
$1s\,3d\ ^3D_2$	$1s\,6h\ ^3H^o_4$	3.8293E+00	6.327E−16	3.198E−02			
$1s\,3d\ ^3D_3$	$1s\,6h\ ^3H^o_4$	3.8727E+00	3.323E−13	1.642E+01			
$1s\,3d\ ^1D_2$	$1s\,6h\ ^3H^o_4$	3.8744E+00	4.003E−12	1.976E+02			
$1s\,4d\ ^3D_2$	$1s\,6h\ ^3H^o_4$	9.1575E+00	7.295E−16	6.448E−03			
$1s\,4d\ ^3D_3$	$1s\,6h\ ^3H^o_4$	9.2624E+00	3.180E−13	2.747E+00			
$1s\,4d\ ^1D_2$	$1s\,6h\ ^3H^o_4$	9.2667E+00	3.921E−12	3.384E+01			
$1s\,5d\ ^3D_2$	$1s\,6h\ ^3H^o_4$	2.5741E+01	3.296E−17	3.686E−05			
$1s\,5d\ ^3D_3$	$1s\,6h\ ^3H^o_4$	2.6168E+01	2.500E−14	2.706E−02			
$1s\,5d\ ^1D_2$	$1s\,6h\ ^3H^o_4$	2.6186E+01	2.013E−13	2.176E−01			
$1s\,5g\ ^3G_4$	$1s\,6h\ ^3H^o_4$	2.6392E+01	1.806E−07	1.922E+05	2.6281E+01	1.815E−07	1.931E+05
$1s\,5g\ ^3G_3$	$1s\,6h\ ^3H^o_4$	2.6397E+01	1.986E−06	2.113E+06	2.6286E+01	1.996E−06	2.123E+06
$1s\,5g\ ^3G_5$	$1s\,6h\ ^3H^o_4$	2.6523E+01	4.039E−17	4.255E−05			
$1s\,5g\ ^1G_4$	$1s\,6h\ ^3H^o_4$	2.6527E+01	6.353E−13	6.691E−01			
$1s\,6d\ ^3D_2$	$1s\,6h\ ^3H^o_4$	1.5031E+03	4.993E−24	1.638E−15			
$1s\,6d\ ^3D_3$	$1s\,6h\ ^3H^o_4$	3.3388E+03	3.254E−21	2.163E−13			
$1s\,6d\ ^1D_2$	$1s\,6h\ ^3H^o_4$	3.5222E+03	6.134E−21	3.664E−13			
$1s\,6g\ ^3G_4$	$1s\,6h\ ^3H^o_4$	9.0013E+03	5.541E−15	5.068E−08	9.2564E+03	5.038E−15	4.321E−08

(*continued on next page*)

Table 6 (*continued*)

Lower	Upper	GRASP2K			FAC		
		λ (Å)	*gf*	A (s^{-1})	λ (Å)	*gf*	A (s^{-1})
$1s\,6g\ ^3G_3$	$1s\,6h\ ^3H^o_4$	9.3695E+03	5.404E−14	4.562E−07	9.2564E+03	5.542E−14	4.753E−07
$1s\,6g\ ^3G_5$	$1s\,6h\ ^3H^o_4$	3.4069E+05	1.141E−30	7.288E−27			
$1s\,2p\ ^3P^o_2$	$1s\,6g\ ^1G_4$	1.4395E+00	5.680E−15	2.031E+00			
$1s\,3p\ ^3P^o_2$	$1s\,6g\ ^1G_4$	3.8194E+00	3.778E−15	1.919E−01			
$1s\,4p\ ^3P^o_2$	$1s\,6g\ ^1G_4$	9.1339E+00	6.563E−14	5.830E−01			
$1s\,4f\ ^3F^o_3$	$1s\,6g\ ^1G_4$	9.2640E+00	3.610E−08	3.117E+05	9.2249E+00	3.550E−08	3.065E+05
$1s\,4f\ ^3F^o_2$	$1s\,6g\ ^1G_4$	9.2662E+00	4.630E−07	3.997E+06	9.2271E+00	4.648E−07	4.012E+06
$1s\,4f\ ^3F^o_4$	$1s\,6g\ ^1G_4$	9.3167E+00	3.774E−07	3.222E+06	9.2773E+00	3.822E−07	3.263E+06
$1s\,4f\ ^1F^o_3$	$1s\,6g\ ^1G_4$	9.3184E+00	4.149E−06	3.541E+07	9.2790E+00	4.203E−06	3.587E+07
$1s\,5p\ ^3P^o_2$	$1s\,6g\ ^1G_4$	2.5647E+01	7.477E−14	8.425E−02			
$1s\,5f\ ^3F^o_3$	$1s\,6g\ ^1G_4$	2.6175E+01	2.866E−08	3.100E+04	2.6065E+01	2.825E−08	3.055E+04
$1s\,5f\ ^3F^o_2$	$1s\,6g\ ^1G_4$	2.6184E+01	3.669E−07	3.966E+05	2.6074E+01	3.687E−07	3.985E+05
$1s\,5f\ ^3F^o_4$	$1s\,6g\ ^1G_4$	2.6391E+01	3.061E−07	3.257E+05	2.6281E+01	3.074E−07	3.271E+05
$1s\,5f\ ^1F^o_3$	$1s\,6g\ ^1G_4$	2.6398E+01	3.368E−06	3.582E+06	2.6287E+01	3.380E−06	3.595E+06
$1s\,6p\ ^3P^o_2$	$1s\,6g\ ^1G_4$	1.3363E+03	2.421E−18	1.005E−09			
$1s\,6f\ ^3F^o_3$	$1s\,6g\ ^1G_4$	3.4068E+03	4.316E−14	2.756E−06	3.4619E+03	4.205E−14	2.578E−06
$1s\,6f\ ^3F^o_2$	$1s\,6g\ ^1G_4$	3.4975E+03	5.097E−13	3.088E−05	3.4608E+03	5.197E−13	3.188E−05
$1s\,6f\ ^3F^o_4$	$1s\,6g\ ^1G_4$	8.9311E+03	2.547E−14	2.366E−07	9.2773E+03	2.245E−14	1.917E−07
$1s\,6f\ ^1F^o_3$	$1s\,6g\ ^1G_4$	9.4124E+03	2.394E−13	2.002E−06	9.2882E+03	2.460E−13	2.096E−06
$1s\,6h\ ^3H^o_5$	$1s\,6g\ ^1G_4$	2.9962E+05	2.062E−24	1.703E−20			
$1s\,6h\ ^3H^o_4$	$1s\,6g\ ^1G_4$	1.9372E+06	1.973E−27	3.896E−25			
$1s\,5g\ ^3G_4$	$1s\,6h\ ^3H^o_6$	2.6344E+01	8.894E−07	6.576E+05	2.6232E+01	8.917E−07	6.593E+05
$1s\,5g\ ^3G_5$	$1s\,6h\ ^3H^o_6$	2.6474E+01	1.048E−05	7.674E+06	2.6361E+01	1.054E−05	7.716E+06
$1s\,5g\ ^1G_4$	$1s\,6h\ ^3H^o_6$	2.6478E+01	3.306E−07	2.420E+05	2.6365E+01	3.324E−07	2.432E+05
$1s\,6g\ ^3G_4$	$1s\,6h\ ^3H^o_6$	5.5520E+03	1.164E−13	1.938E−06	5.5614E+03	1.139E−13	1.874E−06
$1s\,6g\ ^3G_5$	$1s\,6h\ ^3H^o_6$	1.3897E+04	8.779E−14	2.332E−07	1.3933E+04	8.611E−14	2.256E−07
$1s\,6g\ ^1G_4$	$1s\,6h\ ^3H^o_6$	1.4598E+04	2.390E−15	5.755E−09	1.3934E+04	2.733E−15	7.163E−09
$1s\,3d\ ^3D_3$	$1s\,6h\ ^1H^o_5$	3.8717E+00	4.245E−16	1.717E−02			
$1s\,4d\ ^3D_3$	$1s\,6h\ ^1H^o_5$	9.2562E+00	4.469E−16	3.163E−03			
$1s\,5d\ ^3D_3$	$1s\,6h\ ^1H^o_5$	2.6119E+01	2.181E−16	1.939E−04			
$1s\,5g\ ^3G_4$	$1s\,6h\ ^1H^o_5$	2.6342E+01	3.299E−08	2.883E+04	2.6232E+01	3.216E−08	2.810E+04
$1s\,5g\ ^3G_3$	$1s\,6h\ ^1H^o_5$	2.6348E+01	7.157E−07	6.251E+05	2.6237E+01	7.181E−07	6.272E+05
$1s\,5g\ ^3G_5$	$1s\,6h\ ^1H^o_5$	2.6473E+01	4.992E−07	4.320E+05	2.6361E+01	5.019E−07	4.342E+05
$1s\,5g\ ^1G_4$	$1s\,6h\ ^1H^o_5$	2.6477E+01	8.653E−06	7.485E+06	2.6365E+01	8.697E−06	7.523E+06
$1s\,6d\ ^3D_3$	$1s\,6h\ ^1H^o_5$	2.6964E+03	7.459E−22	6.221E−14			
$1s\,6g\ ^3G_4$	$1s\,6h\ ^1H^o_5$	5.4809E+03	4.490E−15	9.064E−08	5.5614E+03	4.383E−15	8.520E−08
$1s\,6g\ ^3G_3$	$1s\,6h\ ^1H^o_5$	5.6153E+03	9.058E−14	1.742E−06	5.5614E+03	9.204E−14	1.789E−06
$1s\,6g\ ^3G_5$	$1s\,6h\ ^1H^o_5$	1.3461E+04	4.602E−15	1.540E−08	1.3933E+04	4.100E−15	1.269E−08
$1s\,6g\ ^1G_4$	$1s\,6h\ ^1H^o_5$	1.4116E+04	6.916E−14	2.105E−07	1.3934E+04	7.107E−14	2.201E−07
$1s\,2p\ ^3P^o_1$	$1s\,7s\ ^3S_1$	1.3378E+00	7.061E−11	8.772E+04	1.3323E+00	1.617E−10	2.008E+05
$1s\,2p\ ^3P^o_2$	$1s\,7s\ ^3S_1$	1.3964E+00	8.788E−08	1.002E+08	1.3905E+00	8.717E−08	9.938E+07
$1s\,2p\ ^1P^o_1$	$1s\,7s\ ^3S_1$	1.4019E+00	9.183E−08	1.039E+08	1.3961E+00	8.599E−08	9.725E+07
$1s\,3p\ ^3P^o_1$	$1s\,7s\ ^3S_1$	3.4180E+00	6.412E−11	1.220E+04	3.4039E+00	8.987E−11	1.710E+04
$1s\,3p\ ^3P^o_2$	$1s\,7s\ ^3S_1$	3.5305E+00	5.822E−08	1.038E+07	3.5159E+00	5.726E−08	1.021E+07
$1s\,3p\ ^1P^o_1$	$1s\,7s\ ^3S_1$	3.5405E+00	5.893E−08	1.045E+07	3.5260E+00	5.669E−08	1.005E+07
$1s\,4p\ ^3P^o_1$	$1s\,7s\ ^3S_1$	7.4166E+00	4.198E−11	1.697E+03	7.3859E+00	5.786E−11	2.338E+03
$1s\,4p\ ^3P^o_2$	$1s\,7s\ ^3S_1$	7.6388E+00	3.929E−08	1.497E+06	7.6070E+00	3.893E−08	1.483E+06
$1s\,4p\ ^1P^o_1$	$1s\,7s\ ^3S_1$	7.6581E+00	3.974E−08	1.507E+06	7.6265E+00	3.858E−08	1.462E+06
$1s\,4f\ ^3F^o_3$	$1s\,7s\ ^3S_1$	7.7295E+00	3.020E−15	1.124E−01			
$1s\,4f\ ^3F^o_2$	$1s\,7s\ ^3S_1$	7.7310E+00	4.463E−16	1.660E−02			
$1s\,4f\ ^1F^o_3$	$1s\,7s\ ^3S_1$	7.7674E+00	9.051E−15	3.336E−01			
$1s\,5p\ ^3P^o_1$	$1s\,7s\ ^3S_1$	1.6020E+01	2.993E−11	2.593E+02	1.5955E+01	4.220E−11	3.655E+02
$1s\,5p\ ^3P^o_2$	$1s\,7s\ ^3S_1$	1.6551E+01	2.882E−08	2.340E+05	1.6483E+01	2.871E−08	2.329E+05
$1s\,5p\ ^1P^o_1$	$1s\,7s\ ^3S_1$	1.6597E+01	2.919E−08	2.356E+05	1.6529E+01	2.843E−08	2.294E+05
$1s\,5f\ ^3F^o_3$	$1s\,7s\ ^3S_1$	1.6769E+01	2.832E−15	2.239E−02			
$1s\,5f\ ^3F^o_2$	$1s\,7s\ ^3S_1$	1.6773E+01	2.941E−17	2.324E−04			
$1s\,5f\ ^1F^o_3$	$1s\,7s\ ^3S_1$	1.6860E+01	1.476E−14	1.154E−01			
$1s\,6p\ ^3P^o_1$	$1s\,7s\ ^3S_1$	4.2860E+01	2.300E−11	2.784E+01	4.2690E+01	5.831E−11	7.054E+01
$1s\,6p\ ^3P^o_2$	$1s\,7s\ ^3S_1$	4.5091E+01	2.306E−08	2.522E+04	4.4909E+01	2.285E−08	2.498E+04
$1s\,6p\ ^1P^o_1$	$1s\,7s\ ^3S_1$	4.5287E+01	2.341E−08	2.537E+04	4.5084E+01	2.254E−08	2.444E+04
$1s\,6f\ ^3F^o_3$	$1s\,7s\ ^3S_1$	4.6035E+01	2.643E−15	2.773E−03			
$1s\,6f\ ^3F^o_2$	$1s\,7s\ ^3S_1$	4.6051E+01	1.251E−16	1.312E−04			
$1s\,6f\ ^1F^o_3$	$1s\,7s\ ^3S_1$	4.6435E+01	1.966E−14	2.027E−02			
$1s\,2s\ ^3S_1$	$1s\,7p\ ^3P^o_1$	1.3266E+00	9.923E−10	1.254E+06	1.3210E+00	1.573E−09	1.987E+06
$1s\,3s\ ^3S_1$	$1s\,7p\ ^3P^o_1$	3.3968E+00	3.292E−10	6.343E+04	3.3827E+00	4.928E−10	9.495E+04
$1s\,3d\ ^3D_2$	$1s\,7p\ ^3P^o_1$	3.5373E+00	5.806E−10	1.032E+05	3.5225E+00	5.732E−10	1.018E+05
$1s\,3d\ ^3D_1$	$1s\,7p\ ^3P^o_1$	3.5388E+00	5.924E−10	1.052E+05	3.5240E+00	5.632E−10	9.998E+04
$1s\,3d\ ^3D_3$	$1s\,7p\ ^3P^o_1$	3.5743E+00	9.720E−09	1.692E+06	3.5593E+00	9.462E−09	1.646E+06
$1s\,3d\ ^1D_2$	$1s\,7p\ ^3P^o_1$	3.5757E+00	3.723E−09	6.474E+05	3.5607E+00	3.624E−09	6.301E+05
$1s\,4s\ ^3S_1$	$1s\,7p\ ^3P^o_1$	7.3716E+00	1.514E−10	6.195E+03	7.3412E+00	2.184E−10	8.937E+03
$1s\,4d\ ^3D_2$	$1s\,7p\ ^3P^o_1$	7.6476E+00	6.420E−10	2.441E+04	7.6163E+00	6.362E−10	2.418E+04

(*continued on next page*)

Table 6 (*continued*)

Lower	Upper	GRASP2K			FAC		
		λ (Å)	*gf*	A (s^{-1})	λ (Å)	*gf*	A (s^{-1})
$1s\,4d\ ^3D_1$	$1s\,7p\ ^3P^o_1$	7.6504E+00	6.386E−10	2.426E+04	7.6191E+00	6.185E−10	2.348E+04
$1s\,4d\ ^3D_3$	$1s\,7p\ ^3P^o_1$	7.7206E+00	1.056E−08	3.939E+05	7.6888E+00	1.031E−08	3.845E+05
$1s\,4d\ ^1D_2$	$1s\,7p\ ^3P^o_1$	7.7236E+00	4.009E−09	1.494E+05	7.6918E+00	3.961E−09	1.476E+05
$1s\,5s\ ^3S_1$	$1s\,7p\ ^3P^o_1$	1.5898E+01	8.382E−11	7.373E+02	1.5833E+01	1.150E−10	1.011E+03
$1s\,5d\ ^3D_2$	$1s\,7p\ ^3P^o_1$	1.6554E+01	6.141E−10	4.983E+03	1.6489E+01	6.088E−10	4.936E+03
$1s\,5d\ ^3D_1$	$1s\,7p\ ^3P^o_1$	1.6561E+01	6.033E−10	4.891E+03	1.6495E+01	5.889E−10	4.771E+03
$1s\,5d\ ^3D_3$	$1s\,7p\ ^3P^o_1$	1.6729E+01	1.001E−08	7.953E+04	1.6663E+01	9.785E−09	7.770E+04
$1s\,5d\ ^1D_2$	$1s\,7p\ ^3P^o_1$	1.6737E+01	3.776E−09	2.997E+04	1.6670E+01	3.758E−09	2.981E+04
$1s\,5g\ ^3G_3$	$1s\,7p\ ^3P^o_1$	1.6823E+01	5.398E−18	4.241E−05			
$1s\,6s\ ^3S_1$	$1s\,7p\ ^3P^o_1$	4.2260E+01	5.061E−11	6.301E+01	4.2057E+01	6.306E−11	7.859E+01
$1s\,6d\ ^3D_2$	$1s\,7p\ ^3P^o_1$	4.4993E+01	5.884E−10	6.463E+02	4.4844E+01	5.978E−10	6.553E+02
$1s\,6d\ ^3D_1$	$1s\,7p\ ^3P^o_1$	4.5021E+01	5.741E−10	6.298E+02	4.4837E+01	5.631E−10	6.175E+02
$1s\,6d\ ^3D_3$	$1s\,7p\ ^3P^o_1$	4.5746E+01	9.580E−09	1.018E+04	4.5589E+01	9.401E−09	9.972E+03
$1s\,6d\ ^1D_2$	$1s\,7p\ ^3P^o_1$	4.5778E+01	3.602E−09	3.821E+03	4.5600E+01	3.564E−09	3.779E+03
$1s\,6g\ ^3G_3$	$1s\,7p\ ^3P^o_1$	4.6153E+01	1.003E−17	1.047E−05			
$1s\,7s\ ^3S_1$	$1s\,7p\ ^3P^o_1$	7.6504E+03	1.709E−16	6.493E−09	7.3461E+03	3.329E−16	1.360E−08
$1s\,2p\ ^3P^o_2$	$1s\,7s\ ^1S_0$	1.3961E+00	5.700E−08	1.951E+08	1.3903E+00	5.814E−08	1.989E+08
$1s\,3p\ ^3P^o_2$	$1s\,7s\ ^1S_0$	3.5288E+00	3.806E−08	2.038E+07	3.5145E+00	3.822E−08	2.046E+07
$1s\,4p\ ^3P^o_2$	$1s\,7s\ ^1S_0$	7.6311E+00	2.568E−08	2.941E+06	7.6005E+00	2.602E−08	2.979E+06
$1s\,4f\ ^3F^o_2$	$1s\,7s\ ^1S_0$	7.7232E+00	2.042E−15	2.284E−01			
$1s\,5p\ ^3P^o_2$	$1s\,7s\ ^1S_0$	1.6515E+01	1.876E−08	4.589E+05	1.6452E+01	1.924E−08	4.702E+05
$1s\,5f\ ^3F^o_2$	$1s\,7s\ ^1S_0$	1.6736E+01	3.426E−15	8.160E−02			
$1s\,6p\ ^3P^o_2$	$1s\,7s\ ^1S_0$	4.4825E+01	1.486E−08	4.934E+04	4.4685E+01	1.546E−08	5.123E+04
$1s\,6f\ ^3F^o_2$	$1s\,7s\ ^1S_0$	4.5774E+01	4.081E−15	1.299E−02			
$1s\,3d\ ^3D_2$	$1s\,7p\ ^3P^o_0$	3.5372E+00	3.772E−10	2.011E+05	3.5228E+00	3.663E−10	1.952E+05
$1s\,3d\ ^1D_2$	$1s\,7p\ ^3P^o_0$	3.5756E+00	4.547E−09	2.372E+06	3.5610E+00	4.361E−09	2.274E+06
$1s\,4d\ ^3D_2$	$1s\,7p\ ^3P^o_0$	7.6470E+00	4.064E−10	4.636E+04	7.6177E+00	3.968E−10	4.522E+04
$1s\,4d\ ^1D_2$	$1s\,7p\ ^3P^o_0$	7.7230E+00	4.905E−09	5.486E+05	7.6932E+00	4.762E−09	5.322E+05
$1s\,5d\ ^3D_2$	$1s\,7p\ ^3P^o_0$	1.6552E+01	3.834E−10	9.335E+03	1.6495E+01	3.754E−10	9.126E+03
$1s\,5d\ ^1D_2$	$1s\,7p\ ^3P^o_0$	1.6734E+01	4.624E−09	1.101E+05	1.6677E+01	4.518E−09	1.074E+05
$1s\,6d\ ^3D_2$	$1s\,7p\ ^3P^o_0$	4.4975E+01	3.644E−10	1.202E+03	4.4891E+01	3.446E−10	1.131E+03
$1s\,6d\ ^1D_2$	$1s\,7p\ ^3P^o_0$	4.5759E+01	4.411E−09	1.405E+04	4.5649E+01	4.337E−09	1.376E+04
$1s^2\ ^1S_0$	$1s\,7p\ ^3P^o_2$	3.1400E−01	6.200E−06	8.387E+10	3.1270E−01	6.930E−06	9.375E+10
$1s\,2s\ ^3S_1$	$1s\,7p\ ^3P^o_2$	1.3253E+00	7.079E−07	5.377E+08	1.3197E+00	7.260E−07	5.513E+08
$1s\,2s\ ^1S_0$	$1s\,7p\ ^3P^o_2$	1.3374E+00	4.714E−07	3.516E+08	1.3320E+00	4.707E−07	3.509E+08
$1s\,3s\ ^3S_1$	$1s\,7p\ ^3P^o_2$	3.3884E+00	2.267E−07	2.634E+07	3.3744E+00	2.291E−07	2.661E+07
$1s\,3s\ ^1S_0$	$1s\,7p\ ^3P^o_2$	3.4094E+00	1.548E−07	1.776E+07	3.3955E+00	1.499E−07	1.720E+07
$1s\,3d\ ^3D_2$	$1s\,7p\ ^3P^o_2$	3.5282E+00	1.202E−17	1.288E−03			
$1s\,3d\ ^3D_1$	$1s\,7p\ ^3P^o_2$	3.5297E+00	2.420E−13	2.591E+01			
$1s\,3d\ ^3D_3$	$1s\,7p\ ^3P^o_2$	3.5650E+00	3.454E−08	3.626E+06	3.5501E+00	3.333E−08	3.499E+06
$1s\,3d\ ^1D_2$	$1s\,7p\ ^3P^o_2$	3.5665E+00	8.900E−09	9.335E+05	3.5515E+00	8.324E−09	8.730E+05
$1s\,4s\ ^3S_1$	$1s\,7p\ ^3P^o_2$	7.3324E+00	1.020E−07	2.530E+06	7.3023E+00	1.027E−07	2.547E+06
$1s\,4s\ ^1S_0$	$1s\,7p\ ^3P^o_2$	7.3720E+00	7.087E−08	1.740E+06	7.3421E+00	6.736E−08	1.652E+06
$1s\,4d\ ^3D_2$	$1s\,7p\ ^3P^o_2$	7.6054E+00	7.859E−14	1.813E+00			
$1s\,4d\ ^3D_1$	$1s\,7p\ ^3P^o_2$	7.6082E+00	1.657E−13	3.818E+00			
$1s\,4d\ ^3D_3$	$1s\,7p\ ^3P^o_2$	7.6776E+00	3.901E−08	8.828E+05	7.6461E+00	3.790E−08	8.575E+05
$1s\,4d\ ^1D_2$	$1s\,7p\ ^3P^o_2$	7.6806E+00	9.934E−09	2.246E+05	7.6491E+00	9.464E−09	2.139E+05
$1s\,5s\ ^3S_1$	$1s\,7p\ ^3P^o_2$	1.5717E+01	5.498E−08	2.969E+05	1.5653E+01	5.521E−08	2.980E+05
$1s\,5s\ ^1S_0$	$1s\,7p\ ^3P^o_2$	1.5808E+01	3.839E−08	2.049E+05	1.5745E+01	3.617E−08	1.930E+05
$1s\,5d\ ^3D_2$	$1s\,7p\ ^3P^o_2$	1.6358E+01	1.841E−13	9.179E−01			
$1s\,5d\ ^3D_1$	$1s\,7p\ ^3P^o_2$	1.6364E+01	1.037E−13	5.164E−01			
$1s\,5d\ ^3D_3$	$1s\,7p\ ^3P^o_2$	1.6529E+01	3.782E−08	1.847E+05	1.6463E+01	3.680E−08	1.796E+05
$1s\,5d\ ^1D_2$	$1s\,7p\ ^3P^o_2$	1.6536E+01	9.557E−09	4.663E+04	1.6471E+01	9.189E−09	4.480E+04
$1s\,5g\ ^3G_4$	$1s\,7p\ ^3P^o_2$	1.6618E+01	1.900E−16	9.176E−04			
$1s\,5g\ ^3G_3$	$1s\,7p\ ^3P^o_2$	1.6620E+01	4.014E−16	1.939E−03			
$1s\,5g\ ^1G_4$	$1s\,7p\ ^3P^o_2$	1.6671E+01	5.026E−16	2.413E−03			
$1s\,6s\ ^3S_1$	$1s\,7p\ ^3P^o_2$	4.1005E+01	3.153E−08	2.501E+04	4.0810E+01	3.175E−08	2.522E+04
$1s\,6s\ ^1S_0$	$1s\,7p\ ^3P^o_2$	4.1360E+01	2.208E−08	1.722E+04	4.1111E+01	2.071E−08	1.620E+04
$1s\,6d\ ^3D_2$	$1s\,7p\ ^3P^o_2$	4.3572E+01	2.575E−13	1.809E−01			
$1s\,6d\ ^3D_1$	$1s\,7p\ ^3P^o_2$	4.3599E+01	6.437E−14	4.518E−02			
$1s\,6d\ ^3D_3$	$1s\,7p\ ^3P^o_2$	4.4278E+01	3.619E−08	2.463E+04	4.4127E+01	3.518E−08	2.389E+04
$1s\,6d\ ^1D_2$	$1s\,7p\ ^3P^o_2$	4.4308E+01	9.105E−09	6.187E+03	4.4138E+01	8.787E−09	5.966E+03
$1s\,6g\ ^3G_4$	$1s\,7p\ ^3P^o_2$	4.4650E+01	3.033E−16	2.030E−04			
$1s\,6g\ ^3G_3$	$1s\,7p\ ^3P^o_2$	4.4659E+01	1.017E−15	6.805E−04			
$1s\,6g\ ^1G_4$	$1s\,7p\ ^3P^o_2$	4.4874E+01	1.154E−15	7.646E−04			
$1s\,7s\ ^3S_1$	$1s\,7p\ ^3P^o_2$	1.1691E+03	3.824E−11	3.733E−02	1.1590E+03	3.901E−11	3.842E−02
$1s\,7s\ ^1S_0$	$1s\,7p\ ^3P^o_2$	1.3812E+03	1.542E−11	1.078E−02	1.3316E+03	1.714E−11	1.279E−02
$1s\,2p\ ^3P^o_1$	$1s\,7d\ ^3D_2$	1.3362E+00	4.478E−08	3.345E+07	1.3307E+00	4.941E−08	3.691E+07
$1s\,2p\ ^3P^o_0$	$1s\,7d\ ^3D_2$	1.3371E+00	2.808E−08	2.095E+07	1.3315E+00	2.860E−08	2.133E+07
$1s\,2p\ ^3P^o_2$	$1s\,7d\ ^3D_2$	1.3946E+00	2.722E−11	1.867E+04	1.3888E+00	1.197E−10	8.211E+04
$1s\,2p\ ^1P^o_1$	$1s\,7d\ ^3D_2$	1.4001E+00	5.100E−13	3.471E+02	1.3943E+00	6.804E−11	4.629E+04

(*continued on next page*)

Table 6 (*continued*)

Lower	Upper	GRASP2K			FAC		
		λ (Å)	*gf*	A (s^{-1})	λ (Å)	*gf*	A (s^{-1})
$1s\,3p\ ^3P^o_1$	$1s\,7d\ ^3D_2$	3.4075E+00	1.627E−08	1.869E+06	3.3932E+00	1.702E−08	1.956E+06
$1s\,3p\ ^3P^o_0$	$1s\,7d\ ^3D_2$	3.4089E+00	1.009E−08	1.158E+06	3.3946E+00	9.875E−09	1.133E+06
$1s\,3p\ ^3P^o_2$	$1s\,7d\ ^3D_2$	3.5193E+00	1.222E−11	1.316E+03	3.5045E+00	4.385E−11	4.723E+03
$1s\,3p\ ^1P^o_1$	$1s\,7d\ ^3D_2$	3.5292E+00	7.061E−13	7.563E+01	3.5145E+00	2.920E−11	3.127E+03
$1s\,4p\ ^3P^o_1$	$1s\,7d\ ^3D_2$	7.3673E+00	7.197E−09	1.769E+05	7.3356E+00	7.478E−09	1.838E+05
$1s\,4p\ ^3P^o_0$	$1s\,7d\ ^3D_2$	7.3700E+00	4.458E−09	1.095E+05	7.3382E+00	4.345E−09	1.067E+05
$1s\,4p\ ^3P^o_2$	$1s\,7d\ ^3D_2$	7.5864E+00	5.874E−12	1.361E+02	7.5537E+00	2.000E−11	4.636E+02
$1s\,4p\ ^1P^o_1$	$1s\,7d\ ^3D_2$	7.6055E+00	4.053E−13	9.348E+00	7.5729E+00	1.427E−11	3.293E+02
$1s\,4f\ ^3F^o_3$	$1s\,7d\ ^3D_2$	7.6759E+00	1.692E−09	3.830E+04	7.6429E+00	1.661E−09	3.762E+04
$1s\,4f\ ^3F^o_2$	$1s\,7d\ ^3D_2$	7.6774E+00	4.251E−10	9.622E+03	7.6444E+00	4.160E−10	9.418E+03
$1s\,4f\ ^3F^o_4$	$1s\,7d\ ^3D_2$	7.7121E+00	3.413E−09	7.654E+04	7.6789E+00	3.354E−09	7.524E+04
$1s\,4f\ ^1F^o_3$	$1s\,7d\ ^3D_2$	7.7133E+00	4.204E−10	9.426E+03	7.6800E+00	4.388E−10	9.841E+03
$1s\,5p\ ^3P^o_1$	$1s\,7d\ ^3D_2$	1.5792E+01	3.717E−09	1.988E+04	1.5722E+01	3.848E−09	2.059E+04
$1s\,5p\ ^3P^o_0$	$1s\,7d\ ^3D_2$	1.5798E+01	2.303E−09	1.231E+04	1.5728E+01	2.239E−09	1.197E+04
$1s\,5p\ ^3P^o_2$	$1s\,7d\ ^3D_2$	1.6307E+01	3.226E−12	1.619E+01	1.6234E+01	1.060E−11	5.324E+01
$1s\,5p\ ^1P^o_1$	$1s\,7d\ ^3D_2$	1.6352E+01	2.514E−13	1.255E+00	1.6279E+01	7.983E−12	3.984E+01
$1s\,5f\ ^3F^o_3$	$1s\,7d\ ^3D_2$	1.6519E+01	2.775E−09	1.357E+04	1.6446E+01	2.756E−09	1.347E+04
$1s\,5f\ ^3F^o_2$	$1s\,7d\ ^3D_2$	1.6522E+01	6.968E−10	3.405E+03	1.6450E+01	6.900E−10	3.373E+03
$1s\,5f\ ^3F^o_4$	$1s\,7d\ ^3D_2$	1.6605E+01	5.591E−09	2.705E+04	1.6532E+01	5.516E−09	2.669E+04
$1s\,5f\ ^1F^o_3$	$1s\,7d\ ^3D_2$	1.6607E+01	6.887E−10	3.331E+03	1.6535E+01	7.220E−10	3.493E+03
$1s\,6p\ ^3P^o_1$	$1s\,7d\ ^3D_2$	4.1263E+01	2.028E−09	1.589E+03	4.1063E+01	2.093E−09	1.641E+03
$1s\,6p\ ^3P^o_0$	$1s\,7d\ ^3D_2$	4.1288E+01	1.257E−09	9.836E+02	4.1000E+01	1.227E−09	9.657E+02
$1s\,6p\ ^3P^o_2$	$1s\,7d\ ^3D_2$	4.3326E+01	1.907E−12	1.355E+00	4.3112E+01	6.034E−12	4.294E+00
$1s\,6p\ ^1P^o_1$	$1s\,7d\ ^3D_2$	4.3508E+01	1.635E−13	1.152E−01	4.3273E+01	3.074E−12	2.171E+00
$1s\,6f\ ^3F^o_3$	$1s\,7d\ ^3D_2$	4.4197E+01	3.605E−09	2.462E+03	4.4000E+01	3.604E−09	2.462E+03
$1s\,6f\ ^3F^o_2$	$1s\,7d\ ^3D_2$	4.4212E+01	9.051E−10	6.177E+02	4.4000E+01	9.006E−10	6.153E+02
$1s\,6f\ ^3F^o_4$	$1s\,7d\ ^3D_2$	4.4555E+01	7.249E−09	4.871E+03	4.4354E+01	7.175E−09	4.824E+03
$1s\,6f\ ^1F^o_3$	$1s\,7d\ ^3D_2$	4.4566E+01	8.930E−10	5.998E+02	4.4354E+01	9.294E−10	6.249E+02
$1s\,6h\ ^3H^o_4$	$1s\,7d\ ^3D_2$	4.4777E+01	1.788E−21	1.190E−09			
$1s\,7p\ ^3P^o_1$	$1s\,7d\ ^3D_2$	1.2946E+03	1.100E−12	8.757E−04	1.2624E+03	1.212E−12	1.006E−03
$1s\,7p\ ^3P^o_0$	$1s\,7d\ ^3D_2$	1.3100E+03	6.563E−13	5.102E−04	1.2259E+03	7.685E−13	6.764E−04
$1s\,7p\ ^3P^o_2$	$1s\,7d\ ^3D_2$	2.0924E+04	2.094E−19	6.381E−13			
$1s\,2p\ ^3P^o_1$	$1s\,7d\ ^3D_1$	1.3362E+00	4.400E−08	5.479E+07	1.3307E+00	4.658E−08	5.799E+07
$1s\,2p\ ^3P^o_2$	$1s\,7d\ ^3D_1$	1.3946E+00	9.500E−14	1.086E+02			
$1s\,2p\ ^1P^o_1$	$1s\,7d\ ^3D_1$	1.4001E+00	4.968E−11	5.634E+04	1.3943E+00	6.617E−11	7.503E+04
$1s\,3p\ ^3P^o_1$	$1s\,7d\ ^3D_1$	3.4074E+00	1.582E−08	3.030E+06	3.3932E+00	1.606E−08	3.075E+06
$1s\,3p\ ^3P^o_2$	$1s\,7d\ ^3D_1$	3.5192E+00	1.300E−13	2.334E+01			
$1s\,3p\ ^1P^o_1$	$1s\,7d\ ^3D_1$	3.5291E+00	1.664E−11	2.970E+03	3.5145E+00	2.062E−11	3.680E+03
$1s\,4p\ ^3P^o_1$	$1s\,7d\ ^3D_1$	7.3668E+00	6.984E−09	2.861E+05	7.3357E+00	7.059E−09	2.892E+05
$1s\,4p\ ^3P^o_2$	$1s\,7d\ ^3D_1$	7.5859E+00	8.791E−14	3.396E+00			
$1s\,4p\ ^1P^o_1$	$1s\,7d\ ^3D_1$	7.6050E+00	7.421E−12	2.853E+02	7.5730E+00	8.740E−12	3.359E+02
$1s\,4f\ ^3F^o_3$	$1s\,7d\ ^3D_1$	7.6754E+00	2.849E−10	1.075E+04	7.6430E+00	2.810E−10	1.060E+04
$1s\,4f\ ^3F^o_2$	$1s\,7d\ ^3D_1$	7.6769E+00	9.882E−10	3.728E+04	7.6445E+00	9.709E−10	3.662E+04
$1s\,4f\ ^1F^o_3$	$1s\,7d\ ^3D_1$	7.7127E+00	2.289E−09	8.555E+04	7.6801E+00	2.268E−09	8.477E+04
$1s\,5p\ ^3P^o_1$	$1s\,7d\ ^3D_1$	1.5790E+01	3.602E−09	3.212E+04	1.5722E+01	3.635E−09	3.241E+04
$1s\,5p\ ^3P^o_2$	$1s\,7d\ ^3D_1$	1.6305E+01	5.927E−14	4.957E−01			
$1s\,5p\ ^1P^o_1$	$1s\,7d\ ^3D_1$	1.6349E+01	3.876E−12	3.224E+01	1.6280E+01	4.371E−12	3.635E+01
$1s\,5f\ ^3F^o_3$	$1s\,7d\ ^3D_1$	1.6516E+01	4.669E−10	3.806E+03	1.6447E+01	4.657E−10	3.795E+03
$1s\,5f\ ^3F^o_2$	$1s\,7d\ ^3D_1$	1.6520E+01	1.620E−09	1.320E+04	1.6451E+01	1.610E−09	1.311E+04
$1s\,5f\ ^1F^o_3$	$1s\,7d\ ^3D_1$	1.6605E+01	3.751E−09	3.025E+04	1.6535E+01	3.730E−09	3.008E+04
$1s\,6p\ ^3P^o_1$	$1s\,7d\ ^3D_1$	4.1248E+01	1.961E−09	2.563E+03	4.1067E+01	1.974E−09	2.581E+03
$1s\,6p\ ^3P^o_2$	$1s\,7d\ ^3D_1$	4.3310E+01	4.142E−14	4.910E−02			
$1s\,6p\ ^1P^o_1$	$1s\,7d\ ^3D_1$	4.3491E+01	2.199E−12	2.585E+00	4.3277E+01	3.706E−12	4.363E+00
$1s\,6f\ ^3F^o_3$	$1s\,7d\ ^3D_1$	4.4180E+01	6.062E−10	6.905E+02	4.4005E+01	5.983E−10	6.812E+02
$1s\,6f\ ^3F^o_2$	$1s\,7d\ ^3D_1$	4.4195E+01	2.104E−09	2.395E+03	4.4004E+01	2.101E−09	2.392E+03
$1s\,6f\ ^1F^o_3$	$1s\,7d\ ^3D_1$	4.4549E+01	4.862E−09	5.447E+03	4.4358E+01	4.862E−09	5.447E+03
$1s\,7p\ ^3P^o_1$	$1s\,7d\ ^3D_1$	1.2801E+03	1.102E−12	1.496E−03	1.2659E+03	1.132E−12	1.558E−03
$1s\,7p\ ^3P^o_2$	$1s\,7d\ ^3D_1$	1.7684E+04	2.108E−20	1.499E−13			
$1s\,2s\ ^3S_1$	$1s\,7p\ ^1P^o_1$	1.3252E+00	7.024E−07	8.893E+08	1.3196E+00	7.245E−07	9.173E+08
$1s\,3s\ ^3S_1$	$1s\,7p\ ^1P^o_1$	3.3877E+00	2.240E−07	4.340E+07	3.3738E+00	2.287E−07	4.430E+07
$1s\,3d\ ^3D_2$	$1s\,7p\ ^1P^o_1$	3.5275E+00	2.870E−13	5.129E+01			
$1s\,3d\ ^3D_1$	$1s\,7p\ ^1P^o_1$	3.5290E+00	3.245E−15	5.794E−01			
$1s\,3d\ ^3D_3$	$1s\,7p\ ^1P^o_1$	3.5643E+00	6.031E−09	1.055E+06	3.5494E+00	6.273E−09	1.097E+06
$1s\,3d\ ^1D_2$	$1s\,7p\ ^1P^o_1$	3.5657E+00	1.963E−08	3.433E+06	3.5508E+00	1.869E−08	3.269E+06
$1s\,4s\ ^3S_1$	$1s\,7p\ ^1P^o_1$	7.3292E+00	1.005E−07	4.160E+06	7.2994E+00	1.026E−07	4.245E+06
$1s\,4d\ ^3D_2$	$1s\,7p\ ^1P^o_1$	7.6019E+00	3.982E−14	1.532E+00			
$1s\,4d\ ^3D_1$	$1s\,7p\ ^1P^o_1$	7.6047E+00	4.575E−14	1.759E+00			
$1s\,4d\ ^3D_3$	$1s\,7p\ ^1P^o_1$	7.6740E+00	6.836E−09	2.581E+05	7.6429E+00	7.123E−09	2.688E+05
$1s\,4d\ ^1D_2$	$1s\,7p\ ^1P^o_1$	7.6770E+00	2.199E−08	8.294E+05	7.6459E+00	2.128E−08	8.026E+05
$1s\,5s\ ^3S_1$	$1s\,7p\ ^1P^o_1$	1.5702E+01	5.403E−08	4.873E+05	1.5640E+01	5.523E−08	4.978E+05
$1s\,5d\ ^3D_2$	$1s\,7p\ ^1P^o_1$	1.6342E+01	9.126E−20	7.599E−07			

(*continued on next page*)

Table 6 (*continued*)

Lower	Upper	GRASP2K			FAC		
		λ (Å)	*gf*	A (s^{-1})	λ (Å)	*gf*	A (s^{-1})
1s 5d $^3D_1$	1s 7p $^1P^o_1$	1.6348E+01	1.012E−13	8.420E−01			
1s 5d $^3D_3$	1s 7p $^1P^o_1$	1.6512E+01	6.645E−09	5.418E+04	1.6449E+01	6.925E−09	5.643E+04
1s 5d $^1D_2$	1s 7p $^1P^o_1$	1.6520E+01	2.120E−08	1.727E+05	1.6456E+01	2.069E−08	1.684E+05
1s 5g $^3G_3$	1s 7p $^1P^o_1$	1.6603E+01	6.845E−18	5.521E−05			
1s 6s $^3S_1$	1s 7p $^1P^o_1$	4.0902E+01	3.083E−08	4.097E+04	4.0720E+01	3.189E−08	4.241E+04
1s 6d $^3D_2$	1s 7p $^1P^o_1$	4.3457E+01	1.217E−14	1.433E−02			
1s 6d $^3D_1$	1s 7p $^1P^o_1$	4.3483E+01	1.543E−13	1.814E−01			
1s 6d $^3D_3$	1s 7p $^1P^o_1$	4.4159E+01	6.358E−09	7.250E+03	4.4022E+01	6.675E−09	7.593E+03
1s 6d $^1D_2$	1s 7p $^1P^o_1$	4.4189E+01	2.019E−08	2.299E+04	4.4032E+01	1.986E−08	2.258E+04
1s 6g $^3G_3$	1s 7p $^1P^o_1$	4.4538E+01	9.976E−19	1.118E−06			
1s 7s $^3S_1$	1s 7p $^1P^o_1$	1.0915E+03	4.698E−11	8.768E−02	1.0907E+03	4.671E−11	8.656E−02
1s 7d $^3D_2$	1s 7p $^1P^o_1$	7.6625E+04	4.221E−22	1.598E−16			
1s 7d $^3D_1$	1s 7p $^1P^o_1$	2.3287E+05	1.361E−22	5.579E−18			
1s 2p $^3P^o_1$	1s 7d $^3D_3$	1.3358E+00	7.245E−07	3.869E+08	1.3303E+00	7.408E−07	3.955E+08
1s 2p $^3P^o_2$	1s 7d $^3D_3$	1.3942E+00	3.102E−06	1.520E+09	1.3883E+00	3.269E−06	1.602E+09
1s 2p $^1P^o_1$	1s 7d $^3D_3$	1.3997E+00	5.609E−07	2.728E+08	1.3939E+00	5.880E−07	2.859E+08
1s 3p $^3P^o_1$	1s 7d $^3D_3$	3.4048E+00	2.467E−07	2.028E+07	3.3906E+00	2.512E−07	2.065E+07
1s 3p $^3P^o_2$	1s 7d $^3D_3$	3.5164E+00	1.176E−06	9.066E+07	3.5016E+00	1.199E−06	9.241E+07
1s 3p $^1P^o_1$	1s 7d $^3D_3$	3.5263E+00	2.112E−07	1.619E+07	3.5116E+00	2.148E−07	1.645E+07
1s 4p $^3P^o_1$	1s 7d $^3D_3$	7.3548E+00	1.069E−07	1.882E+06	7.3233E+00	1.078E−07	1.899E+06
1s 4p $^3P^o_2$	1s 7d $^3D_3$	7.5732E+00	5.437E−07	9.033E+06	7.5406E+00	5.503E−07	9.145E+06
1s 4p $^1P^o_1$	1s 7d $^3D_3$	7.5922E+00	9.799E−08	1.620E+06	7.5597E+00	9.827E−08	1.624E+06
1s 4f $^3F^o_3$	1s 7d $^3D_3$	7.6624E+00	1.187E−14	1.927E−01			
1s 4f $^3F^o_2$	1s 7d $^3D_3$	7.6639E+00	5.976E−14	9.696E−01			
1s 4f $^3F^o_4$	1s 7d $^3D_3$	7.6985E+00	1.906E−08	3.064E+05	7.6654E+00	1.878E−08	3.020E+05
1s 4f $^1F^o_3$	1s 7d $^3D_3$	7.6996E+00	2.291E−09	3.683E+04	7.6665E+00	2.252E−09	3.621E+04
1s 5p $^3P^o_1$	1s 7d $^3D_3$	1.5735E+01	5.408E−08	2.082E+05	1.5665E+01	5.427E−08	2.089E+05
1s 5p $^3P^o_2$	1s 7d $^3D_3$	1.6246E+01	2.913E−07	1.052E+06	1.6174E+01	2.949E−07	1.065E+06
1s 5p $^1P^o_1$	1s 7d $^3D_3$	1.6290E+01	5.274E−08	1.894E+05	1.6219E+01	5.244E−08	1.883E+05
1s 5f $^3F^o_3$	1s 7d $^3D_3$	1.6456E+01	1.679E−14	5.907E−02			
1s 5f $^3F^o_2$	1s 7d $^3D_3$	1.6460E+01	5.449E−14	1.917E−01			
1s 5f $^3F^o_4$	1s 7d $^3D_3$	1.6542E+01	3.177E−08	1.106E+05	1.6469E+01	3.151E−08	1.097E+05
1s 5f $^1F^o_3$	1s 7d $^3D_3$	1.6544E+01	3.820E−09	1.330E+04	1.6472E+01	3.779E−09	1.316E+04
1s 6p $^3P^o_1$	1s 7d $^3D_3$	4.0875E+01	2.875E−08	1.639E+04	4.0680E+01	2.791E−08	1.593E+04
1s 6p $^3P^o_2$	1s 7d $^3D_3$	4.2898E+01	1.671E−07	8.652E+04	4.2690E+01	1.695E−07	8.791E+04
1s 6p $^1P^o_1$	1s 7d $^3D_3$	4.3077E+01	3.045E−08	1.563E+04	4.2848E+01	3.049E−08	1.569E+04
1s 6f $^3F^o_3$	1s 7d $^3D_3$	4.3752E+01	1.969E−14	9.804E−03			
1s 6f $^3F^o_2$	1s 7d $^3D_3$	4.3767E+01	4.018E−14	1.999E−02			
1s 6f $^3F^o_4$	1s 7d $^3D_3$	4.4102E+01	4.150E−08	2.033E+04	4.3907E+01	4.131E−08	2.024E+04
1s 6f $^1F^o_3$	1s 7d $^3D_3$	4.4114E+01	4.989E−09	2.443E+03	4.3908E+01	4.957E−09	2.429E+03
1s 6h $^3H^o_5$	1s 7d $^3D_3$	4.4315E+01	9.137E−18	4.434E−06			
1s 6h $^3H^o_4$	1s 7d $^3D_3$	4.4320E+01	2.233E−18	1.083E−06			
1s 6h $^1H^o_5$	1s 7d $^3D_3$	4.4461E+01	1.723E−18	8.305E−07			
1s 7p $^3P^o_1$	1s 7d $^3D_3$	9.9748E+02	3.656E−11	3.502E−02	9.7908E+02	3.761E−11	3.707E−02
1s 7p $^3P^o_2$	1s 7d $^3D_3$	3.5985E+03	3.897E−12	2.868E−04	3.3938E+03	4.609E−12	3.780E−04
1s 7p $^1P^o_1$	1s 7d $^3D_3$	4.6072E+03	3.345E−13	1.502E−05	4.1560E+03	4.627E−13	2.531E−05
1s 2s $^3S_1$	1s 7f $^3F^o_3$	1.3248E+00	4.372E−11	2.374E+04			
1s 3s $^3S_1$	1s 7f $^3F^o_3$	3.3852E+00	9.240E−15	7.683E−01			
1s 3d $^3D_2$	1s 7f $^3F^o_3$	3.5247E+00	2.120E−07	1.626E+07	3.5099E+00	2.183E−07	1.674E+07
1s 3d $^3D_1$	1s 7f $^3F^o_3$	3.5262E+00	3.577E−08	2.742E+06	3.5113E+00	3.619E−08	2.773E+06
1s 3d $^3D_3$	1s 7f $^3F^o_3$	3.5615E+00	1.257E−12	9.441E+01			
1s 3d $^1D_2$	1s 7f $^3F^o_3$	3.5629E+00	1.636E−11	1.228E+03			
1s 4s $^3S_1$	1s 7f $^3F^o_3$	7.3173E+00	6.507E−14	1.158E+00			
1s 4d $^3D_2$	1s 7f $^3F^o_3$	7.5891E+00	1.297E−07	2.146E+06	7.5575E+00	1.316E−07	2.177E+06
1s 4d $^3D_1$	1s 7f $^3F^o_3$	7.5919E+00	2.189E−08	3.619E+05	7.5603E+00	2.182E−08	3.607E+05
1s 4d $^3D_3$	1s 7f $^3F^o_3$	7.6610E+00	6.830E−13	1.109E+01			
1s 4d $^1D_2$	1s 7f $^3F^o_3$	7.6640E+00	1.512E−11	2.452E+02			
1s 5s $^3S_1$	1s 7f $^3F^o_3$	1.5648E+01	8.099E−15	3.152E−02			
1s 5d $^3D_2$	1s 7f $^3F^o_3$	1.6283E+01	7.588E−08	2.727E+05	1.6216E+01	7.648E−08	2.748E+05
1s 5d $^3D_1$	1s 7f $^3F^o_3$	1.6289E+01	1.281E−08	4.601E+04	1.6222E+01	1.268E−08	4.552E+04
1s 5d $^3D_3$	1s 7f $^3F^o_3$	1.6452E+01	4.024E−13	1.417E+00			
1s 5d $^1D_2$	1s 7f $^3F^o_3$	1.6459E+01	1.044E−11	3.671E+01			
1s 5g $^3G_4$	1s 7f $^3F^o_3$	1.6541E+01	2.537E−09	8.837E+03	1.6470E+01	2.522E−09	8.786E+03
1s 5g $^3G_3$	1s 7f $^3F^o_3$	1.6543E+01	3.069E−10	1.069E+03	1.6472E+01	3.028E−10	1.054E+03
1s 5g $^3G_5$	1s 7f $^3F^o_3$	1.6592E+01	1.834E−09	6.348E+03	1.6521E+01	1.818E−09	6.295E+03
1s 5g $^1G_4$	1s 7f $^3F^o_3$	1.6593E+01	1.091E−10	3.777E+02	1.6522E+01	1.137E−10	3.937E+02
1s 6s $^3S_1$	1s 7f $^3F^o_3$	4.0535E+01	3.060E−16	1.774E−04			
1s 6d $^3D_2$	1s 7f $^3F^o_3$	4.3043E+01	4.447E−08	2.287E+04	4.2880E+01	4.463E−08	2.293E+04
1s 6d $^3D_1$	1s 7f $^3F^o_3$	4.3069E+01	7.515E−09	3.860E+03	4.2873E+01	7.412E−09	3.810E+03
1s 6d $^3D_3$	1s 7f $^3F^o_3$	4.3731E+01	2.440E−13	1.216E−01			
1s 6d $^1D_2$	1s 7f $^3F^o_3$	4.3761E+01	6.745E−12	3.356E+00			

(*continued on next page*)

Table 6 (*continued*)

Lower	Upper	GRASP2K			FAC		
		λ (Å)	*gf*	A (s^{-1})	λ (Å)	*gf*	A (s^{-1})
$1s\,6g\ ^3G_4$	$1s\,7f\ ^3F^o_3$	4.4095E+01	5.957E−09	2.919E+03	4.3907E+01	5.943E−09	2.912E+03
$1s\,6g\ ^3G_3$	$1s\,7f\ ^3F^o_3$	4.4103E+01	7.176E−10	3.515E+02	4.3907E+01	7.132E−10	3.495E+02
$1s\,6g\ ^3G_5$	$1s\,7f\ ^3F^o_3$	4.4306E+01	4.285E−09	2.080E+03	4.4116E+01	4.256E−09	2.066E+03
$1s\,6g\ ^1G_4$	$1s\,7f\ ^3F^o_3$	4.4313E+01	2.540E−10	1.233E+02	4.4116E+01	2.616E−10	1.270E+02
$1s\,7s\ ^3S_1$	$1s\,7f\ ^3F^o_3$	8.7909E+02	9.255E−18	1.141E−08			
$1s\,7d\ ^3D_2$	$1s\,7f\ ^3F^o_3$	4.2661E+03	3.833E−13	2.007E−05	4.3591E+03	3.562E−13	1.771E−05
$1s\,7d\ ^3D_1$	$1s\,7f\ ^3F^o_3$	4.4317E+03	5.768E−14	2.799E−06	4.3178E+03	6.085E−14	3.083E−06
$1s\,7d\ ^3D_3$	$1s\,7f\ ^3F^o_3$	2.3237E+05	1.291E−23	2.278E−19			
$1s^2\ ^1S_0$	$1s\,7f\ ^3F^o_2$	3.1390E−01	4.947E−11	6.694E+05			
$1s\,2s\ ^3S_1$	$1s\,7f\ ^3F^o_2$	1.3248E+00	1.507E−11	1.146E+04			
$1s\,2s\ ^1S_0$	$1s\,7f\ ^3F^o_2$	1.3369E+00	1.400E−11	1.045E+04			
$1s\,3s\ ^3S_1$	$1s\,7f\ ^3F^o_2$	3.3851E+00	1.421E−13	1.654E+01			
$1s\,3s\ ^1S_0$	$1s\,7f\ ^3F^o_2$	3.4060E+00	5.718E−14	6.576E+00			
$1s\,3d\ ^3D_2$	$1s\,7f\ ^3F^o_2$	3.5247E+00	5.320E−08	5.713E+06	3.5099E+00	5.455E−08	5.857E+06
$1s\,3d\ ^3D_1$	$1s\,7f\ ^3F^o_2$	3.5262E+00	1.239E−07	1.330E+07	3.5113E+00	1.271E−07	1.363E+07
$1s\,3d\ ^3D_3$	$1s\,7f\ ^3F^o_2$	3.5614E+00	1.346E−14	1.416E+00			
$1s\,3d\ ^1D_2$	$1s\,7f\ ^3F^o_2$	3.5628E+00	5.049E−13	5.306E+01			
$1s\,4s\ ^3S_1$	$1s\,7f\ ^3F^o_2$	7.3170E+00	2.407E−13	5.998E+00			
$1s\,4s\ ^1S_0$	$1s\,7f\ ^3F^o_2$	7.3564E+00	1.604E−13	3.954E+00			
$1s\,4d\ ^3D_2$	$1s\,7f\ ^3F^o_2$	7.5889E+00	3.251E−08	7.530E+05	7.5575E+00	3.288E−08	7.616E+05
$1s\,4d\ ^3D_1$	$1s\,7f\ ^3F^o_2$	7.5917E+00	7.584E−08	1.755E+06	7.5603E+00	7.665E−08	1.773E+06
$1s\,4d\ ^3D_3$	$1s\,7f\ ^3F^o_2$	7.6607E+00	6.576E−15	1.495E−01			
$1s\,4d\ ^1D_2$	$1s\,7f\ ^3F^o_2$	7.6637E+00	7.964E−13	1.809E+01			
$1s\,5s\ ^3S_1$	$1s\,7f\ ^3F^o_2$	1.5646E+01	1.174E−13	6.400E−01			
$1s\,5s\ ^1S_0$	$1s\,7f\ ^3F^o_2$	1.5737E+01	7.104E−14	3.827E−01			
$1s\,5d\ ^3D_2$	$1s\,7f\ ^3F^o_2$	1.6281E+01	1.900E−08	9.564E+04	1.6216E+01	1.911E−08	9.613E+04
$1s\,5d\ ^3D_1$	$1s\,7f\ ^3F^o_2$	1.6288E+01	4.437E−08	2.231E+05	1.6222E+01	4.453E−08	2.238E+05
$1s\,5d\ ^3D_3$	$1s\,7f\ ^3F^o_2$	1.6451E+01	9.948E−15	4.904E−02			
$1s\,5d\ ^1D_2$	$1s\,7f\ ^3F^o_2$	1.6458E+01	6.222E−13	3.064E+00			
$1s\,5g\ ^3G_4$	$1s\,7f\ ^3F^o_2$	1.6539E+01	2.043E−10	9.963E+02	1.6470E+01	2.039E−10	9.947E+02
$1s\,5g\ ^3G_3$	$1s\,7f\ ^3F^o_2$	1.6541E+01	1.835E−09	8.949E+03	1.6472E+01	1.817E−09	8.858E+03
$1s\,5g\ ^1G_4$	$1s\,7f\ ^3F^o_2$	1.6592E+01	1.387E−09	6.722E+03	1.6522E+01	1.376E−09	6.669E+03
$1s\,6s\ ^3S_1$	$1s\,7f\ ^3F^o_2$	4.0528E+01	4.682E−14	3.803E−02			
$1s\,6s\ ^1S_0$	$1s\,7f\ ^3F^o_2$	4.0875E+01	2.291E−14	1.830E−02			
$1s\,6d\ ^3D_2$	$1s\,7f\ ^3F^o_2$	4.3034E+01	1.113E−08	8.018E+03	4.2880E+01	1.115E−08	8.022E+03
$1s\,6d\ ^3D_1$	$1s\,7f\ ^3F^o_2$	4.3060E+01	2.601E−08	1.871E+04	4.2874E+01	2.603E−08	1.873E+04
$1s\,6d\ ^3D_3$	$1s\,7f\ ^3F^o_2$	4.3722E+01	9.348E−15	6.523E−03			
$1s\,6d\ ^1D_2$	$1s\,7f\ ^3F^o_2$	4.3752E+01	4.162E−13	2.900E−01			
$1s\,6g\ ^3G_4$	$1s\,7f\ ^3F^o_2$	4.4085E+01	4.800E−10	3.295E+02	4.3907E+01	4.754E−10	3.262E+02
$1s\,6g\ ^3G_3$	$1s\,7f\ ^3F^o_2$	4.4094E+01	4.293E−09	2.946E+03	4.3907E+01	4.279E−09	2.936E+03
$1s\,6g\ ^1G_4$	$1s\,7f\ ^3F^o_2$	4.4303E+01	3.232E−09	2.197E+03	4.4116E+01	3.227E−09	2.193E+03
$1s\,7s\ ^3S_1$	$1s\,7f\ ^3F^o_2$	8.7540E+02	1.929E−17	3.359E−08			
$1s\,7s\ ^1S_0$	$1s\,7f\ ^3F^o_2$	9.8912E+02	1.980E−17	2.700E−08			
$1s\,7d\ ^3D_2$	$1s\,7f\ ^3F^o_2$	4.1806E+03	1.020E−13	7.789E−06	4.3602E+03	8.894E−14	6.188E−06
$1s\,7d\ ^3D_1$	$1s\,7f\ ^3F^o_2$	4.3395E+03	2.128E−13	1.508E−05	4.3189E+03	2.135E−13	1.514E−05
$1s\,7d\ ^3D_3$	$1s\,7f\ ^3F^o_2$	1.0992E+05	3.776E−23	4.169E−18			
$1s\,2p\ ^3P^o_1$	$1s\,7d\ ^1D_2$	1.3358E+00	2.774E−07	2.074E+08	1.3303E+00	2.850E−07	2.130E+08
$1s\,2p\ ^3P^o_0$	$1s\,7d\ ^1D_2$	1.3367E+00	3.356E−07	2.506E+08	1.3311E+00	3.437E−07	2.566E+08
$1s\,2p\ ^3P^o_2$	$1s\,7d\ ^1D_2$	1.3942E+00	7.807E−07	5.358E+08	1.3883E+00	8.173E−07	5.609E+08
$1s\,2p\ ^1P^o_1$	$1s\,7d\ ^1D_2$	1.3997E+00	1.753E−06	1.194E+09	1.3939E+00	1.832E−06	1.247E+09
$1s\,3p\ ^3P^o_1$	$1s\,7d\ ^1D_2$	3.4047E+00	9.352E−08	1.076E+07	3.3905E+00	9.546E−08	1.098E+07
$1s\,3p\ ^3P^o_0$	$1s\,7d\ ^1D_2$	3.4061E+00	1.139E−07	1.310E+07	3.3919E+00	1.162E−07	1.336E+07
$1s\,3p\ ^3P^o_2$	$1s\,7d\ ^1D_2$	3.5163E+00	2.950E−07	3.183E+07	3.5016E+00	2.998E−07	3.234E+07
$1s\,3p\ ^1P^o_1$	$1s\,7d\ ^1D_2$	3.5262E+00	6.667E−07	7.153E+07	3.5116E+00	6.762E−07	7.254E+07
$1s\,4p\ ^3P^o_1$	$1s\,7d\ ^1D_2$	7.3543E+00	4.023E−08	9.922E+05	7.3231E+00	4.103E−08	1.012E+06
$1s\,4p\ ^3P^o_0$	$1s\,7d\ ^1D_2$	7.3570E+00	4.925E−08	1.214E+06	7.3257E+00	4.994E−08	1.230E+06
$1s\,4p\ ^3P^o_2$	$1s\,7d\ ^1D_2$	7.5726E+00	1.361E−07	3.167E+06	7.5404E+00	1.375E−07	3.200E+06
$1s\,4p\ ^1P^o_1$	$1s\,7d\ ^1D_2$	7.5916E+00	3.096E−07	7.166E+06	7.5595E+00	3.110E−07	7.199E+06
$1s\,4f\ ^3F^o_3$	$1s\,7d\ ^1D_2$	7.6618E+00	2.579E−13	5.861E+00			
$1s\,4f\ ^3F^o_2$	$1s\,7d\ ^1D_2$	7.6633E+00	1.012E−18	2.299E−05			
$1s\,4f\ ^3F^o_4$	$1s\,7d\ ^1D_2$	7.6979E+00	1.547E−09	3.482E+04	7.6651E+00	1.558E−09	3.507E+04
$1s\,4f\ ^1F^o_3$	$1s\,7d\ ^1D_2$	7.6990E+00	1.365E−08	3.073E+05	7.6663E+00	1.346E−08	3.029E+05
$1s\,5p\ ^3P^o_1$	$1s\,7d\ ^1D_2$	1.5732E+01	2.027E−08	1.093E+05	1.5665E+01	2.079E−08	1.121E+05
$1s\,5p\ ^3P^o_0$	$1s\,7d\ ^1D_2$	1.5738E+01	2.489E−08	1.341E+05	1.5671E+01	2.518E−08	1.356E+05
$1s\,5p\ ^3P^o_2$	$1s\,7d\ ^1D_2$	1.6243E+01	7.285E−08	3.683E+05	1.6173E+01	7.372E−08	3.728E+05
$1s\,5p\ ^1P^o_1$	$1s\,7d\ ^1D_2$	1.6288E+01	1.665E−07	8.375E+05	1.6218E+01	1.667E−07	8.385E+05
$1s\,5f\ ^3F^o_3$	$1s\,7d\ ^1D_2$	1.6454E+01	4.024E−13	1.983E+00			
$1s\,5f\ ^3F^o_2$	$1s\,7d\ ^1D_2$	1.6457E+01	1.812E−15	8.923E−03			
$1s\,5f\ ^3F^o_4$	$1s\,7d\ ^1D_2$	1.6539E+01	2.579E−09	1.258E+04	1.6468E+01	2.613E−09	1.274E+04
$1s\,5f\ ^1F^o_3$	$1s\,7d\ ^1D_2$	1.6542E+01	2.277E−08	1.110E+05	1.6471E+01	2.258E−08	1.101E+05
$1s\,6p\ ^3P^o_1$	$1s\,7d\ ^1D_2$	4.0858E+01	1.073E−08	8.576E+03	4.0674E+01	1.190E−08	9.521E+03

(*continued on next page*)

Table 6 (*continued*)

Lower	Upper	GRASP2K			FAC		
		λ (Å)	*gf*	A (s^{-1})	λ (Å)	*gf*	A (s^{-1})
$1s\,6p\ ^3P^o_0$	$1s\,7d\ ^1D_2$	4.0882E+01	1.321E−08	1.055E+04	4.0612E+01	1.340E−08	1.074E+04
$1s\,6p\ ^3P^o_2$	$1s\,7d\ ^1D_2$	4.2880E+01	4.171E−08	3.026E+04	4.2684E+01	4.240E−08	3.079E+04
$1s\,6p\ ^1P^o_1$	$1s\,7d\ ^1D_2$	4.3058E+01	9.601E−08	6.908E+04	4.2841E+01	9.514E−08	6.856E+04
$1s\,6f\ ^3F^o_3$	$1s\,7d\ ^1D_2$	4.3733E+01	5.031E−13	3.509E−01			
$1s\,6f\ ^3F^o_2$	$1s\,7d\ ^1D_2$	4.3748E+01	6.962E−15	4.853E−03			
$1s\,6f\ ^3F^o_4$	$1s\,7d\ ^1D_2$	4.4083E+01	3.368E−09	2.312E+03	4.3900E+01	3.427E−09	2.352E+03
$1s\,6f\ ^1F^o_3$	$1s\,7d\ ^1D_2$	4.4094E+01	2.973E−08	2.040E+04	4.3901E+01	2.963E−08	2.033E+04
$1s\,6h\ ^3H^o_4$	$1s\,7d\ ^1D_2$	4.4301E+01	4.583E−18	3.115E−06			
$1s\,7p\ ^3P^o_1$	$1s\,7d\ ^1D_2$	9.8772E+02	1.410E−11	1.928E−02	9.7564E+02	1.532E−11	2.128E−02
$1s\,7p\ ^3P^o_0$	$1s\,7d\ ^1D_2$	9.9663E+02	1.685E−11	2.263E−02	9.5369E+02	1.915E−11	2.785E−02
$1s\,7p\ ^3P^o_2$	$1s\,7d\ ^1D_2$	3.4747E+03	1.082E−12	1.196E−04	3.3529E+03	1.194E−12	1.405E−04
$1s\,7p\ ^1P^o_1$	$1s\,7d\ ^1D_2$	4.4062E+03	1.207E−12	8.296E−05	4.0947E+03	1.481E−12	1.169E−04
$1s\,7f\ ^3F^o_3$	$1s\,7d\ ^1D_2$	1.7858E+05	7.949E−22	3.325E−17			
$1s\,7f\ ^3F^o_2$	$1s\,7d\ ^1D_2$	1.2412E+06	1.105E−25	9.570E−23			
$1s\,3d\ ^3D_2$	$1s\,7f\ ^3F^o_4$	3.5233E+00	4.205E−07	2.510E+07	3.5085E+00	4.222E−07	2.520E+07
$1s\,3d\ ^3D_3$	$1s\,7f\ ^3F^o_4$	3.5600E+00	2.526E−06	1.477E+08	3.5449E+00	2.596E−06	1.518E+08
$1s\,3d\ ^1D_2$	$1s\,7f\ ^3F^o_4$	3.5614E+00	2.038E−07	1.191E+07	3.5463E+00	2.095E−07	1.224E+07
$1s\,4d\ ^3D_2$	$1s\,7f\ ^3F^o_4$	7.5826E+00	2.510E−07	3.235E+06	7.5510E+00	2.533E−07	3.265E+06
$1s\,4d\ ^3D_3$	$1s\,7f\ ^3F^o_4$	7.6543E+00	1.564E−06	1.979E+07	7.6222E+00	1.584E−06	2.003E+07
$1s\,4d\ ^1D_2$	$1s\,7f\ ^3F^o_4$	7.6573E+00	1.270E−07	1.605E+06	7.6252E+00	1.286E−07	1.625E+06
$1s\,5d\ ^3D_2$	$1s\,7f\ ^3F^o_4$	1.6252E+01	1.445E−07	4.054E+05	1.6186E+01	1.453E−07	4.077E+05
$1s\,5d\ ^3D_3$	$1s\,7f\ ^3F^o_4$	1.6421E+01	9.255E−07	2.544E+06	1.6353E+01	9.309E−07	2.558E+06
$1s\,5d\ ^1D_2$	$1s\,7f\ ^3F^o_4$	1.6428E+01	7.534E−08	2.069E+05	1.6360E+01	7.572E−08	2.078E+05
$1s\,5g\ ^3G_4$	$1s\,7f\ ^3F^o_4$	1.6509E+01	3.180E−15	8.647E−03			
$1s\,5g\ ^3G_3$	$1s\,7f\ ^3F^o_4$	1.6511E+01	4.291E−16	1.166E−03			
$1s\,5g\ ^3G_5$	$1s\,7f\ ^3F^o_4$	1.6560E+01	1.498E−08	4.050E+04	1.6489E+01	1.487E−08	4.021E+04
$1s\,5g\ ^1G_4$	$1s\,7f\ ^3F^o_4$	1.6562E+01	1.077E−09	2.909E+03	1.6491E+01	1.062E−09	2.871E+03
$1s\,6d\ ^3D_2$	$1s\,7f\ ^3F^o_4$	4.2832E+01	8.329E−08	3.365E+04	4.2671E+01	8.278E−08	3.340E+04
$1s\,6d\ ^3D_3$	$1s\,7f\ ^3F^o_4$	4.3514E+01	5.502E−07	2.154E+05	4.3345E+01	5.513E−07	2.156E+05
$1s\,6d\ ^1D_2$	$1s\,7f\ ^3F^o_4$	4.3544E+01	4.488E−08	1.754E+04	4.3355E+01	4.548E−08	1.778E+04
$1s\,6g\ ^3G_4$	$1s\,7f\ ^3F^o_4$	4.3874E+01	8.351E−15	3.215E−03			
$1s\,6g\ ^3G_3$	$1s\,7f\ ^3F^o_4$	4.3882E+01	5.086E−16	1.957E−04			
$1s\,6g\ ^3G_5$	$1s\,7f\ ^3F^o_4$	4.4083E+01	3.532E−08	1.347E+04	4.3895E+01	3.519E−08	1.342E+04
$1s\,6g\ ^1G_4$	$1s\,7f\ ^3F^o_4$	4.4090E+01	2.529E−09	9.643E+02	4.3895E+01	2.514E−09	9.588E+02
$1s\,7d\ ^3D_2$	$1s\,7f\ ^3F^o_4$	2.8680E+03	2.422E−12	2.182E−04	2.9119E+03	2.266E−12	1.964E−04
$1s\,7d\ ^3D_3$	$1s\,7f\ ^3F^o_4$	8.4332E+03	6.104E−13	6.362E−06	8.7593E+03	5.382E−13	5.155E−06
$1s\,7d\ ^1D_2$	$1s\,7f\ ^3F^o_4$	9.2016E+03	3.828E−14	3.351E−07	9.0446E+03	4.045E−14	3.633E−07
$1s\,2p\ ^3P^o_2$	$1s\,7g\ ^3G_4$	1.3940E+00	1.685E−11	6.427E+03			
$1s\,3p\ ^3P^o_2$	$1s\,7g\ ^3G_4$	3.5149E+00	1.323E−11	7.934E+02			
$1s\,4p\ ^3P^o_2$	$1s\,7g\ ^3G_4$	7.5664E+00	2.232E−13	2.889E+00			
$1s\,4f\ ^3F^o_3$	$1s\,7g\ ^3G_4$	7.6554E+00	4.102E−07	5.187E+06	7.6229E+00	4.168E−07	5.271E+06
$1s\,4f\ ^3F^o_2$	$1s\,7g\ ^3G_4$	7.6569E+00	3.311E−08	4.186E+05	7.6244E+00	3.332E−08	4.212E+05
$1s\,4f\ ^3F^o_4$	$1s\,7g\ ^3G_4$	7.6914E+00	6.083E−13	7.620E+00			
$1s\,4f\ ^1F^o_3$	$1s\,7g\ ^3G_4$	7.6926E+00	1.492E−12	1.869E+01			
$1s\,5p\ ^3P^o_2$	$1s\,7g\ ^3G_4$	1.6215E+01	2.286E−14	6.444E−02			
$1s\,5f\ ^3F^o_3$	$1s\,7g\ ^3G_4$	1.6424E+01	3.500E−07	9.616E+05	1.6354E+01	3.528E−07	9.693E+05
$1s\,5f\ ^3F^o_2$	$1s\,7g\ ^3G_4$	1.6428E+01	2.827E−08	7.765E+04	1.6358E+01	2.820E−08	7.745E+04
$1s\,5f\ ^3F^o_4$	$1s\,7g\ ^3G_4$	1.6509E+01	5.308E−13	1.443E+00			
$1s\,5f\ ^1F^o_3$	$1s\,7g\ ^3G_4$	1.6512E+01	1.496E−12	4.068E+00			
$1s\,6p\ ^3P^o_2$	$1s\,7g\ ^3G_4$	4.2681E+01	1.962E−14	7.981E−03			
$1s\,6f\ ^3F^o_3$	$1s\,7g\ ^3G_4$	4.3526E+01	2.388E−07	9.340E+04	4.3346E+01	2.395E−07	9.368E+04
$1s\,6f\ ^3F^o_2$	$1s\,7g\ ^3G_4$	4.3540E+01	1.930E−08	7.546E+03	4.3346E+01	1.916E−08	7.494E+03
$1s\,6f\ ^3F^o_4$	$1s\,7g\ ^3G_4$	4.3873E+01	3.710E−13	1.429E−01			
$1s\,6f\ ^1F^o_3$	$1s\,7g\ ^3G_4$	4.3884E+01	1.132E−12	4.356E−01			
$1s\,6h\ ^3H^o_5$	$1s\,7g\ ^3G_4$	4.4083E+01	4.476E−09	1.707E+03	4.3896E+01	4.459E−09	1.700E+03
$1s\,6h\ ^3H^o_4$	$1s\,7g\ ^3G_4$	4.4088E+01	3.202E−10	1.221E+02	4.3896E+01	3.185E−10	1.214E+02
$1s\,6h\ ^3H^o_6$	$1s\,7g\ ^3G_4$	4.4223E+01	1.616E−09	6.123E+02	4.4034E+01	1.606E−09	6.089E+02
$1s\,6h\ ^1H^o_5$	$1s\,7g\ ^3G_4$	4.4227E+01	6.000E−11	2.273E+01	4.4034E+01	6.182E−11	2.342E+01
$1s\,7p\ ^3P^o_2$	$1s\,7g\ ^3G_4$	2.5209E+03	4.451E−21	5.191E−13			
$1s\,7f\ ^3F^o_3$	$1s\,7g\ ^3G_4$	8.7347E+03	1.399E−13	1.359E−06	8.7974E+03	1.354E−13	1.286E−06
$1s\,7f\ ^3F^o_2$	$1s\,7g\ ^3G_4$	9.1165E+03	9.944E−15	8.867E−08	8.7927E+03	1.085E−14	1.031E−07
$1s\,7f\ ^3F^o_4$	$1s\,7g\ ^3G_4$	4.7642E+06	1.343E−27	4.385E−26			
$1s\,2p\ ^3P^o_1$	$1s\,7g\ ^3G_3$	1.3356E+00	3.671E−14	1.961E+01			
$1s\,2p\ ^3P^o_2$	$1s\,7g\ ^3G_3$	1.3940E+00	1.616E−12	7.925E+02			
$1s\,2p\ ^1P^o_1$	$1s\,7g\ ^3G_3$	1.3995E+00	1.116E−11	5.428E+03			
$1s\,3p\ ^3P^o_1$	$1s\,7g\ ^3G_3$	3.4034E+00	3.734E−14	3.072E+00			
$1s\,3p\ ^3P^o_2$	$1s\,7g\ ^3G_3$	3.5149E+00	1.511E−12	1.166E+02			
$1s\,3p\ ^1P^o_1$	$1s\,7g\ ^3G_3$	3.5248E+00	7.982E−12	6.122E+02			
$1s\,4p\ ^3P^o_1$	$1s\,7g\ ^3G_3$	7.3482E+00	8.284E−16	1.462E−02			
$1s\,4p\ ^3P^o_2$	$1s\,7g\ ^3G_3$	7.5662E+00	2.075E−15	3.453E−02			
$1s\,4p\ ^1P^o_1$	$1s\,7g\ ^3G_3$	7.5852E+00	9.542E−14	1.580E+00			

(*continued on next page*)

Table 6 (*continued*)

Lower	Upper	GRASP2K			FAC		
		λ (Å)	*gf*	A (s^{-1})	λ (Å)	*gf*	A (s^{-1})
$1s\,4f\ ^3F^o_3$	$1s\,7g\ ^3G_3$	7.6553E+00	4.932E−08	8.020E+05	7.6229E+00	5.002E−08	8.132E+05
$1s\,4f\ ^3F^o_2$	$1s\,7g\ ^3G_3$	7.6568E+00	2.955E−07	4.803E+06	7.6244E+00	2.999E−07	4.874E+06
$1s\,4f\ ^3F^o_4$	$1s\,7g\ ^3G_3$	7.6913E+00	1.523E−19	2.453E−06			
$1s\,4f\ ^1F^o_3$	$1s\,7g\ ^3G_3$	7.6924E+00	2.237E−13	3.603E+00			
$1s\,5p\ ^3P^o_1$	$1s\,7g\ ^3G_3$	1.5705E+01	1.628E−19	6.288E−07			
$1s\,5p\ ^3P^o_2$	$1s\,7g\ ^3G_3$	1.6214E+01	8.575E−14	3.108E−01			
$1s\,5p\ ^1P^o_1$	$1s\,7g\ ^3G_3$	1.6258E+01	3.715E−14	1.339E−01			
$1s\,5f\ ^3F^o_3$	$1s\,7g\ ^3G_3$	1.6423E+01	4.206E−08	1.486E+05	1.6354E+01	4.233E−08	1.495E+05
$1s\,5f\ ^3F^o_2$	$1s\,7g\ ^3G_3$	1.6427E+01	2.522E−07	8.905E+05	1.6358E+01	2.538E−07	8.963E+05
$1s\,5f\ ^3F^o_4$	$1s\,7g\ ^3G_3$	1.6508E+01	1.692E−17	5.915E−05			
$1s\,5f\ ^1F^o_3$	$1s\,7g\ ^3G_3$	1.6511E+01	1.720E−13	6.013E−01			
$1s\,6p\ ^3P^o_1$	$1s\,7g\ ^3G_3$	4.0673E+01	3.156E−18	1.818E−06			
$1s\,6p\ ^3P^o_2$	$1s\,7g\ ^3G_3$	4.2676E+01	7.118E−14	3.724E−02			
$1s\,6p\ ^1P^o_1$	$1s\,7g\ ^3G_3$	4.2852E+01	3.084E−14	1.601E−02			
$1s\,6f\ ^3F^o_3$	$1s\,7g\ ^3G_3$	4.3521E+01	2.867E−08	1.442E+04	4.3346E+01	2.874E−08	1.445E+04
$1s\,6f\ ^3F^o_2$	$1s\,7g\ ^3G_3$	4.3535E+01	1.721E−07	8.651E+04	4.3346E+01	1.724E−07	8.672E+04
$1s\,6f\ ^3F^o_4$	$1s\,7g\ ^3G_3$	4.3867E+01	3.588E−17	1.777E−05			
$1s\,6f\ ^1F^o_3$	$1s\,7g\ ^3G_3$	4.3878E+01	1.112E−13	5.505E−02			
$1s\,6h\ ^3H^o_5$	$1s\,7g\ ^3G_3$	4.4077E+01	2.145E−10	1.052E+02	4.3896E+01	2.123E−10	1.041E+02
$1s\,6h\ ^3H^o_4$	$1s\,7g\ ^3G_3$	4.4083E+01	3.516E−09	1.724E+03	4.3896E+01	3.503E−09	1.718E+03
$1s\,6h\ ^1H^o_5$	$1s\,7g\ ^3G_3$	4.4222E+01	1.299E−09	6.331E+02	4.4034E+01	1.297E−09	6.323E+02
$1s\,7p\ ^3P^o_1$	$1s\,7g\ ^3G_3$	8.8963E+02	4.277E−20	5.149E−11			
$1s\,7p\ ^3P^o_2$	$1s\,7g\ ^3G_3$	2.5035E+03	1.266E−18	1.925E−10			
$1s\,7p\ ^1P^o_1$	$1s\,7g\ ^3G_3$	2.9534E+03	5.714E−20	6.242E−12			
$1s\,7f\ ^3F^o_3$	$1s\,7g\ ^3G_3$	8.5297E+03	1.804E−14	2.362E−07	8.7975E+03	1.625E−14	1.984E−07
$1s\,7f\ ^3F^o_2$	$1s\,7g\ ^3G_3$	8.8934E+03	9.547E−14	1.150E−06	8.7928E+03	9.768E−14	1.193E−06
$1s\,7f\ ^3F^o_4$	$1s\,7g\ ^3G_3$	3.3768E+05	1.239E−26	1.035E−22			
$1s\,2s\ ^3S_1$	$1s\,7f\ ^1F^o_3$	1.3246E+00	2.065E−13	1.121E+02			
$1s\,3s\ ^3S_1$	$1s\,7f\ ^1F^o_3$	3.3838E+00	5.178E−13	4.309E+01			
$1s\,3d\ ^3D_2$	$1s\,7f\ ^1F^o_3$	3.5233E+00	4.933E−08	3.787E+06	3.5085E+00	4.924E−08	3.779E+06
$1s\,3d\ ^3D_1$	$1s\,7f\ ^1F^o_3$	3.5247E+00	2.810E−07	2.155E+07	3.5099E+00	2.827E−07	2.168E+07
$1s\,3d\ ^3D_3$	$1s\,7f\ ^1F^o_3$	3.5600E+00	3.035E−07	2.282E+07	3.5449E+00	3.115E−07	2.342E+07
$1s\,3d\ ^1D_2$	$1s\,7f\ ^1F^o_3$	3.5614E+00	1.816E−06	1.364E+08	3.5463E+00	1.864E−06	1.400E+08
$1s\,4s\ ^3S_1$	$1s\,7f\ ^1F^o_3$	7.3110E+00	3.646E−13	6.500E+00			
$1s\,4d\ ^3D_2$	$1s\,7f\ ^1F^o_3$	7.5823E+00	3.022E−08	5.008E+05	7.5510E+00	3.040E−08	5.038E+05
$1s\,4d\ ^3D_1$	$1s\,7f\ ^1F^o_3$	7.5851E+00	1.684E−07	2.788E+06	7.5538E+00	1.701E−07	2.817E+06
$1s\,4d\ ^3D_3$	$1s\,7f\ ^1F^o_3$	7.6541E+00	1.878E−07	3.055E+06	7.6222E+00	1.901E−07	3.091E+06
$1s\,4d\ ^1D_2$	$1s\,7f\ ^1F^o_3$	7.6570E+00	1.125E−06	1.828E+07	7.6252E+00	1.137E−06	1.848E+07
$1s\,5s\ ^3S_1$	$1s\,7f\ ^1F^o_3$	1.5619E+01	2.264E−13	8.845E−01			
$1s\,5d\ ^3D_2$	$1s\,7f\ ^1F^o_3$	1.6251E+01	1.759E−08	6.347E+04	1.6186E+01	1.767E−08	6.374E+04
$1s\,5d\ ^3D_1$	$1s\,7f\ ^1F^o_3$	1.6258E+01	9.706E−08	3.499E+05	1.6192E+01	9.776E−08	3.523E+05
$1s\,5d\ ^3D_3$	$1s\,7f\ ^1F^o_3$	1.6420E+01	1.111E−07	3.925E+05	1.6353E+01	1.117E−07	3.946E+05
$1s\,5d\ ^1D_2$	$1s\,7f\ ^1F^o_3$	1.6427E+01	6.654E−07	2.349E+06	1.6360E+01	6.680E−07	2.357E+06
$1s\,5g\ ^3G_4$	$1s\,7f\ ^1F^o_3$	1.6508E+01	8.835E−15	3.089E−02			
$1s\,5g\ ^3G_3$	$1s\,7f\ ^1F^o_3$	1.6510E+01	1.556E−15	5.439E−03			
$1s\,5g\ ^3G_5$	$1s\,7f\ ^1F^o_3$	1.6559E+01	7.076E−10	2.459E+03	1.6489E+01	7.100E−10	2.467E+03
$1s\,5g\ ^1G_4$	$1s\,7f\ ^1F^o_3$	1.6561E+01	1.182E−08	4.106E+04	1.6491E+01	1.168E−08	4.060E+04
$1s\,6s\ ^3S_1$	$1s\,7f\ ^1F^o_3$	4.0343E+01	1.294E−13	7.577E−02			
$1s\,6d\ ^3D_2$	$1s\,7f\ ^1F^o_3$	4.2826E+01	1.020E−08	5.300E+03	4.2671E+01	1.086E−08	5.638E+03
$1s\,6d\ ^3D_1$	$1s\,7f\ ^1F^o_3$	4.2851E+01	5.600E−08	2.906E+04	4.2665E+01	5.622E−08	2.918E+04
$1s\,6d\ ^3D_3$	$1s\,7f\ ^1F^o_3$	4.3507E+01	6.599E−08	3.322E+04	4.3345E+01	6.615E−08	3.327E+04
$1s\,6d\ ^1D_2$	$1s\,7f\ ^1F^o_3$	4.3537E+01	3.957E−07	1.989E+05	4.3355E+01	3.952E−07	1.986E+05
$1s\,6g\ ^3G_4$	$1s\,7f\ ^1F^o_3$	4.3867E+01	2.568E−14	1.272E−02			
$1s\,6g\ ^3G_3$	$1s\,7f\ ^1F^o_3$	4.3875E+01	3.279E−15	1.623E−03			
$1s\,6g\ ^3G_5$	$1s\,7f\ ^1F^o_3$	4.4076E+01	1.668E−09	8.183E+02	4.3895E+01	1.679E−09	8.235E+02
$1s\,6g\ ^1G_4$	$1s\,7f\ ^1F^o_3$	4.4083E+01	2.777E−08	1.362E+04	4.3895E+01	2.765E−08	1.355E+04
$1s\,7s\ ^3S_1$	$1s\,7f\ ^1F^o_3$	7.9654E+02	2.248E−16	3.376E−07			
$1s\,7d\ ^3D_2$	$1s\,7f\ ^1F^o_3$	2.8385E+03	3.075E−13	3.636E−05	2.9112E+03	2.970E−13	3.312E−05
$1s\,7d\ ^3D_1$	$1s\,7f\ ^1F^o_3$	2.9109E+03	1.557E−12	1.751E−04	2.8927E+03	1.569E−12	1.772E−04
$1s\,7d\ ^3D_3$	$1s\,7f\ ^1F^o_3$	8.1837E+03	8.017E−14	1.141E−06	8.7525E+03	6.474E−14	7.985E−07
$1s\,7d\ ^1D_2$	$1s\,7f\ ^1F^o_3$	8.9054E+03	3.724E−13	4.474E−06	9.0373E+03	3.515E−13	4.066E−06
$1s\,7g\ ^3G_4$	$1s\,7f\ ^1F^o_3$	2.9370E+05	1.846E−23	2.039E−19			
$1s\,7g\ ^3G_3$	$1s\,7f\ ^1F^o_3$	1.5307E+06	1.214E−26	4.936E−24			
$1s\,4f\ ^3F^o_3$	$1s\,7g\ ^3G_5$	7.6514E+00	2.899E−07	3.003E+06	7.6190E+00	2.900E−07	3.003E+06
$1s\,4f\ ^3F^o_4$	$1s\,7g\ ^3G_5$	7.6874E+00	2.475E−06	2.540E+07	7.6547E+00	2.516E−06	2.582E+07
$1s\,4f\ ^1F^o_3$	$1s\,7g\ ^3G_5$	7.6885E+00	1.170E−07	1.200E+06	7.6558E+00	1.189E−07	1.220E+06
$1s\,5f\ ^3F^o_3$	$1s\,7g\ ^3G_5$	1.6406E+01	2.441E−07	5.499E+05	1.6336E+01	2.453E−07	5.528E+05
$1s\,5f\ ^3F^o_4$	$1s\,7g\ ^3G_5$	1.6491E+01	2.124E−06	4.737E+06	1.6420E+01	2.140E−06	4.772E+06
$1s\,5f\ ^1F^o_3$	$1s\,7g\ ^3G_5$	1.6493E+01	1.005E−07	2.240E+05	1.6423E+01	1.012E−07	2.256E+05
$1s\,6f\ ^3F^o_3$	$1s\,7g\ ^3G_5$	4.3397E+01	1.644E−07	5.294E+04	4.3219E+01	1.643E−07	5.291E+04
$1s\,6f\ ^3F^o_4$	$1s\,7g\ ^3G_5$	4.3742E+01	1.459E−06	4.624E+05	4.3559E+01	1.462E−06	4.634E+05

(*continued on next page*)

Table 6 (*continued*)

Lower	Upper	GRASP2K			FAC		
		λ (Å)	*gf*	A (s^{-1})	λ (Å)	*gf*	A (s^{-1})
$1s\,6f\ ^1F^o_3$	$1s\,7g\ ^3G_5$	4.3753E+01	6.906E−08	2.188E+04	4.3560E+01	6.976E−08	2.210E+04
$1s\,6h\ ^3H^o_5$	$1s\,7g\ ^3G_5$	4.3951E+01	2.044E−15	6.415E−04			
$1s\,6h\ ^3H^o_4$	$1s\,7g\ ^3G_5$	4.3956E+01	4.299E−19	1.349E−07			
$1s\,6h\ ^3H^o_6$	$1s\,7g\ ^3G_5$	4.4090E+01	1.830E−08	5.710E+03	4.3903E+01	1.822E−08	5.684E+03
$1s\,6h\ ^1H^o_5$	$1s\,7g\ ^3G_5$	4.4094E+01	8.725E−10	2.721E+02	4.3903E+01	8.677E−10	2.706E+02
$1s\,7f\ ^3F^o_3$	$1s\,7g\ ^3G_5$	5.4759E+03	3.951E−13	7.989E−06	5.5025E+03	3.830E−13	7.606E−06
$1s\,7f\ ^3F^o_4$	$1s\,7g\ ^3G_5$	1.4632E+04	1.821E−13	5.159E−07	1.4765E+04	1.751E−13	4.831E−07
$1s\,7f\ ^1F^o_3$	$1s\,7g\ ^3G_5$	1.5450E+04	7.324E−15	1.861E−08	1.4784E+04	8.325E−15	2.290E−08
$1s\,3d\ ^3D_3$	$1s\,7h\ ^3H^o_5$	3.5591E+00	6.235E−12	2.985E+02			
$1s\,4d\ ^3D_3$	$1s\,7h\ ^3H^o_5$	7.6503E+00	3.513E−12	3.640E+01			
$1s\,5d\ ^3D_3$	$1s\,7h\ ^3H^o_5$	1.6403E+01	6.894E−14	1.554E−01			
$1s\,5g\ ^3G_4$	$1s\,7h\ ^3H^o_5$	1.6491E+01	7.809E−07	1.741E+06	1.6420E+01	7.881E−07	1.757E+06
$1s\,5g\ ^3G_3$	$1s\,7h\ ^3H^o_5$	1.6493E+01	3.746E−08	8.351E+04	1.6423E+01	3.751E−08	8.363E+04
$1s\,5g\ ^3G_5$	$1s\,7h\ ^3H^o_5$	1.6542E+01	3.738E−13	8.285E−01			
$1s\,5g\ ^1G_4$	$1s\,7h\ ^3H^o_5$	1.6543E+01	7.520E−13	1.666E+00			
$1s\,6d\ ^3D_3$	$1s\,7h\ ^3H^o_5$	4.3385E+01	6.788E−14	2.187E−02			
$1s\,6g\ ^3G_4$	$1s\,7h\ ^3H^o_5$	4.3742E+01	8.186E−07	2.594E+05	4.3559E+01	8.213E−07	2.602E+05
$1s\,6g\ ^3G_3$	$1s\,7h\ ^3H^o_5$	4.3751E+01	3.929E−08	1.245E+04	4.3559E+01	3.911E−08	1.239E+04
$1s\,6g\ ^3G_5$	$1s\,7h\ ^3H^o_5$	4.3950E+01	3.908E−13	1.227E−01			
$1s\,6g\ ^1G_4$	$1s\,7h\ ^3H^o_5$	4.3957E+01	8.040E−13	2.523E−01			
$1s\,7d\ ^3D_3$	$1s\,7h\ ^3H^o_5$	5.3474E+03	4.485E−21	9.510E−14			
$1s\,7g\ ^3G_4$	$1s\,7h\ ^3H^o_5$	1.4659E+04	5.334E−14	1.505E−07	1.4689E+04	5.242E−14	1.460E−07
$1s\,7g\ ^3G_3$	$1s\,7h\ ^3H^o_5$	1.5275E+04	2.262E−15	5.879E−09	1.4689E+04	2.496E−15	6.956E−09
$1s\,7g\ ^3G_5$	$1s\,7h\ ^3H^o_5$	1.1751E+07	4.945E−29	2.170E−28			
$1s\,3d\ ^3D_2$	$1s\,7h\ ^3H^o_4$	3.5224E+00	9.274E−16	5.539E−02			
$1s\,3d\ ^3D_3$	$1s\,7h\ ^3H^o_4$	3.5591E+00	4.087E−13	2.391E+01			
$1s\,3d\ ^1D_2$	$1s\,7h\ ^3H^o_4$	3.5605E+00	4.517E−12	2.641E+02			
$1s\,4d\ ^3D_2$	$1s\,7h\ ^3H^o_4$	7.5785E+00	4.314E−16	5.566E−03			
$1s\,4d\ ^3D_3$	$1s\,7h\ ^3H^o_4$	7.6502E+00	2.093E−13	2.650E+00			
$1s\,4d\ ^1D_2$	$1s\,7h\ ^3H^o_4$	7.6531E+00	2.617E−12	3.312E+01			
$1s\,5d\ ^3D_2$	$1s\,7h\ ^3H^o_4$	1.6234E+01	1.476E−17	4.152E−05			
$1s\,5d\ ^3D_3$	$1s\,7h\ ^3H^o_4$	1.6402E+01	2.182E−15	6.010E−03			
$1s\,5d\ ^1D_2$	$1s\,7h\ ^3H^o_4$	1.6409E+01	4.943E−14	1.361E−01			
$1s\,5g\ ^3G_4$	$1s\,7h\ ^3H^o_4$	1.6490E+01	5.583E−08	1.522E+05	1.6420E+01	5.629E−08	1.534E+05
$1s\,5g\ ^3G_3$	$1s\,7h\ ^3H^o_4$	1.6492E+01	6.137E−07	1.672E+06	1.6423E+01	6.190E−07	1.686E+06
$1s\,5g\ ^3G_5$	$1s\,7h\ ^3H^o_4$	1.6541E+01	8.746E−16	2.369E−03			
$1s\,5g\ ^1G_4$	$1s\,7h\ ^3H^o_4$	1.6543E+01	1.942E−13	5.259E−01			
$1s\,6d\ ^3D_2$	$1s\,7h\ ^3H^o_4$	4.2704E+01	9.336E−18	3.794E−06			
$1s\,6d\ ^3D_3$	$1s\,7h\ ^3H^o_4$	4.3381E+01	8.044E−15	3.168E−03			
$1s\,6d\ ^1D_2$	$1s\,7h\ ^3H^o_4$	4.3411E+01	5.285E−14	2.079E−02			
$1s\,6g\ ^3G_4$	$1s\,7h\ ^3H^o_4$	4.3739E+01	5.849E−08	2.266E+04	4.3559E+01	5.866E−08	2.272E+04
$1s\,6g\ ^3G_3$	$1s\,7h\ ^3H^o_4$	4.3747E+01	6.433E−07	2.491E+05	4.3559E+01	6.453E−07	2.499E+05
$1s\,6g\ ^3G_5$	$1s\,7h\ ^3H^o_4$	4.3947E+01	9.550E−18	3.665E−06			
$1s\,6g\ ^1G_4$	$1s\,7h\ ^3H^o_4$	4.3954E+01	2.072E−13	7.949E−02			
$1s\,7d\ ^3D_2$	$1s\,7h\ ^3H^o_4$	2.3873E+03	4.238E−24	5.512E−16			
$1s\,7d\ ^3D_3$	$1s\,7h\ ^3H^o_4$	5.2970E+03	2.811E−21	7.426E−14			
$1s\,7d\ ^1D_2$	$1s\,7h\ ^3H^o_4$	5.5903E+03	3.729E−21	8.844E−14			
$1s\,7g\ ^3G_4$	$1s\,7h\ ^3H^o_4$	1.4287E+04	4.118E−15	1.495E−08	1.4689E+04	3.744E−15	1.275E−08
$1s\,7g\ ^3G_3$	$1s\,7h\ ^3H^o_4$	1.4871E+04	4.016E−14	1.346E−07	1.4689E+04	4.119E−14	1.402E−07
$1s\,7g\ ^3G_5$	$1s\,7h\ ^3H^o_4$	5.3648E+05	2.939E−30	7.568E−27			
$1s\,2p\ ^3P^o_2$	$1s\,7g\ ^1G_4$	1.3938E+00	1.901E−14	7.251E+00			
$1s\,3p\ ^3P^o_2$	$1s\,7g\ ^1G_4$	3.5141E+00	2.638E−15	1.583E−01			
$1s\,4p\ ^3P^o_2$	$1s\,7g\ ^1G_4$	7.5624E+00	3.399E−14	4.405E−01			
$1s\,4f\ ^3F^o_3$	$1s\,7g\ ^1G_4$	7.6513E+00	1.704E−08	2.158E+05	7.6190E+00	1.671E−08	2.116E+05
$1s\,4f\ ^3F^o_2$	$1s\,7g\ ^1G_4$	7.6528E+00	2.186E−07	2.766E+06	7.6205E+00	2.189E−07	2.770E+06
$1s\,4f\ ^3F^o_4$	$1s\,7g\ ^1G_4$	7.6873E+00	1.770E−07	2.220E+06	7.6547E+00	1.797E−07	2.254E+06
$1s\,4f\ ^1F^o_3$	$1s\,7g\ ^1G_4$	7.6884E+00	1.945E−06	2.439E+07	7.6558E+00	1.977E−06	2.478E+07
$1s\,5p\ ^3P^o_2$	$1s\,7g\ ^1G_4$	1.6196E+01	4.008E−14	1.132E−01			
$1s\,5f\ ^3F^o_3$	$1s\,7g\ ^1G_4$	1.6405E+01	1.439E−08	3.963E+04	1.6336E+01	1.419E−08	3.908E+04
$1s\,5f\ ^3F^o_2$	$1s\,7g\ ^1G_4$	1.6409E+01	1.841E−07	5.068E+05	1.6340E+01	1.852E−07	5.100E+05
$1s\,5f\ ^3F^o_4$	$1s\,7g\ ^1G_4$	1.6490E+01	1.518E−07	4.138E+05	1.6420E+01	1.528E−07	4.166E+05
$1s\,5f\ ^1F^o_3$	$1s\,7g\ ^1G_4$	1.6493E+01	1.670E−06	4.549E+06	1.6423E+01	1.681E−06	4.581E+06
$1s\,6p\ ^3P^o_2$	$1s\,7g\ ^1G_4$	4.2553E+01	3.141E−14	1.286E−02			
$1s\,6f\ ^3F^o_3$	$1s\,7g\ ^1G_4$	4.3393E+01	9.707E−09	3.821E+03	4.3219E+01	1.009E−08	3.971E+03
$1s\,6f\ ^3F^o_2$	$1s\,7g\ ^1G_4$	4.3407E+01	1.241E−07	4.880E+04	4.3218E+01	1.246E−07	4.903E+04
$1s\,6f\ ^3F^o_4$	$1s\,7g\ ^1G_4$	4.3738E+01	1.042E−07	4.037E+04	4.3559E+01	1.044E−07	4.045E+04
$1s\,6f\ ^1F^o_3$	$1s\,7g\ ^1G_4$	4.3749E+01	1.147E−06	4.441E+05	4.3560E+01	1.148E−06	4.449E+05
$1s\,6h\ ^3H^o_5$	$1s\,7g\ ^1G_4$	4.3947E+01	4.178E−15	1.603E−03			
$1s\,6h\ ^3H^o_4$	$1s\,7g\ ^1G_4$	4.3952E+01	1.102E−15	4.227E−04			
$1s\,6h\ ^3H^o_6$	$1s\,7g\ ^1G_4$	4.4086E+01	5.767E−10	2.199E+02	4.3903E+01	5.785E−10	2.205E+02
$1s\,6h\ ^1H^o_5$	$1s\,7g\ ^1G_4$	4.4090E+01	1.511E−08	5.759E+03	4.3903E+01	1.504E−08	5.734E+03

(*continued on next page*)

Table 6 (*continued*)

Lower	Upper	GRASP2K			FAC		
		λ (Å)	*gf*	A (s^{-1})	λ (Å)	*gf*	A (s^{-1})
$1s\,7p\ ^3P^o_2$	$1s\,7g\ ^1G_4$	2.1414E+03	1.517E−18	2.452E−10			
$1s\,7f\ ^3F^o_3$	$1s\,7g\ ^1G_4$	5.4114E+03	2.420E−14	6.124E−07	5.5025E+03	2.355E−14	5.716E−07
$1s\,7f\ ^3F^o_2$	$1s\,7g\ ^1G_4$	5.5556E+03	2.854E−13	6.854E−06	5.5006E+03	2.907E−13	7.060E−06
$1s\,7f\ ^3F^o_4$	$1s\,7g\ ^1G_4$	1.4181E+04	1.429E−14	5.268E−08	1.4765E+04	1.251E−14	4.217E−08
$1s\,7f\ ^1F^o_3$	$1s\,7g\ ^1G_4$	1.4947E+04	1.343E−13	4.455E−07	1.4784E+04	1.370E−13	4.608E−07
$1s\,7h\ ^3H^o_5$	$1s\,7g\ ^1G_4$	4.7824E+05	1.517E−24	4.917E−21			
$1s\,7h\ ^3H^o_4$	$1s\,7g\ ^1G_4$	3.2051E+06	1.293E−27	9.331E−26			
$1s\,5g\ ^3G_4$	$1s\,7h\ ^3H^o_6$	1.6478E+01	2.768E−07	5.230E+05	1.6408E+01	2.770E−07	5.234E+05
$1s\,5g\ ^3G_5$	$1s\,7h\ ^3H^o_6$	1.6529E+01	3.232E−06	6.069E+06	1.6459E+01	3.261E−06	6.125E+06
$1s\,5g\ ^1G_4$	$1s\,7h\ ^3H^o_6$	1.6531E+01	1.019E−07	1.913E+05	1.6460E+01	1.028E−07	1.931E+05
$1s\,6g\ ^3G_4$	$1s\,7h\ ^3H^o_6$	4.3656E+01	2.869E−07	7.725E+04	4.3473E+01	2.870E−07	7.727E+04
$1s\,6g\ ^3G_5$	$1s\,7h\ ^3H^o_6$	4.3863E+01	3.400E−06	9.068E+05	4.3678E+01	3.410E−06	9.095E+05
$1s\,6g\ ^1G_4$	$1s\,7h\ ^3H^o_6$	4.3870E+01	1.073E−07	2.860E+04	4.3678E+01	1.082E−07	2.887E+04
$1s\,7g\ ^3G_4$	$1s\,7h\ ^3H^o_6$	8.8116E+03	8.646E−14	5.714E−07	8.8256E+03	8.470E−14	5.532E−07
$1s\,7g\ ^3G_5$	$1s\,7h\ ^3H^o_6$	2.2048E+04	6.532E−14	6.895E−08	2.2104E+04	6.405E−14	6.670E−08
$1s\,7g\ ^1G_4$	$1s\,7h\ ^3H^o_6$	2.3159E+04	1.778E−15	1.701E−09	2.2104E+04	2.033E−15	2.117E−09
$1s\,4f\ ^3F^o_4$	$1s\,7i\ ^3I_6$	7.6847E+00	1.806E−12	1.569E+01			
$1s\,5f\ ^3F^o_4$	$1s\,7i\ ^3I_6$	1.6478E+01	1.456E−12	2.751E+00			
$1s\,6f\ ^3F^o_4$	$1s\,7i\ ^3I_6$	4.3655E+01	6.343E−14	1.708E−02			
$1s\,6h\ ^3H^o_5$	$1s\,7i\ ^3I_6$	4.3863E+01	2.235E−06	5.960E+05	4.3678E+01	2.243E−06	5.983E+05
$1s\,6h\ ^3H^o_4$	$1s\,7i\ ^3I_6$	4.3869E+01	7.139E−08	1.903E+04	4.3678E+01	7.123E−08	1.899E+04
$1s\,6h\ ^3H^o_6$	$1s\,7i\ ^3I_6$	4.4002E+01	4.282E−13	1.135E−01			
$1s\,6h\ ^1H^o_5$	$1s\,7i\ ^3I_6$	4.4006E+01	9.095E−13	2.410E−01			
$1s\,7f\ ^3F^o_4$	$1s\,7i\ ^3I_6$	8.7950E+03	4.030E−22	2.673E−15			
$1s\,7h\ ^3H^o_5$	$1s\,7i\ ^3I_6$	2.2088E+04	1.687E−14	1.774E−08	2.2113E+04	1.661E−14	1.728E−08
$1s\,7h\ ^3H^o_4$	$1s\,7i\ ^3I_6$	2.2991E+04	4.777E−16	4.637E−10	2.2113E+04	5.275E−16	5.488E−10
$1s\,7h\ ^3H^o_6$	$1s\,7i\ ^3I_6$	2.7778E+08	1.588E−33	1.036E−35			
$1s\,4f\ ^3F^o_3$	$1s\,7i\ ^3I_5$	7.6487E+00	4.069E−17	4.218E−04			
$1s\,4f\ ^3F^o_4$	$1s\,7i\ ^3I_5$	7.6846E+00	6.867E−14	7.052E−01			
$1s\,4f\ ^1F^o_3$	$1s\,7i\ ^3I_5$	7.6858E+00	1.434E−12	1.472E+01			
$1s\,5f\ ^3F^o_3$	$1s\,7i\ ^3I_5$	1.6393E+01	2.438E−17	5.502E−05			
$1s\,5f\ ^3F^o_4$	$1s\,7i\ ^3I_5$	1.6478E+01	5.569E−14	1.244E−01			
$1s\,5f\ ^1F^o_3$	$1s\,7i\ ^3I_5$	1.6481E+01	1.157E−12	2.584E+00			
$1s\,6f\ ^3F^o_3$	$1s\,7i\ ^3I_5$	4.3310E+01	6.496E−19	2.100E−07			
$1s\,6f\ ^3F^o_4$	$1s\,7i\ ^3I_5$	4.3653E+01	2.487E−15	7.915E−04			
$1s\,6f\ ^1F^o_3$	$1s\,7i\ ^3I_5$	4.3664E+01	5.058E−14	1.609E−02			
$1s\,6h\ ^3H^o_5$	$1s\,7i\ ^3I_5$	4.3861E+01	1.065E−07	3.356E+04	4.3678E+01	1.068E−07	3.367E+04
$1s\,6h\ ^3H^o_4$	$1s\,7i\ ^3I_5$	4.3866E+01	1.845E−06	5.814E+05	4.3678E+01	1.851E−06	5.836E+05
$1s\,6h\ ^3H^o_6$	$1s\,7i\ ^3I_5$	4.4000E+01	6.477E−17	2.029E−05			
$1s\,6h\ ^1H^o_5$	$1s\,7i\ ^3I_5$	4.4004E+01	2.541E−13	7.958E−02			
$1s\,7f\ ^3F^o_3$	$1s\,7i\ ^3I_5$	4.3626E+03	1.645E−27	5.241E−20			
$1s\,7f\ ^3F^o_4$	$1s\,7i\ ^3I_5$	8.6997E+03	1.609E−23	1.289E−16			
$1s\,7f\ ^1F^o_3$	$1s\,7i\ ^3I_5$	8.9822E+03	3.033E−22	2.280E−15			
$1s\,7h\ ^3H^o_5$	$1s\,7i\ ^3I_5$	2.1496E+04	8.714E−16	1.144E−09	2.2113E+04	7.913E−16	9.729E−10
$1s\,7h\ ^3H^o_4$	$1s\,7i\ ^3I_5$	2.2351E+04	1.344E−14	1.631E−08	2.2113E+04	1.371E−14	1.686E−08
$1s\,7h\ ^3H^o_6$	$1s\,7i\ ^3I_5$	8.0038E+05	8.707E−31	8.242E−28			
$1s\,3d\ ^3D_3$	$1s\,7h\ ^1H^o_5$	3.5586E+00	2.702E−16	1.294E−02			
$1s\,4d\ ^3D_3$	$1s\,7h\ ^1H^o_5$	7.6476E+00	2.941E−16	3.049E−03			
$1s\,5d\ ^3D_3$	$1s\,7h\ ^1H^o_5$	1.6390E+01	1.850E−16	4.176E−04			
$1s\,5g\ ^3G_4$	$1s\,7h\ ^1H^o_5$	1.6478E+01	1.027E−08	2.293E+04	1.6408E+01	9.994E−09	2.231E+04
$1s\,5g\ ^3G_3$	$1s\,7h\ ^1H^o_5$	1.6480E+01	2.227E−07	4.972E+05	1.6410E+01	2.231E−07	4.981E+05
$1s\,5g\ ^3G_5$	$1s\,7h\ ^1H^o_5$	1.6529E+01	1.539E−07	3.417E+05	1.6459E+01	1.553E−07	3.447E+05
$1s\,5g\ ^1G_4$	$1s\,7h\ ^1H^o_5$	1.6530E+01	2.668E−06	5.920E+06	1.6460E+01	2.692E−06	5.973E+06
$1s\,6d\ ^3D_3$	$1s\,7h\ ^1H^o_5$	4.3297E+01	1.613E−16	5.219E−05			
$1s\,6g\ ^3G_4$	$1s\,7h\ ^1H^o_5$	4.3653E+01	1.064E−08	3.387E+03	4.3473E+01	1.104E−08	3.512E+03
$1s\,6g\ ^3G_3$	$1s\,7h\ ^1H^o_5$	4.3661E+01	2.309E−07	7.345E+04	4.3473E+01	2.318E−07	7.376E+04
$1s\,6g\ ^3G_5$	$1s\,7h\ ^1H^o_5$	4.3860E+01	1.619E−07	5.104E+04	4.3678E+01	1.624E−07	5.118E+04
$1s\,6g\ ^1G_4$	$1s\,7h\ ^1H^o_5$	4.3867E+01	2.807E−06	8.845E+05	4.3678E+01	2.815E−06	8.872E+05
$1s\,7d\ ^3D_3$	$1s\,7h\ ^1H^o_5$	4.2781E+03	7.935E−22	2.629E−14			
$1s\,7g\ ^3G_4$	$1s\,7h\ ^1H^o_5$	8.6987E+03	3.334E−15	2.672E−08	8.8256E+03	3.259E−15	2.515E−08
$1s\,7g\ ^3G_3$	$1s\,7h\ ^1H^o_5$	8.9120E+03	6.726E−14	5.135E−07	8.8255E+03	6.841E−14	5.281E−07
$1s\,7g\ ^3G_5$	$1s\,7h\ ^1H^o_5$	2.1355E+04	3.424E−15	4.553E−09	2.2104E+04	3.050E−15	3.753E−09
$1s\,7g\ ^1G_4$	$1s\,7h\ ^1H^o_5$	2.2395E+04	5.146E−14	6.221E−08	2.2104E+04	5.287E−14	6.506E−08
$1s\,7i\ ^3I_6$	$1s\,7h\ ^1H^o_5$	6.8074E+05	2.383E−25	3.119E−22			
$1s\,7i\ ^3I_5$	$1s\,7h\ ^1H^o_5$	4.4823E+06	2.314E−28	6.985E−27			
$1s\,6h\ ^3H^o_5$	$1s\,7i\ ^3I_7$	4.3801E+01	4.717E−07	1.093E+05	4.3617E+01	4.715E−07	1.092E+05
$1s\,6h\ ^3H^o_6$	$1s\,7i\ ^3I_7$	4.3940E+01	7.252E−06	1.670E+06	4.3754E+01	7.280E−06	1.676E+06
$1s\,6h\ ^1H^o_5$	$1s\,7i\ ^3I_7$	4.3944E+01	1.639E−07	3.775E+04	4.3754E+01	1.654E−07	3.810E+04
$1s\,7h\ ^3H^o_5$	$1s\,7i\ ^3I_7$	1.2900E+04	1.788E−14	4.778E−08	1.2909E+04	1.756E−14	4.647E−08
$1s\,7h\ ^3H^o_6$	$1s\,7i\ ^3I_7$	3.1010E+04	1.983E−14	9.171E−09	3.1022E+04	1.957E−14	8.967E−09
$1s\,7h\ ^1H^o_5$	$1s\,7i\ ^3I_7$	3.2494E+04	3.897E−16	1.641E−10	3.1022E+04	4.448E−16	2.038E−10

(*continued on next page*)

Table 6 (*continued*)

Lower	Upper	GRASP2K			FAC		
		λ (Å)	*gf*	A (s^{-1})	λ (Å)	*gf*	A (s^{-1})
$1s\,4f\ ^3F^o_4$	$1s\,7i\ ^1I_6$	7.6827E+00	9.016E−17	7.837E−04			
$1s\,5f\ ^3F^o_4$	$1s\,7i\ ^1I_6$	1.6469E+01	7.167E−17	1.356E−04			
$1s\,6f\ ^3F^o_4$	$1s\,7i\ ^1I_6$	4.3592E+01	1.033E−18	2.790E−07			
$1s\,6h\ ^3H^o_5$	$1s\,7i\ ^1I_6$	4.3799E+01	1.213E−08	3.246E+03	4.3617E+01	1.257E−08	3.362E+03
$1s\,6h\ ^3H^o_4$	$1s\,7i\ ^1I_6$	4.3805E+01	3.950E−07	1.056E+05	4.3617E+01	3.961E−07	1.059E+05
$1s\,6h\ ^3H^o_6$	$1s\,7i\ ^1I_6$	4.3938E+01	2.473E−07	6.572E+04	4.3754E+01	2.481E−07	6.595E+04
$1s\,6h\ ^1H^o_5$	$1s\,7i\ ^1I_6$	4.3942E+01	6.182E−06	1.643E+06	4.3754E+01	6.204E−06	1.648E+06
$1s\,7f\ ^3F^o_4$	$1s\,7i\ ^1I_6$	6.8024E+03	6.449E−27	7.151E−20			
$1s\,7h\ ^3H^o_5$	$1s\,7i\ ^1I_6$	1.2726E+04	4.791E−16	1.518E−09	1.2909E+04	4.684E−16	1.430E−09
$1s\,7h\ ^3H^o_4$	$1s\,7i\ ^1I_6$	1.3020E+04	1.456E−14	4.408E−08	1.2909E+04	1.475E−14	4.504E−08
$1s\,7h\ ^3H^o_6$	$1s\,7i\ ^1I_6$	3.0020E+04	7.453E−16	4.243E−10	3.1022E+04	6.673E−16	3.527E−10
$1s\,7h\ ^1H^o_5$	$1s\,7i\ ^1I_6$	3.1409E+04	1.627E−14	8.462E−09	3.1022E+04	1.668E−14	8.818E−09

Table 7
Calculated values using the GRASP2K code of the magnetic dipole A, electric quadrupole B and Landé g-factors for all levels of interest. For this calculation, the active set expanded to $n = 10$ (GRASP3) has been considered.

Configuration	A (MHz)	B (MHz)	g_J
$1s\,2s\ ^3S_1$	1.329E+07	1.941E+00	1.935167E+00
$1s\,2p\ ^3P^o_1$	1.218E+07	4.527E+03	1.285193E+00
$1s\,2p\ ^3P^o_2$	5.965E+06	−6.466E+04	1.458966E+00
$1s\,2p\ ^1P^o_1$	−5.636E+06	−3.488E+04	1.150634E+00
$1s\,3s\ ^3S_1$	1.218E+07	1.709E+00	1.942586E+00
$1s\,3p\ ^3P^o_1$	1.184E+07	1.265E+03	1.291576E+00
$1s\,3p\ ^3P^o_2$	5.890E+06	−1.976E+04	1.467393E+00
$1s\,3d\ ^3D_2$	5.879E+06	−3.874E+03	1.067061E+00
$1s\,3d\ ^3D_1$	−5.824E+06	−1.941E+03	5.145892E−01
$1s\,3p\ ^1P^o_1$	−5.774E+06	−1.065E+04	1.165553E+00
$1s\,3d\ ^3D_3$	3.915E+06	−5.068E+03	1.308971E+00
$1s\,3d\ ^1D_2$	−3.892E+06	−4.040E+03	1.074253E+00
$1s\,4s\ ^3S_1$	1.191E+07	8.684E−01	1.945151E+00
$1s\,4p\ ^3P^o_1$	1.175E+07	5.208E+02	1.293822E+00
$1s\,4p\ ^3P^o_2$	5.871E+06	−8.406E+03	1.470347E+00
$1s\,4d\ ^3D_2$	5.867E+06	−1.672E+03	1.070326E+00
$1s\,4d\ ^3D_1$	−5.843E+06	−8.397E+02	5.195030E−01
$1s\,4p\ ^1P^o_1$	−5.809E+06	−4.532E+03	1.170777E+00
$1s\,4d\ ^3D_3$	3.909E+06	−2.169E+03	1.312098E+00
$1s\,4f\ ^3F^o_3$	3.908E+06	−7.731E+02	1.025485E+00
$1s\,4f\ ^3F^o_2$	−3.901E+06	−6.174E+02	6.782567E−01
$1s\,4d\ ^1D_2$	−3.900E+06	−1.729E+03	1.078311E+00
$1s\,4f\ ^3F^o_4$	2.930E+06	−8.773E+02	1.232907E+00
$1s\,4f\ ^1F^o_3$	−2.927E+06	−7.820E+02	1.044150E+00
$1s\,5s\ ^3S_1$	1.181E+07	4.676E−01	1.946327E+00
$1s\,5p\ ^3P^o_1$	1.172E+07	2.630E+02	1.294862E+00
$1s\,5p\ ^3P^o_2$	5.865E+06	−4.316E+03	1.471711E+00
$1s\,5d\ ^3D_2$	5.862E+06	−8.637E+02	1.071827E+00
$1s\,5p\ ^1P^o_1$	−5.822E+06	−2.327E+03	1.173184E+00
$1s\,5d\ ^3D_1$	−5.851E+06	−4.344E+02	5.217790E−01
$1s\,5d\ ^3D_3$	3.907E+06	−1.116E+03	1.313549E+00
$1s\,5f\ ^3F^o_3$	3.906E+06	−3.993E+02	1.026955E+00
$1s\,5f\ ^3F^o_2$	−3.903E+06	−3.188E+02	6.802985E−01
$1s\,5d\ ^1D_2$	−3.902E+06	−8.908E+02	1.080205E+00
$1s\,5f\ ^3F^o_4$	2.930E+06	−4.520E+02	1.234400E+00
$1s\,5g\ ^3G_4$	2.930E+06	−2.098E+02	1.011596E+00
$1s\,5g\ ^3G_3$	−2.928E+06	−1.874E+02	7.594756E−01
$1s\,5f\ ^1F^o_3$	−2.928E+06	−4.029E+02	1.046058E+00
$1s\,5g\ ^3G_5$	2.344E+06	−2.262E+02	1.186952E+00
$1s\,5g\ ^1G_4$	−2.343E+06	−2.112E+02	1.029827E+00
$1s\,6s\ ^3S_1$	1.177E+07	2.710E−01	1.946963E+00
$1s\,6p\ ^3P^o_1$	1.171E+07	1.507E+02	1.295417E+00
$1s\,6p\ ^3P^o_2$	5.862E+06	−2.497E+03	1.472450E+00
$1s\,6d\ ^3D_2$	5.860E+06	−5.019E+02	1.072640E+00
$1s\,6p\ ^1P^o_1$	−5.828E+06	−1.346E+03	1.174496E+00
$1s\,6d\ ^3D_1$	−5.854E+06	−2.527E+02	5.230139E−01
$1s\,6d\ ^3D_3$	3.907E+06	−6.475E+02	1.314338E+00
$1s\,6f\ ^3F^o_3$	3.906E+06	−2.320E+02	1.027753E+00
$1s\,6f\ ^3F^o_2$	−3.904E+06	−1.853E+02	6.814050E−01
$1s\,6d\ ^1D_2$	−3.903E+06	−5.171E+02	1.081237E+00
$1s\,6f\ ^3F^o_4$	2.929E+06	−2.624E+02	1.235214E+00
$1s\,6g\ ^3G_4$	2.929E+06	−1.220E+02	1.012411E+00
$1s\,6g\ ^3G_3$	−2.929E+06	−1.090E+02	7.605229E−01
$1s\,6f\ ^1F^o_3$	−2.928E+06	−2.339E+02	1.047097E+00
$1s\,6g\ ^3G_5$	2.344E+06	−1.314E+02	1.187784E+00
$1s\,6h\ ^3H^o_5$	2.343E+06	−7.193E+01	1.005467E+00
$1s\,6h\ ^3H^o_4$	−2.343E+06	−6.707E+01	8.080359E−01
$1s\,6g\ ^1G_4$	−2.343E+06	−1.227E+02	1.030843E+00
$1s\,6h\ ^3H^o_6$	1.953E+06	−7.560E+01	1.156123E+00
$1s\,6h\ ^1H^o_5$	−1.952E+06	−7.210E+01	1.021980E+00
$1s\,7s\ ^3S_1$	1.175E+07	1.638E−01	1.947346E+00
$1s\,7p\ ^3P^o_1$	1.170E+07	9.511E+01	1.295852E+00
$1s\,7p\ ^3P^o_2$	5.860E+06	−1.576E+03	1.472878E+00
$1s\,7d\ ^3D_2$	5.859E+06	−3.166E+02	1.073129E+00
$1s\,7d\ ^3D_1$	−5.855E+06	−1.596E+02	5.237575E−01
$1s\,7p\ ^1P^o_1$	−5.830E+06	−8.507E+02	1.175151E+00
$1s\,7d\ ^3D_3$	3.906E+06	−4.081E+02	1.314814E+00
$1s\,7f\ ^3F^o_3$	3.906E+06	−1.466E+02	1.028235E+00
$1s\,7f\ ^3F^o_2$	−3.904E+06	−1.171E+02	6.820742E−01
$1s\,7d\ ^1D_2$	−3.904E+06	−3.263E+02	1.081860E+00

(*continued on next page*)

Table 7 (*continued*)

Configuration	A (MHz)	B (MHz)	g_J
$1s\,7f\ ^3F^o_4$	2.929E+06	−1.654E+02	1.235703E+00
$1s\,7g\ ^3G_4$	2.929E+06	−7.700E+01	1.012903E+00
$1s\,7g\ ^3G_3$	−2.929E+06	−6.881E+01	7.611546E−01
$1s\,7f\ ^1F^o_3$	−2.928E+06	−1.475E+02	1.047721E+00
$1s\,7g\ ^3G_5$	2.343E+06	−8.289E+01	1.188286E+00
$1s\,7h\ ^3H^o_5$	2.343E+06	−4.542E+01	1.005969E+00
$1s\,7h\ ^3H^o_4$	−2.343E+06	−4.235E+01	8.086497E−01
$1s\,7g\ ^1G_4$	−2.343E+06	−7.742E+01	1.031456E+00
$1s\,7h\ ^3H^o_6$	1.953E+06	−4.771E+01	1.156632E+00
$1s\,7i\ ^3I_6$	1.953E+06	−2.870E+01	1.002418E+00
$1s\,7i\ ^3I_5$	−1.953E+06	−2.743E+01	8.402692E−01
$1s\,7h\ ^1H^o_5$	−1.952E+06	−4.550E+01	1.022582E+00
$1s\,7i\ ^3I_7$	1.674E+06	−2.974E+01	1.134057E+00
$1s\,7i\ ^1I_6$	−1.674E+06	−2.879E+01	1.017106E+00

Table 8
Calculated values using the GRASP2K code of normal, specific mass shifts and electron densities at the nucleus for the all singly excited levels up to $n = 7$ with increasing the active set to $n = 10$ (GRASP3).

Index	Configuration	K_{NMS}	K_{SMS}	Electron densities at the nucleus
1	$1s^2\ ^1S_0$	2.862115E+03	8.372810E+00	2.355815E+05
2	$1s\,2s\ ^3S_1$	1.819580E+03	6.544528E−01	1.364262E+05
3	$1s\,2p\ ^3P^o_1$	1.817000E+03	−8.021940E+01	1.201622E+05
4	$1s\,2p\ ^3P^o_0$	1.815498E+03	−1.953285E+02	1.201173E+05
5	$1s\,2s\ ^1S_0$	1.815192E+03	1.618605E+00	1.360149E+05
6	$1s\,2p\ ^3P^o_2$	1.803659E+03	−2.058238E+02	1.196642E+05
7	$1s\,2p\ ^1P^o_1$	1.802099E+03	8.321168E+01	1.198328E+05
8	$1s\,3s\ ^3S_1$	1.613866E+03	2.454228E−01	1.247247E+05
9	$1s\,3p\ ^3P^o_1$	1.613208E+03	−1.706693E+01	1.199436E+05
10	$1s\,3s\ ^1S_0$	1.612703E+03	5.420968E−01	1.246202E+05
11	$1s\,3p\ ^3P^o_0$	1.612808E+03	−4.218003E+01	1.199297E+05
12	$1s\,3p\ ^3P^o_2$	1.609187E+03	−4.894801E+01	1.197682E+05
13	$1s\,3d\ ^3D_2$	1.608843E+03	3.867396E−02	1.197815E+05
14	$1s\,3d\ ^3D_1$	1.608690E+03	1.545303E−01	1.197794E+05
15	$1s\,3p\ ^1P^o_1$	1.608726E+03	1.988737E+01	1.198104E+05
16	$1s\,3d\ ^3D_3$	1.607560E+03	6.261143E−02	1.197794E+05
17	$1s\,3d\ ^1D_2$	1.607466E+03	2.896360E−03	1.197827E+05
18	$1s\,4s\ ^3S_1$	1.542191E+03	1.159027E−01	1.218552E+05
19	$1s\,4p\ ^3P^o_1$	1.541967E+03	−6.423856E+00	1.198675E+05
20	$1s\,4s\ ^1S_0$	1.541823E+03	2.449015E−01	1.218158E+05
21	$1s\,4p\ ^3P^o_0$	1.541804E+03	−1.595949E+01	1.198612E+05
22	$1s\,4p\ ^3P^o_2$	1.540267E+03	−1.916717E+01	1.197893E+05
23	$1s\,4d\ ^3D_2$	1.540095E+03	2.748062E−02	1.197824E+05
24	$1s\,4d\ ^3D_1$	1.540053E+03	8.509648E−02	1.197813E+05
25	$1s\,4p\ ^1P^o_1$	1.540076E+03	7.809108E+00	1.198064E+05
26	$1s\,4d\ ^3D_3$	1.539548E+03	4.557849E−02	1.197813E+05
27	$1s\,4f\ ^3F^o_3$	1.539594E+03	1.470809E−02	1.198033E+05
28	$1s\,4f\ ^3F^o_2$	1.539566E+03	2.242135E−02	1.198053E+05
29	$1s\,4d\ ^1D_2$	1.539534E+03	8.086057E−03	1.197830E+05
30	$1s\,4f\ ^3F^o_4$	1.539324E+03	6.452494E−03	1.198035E+05
31	$1s\,4f\ ^1F^o_3$	1.539303E+03	1.282208E−02	1.198050E+05
32	$1s\,5s\ ^3S_1$	1.509220E+03	6.414105E−02	1.208374E+05
33	$1s\,5p\ ^3P^o_1$	1.509162E+03	−3.114675E+00	1.198376E+05
34	$1s\,5s\ ^1S_0$	1.509195E+03	1.322070E−01	1.208210E+05
35	$1s\,5p\ ^3P^o_0$	1.509081E+03	−7.758204E+00	1.198342E+05
36	$1s\,5p\ ^3P^o_2$	1.508292E+03	−9.475364E+00	1.197965E+05
37	$1s\,5d\ ^3D_2$	1.508180E+03	1.819042E−02	1.197829E+05
38	$1s\,5p\ ^1P^o_1$	1.508197E+03	3.868506E+00	1.198052E+05
39	$1s\,5d\ ^3D_1$	1.508177E+03	4.981599E−02	1.197822E+05
40	$1s\,5d\ ^3D_3$	1.507896E+03	2.909923E−02	1.197823E+05
41	$1s\,5f\ ^3F^o_3$	1.507945E+03	9.888449E−03	1.198037E+05
42	$1s\,5f\ ^3F^o_2$	1.507930E+03	1.398999E−02	1.198047E+05
43	$1s\,5d\ ^1D_2$	1.507911E+03	7.316622E−03	1.197832E+05
44	$1s\,5f\ ^3F^o_4$	1.507807E+03	5.878058E−03	1.198038E+05
45	$1s\,5g\ ^3G_4$	1.507772E+03	6.925163E−03	1.197834E+05
46	$1s\,5g\ ^3G_3$	1.507765E+03	9.936995E−03	1.197835E+05
47	$1s\,5f\ ^1F^o_3$	1.507796E+03	8.879435E−03	1.198046E+05
48	$1s\,5g\ ^3G_5$	1.507690E+03	3.848136E−03	1.197834E+05
49	$1s\,5g\ ^1G_4$	1.507684E+03	6.841721E−03	1.197835E+05
50	$1s\,6s\ ^3S_1$	1.491393E+03	3.966973E−02	1.203896E+05
51	$1s\,6p\ ^3P^o_1$	1.491425E+03	−1.747137E+00	1.198237E+05
52	$1s\,6s\ ^1S_0$	1.491595E+03	8.044927E−02	1.203841E+05
53	$1s\,6p\ ^3P^o_0$	1.491378E+03	−4.358955E+00	1.198217E+05
54	$1s\,6p\ ^3P^o_2$	1.490923E+03	−5.374441E+00	1.197997E+05
55	$1s\,6d\ ^3D_2$	1.490835E+03	1.260114E−02	1.197831E+05
56	$1s\,6p\ ^1P^o_1$	1.490867E+03	2.197926E+00	1.198047E+05
57	$1s\,6d\ ^3D_1$	1.490852E+03	3.168686E−02	1.197827E+05
58	$1s\,6d\ ^3D_3$	1.490668E+03	1.933123E−02	1.197827E+05
59	$1s\,6f\ ^3F^o_3$	1.490720E+03	6.648316E−03	1.198039E+05
60	$1s\,6f\ ^3F^o_2$	1.490711E+03	9.068110E−03	1.198045E+05
61	$1s\,6d\ ^1D_2$	1.490698E+03	6.001879E−03	1.197833E+05
62	$1s\,6f\ ^3F^o_4$	1.490640E+03	4.399590E−03	1.198040E+05
63	$1s\,6g\ ^3G_4$	1.490603E+03	4.841594E−03	1.197834E+05
64	$1s\,6g\ ^3G_3$	1.490603E+03	6.624087E−03	1.197835E+05
65	$1s\,6f\ ^1F^o_3$	1.490634E+03	6.033506E−03	1.198044E+05
66	$1s\,6g\ ^3G_5$	1.490556E+03	2.987498E−03	1.197834E+05
67	$1s\,6h\ ^3H^o_5$	1.490594E+03	2.961360E−03	1.198041E+05
68	$1s\,6h\ ^3H^o_4$	1.490591E+03	3.804622E−03	1.198043E+05
69	$1s\,6g\ ^1G_4$	1.490556E+03	4.747536E−03	1.197835E+05
70	$1s\,6h\ ^3H^o_6$	1.490562E+03	1.899926E−03	1.198041E+05
71	$1s\,6h\ ^1H^o_5$	1.490560E+03	2.752518E−03	1.198043E+05

(*continued on next page*)

Table 8 (*continued*)

Index	Configuration	K_{NMS}	K_{SMS}	Electron densities at the nucleus
72	$1s\,7s\ ^3S_1$	1.480650E+03	2.694334E−02	1.201626E+05
73	$1s\,7p\ ^3P^o_1$	1.481084E+03	−1.087763E+00	1.198166E+05
74	$1s\,7s\ ^1S_0$	1.481167E+03	5.410009E−02	1.201644E+05
75	$1s\,7p\ ^3P^o_0$	1.481058E+03	−2.715643E+00	1.198153E+05
76	$1s\,7p\ ^3P^o_2$	1.480758E+03	−3.364477E+00	1.198013E+05
77	$1s\,7d\ ^3D_2$	1.480376E+03	9.571873E−03	1.197832E+05
78	$1s\,7d\ ^3D_1$	1.480415E+03	2.200799E−02	1.197830E+05
79	$1s\,7p\ ^1P^o_1$	1.480741E+03	1.381522E+00	1.198045E+05
80	$1s\,7d\ ^3D_3$	1.480267E+03	1.390302E−02	1.197830E+05
81	$1s\,7f\ ^3F^o_3$	1.480333E+03	4.632020E−03	1.198040E+05
82	$1s\,7f\ ^3F^o_2$	1.480328E+03	6.156500E−03	1.198044E+05
83	$1s\,7d\ ^1D_2$	1.480318E+03	5.311102E−03	1.197834E+05
84	$1s\,7f\ ^3F^o_4$	1.480278E+03	3.356779E−03	1.198040E+05
85	$1s\,7g\ ^3G_4$	1.480235E+03	3.714721E−03	1.197834E+05
86	$1s\,7g\ ^3G_3$	1.480243E+03	4.889674E−03	1.197835E+05
87	$1s\,7f\ ^1F^o_3$	1.480274E+03	4.340171E−03	1.198043E+05
88	$1s\,7g\ ^3G_5$	1.480206E+03	2.491921E−03	1.197834E+05
89	$1s\,7h\ ^3H^o_5$	1.480247E+03	2.300436E−03	1.198041E+05
90	$1s\,7h\ ^3H^o_4$	1.480245E+03	2.822402E−03	1.198042E+05
91	$1s\,7g\ ^1G_4$	1.480212E+03	3.650499E−03	1.197835E+05
92	$1s\,7h\ ^3H^o_6$	1.480226E+03	1.590809E−03	1.198041E+05
93	$1s\,7i\ ^3I_6$	1.480190E+03	1.649752E−03	1.197834E+05
94	$1s\,7i\ ^3I_5$	1.480190E+03	2.164438E−03	1.197835E+05
95	$1s\,7h\ ^1H^o_5$	1.480225E+03	2.112037E−03	1.198042E+05
96	$1s\,7i\ ^3I_7$	1.480176E+03	1.080355E−03	1.197834E+05
97	$1s\,7i\ ^1I_6$	1.480176E+03	1.594008E−03	1.197835E+05