

# Auger rates for Ni-, Cu-, and Zn-like ions

U. I. Safronova<sup>1</sup>, W. R. Johnson<sup>1</sup>, and J. R. Albritton<sup>2</sup>

<sup>1</sup>Department of Physics, University of Notre Dame, Notre Dame, IN 46556

<sup>2</sup>Lawrence Livermore National Laboratory, PO Box 808, Livermore, CA 94551

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## Abstract

Relativistic calculations of nonradiative transition rates to  $K$ ,  $L$ , and  $M$ -shell vacancy states in Ni-, Cu-, and Zn-like ions with  $Z=32, 36, 42, 47, 56, 60, 66, 74, 83$ , and  $92$  are performed. Auger and Coster-Kronig transition probabilities are calculated using both Dirac-Hartree-Fock and model-potential wave functions. Tabulated data are presented for  $K$ - and  $L$ -shells Auger rates in Ni-, Cu-, and Zn-like ions, for  $M$ -shell Auger rates in Zn-like ions, and for Coster-Kronig rates in Cu-like ions. Results obtained by averaging over angular momentum substates are also presented and semi-empirical formulas are given for the average rates.

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## 1 INTRODUCTION

Nickel-like ions are found in astrophysical and Tokamak plasmas [1, 2] as well as plasmas produced in the laboratory by high-power lasers [3, 4]. Quantitative data for both radiative and nonradiative transitions in Ni-like ions are needed to study kinetics in these plasmas. In the present paper, we evaluate autoionization rates in Ni-like, Cu-like and Zn-like ions for selected nuclear charges ranging from  $Z = 32$  to 92 to fulfill this need in part.

We do a comprehensive study of all possible autoionizing transitions starting from a hole in the  $K$ ,  $L$ , or  $M$  shell of each of the ions considered. For Ni-like ions, we consider all possible arrangements of the two holes in the final state after autoionization. For Cu-like ions, we again start from an initial hole in either the  $K$ ,  $L$ , or  $M$  shell and study transitions in which a valence electron with  $n$  ranging from 4 to 7 is ionized, leaving a single hole in the core. Finally, for Zn-like ions, we study transitions from states with a  $K$ ,  $L$ , or  $M$ -shell hole and two valence electrons with principal quantum numbers ranging from 4 to 7. The bound-state and continuum wave functions for each ion are obtained by solving the “frozen-core” Dirac-Hartree-Fock (DHF) equations, where the core is taken to be the closed-shell nickel-like ion in its ground state. For the sake of simplicity, we work in lowest-order perturbation theory and ignore the multiplet structure of the excited states. For each value of  $Z$ , autoionization rates are determined as functions of the principal and angular-momentum quantum numbers ( $n_0l_0j_0$ ) of the initial hole state, and the quantum numbers ( $n_1l_1j_1$ ) and ( $n_2l_2j_2$ ) of the two ionized electrons.

Because of the large number of ionization and excitation states making up the ensemble, modeling of the entire plasma kinetics is often practical only at a reduced level of description. To this end, the autoionization rate  $A(n_0l_0j_0, n_1l_1j_1, n_2l_2j_2)$  is averaged over the angular momentum quantum numbers to obtain rates  $A(n_0, n_1, n_2)$  that are functions of principal quantum numbers only. We show that these averaged rates are amenable to scaling, so that modestly accurate rates for any such atom may be obtained from simple formulae and a table of parameters. The average rates are also compared to a semi-empirical formula that results from three successive simplifications that have been made in the past when *ab-initio* calculations were not available: 1) ignoring exchange and retaining only dipole contributions, 2) factoring the two-particle interaction integral into a product of two one-particle interactions, and 3) replacing the acceleration form of the one-electron radial integral involving the continuum wave function by its length form. Approximation 1) is found to be least harmful, while approximations 2) and 3) almost always lead to large errors in comparison with exact data. We find, nevertheless, that the formula for average rates resulting from these three approximations is in fair agreement with our *ab-initio* calculations.

Studies of nonradiative transition rates for satellites of Ne-like resonance lines were made by Chen [5] and Nilsen [6], using different modifications of the multiconfiguration Dirac-Fock (MCDF) method. The continuum wave functions in Ref. [5] were obtained by solving the Dirac equations without exchange, whereas, distorted-wave Dirac continuum functions from the YODA code were used in [6]. Recently, [7, 8], rates for doubly-excited  $1s^22s2p^63lnl'$  and  $1s^22s^22p^53lnl'$  states, with  $n$  up to 8, for ions with  $Z = 26$  and  $29$  were evaluated using Cowan’s multi-configuration Hartree-Fock code and the YODA code. In these studies, as in the present calculations, the number of levels increases rapidly with increasing  $n$ .

During the past 50 years, there have been numerous calculations of  $K$ -shell Auger rates, among which those of McGuire [9], and Walters and Bhalla [10] are particularly noteworthy. A detailed review of experimental and theoretical results up to 1971 was given by Bambynek *et al.* [11], and a review of results up to 1981 was given by Åberg and Howat [12]. More recently, relativistic calculations of  $K$ -shell [13] and  $L$ -shell [14] Auger rates for selected high- $Z$  ions were reported by Chen *et al.*. Benchmark relativistic calculations of Auger and Coster-Kronig rates for selected elements with atomic numbers  $Z=18-96$  were reported by Chen *et al.* in Ref. [15].

## 2 Auger Transitions

In this paper, autoionization rates are calculated for Ni-like, Cu-like, and Zn-like ions using orbitals determined in a self-consistent potential of the closed Ni-like core. When we discuss Ni-like ions

here and later, we refer to ions with a closed  $3d^{10}$  structure. We do not consider the case of neutral Ni, which has a  $3d^8 4s^2$  ground-state. The Ni-like core wave function is represented by  $|0\rangle$  in second quantization. The wave function for the initial state of a Ni-like ion having a hole with quantum numbers  $(n_0 l_0 j_0)$  is  $a_0|0\rangle$ , where the subscript 0 on the annihilation operator  $a_0$  refers to the entire set of quantum numbers  $n_0, l_0, j_0$ , and  $m_0$ . The wave function for the autoionized final state of the Ni-like ion which has two holes with quantum numbers  $(n_1 l_1 j_1)$  and  $(n_2 l_2 j_2)$  and a continuum electron with momentum  $\mathbf{p}$  and spin-projection  $\lambda$  is given by  $a_{\mathbf{p}\lambda}^\dagger a_1 a_2|0\rangle$ , where  $a_{\mathbf{p}\lambda}^\dagger$  is the creation operator for the continuum electron. Similarly, the wave function of the initial state of a Cu-like ion with a hole  $(n_0 l_0 j_0)$  and a single valence electron  $(n_1 l_1 j_1)$  is  $a_0 a_1^\dagger|0\rangle$ , while the wave function of the corresponding final state, which has a continuum electron and a hole with quantum numbers  $(n_2 l_2 j_2)$  is  $a_{\mathbf{p}\lambda}^\dagger a_2|0\rangle$ . Finally, for the case of a Zn-like ion with a hole in  $(n_0 l_0 j_0)$  and two valence electrons  $(n_1 l_1 j_1)$  and  $(n_2 l_2 j_2)$ , the initial-state wave function is  $a_0 a_1^\dagger a_2^\dagger|0\rangle$  and the final state wave function is  $a_{\mathbf{p}\lambda}^\dagger|0\rangle$ . Summarizing, we consider the three possibilities:

$$\begin{aligned} a_0|0\rangle &\rightarrow a_{\mathbf{p}\lambda}^\dagger a_1 a_2|0\rangle && \text{Ni-like ions} \\ a_0 a_2^\dagger|0\rangle &\rightarrow a_{\mathbf{p}\lambda}^\dagger a_1|0\rangle && \text{Cu-like ions} \\ a_0 a_1^\dagger a_2^\dagger|0\rangle &\rightarrow a_{\mathbf{p}\lambda}^\dagger|0\rangle && \text{Zn-like ions} \end{aligned}$$

## 2.1 Rate formulas

A detailed derivation of the formula for the autoionization rate for the case of Ni-like ions is given in Appendix A; since autoionization of Cu- and Zn-like ions can be treated in a closely parallel way, and lead to an essentially identical formulae, we quote only the final results for these cases. For all three cases, the autoionization rate is given by the formula

$$A(n_0 l_0 j_0, n_1 l_1 j_1, n_2 l_2 j_2) = \frac{2\pi}{(2j_0 + 1)} \eta_{12}^2 \sum_{ijL} \frac{1}{[L]} |Z_L(\epsilon l j, n_0 l_0 j_0, n_2 l_2 j_2, n_1 l_1 j_1)|^2, \quad (1)$$

where  $\eta_{12}$  is a normalization factor given by

$$\eta_{12} = \begin{cases} 1/\sqrt{2} & (n_1 l_1 j_1) = (n_2 l_2 j_2) \\ 1 & \text{otherwise} \end{cases}$$

This is the ‘‘per-hole/per-shell/per-shell’’ rate. To obtain the ‘‘per-hole/per-electron/per-electron’’ rate used in plasma kinetics studies, one simply multiplies the rate given in Eq. (1) by the statistical weight  $g_{12}$  of the two-electron state  $(n_1 l_1 j_1 n_2 l_2 j_2)$ :

$$g_{12} = \begin{cases} \frac{1}{j_1(2j_1 + 1)}, & \text{for } (n_1 l_1 j_1) = (n_2 l_2 j_2), \\ \frac{1}{(2j_1 + 1)(2j_2 + 1)}, & \text{otherwise.} \end{cases}$$

In Appendix B, we show that the rates given above by Eq. (1) are invariant with respect to interchange of  $(n_1 l_1 j_1)$  and  $(n_2 l_2 j_2)$ . The rate in Eq. (1) is evaluated numerically using Dirac-Fock or relativistic model potential wave functions. The Breit interaction is not included in the calculation. Energies are determined from eigenvalues of the Dirac-Fock or model potential equations.

## 2.2 Atomic Kinetics

For the sake of definiteness, we illustrate the use of our Auger rates in an atomic kinetics scheme. It is common to account the plasma ensemble according to the number of electrons,  $N_i$ , occupying the subshell ( $n_i l_i j_i$ ). The initial state ( $N_0, N_1, N_2$ ) decays to the final state ( $N_0 + 1, N_1 - 1, N_2 - 1$ ), and the time rate of change of the probability or fraction of atoms with occupations ( $N_0, N_1, N_2$ ) may be written

$$\begin{aligned} \frac{dF(N_0, N_1, N_2)}{dt} = & -F(N_0, N_1, N_2)(D_0 - N_0) N_1 N_2 A(0, 1, 2) \\ & + F(N_0 - 1, N_1 + 1, N_2 + 1)[D_0 - (N_0 - 1)](N_1 + 1)(N_2 + 1) A(\tilde{0}, \tilde{1}, \tilde{2}), \end{aligned} \quad (2)$$

where  $D_0 = 2j_0 + 1$ . In the above equation, we designate the autoionization rate for the state ( $N_0 + 1, N_1 - 1, N_2 - 1$ ) by  $A(\tilde{0}, \tilde{1}, \tilde{2})$ . Here we record only the active level occupations, and the rate is used in its “per-hole/per-electron/per-electron” form; note the explicit occupation factors in the two terms. The first term on the right-hand-side represents the loss from the state due to the Auger process, and the second represents its gain from the Auger process acting on an “adjacent” state. In the special case that ( $n_1 l_1 j_1$ ) and ( $n_2 l_2 j_2$ ) are the same, we have initial and final states with occupation numbers ( $N_0, N_1$ ) and ( $N_0 + 1, N_1 - 2$ ); and the associated rate equation:

$$\begin{aligned} \frac{dF(N_0, N_1)}{dt} = & -F(N_0, N_1)(D_0 - N_0) \frac{N_1(N_1 - 1)}{2} A(0, 1) \\ & + F(N_0 - 1, N_1 + 2)[D_0 - (N_0 - 1)] \frac{(N_1 + 2)(N_1 + 1)}{2} A(\tilde{0}, \tilde{1}). \end{aligned} \quad (3)$$

## 2.3 Averages

For plasma applications [16, 17], it is often useful to consider rates averaged over atomic subshells. To obtain such rates, it should be noted that the number of electrons in a shell with principal quantum number  $n$  is  $2n^2$ . The number of two-particle states with principal quantum numbers  $n_1$  and  $n_2$  is  $4n_1^2 n_2^2$  when  $n_1 \neq n_2$  and  $2n_1^4 - n_1^2$  for  $n_1 = n_2$ . Consequently, the average rates in the per-hole/per-electron/per-electron form are given by

$$A(n_0, n_1, n_2) = \frac{1}{8n_0^2 n_1^2 n_2^2} \sum_{l_1 j_1} \sum_{l_2 j_2} \sum_{l_0 j_0} (2j_0 + 1) A(n_0 l_0 j_0, n_1 l_1 j_1, n_2 l_2 j_2), \quad n_1 \neq n_2 \quad (4)$$

$$A(n_0, n_1, n_1) = \frac{1}{2n_0^2 (2n_1^4 - n_1^2)} \sum_{l_1 j_1} \sum_{l_2 j_2} \sum_{l_0 j_0} (2j_0 + 1) A(n_0 l_0 j_0, n_1 l_1 j_1, n_1 l_2 j_2), \quad n_1 = n_2 \quad (5)$$

The factor  $2j_0 + 1$  occurs in above formulas since the rate given in Eq. (1) was averaged over magnetic substates of the initial hole state ( $n_0 l_0 j_0$ ) and summed over completely filled subshells ( $n_1 l_1 j_1$ ) and ( $n_2 l_2 j_2$ ).

## 3 Result and Discussion

We first compare the present calculations with previous calculations from [15], which were carried out for neutral atoms. For this purpose, we evaluate Auger and Coster-Kronig (CK) rates in neutral Zn using various different central potentials to determine the electron orbitals: the Dirac-Fock (DF) potential, a Dirac-Hartree model potential for a closed-core ion (MP), and Dirac-Hartree potentials with a hole in the  $1s$  shell (MP-1s) or  $2s$  shell (MP-2s). The comparisons are shown in Table A, It

is seen that the  $K$ -shell rates calculated using the MP-1s potential and the  $L_1$  rates calculated in the MP-2s potential are in closest agreement with the MCHF results of [15]. The  $K$ -shell Auger rates are found to be insensitive to the potential. The largest differences between our calculations and those of Ref. [15] are for CK transitions which occur for energies near threshold. For these CK transitions, small differences in the energies of the continuum electron lead to rather large differences in the decay rates. Our calculations for neutral atoms are in satisfactory agreement with the benchmark calculations of Ref. [15]. As the ionic charge increases, details of the potential become less important, and the present calculations become more and more precise.

### 3.1 Sample Calculations

The remaining calculations are carried out using only the DF and MP potentials described above. These closed-shell potentials, provide natural starting points for future improvements of the present calculations using many-body perturbation theory (MBPT). Accurate MBPT calculations have already been carried out for energies and radiative transition probabilities in many-electron systems in Refs. [18, 19], for example.

Auger and Coster-Kronig rates for Ni-, Cu-, and Zn-like ions are given in Tables I–X. The  $K$ -shell Auger rates are presented in Table I as  $A(n_0l_0j_0, n_1l_1j_1, n_2l_2j_2)$  with  $n_0l_0j_0=1s_{1/2}$ . The  $L_1$ ,  $L_2$ , and  $L_3$  rates are presented in Tables II, III, and IV as  $A(n_0l_0j_0, n_1l_1j_1, n_2l_2j_2)$  with  $n_0l_0j_0=2s_{1/2}$ ,  $2p_{1/2}$ , and  $2p_{3/2}$ , respectively. The  $M_1$ ,  $M_2$ ,  $M_3$ ,  $M_4$  and  $M_5$  rates are presented in Tables V, VI, VII, VIII, and IX as  $A(n_0l_0j_0, n_1l_1j_1, n_2l_2j_2)$  with  $n_0l_0j_0=3s_{1/2}$ ,  $3p_{1/2}$ ,  $3p_{3/2}$ ,  $3d_{3/2}$ , and  $3d_{5/2}$ , respectively. In Table X, we list Coster-Kronig rates  $A(n_0l_0j_0, n_1l_1j_1, n_2l_2j_2)$  for Cu-like ions with  $n_1=n_0=2$  or 3, and  $n_2=4$ –7. It was found that the CK rates are nonzero for only a few Ni-like ions ( $Z=32,36$ ) and it seemed unreasonable to tabulate these few values. From preliminary calculations in Zn-like ions, we found the CK rates to be similar to those tabulated for Cu-like ions. However, the resulting tables would be much-much larger since the  $3lj$  hole would be replaced by a  $4lj$  hole!

To limit the size of the tables we list only those rates for which  $A > 10^{-3}$  mau. Thus, for example, rates for only 31 of the possible 36 configurations for  $K$ -shell Auger transitions in Ni are listed; the remaining rates fall below the cut-off. In the tables, we present results obtained by using the MP potential, since the MP energies are somewhat closer to experimental energies than are the DF energies. The rates for Ni-like ions are seen to change very slowly with  $Z$ ; by contrast, those for Zn-like ions increase by a factor of 600 from  $Z=32$  to  $Z=92$ .

### 3.2 Average Auger and Coster-Kronig rates

In Tables B–F, we present average Auger and Coster-Kronig rates in Ni-, Cu-, and Zn-like ions with  $Z=32$ –92. In these tables, we again compare results calculated using the DF and MP potentials. The two sets of Auger rates for Ni-like ions given in Table B differ by 5–10% for low- $Z$  ions and 1–5% for high- $Z$  ions. The smallest difference between the two sets occurs for the  $K$ -shell Auger transitions:  $A(1\ 2\ 2)$ ,  $A(1\ 2\ 3)$ , and  $A(1\ 3\ 3)$ . The  $L$ -shell Auger rates  $A(2\ 3\ 3)$  are more sensitive to the potential. The average  $K$ - and  $L$ -shell Auger rates increase smoothly with increasing  $Z$ .

Auger and Coster-Kronig rates for Cu-like ions are calculated for all  $(n_2l_2j_2)$  valence states  $n_2 \leq 7$  with all possible values of  $(l_2j_2)$ . The 920 distinct configurations for Auger rates and 520 distinct configurations for CK rates, respectively, are taken into account. Average Auger and CK rates for Cu-like ions are presented in Tables C and D. Comparison of rates calculated by using the DF and MP potentials shows that only low-lying states in low- $Z$  ions are sensitive to the choice of potential. Two sets of results for  $A(1\ 2\ 4)$  and  $A(1\ 3\ 4)$  differ by 18% for  $Z=32$  and by only 2% for  $Z=92$ . The difference in the two sets of data is larger for  $L$ -shell transitions than for  $K$ -shell

transitions in low- $Z$  ions. As can be seen from the Table C, the difference between the two sets of data for  $A(2\ 3\ 4)$  is 38% for  $Z=32$ ; however, with increasing  $n$  and  $Z$ , the difference becomes smaller and for  $U^{+63}$ , it is only 1-2%. The average  $K$ - and  $L$ -shell Auger rates for Cu-like ions smoothly increase with increasing  $Z$ ; this increase is much larger than for the Ni-like ions discussed in the previous paragraph: the ratio of  $A$ -values for  $Z=92$  and  $Z=32$  is about 20-40 for Cu-like ions and 2-4 for Ni-like ions.

In Table D, we present average  $L$ - and  $M$ -shells Coster-Kronig rates for Cu-like ions in the range  $Z=32$ –92 calculated. As can be seen,  $A$  vanishes for some of the  $A(2\ 2\ 4)$ ,  $A(3\ 3\ 4)$ , and  $A(3\ 3\ 4)$  transitions. The Coster-Kronig transitions are transitions within a given shell,  $n_0=n_1$ , and the energy of the continuum electron  $\epsilon_p$  equals  $\epsilon_1 - \epsilon_0 + \epsilon_2$ . When  $\epsilon_1 - \epsilon_0$  is very small and can not compensate for the valence energy  $\epsilon_2$ , the transition is energetically forbidden. Consequently, the CK rates are very sensitive to energies. Since, as noted previously, MP energies are generally in better agreement with experimental energies than are DF energies, we present only the MP results in Table D. The CK rate is important, when is it is allowed, because the  $A$ -values for Coster-Kronig transitions are larger than the  $A$ -values for other autoionization transitions such as those shown in Table C.

Auger rates in Zn-like ions are calculated for all  $(n_1l_1j_1, n_2l_2j_2)$  configurations with  $n_1 \leq 7$  and  $n_2 \leq 7$  including all possible  $(l_1j_1)$  and  $(l_2j_2)$ . There are 28, 45, 66, and 91 configurations with  $n_1=n_2=4, 5, 6,$  and  $7$ , respectively. The number of configurations with  $n_1 \neq n_2$  is much larger: 63 configurations with  $n_1=4, n_2=5$ ; 77 and 99 configurations with  $n_1=4$  and  $5$ , and  $n_2=6$ , respectively; and 91, 117, and 143 configurations with  $n_1=4, 5, 6$  and  $n_2=7$ , respectively. That gives a total of 820 different configurations in the case of  $K$ -shell Auger rates. The number of configurations increases by factor of 3–5 for  $L$ -shell or  $M$ -shell Auger rates. The final number of configurations for  $K$ -,  $L$ -, and  $M$ -shells Auger rates in Zn-like ions is equal to 7380 for each  $Z$ . The resulting  $A(n_0l_0j_0, n_1l_1j_1, n_2l_2j_2)$ -values are averaged over  $lj$  using Eqs. (4) and (5). Average Auger rates for Zn-like ions with  $Z=32$ –92 are given in Tables E and F. In these tables, we compare average Auger rates for Zn-like ions, calculated using DF and MP potentials. As can be seen,  $A$ -values of low-lying states ( $n_1=4, 5$ ) are sensitive to the starting potentials. Even for  $K$ -shell Auger rates, the difference between values of  $A(1\ 4\ 4)$  and  $A(1\ 4\ 5)$  given in Tables E and F about 40% for ions with  $Z=32$ . This difference decreases slowly with  $Z$  and even for  $Z=92$ , it is about 5%. The  $Z$ -dependence of the average  $K$ -,  $L$ - and  $M$ -shell  $A$ s for Ni-like and Cu-like ions, the  $A$ -values smoothly increase with  $Z$ ; the increase for Zn-like ions being larger than that for Cu-like ions: the ratio of  $A$ -values for  $Z=92$  and  $Z=32$  is about 100–200 for Zn-like ions and 20–40 for Cu-like ions. The above comments pertain to average  $K$ - and  $L$ -shell Auger rates in Zn-like ions; The  $M$ -shell rates change more slowly: the ratio of  $A$ -values for  $Z=92$  and  $Z=32$  is about 10-30 for the  $M$ -shell in Zn-like ions.

### 3.3 Scaled average Auger rates

As discussed in the previous subsection, the average Auger rates change smoothly with  $Z$  and rate curves for different values of  $n$  for valence electrons are similar. For plasma applications, it is useful to have results in analytical rather than numerical form.

We can approximate the average rates for Cu-like ions reasonably well with the formula

$$A(n_0, n_1, n_2) = A_0^{\text{Cu}}(n_0, n_1) \frac{(Z - 28)}{(n_2)^5}, \quad (6)$$

where the constant  $A_0^{\text{Cu}}(1, 2) = 0.36 \pm 0.02$  mau,  $A_0^{\text{Cu}}(1, 3) = 0.032 \pm 0.002$  mau, and  $A_0^{\text{Cu}}(2, 3) = 1.40 \pm 0.05$  mau. With the aid of this approximation, we can predict  $A(1\ 2\ n)$ ,  $A(1\ 3\ n)$ , and

$A(2\ 3\ n)$  for  $n > 7$  and arbitrary  $Z$ .

Similar formulas can be developed for average Auger rates in Zn-like ions. We find:

$$A(n_0, n_1, n_2) = A_0^{Zn}(n_0) \frac{(Z - 29)}{(n_1 n_2)^5}, \quad (7)$$

where  $A^{Zn}(1) = 5.75 \pm 0.75$  mau,  $A^{Zn}(2) = 185 \pm 35$  mau, and  $A^{Zn}(3) = 3500 \pm 500$  mau. Using these approximations, we can predict  $A(n_0, n_1, n_2)$  for  $n > 7$  and arbitrary  $Z$ . It should be noted that the  $A(3\ 4\ 7)$  rates are sensitive to threshold energies and we did not obtain a smooth  $Z$ - and  $n_2$ -dependence for  $A(3\ 4\ n_2)$ . We were also unable to find reasonable approximations of the type given in Eqs. (6) and (7) for Ni-like ions, or for CK rates in Cu-like ions.

Badnell [20] proposed a semi-empirical formula of the following type to describe average Auger rates:

$$A(n_0, n_1, n_2) = A_0 \frac{(n_0 n_1)^3}{2(n_1^2 - n_0^2)^3 n_2^5} \frac{Z_{n_2}^2}{[(n_0 Z_{n_1})^2 - (n_1 Z_{n_0})^2]}, \quad (8)$$

where  $A_0 = 3.74 \times 10^{16} \text{ s}^{-1} = 905$  mau. The quantities  $Z_{n_k} = Z - \sigma_{n_k}$  in this formula are ‘‘screened’’ charges for electrons in the  $n_k$  shell. This formula gives a reasonable approximation to the average rates obtained from the present Dirac-Fock calculations provided we choose  $\sigma_1 = 0.625$ ,  $\sigma_2 = 6.706$ ,  $\sigma_3 = 17.44$ ,  $\sigma_4 = 26.25$ ,  $\sigma_5 = 27.61$ ,  $\sigma_6 = 27.57$ , and  $\sigma_7 = 27.67$ . To illustrate the quality of the approximation given by Eq. (8), we compare average DF rates for Ni-like ions with values obtained from Eq. (8) in Fig. 1. In this figure,  $\Delta$  is the percent difference between average rates determined by formula (8) and Dirac-Fock rates; this difference ranges from 3% to 30%. In Fig. 2, we make similar comparisons for Cu-like ions. We present  $\Delta_S$ , the percent difference between average rates determined by (8) and DF rates, and  $\Delta_F$  the percent difference in rates determined by (6) and DF rates. We find that the rates obtained from Eq. (8) remain in close agreement with the DF values. Finally, for Zn-like ions, we show in Fig. 3 the percent error  $\Delta_S$  between average rates determined by (8) and DF rates, and  $\Delta_F$  the difference between rates from (7) and DF rates. The differences between average DF rates and the rates from (8) range from 10% to 80%. The best agreement between the two sets of data is obtained for  $A(3\ 4\ 4)$ , and the disagreement increases up to 300% with increasing difference between  $n_0$  and  $n_1$  [ $A(1\ 4\ 4)$ ,  $A(1\ 5\ 6)$ ]. We conclude, that the semi-empirical formula (8) is a useful approximation for Ni-like and Cu-like ions, and for low-lying excited states of Zn-like ions.

The screened-hydrogenic approximation [16, 17, 20] is often used to obtain Auger rates for use in plasma diagnostic applications. To assess the quality of this approximation, we present in Table G, a comparison of average DF rates with rates obtained using screened hydrogenic functions (designated by SC) for Ni-, Cu-, and Zn-like Ag ( $Z=47$ ). The differences range from 10% to 300%.

## 4 Conclusion

In summary, a systematic study of the Auger and Coster-Kronig rates of  $K$ ,  $L$ , and  $M$ -shell vacancy states in Ni-, Cu-, and Zn-like ions with  $Z=32-92$  is performed. All possible valence  $4l-7l$  electrons in Cu- and Zn-like ions are included. The calculations are carried out using both the non-local Dirac-Fock potential and a local Dirac-Hartree model potential. Comparison of transition rates calculated by using the DF and MP potentials shows that only low-lying states of low- $Z$  ions are sensitive to the potential. There are larger differences between the two sets of data for L-shell transitions than for  $K$ -shell transitions for low- $Z$  ions.

In Tables I-X, we give Auger and Coster-Kronig rates  $A(n_0 l_0 j_0, n_1 l_1 j_1, n_2 l_2 j_2)$  satisfying the cut-off criterion  $A < 10^{-3}$  mau for ions with nuclear charges  $Z=32-92$ . These rates were calculated

using a local Dirac-Hartree model potential. The tables include  $K$ - and  $L$ -shell Auger rates in Ni-, Cu-, and Zn-like ions,  $M$ -shell Auger rates in Zn-like ions, and the  $L$ - and  $M$ -shell Coster-Kronig rates in Cu-like ions.

Auger and Coster-Kronig rates averaged over  $lj$  subshells were also presented in Tables B-F. These average rates are useful for plasma applications. The average Auger and Coster-Kronig rates are presented for all possible states in Ni-like ions and for all possible  $4l-7l$  valence electrons in Cu- and Zn-like ions with  $Z=32-92$ . These data are scaled over  $Z$  and  $n$  of the valence electron. On the basis of the scaled data, we can predict average Auger rates for  $K$ - and  $L$ -vacancy states for  $n_1 > 7$  or  $n_2 > 7$  and arbitrary  $Z$ . We also find that the semi-empirical formula (8) for average rates often used in plasma studies provides a reasonable approximation to our *ab-initio* calculations, provided screening parameters are appropriately adjusted.

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## A Autoionization rates for Ni-like ions

For autoionization of Ni-like ions, the initial and final states are

$$|I\rangle = a_0|0\rangle \quad (9)$$

$$|F\rangle = \eta_{12} a_{\mathbf{p}\lambda}^\dagger a_1 a_2 |0\rangle, \quad (10)$$

where  $|0\rangle$  is the state vector of the closed-shell atom Ni-like core. The quantity  $\eta_{12}$  is a normalization factor:

$$\eta_{12} = \begin{cases} 1/\sqrt{2} & \text{for } (n_1 l_1 j_1) = (n_2 l_2 j_2) \\ 1 & \text{otherwise} \end{cases}$$

We start our analysis using the expression for the lowest-order  $S$ -matrix element in terms of interaction Hamiltonian:

$$\begin{aligned} S_{FI} &= i \int \langle F | H_I(t) | I \rangle dt \\ &= 2\pi i \delta(E_F - E_I) \langle F | H_I | I \rangle. \end{aligned} \quad (11)$$

Squaring the  $S$ -matrix element and substituting the interaction time for one factor of  $\delta(E_F - E_I)$ , we find that the interaction rate is

$$W_{FI} = 2\pi \delta(E_F - E_I) |\langle F | H_I | I \rangle|^2. \quad (12)$$

Substituting the number of states in momentum interval  $d^3p$  and integrating over energy, we find that the probability per second for transitions into  $d\Omega_p$  is given by

$$dw_{FI} = \frac{V}{(2\pi)^2} \frac{p\epsilon}{c^2} |\langle F | H_I | I \rangle|^2 d\Omega_p. \quad (13)$$

The matrix element must be evaluated at energy  $\epsilon = \epsilon_{\mathbf{p}} = \epsilon_1 + \epsilon_2 - \epsilon_0$ , where, for example, the subscript 0 represents the quantum numbers  $(n_0, l_0, j_0)$ .

The initial and final states above are eigenstates of the unperturbed Hamiltonian  $H_0$ . The interaction Hamiltonian  $H_I = V$  is the residual Coulomb interaction, which is given by

$$V = \frac{1}{2} \sum_{ijkl} v_{ijkl} : a_i^\dagger a_j^\dagger a_l a_k : - \sum_{ij} U_{ij} : a_i^\dagger a_j : \quad (14)$$

in second quantization. The Breit interaction should be added to  $V$  for high- $Z$  atoms. The matrix element of the interaction Hamiltonian is

$$\begin{aligned} \langle F | H_I | I \rangle &= \frac{\eta_{12}}{2} \sum_{ijkl} v_{ijkl} \langle 0 | a_2^\dagger a_1^\dagger a_{\epsilon j l} : a_i^\dagger a_j^\dagger a_l a_k : a_0 | 0 \rangle \\ &= \eta_{12} \tilde{v}_{\epsilon 0 2 1} = \eta_{12} (v_{\epsilon 0 2 1} - v_{\epsilon 0 1 2}) . \end{aligned} \quad (15)$$

The final electron has energy  $\epsilon$ , momentum  $\mathbf{p}$  and is in a polarization state  $\chi_\lambda$ . The partial-wave decomposition of the corresponding scattering wave function, which is asymptotically a plane wave, plus an *incoming* spherical wave (appropriate to final states in ionization processes) is given by

$$\psi_{\epsilon \mathbf{p} \lambda}(\mathbf{r}) = \sqrt{\frac{(2\pi)^3 c^2}{\epsilon p V}} \sum_{jlm} \left[ \Omega_{jlm}^\dagger(\hat{p}) \chi_\lambda \right] i^{l-1} e^{-i\delta_{lj}} w_{\epsilon l j m}(\mathbf{r}). \quad (16)$$

In this equation,  $\Omega_{l j m}^\dagger$  is a spherical spinor,  $l$  is the orbital angular momentum,  $\delta_{lj}$  is the scattering phase shift, and  $w_{\epsilon l j m}(\mathbf{r})$  is a continuum solution to the Dirac equation with energy  $\epsilon$  and angular momentum components  $(l j m)$ . The partial-wave component of the scattering wave function  $w_{\epsilon l j m}(\mathbf{r})$  is given by

$$w_{\epsilon l j m}(\mathbf{r}) = \frac{1}{r} \begin{pmatrix} i S_{lj}(r) \Omega_{jlm}(\hat{r}) \\ T_{lj}(r) \Omega_{j l' m}(\hat{r}) \end{pmatrix}, \quad (17)$$

where asymptotically the radial wave functions take the form

$$\begin{aligned} S_{lj}(r) &\rightarrow \sqrt{\frac{\epsilon + mc^2}{\pi c^2 p}} \cos \left( pr + \nu \log 2pr - (l+1) \frac{\pi}{2} + \delta_{jl} \right) \\ T_{lj}(r) &\rightarrow \sqrt{\frac{\epsilon - mc^2}{\pi c^2 p}} \sin \left( pr + \nu \log 2pr - (l+1) \frac{\pi}{2} + \delta_{jl} \right). \end{aligned} \quad (18)$$

Substituting the scattering wave function into the matrix element leads to the expression

$$\tilde{v}_{\epsilon 0 2 1} = \sqrt{\frac{(2\pi)^3 c^2}{\epsilon p V}} \sum_{\kappa m} \left[ \chi_\lambda^\dagger \Omega_{l j m}(\hat{p}) \right] i^{-l-1} e^{i\delta_{lj}} \tilde{v}_{\epsilon l j m 0 2 1}. \quad (19)$$

Summing over spins ( $\lambda$ ) and integrating over scattering angles, we find the transition rate to from a specific initial state  $I$  to a specific final state  $F$  is

$$A_{FI} = 2\pi \eta_{12}^2 \sum_{\kappa m} |\tilde{v}_{\epsilon l j m 0 2 1}|^2. \quad (20)$$

We may decompose the matrix element of the interaction as

$$\tilde{v}_{\epsilon l j m 0 2 1} = \sum_{LM_L} (-1)^{j+j_0+L-m-m_0-M_L} \begin{pmatrix} j & j_2 & L \\ -m & m_2 & M_L \end{pmatrix} \begin{pmatrix} L & j_0 & j_1 \\ -M_L & -m_0 & -m_1 \end{pmatrix} Z_L(\epsilon l j m 0 2 1). \quad (21)$$

In this expression, the quantity

$$Z_L(abcd) = X_L(abcd) + [L] \sum_K \left\{ \begin{array}{ccc} a & c & L \\ b & d & K \end{array} \right\} X_K(abdc), \quad (22)$$

where

$$X_L(abcd) = \langle a \| C_L \| c \rangle \langle b \| C_L \| d \rangle \int_0^\infty \int_0^\infty dr dr' \frac{r^L}{r^{L+1}} (G_a G_c + F_a F_c) (G_b G_d + F_b F_d)'. \quad (23)$$

In the above,  $G_k$  and  $F_k$  are radial components of the Dirac orbital for an electron with quantum number set  $a = (n_a l_a j_a)$  and  $C_L$  is a normalized spherical harmonic.

Averaging over initial hole substates and summing over all possible final magnetic substates, we find (in atomic units)

$$A(n_0 l_0 j_0, n_1 l_1 j_1, n_2 l_2 j_2) = \frac{2\pi}{[j_0]} \eta_{12}^2 \sum_{l_j L} \frac{1}{[L]} |Z_L(\epsilon l j, n_0 l_0 j_0, n_2 l_2 j_2, n_1 l_1 j_1)|^2. \quad (24)$$

Here we use  $A$  to designate the Auger rate/ion for transitions to final two-hole states of the appropriate symmetry. The atomic unit of frequency in the above equations is

$$\begin{aligned} [T^{-1}] &= 4.134137 \times 10^{16} \text{ sec}^{-1} \\ &= 27.21138 \text{ eV}. \end{aligned}$$

## B Interchange Symmetry

It is of interest to compare the rate to final state  $(n_1 l_1 j_1, n_2 l_2 j_2)$  with the rate to  $(n_2 l_2 j_2, n_1 l_1 j_1)$ . One expects the rates to these two possible states to be identical, since the states differ only by sign; however, the formula (24) appears to be unsymmetrical with respect to interchange of final states. From the definition

$$Z_L(abcd) = X_L(abcd) + [L] \sum_K \left\{ \begin{array}{ccc} a & c & L \\ b & d & K \end{array} \right\} X_K(abdc), \quad (25)$$

it follows

$$\begin{aligned} \sum_L \frac{1}{[L]} [Z_L(abcd)]^2 &= \sum_L \frac{1}{[L]} [X_L(abcd)]^2 \\ &+ 2 \sum_{LK} \left\{ \begin{array}{ccc} a & c & L \\ b & d & K \end{array} \right\} X_K(abdc) X_L(abcd) \\ &+ \sum_{LKK'} [L] \left\{ \begin{array}{ccc} a & c & L \\ b & d & K \end{array} \right\} \left\{ \begin{array}{ccc} a & c & L \\ b & d & K' \end{array} \right\} X_K(abdc) X_{K'}(abdc) \\ &= \sum_L \frac{1}{[L]} [X_L(abcd)]^2 + \sum_L \frac{1}{[L]} [X_L(abdc)]^2 \\ &+ 2 \sum_{LK} \left\{ \begin{array}{ccc} a & c & L \\ b & d & K \end{array} \right\} X_K(abdc) X_L(abcd), \end{aligned} \quad (26)$$

where we have used the orthogonality relation

$$\sum_L [L] \begin{Bmatrix} a & c & L \\ b & d & K \end{Bmatrix} \begin{Bmatrix} a & c & L \\ b & d & K' \end{Bmatrix} = \frac{\delta_{KK'}}{[K]}. \quad (27)$$

The final expression in Eq. (26) is manifestly symmetric with respect to the interchange of  $c$  and  $d$ ; consequently, the rate in Eq. (24) is symmetric with respect to interchange of final hole states  $n_1 l_1 j_1$  and  $n_2 l_2 j_2$ .

# EXPLANATION OF TABLES

TABLES I-IX. Auger rates  $A(n_0l_0j_0, n_1l_1j_1, n_2l_2j_2)$  (in mau) as function of  $Z$  for Ni-, Cu-, and Zn-like ions.

The nuclear charge  $Z=32$ , etc. of the ions is given in the column headings. In the first column, we give the configuration  $n_0l_0j_0, n_1l_1j_1, n_2l_2j_2$  describing one of the following processes:

$$\begin{array}{ll}
 a_{n_0l_0j_0}|0\rangle \rightarrow a_{\mathbf{p}\lambda}^\dagger a_{n_1l_1j_1} a_{n_2l_2j_2}|0\rangle & \text{Ni-like ions} \\
 a_{n_0l_0j_0} a_{n_2l_2j_2}^\dagger|0\rangle \rightarrow a_{\mathbf{p}\lambda}^\dagger a_{n_1l_1j_1}|0\rangle & \text{Cu-like ions} \\
 a_{n_0l_0j_0} a_{n_1l_1j_1}^\dagger a_{n_2l_2j_2}^\dagger|0\rangle \rightarrow a_{\mathbf{p}\lambda}^\dagger|0\rangle & \text{Zn-like ions}
 \end{array}$$

The following notation is used:  $ns=ns_{1/2}$ ,  $np=np_{3/2}$ ,  $np^*=np_{1/2}$ ,  $nd=nd_{5/2}$ ,  $nd^*=nd_{3/2}$ ,  $nf=nf_{7/2}$ ,  $nf^*=nf_{5/2}$ ,  $ng=ng_{9/2}$ ,  $ng^*=ng_{7/2}$ ,  $nh=nh_{11/2}$ ,  $nh^*=nh_{9/2}$ . We also use  $a[-b]=a^{-b}$ ,  $a[+b]=a^{+b}$ , and  $a[0]=a$  to represent powers of ten.

The rows contain the ‘‘per-hole/per-shell/per-shell’’ Auger rates in milliatomic units (mau);  $1 \text{ mau} = 0.02721138 \text{ eV} = 4.134137 \times 10^{13} \text{ s}^{-1}$ . Only those rates satisfying the restriction  $A > 10^{-3} \text{ mau}$  are tabulated.

TABLE X. Coster-Kronig rates  $A(n_0l_0j_0, n_0l_1j_1, n_2l_2j_2)$  (in mau) as function of  $Z$  for Cu-like ions.

In the first column, we give the configuration  $n_0l_0j_0, n_1l_1j_1, n_2l_2j_2$  describing the Coster-Kronig process  $a_{n_0l_0j_0} a_{n_2l_2j_2}^\dagger|0\rangle \rightarrow a_{\mathbf{p}\lambda}^\dagger a_{n_1l_1j_1}|0\rangle$  with  $n_1 = n_0$ .

The remaining notation is the same as that for TABLES I-IX.

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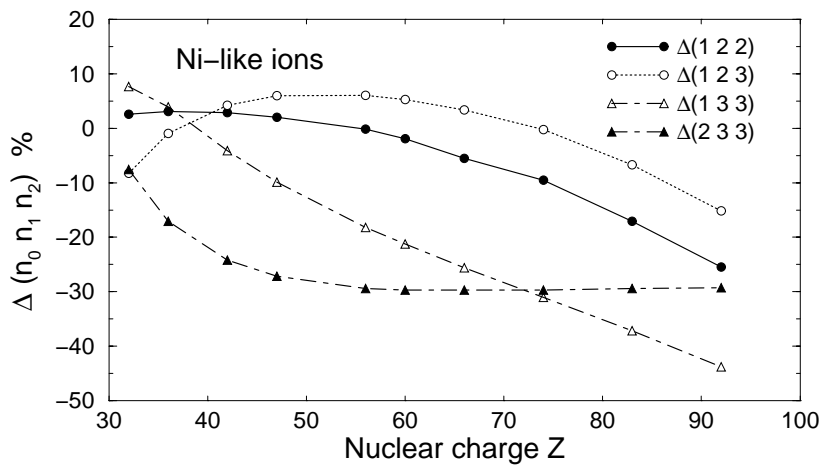


FIG. 1. Percent difference  $\Delta$  between average rates from Eq. (8) and Dirac-Fock rates for Ni-like ions.

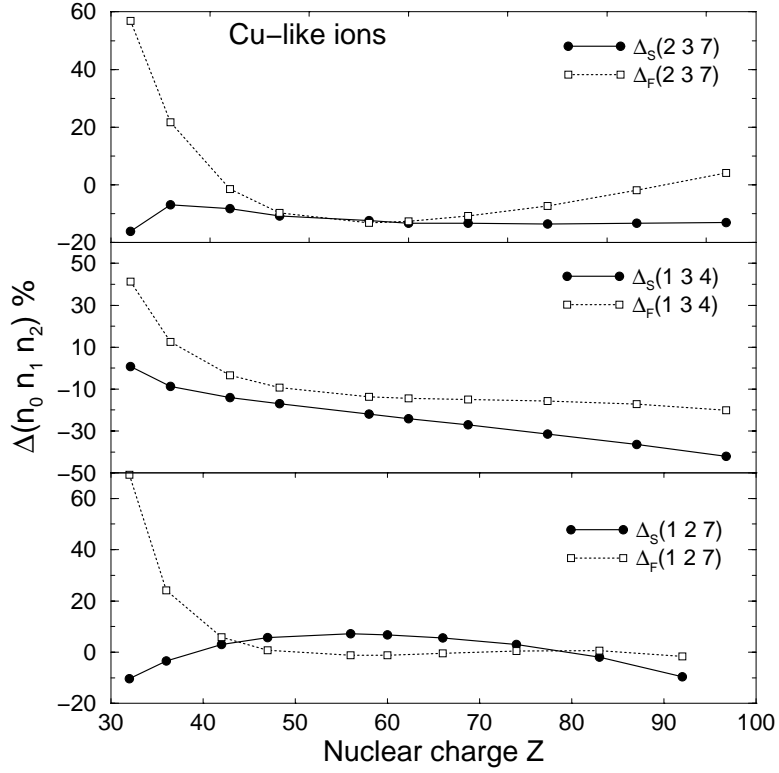


FIG. 2. Percent difference  $\Delta_S$  between average rates from Eq. (8) and Dirac-Fock rates, and percent difference  $\Delta_F$  between Eq. (6) and Dirac-Fock rates for Cu-like ions.

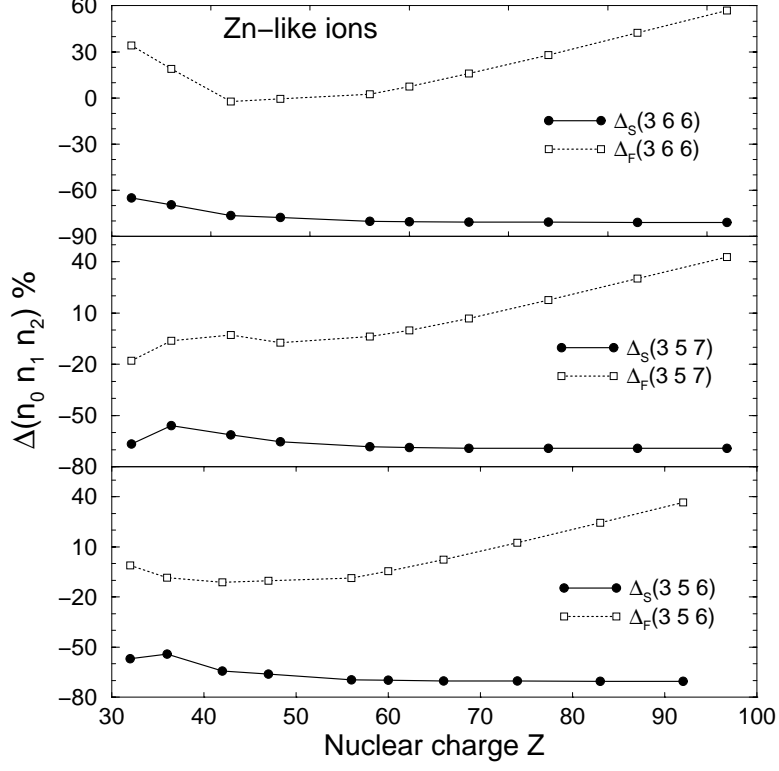


FIG. 3. Percent difference  $\Delta_S$  between average rates from Eq. (8) and Dirac-Fock rates, and percent difference  $\Delta_F$  between Eq. (7) and Dirac-Fock rates for Zn-like ions.

Table A: K-shell Auger rates and L<sub>1</sub>-shell Coster-Kronig rates (in mau) for zinc, Z=30. The headings DF and MP are defined in the text. The heading Chen refers to data from Ref. [15].

K-shell Auger transitions				L <sub>1</sub> -shell Coster-Kronig and Auger transitions					
$1s n_1 j_1 n_2 j_2$	DF	MP	MP-1s	Chen	$2s n_1 j_1 n_2 j_2$	DF	MP	MP-2s	Chen
$1s 2s_{1/2} 2s_{1/2}$	1.844	1.738	1.817	2.084	$2s 2p_{1/2} 3p_{1/2}$	8.459	9.731	17.722	17.852
$1s 2s_{1/2} 2p_{1/2}$	2.099	1.972	2.135	2.329	$2s 2p_{1/2} 3p_{3/2}$	9.385	9.684	24.848	25.612
$1s 2s_{1/2} 2p_{3/2}$	3.708	3.503	3.783	4.094	$2s 2p_{1/2} 3d_{3/2}$	17.149	28.179	17.610	20.978
$1s 2p_{1/2} 2p_{1/2}$	0.362	0.338	0.381	0.415	$2s 2p_{3/2} 3d_{3/2}$	42.619	67.213	41.941	50.604
$1s 2p_{1/2} 2p_{3/2}$	8.697	8.261	9.211	9.723	$2s 2p_{3/2} 3d_{5/2}$	55.874	93.338	60.961	71.619
$1s 2p_{3/2} 2p_{3/2}$	4.758	4.529	5.051	5.373	$2s 3s_{1/2} 3d_{5/2}$	1.789	2.964	2.523	2.881
$1s 2s_{1/2} 3s_{1/2}$	0.481	0.500	0.490	0.564	$2s 2p_{1/2} 3d_{5/2}$	26.241	47.655	28.337	34.015
$1s 2s_{1/2} 3p_{1/2}$	0.266	0.280	0.277	0.306	$2s 2p_{1/2} 4s_{1/2}$	1.284	1.775	1.894	1.618
$1s 2s_{1/2} 3p_{3/2}$	0.466	0.495	0.487	0.534	$2s 2p_{3/2} 3s_{1/2}$	0.000	34.634	42.157	40.266
$1s 2s_{1/2} 3d_{3/2}$	0.012	0.015	0.013	0.017	$2s 2p_{3/2} 3p_{1/2}$	18.610	8.953	21.018	22.132
$1s 2s_{1/2} 3d_{5/2}$	0.013	0.021	0.018	0.023	$2s 2p_{3/2} 3p_{3/2}$	39.858	23.729	45.255	47.366
$1s 2p_{1/2} 3s_{1/2}$	0.235	0.244	0.248	0.269	$2s 2p_{3/2} 4s_{1/2}$	2.270	3.194	3.371	2.897
$1s 2p_{1/2} 3p_{1/2}$	0.087	0.091	0.094	0.102	$2s 3s_{1/2} 3s_{1/2}$	0.928	1.023	0.961	0.990
$1s 2p_{1/2} 3p_{3/2}$	0.949	1.018	1.030	1.087	$2s 3s_{1/2} 3p_{1/2}$	1.688	1.838	1.735	1.804
$1s 2p_{1/2} 3d_{3/2}$	0.016	0.020	0.018	0.024	$2s 3s_{1/2} 3p_{3/2}$	3.233	3.571	3.356	3.500
$1s 2p_{1/2} 3d_{5/2}$	0.047	0.073	0.065	0.086	$2s 3s_{1/2} 3d_{3/2}$	1.493	2.018	1.727	1.960
$1s 2p_{3/2} 3s_{1/2}$	0.415	0.434	0.439	0.472	$2s 3s_{1/2} 4s_{1/2}$	0.100	0.179	0.144	0.134
$1s 2p_{3/2} 3p_{1/2}$	0.951	1.014	1.030	1.090	$2s 3p_{1/2} 3p_{1/2}$	0.026	0.035	0.026	
$1s 2p_{3/2} 3p_{3/2}$	1.051	1.131	1.145	1.222	$2s 3p_{1/2} 3p_{3/2}$	0.048	0.054	0.056	0.061
$1s 2p_{3/2} 3d_{3/2}$	0.073	0.094	0.084	0.104	$2s 3p_{1/2} 3d_{3/2}$	0.021	0.021	0.024	0.029
$1s 2p_{3/2} 3d_{5/2}$	0.057	0.090	0.080	0.105	$2s 3p_{1/2} 3d_{5/2}$	0.324	0.473	0.488	0.571
$1s 3s_{1/2} 3s_{1/2}$	0.031	0.036	0.033	0.038	$2s 3p_{1/2} 4s_{1/2}$	0.079	0.140	0.115	0.107
$1s 3s_{1/2} 3p_{1/2}$	0.030	0.035	0.032	0.035	$2s 3p_{3/2} 3p_{3/2}$	0.081	0.105	0.087	0.085
$1s 3s_{1/2} 3p_{3/2}$	0.052	0.061	0.057	0.062	$2s 3p_{3/2} 3d_{3/2}$	0.396	0.470	0.495	0.580
$1s 3s_{1/2} 3d_{3/2}$	0.001	0.002	0.001		$2s 3p_{3/2} 3d_{5/2}$	0.234	0.341	0.358	0.415
$1s 3s_{1/2} 3d_{5/2}$	0.001	0.002	0.002		$2s 3p_{3/2} 4s_{1/2}$	0.150	0.272	0.223	0.208
$1s 3p_{1/2} 3p_{1/2}$	0.005	0.006	0.006		$2s 3d_{3/2} 3d_{3/2}$	0.031	0.054	0.046	0.058
$1s 3p_{1/2} 3p_{3/2}$	0.105	0.126	0.116	0.124	$2s 3d_{3/2} 3d_{5/2}$	1.681	3.423	2.434	3.022
$1s 3p_{1/2} 3d_{3/2}$	0.001	0.002	0.002		$2s 3d_{3/2} 4s_{1/2}$	0.067	0.149	0.111	0.114
$1s 3p_{1/2} 3d_{5/2}$	0.004	0.007	0.006		$2s 3d_{5/2} 3d_{5/2}$	0.378	0.924	0.665	0.828
$1s 3p_{3/2} 3p_{3/2}$	0.058	0.071	0.065	0.070	$2s 3d_{5/2} 4s_{1/2}$	0.080	0.219	0.162	0.167
$1s 3p_{3/2} 3d_{3/2}$	0.007	0.010	0.008	0.010	$2s 4s_{1/2} 4s_{1/2}$	0.003		0.005	0.005
$1s 3p_{3/2} 3d_{5/2}$	0.005	0.009	0.007	0.010					
$1s 3d_{3/2} 3d_{3/2}$	0.000	0.000	0.000						
$1s 3d_{3/2} 3d_{5/2}$	0.000	0.001	0.000						
$1s 3d_{5/2} 3d_{5/2}$	0.000	0.000	0.000						

Table B: Average Auger Rates  $A(n_0, n_1, n_2)$  in mau for Ni-like ions

$Z$	Dirac-Fock potential				Model potential			
	A(1 2 2)	A(1 2 3)	A(1 3 3)	A(2 3 3)	A(1 2 2)	A(1 2 3)	A(1 3 3)	A(2 3 3)
32	7.93[-1]	3.87[-2]	2.24[-3]	1.50[-1]	7.60[-1]	3.74[-2]	2.18[-3]	1.34[-1]
36	8.41[-1]	4.62[-2]	2.98[-3]	2.11[-1]	8.13[-1]	4.39[-2]	2.79[-3]	1.91[-1]
42	9.06[-1]	5.70[-2]	4.17[-3]	2.92[-1]	8.82[-1]	5.42[-2]	3.88[-3]	2.69[-1]
47	9.56[-1]	6.52[-2]	5.15[-3]	3.47[-1]	9.34[-1]	6.22[-2]	4.81[-3]	3.25[-1]
56	1.04[+0]	7.86[-2]	6.83[-3]	4.25[-1]	1.02[+0]	7.57[-2]	6.45[-3]	4.04[-1]
60	1.08[+0]	8.43[-2]	7.55[-3]	4.52[-1]	1.06[+0]	8.14[-2]	7.16[-3]	4.32[-1]
66	1.14[+0]	9.26[-2]	8.62[-3]	4.87[-1]	1.13[+0]	8.95[-2]	8.22[-3]	4.68[-1]
74	1.24[+0]	1.04[-1]	1.01[-2]	5.24[-1]	1.22[+0]	1.01[-1]	9.67[-3]	5.06[-1]
83	1.38[+0]	1.19[-1]	1.18[-2]	5.57[-1]	1.36[+0]	1.16[-1]	1.15[-2]	5.41[-1]
92	1.57[+0]	1.38[-1]	1.40[-2]	5.85[-1]	1.55[+0]	1.35[-1]	1.36[-2]	5.71[-1]

Table C: Average Auger Rates  $A(n_0, n_1, n_2)$  in mau for Cu-like ions

$Z$	Dirac-Fock potential				Model potential			
	A(1 2 4)	A(1 2 5)	A(1 2 6)	A(1 2 7)	A(1 2 4)	A(1 2 5)	A(1 2 6)	A(1 2 7)
32	1.61[-3]	3.49[-4]	1.23[-4]	5.06[-5]	1.88[-3]	4.16[-4]	1.35[-4]	5.46[-5]
36	3.65[-3]	9.09[-4]	3.27[-4]	1.38[-4]	4.03[-3]	1.01[-3]	3.51[-4]	1.47[-4]
42	6.59[-3]	1.79[-3]	6.56[-4]	2.83[-4]	7.03[-3]	1.91[-3]	6.92[-4]	2.99[-4]
47	8.83[-3]	2.49[-3]	9.18[-4]	4.04[-4]	9.28[-3]	2.62[-3]	9.66[-4]	4.22[-4]
56	1.25[-2]	3.64[-3]	1.37[-3]	6.08[-4]	1.29[-2]	3.77[-3]	1.42[-3]	6.30[-4]
60	1.40[-2]	4.12[-3]	1.56[-3]	6.93[-4]	1.44[-2]	4.25[-3]	1.61[-3]	7.16[-4]
66	1.61[-2]	4.81[-3]	1.83[-3]	8.17[-4]	1.65[-2]	4.94[-3]	1.88[-3]	8.41[-4]
74	1.90[-2]	5.73[-3]	2.19[-3]	9.81[-4]	1.94[-2]	5.86[-3]	2.24[-3]	1.01[-3]
83	2.24[-2]	6.81[-3]	2.61[-3]	1.17[-3]	2.28[-2]	6.94[-3]	2.67[-3]	1.20[-3]
92	2.65[-2]	8.08[-3]	3.10[-3]	1.39[-3]	2.69[-2]	8.22[-3]	3.16[-3]	1.42[-3]
$Z$	Dirac-Fock potential				Model potential			
	A(1 3 4)	A(1 3 5)	A(1 3 6)	A(1 3 7)	A(1 3 4)	A(1 3 5)	A(1 3 6)	A(1 3 7)
32	8.84[-5]	1.91[-5]	6.58[-6]	2.69[-6]	1.04[-4]	2.28[-5]	7.41[-6]	2.98[-6]
36	2.22[-4]	5.52[-5]	1.93[-5]	8.07[-6]	2.41[-4]	6.04[-5]	2.09[-5]	8.77[-6]
42	4.53[-4]	1.23[-4]	4.38[-5]	1.87[-5]	4.73[-4]	1.28[-4]	4.63[-5]	2.00[-5]
47	6.55[-4]	1.84[-4]	6.76[-5]	2.88[-5]	6.73[-4]	1.89[-4]	6.95[-5]	3.04[-5]
56	1.01[-3]	2.95[-4]	1.09[-4]	4.76[-5]	1.03[-3]	3.00[-4]	1.12[-4]	4.98[-5]
60	1.17[-3]	3.43[-4]	1.27[-4]	5.61[-5]	1.18[-3]	3.48[-4]	1.31[-4]	5.84[-5]
66	1.40[-3]	4.16[-4]	1.55[-4]	6.87[-5]	1.41[-3]	4.21[-4]	1.60[-4]	7.12[-5]
74	1.71[-3]	5.12[-4]	1.93[-4]	8.57[-5]	1.72[-3]	5.18[-4]	1.98[-4]	8.85[-5]
83	2.08[-3]	6.27[-4]	2.37[-4]	1.06[-4]	2.09[-3]	6.33[-4]	2.43[-4]	1.09[-4]
92	2.50[-3]	7.58[-4]	2.87[-4]	1.28[-4]	2.52[-3]	7.66[-4]	2.94[-4]	1.32[-4]
$Z$	Dirac-Fock potential				Model potential			
	A(2 3 4)	A(2 3 5)	A(2 3 6)	A(2 3 7)	A(2 3 4)	A(2 3 5)	A(2 3 6)	A(2 3 7)
32	4.32[-3]	1.06[-3]	4.76[-4]	2.12[-4]	5.96[-3]	1.45[-3]	4.96[-4]	2.07[-4]
36	1.26[-2]	3.35[-3]	1.29[-3]	5.47[-4]	1.47[-2]	3.83[-3]	1.36[-3]	5.86[-4]
42	2.64[-2]	7.41[-3]	2.76[-3]	1.19[-3]	2.84[-2]	7.85[-3]	2.89[-3]	1.26[-3]
47	3.75[-2]	1.08[-2]	4.05[-3]	1.75[-3]	3.92[-2]	1.12[-2]	4.18[-3]	1.85[-3]
56	5.48[-2]	1.62[-2]	6.11[-3]	2.68[-3]	5.61[-2]	1.65[-2]	6.30[-3]	2.82[-3]
60	6.13[-2]	1.82[-2]	6.92[-3]	3.06[-3]	6.25[-2]	1.86[-2]	7.12[-3]	3.20[-3]
66	6.99[-2]	2.10[-2]	8.01[-3]	3.55[-3]	7.09[-2]	2.13[-2]	8.22[-3]	3.71[-3]
74	7.94[-2]	2.40[-2]	9.25[-3]	4.13[-3]	8.03[-2]	2.44[-2]	9.46[-3]	4.29[-3]
83	8.81[-2]	2.69[-2]	1.04[-2]	4.67[-3]	8.90[-2]	2.73[-2]	1.06[-2]	4.82[-3]
92	9.54[-2]	2.93[-2]	1.14[-2]	5.12[-3]	9.63[-2]	2.97[-2]	1.16[-2]	5.27[-3]

Table D: Average Coster-Kronig Rates  $A(n_0, n_0, n_2)$  (in mau ) for Cu-like ions, calculated using Model Potential method

$Z$	$n_0=2$				$n_0=3$			
	$A(2\ 2\ 4)$	$A(2\ 2\ 5)$	$A(2\ 2\ 6)$	$A(2\ 2\ 7)$	$A(3\ 3\ 4)$	$A(3\ 3\ 5)$	$A(3\ 3\ 6)$	$A(3\ 3\ 7)$
32	2.92[-2]	7.66[-3]	2.59[-3]	1.08[-3]	8.36[-2]	1.74[-2]	5.71[-3]	2.41[-3]
36	4.96[-2]	1.51[-2]	5.99[-3]	2.60[-3]	1.22[-1]	5.04[-2]	1.94[-2]	8.71[-3]
42	7.12[-2]	2.61[-2]	1.21[-2]	5.47[-3]	9.34[-3]	5.10[-2]	4.01[-2]	1.98[-2]
47	4.92[-2]	3.50[-2]	1.61[-2]	7.75[-3]	4.27[-3]	2.39[-2]	3.51[-2]	2.58[-2]
56	4.15[-2]	3.47[-2]	2.16[-2]	1.09[-2]	0.00[+0]	3.61[-3]	1.40[-2]	2.16[-2]
60	0.00[+0]	3.39[-2]	1.79[-2]	1.23[-2]	0.00[+0]	0.00[+0]	3.27[-3]	2.02[-2]
66	0.00[+0]	4.27[-2]	1.96[-2]	1.19[-2]	0.00[+0]	0.00[+0]	3.44[-3]	9.27[-3]
74	0.00[+0]	5.56[-2]	2.15[-2]	9.67[-3]	0.00[+0]	0.00[+0]	3.16[-3]	9.54[-3]
83	0.00[+0]	5.33[-2]	2.18[-2]	1.00[-2]	0.00[+0]	0.00[+0]	3.29[-3]	9.78[-3]
92	0.00[+0]	5.47[-2]	2.18[-2]	9.96[-3]	0.00[+0]	0.00[+0]	4.09[-3]	1.95[-2]

Table E: Average Auger Rates  $A(n_0, n_1, n_2)$  in mau for Zn-like ions. Dirac-Fock potential

$Z$	$A(1\ 4\ 4)$	$A(1\ 4\ 5)$	$A(1\ 4\ 6)$	$A(1\ 4\ 7)$	$A(1\ 5\ 5)$	$A(1\ 5\ 6)$	$A(1\ 5\ 7)$	$A(1\ 6\ 6)$	$A(1\ 6\ 7)$	$A(1\ 7\ 7)$
32	3.84[-6]	8.02[-7]	3.05[-7]	1.28[-7]	1.76[-7]	6.64[-8]	2.77[-8]	2.18[-8]	8.99[-9]	3.66[-9]
36	1.81[-5]	4.36[-6]	1.64[-6]	6.97[-7]	1.10[-6]	4.08[-7]	1.73[-7]	1.43[-7]	5.97[-8]	2.53[-8]
42	5.39[-5]	1.41[-5]	5.33[-6]	2.30[-6]	3.89[-6]	1.44[-6]	6.20[-7]	5.26[-7]	2.24[-7]	9.74[-8]
47	9.09[-5]	2.47[-5]	9.07[-6]	4.08[-6]	7.05[-6]	2.54[-6]	1.14[-6]	9.48[-7]	4.19[-7]	1.85[-7]
56	1.64[-4]	4.61[-5]	1.76[-5]	7.76[-6]	1.37[-5]	5.10[-6]	2.25[-6]	1.94[-6]	8.44[-7]	3.77[-7]
60	1.97[-4]	5.60[-5]	2.14[-5]	9.49[-6]	1.68[-5]	6.28[-6]	2.78[-6]	2.40[-6]	1.05[-6]	4.70[-7]
66	2.47[-4]	7.11[-5]	2.73[-5]	1.21[-5]	2.15[-5]	8.08[-6]	3.59[-6]	3.11[-6]	1.36[-6]	6.13[-7]
74	3.16[-4]	9.16[-5]	3.52[-5]	1.57[-5]	2.80[-5]	1.05[-5]	4.70[-6]	4.08[-6]	1.79[-6]	8.09[-7]
83	3.97[-4]	1.16[-4]	4.46[-5]	1.99[-5]	3.56[-5]	1.34[-5]	6.01[-6]	5.21[-6]	2.30[-6]	1.04[-6]
92	4.89[-4]	1.43[-4]	5.51[-5]	2.46[-5]	4.41[-5]	1.66[-5]	7.43[-6]	6.46[-6]	2.85[-6]	1.29[-6]
$Z$	$A(2\ 4\ 4)$	$A(2\ 4\ 5)$	$A(2\ 4\ 6)$	$A(2\ 4\ 7)$	$A(2\ 5\ 5)$	$A(2\ 5\ 6)$	$A(2\ 5\ 7)$	$A(2\ 6\ 6)$	$A(2\ 6\ 7)$	$A(2\ 7\ 7)$
32	1.39[-4]	3.25[-5]	2.01[-5]	1.01[-5]	8.08[-6]	4.89[-6]	2.44[-6]	1.70[-6]	8.38[-7]	3.56[-7]
36	8.19[-4]	2.10[-4]	9.23[-5]	4.12[-5]	5.68[-5]	2.42[-5]	1.07[-5]	8.76[-6]	3.80[-6]	1.64[-6]
42	2.57[-3]	6.93[-4]	2.77[-4]	1.20[-4]	1.96[-4]	7.57[-5]	3.30[-5]	2.81[-5]	1.21[-5]	5.35[-6]
47	4.29[-3]	1.18[-3]	4.39[-4]	2.01[-4]	3.39[-4]	1.23[-4]	5.60[-5]	4.65[-5]	2.07[-5]	9.21[-6]
56	7.28[-3]	2.04[-3]	7.86[-4]	3.45[-4]	5.95[-4]	2.24[-4]	9.81[-5]	8.49[-5]	3.67[-5]	1.65[-5]
60	8.49[-3]	2.38[-3]	9.19[-4]	4.05[-4]	6.99[-4]	2.63[-4]	1.16[-4]	1.00[-4]	4.34[-5]	1.95[-5]
66	1.01[-2]	2.86[-3]	1.10[-3]	4.87[-4]	8.41[-4]	3.16[-4]	1.40[-4]	1.21[-4]	5.26[-5]	2.37[-5]
74	1.20[-2]	3.40[-3]	1.31[-3]	5.84[-4]	1.00[-3]	3.78[-4]	1.68[-4]	1.45[-4]	6.32[-5]	2.85[-5]
83	1.37[-2]	3.92[-3]	1.51[-3]	6.75[-4]	1.16[-3]	4.37[-4]	1.94[-4]	1.67[-4]	7.34[-5]	3.31[-5]
92	1.52[-2]	4.35[-3]	1.68[-3]	7.52[-4]	1.29[-3]	4.86[-4]	2.16[-4]	1.87[-4]	8.21[-5]	3.70[-5]
$Z$	$A(3\ 4\ 4)$	$A(3\ 4\ 5)$	$A(3\ 4\ 6)$	$A(3\ 4\ 7)$	$A(3\ 5\ 5)$	$A(3\ 5\ 6)$	$A(3\ 5\ 7)$	$A(3\ 6\ 6)$	$A(3\ 6\ 7)$	$A(3\ 7\ 7)$
32	1.63[-2]	3.16[-3]	2.37[-3]	1.29[-3]	6.34[-4]	4.27[-4]	2.43[-4]	1.30[-4]	7.56[-5]	3.44[-5]
36	3.94[-2]	9.14[-3]	4.23[-3]	2.21[-3]	2.17[-3]	9.31[-4]	4.39[-4]	3.41[-4]	1.45[-4]	5.95[-5]
42	8.58[-2]	2.17[-2]	8.78[-3]	4.15[-3]	5.53[-3]	2.11[-3]	8.91[-4]	7.70[-4]	3.22[-4]	1.43[-4]
47	1.24[-1]	3.25[-2]	1.21[-2]	5.85[-3]	8.14[-3]	2.89[-3]	1.30[-3]	1.05[-3]	4.65[-4]	2.06[-4]
56	1.83[-1]	4.85[-2]	1.89[-2]	8.51[-3]	1.17[-2]	4.26[-3]	1.87[-3]	1.52[-3]	6.53[-4]	2.86[-4]
60	1.91[-1]	5.42[-2]	2.12[-2]	9.45[-3]	1.29[-2]	4.68[-3]	2.07[-3]	1.67[-3]	7.15[-4]	3.12[-4]
66	2.26[-1]	6.19[-2]	2.41[-2]	1.08[-2]	1.44[-2]	5.21[-3]	2.31[-3]	1.85[-3]	7.92[-4]	3.44[-4]
74	2.30[-1]	7.01[-2]	2.73[-2]	1.24[-2]	1.60[-2]	5.77[-3]	2.55[-3]	2.03[-3]	8.71[-4]	3.79[-4]
83	2.22[-1]	7.74[-2]	3.02[-2]	1.38[-2]	1.74[-2]	6.25[-3]	2.76[-3]	2.20[-3]	9.37[-4]	4.08[-4]
92	2.02[-1]	8.23[-2]	3.25[-2]	1.50[-2]	1.86[-2]	6.64[-3]	2.94[-3]	2.33[-3]	1.25[-3]	4.31[-4]

Table F: Average Auger Rates  $A(n_0, n_1, n_2)$  in mau for Zn-like ions. Model potential

$Z$	A(1 4 4)	A(1 4 5)	A(1 4 6)	A(1 4 7)	A(1 5 5)	A(1 5 6)	A(1 5 7)	A(1 6 6)	A(1 6 7)	A(1 7 7)
32	5.42[-6]	1.15[-6]	3.74[-7]	1.50[-7]	2.59[-7]	8.21[-8]	3.31[-8]	2.70[-8]	1.07[-8]	4.36[-9]
36	2.28[-5]	5.53[-6]	1.91[-6]	8.01[-7]	1.41[-6]	4.78[-7]	2.01[-7]	1.68[-7]	6.94[-8]	2.94[-8]
42	6.30[-5]	1.65[-5]	5.97[-6]	2.57[-6]	4.57[-6]	1.62[-6]	6.97[-7]	5.92[-7]	2.52[-7]	1.09[-7]
47	1.03[-4]	2.80[-5]	1.03[-5]	4.49[-6]	8.00[-6]	2.88[-6]	1.26[-6]	1.08[-6]	4.63[-7]	2.04[-7]
56	1.79[-4]	5.05[-5]	1.89[-5]	8.37[-6]	1.50[-5]	5.51[-6]	2.43[-6]	2.09[-6]	9.13[-7]	4.08[-7]
60	2.14[-4]	6.08[-5]	2.29[-5]	1.02[-5]	1.82[-5]	6.73[-6]	2.99[-6]	2.57[-6]	1.13[-6]	5.05[-7]
66	2.65[-4]	7.63[-5]	2.90[-5]	1.29[-5]	2.31[-5]	8.60[-6]	3.83[-6]	3.31[-6]	1.45[-6]	6.54[-7]
74	3.35[-4]	9.73[-5]	3.71[-5]	1.66[-5]	2.98[-5]	1.11[-5]	4.97[-6]	4.31[-6]	1.90[-6]	8.57[-7]
83	4.17[-4]	1.22[-4]	4.67[-5]	2.09[-5]	3.76[-5]	1.41[-5]	6.31[-6]	5.47[-6]	2.40[-6]	1.09[-6]
92	5.10[-4]	1.50[-4]	5.74[-5]	2.57[-5]	4.62[-5]	1.74[-5]	7.77[-6]	6.74[-6]	2.95[-6]	1.35[-6]
$Z$	A(2 4 4)	A(2 4 5)	A(2 4 6)	A(2 4 7)	A(2 5 5)	A(2 5 6)	A(2 5 7)	A(2 6 6)	A(2 6 7)	A(2 7 7)
32	2.88[-4]	6.75[-5]	2.31[-5]	9.68[-6]	1.68[-5]	5.65[-6]	2.36[-6]	1.97[-6]	8.12[-7]	3.44[-7]
36	1.23[-3]	3.10[-4]	1.10[-4]	4.72[-5]	8.24[-5]	2.88[-5]	1.23[-5]	1.04[-5]	4.38[-6]	1.89[-6]
42	3.23[-3]	8.58[-4]	3.15[-4]	1.38[-4]	2.39[-4]	8.59[-5]	3.75[-5]	3.19[-5]	1.37[-5]	6.03[-6]
47	5.04[-3]	1.37[-3]	5.10[-4]	2.24[-4]	3.90[-4]	1.42[-4]	6.25[-5]	5.33[-5]	2.31[-5]	1.03[-5]
56	8.08[-3]	2.25[-3]	8.49[-4]	3.78[-4]	6.55[-4]	2.41[-4]	1.07[-4]	9.15[-5]	4.00[-5]	1.79[-5]
60	9.28[-3]	2.60[-3]	9.86[-4]	4.40[-4]	7.62[-4]	2.81[-4]	1.25[-4]	1.07[-4]	4.69[-5]	2.10[-5]
66	1.09[-2]	3.08[-3]	1.17[-3]	5.24[-4]	9.06[-4]	3.35[-4]	1.49[-4]	1.28[-4]	5.62[-5]	2.52[-5]
74	1.28[-2]	3.63[-3]	1.38[-3]	6.20[-4]	1.07[-3]	3.98[-4]	1.78[-4]	1.52[-4]	6.70[-5]	3.01[-5]
83	1.45[-2]	4.14[-3]	1.58[-3]	7.11[-4]	1.23[-3]	4.56[-4]	2.04[-4]	1.75[-4]	7.70[-5]	3.47[-5]
92	1.60[-2]	4.57[-3]	1.75[-3]	7.88[-4]	1.36[-3]	5.05[-4]	2.26[-4]	1.94[-4]	8.53[-5]	3.85[-5]
$Z$	A(3 4 4)	A(3 4 5)	A(3 4 6)	A(3 4 7)	A(3 5 5)	A(3 5 6)	A(3 5 7)	A(3 6 6)	A(3 6 7)	A(3 7 7)
32	4.12[-2]	1.30[-2]	4.53[-3]	1.93[-3]	2.23[-3]	7.08[-4]	2.94[-4]	2.27[-4]	9.23[-5]	3.83[-5]
36	5.96[-2]	1.83[-2]	6.65[-3]	2.88[-3]	3.85[-3]	1.31[-3]	5.59[-4]	4.60[-4]	1.94[-4]	8.38[-5]
42	9.93[-2]	3.02[-2]	1.13[-2]	5.04[-3]	7.18[-3]	2.54[-3]	1.12[-3]	9.13[-4]	3.94[-4]	1.72[-4]
47	1.36[-1]	4.07[-2]	1.54[-2]	6.94[-3]	9.85[-3]	3.49[-3]	1.54[-3]	1.26[-3]	5.38[-4]	2.34[-4]
56	1.31[-1]	5.67[-2]	2.15[-2]	9.73[-3]	1.35[-2]	4.76[-3]	2.10[-3]	1.69[-3]	7.23[-4]	3.13[-4]
60	2.12[-1]	6.20[-2]	2.37[-2]	1.08[-2]	1.47[-2]	5.17[-3]	2.28[-3]	1.83[-3]	7.83[-4]	3.39[-4]
66	1.95[-1]	6.92[-2]	2.66[-2]	1.21[-2]	1.61[-2]	5.68[-3]	2.50[-3]	2.00[-3]	8.55[-4]	3.70[-4]
74	1.84[-1]	7.69[-2]	2.97[-2]	1.35[-2]	1.76[-2]	6.20[-3]	2.73[-3]	2.18[-3]	9.26[-4]	4.00[-4]
83	1.55[-1]	8.17[-2]	3.24[-2]	1.49[-2]	1.89[-2]	6.65[-3]	2.93[-3]	2.33[-3]	9.89[-4]	4.26[-4]
92	1.09[-1]	9.05[-2]	3.46[-2]	1.60[-2]	2.00[-2]	7.01[-3]	3.08[-3]	2.44[-3]	1.04[-3]	4.48[-4]

Table G: Average Auger Rates  $A(n_0, n_1, n_2)$  in mau for for Ni-, Cu-, and Zn-like Ag, calculated by Dirac-Fock (DF) and screend-hydrogenic (SC) functions.

$n_0$	$n_1$	$n_2$	DF	SC	$n_0$	$n_1$	$n_2$	DF	SC
Ni-like Ag									
1	2	2	9.56[-1]	6.98[-1]	1	3	3	5.15[-3]	2.63[-3]
1	2	3	6.52[-2]	3.70[-2]	2	3	3	3.47[-1]	1.32[-1]
Cu-like Ag									
1	2	4	8.83[-3]	5.79[-3]	1	3	6	6.76[-5]	4.74[-5]
1	2	5	2.49[-3]	1.66[-3]	1	3	7	2.88[-5]	2.17[-5]
1	2	6	9.18[-4]	6.68[-4]	2	3	4	3.75[-2]	2.06[-2]
1	2	7	4.04[-4]	3.06[-4]	2	3	5	1.08[-2]	5.90[-3]
1	3	4	6.55[-4]	4.11[-4]	2	3	6	4.05[-3]	2.38[-3]
1	3	5	1.84[-4]	1.18[-4]	2	3	7	1.75[-3]	1.09[-3]
Zn-like Ag									
1	4	4	9.09[-5]	8.29[-5]	2	5	6	1.23[-4]	5.08[-5]
1	4	5	2.47[-5]	2.37[-5]	2	5	7	5.60[-5]	2.33[-5]
1	4	6	9.07[-6]	9.56[-6]	2	6	6	4.65[-5]	2.03[-5]
1	4	7	4.08[-6]	4.38[-6]	2	6	7	2.07[-5]	9.32[-6]
1	5	5	7.05[-6]	7.23[-6]	2	7	7	9.21[-6]	3.88[-6]
1	5	6	2.54[-6]	2.92[-6]	3	4	4	1.24[-1]	1.12[-1]
1	5	7	1.14[-6]	1.34[-6]	3	4	5	3.25[-2]	3.19[-2]
1	6	6	9.48[-7]	1.44[-6]	3	4	6	1.21[-2]	1.29[-2]
1	6	7	4.19[-7]	6.58[-7]	3	4	7	5.85[-3]	5.91[-3]
1	7	7	1.85[-7]	2.97[-7]	3	5	5	8.14[-3]	2.89[-3]
2	4	4	4.29[-3]	1.90[-3]	3	5	6	2.89[-3]	1.17[-3]
2	4	5	1.18[-3]	5.45[-4]	3	5	7	1.30[-3]	5.35[-4]
2	4	6	4.39[-4]	2.20[-4]	3	6	6	1.05[-3]	3.23[-4]
2	4	7	2.01[-4]	1.01[-4]	3	6	7	4.65[-4]	1.48[-4]
2	5	5	3.39[-4]	1.26[-4]	3	7	7	2.06[-4]	5.08[-5]

TABLE I.  $K$ -shell Auger rates  $A(n_0j_0l_0, n_1j_1l_1, n_2j_2l_2)$  (in mau) as function of  $Z$  for Ni-, Cu-, and Zn-like ions.

	$Z=32$	$Z=36$	$Z=42$	$Z=47$	$Z=56$	$Z=60$	$Z=66$	$Z=74$	$Z=83$	$Z=92$
Ni-like ions										
$1s2s2s$	1.82[0]	1.97[0]	2.21[0]	2.44[0]	2.91[0]	3.16[0]	3.15[0]	4.34[0]	5.51[0]	7.24[0]
$1s2s2p^*$	2.08[0]	2.30[0]	2.65[0]	2.97[0]	3.67[0]	4.06[0]	4.06[0]	5.99[0]	8.05[0]	1.13[1]
$1s2s2p$	3.64[0]	3.88[0]	4.18[0]	4.40[0]	4.78[0]	4.94[0]	4.94[0]	5.49[0]	5.86[0]	6.27[0]
$1s2p^*2p^*$	3.58[-1]	3.89[-1]	4.30[-1]	4.61[-1]	5.15[-1]	5.39[-1]	5.39[-1]	6.23[-1]	6.82[-1]	7.44[-1]
$1s2p^*2p$	8.67[0]	9.27[0]	1.00[1]	1.05[1]	1.13[1]	1.17[1]	1.17[1]	1.26[1]	1.32[1]	1.36[1]
$1s2p2p$	4.72[0]	4.97[0]	5.22[0]	5.35[0]	5.43[0]	5.41[0]	5.41[0]	5.14[0]	4.81[0]	4.36[0]
$1s2s3s$	4.97[-1]	5.70[-1]	6.99[-1]	8.17[-1]	1.06[0]	1.18[0]	1.18[0]	1.74[0]	2.28[0]	3.05[0]
$1s2s3p^*$	2.77[-1]	3.34[-1]	4.35[-1]	5.28[-1]	7.27[-1]	8.33[-1]	8.33[-1]	1.35[0]	1.89[0]	2.72[0]
$1s2s3p$	4.79[-1]	5.58[-1]	6.84[-1]	7.84[-1]	9.53[-1]	1.02[0]	1.02[0]	1.27[0]	1.44[0]	1.61[0]
$1s2s3d^*$	1.34[-2]	2.12[-2]	3.32[-2]	4.34[-2]	6.18[-2]	7.02[-2]	7.02[-2]	1.01[-1]	1.22[-1]	1.44[-1]
$1s2s3d$	1.84[-2]	2.85[-2]	4.30[-2]	5.41[-2]	7.15[-2]	7.80[-2]	7.80[-2]	9.57[-2]	1.03[-1]	1.07[-1]
$1s2p^*3s$	2.45[-1]	2.84[-1]	3.54[-1]	4.18[-1]	5.55[-1]	6.28[-1]	6.28[-1]	9.80[-1]	1.34[0]	1.91[0]
$1s2p^*3p^*$	9.05[-2]	1.07[-1]	1.33[-1]	1.54[-1]	1.90[-1]	2.05[-1]	2.05[-1]	2.58[-1]	2.92[-1]	3.28[-1]
$1s2p^*3p$	9.93[-1]	1.16[0]	1.41[0]	1.60[0]	1.92[0]	2.05[0]	2.05[0]	2.46[0]	2.71[0]	2.95[0]
$1s2p^*3d^*$	1.84[-2]	2.89[-2]	4.47[-2]	5.76[-2]	7.93[-2]	8.83[-2]	8.83[-2]	1.17[-1]	1.34[-1]	1.49[-1]
$1s2p^*3d$	6.60[-2]	1.02[-1]	1.53[-1]	1.91[-1]	2.46[-1]	2.64[-1]	2.64[-1]	3.06[-1]	3.13[-1]	3.07[-1]
$1s2p3s$	4.27[-1]	4.78[-1]	5.57[-1]	6.19[-1]	7.18[-1]	7.58[-1]	7.58[-1]	8.84[-1]	9.56[-1]	1.02[0]
$1s2p3p^*$	9.92[-1]	1.15[0]	1.39[0]	1.57[0]	1.84[0]	1.95[0]	1.95[0]	2.26[0]	2.41[0]	2.52[0]
$1s2p3p$	1.10[0]	1.26[0]	1.49[0]	1.65[0]	1.86[0]	1.93[0]	1.93[0]	2.03[0]	2.00[0]	1.91[0]
$1s2p3d^*$	8.50[-2]	1.32[-1]	1.99[-1]	2.51[-1]	3.30[-1]	3.60[-1]	3.60[-1]	4.33[-1]	4.57[-1]	4.62[-1]
$1s2p3d$	8.09[-2]	1.24[-1]	1.84[-1]	2.26[-1]	2.84[-1]	3.01[-1]	3.01[-1]	3.28[-1]	3.20[-1]	2.95[-1]
$1s3s3s$	3.36[-2]	4.07[-2]	5.44[-2]	6.74[-2]	9.45[-2]	1.08[-1]	1.08[-1]	1.71[-1]	2.30[-1]	3.14[-1]
$1s3s3p^*$	3.27[-2]	4.15[-2]	5.84[-2]	7.50[-2]	1.11[-1]	1.30[-1]	1.30[-1]	2.24[-1]	3.20[-1]	4.69[-1]
$1s3s3p$	5.65[-2]	6.91[-2]	9.15[-2]	1.11[-1]	1.44[-1]	1.58[-1]	1.58[-1]	2.06[-1]	2.35[-1]	2.65[-1]
$1s3s3d^*$	1.45[-3]	2.39[-3]	4.03[-3]	5.54[-3]	8.42[-3]	9.74[-3]	9.74[-3]	1.46[-2]	1.78[-2]	2.11[-2]
$1s3s3d$	1.98[-3]	3.20[-3]	5.20[-3]	6.87[-3]	9.63[-3]	1.07[-2]	1.07[-2]	1.36[-2]	1.47[-2]	1.53[-2]
$1s3p^*3p^*$	5.46[-3]	7.00[-3]	9.75[-3]	1.21[-2]	1.65[-2]	1.84[-2]	1.84[-2]	2.50[-2]	2.93[-2]	3.38[-2]
$1s3p^*3p$	1.14[-1]	1.44[-1]	1.96[-1]	2.40[-1]	3.14[-1]	3.45[-1]	3.45[-1]	4.45[-1]	5.03[-1]	5.57[-1]
$1s3p^*3d^*$	1.65[-3]	2.77[-3]	4.72[-3]	6.45[-3]	9.58[-3]	1.09[-2]	1.09[-2]	1.54[-2]	1.79[-2]	2.02[-2]
$1s3p^*3d$	6.21[-3]	1.03[-2]	1.69[-2]	2.24[-2]	3.08[-2]	3.39[-2]	3.39[-2]	4.05[-2]	4.15[-2]	4.02[-2]
$1s3p3p$	6.36[-2]	7.93[-2]	1.06[-1]	1.27[-1]	1.60[-1]	1.71[-1]	1.71[-1]	2.00[-1]	2.08[-1]	2.08[-1]
$1s3p3d^*$	8.08[-3]	1.35[-2]	2.29[-2]	3.10[-2]	4.52[-2]	5.10[-2]	5.10[-2]	6.82[-2]	7.64[-2]	8.17[-2]
$1s3p3d$	7.53[-3]	1.24[-2]	2.05[-2]	2.70[-2]	3.73[-2]	4.09[-2]	4.09[-2]	4.89[-2]	5.01[-2]	4.86[-2]
Cu-like ions										
$1s2s4s$	5.09[-2]	9.64[-2]	1.62[-1]	2.16[-1]	3.16[-1]	3.64[-1]	4.45[-1]	5.75[-1]	7.68[-1]	1.04[0]
$1s2s4p^*$	2.36[-2]	5.36[-2]	9.97[-2]	1.39[-1]	2.19[-1]	2.60[-1]	3.32[-1]	4.54[-1]	6.50[-1]	9.52[-1]
$1s2s4p$	4.17[-2]	9.16[-2]	1.60[-1]	2.12[-1]	2.95[-1]	3.29[-1]	3.79[-1]	4.45[-1]	5.21[-1]	6.01[-1]
$1s2p^*4s$	2.46[-2]	4.70[-2]	7.98[-2]	1.07[-1]	1.59[-1]	1.85[-1]	2.31[-1]	3.07[-1]	4.29[-1]	6.16[-1]
$1s2p^*4p$	8.54[-2]	1.86[-1]	3.22[-1]	4.21[-1]	5.74[-1]	6.35[-1]	7.20[-1]	8.27[-1]	9.41[-1]	1.05[0]
$1s2p^*4d$	6.31[-3]	1.78[-2]	3.88[-2]	5.70[-2]	8.69[-2]	9.82[-2]	1.13[-1]	1.27[-1]	1.37[-1]	1.40[-1]
$1s2p4s$	4.30[-2]	7.89[-2]	1.26[-1]	1.58[-1]	2.06[-1]	2.24[-1]	2.48[-1]	2.76[-1]	3.04[-1]	3.28[-1]
$1s2p4p^*$	8.35[-2]	1.81[-1]	3.10[-1]	4.00[-1]	5.33[-1]	5.82[-1]	6.47[-1]	7.20[-1]	7.83[-1]	8.28[-1]
$1s2p4p$	9.44[-2]	2.03[-1]	3.42[-1]	4.35[-1]	5.60[-1]	6.01[-1]	6.48[-1]	6.86[-1]	7.00[-1]	6.84[-1]
$1s2p4d^*$	7.97[-3]	2.27[-2]	5.01[-2]	7.43[-2]	1.15[-1]	1.32[-1]	1.54[-1]	1.77[-1]	1.96[-1]	2.05[-1]
$1s2p4d$	7.73[-3]	2.16[-2]	4.67[-2]	6.78[-2]	1.01[-1]	1.12[-1]	1.26[-1]	1.37[-1]	1.40[-1]	1.35[-1]
$1s3s4s$	6.87[-3]	1.37[-2]	2.52[-2]	3.56[-2]	5.63[-2]	6.66[-2]	8.41[-2]	1.12[-1]	1.54[-1]	2.13[-1]
$1s3s4p^*$	2.79[-3]	6.66[-3]	1.34[-2]	1.98[-2]	3.35[-2]	4.07[-2]	5.35[-2]	7.54[-2]	1.10[-1]	1.64[-1]
$1s3p^*4s$	3.29[-3]	6.85[-3]	1.32[-2]	1.92[-2]	3.19[-2]	3.85[-2]	5.02[-2]	7.02[-2]	1.02[-1]	1.51[-1]
$1s3p^*4p$	9.84[-3]	2.33[-2]	4.50[-2]	6.31[-2]	9.43[-2]	1.07[-1]	1.26[-1]	1.50[-1]	1.75[-1]	1.99[-1]
$1s3p4p^*$	9.63[-3]	2.27[-2]	4.39[-2]	6.14[-2]	9.12[-2]	1.04[-1]	1.21[-1]	1.42[-1]	1.64[-1]	1.84[-1]
$1s3p4p$	1.09[-2]	2.56[-2]	4.86[-2]	6.70[-2]	9.59[-2]	1.07[-1]	1.21[-1]	1.35[-1]	1.45[-1]	1.49[-1]
$1s2s5s$	1.59[-2]	3.60[-2]	6.67[-2]	9.24[-2]	1.41[-1]	1.64[-1]	2.03[-1]	2.65[-1]	3.56[-1]	4.85[-1]
$1s2s5p^*$	8.26[-3]	2.11[-2]	4.23[-2]	6.12[-2]	9.97[-2]	1.20[-1]	1.54[-1]	2.13[-1]	3.07[-1]	4.51[-1]
$1s2s5p$	1.47[-2]	3.62[-2]	6.85[-2]	9.37[-2]	1.35[-1]	1.53[-1]	1.79[-1]	2.12[-1]	2.51[-1]	2.93[-1]
$1s2p^*5s$	7.66[-3]	1.74[-2]	3.25[-2]	4.52[-2]	6.97[-2]	8.20[-2]	1.03[-1]	1.38[-1]	1.94[-1]	2.79[-1]
$1s2p^*5p$	3.00[-2]	7.33[-2]	1.36[-1]	1.84[-1]	2.60[-1]	2.91[-1]	3.34[-1]	3.88[-1]	4.46[-1]	5.03[-1]

	$Z = 32$	$Z = 36$	$Z = 42$	$Z = 47$	$Z = 56$	$Z = 60$	$Z = 66$	$Z = 74$	$Z = 83$	$Z = 92$
Cu-like ions										
$1s2p5s$	1.34[-2]	2.93[-2]	5.11[-2]	6.68[-2]	9.02[-2]	9.90[-2]	1.11[-1]	1.24[-1]	1.37[-1]	1.48[-1]
$1s2p5p^*$	2.92[-2]	7.08[-2]	1.30[-1]	1.74[-1]	2.39[-1]	2.64[-1]	2.96[-1]	3.31[-1]	3.62[-1]	3.82[-1]
$1s2p5p$	3.32[-2]	7.99[-2]	1.45[-1]	1.91[-1]	2.54[-1]	2.76[-1]	3.01[-1]	3.22[-1]	3.32[-1]	3.28[-1]
$1s2p5d^*$	3.42[-3]	1.02[-2]	2.37[-2]	3.61[-2]	5.79[-2]	6.67[-2]	7.87[-2]	9.19[-2]	1.03[-1]	1.08[-1]
$1s2s6s$	7.04[-3]	1.74[-2]	3.39[-2]	4.81[-2]	7.49[-2]	8.79[-2]	1.09[-1]	1.44[-1]	1.94[-1]	2.64[-1]
$1s2s6p^*$	3.89[-3]	1.05[-2]	2.20[-2]	3.25[-2]	5.39[-2]	6.50[-2]	8.43[-2]	1.17[-1]	1.69[-1]	2.48[-1]
$1s2s6p$	6.92[-3]	1.81[-2]	3.57[-2]	4.98[-2]	7.36[-2]	8.36[-2]	9.83[-2]	1.18[-1]	1.40[-1]	1.64[-1]
$1s2p^*6s$	3.39[-3]	8.39[-3]	1.64[-2]	2.34[-2]	3.69[-2]	4.36[-2]	5.51[-2]	7.43[-2]	1.04[-1]	1.50[-1]
$1s2p^*6p^*$	1.27[-3]	3.35[-3]	6.68[-3]	9.37[-3]	1.39[-2]	1.58[-2]	1.85[-2]	2.19[-2]	2.56[-2]	2.91[-2]
$1s2p^*6p$	1.41[-2]	3.66[-2]	7.09[-2]	9.76[-2]	1.40[-1]	1.58[-1]	1.82[-1]	2.13[-1]	2.47[-1]	2.79[-1]
$1s2p^*6d$	1.42[-3]	4.30[-3]	1.02[-2]	1.56[-2]	2.49[-2]	2.87[-2]	3.35[-2]	3.86[-2]	4.24[-2]	4.40[-2]
$1s2p6s$	5.92[-3]	1.41[-2]	2.59[-2]	3.46[-2]	4.77[-2]	5.26[-2]	5.92[-2]	6.68[-2]	7.39[-2]	7.97[-2]
$1s2p6p^*$	1.37[-2]	3.53[-2]	6.75[-2]	9.17[-2]	1.28[-1]	1.42[-1]	1.60[-1]	1.80[-1]	1.97[-1]	2.08[-1]
$1s2p6p$	1.56[-2]	3.99[-2]	7.54[-2]	1.01[-1]	1.37[-1]	1.50[-1]	1.65[-1]	1.78[-1]	1.84[-1]	1.82[-1]
$1s2p6d^*$	1.80[-3]	5.49[-3]	1.31[-2]	2.03[-2]	3.30[-2]	3.82[-2]	4.54[-2]	5.33[-2]	5.98[-2]	6.35[-2]
$1s2p6d$	1.74[-3]	5.24[-3]	1.23[-2]	1.85[-2]	2.89[-2]	3.28[-2]	3.75[-2]	4.17[-2]	4.36[-2]	4.26[-2]
$1s3p^*6p$	1.63[-3]	4.58[-3]	9.91[-3]	1.46[-2]	2.31[-2]	2.67[-2]	3.20[-2]	3.88[-2]	4.60[-2]	5.30[-2]
$1s3p6p^*$	1.58[-3]	4.44[-3]	9.58[-3]	1.41[-2]	2.20[-2]	2.53[-2]	3.00[-2]	3.57[-2]	4.14[-2]	4.63[-2]
$1s3p6p$	1.81[-3]	5.04[-3]	1.07[-2]	1.56[-2]	2.35[-2]	2.66[-2]	3.07[-2]	3.49[-2]	3.82[-2]	3.97[-2]
$1s2s7s$	3.73[-3]	9.71[-3]	1.96[-2]	2.82[-2]	4.46[-2]	5.25[-2]	6.56[-2]	8.65[-2]	1.17[-1]	1.60[-1]
$1s2s7p^*$	2.14[-3]	6.02[-3]	1.29[-2]	1.93[-2]	3.24[-2]	3.92[-2]	5.11[-2]	7.12[-2]	1.03[-1]	1.51[-1]
$1s2s7p$	3.81[-3]	1.04[-2]	2.10[-2]	2.97[-2]	4.44[-2]	5.07[-2]	5.99[-2]	7.20[-2]	8.61[-2]	1.01[-1]
$1s2p^*7s$	1.80[-3]	4.68[-3]	9.49[-3]	1.37[-2]	2.18[-2]	2.59[-2]	3.29[-2]	4.45[-2]	6.26[-2]	9.01[-2]
$1s2p^*7p$	7.78[-3]	2.09[-2]	4.16[-2]	5.79[-2]	8.45[-2]	9.53[-2]	1.11[-1]	1.30[-1]	1.51[-1]	1.71[-1]
$1s2p^*7d$	8.35[-4]	2.58[-3]	6.20[-3]	9.61[-3]	1.55[-2]	1.79[-2]	2.10[-2]	2.43[-2]	2.68[-2]	2.80[-2]
$1s2p7s$	3.14[-3]	7.87[-3]	1.49[-2]	2.02[-2]	2.83[-2]	3.13[-2]	3.53[-2]	4.00[-2]	4.43[-2]	4.78[-2]
$1s2p7p^*$	7.54[-3]	2.01[-2]	3.95[-2]	5.43[-2]	7.69[-2]	8.54[-2]	9.65[-2]	1.09[-1]	1.19[-1]	1.26[-1]
$1s2p7p$	8.60[-3]	2.28[-2]	4.42[-2]	6.00[-2]	8.27[-2]	9.05[-2]	9.98[-2]	1.08[-1]	1.13[-1]	1.12[-1]
$1s2p7d^*$	1.06[-3]	3.29[-3]	7.98[-3]	1.25[-2]	2.05[-2]	2.38[-2]	2.84[-2]	3.35[-2]	3.78[-2]	4.01[-2]
$1s2p7d$	1.03[-3]	3.15[-3]	7.45[-3]	1.15[-2]	1.80[-2]	2.05[-2]	2.35[-2]	2.63[-2]	2.76[-2]	2.70[-2]
$1s3p^*7p$	8.97[-4]	2.62[-3]	5.82[-3]	8.70[-3]	1.39[-2]	1.61[-2]	1.94[-2]	2.36[-2]	2.81[-2]	3.25[-2]
$1s3p7p^*$	8.70[-4]	2.53[-3]	5.61[-3]	8.35[-3]	1.32[-2]	1.52[-2]	1.81[-2]	2.16[-2]	2.51[-2]	2.80[-2]
$1s3p7p$	9.97[-4]	2.88[-3]	6.30[-3]	9.24[-3]	1.42[-2]	1.61[-2]	1.86[-2]	2.13[-2]	2.33[-2]	2.43[-2]
Zn-like ions										
$1s4s4p^*$	2.81[-4]	1.10[-3]	3.03[-3]	5.07[-3]	9.61[-3]	1.21[-2]	1.63[-2]	2.37[-2]	3.54[-2]	5.31[-2]
$1s4s4p$	4.95[-4]	1.87[-3]	4.85[-3]	7.65[-3]	1.28[-2]	1.50[-2]	1.83[-2]	2.25[-2]	2.72[-2]	3.17[-2]
$1s4p^*4p$	8.29[-4]	3.67[-3]	1.01[-2]	1.62[-2]	2.74[-2]	3.22[-2]	3.92[-2]	4.80[-2]	5.73[-2]	6.58[-2]
$1s4p4p$	4.71[-4]	2.07[-3]	5.58[-3]	8.82[-3]	1.44[-2]	1.66[-2]	1.96[-2]	2.28[-2]	2.53[-2]	2.67[-2]
$1s4p4d^*$	6.41[-5]	3.67[-4]	1.28[-3]	2.33[-3]	4.54[-3]	5.57[-3]	7.08[-3]	8.97[-3]	1.09[-2]	1.24[-2]
$1s4s5s$	2.19[-4]	8.64[-4]	2.40[-3]	4.00[-3]	7.44[-3]	9.19[-3]	1.21[-2]	1.69[-2]	2.38[-2]	3.35[-2]
$1s4s5p^*$	9.82[-5]	4.33[-4]	1.29[-3]	2.23[-3]	4.38[-3]	5.54[-3]	7.60[-3]	1.11[-2]	1.67[-2]	2.52[-2]
$1s4s5p$	1.74[-4]	7.41[-4]	2.07[-3]	3.38[-3]	5.87[-3]	6.98[-3]	8.62[-3]	1.08[-2]	1.31[-2]	1.54[-2]
$1s4p^*5s$	8.73[-5]	4.08[-4]	1.23[-3]	2.14[-3]	4.22[-3]	5.34[-3]	7.31[-3]	1.07[-2]	1.60[-2]	2.41[-2]
$1s4p^*5p$	2.91[-4]	1.44[-3]	4.26[-3]	7.08[-3]	1.24[-2]	1.48[-2]	1.82[-2]	2.25[-2]	2.72[-2]	3.15[-2]
$1s4p5s$	1.54[-4]	6.95[-4]	1.97[-3]	3.23[-3]	5.60[-3]	6.65[-3]	8.18[-3]	1.02[-2]	1.23[-2]	1.43[-2]
$1s4p5p^*$	2.89[-4]	1.44[-3]	4.24[-3]	7.03[-3]	1.23[-2]	1.46[-2]	1.79[-2]	2.21[-2]	2.65[-2]	3.04[-2]
$1s4p5p$	3.31[-4]	1.63[-3]	4.73[-3]	7.73[-3]	1.31[-2]	1.52[-2]	1.82[-2]	2.14[-2]	2.40[-2]	2.55[-2]
$1s4s6s$	9.71[-5]	4.17[-4]	1.22[-3]	2.08[-3]	3.96[-3]	4.92[-3]	6.54[-3]	9.15[-3]	1.30[-2]	1.82[-2]
$1s4p^*6p$	1.37[-4]	7.21[-4]	2.22[-3]	3.75[-3]	6.70[-3]	8.01[-3]	9.94[-3]	1.24[-2]	1.50[-2]	1.75[-2]
$1s4p6p^*$	1.36[-4]	7.16[-4]	2.20[-3]	3.71[-3]	6.59[-3]	7.86[-3]	9.71[-3]	1.20[-2]	1.44[-2]	1.66[-2]
$1s4p6p$	1.56[-4]	8.14[-4]	2.46[-3]	4.10[-3]	7.06[-3]	8.28[-3]	9.94[-3]	1.18[-2]	1.33[-2]	1.42[-2]
$1s4s7s$	5.15[-5]	2.33[-4]	7.04[-4]	1.22[-3]	2.35[-3]	2.94[-3]	3.93[-3]	5.51[-3]	7.82[-3]	1.10[-2]
$1s4s7p^*$	2.54[-5]	1.24[-4]	3.93[-4]	7.02[-4]	1.42[-3]	1.82[-3]	2.52[-3]	3.72[-3]	5.62[-3]	8.47[-3]
$1s4s7p$	4.52[-5]	2.12[-4]	6.35[-4]	1.07[-3]	1.93[-3]	2.31[-3]	2.89[-3]	3.65[-3]	4.50[-3]	5.34[-3]
$1s4p^*7s$	2.05[-5]	1.10[-4]	3.60[-4]	6.49[-4]	1.32[-3]	1.69[-3]	2.33[-3]	3.44[-3]	5.18[-3]	7.80[-3]
$1s4p^*7p$	7.55[-5]	4.12[-4]	1.30[-3]	2.23[-3]	4.03[-3]	4.84[-3]	6.03[-3]	7.56[-3]	9.20[-3]	1.07[-2]
$1s4p7s$	3.61[-5]	1.87[-4]	5.77[-4]	9.78[-4]	1.76[-3]	2.10[-3]	2.61[-3]	3.27[-3]	3.97[-3]	4.63[-3]

	$Z=32$	$Z=36$	$Z=42$	$Z=47$	$Z=56$	$Z=60$	$Z=66$	$Z=74$	$Z=83$	$Z=92$
Zn-like ions										
$1s4p7p^*$	7.48[-5]	4.09[-4]	1.29[-3]	2.20[-3]	3.95[-3]	4.72[-3]	5.85[-3]	7.28[-3]	8.74[-3]	1.00[-2]
$1s4p7p$	8.59[-5]	4.66[-4]	1.45[-3]	2.43[-3]	4.25[-3]	5.00[-3]	6.03[-3]	7.18[-3]	8.13[-3]	8.70[-3]
$1s5s5s$	3.42[-5]	1.61[-4]	4.92[-4]	8.54[-4]	1.65[-3]	2.06[-3]	2.76[-3]	3.88[-3]	5.50[-3]	7.75[-3]
$1s5s5p^*$	3.05[-5]	1.61[-4]	5.23[-4]	9.42[-4]	1.92[-3]	2.46[-3]	3.40[-3]	5.02[-3]	7.59[-3]	1.14[-2]
$1s5s5p$	5.41[-5]	2.75[-4]	8.42[-4]	1.43[-3]	2.57[-3]	3.09[-3]	3.85[-3]	4.85[-3]	5.94[-3]	6.99[-3]
$1s5p^*5p$	1.02[-4]	5.65[-4]	1.80[-3]	3.08[-3]	5.57[-3]	6.68[-3]	8.31[-3]	1.04[-2]	1.26[-2]	1.46[-2]
$1s5p^*5d$	7.33[-6]	4.81[-5]	1.83[-4]	3.44[-4]	6.68[-4]	8.07[-4]	9.93[-4]	1.19[-3]	1.31[-3]	1.33[-3]
$1s5p5p$	5.81[-5]	3.21[-4]	1.00[-3]	1.69[-3]	2.97[-3]	3.49[-3]	4.22[-3]	5.03[-3]	5.70[-3]	6.11[-3]
$1s5p5d^*$	9.65[-6]	6.47[-5]	2.54[-4]	4.91[-4]	1.02[-3]	1.27[-3]	1.65[-3]	2.15[-3]	2.65[-3]	3.07[-3]
$1s5p5d$	9.13[-6]	5.99[-5]	2.29[-4]	4.30[-4]	8.45[-4]	1.03[-3]	1.27[-3]	1.55[-3]	1.75[-3]	1.85[-3]
$1s5s6s$	3.03[-5]	1.55[-4]	5.00[-4]	8.89[-4]	1.76[-3]	2.21[-3]	2.97[-3]	4.20[-3]	5.98[-3]	8.43[-3]
$1s5s6p^*$	1.44[-5]	8.03[-5]	2.72[-4]	4.99[-4]	1.04[-3]	1.33[-3]	1.86[-3]	2.76[-3]	4.18[-3]	6.32[-3]
$1s5s6p$	2.55[-5]	1.38[-4]	4.39[-4]	7.61[-4]	1.40[-3]	1.69[-3]	2.12[-3]	2.69[-3]	3.31[-3]	3.92[-3]
$1s5p^*6s$	1.35[-5]	7.74[-5]	2.65[-4]	4.88[-4]	1.02[-3]	1.31[-3]	1.82[-3]	2.70[-3]	4.09[-3]	6.17[-3]
$1s5p^*6p$	4.79[-5]	2.83[-4]	9.34[-4]	1.63[-3]	3.01[-3]	3.63[-3]	4.54[-3]	5.72[-3]	6.96[-3]	8.10[-3]
$1s5p6s$	2.40[-5]	1.32[-4]	4.27[-4]	7.40[-4]	1.36[-3]	1.64[-3]	2.06[-3]	2.60[-3]	3.19[-3]	3.76[-3]
$1s5p6p^*$	4.78[-5]	2.82[-4]	9.31[-4]	1.62[-3]	2.99[-3]	3.60[-3]	4.50[-3]	5.65[-3]	6.86[-3]	7.94[-3]
$1s5p6p$	5.48[-5]	3.21[-4]	1.04[-3]	1.80[-3]	3.20[-3]	3.80[-3]	4.61[-3]	5.54[-3]	6.31[-3]	6.79[-3]
$1s5s7s$	1.60[-5]	8.69[-5]	2.89[-4]	5.21[-4]	1.05[-3]	1.32[-3]	1.78[-3]	2.53[-3]	3.61[-3]	5.09[-3]
$1s5s7p^*$	7.91[-6]	4.59[-5]	1.60[-4]	2.97[-4]	6.25[-4]	8.06[-4]	1.13[-3]	1.68[-3]	2.55[-3]	3.85[-3]
$1s5s7p$	1.41[-5]	7.88[-5]	2.58[-4]	4.53[-4]	8.45[-4]	1.02[-3]	1.29[-3]	1.65[-3]	2.04[-3]	2.42[-3]
$1s5p^*7s$	7.17[-6]	4.32[-5]	1.53[-4]	2.85[-4]	6.02[-4]	7.77[-4]	1.09[-3]	1.62[-3]	2.45[-3]	3.70[-3]
$1s5p^*7p$	2.64[-5]	1.62[-4]	5.48[-4]	9.68[-4]	1.81[-3]	2.19[-3]	2.75[-3]	3.48[-3]	4.25[-3]	4.96[-3]
$1s5p7s$	1.27[-5]	7.39[-5]	2.46[-4]	4.33[-4]	8.06[-4]	9.77[-4]	1.23[-3]	1.56[-3]	1.92[-3]	2.25[-3]
$1s5p7p^*$	2.63[-5]	1.61[-4]	5.45[-4]	9.62[-4]	1.79[-3]	2.17[-3]	2.71[-3]	3.42[-3]	4.15[-3]	4.80[-3]
$1s5p7p$	3.02[-5]	1.83[-4]	6.12[-4]	1.07[-3]	1.93[-3]	2.29[-3]	2.80[-3]	3.37[-3]	3.86[-3]	4.16[-3]
$1s6s6s$	6.71[-6]	3.75[-5]	1.27[-4]	2.31[-4]	4.67[-4]	5.91[-4]	8.01[-4]	1.14[-3]	1.63[-3]	2.29[-3]
$1s6s6p^*$	6.36[-6]	3.87[-5]	1.38[-4]	2.59[-4]	5.49[-4]	7.09[-4]	9.95[-4]	1.48[-3]	2.25[-3]	3.40[-3]
$1s6s6p$	1.13[-5]	6.63[-5]	2.23[-4]	3.94[-4]	7.39[-4]	8.97[-4]	1.13[-3]	1.44[-3]	1.78[-3]	2.11[-3]
$1s6p^*6p$	2.25[-5]	1.41[-4]	4.84[-4]	8.60[-4]	1.61[-3]	1.96[-3]	2.46[-3]	3.11[-3]	3.79[-3]	4.42[-3]
$1s6s6p$	1.13[-5]	6.63[-5]	2.23[-4]	3.94[-4]	7.39[-4]	8.97[-4]	1.13[-3]	1.44[-3]	1.78[-3]	2.11[-3]
$1s6p^*6p$	2.25[-5]	1.41[-4]	4.84[-4]	8.60[-4]	1.61[-3]	1.96[-3]	2.46[-3]	3.11[-3]	3.79[-3]	4.42[-3]
$1s6p6p$	1.29[-5]	8.01[-5]	2.72[-4]	4.76[-4]	8.66[-4]	1.03[-3]	1.26[-3]	1.52[-3]	1.75[-3]	1.89[-3]
$1s6s7s$	7.11[-6]	4.19[-5]	1.47[-4]	2.71[-4]	5.56[-4]	7.06[-4]	9.61[-4]	1.37[-3]	1.96[-3]	2.77[-3]
$1s6s7p^*$	3.50[-6]	2.21[-5]	8.10[-5]	1.54[-4]	3.30[-4]	4.28[-4]	6.03[-4]	9.02[-4]	1.37[-3]	2.07[-3]
$1s6s7p$	6.23[-6]	3.80[-5]	1.31[-4]	2.35[-4]	4.46[-4]	5.44[-4]	6.91[-4]	8.84[-4]	1.10[-3]	1.30[-3]
$1s6p^*7s$	3.37[-6]	2.16[-5]	7.96[-5]	1.51[-4]	3.25[-4]	4.22[-4]	5.94[-4]	8.89[-4]	1.35[-3]	2.04[-3]
$1s6p^*7p$	1.24[-5]	8.05[-5]	2.84[-4]	5.11[-4]	9.72[-4]	1.18[-3]	1.49[-3]	1.89[-3]	2.32[-3]	2.71[-3]
$1s6p7s$	5.99[-6]	3.70[-5]	1.28[-4]	2.30[-4]	4.38[-4]	5.34[-4]	6.77[-4]	8.65[-4]	1.07[-3]	1.26[-3]
$1s6p7p^*$	1.24[-5]	8.04[-5]	2.83[-4]	5.10[-4]	9.68[-4]	1.18[-3]	1.48[-3]	1.88[-3]	2.30[-3]	2.67[-3]
$1s6p7p$	1.42[-5]	9.16[-5]	3.19[-4]	5.65[-4]	1.04[-3]	1.25[-3]	1.53[-3]	1.86[-3]	2.14[-3]	2.31[-3]
$1s7s7p^*$	1.85[-6]	1.23[-5]	4.67[-5]	8.98[-5]	1.96[-4]	2.55[-4]	3.60[-4]	5.40[-4]	8.24[-4]	1.24[-3]
$1s7p^*7p$	6.82[-6]	4.60[-5]	1.66[-4]	3.03[-4]	5.82[-4]	7.10[-4]	9.00[-4]	1.15[-3]	1.40[-3]	1.64[-3]

TABLE II.  $L_1$ -shell Auger rates  $A(n_0j_0l_0, n_1j_1l_1, n_2j_2l_2)$  (in mau) as function of  $Z$  for Ni-, Cu-, and Zn-like ions.

	$Z=32$	$Z=36$	$Z=42$	$Z=47$	$Z=56$	$Z=60$	$Z=66$	$Z=74$	$Z=83$	$Z=92$
Ni-like ions										
$2s3s3s$	9.77[-1]	1.08[0]	1.27[0]	1.43[0]	1.70[0]	1.82[0]	1.82[0]	2.26[0]	2.59[0]	3.01[0]
$2s3s3p^*$	1.77[0]	2.02[0]	2.46[0]	2.81[0]	3.40[0]	3.66[0]	3.66[0]	4.61[0]	5.35[0]	6.28[0]
$2s3s3p$	3.41[0]	3.87[0]	4.66[0]	5.28[0]	6.25[0]	6.63[0]	6.63[0]	7.84[0]	8.56[0]	9.27[0]
$2s3s3d^*$	1.77[0]	2.49[0]	3.43[0]	4.09[0]	5.00[0]	5.32[0]	5.32[0]	6.16[0]	6.52[0]	6.78[0]
$2s3s3d$	2.58[0]	3.62[0]	4.95[0]	5.84[0]	7.01[0]	7.38[0]	7.38[0]	8.14[0]	8.28[0]	8.19[0]
$2s3p^*3p^*$	2.64[-2]	2.60[-2]	2.54[-2]	2.44[-2]	2.18[-2]	2.06[-2]	2.06[-2]	1.65[-2]	1.40[-2]	1.16[-2]
$2s3p^*3p$	5.55[-2]	7.80[-2]	1.14[-1]	1.43[-1]	1.84[-1]	1.99[-1]	1.99[-1]	2.38[-1]	2.64[-1]	2.99[-1]
$2s3p^*3d^*$	2.41[-2]	3.66[-2]	5.93[-2]	8.09[-2]	1.23[-1]	1.43[-1]	1.43[-1]	2.15[-1]	2.66[-1]	3.23[-1]
$2s3p^*3d$	5.14[-1]	7.72[-1]	1.14[0]	1.43[0]	1.87[0]	2.05[0]	2.05[0]	2.60[0]	2.93[0]	3.24[0]
$2s3p3p$	8.79[-2]	1.02[-1]	1.24[-1]	1.42[-1]	1.70[-1]	1.82[-1]	1.82[-1]	2.29[-1]	2.73[-1]	3.35[-1]
$2s3p3d^*$	5.07[-1]	7.20[-1]	9.67[-1]	1.10[0]	1.17[0]	1.15[0]	1.15[0]	8.98[-1]	6.80[-1]	4.95[-1]
$2s3p3d$	3.66[-1]	5.17[-1]	6.93[-1]	7.85[-1]	8.34[-1]	8.18[-1]	8.18[-1]	6.57[-1]	5.36[-1]	4.66[-1]
$2s3d^*3d^*$	4.71[-2]	8.76[-2]	1.49[-1]	1.95[-1]	2.58[-1]	2.77[-1]	2.77[-1]	3.10[-1]	3.04[-1]	2.79[-1]
$2s3d^*3d$	2.53[0]	4.33[0]	6.70[0]	8.26[0]	1.02[1]	1.08[1]	1.08[1]	1.18[1]	1.18[1]	1.13[1]
$2s3d3d$	6.89[-1]	1.19[0]	1.86[0]	2.29[0]	2.84[0]	2.99[0]	2.99[0]	3.21[0]	3.13[0]	2.92[0]
Cu-like ions										
$2s3s4s$	1.80[-1]	3.22[-1]	5.09[-1]	6.44[-1]	8.54[-1]	9.41[-1]	1.07[0]	1.24[0]	1.46[0]	1.72[0]
$2s3s4p^*$	1.49[-1]	3.19[-1]	5.51[-1]	7.23[-1]	9.95[-1]	1.11[0]	1.27[0]	1.50[0]	1.78[0]	2.13[0]
$2s3s4p$	2.94[-1]	6.26[-1]	1.07[0]	1.39[0]	1.88[0]	2.07[0]	2.33[0]	2.66[0]	3.00[0]	3.35[0]
$2s3s4d^*$	1.60[-1]	3.98[-1]	7.67[-1]	1.05[0]	1.47[0]	1.63[0]	1.84[0]	2.08[0]	2.30[0]	2.49[0]
$2s3s4d$	2.38[-1]	5.86[-1]	1.12[0]	1.51[0]	2.08[0]	2.29[0]	2.54[0]	2.79[0]	2.97[0]	3.07[0]
$2s3p^*4s$	1.43[-1]	2.58[-1]	4.07[-1]	5.11[-1]	6.70[-1]	7.35[-1]	8.31[-1]	9.63[-1]	1.13[0]	1.35[0]
$2s3p^*4d^*$	1.97[-3]	5.29[-3]	1.35[-2]	2.32[-2]	4.43[-2]	5.43[-2]	6.94[-2]	8.92[-2]	1.11[-1]	1.33[-1]
$2s3p^*4d$	4.31[-2]	1.02[-1]	1.89[-1]	2.55[-1]	3.61[-1]	4.06[-1]	4.72[-1]	5.61[-1]	6.68[-1]	7.86[-1]
$2s3p4s$	2.76[-1]	4.95[-1]	7.73[-1]	9.61[-1]	1.23[0]	1.33[0]	1.47[0]	1.63[0]	1.80[0]	1.96[0]
$2s3p4p$	1.33[-2]	2.79[-2]	4.67[-2]	5.98[-2]	7.92[-2]	8.69[-2]	9.86[-2]	1.16[-1]	1.44[-1]	1.84[-1]
$2s3p4d^*$	4.13[-2]	9.14[-2]	1.48[-1]	1.75[-1]	1.86[-1]	1.78[-1]	1.57[-1]	1.19[-1]	7.48[-2]	4.90[-2]
$2s3p4d$	3.03[-2]	6.65[-2]	1.09[-1]	1.32[-1]	1.44[-1]	1.40[-1]	1.25[-1]	9.46[-2]	6.05[-2]	4.42[-2]
$2s3d^*4s$	1.38[-1]	3.06[-1]	5.45[-1]	7.12[-1]	9.39[-1]	1.02[0]	1.11[0]	1.20[0]	1.27[0]	1.31[0]
$2s3d^*4p^*$	2.57[-3]	7.71[-3]	1.82[-2]	2.83[-2]	4.72[-2]	5.56[-2]	6.80[-2]	8.41[-2]	1.02[-1]	1.19[-1]
$2s3d^*4p$	4.36[-2]	1.16[-1]	2.21[-1]	2.90[-1]	3.61[-1]	3.74[-1]	3.73[-1]	3.45[-1]	2.87[-1]	2.19[-1]
$2s3d^*4d^*$	8.58[-3]	2.82[-2]	6.71[-2]	1.00[-1]	1.50[-1]	1.68[-1]	1.88[-1]	2.05[-1]	2.09[-1]	2.01[-1]
$2s3d^*4d$	2.18[-1]	6.08[-1]	1.20[0]	1.61[0]	2.15[0]	2.32[0]	2.52[0]	2.70[0]	2.81[0]	2.83[0]
$2s3d4s$	2.01[-1]	4.45[-1]	7.87[-1]	1.02[0]	1.32[0]	1.41[0]	1.51[0]	1.59[0]	1.61[0]	1.58[0]
$2s3d4p^*$	4.24[-2]	1.18[-1]	2.43[-1]	3.42[-1]	4.99[-1]	5.60[-1]	6.44[-1]	7.45[-1]	8.45[-1]	9.35[-1]
$2s3d4p$	3.22[-2]	8.59[-2]	1.65[-1]	2.17[-1]	2.72[-1]	2.81[-1]	2.81[-1]	2.61[-1]	2.24[-1]	1.87[-1]
$2s3d4d^*$	2.14[-1]	5.99[-1]	1.18[0]	1.58[0]	2.08[0]	2.24[0]	2.41[0]	2.55[0]	2.61[0]	2.58[0]
$2s3d4d$	1.20[-1]	3.40[-1]	6.84[-1]	9.28[-1]	1.25[0]	1.35[0]	1.46[0]	1.54[0]	1.56[0]	1.52[0]
$2s3s5s$	5.52[-2]	1.17[-1]	2.02[-1]	2.65[-1]	3.64[-1]	4.05[-1]	4.64[-1]	5.45[-1]	6.45[-1]	7.63[-1]
$2s3s5p^*$	5.21[-2]	1.25[-1]	2.32[-1]	3.14[-1]	4.48[-1]	5.03[-1]	5.84[-1]	6.94[-1]	8.30[-1]	9.93[-1]
$2s3s5p$	1.03[-1]	2.46[-1]	4.54[-1]	6.10[-1]	8.53[-1]	9.48[-1]	1.08[0]	1.25[0]	1.43[0]	1.60[0]
$2s3s5d^*$	6.83[-2]	1.75[-1]	3.49[-1]	4.85[-1]	6.95[-1]	7.75[-1]	8.82[-1]	1.01[0]	1.12[0]	1.23[0]
$2s3s5d$	1.01[-1]	2.58[-1]	5.09[-1]	7.01[-1]	9.86[-1]	1.09[0]	1.22[0]	1.35[0]	1.46[0]	1.52[0]
$2s3s5f$	3.86[-5]	1.88[-3]	1.94[-2]	4.89[-2]	1.16[-1]	1.45[-1]	1.84[-1]	2.24[-1]	2.51[-1]	2.60[-1]
$2s3p^*5s$	4.31[-2]	9.02[-2]	1.52[-1]	1.95[-1]	2.60[-1]	2.86[-1]	3.25[-1]	3.78[-1]	4.46[-1]	5.32[-1]
$2s3p^*5d$	1.79[-2]	4.23[-2]	7.76[-2]	1.04[-1]	1.48[-1]	1.66[-1]	1.94[-1]	2.32[-1]	2.79[-1]	3.33[-1]
$2s3p5s$	8.30[-2]	1.73[-1]	2.88[-1]	3.66[-1]	4.77[-1]	5.18[-1]	5.73[-1]	6.39[-1]	7.06[-1]	7.67[-1]
$2s3p5f^*$	3.55[-5]	1.81[-3]	1.79[-2]	4.28[-2]	9.01[-2]	1.06[-1]	1.21[-1]	1.25[-1]	1.11[-1]	8.41[-2]
$2s3d^*5s$	4.14[-2]	1.06[-1]	2.02[-1]	2.69[-1]	3.61[-1]	3.91[-1]	4.29[-1]	4.64[-1]	4.89[-1]	5.02[-1]
$2s3d^*5p$	1.53[-2]	4.55[-2]	9.36[-2]	1.27[-1]	1.65[-1]	1.73[-1]	1.76[-1]	1.67[-1]	1.44[-1]	1.13[-1]
$2s3d^*5d^*$	3.66[-3]	1.25[-2]	3.05[-2]	4.63[-2]	7.07[-2]	7.93[-2]	8.95[-2]	9.81[-2]	1.01[-1]	9.81[-2]
$2s3d^*5d$	9.14[-2]	2.56[-1]	5.05[-1]	6.74[-1]	8.91[-1]	9.60[-1]	1.04[0]	1.12[0]	1.17[0]	1.19[0]
$2s3d^*5f$	8.57[-5]	4.76[-3]	5.12[-2]	1.29[-1]	2.95[-1]	3.63[-1]	4.50[-1]	5.29[-1]	5.71[-1]	5.66[-1]
$2s3d5s$	6.03[-2]	1.54[-1]	2.91[-1]	3.85[-1]	5.06[-1]	5.43[-1]	5.84[-1]	6.15[-1]	6.22[-1]	6.05[-1]
$2s3d5p^*$	1.48[-2]	4.57[-2]	1.01[-1]	1.45[-1]	2.17[-1]	2.46[-1]	2.84[-1]	3.30[-1]	3.75[-1]	4.13[-1]
$2s3d5p$	1.13[-2]	3.40[-2]	7.08[-2]	9.67[-2]	1.26[-1]	1.33[-1]	1.35[-1]	1.29[-1]	1.13[-1]	9.52[-2]

	$Z=32$	$Z=36$	$Z=42$	$Z=47$	$Z=56$	$Z=60$	$Z=66$	$Z=74$	$Z=83$	$Z=92$
Cu-like ions										
$2s3d5d^*$	8.96[-2]	2.52[-1]	4.95[-1]	6.56[-1]	8.56[-1]	9.15[-1]	9.81[-1]	1.03[0]	1.06[0]	1.05[0]
$2s3d5d$	5.03[-2]	1.44[-1]	2.91[-1]	3.94[-1]	5.28[-1]	5.69[-1]	6.15[-1]	6.51[-1]	6.64[-1]	6.51[-1]
$2s3d5f^*$	9.30[-5]	5.20[-3]	5.61[-2]	1.42[-1]	3.27[-1]	4.04[-1]	5.02[-1]	5.95[-1]	6.49[-1]	6.51[-1]
$2s3d5f$	7.46[-5]	4.15[-3]	4.45[-2]	1.11[-1]	2.54[-1]	3.11[-1]	3.82[-1]	4.45[-1]	4.72[-1]	4.59[-1]
$2s3s6s$	2.43[-2]	5.59[-2]	1.01[-1]	1.35[-1]	1.90[-1]	2.13[-1]	2.46[-1]	2.90[-1]	3.44[-1]	4.08[-1]
$2s3s6p^*$	2.45[-2]	6.23[-2]	1.20[-1]	1.66[-1]	2.40[-1]	2.71[-1]	3.17[-1]	3.78[-1]	4.54[-1]	5.43[-1]
$2s3s6p$	4.86[-2]	1.23[-1]	2.36[-1]	3.23[-1]	4.60[-1]	5.15[-1]	5.92[-1]	6.87[-1]	7.89[-1]	8.91[-1]
$2s3s6d^*$	3.56[-2]	9.33[-2]	1.89[-1]	2.66[-1]	3.85[-1]	4.30[-1]	4.92[-1]	5.63[-1]	6.33[-1]	6.95[-1]
$2s3s6d$	5.28[-2]	1.37[-1]	2.76[-1]	3.84[-1]	5.47[-1]	6.06[-1]	6.81[-1]	7.60[-1]	8.24[-1]	8.65[-1]
$2s3p^*6s$	1.89[-2]	4.24[-2]	7.40[-2]	9.62[-2]	1.30[-1]	1.43[-1]	1.63[-1]	1.90[-1]	2.24[-1]	2.68[-1]
$2s3p^*6d$	9.19[-3]	2.20[-2]	4.01[-2]	5.36[-2]	7.63[-2]	8.60[-2]	1.01[-1]	1.21[-1]	1.46[-1]	1.76[-1]
$2s3p6s$	3.64[-2]	8.13[-2]	1.41[-1]	1.81[-1]	2.38[-1]	2.59[-1]	2.87[-1]	3.21[-1]	3.55[-1]	3.85[-1]
$2s3p6p$	2.12[-3]	5.18[-3]	9.48[-3]	1.25[-2]	1.71[-2]	1.90[-2]	2.17[-2]	2.60[-2]	3.26[-2]	4.25[-2]
$2s3d^*6s$	1.81[-2]	4.98[-2]	9.80[-2]	1.32[-1]	1.80[-1]	1.95[-1]	2.14[-1]	2.32[-1]	2.44[-1]	2.50[-1]
$2s3d^*6p$	7.21[-3]	2.27[-2]	4.86[-2]	6.71[-2]	8.91[-2]	9.42[-2]	9.71[-2]	9.35[-2]	8.16[-2]	6.50[-2]
$2s3d^*6d^*$	1.91[-3]	6.64[-3]	1.66[-2]	2.54[-2]	3.91[-2]	4.39[-2]	4.97[-2]	5.47[-2]	5.68[-2]	5.52[-2]
$2s3d^*6d$	4.72[-2]	1.33[-1]	2.64[-1]	3.51[-1]	4.62[-1]	4.97[-1]	5.38[-1]	5.78[-1]	6.06[-1]	6.19[-1]
$2s3d6s$	2.64[-2]	7.24[-2]	1.41[-1]	1.89[-1]	2.52[-1]	2.71[-1]	2.92[-1]	3.08[-1]	3.11[-1]	3.02[-1]
$2s3d6p^*$	6.93[-3]	2.27[-2]	5.17[-2]	7.60[-2]	1.15[-1]	1.31[-1]	1.52[-1]	1.76[-1]	2.00[-1]	2.21[-1]
$2s3d6p$	5.35[-3]	1.70[-2]	3.70[-2]	5.16[-2]	6.90[-2]	7.30[-2]	7.52[-2]	7.26[-2]	6.45[-2]	5.46[-2]
$2s3d6d^*$	4.63[-2]	1.31[-1]	2.58[-1]	3.41[-1]	4.42[-1]	4.71[-1]	5.03[-1]	5.29[-1]	5.41[-1]	5.39[-1]
$2s3d6d$	2.60[-2]	7.52[-2]	1.53[-1]	2.07[-1]	2.77[-1]	2.98[-1]	3.22[-1]	3.42[-1]	3.49[-1]	3.43[-1]
$2s3s7s$	1.29[-2]	3.11[-2]	5.81[-2]	7.88[-2]	1.12[-1]	1.26[-1]	1.46[-1]	1.73[-1]	2.06[-1]	2.44[-1]
$2s3s7p^*$	1.35[-2]	3.56[-2]	7.05[-2]	9.83[-2]	1.44[-1]	1.63[-1]	1.91[-1]	2.29[-1]	2.75[-1]	3.29[-1]
$2s3s7p$	2.67[-2]	7.04[-2]	1.39[-1]	1.92[-1]	2.77[-1]	3.11[-1]	3.59[-1]	4.18[-1]	4.82[-1]	5.46[-1]
$2s3s7d^*$	2.09[-2]	5.56[-2]	1.14[-1]	1.62[-1]	2.35[-1]	2.64[-1]	3.02[-1]	3.47[-1]	3.91[-1]	4.31[-1]
$2s3s7d$	3.10[-2]	8.19[-2]	1.67[-1]	2.34[-1]	3.35[-1]	3.72[-1]	4.19[-1]	4.69[-1]	5.11[-1]	5.38[-1]
$2s3p^*7s$	9.91[-3]	2.34[-2]	4.19[-2]	5.48[-2]	7.45[-2]	8.23[-2]	9.39[-2]	1.10[-1]	1.30[-1]	1.55[-1]
$2s3p^*7p$	4.35[-4]	1.37[-3]	3.20[-3]	4.97[-3]	7.59[-3]	8.74[-3]	9.88[-3]	1.16[-2]	1.32[-2]	1.49[-2]
$2s3p^*7d$	5.37[-3]	1.28[-2]	2.37[-2]	3.21[-2]	4.51[-2]	5.09[-2]	5.90[-2]	7.18[-2]	8.69[-2]	1.05[-1]
$2s3p7s$	1.91[-2]	4.48[-2]	7.95[-2]	1.03[-1]	1.37[-1]	1.49[-1]	1.66[-1]	1.85[-1]	2.05[-1]	2.22[-1]
$2s3p7p^*$	4.22[-4]	1.33[-3]	3.09[-3]	4.71[-3]	7.08[-3]	8.02[-3]	9.12[-3]	1.06[-2]	1.22[-2]	1.43[-2]
$2s3p7p$	1.19[-3]	2.94[-3]	5.41[-3]	7.42[-3]	1.01[-2]	1.13[-2]	1.27[-2]	1.55[-2]	1.94[-2]	2.55[-2]
$2s3d^*7s$	9.51[-3]	2.74[-2]	5.53[-2]	7.54[-2]	1.03[-1]	1.12[-1]	1.23[-1]	1.34[-1]	1.41[-1]	1.43[-1]
$2s3d^*7p$	3.97[-3]	1.30[-2]	2.85[-2]	3.98[-2]	5.37[-2]	5.70[-2]	5.91[-2]	5.74[-2]	5.05[-2]	4.06[-2]
$2s3d^*7d^*$	1.12[-3]	3.96[-3]	1.00[-2]	1.54[-2]	2.39[-2]	2.69[-2]	3.05[-2]	3.37[-2]	3.50[-2]	3.41[-2]
$2s3d^*7d$	2.76[-2]	7.87[-2]	1.56[-1]	2.07[-1]	2.72[-1]	2.93[-1]	3.17[-1]	3.40[-1]	3.57[-1]	3.66[-1]
$2s3d7s$	1.39[-2]	3.98[-2]	7.98[-2]	1.08[-1]	1.45[-1]	1.56[-1]	1.68[-1]	1.78[-1]	1.79[-1]	1.74[-1]
$2s3d7p^*$	3.81[-3]	1.29[-2]	3.02[-2]	4.48[-2]	6.85[-2]	7.79[-2]	9.07[-2]	1.06[-1]	1.20[-1]	1.32[-1]
$2s3d7p$	2.95[-3]	9.77[-3]	2.18[-2]	3.07[-2]	4.17[-2]	4.44[-2]	4.61[-2]	4.48[-2]	4.01[-2]	3.40[-2]
$2s3d7d^*$	2.71[-2]	7.73[-2]	1.52[-1]	2.01[-1]	2.59[-1]	2.77[-1]	2.95[-1]	3.10[-1]	3.16[-1]	3.15[-1]
$2s3d7d$	1.52[-2]	4.44[-2]	9.06[-2]	1.23[-1]	1.64[-1]	1.77[-1]	1.91[-1]	2.03[-1]	2.07[-1]	2.04[-1]
Zn-like ions										
$2s4s4s$	8.08[-3]	2.33[-2]	4.89[-2]	6.89[-2]	1.01[-1]	1.14[-1]	1.33[-1]	1.58[-1]	1.90[-1]	2.27[-1]
$2s4s4p^*$	1.21[-2]	4.08[-2]	9.15[-2]	1.32[-1]	1.97[-1]	2.23[-1]	2.62[-1]	3.15[-1]	3.81[-1]	4.61[-1]
$2s4s4p$	2.38[-2]	8.00[-2]	1.78[-1]	2.54[-1]	3.71[-1]	4.16[-1]	4.79[-1]	5.54[-1]	6.34[-1]	7.10[-1]
$2s4s4d^*$	1.25[-2]	4.89[-2]	1.22[-1]	1.83[-1]	2.76[-1]	3.10[-1]	3.56[-1]	4.06[-1]	4.51[-1]	4.86[-1]
$2s4s4d$	1.86[-2]	7.20[-2]	1.78[-1]	2.63[-1]	3.90[-1]	4.35[-1]	4.89[-1]	5.42[-1]	5.78[-1]	5.93[-1]
$2s4s4f^*$	2.28[-6]	1.73[-4]	2.38[-3]	6.83[-3]	1.84[-2]	2.38[-2]	3.15[-2]	4.02[-2]	4.71[-2]	5.08[-2]
$2s4s4f$	3.01[-6]	2.26[-4]	3.08[-3]	8.75[-3]	2.30[-2]	2.94[-2]	3.81[-2]	4.71[-2]	5.29[-2]	5.43[-2]
$2s4p^*4p$	3.96[-4]	1.92[-3]	5.56[-3]	8.99[-3]	1.48[-2]	1.70[-2]	2.00[-2]	2.34[-2]	2.69[-2]	3.12[-2]
$2s4p^*4d^*$	2.09[-4]	1.06[-3]	3.59[-3]	6.60[-3]	1.31[-2]	1.61[-2]	2.06[-2]	2.65[-2]	3.28[-2]	3.90[-2]
$2s4p^*4d$	3.58[-3]	1.58[-2]	4.09[-2]	6.25[-2]	9.89[-2]	1.14[-1]	1.36[-1]	1.65[-1]	1.98[-1]	2.33[-1]
$2s4p^*4f^*$	5.62[-7]	5.38[-5]	8.35[-4]	2.54[-3]	7.35[-3]	9.77[-3]	1.33[-2]	1.76[-2]	2.15[-2]	2.44[-2]
$2s4p^*4f$	2.57[-6]	2.32[-4]	3.46[-3]	1.03[-2]	2.90[-2]	3.82[-2]	5.15[-2]	6.69[-2]	7.98[-2]	8.74[-2]
$2s4p4p$	5.08[-4]	1.93[-3]	4.45[-3]	6.41[-3]	9.40[-3]	1.06[-2]	1.22[-2]	1.47[-2]	1.85[-2]	2.41[-2]
$2s4p4d^*$	3.57[-3]	1.49[-2]	3.50[-2]	4.84[-2]	6.15[-2]	6.30[-2]	6.14[-2]	5.36[-2]	4.02[-2]	2.65[-2]

	$Z = 32$	$Z = 36$	$Z = 42$	$Z = 47$	$Z = 56$	$Z = 60$	$Z = 66$	$Z = 74$	$Z = 83$	$Z = 92$
Zn-like ions										
$2s4p4d$	2.68[-3]	1.12[-2]	2.67[-2]	3.77[-2]	4.92[-2]	5.08[-2]	5.00[-2]	4.39[-2]	3.35[-2]	2.39[-2]
$2s4p4f^*$	3.11[-6]	2.76[-4]	3.96[-3]	1.13[-2]	2.93[-2]	3.68[-2]	4.59[-2]	5.25[-2]	5.23[-2]	4.54[-2]
$2s4p4f$	2.49[-6]	2.24[-4]	3.24[-3]	9.34[-3]	2.42[-2]	3.06[-2]	3.82[-2]	4.41[-2]	4.46[-2]	4.01[-2]
$2s4d^*4d^*$	3.90[-4]	2.25[-3]	7.29[-3]	1.22[-2]	2.05[-2]	2.35[-2]	2.73[-2]	3.09[-2]	3.29[-2]	3.29[-2]
$2s4d^*4d$	1.86[-2]	8.53[-2]	2.20[-1]	3.26[-1]	4.77[-1]	5.29[-1]	5.92[-1]	6.55[-1]	7.03[-1]	7.29[-1]
$2s4d^*4f$	7.78[-6]	6.71[-4]	9.24[-3]	2.58[-2]	6.53[-2]	8.26[-2]	1.05[-1]	1.28[-1]	1.43[-1]	1.47[-1]
$2s4d4d$	5.23[-3]	2.46[-2]	6.52[-2]	9.85[-2]	1.47[-1]	1.64[-1]	1.84[-1]	2.02[-1]	2.14[-1]	2.17[-1]
$2s4d4f^*$	8.64[-6]	7.47[-4]	1.04[-2]	2.92[-2]	7.57[-2]	9.68[-2]	1.26[-1]	1.57[-1]	1.80[-1]	1.91[-1]
$2s4d4f$	7.08[-6]	6.24[-4]	8.88[-3]	2.53[-2]	6.60[-2]	8.43[-2]	1.09[-1]	1.33[-1]	1.47[-1]	1.49[-1]
$2s4s5s$	4.95[-3]	1.68[-2]	3.84[-2]	5.58[-2]	8.42[-2]	9.59[-2]	1.13[-1]	1.36[-1]	1.64[-1]	1.97[-1]
$2s4s5p^*$	4.22[-3]	1.60[-2]	3.86[-2]	5.74[-2]	8.85[-2]	1.01[-1]	1.20[-1]	1.46[-1]	1.78[-1]	2.16[-1]
$2s4s5p$	8.35[-3]	3.15[-2]	7.54[-2]	1.11[-1]	1.68[-1]	1.91[-1]	2.22[-1]	2.61[-1]	3.02[-1]	3.41[-1]
$2s4s5d^*$	5.33[-3]	2.15[-2]	5.55[-2]	8.45[-2]	1.30[-1]	1.48[-1]	1.70[-1]	1.96[-1]	2.21[-1]	2.40[-1]
$2s4s5d$	7.92[-3]	3.17[-2]	8.09[-2]	1.22[-1]	1.84[-1]	2.07[-1]	2.35[-1]	2.63[-1]	2.84[-1]	2.95[-1]
$2s4p^*5s$	3.63[-3]	1.43[-2]	3.41[-2]	5.03[-2]	7.63[-2]	8.70[-2]	1.03[-1]	1.24[-1]	1.50[-1]	1.82[-1]
$2s4p^*5p$	1.39[-4]	7.53[-4]	2.34[-3]	3.90[-3]	6.63[-3]	7.71[-3]	9.16[-3]	1.08[-2]	1.25[-2]	1.45[-2]
$2s4p^*5d^*$	8.74[-5]	4.58[-4]	1.65[-3]	3.16[-3]	6.53[-3]	8.12[-3]	1.05[-2]	1.35[-2]	1.67[-2]	1.97[-2]
$2s4p^*5d$	1.49[-3]	6.55[-3]	1.69[-2]	2.57[-2]	4.07[-2]	4.70[-2]	5.63[-2]	6.87[-2]	8.34[-2]	9.95[-2]
$2s4p5s$	7.15[-3]	2.80[-2]	6.64[-2]	9.68[-2]	1.44[-1]	1.62[-1]	1.87[-1]	2.17[-1]	2.49[-1]	2.79[-1]
$2s4p5p^*$	1.38[-4]	7.49[-4]	2.32[-3]	3.86[-3]	6.53[-3]	7.57[-3]	8.96[-3]	1.06[-2]	1.23[-2]	1.42[-2]
$2s4p5p$	3.50[-4]	1.47[-3]	3.57[-3]	5.28[-3]	7.92[-3]	8.94[-3]	1.04[-2]	1.25[-2]	1.57[-2]	2.07[-2]
$2s4d^*5s$	3.75[-3]	1.70[-2]	4.51[-2]	6.89[-2]	1.06[-1]	1.19[-1]	1.37[-1]	1.56[-1]	1.73[-1]	1.86[-1]
$2s4d^*5p^*$	7.57[-5]	4.40[-4]	1.59[-3]	2.98[-3]	5.96[-3]	7.35[-3]	9.42[-3]	1.21[-2]	1.49[-2]	1.77[-2]
$2s4d^*5p$	1.25[-3]	5.89[-3]	1.49[-2]	2.14[-2]	2.85[-2]	2.98[-2]	2.98[-2]	2.71[-2]	2.15[-2]	1.49[-2]
$2s4d^*5d^*$	3.32[-4]	1.97[-3]	6.58[-3]	1.12[-2]	1.89[-2]	2.17[-2]	2.53[-2]	2.88[-2]	3.09[-2]	3.12[-2]
$2s4d^*5d$	7.77[-3]	3.61[-2]	9.35[-2]	1.39[-1]	2.04[-1]	2.26[-1]	2.53[-1]	2.82[-1]	3.05[-1]	3.20[-1]
$2s4d5s$	5.57[-3]	2.50[-2]	6.56[-2]	9.94[-2]	1.50[-1]	1.67[-1]	1.88[-1]	2.09[-1]	2.22[-1]	2.27[-1]
$2s4d5p^*$	1.25[-3]	6.14[-3]	1.70[-2]	2.68[-2]	4.34[-2]	5.04[-2]	6.05[-2]	7.36[-2]	8.84[-2]	1.04[-1]
$2s4d5p$	9.44[-4]	4.44[-3]	1.15[-2]	1.69[-2]	2.31[-2]	2.43[-2]	2.45[-2]	2.24[-2]	1.80[-2]	1.33[-2]
$2s4d5d^*$	7.78[-3]	3.60[-2]	9.33[-2]	1.38[-1]	2.02[-1]	2.23[-1]	2.50[-1]	2.76[-1]	2.97[-1]	3.09[-1]
$2s4d5d$	4.39[-3]	2.09[-2]	5.61[-2]	8.50[-2]	1.27[-1]	1.42[-1]	1.59[-1]	1.76[-1]	1.88[-1]	1.92[-1]
$2s4d5f^*$	7.59[-6]	6.47[-4]	8.44[-3]	2.25[-2]	5.47[-2]	6.86[-2]	8.73[-2]	1.07[-1]	1.22[-1]	1.29[-1]
$2s4s6s$	2.18[-3]	8.02[-3]	1.91[-2]	2.84[-2]	4.36[-2]	4.99[-2]	5.91[-2]	7.14[-2]	8.64[-2]	1.04[-1]
$2s4s6p^*$	1.98[-3]	7.97[-3]	2.00[-2]	3.03[-2]	4.76[-2]	5.48[-2]	6.54[-2]	7.97[-2]	9.72[-2]	1.18[-1]
$2s4s6p$	3.93[-3]	1.57[-2]	3.92[-2]	5.90[-2]	9.10[-2]	1.04[-1]	1.22[-1]	1.44[-1]	1.67[-1]	1.90[-1]
$2s4s6d^*$	2.78[-3]	1.15[-2]	3.01[-2]	4.63[-2]	7.21[-2]	8.20[-2]	9.52[-2]	1.10[-1]	1.24[-1]	1.36[-1]
$2s4s6d$	4.13[-3]	1.69[-2]	4.39[-2]	6.69[-2]	1.02[-1]	1.15[-1]	1.31[-1]	1.48[-1]	1.60[-1]	1.67[-1]
$2s4s6f^*$	1.49[-6]	1.11[-4]	1.41[-3]	3.78[-3]	9.42[-3]	1.20[-2]	1.55[-2]	1.94[-2]	2.26[-2]	2.44[-2]
$2s4s6f$	1.96[-6]	1.46[-4]	1.82[-3]	4.84[-3]	1.18[-2]	1.48[-2]	1.87[-2]	2.27[-2]	2.54[-2]	2.61[-2]
$2s4p^*6s$	1.59[-3]	6.71[-3]	1.66[-2]	2.48[-2]	3.81[-2]	4.35[-2]	5.15[-2]	6.22[-2]	7.55[-2]	9.18[-2]
$2s4p^*6d$	7.66[-4]	3.38[-3]	8.78[-3]	1.33[-2]	2.11[-2]	2.44[-2]	2.93[-2]	3.59[-2]	4.37[-2]	5.25[-2]
$2s4p^*6f$	1.58[-6]	1.46[-4]	1.98[-3]	5.38[-3]	1.38[-2]	1.77[-2]	2.32[-2]	2.95[-2]	3.49[-2]	3.84[-2]
$2s4p6s$	3.13[-3]	1.32[-2]	3.24[-2]	4.78[-2]	7.18[-2]	8.11[-2]	9.38[-2]	1.09[-1]	1.25[-1]	1.40[-1]
$2s4p6f^*$	1.91[-6]	1.74[-4]	2.25[-3]	5.88[-3]	1.37[-2]	1.67[-2]	2.01[-2]	2.21[-2]	2.14[-2]	1.81[-2]
$2s4p6f$	1.52[-6]	1.44[-4]	1.86[-3]	4.94[-3]	1.17[-2]	1.44[-2]	1.75[-2]	1.96[-2]	1.94[-2]	1.72[-2]
$2s4d^*6s$	1.64[-3]	7.96[-3]	2.19[-2]	3.39[-2]	5.25[-2]	5.94[-2]	6.83[-2]	7.79[-2]	8.62[-2]	9.24[-2]
$2s4d^*6d^*$	1.73[-4]	1.05[-3]	3.55[-3]	6.07[-3]	1.03[-2]	1.19[-2]	1.39[-2]	1.58[-2]	1.71[-2]	1.73[-2]
$2s4d^*6d$	4.02[-3]	1.88[-2]	4.91[-2]	7.30[-2]	1.07[-1]	1.19[-1]	1.33[-1]	1.49[-1]	1.61[-1]	1.70[-1]
$2s4d^*6f^*$	1.68[-6]	1.47[-4]	1.93[-3]	5.13[-3]	1.23[-2]	1.54[-2]	1.94[-2]	2.33[-2]	2.59[-2]	2.66[-2]
$2s4d^*6f$	5.02[-6]	4.21[-4]	5.23[-3]	1.34[-2]	3.10[-2]	3.82[-2]	4.74[-2]	5.65[-2]	6.24[-2]	6.41[-2]
$2s4d6s$	2.43[-3]	1.17[-2]	3.19[-2]	4.89[-2]	7.43[-2]	8.32[-2]	9.39[-2]	1.04[-1]	1.11[-1]	1.13[-1]
$2s4d6p^*$	5.85[-4]	3.05[-3]	8.78[-3]	1.40[-2]	2.31[-2]	2.69[-2]	3.23[-2]	3.94[-2]	4.74[-2]	5.55[-2]
$2s4d6d^*$	4.02[-3]	1.88[-2]	4.89[-2]	7.25[-2]	1.06[-1]	1.17[-1]	1.30[-1]	1.44[-1]	1.55[-1]	1.62[-1]
$2s4d6d$	2.27[-3]	1.09[-2]	2.96[-2]	4.50[-2]	6.74[-2]	7.52[-2]	8.46[-2]	9.37[-2]	1.00[-1]	1.03[-1]
$2s4d6f^*$	5.57[-6]	4.68[-4]	5.87[-3]	1.52[-2]	3.58[-2]	4.45[-2]	5.60[-2]	6.82[-2]	7.74[-2]	8.19[-2]
$2s4d6f$	4.56[-6]	3.89[-4]	4.96[-3]	1.30[-2]	3.04[-2]	3.77[-2]	4.69[-2]	5.59[-2]	6.13[-2]	6.22[-2]
$2s4f^*6d$	1.83[-6]	1.55[-4]	2.07[-3]	5.66[-3]	1.41[-2]	1.78[-2]	2.29[-2]	2.84[-2]	3.28[-2]	3.53[-2]

	$Z = 32$	$Z = 36$	$Z = 42$	$Z = 47$	$Z = 56$	$Z = 60$	$Z = 66$	$Z = 74$	$Z = 83$	$Z = 92$
Zn-like ions										
$2s4s7s$	1.15[-3]	4.45[-3]	1.10[-2]	1.64[-2]	2.56[-2]	2.94[-2]	3.49[-2]	4.24[-2]	5.13[-2]	6.18[-2]
$2s4s7p^*$	1.09[-3]	4.55[-3]	1.17[-2]	1.80[-2]	2.85[-2]	3.30[-2]	3.95[-2]	4.82[-2]	5.90[-2]	7.17[-2]
$2s4s7p$	2.17[-3]	9.00[-3]	2.30[-2]	3.50[-2]	5.48[-2]	6.27[-2]	7.38[-2]	8.75[-2]	1.02[-1]	1.16[-1]
$2s4s7d^*$	1.63[-3]	6.84[-3]	1.82[-2]	2.81[-2]	4.41[-2]	5.03[-2]	5.85[-2]	6.79[-2]	7.69[-2]	8.45[-2]
$2s4s7d$	2.42[-3]	1.01[-2]	2.65[-2]	4.07[-2]	6.26[-2]	7.06[-2]	8.08[-2]	9.12[-2]	9.94[-2]	1.04[-1]
$2s4p^*7s$	8.39[-4]	3.69[-3]	9.42[-3]	1.42[-2]	2.19[-2]	2.50[-2]	2.97[-2]	3.59[-2]	4.37[-2]	5.31[-2]
$2s4p^*7d$	4.47[-4]	2.00[-3]	5.11[-3]	7.87[-3]	1.25[-2]	1.44[-2]	1.72[-2]	2.13[-2]	2.60[-2]	3.14[-2]
$2s4p7s$	1.65[-3]	7.24[-3]	1.83[-2]	2.73[-2]	4.13[-2]	4.67[-2]	5.41[-2]	6.30[-2]	7.23[-2]	8.09[-2]
$2s4d^*7s$	8.62[-4]	4.38[-3]	1.23[-2]	1.93[-2]	3.01[-2]	3.41[-2]	3.93[-2]	4.48[-2]	4.96[-2]	5.30[-2]
$2s4d^*7d^*$	1.02[-4]	6.26[-4]	2.14[-3]	3.68[-3]	6.27[-3]	7.24[-3]	8.47[-3]	9.67[-3]	1.05[-2]	1.06[-2]
$2s4d^*7d$	2.35[-3]	1.11[-2]	2.91[-2]	4.33[-2]	6.35[-2]	7.05[-2]	7.93[-2]	8.84[-2]	9.62[-2]	1.02[-1]
$2s4d7s$	1.28[-3]	6.45[-3]	1.80[-2]	2.78[-2]	4.26[-2]	4.78[-2]	5.40[-2]	5.99[-2]	6.37[-2]	6.47[-2]
$2s4d7p^*$	3.22[-4]	1.74[-3]	5.12[-3]	8.27[-3]	1.37[-2]	1.60[-2]	1.94[-2]	2.36[-2]	2.84[-2]	3.32[-2]
$2s4d7d^*$	2.35[-3]	1.11[-2]	2.90[-2]	4.29[-2]	6.25[-2]	6.91[-2]	7.72[-2]	8.53[-2]	9.17[-2]	9.57[-2]
$2s4d7d$	1.33[-3]	6.47[-3]	1.76[-2]	2.68[-2]	4.02[-2]	4.49[-2]	5.05[-2]	5.61[-2]	6.00[-2]	6.16[-2]
$2s5s5s$	7.58[-4]	3.03[-3]	7.50[-3]	1.12[-2]	1.75[-2]	2.00[-2]	2.38[-2]	2.88[-2]	3.50[-2]	4.22[-2]
$2s5s5p^*$	1.27[-3]	5.59[-3]	1.44[-2]	2.19[-2]	3.44[-2]	3.96[-2]	4.71[-2]	5.74[-2]	7.00[-2]	8.53[-2]
$2s5s5p$	2.51[-3]	1.10[-2]	2.81[-2]	4.24[-2]	6.54[-2]	7.44[-2]	8.70[-2]	1.02[-1]	1.18[-1]	1.34[-1]
$2s5s5d^*$	1.60[-3]	7.47[-3]	2.05[-2]	3.19[-2]	4.99[-2]	5.67[-2]	6.56[-2]	7.56[-2]	8.47[-2]	9.20[-2]
$2s5s5d$	2.37[-3]	1.10[-2]	2.99[-2]	4.60[-2]	7.06[-2]	7.94[-2]	9.03[-2]	1.01[-1]	1.09[-1]	1.12[-1]
$2s5p^*5d$	5.19[-4]	2.55[-3]	7.05[-3]	1.10[-2]	1.79[-2]	2.08[-2]	2.50[-2]	3.07[-2]	3.73[-2]	4.44[-2]
$2s5p^*5f$	8.62[-7]	7.44[-5]	1.10[-3]	3.15[-3]	8.39[-3]	1.09[-2]	1.44[-2]	1.84[-2]	2.17[-2]	2.36[-2]
$2s5p5f^*$	1.06[-6]	8.92[-5]	1.27[-3]	3.53[-3]	8.73[-3]	1.08[-2]	1.34[-2]	1.53[-2]	1.53[-2]	1.35[-2]
$2s5p5f$	8.59[-7]	7.23[-5]	1.05[-3]	2.93[-3]	7.32[-3]	9.14[-3]	1.13[-2]	1.31[-2]	1.34[-2]	1.23[-2]
$2s5d^*5d$	3.26[-3]	1.53[-2]	3.99[-2]	5.93[-2]	8.69[-2]	9.64[-2]	1.08[-1]	1.21[-1]	1.31[-1]	1.38[-1]
$2s5d^*5f^*$	9.52[-7]	8.51[-5]	1.16[-3]	3.19[-3]	7.94[-3]	1.00[-2]	1.27[-2]	1.55[-2]	1.73[-2]	1.79[-2]
$2s5d^*5f$	2.82[-6]	2.36[-4]	2.96[-3]	7.69[-3]	1.78[-2]	2.19[-2]	2.71[-2]	3.23[-2]	3.56[-2]	3.66[-2]
$2s5d5d$	9.22[-4]	4.44[-3]	1.21[-2]	1.84[-2]	2.77[-2]	3.10[-2]	3.49[-2]	3.88[-2]	4.17[-2]	4.29[-2]
$2s5d5f^*$	3.13[-6]	2.63[-4]	3.34[-3]	8.77[-3]	2.08[-2]	2.59[-2]	3.28[-2]	4.02[-2]	4.60[-2]	4.92[-2]
$2s5d5f$	2.57[-6]	2.22[-4]	2.91[-3]	7.79[-3]	1.87[-2]	2.33[-2]	2.93[-2]	3.51[-2]	3.87[-2]	3.94[-2]
$2s5s6s$	6.68[-4]	2.89[-3]	7.47[-3]	1.14[-2]	1.80[-2]	2.08[-2]	2.48[-2]	3.02[-2]	3.68[-2]	4.44[-2]
$2s5s6p^*$	5.97[-4]	2.79[-3]	7.47[-3]	1.16[-2]	1.85[-2]	2.14[-2]	2.56[-2]	3.13[-2]	3.84[-2]	4.68[-2]
$2s5s6p$	1.18[-3]	5.50[-3]	1.46[-2]	2.25[-2]	3.53[-2]	4.04[-2]	4.76[-2]	5.64[-2]	6.57[-2]	7.46[-2]
$2s5s6d^*$	8.33[-4]	3.98[-3]	1.11[-2]	1.75[-2]	2.76[-2]	3.15[-2]	3.66[-2]	4.24[-2]	4.77[-2]	5.21[-2]
$2s5s6d$	1.24[-3]	5.86[-3]	1.62[-2]	2.52[-2]	3.91[-2]	4.42[-2]	5.04[-2]	5.68[-2]	6.15[-2]	6.39[-2]
$2s5p^*6s$	5.56[-4]	2.63[-3]	7.02[-3]	1.08[-2]	1.72[-2]	1.98[-2]	2.37[-2]	2.89[-2]	3.53[-2]	4.30[-2]
$2s5p^*6d$	2.66[-4]	1.32[-3]	3.66[-3]	5.71[-3]	9.28[-3]	1.08[-2]	1.30[-2]	1.60[-2]	1.96[-2]	2.34[-2]
$2s5p6s$	1.10[-3]	5.18[-3]	1.37[-2]	2.10[-2]	3.26[-2]	3.72[-2]	4.36[-2]	5.14[-2]	5.96[-2]	6.73[-2]
$2s5d^*6s$	6.98[-4]	3.50[-3]	9.96[-3]	1.57[-2]	2.48[-2]	2.82[-2]	3.27[-2]	3.77[-2]	4.22[-2]	4.57[-2]
$2s5d^*6d$	1.68[-3]	7.98[-3]	2.10[-2]	3.13[-2]	4.59[-2]	5.10[-2]	5.73[-2]	6.40[-2]	6.97[-2]	7.38[-2]
$2s5d6s$	1.04[-3]	5.16[-3]	1.45[-2]	2.26[-2]	3.51[-2]	3.95[-2]	4.50[-2]	5.04[-2]	5.42[-2]	5.59[-2]
$2s5d6p^*$	2.44[-4]	1.27[-3]	3.64[-3]	5.79[-3]	9.52[-3]	1.11[-2]	1.34[-2]	1.65[-2]	2.00[-2]	2.37[-2]
$2s5d6d^*$	1.68[-3]	7.97[-3]	2.09[-2]	3.12[-2]	4.57[-2]	5.07[-2]	5.69[-2]	6.34[-2]	6.88[-2]	7.26[-2]
$2s5d6d$	9.54[-4]	4.66[-3]	1.28[-2]	1.95[-2]	2.95[-2]	3.30[-2]	3.72[-2]	4.15[-2]	4.46[-2]	4.62[-2]
$2s5s7s$	3.53[-4]	1.60[-3]	4.27[-3]	6.61[-3]	1.06[-2]	1.22[-2]	1.46[-2]	1.79[-2]	2.18[-2]	2.63[-2]
$2s5s7p^*$	3.28[-4]	1.59[-3]	4.37[-3]	6.85[-3]	1.11[-2]	1.29[-2]	1.55[-2]	1.90[-2]	2.33[-2]	2.84[-2]
$2s5s7p$	6.52[-4]	3.15[-3]	8.59[-3]	1.34[-2]	2.13[-2]	2.44[-2]	2.89[-2]	3.43[-2]	4.02[-2]	4.58[-2]
$2s5s7d^*$	4.89[-4]	2.37[-3]	6.72[-3]	1.06[-2]	1.69[-2]	1.93[-2]	2.25[-2]	2.61[-2]	2.95[-2]	3.23[-2]
$2s5s7d$	7.26[-4]	3.49[-3]	9.81[-3]	1.53[-2]	2.40[-2]	2.71[-2]	3.10[-2]	3.51[-2]	3.81[-2]	3.97[-2]
$2s5p^*7s$	2.93[-4]	1.45[-3]	3.97[-3]	6.16[-3]	9.86[-3]	1.14[-2]	1.37[-2]	1.67[-2]	2.04[-2]	2.49[-2]
$2s5p^*7d$	1.56[-4]	7.78[-4]	2.16[-3]	3.40[-3]	5.48[-3]	6.35[-3]	7.73[-3]	9.48[-3]	1.16[-2]	1.40[-2]
$2s5p7s$	5.80[-4]	2.85[-3]	7.76[-3]	1.19[-2]	1.87[-2]	2.14[-2]	2.52[-2]	2.97[-2]	3.44[-2]	3.88[-2]
$2s5d^*7s$	3.67[-4]	1.93[-3]	5.61[-3]	8.91[-3]	1.42[-2]	1.62[-2]	1.88[-2]	2.17[-2]	2.42[-2]	2.62[-2]
$2s5d^*7d$	9.85[-4]	4.71[-3]	1.24[-2]	1.86[-2]	2.73[-2]	3.04[-2]	3.42[-2]	3.82[-2]	4.17[-2]	4.43[-2]
$2s5d7s$	5.45[-4]	2.84[-3]	8.18[-3]	1.29[-2]	2.01[-2]	2.27[-2]	2.59[-2]	2.90[-2]	3.12[-2]	3.21[-2]
$2s5d7p^*$	1.34[-4]	7.23[-4]	2.12[-3]	3.42[-3]	5.67[-3]	6.62[-3]	8.02[-3]	9.86[-3]	1.20[-2]	1.42[-2]
$2s5d7d^*$	9.85[-4]	4.71[-3]	1.24[-2]	1.85[-2]	2.71[-2]	3.01[-2]	3.38[-2]	3.76[-2]	4.08[-2]	4.31[-2]

	$Z = 32$	$Z = 36$	$Z = 42$	$Z = 47$	$Z = 56$	$Z = 60$	$Z = 66$	$Z = 74$	$Z = 83$	$Z = 92$
Zn-like ions										
$2s5d7d$	5.58[-4]	2.75[-3]	7.60[-3]	1.16[-2]	1.76[-2]	1.97[-2]	2.23[-2]	2.49[-2]	2.68[-2]	2.78[-2]
$2s6s6s$	1.47[-4]	6.89[-4]	1.86[-3]	2.89[-3]	4.65[-3]	5.38[-3]	6.46[-3]	7.90[-3]	9.64[-3]	1.17[-2]
$2s6s6p^*$	2.61[-4]	1.31[-3]	3.64[-3]	5.71[-3]	9.23[-3]	1.07[-2]	1.29[-2]	1.58[-2]	1.93[-2]	2.36[-2]
$2s6s6p$	5.18[-4]	2.59[-3]	7.13[-3]	1.11[-2]	1.76[-2]	2.02[-2]	2.39[-2]	2.83[-2]	3.30[-2]	3.75[-2]
$2s6s6d^*$	3.64[-4]	1.87[-3]	5.41[-3]	8.58[-3]	1.37[-2]	1.57[-2]	1.82[-2]	2.11[-2]	2.38[-2]	2.59[-2]
$2s6s6d$	5.40[-4]	2.75[-3]	7.88[-3]	1.24[-2]	1.94[-2]	2.20[-2]	2.51[-2]	2.83[-2]	3.06[-2]	3.17[-2]
$2s6p^*6d$	1.25[-4]	6.57[-4]	1.88[-3]	3.00[-3]	4.94[-3]	5.76[-3]	6.97[-3]	8.59[-3]	1.05[-2]	1.25[-2]
$2s6d^*6d$	8.71[-4]	4.17[-3]	1.10[-2]	1.65[-2]	2.42[-2]	2.69[-2]	3.02[-2]	3.38[-2]	3.68[-2]	3.90[-2]
$2s6d^*6f$	1.06[-6]	8.74[-5]	1.04[-3]	2.61[-3]	5.79[-3]	7.04[-3]	8.62[-3]	1.01[-2]	1.12[-2]	1.15[-2]
$2s6d6d$	2.47[-4]	1.22[-3]	3.38[-3]	5.18[-3]	7.85[-3]	8.78[-3]	9.94[-3]	1.11[-2]	1.20[-2]	1.25[-2]
$2s6d6f^*$	1.18[-6]	9.74[-5]	1.18[-3]	2.99[-3]	6.81[-3]	8.39[-3]	1.05[-2]	1.28[-2]	1.46[-2]	1.57[-2]
$2s6d6f$	9.69[-7]	8.27[-5]	1.04[-3]	2.69[-3]	6.22[-3]	7.67[-3]	9.52[-3]	1.13[-2]	1.25[-2]	1.27[-2]
$2s6s7s$	1.55[-4]	7.65[-4]	2.13[-3]	3.35[-3]	5.44[-3]	6.32[-3]	7.61[-3]	9.34[-3]	1.14[-2]	1.38[-2]
$2s6s7p^*$	1.44[-4]	7.49[-4]	2.13[-3]	3.39[-3]	5.54[-3]	6.44[-3]	7.77[-3]	9.55[-3]	1.17[-2]	1.43[-2]
$2s6s7p$	2.85[-4]	1.48[-3]	4.19[-3]	6.60[-3]	1.06[-2]	1.22[-2]	1.45[-2]	1.73[-2]	2.02[-2]	2.30[-2]
$2s6s7d^*$	2.14[-4]	1.11[-3]	3.27[-3]	5.22[-3]	8.39[-3]	9.60[-3]	1.12[-2]	1.30[-2]	1.47[-2]	1.61[-2]
$2s6s7d$	3.17[-4]	1.64[-3]	4.76[-3]	7.54[-3]	1.19[-2]	1.35[-2]	1.55[-2]	1.75[-2]	1.90[-2]	1.97[-2]
$2s6p^*7s$	1.38[-4]	7.22[-4]	2.06[-3]	3.25[-3]	5.30[-3]	6.17[-3]	7.42[-3]	9.11[-3]	1.12[-2]	1.37[-2]
$2s6p7s$	2.73[-4]	1.42[-3]	4.03[-3]	6.32[-3]	1.01[-2]	1.17[-2]	1.38[-2]	1.64[-2]	1.91[-2]	2.16[-2]
$2s6d^*7s$	1.91[-4]	1.03[-3]	3.05[-3]	4.88[-3]	7.85[-3]	8.99[-3]	1.05[-2]	1.21[-2]	1.37[-2]	1.49[-2]
$2s6d^*7d$	5.10[-4]	2.46[-3]	6.55[-3]	9.80[-3]	1.44[-2]	1.60[-2]	1.81[-2]	2.02[-2]	2.21[-2]	2.35[-2]
$2s6d7s$	2.84[-4]	1.51[-3]	4.44[-3]	7.06[-3]	1.11[-2]	1.26[-2]	1.44[-2]	1.63[-2]	1.76[-2]	1.82[-2]
$2s6d7d^*$	5.10[-4]	2.46[-3]	6.55[-3]	9.79[-3]	1.44[-2]	1.60[-2]	1.80[-2]	2.01[-2]	2.19[-2]	2.32[-2]
$2s6d7d$	2.89[-4]	1.44[-3]	4.02[-3]	6.19[-3]	9.39[-3]	1.05[-2]	1.19[-2]	1.33[-2]	1.44[-2]	1.50[-2]
$2s7s7s$	4.11[-5]	2.12[-4]	6.08[-4]	9.68[-4]	1.59[-3]	1.86[-3]	2.24[-3]	2.76[-3]	3.38[-3]	4.09[-3]
$2s7s7p^*$	7.56[-5]	4.12[-4]	1.21[-3]	1.93[-3]	3.18[-3]	3.71[-3]	4.48[-3]	5.52[-3]	6.78[-3]	8.29[-3]
$2s7s7p$	1.50[-4]	8.15[-4]	2.37[-3]	3.76[-3]	6.10[-3]	7.04[-3]	8.35[-3]	9.97[-3]	1.17[-2]	1.33[-2]
$2s7s7d^*$	1.12[-4]	6.13[-4]	1.84[-3]	2.97[-3]	4.80[-3]	5.51[-3]	6.44[-3]	7.49[-3]	8.45[-3]	9.22[-3]
$2s7s7d$	1.67[-4]	9.02[-4]	2.69[-3]	4.29[-3]	6.81[-3]	7.73[-3]	8.89[-3]	1.00[-2]	1.09[-2]	1.13[-2]
$2s7p^*7d$	4.02[-5]	2.20[-4]	6.54[-4]	1.05[-3]	1.73[-3]	2.03[-3]	2.47[-3]	3.06[-3]	3.74[-3]	4.46[-3]
$2s7p7f^*$	1.21[-7]	1.27[-5]	1.80[-4]	4.74[-4]	1.16[-3]	1.44[-3]	1.75[-3]	2.00[-3]	2.02[-3]	1.81[-3]
$2s7d^*7d$	2.98[-4]	1.45[-3]	3.89[-3]	5.83[-3]	8.59[-3]	9.54[-3]	1.07[-2]	1.20[-2]	1.32[-2]	1.40[-2]
$2s7d^*7f^*$	1.50[-7]	1.33[-5]	1.70[-4]	4.43[-4]	1.04[-3]	1.29[-3]	1.62[-3]	1.94[-3]	2.16[-3]	2.23[-3]
$2s7d^*7f$	4.42[-7]	3.62[-5]	4.20[-4]	1.03[-3]	2.23[-3]	2.69[-3]	3.28[-3]	3.84[-3]	4.21[-3]	4.35[-3]
$2s7d7d$	8.45[-5]	4.27[-4]	1.20[-3]	1.85[-3]	2.81[-3]	3.15[-3]	3.57[-3]	4.00[-3]	4.34[-3]	4.53[-3]
$2s7d7f^*$	4.91[-7]	4.04[-5]	4.75[-4]	1.18[-3]	2.63[-3]	3.22[-3]	4.00[-3]	4.85[-3]	5.54[-3]	5.98[-3]
$2s7d7f$	4.05[-7]	3.44[-5]	4.21[-4]	1.07[-3]	2.42[-3]	2.97[-3]	3.67[-3]	4.35[-3]	4.78[-3]	4.89[-3]

TABLE III.  $L_2$ -shell Auger rates  $A(n_0j_0l_0, n_1j_1l_1, n_2j_2l_2)$  (in mau) as function of  $Z$  for Ni-, Cu-, and Zn-like ions.

	$Z=32$	$Z=36$	$Z=42$	$Z=47$	$Z=56$	$Z=60$	$Z=66$	$Z=74$	$Z=83$	$Z=92$
Ni-like ions										
$2p^*3s3s$	8.52[-2]	9.10[-2]	1.01[-1]	1.08[-1]	1.18[-1]	1.21[-1]	1.21[-1]	1.30[-1]	1.33[-1]	1.36[-1]
$2p^*3s3p^*$	1.56[0]	1.74[0]	2.07[0]	2.34[0]	2.81[0]	3.02[0]	3.02[0]	3.81[0]	4.45[0]	5.27[0]
$2p^*3s3p$	1.27[-1]	1.48[-1]	1.84[-1]	2.13[-1]	2.60[-1]	2.79[-1]	2.79[-1]	3.38[-1]	3.72[-1]	4.04[-1]
$2p^*3s3d^*$	7.06[-2]	7.83[-2]	8.97[-2]	1.02[-1]	1.32[-1]	1.49[-1]	1.49[-1]	2.31[-1]	3.11[-1]	4.24[-1]
$2p^*3s3d$	1.50[-1]	2.04[-1]	2.72[-1]	3.17[-1]	3.72[-1]	3.88[-1]	3.88[-1]	4.07[-1]	3.95[-1]	3.70[-1]
$2p^*3p^*3p^*$	1.33[0]	1.55[0]	1.91[0]	2.20[0]	2.69[0]	2.90[0]	2.90[0]	3.70[0]	4.33[0]	5.14[0]
$2p^*3p^*3p$	4.58[0]	5.26[0]	6.39[0]	7.26[0]	8.62[0]	9.16[0]	9.16[0]	1.09[1]	1.20[1]	1.31[1]
$2p^*3p^*3d^*$	1.54[0]	2.20[0]	3.07[0]	3.67[0]	4.50[0]	4.78[0]	4.78[0]	5.46[0]	5.71[0]	5.86[0]
$2p^*3p^*3d$	2.98[0]	4.17[0]	5.67[0]	6.64[0]	7.88[0]	8.25[0]	8.25[0]	8.94[0]	8.96[0]	8.71[0]
$2p^*3p3p$	1.25[-1]	1.41[-1]	1.68[-1]	1.87[-1]	2.13[-1]	2.22[-1]	2.22[-1]	2.42[-1]	2.44[-1]	2.35[-1]
$2p^*3p3d^*$	1.85[0]	2.72[0]	3.93[0]	4.80[0]	5.99[0]	6.39[0]	6.39[0]	7.19[0]	7.32[0]	7.19[0]
$2p^*3p3d$	2.70[-1]	3.80[-1]	5.20[-1]	6.11[-1]	7.25[-1]	7.57[-1]	7.57[-1]	8.01[-1]	7.85[-1]	7.41[-1]
$2p^*3d^*3d^*$	1.23[0]	2.11[0]	3.28[0]	4.07[0]	5.05[0]	5.32[0]	5.32[0]	5.69[0]	5.52[0]	5.09[0]
$2p^*3d^*3d$	5.58[0]	9.51[0]	1.46[1]	1.80[1]	2.20[1]	2.30[1]	2.30[1]	2.40[1]	2.29[1]	2.08[1]
$2p^*3d3d$	2.63[-1]	4.45[-1]	6.78[-1]	8.25[-1]	9.90[-1]	1.03[0]	1.03[0]	1.04[0]	9.62[-1]	8.43[-1]
Cu-like ions										
$2p^*3s4p^*$	1.08[-1]	2.14[-1]	3.38[-1]	4.20[-1]	5.46[-1]	5.98[-1]	6.75[-1]	7.87[-1]	9.35[-1]	1.13[0]
$2p^*3s4p$	1.02[-2]	2.18[-2]	3.77[-2]	4.95[-2]	6.82[-2]	7.57[-2]	8.63[-2]	9.97[-2]	1.14[-1]	1.28[-1]
$2p^*3p^*4s$	1.61[-1]	2.97[-1]	4.87[-1]	6.27[-1]	8.53[-1]	9.48[-1]	1.09[0]	1.28[0]	1.53[0]	1.84[0]
$2p^*3p^*4p^*$	2.06[-1]	4.38[-1]	7.49[-1]	9.75[-1]	1.33[0]	1.48[0]	1.70[0]	2.00[0]	2.39[0]	2.88[0]
$2p^*3p^*4p$	3.89[-1]	8.37[-1]	1.44[0]	1.88[0]	2.54[0]	2.80[0]	3.16[0]	3.62[0]	4.11[0]	4.62[0]
$2p^*3p^*4d^*$	1.40[-1]	3.51[-1]	6.83[-1]	9.38[-1]	1.32[0]	1.46[0]	1.64[0]	1.84[0]	2.02[0]	2.16[0]
$2p^*3p^*4d$	2.74[-1]	6.71[-1]	1.28[0]	1.72[0]	2.35[0]	2.57[0]	2.83[0]	3.08[0]	3.24[0]	3.29[0]
$2p^*3p4s$	1.16[-2]	2.19[-2]	3.70[-2]	4.83[-2]	6.58[-2]	7.25[-2]	8.16[-2]	9.22[-2]	1.03[-1]	1.12[-1]
$2p^*3p4p^*$	3.25[-1]	6.64[-1]	1.08[0]	1.35[0]	1.74[0]	1.89[0]	2.08[0]	2.32[0]	2.57[0]	2.82[0]
$2p^*3p4p$	1.91[-2]	3.94[-2]	6.46[-2]	8.12[-2]	1.04[-1]	1.12[-1]	1.23[-1]	1.33[-1]	1.40[-1]	1.41[-1]
$2p^*3p4d^*$	1.62[-1]	4.05[-1]	7.84[-1]	1.07[0]	1.48[0]	1.63[0]	1.80[0]	1.98[0]	2.10[0]	2.15[0]
$2p^*3p4d$	2.34[-2]	5.38[-2]	9.66[-2]	1.26[-1]	1.67[-1]	1.81[-1]	1.96[-1]	2.09[-1]	2.16[-1]	2.15[-1]
$2p^*3d^*4s$	7.36[-3]	1.39[-2]	2.22[-2]	2.86[-2]	4.08[-2]	4.70[-2]	5.79[-2]	7.64[-2]	1.05[-1]	1.45[-1]
$2p^*3d^*4p^*$	1.08[-1]	2.75[-1]	5.17[-1]	6.88[-1]	9.21[-1]	9.98[-1]	1.09[0]	1.17[0]	1.21[0]	1.22[0]
$2p^*3d^*4p$	1.53[-1]	4.17[-1]	8.50[-1]	1.18[0]	1.67[0]	1.84[0]	2.05[0]	2.23[0]	2.34[0]	2.35[0]
$2p^*3d^*4d^*$	2.14[-1]	6.22[-1]	1.30[0]	1.81[0]	2.51[0]	2.73[0]	2.98[0]	3.16[0]	3.18[0]	3.04[0]
$2p^*3d^*4d$	5.04[-1]	1.47[0]	3.10[0]	4.33[0]	6.01[0]	6.53[0]	7.10[0]	7.48[0]	7.48[0]	7.08[0]
$2p^*3d4s$	1.46[-2]	3.22[-2]	5.75[-2]	7.46[-2]	9.63[-2]	1.03[-1]	1.09[-1]	1.13[-1]	1.12[-1]	1.08[-1]
$2p^*3d4p^*$	1.99[-1]	4.89[-1]	8.72[-1]	1.12[0]	1.41[0]	1.49[0]	1.58[0]	1.64[0]	1.63[0]	1.57[0]
$2p^*3d4p$	2.11[-2]	5.43[-2]	1.03[-1]	1.37[-1]	1.82[-1]	1.97[-1]	2.12[-1]	2.24[-1]	2.26[-1]	2.19[-1]
$2p^*3d4d^*$	4.70[-1]	1.31[0]	2.57[0]	3.43[0]	4.50[0]	4.81[0]	5.11[0]	5.27[0]	5.19[0]	4.86[0]
$2p^*3d4d$	4.62[-2]	1.31[-1]	2.64[-1]	3.60[-1]	4.82[-1]	5.17[-1]	5.51[-1]	5.65[-1]	5.46[-1]	4.97[-1]
$2p^*3s5p^*$	3.68[-2]	7.90[-2]	1.30[-1]	1.64[-1]	2.14[-1]	2.35[-1]	2.66[-1]	3.11[-1]	3.71[-1]	4.47[-1]
$2p^*3p^*5s$	5.03[-2]	1.11[-1]	2.00[-1]	2.69[-1]	3.81[-1]	4.28[-1]	4.97[-1]	5.93[-1]	7.14[-1]	8.60[-1]
$2p^*3p^*5p^*$	7.12[-2]	1.68[-1]	3.05[-1]	4.08[-1]	5.73[-1]	6.42[-1]	7.43[-1]	8.83[-1]	1.06[0]	1.28[0]
$2p^*3p^*5p$	1.36[-1]	3.28[-1]	6.08[-1]	8.19[-1]	1.15[0]	1.28[0]	1.46[0]	1.69[0]	1.94[0]	2.20[0]
$2p^*3p^*5d^*$	5.95[-2]	1.54[-1]	3.11[-1]	4.34[-1]	6.22[-1]	6.93[-1]	7.86[-1]	8.91[-1]	9.89[-1]	1.07[0]
$2p^*3p^*5d$	1.16[-1]	2.95[-1]	5.80[-1]	7.97[-1]	1.11[0]	1.23[0]	1.36[0]	1.50[0]	1.60[0]	1.64[0]
$2p^*3p^*5f^*$	3.18[-5]	1.49[-3]	1.47[-2]	3.64[-2]	8.45[-2]	1.05[-1]	1.34[-1]	1.64[-1]	1.88[-1]	1.99[-1]
$2p^*3p^*5f$	3.02[-5]	1.47[-3]	1.52[-2]	3.83[-2]	8.95[-2]	1.11[-1]	1.39[-1]	1.66[-1]	1.81[-1]	1.80[-1]
$2p^*3p5p^*$	1.11[-1]	2.47[-1]	4.19[-1]	5.33[-1]	6.93[-1]	7.52[-1]	8.31[-1]	9.26[-1]	1.03[0]	1.12[0]
$2p^*3p5d^*$	6.84[-2]	1.74[-1]	3.43[-1]	4.71[-1]	6.56[-1]	7.21[-1]	8.02[-1]	8.83[-1]	9.44[-1]	9.76[-1]
$2p^*3d^*5p^*$	3.67[-2]	1.02[-1]	2.02[-1]	2.75[-1]	3.75[-1]	4.08[-1]	4.46[-1]	4.78[-1]	4.93[-1]	4.91[-1]
$2p^*3d^*5p$	5.33[-2]	1.62[-1]	3.54[-1]	5.08[-1]	7.40[-1]	8.23[-1]	9.23[-1]	1.02[0]	1.08[0]	1.09[0]
$2p^*3d^*5d^*$	9.02[-2]	2.68[-1]	5.71[-1]	8.03[-1]	1.13[0]	1.23[0]	1.35[0]	1.44[0]	1.46[0]	1.41[0]
$2p^*3d^*5d$	2.13[-1]	6.41[-1]	1.38[0]	1.96[0]	2.76[0]	3.01[0]	3.30[0]	3.51[0]	3.54[0]	3.38[0]
$2p^*3d^*5f^*$	1.06[-4]	5.31[-3]	5.79[-2]	1.48[-1]	3.44[-1]	4.26[-1]	5.28[-1]	6.21[-1]	6.62[-1]	6.43[-1]
$2p^*3d^*5f$	2.29[-4]	1.16[-2]	1.25[-1]	3.17[-1]	7.30[-1]	8.97[-1]	1.10[0]	1.28[0]	1.34[0]	1.27[0]
$2p^*3d5p^*$	6.73[-2]	1.79[-1]	3.29[-1]	4.25[-1]	5.38[-1]	5.70[-1]	6.02[-1]	6.20[-1]	6.14[-1]	5.85[-1]
$2p^*3d5p$	7.30[-3]	2.08[-2]	4.17[-2]	5.69[-2]	7.78[-2]	8.45[-2]	9.21[-2]	9.81[-2]	1.00[-1]	9.79[-2]

	$Z = 32$	$Z = 36$	$Z = 42$	$Z = 47$	$Z = 56$	$Z = 60$	$Z = 66$	$Z = 74$	$Z = 83$	$Z = 92$
Cu-like ions										
$2p^*3d5d^*$	1.97[-1]	5.48[-1]	1.08[0]	1.43[0]	1.86[0]	1.98[0]	2.10[0]	2.17[0]	2.13[0]	2.01[0]
$2p^*3d5d$	1.94[-2]	5.59[-2]	1.15[-1]	1.58[-1]	2.14[-1]	2.31[-1]	2.47[-1]	2.55[-1]	2.48[-1]	2.28[-1]
$2p^*3d5f^*$	4.76[-5]	2.46[-3]	2.48[-2]	6.04[-2]	1.34[-1]	1.63[-1]	1.99[-1]	2.30[-1]	2.43[-1]	2.35[-1]
$2p^*3s6s$	2.03[-3]	4.42[-3]	7.39[-3]	9.26[-3]	1.17[-2]	1.24[-2]	1.33[-2]	1.43[-2]	1.50[-2]	1.55[-2]
$2p^*3s6p^*$	1.71[-2]	3.84[-2]	6.45[-2]	8.19[-2]	1.08[-1]	1.19[-1]	1.35[-1]	1.57[-1]	1.88[-1]	2.27[-1]
$2p^*3s6p$	1.67[-3]	4.16[-3]	7.90[-3]	1.08[-2]	1.55[-2]	1.75[-2]	2.03[-2]	2.39[-2]	2.78[-2]	3.18[-2]
$2p^*3s6d^*$	1.18[-3]	1.94[-3]	2.82[-3]	3.78[-3]	6.15[-3]	7.34[-3]	9.24[-3]	1.20[-2]	1.58[-2]	2.11[-2]
$2p^*3s6d$	2.58[-3]	5.22[-3]	8.30[-3]	1.02[-2]	1.29[-2]	1.38[-2]	1.50[-2]	1.59[-2]	1.63[-2]	1.62[-2]
$2p^*3p^*6s$	2.23[-2]	5.36[-2]	1.02[-1]	1.40[-1]	2.03[-1]	2.30[-1]	2.69[-1]	3.22[-1]	3.89[-1]	4.70[-1]
$2p^*3p^*6p^*$	3.33[-2]	8.29[-2]	1.56[-1]	2.12[-1]	3.02[-1]	3.40[-1]	3.95[-1]	4.72[-1]	5.68[-1]	6.85[-1]
$2p^*3p^*6p$	6.42[-2]	1.64[-1]	3.16[-1]	4.33[-1]	6.18[-1]	6.91[-1]	7.95[-1]	9.26[-1]	1.07[0]	1.22[0]
$2p^*3p^*6d^*$	3.10[-2]	8.21[-2]	1.69[-1]	2.37[-1]	3.44[-1]	3.85[-1]	4.38[-1]	5.00[-1]	5.57[-1]	6.06[-1]
$2p^*3p^*6d$	6.07[-2]	1.57[-1]	3.15[-1]	4.37[-1]	6.18[-1]	6.83[-1]	7.64[-1]	8.45[-1]	9.05[-1]	9.34[-1]
$2p^*3p6s$	1.56[-3]	3.81[-3]	7.33[-3]	1.01[-2]	1.45[-2]	1.61[-2]	1.84[-2]	2.09[-2]	2.33[-2]	2.52[-2]
$2p^*3p6p^*$	5.14[-2]	1.20[-1]	2.09[-1]	2.69[-1]	3.51[-1]	3.82[-1]	4.22[-1]	4.70[-1]	5.20[-1]	5.68[-1]
$2p^*3p6p$	3.08[-3]	7.38[-3]	1.32[-2]	1.73[-2]	2.32[-2]	2.53[-2]	2.81[-2]	3.10[-2]	3.32[-2]	3.39[-2]
$2p^*3p6d^*$	3.55[-2]	9.19[-2]	1.83[-1]	2.52[-1]	3.52[-1]	3.87[-1]	4.31[-1]	4.75[-1]	5.10[-1]	5.29[-1]
$2p^*3p6d$	5.05[-3]	1.19[-2]	2.19[-2]	2.90[-2]	3.89[-2]	4.22[-2]	4.62[-2]	4.99[-2]	5.23[-2]	5.30[-2]
$2p^*3d^*6p^*$	1.70[-2]	4.99[-2]	1.02[-1]	1.40[-1]	1.93[-1]	2.11[-1]	2.31[-1]	2.47[-1]	2.54[-1]	2.52[-1]
$2p^*3d^*6p$	2.51[-2]	8.05[-2]	1.83[-1]	2.67[-1]	3.95[-1]	4.41[-1]	4.98[-1]	5.52[-1]	5.86[-1]	5.94[-1]
$2p^*3d^*6d^*$	4.67[-2]	1.41[-1]	3.05[-1]	4.31[-1]	6.10[-1]	6.69[-1]	7.36[-1]	7.88[-1]	8.03[-1]	7.75[-1]
$2p^*3d^*6d$	1.11[-1]	3.38[-1]	7.45[-1]	1.06[0]	1.50[0]	1.65[0]	1.81[0]	1.93[0]	1.96[0]	1.88[0]
$2p^*3d^*6f$	1.47[-4]	8.55[-3]	8.73[-2]	2.14[-1]	4.82[-1]	5.88[-1]	7.17[-1]	8.25[-1]	8.63[-1]	8.21[-1]
$2p^*3d6s$	2.00[-3]	5.67[-3]	1.15[-2]	1.57[-2]	2.12[-2]	2.29[-2]	2.46[-2]	2.58[-2]	2.59[-2]	2.50[-2]
$2p^*3d6p^*$	3.12[-2]	8.64[-2]	1.62[-1]	2.11[-1]	2.67[-1]	2.83[-1]	2.99[-1]	3.07[-1]	3.03[-1]	2.87[-1]
$2p^*3d6p$	3.42[-3]	1.02[-2]	2.13[-2]	2.94[-2]	4.08[-2]	4.45[-2]	4.88[-2]	5.22[-2]	5.36[-2]	5.25[-2]
$2p^*3d6d^*$	1.02[-1]	2.86[-1]	5.62[-1]	7.45[-1]	9.65[-1]	1.03[0]	1.09[0]	1.12[0]	1.10[0]	1.04[0]
$2p^*3d6d$	1.01[-2]	2.94[-2]	6.13[-2]	8.46[-2]	1.15[-1]	1.24[-1]	1.33[-1]	1.38[-1]	1.35[-1]	1.24[-1]
$2p^*3s7p^*$	9.34[-3]	2.16[-2]	3.68[-2]	4.72[-2]	6.25[-2]	6.88[-2]	7.79[-2]	9.13[-2]	1.09[-1]	1.32[-1]
$2p^*3s7p$	9.13[-4]	2.37[-3]	4.62[-3]	6.37[-3]	9.24[-3]	1.04[-2]	1.21[-2]	1.43[-2]	1.68[-2]	1.92[-2]
$2p^*3s7d^*$	6.84[-4]	1.13[-3]	1.66[-3]	2.29[-3]	3.72[-3]	4.44[-3]	5.58[-3]	7.24[-3]	9.47[-3]	1.26[-2]
$2p^*3p^*7s$	1.18[-2]	3.00[-2]	5.90[-2]	8.22[-2]	1.21[-1]	1.37[-1]	1.61[-1]	1.94[-1]	2.35[-1]	2.84[-1]
$2p^*3p^*7p^*$	1.83[-2]	4.71[-2]	9.08[-2]	1.25[-1]	1.79[-1]	2.02[-1]	2.36[-1]	2.82[-1]	3.40[-1]	4.11[-1]
$2p^*3p^*7p$	3.54[-2]	9.36[-2]	1.85[-1]	2.57[-1]	3.71[-1]	4.17[-1]	4.81[-1]	5.63[-1]	6.53[-1]	7.46[-1]
$2p^*3p^*7d^*$	1.82[-2]	4.90[-2]	1.02[-1]	1.44[-1]	2.11[-1]	2.36[-1]	2.70[-1]	3.08[-1]	3.45[-1]	3.76[-1]
$2p^*3p^*7d$	3.56[-2]	9.36[-2]	1.90[-1]	2.66[-1]	3.79[-1]	4.20[-1]	4.71[-1]	5.23[-1]	5.62[-1]	5.81[-1]
$2p^*3p7s$	8.26[-4]	2.11[-3]	4.20[-3]	5.86[-3]	8.49[-3]	9.50[-3]	1.08[-2]	1.24[-2]	1.38[-2]	1.49[-2]
$2p^*3p7p^*$	2.81[-2]	6.78[-2]	1.20[-1]	1.55[-1]	2.04[-1]	2.22[-1]	2.45[-1]	2.74[-1]	3.02[-1]	3.30[-1]
$2p^*3p7p$	1.69[-3]	4.19[-3]	7.67[-3]	1.01[-2]	1.37[-2]	1.50[-2]	1.67[-2]	1.85[-2]	1.99[-2]	2.04[-2]
$2p^*3p7d^*$	2.08[-2]	5.45[-2]	1.09[-1]	1.51[-1]	2.11[-1]	2.33[-1]	2.59[-1]	2.86[-1]	3.08[-1]	3.20[-1]
$2p^*3p7d$	2.95[-3]	7.04[-3]	1.30[-2]	1.73[-2]	2.33[-2]	2.53[-2]	2.78[-2]	3.01[-2]	3.16[-2]	3.21[-2]
$2p^*3d^*7s$	5.70[-4]	1.32[-3]	2.95[-3]	3.92[-3]	5.93[-3]	6.71[-3]	8.73[-3]	1.14[-2]	1.59[-2]	2.20[-2]
$2p^*3d^*7p^*$	9.34[-3]	2.81[-2]	5.87[-2]	8.14[-2]	1.13[-1]	1.24[-1]	1.36[-1]	1.45[-1]	1.49[-1]	1.47[-1]
$2p^*3d^*7p$	1.37[-2]	4.65[-2]	1.06[-1]	1.58[-1]	2.36[-1]	2.66[-1]	2.99[-1]	3.34[-1]	3.55[-1]	3.63[-1]
$2p^*3d^*7d^*$	2.74[-2]	8.36[-2]	1.83[-1]	2.61[-1]	3.69[-1]	4.05[-1]	4.46[-1]	4.79[-1]	4.88[-1]	4.74[-1]
$2p^*3d^*7d$	6.51[-2]	2.02[-1]	4.46[-1]	6.45[-1]	9.15[-1]	1.00[0]	1.10[0]	1.18[0]	1.20[0]	1.16[0]
$2p^*3d7s$	1.06[-3]	3.16[-3]	6.61[-3]	9.13[-3]	1.25[-2]	1.35[-2]	1.46[-2]	1.53[-2]	1.54[-2]	1.49[-2]
$2p^*3d7p^*$	1.70[-2]	4.85[-2]	9.26[-2]	1.21[-1]	1.54[-1]	1.63[-1]	1.71[-1]	1.76[-1]	1.73[-1]	1.64[-1]
$2p^*3d7p$	1.88[-3]	5.82[-3]	1.23[-2]	1.72[-2]	2.41[-2]	2.64[-2]	2.90[-2]	3.12[-2]	3.21[-2]	3.16[-2]
$2p^*3d7d^*$	5.94[-2]	1.68[-1]	3.32[-1]	4.40[-1]	5.69[-1]	6.04[-1]	6.39[-1]	6.57[-1]	6.47[-1]	6.12[-1]
$2p^*3d7d$	5.89[-3]	1.74[-2]	3.66[-2]	5.07[-2]	6.94[-2]	7.49[-2]	8.06[-2]	8.36[-2]	8.19[-2]	7.56[-2]
Zn-like ions										
$2p^*4s4p^*$	1.12[-2]	3.66[-2]	7.96[-2]	1.13[-1]	1.67[-1]	1.89[-1]	2.21[-1]	2.67[-1]	3.24[-1]	3.96[-1]
$2p^*4s4p$	9.33[-4]	3.26[-3]	7.64[-3]	1.13[-2]	1.74[-2]	1.98[-2]	2.32[-2]	2.74[-2]	3.17[-2]	3.57[-2]
$2p^*4s4d^*$	5.86[-4]	1.69[-3]	3.36[-3]	4.79[-3]	7.72[-3]	9.21[-3]	1.17[-2]	1.58[-2]	2.21[-2]	3.14[-2]
$2p^*4s4d$	1.20[-3]	4.07[-3]	8.89[-3]	1.24[-2]	1.71[-2]	1.87[-2]	2.05[-2]	2.19[-2]	2.26[-2]	2.26[-2]
$2p^*4s4f^*$	1.19[-6]	8.21[-5]	1.05[-3]	2.93[-3]	7.60[-3]	9.72[-3]	1.25[-2]	1.53[-2]	1.69[-2]	1.69[-2]

	$Z = 32$	$Z = 36$	$Z = 42$	$Z = 47$	$Z = 56$	$Z = 60$	$Z = 66$	$Z = 74$	$Z = 83$	$Z = 92$
Zn-like ions										
$2p^*4p^*4p^*$	7.89[-3]	3.05[-2]	7.13[-2]	1.04[-1]	1.57[-1]	1.78[-1]	2.11[-1]	2.54[-1]	3.10[-1]	3.78[-1]
$2p^*4p^*4p$	2.76[-2]	1.06[-1]	2.44[-1]	3.51[-1]	5.15[-1]	5.78[-1]	6.66[-1]	7.73[-1]	8.87[-1]	1.00[0]
$2p^*4p^*4d^*$	9.75[-3]	4.37[-2]	1.14[-1]	1.74[-1]	2.65[-1]	2.98[-1]	3.40[-1]	3.84[-1]	4.20[-1]	4.42[-1]
$2p^*4p^*4d$	1.84[-2]	7.91[-2]	1.98[-1]	2.92[-1]	4.26[-1]	4.71[-1]	5.25[-1]	5.74[-1]	6.02[-1]	6.04[-1]
$2p^*4p^*4f^*$	2.27[-6]	1.85[-4]	2.50[-3]	7.01[-3]	1.82[-2]	2.34[-2]	3.04[-2]	3.81[-2]	4.38[-2]	4.64[-2]
$2p^*4p^*4f$	1.96[-6]	1.63[-4]	2.23[-3]	6.26[-3]	1.60[-2]	2.02[-2]	2.56[-2]	3.04[-2]	3.24[-2]	3.11[-2]
$2p^*4p4p$	7.35[-4]	2.77[-3]	6.26[-3]	8.91[-3]	1.29[-2]	1.44[-2]	1.63[-2]	1.85[-2]	2.03[-2]	2.12[-2]
$2p^*4p4d^*$	1.34[-2]	6.26[-2]	1.71[-1]	2.66[-1]	4.18[-1]	4.75[-1]	5.47[-1]	6.22[-1]	6.79[-1]	7.11[-1]
$2p^*4p4d$	1.84[-3]	7.84[-3]	1.97[-2]	2.93[-2]	4.36[-2]	4.86[-2]	5.47[-2]	6.03[-2]	6.39[-2]	6.49[-2]
$2p^*4p4f^*$	2.98[-6]	2.17[-4]	2.59[-3]	6.72[-3]	1.55[-2]	1.89[-2]	2.28[-2]	2.55[-2]	2.55[-2]	2.29[-2]
$2p^*4p4f$	1.90[-6]	1.34[-4]	1.55[-3]	3.95[-3]	8.85[-3]	1.07[-2]	1.27[-2]	1.40[-2]	1.36[-2]	1.19[-2]
$2p^*4d^*4d^*$	9.30[-3]	4.58[-2]	1.28[-1]	1.98[-1]	3.05[-1]	3.42[-1]	3.86[-1]	4.25[-1]	4.45[-1]	4.42[-1]
$2p^*4d^*4d$	4.25[-2]	2.04[-1]	5.54[-1]	8.47[-1]	1.27[0]	1.42[0]	1.58[0]	1.72[0]	1.77[0]	1.74[0]
$2p^*4d^*4f^*$	8.52[-6]	7.55[-4]	1.06[-2]	3.02[-2]	7.83[-2]	9.98[-2]	1.28[-1]	1.57[-1]	1.74[-1]	1.75[-1]
$2p^*4d^*4f$	1.90[-5]	1.67[-3]	2.34[-2]	6.63[-2]	1.71[-1]	2.16[-1]	2.76[-1]	3.32[-1]	3.60[-1]	3.55[-1]
$2p^*4d4d$	2.03[-3]	9.61[-3]	2.59[-2]	3.95[-2]	5.89[-2]	6.53[-2]	7.22[-2]	7.73[-2]	7.79[-2]	7.39[-2]
$2p^*4d4f^*$	4.42[-6]	3.61[-4]	4.89[-3]	1.37[-2]	3.57[-2]	4.57[-2]	5.92[-2]	7.32[-2]	8.23[-2]	8.43[-2]
$2p^*4d4f$	2.05[-6]	1.61[-4]	2.07[-3]	5.64[-3]	1.40[-2]	1.76[-2]	2.23[-2]	2.68[-2]	2.92[-2]	2.89[-2]
$2p^*4f^*4f$	4.81[-9]	7.39[-6]	5.39[-4]	2.87[-3]	1.30[-2]	1.90[-2]	2.81[-2]	3.80[-2]	4.40[-2]	4.39[-2]
$2p^*4s5p^*$	3.80[-3]	1.35[-2]	3.06[-2]	4.41[-2]	6.56[-2]	7.44[-2]	8.75[-2]	1.06[-1]	1.29[-1]	1.58[-1]
$2p^*4s5p$	3.24[-4]	1.26[-3]	3.14[-3]	4.77[-3]	7.54[-3]	8.67[-3]	1.03[-2]	1.23[-2]	1.44[-2]	1.63[-2]
$2p^*4p^*5s$	3.49[-3]	1.37[-2]	3.28[-2]	4.86[-2]	7.46[-2]	8.54[-2]	1.01[-1]	1.24[-1]	1.51[-1]	1.85[-1]
$2p^*4p^*5p^*$	5.44[-3]	2.32[-2]	5.76[-2]	8.60[-2]	1.33[-1]	1.52[-1]	1.81[-1]	2.20[-1]	2.68[-1]	3.28[-1]
$2p^*4p^*5p$	9.68[-3]	4.15[-2]	1.03[-1]	1.53[-1]	2.32[-1]	2.64[-1]	3.07[-1]	3.61[-1]	4.19[-1]	4.77[-1]
$2p^*4p^*5d^*$	4.15[-3]	1.92[-2]	5.18[-2]	8.00[-2]	1.24[-1]	1.41[-1]	1.62[-1]	1.85[-1]	2.04[-1]	2.18[-1]
$2p^*4p^*5d$	7.82[-3]	3.48[-2]	9.02[-2]	1.36[-1]	2.03[-1]	2.26[-1]	2.54[-1]	2.81[-1]	2.99[-1]	3.03[-1]
$2p^*4p5s$	2.86[-4]	1.18[-3]	3.03[-3]	4.65[-3]	7.37[-3]	8.47[-3]	1.00[-2]	1.19[-2]	1.37[-2]	1.54[-2]
$2p^*4p5p^*$	9.40[-3]	3.93[-2]	9.46[-2]	1.38[-1]	2.05[-1]	2.31[-1]	2.66[-1]	3.09[-1]	3.55[-1]	3.99[-1]
$2p^*4p5p$	5.08[-4]	2.11[-3]	5.05[-3]	7.38[-3]	1.10[-2]	1.23[-2]	1.42[-2]	1.62[-2]	1.80[-2]	1.89[-2]
$2p^*4p5d^*$	5.67[-3]	2.70[-2]	7.50[-2]	1.18[-1]	1.86[-1]	2.11[-1]	2.44[-1]	2.79[-1]	3.07[-1]	3.24[-1]
$2p^*4p5d$	7.71[-4]	3.34[-3]	8.51[-3]	1.28[-2]	1.91[-2]	2.14[-2]	2.42[-2]	2.68[-2]	2.87[-2]	2.94[-2]
$2p^*4d^*5s$	1.84[-4]	6.39[-4]	1.40[-3]	2.07[-3]	3.41[-3]	4.08[-3]	5.22[-3]	7.12[-3]	1.01[-2]	1.44[-2]
$2p^*4d^*5p^*$	3.31[-3]	1.62[-2]	4.46[-2]	6.90[-2]	1.07[-1]	1.21[-1]	1.38[-1]	1.56[-1]	1.69[-1]	1.76[-1]
$2p^*4d^*5p$	4.68[-3]	2.44[-2]	7.13[-2]	1.15[-1]	1.86[-1]	2.13[-1]	2.48[-1]	2.85[-1]	3.14[-1]	3.30[-1]
$2p^*4d^*5d^*$	7.85[-3]	3.94[-2]	1.12[-1]	1.75[-1]	2.71[-1]	3.05[-1]	3.46[-1]	3.83[-1]	4.04[-1]	4.04[-1]
$2p^*4d^*5d$	1.80[-2]	8.88[-2]	2.48[-1]	3.86[-1]	5.91[-1]	6.62[-1]	7.45[-1]	8.17[-1]	8.52[-1]	8.43[-1]
$2p^*4d^*5f^*$	8.64[-6]	6.55[-4]	8.80[-3]	2.39[-2]	5.87[-2]	7.36[-2]	9.31[-2]	1.12[-1]	1.24[-1]	1.25[-1]
$2p^*4d^*5f$	1.88[-5]	1.45[-3]	1.94[-2]	5.24[-2]	1.28[-1]	1.59[-1]	2.00[-1]	2.37[-1]	2.57[-1]	2.53[-1]
$2p^*4d5p^*$	6.20[-3]	2.89[-2]	7.48[-2]	1.11[-1]	1.63[-1]	1.80[-1]	2.01[-1]	2.18[-1]	2.28[-1]	2.27[-1]
$2p^*4d5p$	6.37[-4]	3.01[-3]	8.05[-3]	1.23[-2]	1.89[-2]	2.12[-2]	2.40[-2]	2.68[-2]	2.86[-2]	2.92[-2]
$2p^*4d5d^*$	1.78[-2]	8.59[-2]	2.34[-1]	3.56[-1]	5.33[-1]	5.92[-1]	6.59[-1]	7.16[-1]	7.41[-1]	7.30[-1]
$2p^*4d5d$	1.71[-3]	8.23[-3]	2.26[-2]	3.47[-2]	5.23[-2]	5.81[-2]	6.46[-2]	6.96[-2]	7.08[-2]	6.77[-2]
$2p^*4f5d^*$	7.85[-6]	6.82[-4]	9.40[-3]	2.62[-2]	6.63[-2]	8.36[-2]	1.06[-1]	1.27[-1]	1.38[-1]	1.36[-1]
$2p^*4s6p^*$	1.76[-3]	6.57[-3]	1.52[-2]	2.21[-2]	3.31[-2]	3.76[-2]	4.42[-2]	5.35[-2]	6.52[-2]	7.99[-2]
$2p^*4p^*6s$	1.55[-3]	6.61[-3]	1.67[-2]	2.53[-2]	3.98[-2]	4.59[-2]	5.49[-2]	6.72[-2]	8.27[-2]	1.01[-1]
$2p^*4p^*6p^*$	2.54[-3]	1.15[-2]	2.93[-2]	4.44[-2]	6.95[-2]	7.99[-2]	9.52[-2]	1.16[-1]	1.42[-1]	1.74[-1]
$2p^*4p^*6p$	4.56[-3]	2.07[-2]	5.34[-2]	8.08[-2]	1.25[-1]	1.43[-1]	1.67[-1]	1.98[-1]	2.32[-1]	2.65[-1]
$2p^*4p^*6d^*$	2.16[-3]	1.02[-2]	2.81[-2]	4.37[-2]	6.86[-2]	7.79[-2]	9.00[-2]	1.03[-1]	1.15[-1]	1.23[-1]
$2p^*4p^*6d$	4.07[-3]	1.85[-2]	4.90[-2]	7.44[-2]	1.13[-1]	1.26[-1]	1.43[-1]	1.59[-1]	1.69[-1]	1.73[-1]
$2p^*4p6p^*$	4.37[-3]	1.92[-2]	4.73[-2]	6.96[-2]	1.04[-1]	1.17[-1]	1.35[-1]	1.57[-1]	1.80[-1]	2.02[-1]
$2p^*4p6d^*$	2.94[-3]	1.42[-2]	4.00[-2]	6.30[-2]	9.97[-2]	1.14[-1]	1.31[-1]	1.50[-1]	1.66[-1]	1.76[-1]
$2p^*4p6d$	3.99[-4]	1.75[-3]	4.50[-3]	6.78[-3]	1.02[-2]	1.14[-2]	1.30[-2]	1.45[-2]	1.55[-2]	1.60[-2]
$2p^*4d^*6p^*$	1.54[-3]	7.92[-3]	2.24[-2]	3.50[-2]	5.48[-2]	6.19[-2]	7.09[-2]	7.99[-2]	8.65[-2]	8.99[-2]
$2p^*4d^*6p$	2.20[-3]	1.21[-2]	3.68[-2]	6.03[-2]	9.94[-2]	1.14[-1]	1.34[-1]	1.55[-1]	1.71[-1]	1.81[-1]
$2p^*4d^*6d^*$	4.06[-3]	2.08[-2]	5.96[-2]	9.39[-2]	1.46[-1]	1.65[-1]	1.87[-1]	2.08[-1]	2.20[-1]	2.21[-1]
$2p^*4d^*6d$	9.33[-3]	4.72[-2]	1.34[-1]	2.10[-1]	3.25[-1]	3.64[-1]	4.12[-1]	4.54[-1]	4.76[-1]	4.73[-1]
$2p^*4d^*6f^*$	5.30[-6]	4.92[-4]	6.23[-3]	1.64[-2]	3.91[-2]	4.87[-2]	6.13[-2]	7.34[-2]	8.08[-2]	8.15[-2]

	$Z = 32$	$Z = 36$	$Z = 42$	$Z = 47$	$Z = 56$	$Z = 60$	$Z = 66$	$Z = 74$	$Z = 83$	$Z = 92$
Zn-like ions										
$2p^*4d^*6f$	1.19[-5]	1.08[-3]	1.37[-2]	3.60[-2]	8.51[-2]	1.05[-1]	1.31[-1]	1.55[-1]	1.68[-1]	1.65[-1]
$2p^*4d6p^*$	2.87[-3]	1.40[-2]	3.69[-2]	5.53[-2]	8.12[-2]	8.98[-2]	9.98[-2]	1.08[-1]	1.13[-1]	1.12[-1]
$2p^*4d6p$	2.98[-4]	1.49[-3]	4.12[-3]	6.40[-3]	9.95[-3]	1.12[-2]	1.28[-2]	1.43[-2]	1.54[-2]	1.57[-2]
$2p^*4d6d^*$	9.20[-3]	4.48[-2]	1.22[-1]	1.86[-1]	2.78[-1]	3.08[-1]	3.43[-1]	3.72[-1]	3.85[-1]	3.80[-1]
$2p^*4d6d$	8.86[-4]	4.33[-3]	1.20[-2]	1.86[-2]	2.81[-2]	3.13[-2]	3.49[-2]	3.77[-2]	3.85[-2]	3.70[-2]
$2p^*4d6f^*$	2.84[-6]	2.26[-4]	2.77[-3]	7.20[-3]	1.71[-2]	2.13[-2]	2.69[-2]	3.24[-2]	3.59[-2]	3.66[-2]
$2p^*4f^*6d^*$	1.82[-6]	1.58[-4]	2.16[-3]	6.00[-3]	1.51[-2]	1.91[-2]	2.43[-2]	2.94[-2]	3.26[-2]	3.32[-2]
$2p^*4f6d^*$	4.04[-6]	3.51[-4]	4.80[-3]	1.33[-2]	3.33[-2]	4.19[-2]	5.29[-2]	6.31[-2]	6.85[-2]	6.78[-2]
$2p^*4s7p^*$	9.65[-4]	3.70[-3]	8.71[-3]	1.27[-2]	1.91[-2]	2.18[-2]	2.56[-2]	3.10[-2]	3.79[-2]	4.64[-2]
$2p^*4p^*7s$	8.21[-4]	3.69[-3]	9.67[-3]	1.49[-2]	2.37[-2]	2.75[-2]	3.30[-2]	4.06[-2]	5.00[-2]	6.14[-2]
$2p^*4p^*7p^*$	1.40[-3]	6.50[-3]	1.70[-2]	2.60[-2]	4.11[-2]	4.73[-2]	5.66[-2]	6.92[-2]	8.48[-2]	1.04[-1]
$2p^*4p^*7p$	2.51[-3]	1.18[-2]	3.13[-2]	4.79[-2]	7.52[-2]	8.61[-2]	1.01[-1]	1.21[-1]	1.41[-1]	1.62[-1]
$2p^*4p^*7d^*$	1.27[-3]	6.09[-3]	1.70[-2]	2.65[-2]	4.19[-2]	4.77[-2]	5.53[-2]	6.36[-2]	7.09[-2]	7.63[-2]
$2p^*4p^*7d$	2.39[-3]	1.11[-2]	2.96[-2]	4.53[-2]	6.91[-2]	7.76[-2]	8.80[-2]	9.83[-2]	1.05[-1]	1.08[-1]
$2p^*4p7s$	6.67[-5]	3.15[-4]	8.71[-4]	1.38[-3]	2.26[-3]	2.61[-3]	3.11[-3]	3.70[-3]	4.28[-3]	4.79[-3]
$2p^*4p7p^*$	2.39[-3]	1.08[-2]	2.71[-2]	4.02[-2]	6.04[-2]	6.81[-2]	7.86[-2]	9.14[-2]	1.05[-1]	1.18[-1]
$2p^*4p7d^*$	1.73[-3]	8.44[-3]	2.39[-2]	3.78[-2]	5.99[-2]	6.83[-2]	7.90[-2]	9.05[-2]	1.00[-1]	1.06[-1]
$2p^*4d^*7p^*$	8.43[-4]	4.47[-3]	1.28[-2]	2.03[-2]	3.20[-2]	3.63[-2]	4.15[-2]	4.68[-2]	5.06[-2]	5.25[-2]
$2p^*4d^*7p$	1.21[-3]	6.87[-3]	2.17[-2]	3.54[-2]	5.94[-2]	6.88[-2]	8.08[-2]	9.38[-2]	1.04[-1]	1.10[-1]
$2p^*4d^*7d^*$	2.38[-3]	1.23[-2]	3.56[-2]	5.62[-2]	8.81[-2]	9.95[-2]	1.13[-1]	1.26[-1]	1.33[-1]	1.34[-1]
$2p^*4d^*7d$	5.49[-3]	2.79[-2]	8.07[-2]	1.26[-1]	1.97[-1]	2.23[-1]	2.51[-1]	2.79[-1]	2.93[-1]	2.93[-1]
$2p^*4d7p^*$	1.57[-3]	7.86[-3]	2.11[-2]	3.17[-2]	4.67[-2]	5.16[-2]	5.73[-2]	6.22[-2]	6.45[-2]	6.38[-2]
$2p^*4d7d^*$	5.38[-3]	2.64[-2]	7.23[-2]	1.10[-1]	1.64[-1]	1.82[-1]	2.02[-1]	2.20[-1]	2.27[-1]	2.25[-1]
$2p^*4d7d$	5.19[-4]	2.56[-3]	7.19[-3]	1.11[-2]	1.69[-2]	1.89[-2]	2.11[-2]	2.28[-2]	2.33[-2]	2.25[-2]
$2p^*5s5p^*$	1.19[-3]	5.05[-3]	1.26[-2]	1.89[-2]	2.94[-2]	3.37[-2]	4.01[-2]	4.90[-2]	6.02[-2]	7.39[-2]
$2p^*5p^*5p^*$	9.38[-4]	4.42[-3]	1.16[-2]	1.77[-2]	2.79[-2]	3.22[-2]	3.85[-2]	4.70[-2]	5.77[-2]	7.07[-2]
$2p^*5p^*5p$	3.30[-3]	1.54[-2]	3.99[-2]	6.02[-2]	9.25[-2]	1.05[-1]	1.23[-1]	1.44[-1]	1.68[-1]	1.90[-1]
$2p^*5p^*5d^*$	1.41[-3]	7.13[-3]	2.02[-2]	3.17[-2]	5.00[-2]	5.68[-2]	6.54[-2]	7.45[-2]	8.18[-2]	8.65[-2]
$2p^*5p^*5d$	2.64[-3]	1.27[-2]	3.41[-2]	5.18[-2]	7.77[-2]	8.66[-2]	9.73[-2]	1.07[-1]	1.13[-1]	1.14[-1]
$2p^*5p^*5f^*$	6.71[-7]	5.83[-5]	7.67[-4]	2.07[-3]	5.08[-3]	6.41[-3]	8.19[-3]	1.01[-2]	1.15[-2]	1.22[-2]
$2p^*5p5d^*$	1.98[-3]	1.05[-2]	3.13[-2]	5.07[-2]	8.26[-2]	9.49[-2]	1.11[-1]	1.28[-1]	1.42[-1]	1.51[-1]
$2p^*5p5d$	2.67[-4]	1.28[-3]	3.49[-3]	5.37[-3]	8.29[-3]	9.34[-3]	1.07[-2]	1.19[-2]	1.29[-2]	1.33[-2]
$2p^*5d^*5d^*$	1.66[-3]	8.45[-3]	2.44[-2]	3.85[-2]	6.02[-2]	6.78[-2]	7.71[-2]	8.57[-2]	9.10[-2]	9.18[-2]
$2p^*5d^*5d$	7.55[-3]	3.74[-2]	1.05[-1]	1.63[-1]	2.48[-1]	2.77[-1]	3.12[-1]	3.42[-1]	3.58[-1]	3.56[-1]
$2p^*5d^*5f^*$	3.45[-6]	2.69[-4]	3.52[-3]	9.43[-3]	2.27[-2]	2.84[-2]	3.57[-2]	4.28[-2]	4.72[-2]	4.80[-2]
$2p^*5d^*5f$	7.56[-6]	5.96[-4]	7.79[-3]	2.08[-2]	4.99[-2]	6.20[-2]	7.73[-2]	9.15[-2]	9.89[-2]	9.80[-2]
$2p^*5d5d$	3.60[-4]	1.76[-3]	4.93[-3]	7.63[-3]	1.16[-2]	1.29[-2]	1.45[-2]	1.57[-2]	1.61[-2]	1.55[-2]
$2p^*5d5f^*$	1.60[-6]	1.28[-4]	1.62[-3]	4.31[-3]	1.05[-2]	1.33[-2]	1.69[-2]	2.07[-2]	2.32[-2]	2.40[-2]
$2p^*5s6p^*$	5.51[-4]	2.45[-3]	6.28[-3]	9.48[-3]	1.48[-2]	1.70[-2]	2.03[-2]	2.48[-2]	3.05[-2]	3.75[-2]
$2p^*5p^*6s$	5.26[-4]	2.44[-3]	6.43[-3]	9.87[-3]	1.57[-2]	1.81[-2]	2.17[-2]	2.67[-2]	3.29[-2]	4.04[-2]
$2p^*5p^*6p^*$	8.76[-4]	4.36[-3]	1.18[-2]	1.83[-2]	2.92[-2]	3.37[-2]	4.04[-2]	4.95[-2]	6.09[-2]	7.46[-2]
$2p^*5p^*6p$	1.55[-3]	7.69[-3]	2.07[-2]	3.18[-2]	4.98[-2]	5.70[-2]	6.70[-2]	7.93[-2]	9.26[-2]	1.06[-1]
$2p^*5p^*6d^*$	7.36[-4]	3.80[-3]	1.09[-2]	1.73[-2]	2.76[-2]	3.14[-2]	3.63[-2]	4.15[-2]	4.59[-2]	4.89[-2]
$2p^*5p^*6d$	1.37[-3]	6.78[-3]	1.86[-2]	2.85[-2]	4.32[-2]	4.84[-2]	5.46[-2]	6.05[-2]	6.43[-2]	6.52[-2]
$2p^*5p6p^*$	1.53[-3]	7.51[-3]	1.99[-2]	3.03[-2]	4.69[-2]	5.34[-2]	6.24[-2]	7.34[-2]	8.52[-2]	9.66[-2]
$2p^*5p6d^*$	1.03[-3]	5.54[-3]	1.67[-2]	2.71[-2]	4.44[-2]	5.10[-2]	5.96[-2]	6.89[-2]	7.67[-2]	8.19[-2]
$2p^*5d^*6p^*$	6.57[-4]	3.48[-3]	1.01[-2]	1.61[-2]	2.56[-2]	2.91[-2]	3.35[-2]	3.82[-2]	4.18[-2]	4.40[-2]
$2p^*5d^*6p$	9.28[-4]	5.24[-3]	1.62[-2]	2.67[-2]	4.42[-2]	5.10[-2]	5.99[-2]	6.95[-2]	7.75[-2]	8.26[-2]
$2p^*5d^*6d^*$	1.72[-3]	8.91[-3]	2.61[-2]	4.13[-2]	6.47[-2]	7.30[-2]	8.32[-2]	9.28[-2]	9.87[-2]	1.00[-1]
$2p^*5d^*6d$	3.90[-3]	1.99[-2]	5.66[-2]	8.85[-2]	1.36[-1]	1.53[-1]	1.73[-1]	1.91[-1]	2.00[-1]	2.00[-1]
$2p^*5d6p^*$	1.22[-3]	6.15[-3]	1.69[-2]	2.57[-2]	3.87[-2]	4.31[-2]	4.84[-2]	5.32[-2]	5.60[-2]	5.62[-2]
$2p^*5d6p$	1.25[-4]	6.34[-4]	1.78[-3]	2.80[-3]	4.38[-3]	4.96[-3]	5.68[-3]	6.40[-3]	6.92[-3]	7.16[-3]
$2p^*5d6d^*$	3.90[-3]	1.95[-2]	5.49[-2]	8.51[-2]	1.30[-1]	1.45[-1]	1.62[-1]	1.78[-1]	1.87[-1]	1.86[-1]
$2p^*5d6d$	3.73[-4]	1.85[-3]	5.25[-3]	8.17[-3]	1.25[-2]	1.39[-2]	1.56[-2]	1.70[-2]	1.75[-2]	1.69[-2]
$2p^*5s7p^*$	3.01[-4]	1.38[-3]	3.59[-3]	5.47[-3]	8.57[-3]	9.86[-3]	1.18[-2]	1.44[-2]	1.77[-2]	2.18[-2]
$2p^*5p^*7s$	2.79[-4]	1.36[-3]	3.72[-3]	5.79[-3]	9.34[-3]	1.08[-2]	1.31[-2]	1.61[-2]	1.99[-2]	2.45[-2]
$2p^*5p^*7p^*$	4.81[-4]	2.47[-3]	6.85[-3]	1.07[-2]	1.72[-2]	2.00[-2]	2.40[-2]	2.94[-2]	3.62[-2]	4.44[-2]

	$Z = 32$	$Z = 36$	$Z = 42$	$Z = 47$	$Z = 56$	$Z = 60$	$Z = 66$	$Z = 74$	$Z = 83$	$Z = 92$
Zn-like ions										
$2p^*5p^*7p$	8.54[-4]	4.40[-3]	1.21[-2]	1.89[-2]	2.99[-2]	3.44[-2]	4.06[-2]	4.83[-2]	5.65[-2]	6.47[-2]
$2p^*5p^*7d^*$	4.32[-4]	2.26[-3]	6.60[-3]	1.05[-2]	1.68[-2]	1.92[-2]	2.22[-2]	2.55[-2]	2.83[-2]	3.02[-2]
$2p^*5p^*7d$	8.08[-4]	4.04[-3]	1.12[-2]	1.73[-2]	2.65[-2]	2.98[-2]	3.37[-2]	3.75[-2]	4.00[-2]	4.07[-2]
$2p^*5p7p^*$	8.39[-4]	4.24[-3]	1.14[-2]	1.75[-2]	2.72[-2]	3.10[-2]	3.63[-2]	4.27[-2]	4.95[-2]	5.61[-2]
$2p^*5p7d^*$	6.03[-4]	3.29[-3]	9.99[-3]	1.63[-2]	2.67[-2]	3.07[-2]	3.59[-2]	4.15[-2]	4.63[-2]	4.96[-2]
$2p^*5d^*7p^*$	3.59[-4]	1.97[-3]	5.81[-3]	9.33[-3]	1.49[-2]	1.70[-2]	1.96[-2]	2.23[-2]	2.44[-2]	2.56[-2]
$2p^*5d^*7p$	5.13[-4]	2.96[-3]	9.46[-3]	1.57[-2]	2.65[-2]	3.07[-2]	3.60[-2]	4.20[-2]	4.69[-2]	5.04[-2]
$2p^*5d^*7d^*$	1.01[-3]	5.28[-3]	1.55[-2]	2.48[-2]	3.90[-2]	4.40[-2]	5.02[-2]	5.60[-2]	5.98[-2]	6.07[-2]
$2p^*5d^*7d$	2.30[-3]	1.18[-2]	3.39[-2]	5.36[-2]	8.33[-2]	9.34[-2]	1.06[-1]	1.17[-1]	1.23[-1]	1.24[-1]
$2p^*5d^*7f$	3.53[-6]	3.11[-4]	3.73[-3]	9.97[-3]	2.26[-2]	2.75[-2]	3.44[-2]	4.02[-2]	4.36[-2]	4.30[-2]
$2p^*5d7p^*$	6.68[-4]	3.46[-3]	9.61[-3]	1.47[-2]	2.22[-2]	2.48[-2]	2.78[-2]	3.06[-2]	3.21[-2]	3.21[-2]
$2p^*5d7d^*$	2.28[-3]	1.15[-2]	3.25[-2]	5.03[-2]	7.66[-2]	8.55[-2]	9.60[-2]	1.05[-1]	1.10[-1]	1.10[-1]
$2p^*5d7d$	2.18[-4]	1.10[-3]	3.13[-3]	4.90[-3]	7.52[-3]	8.40[-3]	9.42[-3]	1.03[-2]	1.06[-2]	1.03[-2]
$2p^*6s6p^*$	2.44[-4]	1.19[-3]	3.20[-3]	4.95[-3]	7.90[-3]	9.15[-3]	1.10[-2]	1.35[-2]	1.67[-2]	2.05[-2]
$2p^*6p^*6p^*$	2.05[-4]	1.07[-3]	3.00[-3]	4.71[-3]	7.60[-3]	8.82[-3]	1.06[-2]	1.30[-2]	1.60[-2]	1.97[-2]
$2p^*6p^*6p$	7.22[-4]	3.75[-3]	1.03[-2]	1.60[-2]	2.53[-2]	2.89[-2]	3.40[-2]	4.03[-2]	4.70[-2]	5.36[-2]
$2p^*6p^*6d^*$	3.42[-4]	1.85[-3]	5.48[-3]	8.77[-3]	1.41[-2]	1.61[-2]	1.86[-2]	2.13[-2]	2.34[-2]	2.48[-2]
$2p^*6p^*6d$	6.37[-4]	3.28[-3]	9.16[-3]	1.41[-2]	2.15[-2]	2.41[-2]	2.72[-2]	3.01[-2]	3.18[-2]	3.21[-2]
$2p^*6p6d^*$	4.81[-4]	2.77[-3]	8.64[-3]	1.43[-2]	2.37[-2]	2.74[-2]	3.23[-2]	3.75[-2]	4.19[-2]	4.49[-2]
$2p^*6d^*6d^*$	4.44[-4]	2.35[-3]	6.95[-3]	1.10[-2]	1.74[-2]	1.96[-2]	2.24[-2]	2.51[-2]	2.67[-2]	2.72[-2]
$2p^*6d^*6d$	2.02[-3]	1.04[-2]	2.97[-2]	4.63[-2]	7.13[-2]	7.99[-2]	9.01[-2]	9.94[-2]	1.05[-1]	1.05[-1]
$2p^*6d^*6f^*$	1.17[-6]	9.76[-5]	1.28[-3]	3.25[-3]	7.63[-3]	9.44[-3]	1.17[-2]	1.40[-2]	1.54[-2]	1.58[-2]
$2p^*6d^*6f$	2.60[-6]	2.18[-4]	2.83[-3]	7.22[-3]	1.68[-2]	2.07[-2]	2.56[-2]	3.01[-2]	3.25[-2]	3.23[-2]
$2p^*6s7p^*$	1.33[-4]	6.69[-4]	1.83[-3]	2.85[-3]	4.58[-3]	5.30[-3]	6.38[-3]	7.84[-3]	9.68[-3]	1.19[-2]
$2p^*6p^*7s$	1.30[-4]	6.63[-4]	1.85[-3]	2.90[-3]	4.71[-3]	5.48[-3]	6.61[-3]	8.16[-3]	1.01[-2]	1.24[-2]
$2p^*6p^*7p^*$	2.25[-4]	1.22[-3]	3.48[-3]	5.51[-3]	8.97[-3]	1.04[-2]	1.26[-2]	1.55[-2]	1.91[-2]	2.34[-2]
$2p^*6p^*7p$	3.97[-4]	2.14[-3]	6.07[-3]	9.51[-3]	1.52[-2]	1.75[-2]	2.06[-2]	2.45[-2]	2.87[-2]	3.28[-2]
$2p^*6p^*7d^*$	2.01[-4]	1.10[-3]	3.31[-3]	5.32[-3]	8.58[-3]	9.81[-3]	1.14[-2]	1.31[-2]	1.44[-2]	1.54[-2]
$2p^*6p^*7d$	3.74[-4]	1.96[-3]	5.54[-3]	8.61[-3]	1.32[-2]	1.48[-2]	1.68[-2]	1.86[-2]	1.98[-2]	2.01[-2]
$2p^*6p7p^*$	3.95[-4]	2.12[-3]	5.94[-3]	9.26[-3]	1.47[-2]	1.68[-2]	1.98[-2]	2.35[-2]	2.74[-2]	3.12[-2]
$2p^*6p7d^*$	2.82[-4]	1.64[-3]	5.17[-3]	8.56[-3]	1.43[-2]	1.65[-2]	1.94[-2]	2.26[-2]	2.53[-2]	2.72[-2]
$2p^*6d^*7p^*$	1.87[-4]	1.05[-3]	3.15[-3]	5.09[-3]	8.21[-3]	9.37[-3]	1.09[-2]	1.24[-2]	1.37[-2]	1.44[-2]
$2p^*6d^*7p$	2.67[-4]	1.56[-3]	5.03[-3]	8.42[-3]	1.42[-2]	1.65[-2]	1.94[-2]	2.27[-2]	2.54[-2]	2.73[-2]
$2p^*6d^*7d^*$	5.21[-4]	2.78[-3]	8.28[-3]	1.33[-2]	2.09[-2]	2.36[-2]	2.71[-2]	3.03[-2]	3.24[-2]	3.29[-2]
$2p^*6d^*7d$	1.19[-3]	6.14[-3]	1.77[-2]	2.82[-2]	4.35[-2]	4.87[-2]	5.54[-2]	6.10[-2]	6.46[-2]	6.48[-2]
$2p^*6d7p^*$	3.48[-4]	1.84[-3]	5.23[-3]	8.10[-3]	1.24[-2]	1.39[-2]	1.56[-2]	1.73[-2]	1.82[-2]	1.84[-2]
$2p^*6d7d^*$	1.18[-3]	6.10[-3]	1.76[-2]	2.74[-2]	4.22[-2]	4.73[-2]	5.33[-2]	5.88[-2]	6.19[-2]	6.21[-2]
$2p^*7p^*7p$	2.17[-4]	1.21[-3]	3.48[-3]	5.50[-3]	8.82[-3]	1.01[-2]	1.20[-2]	1.43[-2]	1.67[-2]	1.91[-2]
$2p^*7p^*7d$	2.04[-4]	1.10[-3]	3.16[-3]	4.93[-3]	7.60[-3]	8.53[-3]	9.65[-3]	1.07[-2]	1.13[-2]	1.15[-2]
$2p^*7p7d^*$	1.56[-4]	9.27[-4]	3.00[-3]	5.06[-3]	8.56[-3]	9.89[-3]	1.17[-2]	1.37[-2]	1.54[-2]	1.65[-2]
$2p^*7d^*7d$	6.94[-4]	3.63[-3]	1.05[-2]	1.67[-2]	2.58[-2]	2.88[-2]	3.28[-2]	3.61[-2]	3.82[-2]	3.83[-2]
$2p^*7d^*7f$	1.09[-6]	9.37[-5]	1.13[-3]	2.95[-3]	6.58[-3]	8.07[-3]	1.00[-2]	1.17[-2]	1.26[-2]	1.25[-2]

TABLE IV.  $L_3$ -shell Auger rates  $A(n_0j_0l_0, n_1j_1l_1, n_2j_2l_2)$  (in mau) as function of  $Z$  for Ni-, Cu-, and Zn-like ions.

	$Z=32$	$Z=36$	$Z=42$	$Z=47$	$Z=56$	$Z=60$	$Z=66$	$Z=74$	$Z=83$	$Z=92$
Ni-like ions										
$2p3s3s$	8.70[-2]	9.46[-2]	1.08[-1]	1.19[-1]	1.37[-1]	1.43[-1]	1.43[-1]	1.59[-1]	1.57[-1]	1.36[-1]
$2p3s3p^*$	5.98[-2]	6.80[-2]	8.12[-2]	9.07[-2]	1.03[-1]	1.06[-1]	1.06[-1]	1.09[-1]	1.04[-1]	9.20[-2]
$2p3s3p$	1.63[0]	1.83[0]	2.18[0]	2.48[0]	2.98[0]	3.20[0]	3.20[0]	4.01[0]	4.62[0]	5.34[0]
$2p3s3d^*$	1.03[-1]	1.37[-1]	1.78[-1]	2.06[-1]	2.45[-1]	2.60[-1]	2.60[-1]	3.28[-1]	4.20[-1]	6.13[-1]
$2p3s3d$	1.36[-1]	1.66[-1]	2.02[-1]	2.29[-1]	2.81[-1]	3.12[-1]	3.12[-1]	5.15[-1]	8.14[-1]	1.39[0]
$2p3p^*3p$	2.48[0]	2.87[0]	3.55[0]	4.09[0]	5.01[0]	5.40[0]	5.40[0]	6.83[0]	7.89[0]	9.13[0]
$2p3p^*3d^*$	1.01[-1]	1.53[-1]	2.26[-1]	2.80[-1]	3.54[-1]	3.79[-1]	3.79[-1]	4.30[-1]	4.42[-1]	4.50[-1]
$2p3p^*3d$	9.80[-1]	1.43[0]	2.06[0]	2.50[0]	3.11[0]	3.31[0]	3.31[0]	3.69[0]	3.70[0]	3.56[0]
$2p3p3p$	3.59[0]	4.14[0]	5.05[0]	5.76[0]	6.85[0]	7.29[0]	7.29[0]	8.67[0]	9.52[0]	1.04[1]
$2p3p3d^*$	2.33[0]	3.32[0]	4.67[0]	5.64[0]	7.11[0]	7.69[0]	7.69[0]	9.48[0]	1.06[1]	1.17[1]
$2p3p3d$	3.45[0]	4.97[0]	7.05[0]	8.53[0]	1.07[1]	1.14[1]	1.14[1]	1.34[1]	1.44[1]	1.51[1]
$2p3d^*3d^*$	2.18[-1]	3.83[-1]	6.20[-1]	7.95[-1]	1.05[0]	1.15[0]	1.15[0]	1.41[0]	1.54[0]	1.64[0]
$2p3d^*3d$	4.44[0]	7.70[0]	1.23[1]	1.56[1]	2.04[1]	2.22[1]	2.22[1]	2.71[1]	2.96[1]	3.17[1]
$2p3d3d$	2.97[0]	5.18[0]	8.26[0]	1.05[1]	1.36[1]	1.47[1]	1.47[1]	1.77[1]	1.89[1]	1.99[1]
Cu-like ions										
$2p3s4p$	1.16[-1]	2.31[-1]	3.67[-1]	4.58[-1]	5.96[-1]	6.52[-1]	7.34[-1]	8.48[-1]	9.90[-1]	1.16[0]
$2p3s4d$	1.08[-2]	1.95[-2]	2.67[-2]	3.01[-2]	3.45[-2]	3.69[-2]	4.28[-2]	6.03[-2]	1.09[-1]	2.19[-1]
$2p3p^*4p$	1.80[-1]	3.72[-1]	6.15[-1]	7.83[-1]	1.04[0]	1.15[0]	1.30[0]	1.52[0]	1.78[0]	2.08[0]
$2p3p^*4d^*$	9.05[-3]	2.37[-2]	4.80[-2]	6.71[-2]	9.53[-2]	1.05[-1]	1.17[-1]	1.27[-1]	1.34[-1]	1.35[-1]
$2p3p^*4d$	8.66[-2]	2.12[-1]	4.01[-1]	5.39[-1]	7.33[-1]	7.98[-1]	8.72[-1]	9.34[-1]	9.53[-1]	9.19[-1]
$2p3p4s$	1.67[-1]	3.10[-1]	5.09[-1]	6.58[-1]	8.96[-1]	9.93[-1]	1.14[0]	1.33[0]	1.56[0]	1.83[0]
$2p3p4p^*$	2.05[-1]	4.43[-1]	7.72[-1]	1.02[0]	1.40[0]	1.56[0]	1.79[0]	2.10[0]	2.47[0]	2.87[0]
$2p3p4p$	5.66[-1]	1.19[0]	2.01[0]	2.59[0]	3.44[0]	3.76[0]	4.21[0]	4.77[0]	5.36[0]	5.96[0]
$2p3p4d^*$	2.09[-1]	5.20[-1]	1.01[0]	1.40[0]	2.00[0]	2.25[0]	2.59[0]	3.01[0]	3.48[0]	3.96[0]
$2p3p4d$	3.15[-1]	7.89[-1]	1.54[0]	2.12[0]	2.99[0]	3.32[0]	3.75[0]	4.24[0]	4.70[0]	5.09[0]
$2p3d^*4s$	1.01[-2]	2.20[-2]	3.90[-2]	5.11[-2]	6.88[-2]	7.56[-2]	8.57[-2]	1.01[-1]	1.26[-1]	1.69[-1]
$2p3d^*4p^*$	8.40[-3]	2.35[-2]	4.92[-2]	6.93[-2]	9.91[-2]	1.09[-1]	1.22[-1]	1.33[-1]	1.41[-1]	1.48[-1]
$2p3d^*4p$	1.63[-1]	4.11[-1]	7.65[-1]	1.02[0]	1.39[0]	1.52[0]	1.71[0]	1.94[0]	2.18[0]	2.42[0]
$2p3d^*4d^*$	3.81[-2]	1.14[-1]	2.48[-1]	3.56[-1]	5.25[-1]	5.89[-1]	6.73[-1]	7.69[-1]	8.57[-1]	9.27[-1]
$2p3d^*4d$	3.83[-1]	1.08[0]	2.21[0]	3.06[0]	4.31[0]	4.78[0]	5.39[0]	6.08[0]	6.75[0]	7.35[0]
$2p3d4s$	1.35[-2]	2.73[-2]	4.59[-2]	5.93[-2]	8.24[-2]	9.41[-2]	1.16[-1]	1.58[-1]	2.41[-1]	3.86[-1]
$2p3d4p^*$	7.80[-2]	2.11[-1]	4.23[-1]	5.83[-1]	8.10[-1]	8.84[-1]	9.67[-1]	1.03[0]	1.03[0]	9.73[-1]
$2p3d4p$	2.53[-1]	6.56[-1]	1.26[0]	1.71[0]	2.35[0]	2.59[0]	2.88[0]	3.19[0]	3.44[0]	3.62[0]
$2p3d4d^*$	3.89[-1]	1.15[0]	2.47[0]	3.52[0]	5.14[0]	5.75[0]	6.56[0]	7.48[0]	8.34[0]	9.07[0]
$2p3d4d$	5.24[-1]	1.53[0]	3.23[0]	4.55[0]	6.53[0]	7.26[0]	8.20[0]	9.24[0]	1.02[1]	1.09[1]
$2p3s5p$	3.97[-2]	8.58[-2]	1.42[-1]	1.79[-1]	2.35[-1]	2.58[-1]	2.91[-1]	3.37[-1]	3.94[-1]	4.62[-1]
$2p3s5f^*$	1.11[-5]	4.15[-4]	3.68[-3]	8.76[-3]	2.09[-2]	2.71[-2]	3.79[-2]	5.60[-2]	8.55[-2]	1.33[-1]
$2p3s5f$	1.91[-5]	7.66[-4]	6.84[-3]	1.64[-2]	3.89[-2]	5.04[-2]	6.95[-2]	1.00[-1]	1.48[-1]	2.20[-1]
$2p3p^*5p$	6.16[-2]	1.39[-1]	2.40[-1]	3.10[-1]	4.18[-1]	4.62[-1]	5.26[-1]	6.13[-1]	7.21[-1]	8.47[-1]
$2p3p^*5d$	3.64[-2]	9.06[-2]	1.74[-1]	2.35[-1]	3.20[-1]	3.48[-1]	3.81[-1]	4.08[-1]	4.17[-1]	4.03[-1]
$2p3p^*5f$	3.00[-5]	1.25[-3]	1.10[-2]	2.58[-2]	5.87[-2]	7.43[-2]	9.84[-2]	1.33[-1]	1.76[-1]	2.29[-1]
$2p3p5s$	5.22[-2]	1.16[-1]	2.09[-1]	2.81[-1]	3.99[-1]	4.47[-1]	5.18[-1]	6.12[-1]	7.24[-1]	8.49[-1]
$2p3p5p^*$	7.13[-2]	1.72[-1]	3.23[-1]	4.38[-1]	6.23[-1]	7.00[-1]	8.10[-1]	9.56[-1]	1.13[0]	1.31[0]
$2p3p5p$	1.96[-1]	4.58[-1]	8.22[-1]	1.09[0]	1.48[0]	1.63[0]	1.85[0]	2.11[0]	2.39[0]	2.67[0]
$2p3p5d^*$	8.88[-2]	2.27[-1]	4.56[-1]	6.39[-1]	9.35[-1]	1.05[0]	1.22[0]	1.44[0]	1.67[0]	1.91[0]
$2p3p5d$	1.34[-1]	3.45[-1]	6.93[-1]	9.67[-1]	1.39[0]	1.55[0]	1.76[0]	2.00[0]	2.24[0]	2.44[0]
$2p3p5f^*$	4.20[-5]	1.95[-3]	1.94[-2]	4.88[-2]	1.19[-1]	1.52[-1]	2.01[-1]	2.66[-1]	3.34[-1]	4.01[-1]
$2p3p5f$	6.28[-5]	2.84[-3]	2.75[-2]	6.76[-2]	1.59[-1]	2.01[-1]	2.61[-1]	3.35[-1]	4.10[-1]	4.77[-1]
$2p3d^*5p$	5.56[-2]	1.52[-1]	2.94[-1]	3.96[-1]	5.45[-1]	6.01[-1]	6.76[-1]	7.67[-1]	8.61[-1]	9.54[-1]
$2p3d^*5d^*$	1.61[-2]	4.92[-2]	1.09[-1]	1.58[-1]	2.36[-1]	2.65[-1]	3.05[-1]	3.49[-1]	3.90[-1]	4.23[-1]
$2p3d^*5d$	1.60[-1]	4.57[-1]	9.35[-1]	1.29[0]	1.81[0]	2.00[0]	2.24[0]	2.53[0]	2.80[0]	3.05[0]
$2p3d^*5f^*$	1.75[-5]	9.64[-4]	1.01[-2]	2.59[-2]	6.30[-2]	8.03[-2]	1.06[-1]	1.37[-1]	1.68[-1]	1.96[-1]
$2p3d^*5f$	6.26[-5]	3.45[-3]	3.69[-2]	9.44[-2]	2.29[-1]	2.92[-1]	3.81[-1]	4.90[-1]	5.96[-1]	6.86[-1]
$2p3d5s$	4.19[-3]	1.02[-2]	1.88[-2]	2.53[-2]	3.66[-2]	4.22[-2]	5.25[-2]	7.22[-2]	1.09[-1]	1.73[-1]
$2p3d5p^*$	2.70[-2]	8.13[-2]	1.74[-1]	2.47[-1]	3.51[-1]	3.86[-1]	4.25[-1]	4.53[-1]	4.54[-1]	4.26[-1]
$2p3d5p$	8.66[-2]	2.47[-1]	5.00[-1]	6.92[-1]	9.77[-1]	1.08[0]	1.21[0]	1.35[0]	1.46[0]	1.53[0]

	$Z = 32$	$Z = 36$	$Z = 42$	$Z = 47$	$Z = 56$	$Z = 60$	$Z = 66$	$Z = 74$	$Z = 83$	$Z = 92$
Cu-like ions										
$2p3d5d^*$	1.64[-1]	4.97[-1]	1.09[0]	1.56[0]	2.30[0]	2.58[0]	2.95[0]	3.37[0]	3.77[0]	4.10[0]
$2p3d5d$	2.21[-1]	6.55[-1]	1.40[0]	1.99[0]	2.88[0]	3.21[0]	3.64[0]	4.11[0]	4.54[0]	4.88[0]
$2p3d5f^*$	1.65[-4]	9.82[-3]	1.09[-1]	2.87[-1]	7.18[-1]	9.23[-1]	1.22[0]	1.60[0]	1.98[0]	2.31[0]
$2p3d5f$	1.58[-4]	9.42[-3]	1.04[-1]	2.72[-1]	6.77[-1]	8.66[-1]	1.14[0]	1.47[0]	1.79[0]	2.05[0]
$2p3s6s$	2.08[-3]	4.58[-3]	7.89[-3]	1.01[-2]	1.33[-2]	1.45[-2]	1.59[-2]	1.72[-2]	1.75[-2]	1.57[-2]
$2p3s6p$	1.85[-2]	4.18[-2]	7.06[-2]	9.01[-2]	1.19[-1]	1.31[-1]	1.48[-1]	1.71[-1]	2.00[-1]	2.35[-1]
$2p3s6d^*$	1.70[-3]	3.29[-3]	4.64[-3]	5.17[-3]	5.33[-3]	5.23[-3]	5.02[-3]	5.14[-3]	7.17[-3]	1.42[-2]
$2p3s6d$	2.29[-3]	3.91[-3]	5.00[-3]	5.29[-3]	5.41[-3]	5.46[-3]	5.87[-3]	8.10[-3]	1.61[-2]	3.69[-2]
$2p3p^*6p$	2.87[-2]	6.78[-2]	1.20[-1]	1.57[-1]	2.13[-1]	2.36[-1]	2.69[-1]	3.14[-1]	3.70[-1]	4.35[-1]
$2p3p^*6d^*$	2.00[-3]	5.48[-3]	1.16[-2]	1.65[-2]	2.39[-2]	2.65[-2]	2.96[-2]	3.27[-2]	3.49[-2]	3.61[-2]
$2p3p^*6d$	1.89[-2]	4.76[-2]	9.22[-2]	1.25[-1]	1.70[-1]	1.85[-1]	2.03[-1]	2.18[-1]	2.23[-1]	2.16[-1]
$2p3p6s$	2.31[-2]	5.58[-2]	1.06[-1]	1.46[-1]	2.12[-1]	2.39[-1]	2.79[-1]	3.32[-1]	3.94[-1]	4.62[-1]
$2p3p6p^*$	3.35[-2]	8.58[-2]	1.67[-1]	2.30[-1]	3.33[-1]	3.76[-1]	4.37[-1]	5.18[-1]	6.12[-1]	7.13[-1]
$2p3p6p$	9.20[-2]	2.27[-1]	4.21[-1]	5.64[-1]	7.82[-1]	8.66[-1]	9.83[-1]	1.13[0]	1.28[0]	1.44[0]
$2p3p6d^*$	4.62[-2]	1.21[-1]	2.47[-1]	3.49[-1]	5.15[-1]	5.83[-1]	6.78[-1]	7.99[-1]	9.33[-1]	1.07[0]
$2p3p6d$	6.97[-2]	1.83[-1]	3.74[-1]	5.27[-1]	7.63[-1]	8.53[-1]	9.73[-1]	1.11[0]	1.25[0]	1.36[0]
$2p3d^*6s$	1.38[-3]	3.89[-3]	7.95[-3]	1.10[-2]	1.57[-2]	1.76[-2]	2.04[-2]	2.45[-2]	3.07[-2]	4.04[-2]
$2p3d^*6p^*$	1.38[-3]	4.56[-3]	1.06[-2]	1.57[-2]	2.34[-2]	2.62[-2]	2.95[-2]	3.26[-2]	3.48[-2]	3.65[-2]
$2p3d^*6p$	2.59[-2]	7.39[-2]	1.46[-1]	1.99[-1]	2.75[-1]	3.04[-1]	3.42[-1]	3.88[-1]	4.36[-1]	4.83[-1]
$2p3d^*6d^*$	8.37[-3]	2.59[-2]	5.84[-2]	8.52[-2]	1.28[-1]	1.44[-1]	1.66[-1]	1.90[-1]	2.13[-1]	2.31[-1]
$2p3d^*6d$	8.29[-2]	2.38[-1]	4.90[-1]	6.76[-1]	9.45[-1]	1.04[0]	1.17[0]	1.31[0]	1.46[0]	1.58[0]
$2p3d6s$	1.84[-3]	4.89[-3]	9.58[-3]	1.31[-2]	1.95[-2]	2.26[-2]	2.83[-2]	3.91[-2]	5.90[-2]	9.29[-2]
$2p3d6p^*$	1.27[-2]	4.02[-2]	8.93[-2]	1.29[-1]	1.86[-1]	2.05[-1]	2.26[-1]	2.41[-1]	2.42[-1]	2.26[-1]
$2p3d6p$	4.04[-2]	1.21[-1]	2.53[-1]	3.54[-1]	5.07[-1]	5.62[-1]	6.33[-1]	7.08[-1]	7.68[-1]	8.07[-1]
$2p3d6d^*$	8.56[-2]	2.61[-1]	5.82[-1]	8.41[-1]	1.24[0]	1.40[0]	1.60[0]	1.83[0]	2.04[0]	2.22[0]
$2p3d6d$	1.15[-1]	3.44[-1]	7.48[-1]	1.07[0]	1.55[0]	1.73[0]	1.96[0]	2.22[0]	2.45[0]	2.64[0]
$2p3d6f^*$	1.29[-4]	6.85[-3]	7.68[-2]	1.94[-1]	4.71[-1]	5.99[-1]	7.86[-1]	1.02[0]	1.25[0]	1.45[0]
$2p3d6f$	1.24[-4]	6.53[-3]	7.34[-2]	1.84[-1]	4.44[-1]	5.62[-1]	7.33[-1]	9.38[-1]	1.13[0]	1.30[0]
$2p3s7p$	1.01[-2]	2.35[-2]	4.06[-2]	5.19[-2]	6.91[-2]	7.58[-2]	8.60[-2]	9.95[-2]	1.17[-1]	1.37[-1]
$2p3s7d$	1.33[-3]	2.29[-3]	2.82[-3]	3.01[-3]	2.98[-3]	3.02[-3]	3.15[-3]	4.35[-3]	8.86[-3]	2.05[-2]
$2p3p^*7p$	1.57[-2]	3.83[-2]	6.90[-2]	9.07[-2]	1.24[-1]	1.37[-1]	1.57[-1]	1.84[-1]	2.16[-1]	2.55[-1]
$2p3p^*7d^*$	1.17[-3]	3.26[-3]	6.97[-3]	9.97[-3]	1.45[-2]	1.61[-2]	1.80[-2]	2.00[-2]	2.14[-2]	2.22[-2]
$2p3p^*7d$	1.11[-2]	2.82[-2]	5.50[-2]	7.47[-2]	1.02[-1]	1.11[-1]	1.22[-1]	1.30[-1]	1.34[-1]	1.30[-1]
$2p3p7s$	1.23[-2]	3.12[-2]	6.15[-2]	8.59[-2]	1.26[-1]	1.43[-1]	1.68[-1]	2.00[-1]	2.38[-1]	2.79[-1]
$2p3p7p^*$	1.84[-2]	4.89[-2]	9.74[-2]	1.36[-1]	1.99[-1]	2.25[-1]	2.63[-1]	3.12[-1]	3.69[-1]	4.30[-1]
$2p3p7p$	5.05[-2]	1.29[-1]	2.45[-1]	3.31[-1]	4.64[-1]	5.16[-1]	5.88[-1]	6.77[-1]	7.73[-1]	8.69[-1]
$2p3p7d^*$	2.71[-2]	7.19[-2]	1.49[-1]	2.11[-1]	3.14[-1]	3.56[-1]	4.16[-1]	4.91[-1]	5.74[-1]	6.60[-1]
$2p3p7d$	4.09[-2]	1.09[-1]	2.26[-1]	3.19[-1]	4.65[-1]	5.20[-1]	5.95[-1]	6.81[-1]	7.66[-1]	8.40[-1]
$2p3d^*7s$	7.33[-4]	2.17[-3]	4.57[-3]	6.46[-3]	9.29[-3]	1.05[-2]	1.21[-2]	1.47[-2]	1.84[-2]	2.41[-2]
$2p3d^*7p^*$	7.54[-4]	2.61[-3]	6.18[-3]	9.24[-3]	1.40[-2]	1.57[-2]	1.77[-2]	1.96[-2]	2.10[-2]	2.20[-2]
$2p3d^*7p$	1.41[-2]	4.17[-2]	8.38[-2]	1.14[-1]	1.59[-1]	1.76[-1]	1.99[-1]	2.26[-1]	2.54[-1]	2.81[-1]
$2p3d^*7d^*$	4.90[-3]	1.54[-2]	3.49[-2]	5.13[-2]	7.71[-2]	8.72[-2]	1.00[-1]	1.15[-1]	1.29[-1]	1.41[-1]
$2p3d^*7d$	4.85[-2]	1.41[-1]	2.90[-1]	4.00[-1]	5.59[-1]	6.16[-1]	6.92[-1]	7.77[-1]	8.60[-1]	9.37[-1]
$2p3d7s$	1.00[-3]	2.73[-3]	5.52[-3]	7.97[-3]	1.15[-2]	1.37[-2]	1.67[-2]	2.36[-2]	3.55[-2]	5.51[-2]
$2p3d7p^*$	6.92[-3]	2.30[-2]	5.17[-2]	7.49[-2]	1.10[-1]	1.22[-1]	1.35[-1]	1.44[-1]	1.44[-1]	1.35[-1]
$2p3d7p$	2.21[-2]	6.85[-2]	1.46[-1]	2.06[-1]	2.98[-1]	3.32[-1]	3.76[-1]	4.20[-1]	4.56[-1]	4.82[-1]
$2p3d7d^*$	5.01[-2]	1.56[-1]	3.46[-1]	5.04[-1]	7.48[-1]	8.43[-1]	9.68[-1]	1.10[0]	1.23[0]	1.35[0]
$2p3d7d$	6.71[-2]	2.04[-1]	4.44[-1]	6.37[-1]	9.29[-1]	1.04[0]	1.18[0]	1.34[0]	1.48[0]	1.60[0]
Zn-like ions										
$2p4s4p$	1.19[-2]	3.92[-2]	8.56[-2]	1.22[-1]	1.79[-1]	2.03[-1]	2.37[-1]	2.82[-1]	3.36[-1]	3.97[-1]
$2p4s4d^*$	8.01[-4]	2.65[-3]	5.55[-3]	7.49[-3]	9.89[-3]	1.06[-2]	1.17[-2]	1.33[-2]	1.67[-2]	2.44[-2]
$2p4s4d$	1.09[-3]	3.29[-3]	6.36[-3]	8.33[-3]	1.11[-2]	1.24[-2]	1.49[-2]	2.05[-2]	3.37[-2]	6.11[-2]
$2p4s4f^*$	8.27[-7]	5.61[-5]	7.19[-4]	2.05[-3]	5.76[-3]	7.77[-3]	1.11[-2]	1.62[-2]	2.34[-2]	3.32[-2]
$2p4s4f$	1.60[-6]	1.11[-4]	1.47[-3]	4.26[-3]	1.22[-2]	1.65[-2]	2.34[-2]	3.37[-2]	4.68[-2]	6.27[-2]
$2p4p^*4p$	1.49[-2]	5.74[-2]	1.34[-1]	1.95[-1]	2.92[-1]	3.32[-1]	3.89[-1]	4.65[-1]	5.54[-1]	6.52[-1]
$2p4p^*4d^*$	7.49[-4]	3.64[-3]	1.04[-2]	1.65[-2]	2.62[-2]	2.98[-2]	3.41[-2]	3.83[-2]	4.11[-2]	4.24[-2]
$2p4p^*4d$	6.92[-3]	3.15[-2]	8.41[-2]	1.29[-1]	1.98[-1]	2.22[-1]	2.51[-1]	2.76[-1]	2.87[-1]	2.79[-1]

	$Z = 32$	$Z = 36$	$Z = 42$	$Z = 47$	$Z = 56$	$Z = 60$	$Z = 66$	$Z = 74$	$Z = 83$	$Z = 92$
Zn-like ions										
$2p4p^*4f^*$	8.31[-7]	6.18[-5]	7.81[-4]	2.17[-3]	5.94[-3]	7.94[-3]	1.12[-2]	1.61[-2]	2.25[-2]	3.00[-2]
$2p4p^*4f$	2.20[-6]	1.67[-4]	2.17[-3]	6.06[-3]	1.65[-2]	2.19[-2]	3.05[-2]	4.25[-2]	5.70[-2]	7.27[-2]
$2p4p4p$	2.21[-2]	8.50[-2]	1.96[-1]	2.83[-1]	4.15[-1]	4.66[-1]	5.35[-1]	6.21[-1]	7.11[-1]	8.02[-1]
$2p4p4d^*$	1.47[-2]	6.46[-2]	1.67[-1]	2.53[-1]	3.92[-1]	4.47[-1]	5.24[-1]	6.20[-1]	7.23[-1]	8.27[-1]
$2p4p4d$	2.31[-2]	1.04[-1]	2.74[-1]	4.20[-1]	6.52[-1]	7.40[-1]	8.55[-1]	9.84[-1]	1.10[0]	1.20[0]
$2p4p4f^*$	2.95[-6]	2.39[-4]	3.26[-3]	9.33[-3]	2.56[-2]	3.38[-2]	4.62[-2]	6.25[-2]	7.99[-2]	9.64[-2]
$2p4p4f$	4.60[-6]	3.68[-4]	4.92[-3]	1.39[-2]	3.70[-2]	4.82[-2]	6.48[-2]	8.55[-2]	1.06[-1]	1.25[-1]
$2p4d^*4d^*$	1.66[-3]	8.43[-3]	2.44[-2]	3.89[-2]	6.29[-2]	7.22[-2]	8.46[-2]	9.86[-2]	1.12[-1]	1.22[-1]
$2p4d^*4d$	3.36[-2]	1.63[-1]	4.53[-1]	7.08[-1]	1.12[0]	1.28[0]	1.49[0]	1.74[0]	1.99[0]	2.20[0]
$2p4d^*4f^*$	1.64[-6]	1.40[-4]	1.95[-3]	5.61[-3]	1.53[-2]	2.00[-2]	2.71[-2]	3.58[-2]	4.47[-2]	5.23[-2]
$2p4d^*4f$	5.76[-6]	4.90[-4]	6.86[-3]	1.97[-2]	5.37[-2]	7.03[-2]	9.46[-2]	1.24[-1]	1.53[-1]	1.77[-1]
$2p4d4d$	2.32[-2]	1.13[-1]	3.16[-1]	4.95[-1]	7.82[-1]	8.91[-1]	1.04[0]	1.20[0]	1.35[0]	1.47[0]
$2p4d4f^*$	1.59[-5]	1.41[-3]	2.04[-2]	5.97[-2]	1.67[-1]	2.20[-1]	3.01[-1]	4.06[-1]	5.14[-1]	6.13[-1]
$2p4d4f$	1.52[-5]	1.34[-3]	1.93[-2]	5.62[-2]	1.54[-1]	2.03[-1]	2.74[-1]	3.62[-1]	4.48[-1]	5.21[-1]
$2p4f^*4f$	4.97[-9]	7.80[-6]	5.94[-4]	3.31[-3]	1.66[-2]	2.57[-2]	4.16[-2]	6.50[-2]	9.19[-2]	1.18[-1]
$2p4f4f$	1.71[-9]	2.74[-6]	2.12[-4]	1.19[-3]	5.99[-3]	9.24[-3]	1.49[-2]	2.32[-2]	3.25[-2]	4.11[-2]
$2p4s5p$	4.07[-3]	1.46[-2]	3.31[-2]	4.77[-2]	7.10[-2]	8.04[-2]	9.41[-2]	1.12[-1]	1.34[-1]	1.58[-1]
$2p4s5d$	4.46[-4]	1.32[-3]	2.44[-3]	3.10[-3]	3.91[-3]	4.24[-3]	4.90[-3]	6.59[-3]	1.11[-2]	2.13[-2]
$2p4p^*5p$	5.09[-3]	2.14[-2]	5.22[-2]	7.71[-2]	1.17[-1]	1.33[-1]	1.57[-1]	1.88[-1]	2.24[-1]	2.64[-1]
$2p4p^*5d^*$	3.18[-4]	1.59[-3]	4.63[-3]	7.43[-3]	1.19[-2]	1.36[-2]	1.56[-2]	1.75[-2]	1.89[-2]	1.95[-2]
$2p4p^*5d$	2.92[-3]	1.35[-2]	3.67[-2]	5.66[-2]	8.70[-2]	9.78[-2]	1.11[-1]	1.22[-1]	1.27[-1]	1.25[-1]
$2p4p5s$	3.72[-3]	1.46[-2]	3.52[-2]	5.22[-2]	8.00[-2]	9.15[-2]	1.08[-1]	1.30[-1]	1.56[-1]	1.85[-1]
$2p4p5p^*$	5.19[-3]	2.24[-2]	5.59[-2]	8.39[-2]	1.30[-1]	1.49[-1]	1.76[-1]	2.12[-1]	2.53[-1]	2.98[-1]
$2p4p5p$	1.53[-2]	6.50[-2]	1.59[-1]	2.35[-1]	3.53[-1]	3.98[-1]	4.61[-1]	5.39[-1]	6.21[-1]	7.02[-1]
$2p4p5d^*$	6.23[-3]	2.82[-2]	7.52[-2]	1.16[-1]	1.83[-1]	2.10[-1]	2.48[-1]	2.95[-1]	3.47[-1]	4.00[-1]
$2p4p5d$	9.81[-3]	4.54[-2]	1.23[-1]	1.91[-1]	3.01[-1]	3.43[-1]	3.98[-1]	4.61[-1]	5.19[-1]	5.68[-1]
$2p4d^*5p^*$	2.61[-4]	1.42[-3]	4.33[-3]	7.07[-3]	1.16[-2]	1.32[-2]	1.53[-2]	1.73[-2]	1.86[-2]	1.93[-2]
$2p4d^*5p$	4.99[-3]	2.39[-2]	6.40[-2]	9.85[-2]	1.54[-1]	1.76[-1]	2.07[-1]	2.45[-1]	2.85[-1]	3.26[-1]
$2p4d^*5d^*$	1.41[-3]	7.26[-3]	2.14[-2]	3.44[-2]	5.59[-2]	6.42[-2]	7.53[-2]	8.79[-2]	9.95[-2]	1.09[-1]
$2p4d^*5d$	1.41[-2]	6.89[-2]	1.92[-1]	3.00[-1]	4.74[-1]	5.40[-1]	6.29[-1]	7.33[-1]	8.35[-1]	9.26[-1]
$2p4d^*5f$	5.26[-6]	4.23[-4]	5.61[-3]	1.54[-2]	3.94[-2]	5.07[-2]	6.69[-2]	8.66[-2]	1.05[-1]	1.21[-1]
$2p4d5s$	3.39[-4]	1.23[-3]	2.63[-3]	3.60[-3]	5.06[-3]	5.72[-3]	6.95[-3]	9.63[-3]	1.56[-2]	2.76[-2]
$2p4d5p^*$	2.40[-3]	1.22[-2]	3.47[-2]	5.49[-2]	8.66[-2]	9.80[-2]	1.12[-1]	1.23[-1]	1.28[-1]	1.25[-1]
$2p4d5p$	7.92[-3]	3.90[-2]	1.08[-1]	1.70[-1]	2.69[-1]	3.07[-1]	3.56[-1]	4.12[-1]	4.62[-1]	5.01[-1]
$2p4d5d^*$	1.42[-2]	7.05[-2]	2.00[-1]	3.17[-1]	5.07[-1]	5.81[-1]	6.81[-1]	7.97[-1]	9.10[-1]	1.01[0]
$2p4d5d$	1.95[-2]	9.67[-2]	2.75[-1]	4.34[-1]	6.89[-1]	7.86[-1]	9.15[-1]	1.06[0]	1.19[0]	1.31[0]
$2p4d5f^*$	1.54[-5]	1.22[-3]	1.68[-2]	4.69[-2]	1.23[-1]	1.60[-1]	2.15[-1]	2.83[-1]	3.54[-1]	4.19[-1]
$2p4d5f$	1.50[-5]	1.16[-3]	1.59[-2]	4.41[-2]	1.14[-1]	1.47[-1]	1.95[-1]	2.54[-1]	3.10[-1]	3.58[-1]
$2p4f^*5d$	6.54[-6]	5.73[-4]	8.14[-3]	2.35[-2]	6.41[-2]	8.41[-2]	1.14[-1]	1.52[-1]	1.91[-1]	2.27[-1]
$2p4f5d$	6.25[-6]	5.47[-4]	7.70[-3]	2.20[-2]	5.91[-2]	7.69[-2]	1.03[-1]	1.34[-1]	1.65[-1]	1.90[-1]
$2p4s6p$	1.89[-3]	7.09[-3]	1.65[-2]	2.40[-2]	3.59[-2]	4.08[-2]	4.77[-2]	5.70[-2]	6.80[-2]	8.05[-2]
$2p4p^*6p$	2.37[-3]	1.05[-2]	2.61[-2]	3.89[-2]	5.96[-2]	6.80[-2]	8.02[-2]	9.61[-2]	1.15[-1]	1.35[-1]
$2p4p^*6d^*$	1.66[-4]	8.42[-4]	2.49[-3]	4.02[-3]	6.48[-3]	7.38[-3]	8.49[-3]	9.57[-3]	1.03[-2]	1.07[-2]
$2p4p^*6d$	1.51[-3]	7.11[-3]	1.95[-2]	3.02[-2]	4.65[-2]	5.23[-2]	5.92[-2]	6.54[-2]	6.84[-2]	6.71[-2]
$2p4p6s$	1.65[-3]	7.06[-3]	1.79[-2]	2.72[-2]	4.26[-2]	4.90[-2]	5.83[-2]	7.06[-2]	8.50[-2]	1.01[-1]
$2p4p6p^*$	2.44[-3]	1.11[-2]	2.89[-2]	4.41[-2]	6.93[-2]	7.98[-2]	9.49[-2]	1.15[-1]	1.37[-1]	1.62[-1]
$2p4p6p$	7.18[-3]	3.21[-2]	8.12[-2]	1.21[-1]	1.85[-1]	2.10[-1]	2.44[-1]	2.86[-1]	3.31[-1]	3.75[-1]
$2p4p6d^*$	3.24[-3]	1.50[-2]	4.07[-2]	6.32[-2]	1.01[-1]	1.16[-1]	1.38[-1]	1.64[-1]	1.94[-1]	2.24[-1]
$2p4p6d$	5.10[-3]	2.41[-2]	6.65[-2]	1.04[-1]	1.65[-1]	1.88[-1]	2.19[-1]	2.55[-1]	2.88[-1]	3.16[-1]
$2p4p6f^*$	1.91[-6]	1.51[-4]	1.88[-3]	5.01[-3]	1.26[-2]	1.62[-2]	2.16[-2]	2.85[-2]	3.59[-2]	4.31[-2]
$2p4p6f$	2.97[-6]	2.31[-4]	2.79[-3]	7.26[-3]	1.76[-2]	2.22[-2]	2.89[-2]	3.71[-2]	4.52[-2]	5.23[-2]
$2p4d^*6p^*$	1.23[-4]	7.06[-4]	2.23[-3]	3.71[-3]	6.16[-3]	7.07[-3]	8.20[-3]	9.30[-3]	1.00[-2]	1.04[-2]
$2p4d^*6p$	2.32[-3]	1.16[-2]	3.19[-2]	4.94[-2]	7.79[-2]	8.91[-2]	1.05[-1]	1.24[-1]	1.44[-1]	1.65[-1]
$2p4d^*6d^*$	7.28[-4]	3.83[-3]	1.14[-2]	1.84[-2]	3.01[-2]	3.46[-2]	4.06[-2]	4.74[-2]	5.38[-2]	5.89[-2]
$2p4d^*6d$	7.28[-3]	3.60[-2]	1.01[-1]	1.58[-1]	2.48[-1]	2.83[-1]	3.29[-1]	3.83[-1]	4.36[-1]	4.84[-1]
$2p4d^*6f$	3.64[-6]	3.13[-4]	3.90[-3]	1.05[-2]	2.60[-2]	3.31[-2]	4.34[-2]	5.57[-2]	6.76[-2]	7.74[-2]
$2p4d6p^*$	1.13[-3]	6.02[-3]	1.78[-2]	2.86[-2]	4.60[-2]	5.22[-2]	5.97[-2]	6.62[-2]	6.89[-2]	6.68[-2]

	$Z = 32$	$Z = 36$	$Z = 42$	$Z = 47$	$Z = 56$	$Z = 60$	$Z = 66$	$Z = 74$	$Z = 83$	$Z = 92$
Zn-like ions										
$2p4d6p$	3.70[-3]	1.91[-2]	5.47[-2]	8.67[-2]	1.39[-1]	1.59[-1]	1.86[-1]	2.15[-1]	2.42[-1]	2.62[-1]
$2p4d6d^*$	7.39[-3]	3.73[-2]	1.07[-1]	1.71[-1]	2.75[-1]	3.15[-1]	3.70[-1]	4.34[-1]	4.97[-1]	5.52[-1]
$2p4d6d$	1.01[-2]	5.09[-2]	1.46[-1]	2.32[-1]	3.69[-1]	4.22[-1]	4.91[-1]	5.70[-1]	6.43[-1]	7.05[-1]
$2p4d6f^*$	9.81[-6]	9.26[-4]	1.17[-2]	3.21[-2]	8.16[-2]	1.05[-1]	1.40[-1]	1.83[-1]	2.28[-1]	2.68[-1]
$2p4d6f$	9.33[-6]	8.89[-4]	1.11[-2]	3.03[-2]	7.57[-2]	9.69[-2]	1.27[-1]	1.64[-1]	2.00[-1]	2.30[-1]
$2p4f^*6d$	3.35[-6]	2.94[-4]	4.15[-3]	1.19[-2]	3.20[-2]	4.19[-2]	5.65[-2]	7.49[-2]	9.39[-2]	1.11[-1]
$2p4f6d$	3.21[-6]	2.81[-4]	3.92[-3]	1.11[-2]	2.95[-2]	3.82[-2]	5.08[-2]	6.60[-2]	8.05[-2]	9.25[-2]
$2p4s7p$	1.04[-3]	3.99[-3]	9.49[-3]	1.38[-2]	2.08[-2]	2.37[-2]	2.78[-2]	3.32[-2]	3.96[-2]	4.69[-2]
$2p4p^*7p$	1.30[-3]	5.91[-3]	1.50[-2]	2.25[-2]	3.47[-2]	3.97[-2]	4.68[-2]	5.62[-2]	6.72[-2]	7.93[-2]
$2p4p^*7d$	8.87[-4]	4.22[-3]	1.16[-2]	1.81[-2]	2.79[-2]	3.14[-2]	3.55[-2]	3.93[-2]	4.12[-2]	4.05[-2]
$2p4p7s$	8.75[-4]	3.95[-3]	1.04[-2]	1.59[-2]	2.54[-2]	2.93[-2]	3.50[-2]	4.26[-2]	5.13[-2]	6.09[-2]
$2p4p7p^*$	1.34[-3]	6.34[-3]	1.69[-2]	2.60[-2]	4.15[-2]	4.78[-2]	5.70[-2]	6.91[-2]	8.29[-2]	9.76[-2]
$2p4p7p$	3.94[-3]	1.83[-2]	4.72[-2]	7.12[-2]	1.10[-1]	1.25[-1]	1.45[-1]	1.71[-1]	1.98[-1]	2.25[-1]
$2p4p7d^*$	1.90[-3]	8.94[-3]	2.45[-2]	3.84[-2]	6.15[-2]	7.10[-2]	8.43[-2]	1.01[-1]	1.19[-1]	1.38[-1]
$2p4p7d$	3.00[-3]	1.44[-2]	4.01[-2]	6.30[-2]	1.00[-1]	1.15[-1]	1.34[-1]	1.56[-1]	1.76[-1]	1.94[-1]
$2p4d^*7p$	1.27[-3]	6.54[-3]	1.83[-2]	2.85[-2]	4.51[-2]	5.17[-2]	6.09[-2]	7.20[-2]	8.39[-2]	9.58[-2]
$2p4d^*7d^*$	4.27[-4]	2.26[-3]	6.84[-3]	1.10[-2]	1.81[-2]	2.08[-2]	2.45[-2]	2.86[-2]	3.25[-2]	3.56[-2]
$2p4d^*7d$	4.26[-3]	2.12[-2]	5.99[-2]	9.36[-2]	1.47[-1]	1.68[-1]	1.95[-1]	2.27[-1]	2.58[-1]	2.87[-1]
$2p4d7p^*$	6.16[-4]	3.44[-3]	1.05[-2]	1.70[-2]	2.74[-2]	3.11[-2]	3.58[-2]	3.96[-2]	4.13[-2]	4.01[-2]
$2p4d7p$	2.02[-3]	1.08[-2]	3.17[-2]	5.06[-2]	8.17[-2]	9.36[-2]	1.10[-1]	1.27[-1]	1.43[-1]	1.56[-1]
$2p4d7d^*$	4.33[-3]	2.20[-2]	6.47[-2]	1.03[-1]	1.66[-1]	1.90[-1]	2.25[-1]	2.63[-1]	3.01[-1]	3.37[-1]
$2p4d7d$	5.92[-3]	3.01[-2]	8.76[-2]	1.38[-1]	2.22[-1]	2.53[-1]	2.96[-1]	3.43[-1]	3.87[-1]	4.27[-1]
$2p5s5p$	1.27[-3]	5.43[-3]	1.36[-2]	2.04[-2]	3.17[-2]	3.63[-2]	4.30[-2]	5.18[-2]	6.22[-2]	7.37[-2]
$2p5s5f$	4.42[-7]	3.36[-5]	4.57[-4]	1.30[-3]	3.58[-3]	4.76[-3]	6.63[-3]	9.25[-3]	1.24[-2]	1.60[-2]
$2p5p^*5p$	1.77[-3]	8.35[-3]	2.18[-2]	3.32[-2]	5.20[-2]	5.98[-2]	7.09[-2]	8.55[-2]	1.02[-1]	1.21[-1]
$2p5p^*5d$	1.01[-3]	5.22[-3]	1.52[-2]	2.41[-2]	3.82[-2]	4.32[-2]	4.93[-2]	5.48[-2]	5.73[-2]	5.60[-2]
$2p5p^*5f$	6.42[-7]	5.20[-5]	6.48[-4]	1.73[-3]	4.39[-3]	5.69[-3]	7.70[-3]	1.05[-2]	1.37[-2]	1.73[-2]
$2p5p5p$	2.65[-3]	1.24[-2]	3.22[-2]	4.86[-2]	7.46[-2]	8.48[-2]	9.88[-2]	1.16[-1]	1.34[-1]	1.52[-1]
$2p5p5d^*$	2.12[-3]	1.04[-2]	2.89[-2]	4.52[-2]	7.20[-2]	8.28[-2]	9.78[-2]	1.17[-1]	1.37[-1]	1.57[-1]
$2p5p5d$	3.36[-3]	1.71[-2]	4.87[-2]	7.72[-2]	1.24[-1]	1.42[-1]	1.65[-1]	1.92[-1]	2.17[-1]	2.37[-1]
$2p5p5f^*$	8.68[-7]	7.44[-5]	9.84[-4]	2.70[-3]	6.99[-3]	9.05[-3]	1.21[-2]	1.61[-2]	2.02[-2]	2.42[-2]
$2p5p5f$	1.36[-6]	1.15[-4]	1.50[-3]	4.04[-3]	1.01[-2]	1.29[-2]	1.69[-2]	2.18[-2]	2.66[-2]	3.09[-2]
$2p5d^*5d^*$	2.97[-4]	1.56[-3]	4.68[-3]	7.57[-3]	1.23[-2]	1.42[-2]	1.66[-2]	1.94[-2]	2.20[-2]	2.41[-2]
$2p5d^*5d$	5.96[-3]	2.98[-2]	8.52[-2]	1.35[-1]	2.15[-1]	2.46[-1]	2.87[-1]	3.36[-1]	3.84[-1]	4.27[-1]
$2p5d^*5f^*$	6.52[-7]	4.91[-5]	6.35[-4]	1.71[-3]	4.25[-3]	5.42[-3]	7.08[-3]	9.09[-3]	1.10[-2]	1.27[-2]
$2p5d^*5f$	2.19[-6]	1.72[-4]	2.25[-3]	6.08[-3]	1.53[-2]	1.96[-2]	2.56[-2]	3.28[-2]	3.96[-2]	4.51[-2]
$2p5d5d$	4.11[-3]	2.07[-2]	5.99[-2]	9.50[-2]	1.52[-1]	1.73[-1]	2.02[-1]	2.34[-1]	2.64[-1]	2.90[-1]
$2p5d5f^*$	6.45[-6]	4.96[-4]	6.73[-3]	1.85[-2]	4.77[-2]	6.15[-2]	8.19[-2]	1.07[-1]	1.33[-1]	1.57[-1]
$2p5d5f$	6.28[-6]	4.73[-4]	6.36[-3]	1.74[-2]	4.40[-2]	5.63[-2]	7.39[-2]	9.50[-2]	1.15[-1]	1.32[-1]
$2p5s6p$	5.91[-4]	2.65[-3]	6.79[-3]	1.03[-2]	1.60[-2]	1.84[-2]	2.18[-2]	2.63[-2]	3.16[-2]	3.75[-2]
$2p5p^*6p$	8.27[-4]	4.08[-3]	1.09[-2]	1.68[-2]	2.65[-2]	3.05[-2]	3.62[-2]	4.37[-2]	5.24[-2]	6.19[-2]
$2p5p^*6d$	5.25[-4]	2.75[-3]	8.07[-3]	1.29[-2]	2.04[-2]	2.32[-2]	2.64[-2]	2.94[-2]	3.08[-2]	3.03[-2]
$2p5p6s$	5.63[-4]	2.62[-3]	6.93[-3]	1.06[-2]	1.69[-2]	1.95[-2]	2.32[-2]	2.81[-2]	3.39[-2]	4.02[-2]
$2p5p6p^*$	8.33[-4]	4.15[-3]	1.13[-2]	1.74[-2]	2.78[-2]	3.21[-2]	3.82[-2]	4.63[-2]	5.55[-2]	6.55[-2]
$2p5p6p$	2.49[-3]	1.23[-2]	3.28[-2]	5.02[-2]	7.81[-2]	8.91[-2]	1.04[-1]	1.23[-1]	1.43[-1]	1.62[-1]
$2p5p6d^*$	1.10[-3]	5.55[-3]	1.56[-2]	2.47[-2]	3.97[-2]	4.57[-2]	5.42[-2]	6.49[-2]	7.64[-2]	8.82[-2]
$2p5p6d$	1.75[-3]	9.06[-3]	2.63[-2]	4.20[-2]	6.77[-2]	7.77[-2]	9.09[-2]	1.06[-1]	1.20[-1]	1.31[-1]
$2p5d^*6p$	9.86[-4]	5.08[-3]	1.44[-2]	2.27[-2]	3.64[-2]	4.18[-2]	4.95[-2]	5.90[-2]	6.92[-2]	7.95[-2]
$2p5d^*6d^*$	3.08[-4]	1.65[-3]	4.99[-3]	8.11[-3]	1.33[-2]	1.52[-2]	1.79[-2]	2.09[-2]	2.37[-2]	2.59[-2]
$2p5d^*6d$	3.08[-3]	1.56[-2]	4.47[-2]	7.07[-2]	1.13[-1]	1.29[-1]	1.51[-1]	1.76[-1]	2.01[-1]	2.23[-1]
$2p5d6p^*$	4.75[-4]	2.59[-3]	7.79[-3]	1.26[-2]	2.03[-2]	2.31[-2]	2.64[-2]	2.94[-2]	3.08[-2]	3.01[-2]
$2p5d6p$	1.57[-3]	8.36[-3]	2.46[-2]	3.94[-2]	6.39[-2]	7.34[-2]	8.60[-2]	1.00[-1]	1.13[-1]	1.24[-1]
$2p5d6d^*$	3.09[-3]	1.58[-2]	4.56[-2]	7.27[-2]	1.17[-1]	1.34[-1]	1.57[-1]	1.84[-1]	2.10[-1]	2.34[-1]
$2p5d6d$	4.25[-3]	2.18[-2]	6.36[-2]	1.01[-1]	1.62[-1]	1.85[-1]	2.16[-1]	2.51[-1]	2.84[-1]	3.11[-1]
$2p5s7p$	3.24[-4]	1.49[-3]	3.89[-3]	5.93[-3]	9.30[-3]	1.07[-2]	1.27[-2]	1.53[-2]	1.84[-2]	2.18[-2]
$2p5p^*7p$	4.53[-4]	2.30[-3]	6.28[-3]	9.72[-3]	1.54[-2]	1.78[-2]	2.11[-2]	2.56[-2]	3.07[-2]	3.62[-2]
$2p5p^*7d$	3.07[-4]	1.63[-3]	4.82[-3]	7.71[-3]	1.23[-2]	1.39[-2]	1.59[-2]	1.77[-2]	1.86[-2]	1.83[-2]

	$Z = 32$	$Z = 36$	$Z = 42$	$Z = 47$	$Z = 56$	$Z = 60$	$Z = 66$	$Z = 74$	$Z = 83$	$Z = 92$
Zn-like ions										
$2p5p7s$	2.99[-4]	1.47[-3]	4.01[-3]	6.25[-3]	1.01[-2]	1.16[-2]	1.39[-2]	1.70[-2]	2.05[-2]	2.43[-2]
$2p5p7p^*$	4.58[-4]	2.37[-3]	6.59[-3]	1.03[-2]	1.66[-2]	1.92[-2]	2.30[-2]	2.79[-2]	3.35[-2]	3.95[-2]
$2p5p7p$	1.37[-3]	6.97[-3]	1.91[-2]	2.94[-2]	4.62[-2]	5.28[-2]	6.20[-2]	7.32[-2]	8.51[-2]	9.69[-2]
$2p5p7d^*$	6.48[-4]	3.30[-3]	9.43[-3]	1.49[-2]	2.42[-2]	2.80[-2]	3.32[-2]	3.99[-2]	4.71[-2]	5.44[-2]
$2p5p7d$	1.03[-3]	5.39[-3]	1.58[-2]	2.54[-2]	4.12[-2]	4.73[-2]	5.54[-2]	6.47[-2]	7.33[-2]	8.05[-2]
$2p5d^*7p$	5.39[-4]	2.86[-3]	8.25[-3]	1.31[-2]	2.11[-2]	2.43[-2]	2.88[-2]	3.43[-2]	4.02[-2]	4.62[-2]
$2p5d^*7d^*$	1.80[-4]	9.74[-4]	2.98[-3]	4.85[-3]	7.97[-3]	9.19[-3]	1.08[-2]	1.26[-2]	1.43[-2]	1.56[-2]
$2p5d^*7d$	1.80[-3]	9.18[-3]	2.65[-2]	4.19[-2]	6.69[-2]	7.65[-2]	8.93[-2]	1.04[-1]	1.19[-1]	1.32[-1]
$2p5d7p^*$	2.60[-4]	1.47[-3]	4.58[-3]	7.39[-3]	1.21[-2]	1.38[-2]	1.59[-2]	1.77[-2]	1.85[-2]	1.81[-2]
$2p5d7p$	8.60[-4]	4.72[-3]	1.42[-2]	2.29[-2]	3.75[-2]	4.32[-2]	5.08[-2]	5.92[-2]	6.70[-2]	7.32[-2]
$2p5d7d^*$	1.81[-3]	9.31[-3]	2.74[-2]	4.35[-2]	7.04[-2]	8.11[-2]	9.50[-2]	1.12[-1]	1.28[-1]	1.42[-1]
$2p5d7d$	2.49[-3]	1.29[-2]	3.80[-2]	6.05[-2]	9.73[-2]	1.12[-1]	1.30[-1]	1.51[-1]	1.71[-1]	1.87[-1]
$2p6s6p$	2.62[-4]	1.28[-3]	3.46[-3]	5.35[-3]	8.54[-3]	9.86[-3]	1.18[-2]	1.43[-2]	1.72[-2]	2.04[-2]
$2p6p^*6p$	3.88[-4]	2.03[-3]	5.64[-3]	8.82[-3]	1.42[-2]	1.64[-2]	1.95[-2]	2.37[-2]	2.84[-2]	3.36[-2]
$2p6p^*6d$	2.46[-4]	1.37[-3]	4.15[-3]	6.73[-3]	1.09[-2]	1.24[-2]	1.42[-2]	1.58[-2]	1.66[-2]	1.63[-2]
$2p6p6p$	5.82[-4]	3.03[-3]	8.36[-3]	1.30[-2]	2.04[-2]	2.34[-2]	2.74[-2]	3.24[-2]	3.77[-2]	4.30[-2]
$2p6p6d^*$	5.13[-4]	2.70[-3]	7.78[-3]	1.24[-2]	2.00[-2]	2.31[-2]	2.74[-2]	3.28[-2]	3.87[-2]	4.46[-2]
$2p6p6d$	8.16[-4]	4.44[-3]	1.33[-2]	2.14[-2]	3.50[-2]	4.02[-2]	4.72[-2]	5.51[-2]	6.24[-2]	6.84[-2]
$2p6d^*6d$	1.60[-3]	8.25[-3]	2.40[-2]	3.82[-2]	6.12[-2]	7.01[-2]	8.22[-2]	9.62[-2]	1.10[-1]	1.22[-1]
$2p6d^*6f$	7.68[-7]	6.49[-5]	8.04[-4]	2.11[-3]	5.11[-3]	6.47[-3]	8.38[-3]	1.06[-2]	1.27[-2]	1.44[-2]
$2p6d6d$	1.10[-3]	5.75[-3]	1.69[-2]	2.71[-2]	4.34[-2]	4.96[-2]	5.79[-2]	6.72[-2]	7.61[-2]	8.37[-2]
$2p6d6f^*$	2.07[-6]	1.91[-4]	2.43[-3]	6.43[-3]	1.59[-2]	2.03[-2]	2.67[-2]	3.46[-2]	4.27[-2]	5.01[-2]
$2p6d6f$	1.96[-6]	1.82[-4]	2.30[-3]	6.02[-3]	1.47[-2]	1.85[-2]	2.41[-2]	3.06[-2]	3.68[-2]	4.20[-2]
$2p6s7p$	1.44[-4]	7.21[-4]	1.98[-3]	3.09[-3]	4.96[-3]	5.73[-3]	6.84[-3]	8.31[-3]	1.00[-2]	1.19[-2]
$2p6p^*7p$	2.13[-4]	1.15[-3]	3.24[-3]	5.10[-3]	8.24[-3]	9.54[-3]	1.14[-2]	1.38[-2]	1.66[-2]	1.96[-2]
$2p6p7s$	1.39[-4]	7.14[-4]	2.00[-3]	3.14[-3]	5.09[-3]	5.90[-3]	7.07[-3]	8.61[-3]	1.04[-2]	1.24[-2]
$2p6p7p^*$	2.13[-4]	1.16[-3]	3.30[-3]	5.21[-3]	8.46[-3]	9.81[-3]	1.17[-2]	1.43[-2]	1.72[-2]	2.02[-2]
$2p6p7p$	6.40[-4]	3.44[-3]	9.71[-3]	1.52[-2]	2.41[-2]	2.77[-2]	3.26[-2]	3.86[-2]	4.50[-2]	5.14[-2]
$2p6p7d^*$	3.01[-4]	1.61[-3]	4.69[-3]	7.50[-3]	1.22[-2]	1.41[-2]	1.68[-2]	2.02[-2]	2.38[-2]	2.75[-2]
$2p6p7d$	4.79[-4]	2.64[-3]	7.99[-3]	1.30[-2]	2.12[-2]	2.45[-2]	2.88[-2]	3.37[-2]	3.82[-2]	4.19[-2]
$2p6d^*7p$	2.81[-4]	1.52[-3]	4.46[-3]	7.13[-3]	1.16[-2]	1.34[-2]	1.59[-2]	1.91[-2]	2.25[-2]	2.59[-2]
$2p6d^*7d$	9.33[-4]	4.87[-3]	1.42[-2]	2.27[-2]	3.63[-2]	4.16[-2]	4.87[-2]	5.70[-2]	6.52[-2]	7.26[-2]
$2p6d7p$	4.47[-4]	2.51[-3]	7.67[-3]	1.25[-2]	2.05[-2]	2.37[-2]	2.78[-2]	3.26[-2]	3.69[-2]	4.04[-2]
$2p6d7d^*$	9.36[-4]	4.87[-3]	1.44[-2]	2.29[-2]	3.70[-2]	4.26[-2]	4.97[-2]	5.85[-2]	6.69[-2]	7.43[-2]
$2p6d7d$	1.29[-3]	6.79[-3]	2.02[-2]	3.23[-2]	5.21[-2]	5.97[-2]	6.95[-2]	8.10[-2]	9.16[-2]	1.01[-1]
$2p7p^*7p$	1.17[-4]	6.54[-4]	1.90[-3]	3.02[-3]	4.93[-3]	5.72[-3]	6.86[-3]	8.34[-3]	1.00[-2]	1.18[-2]
$2p7p7p$	1.76[-4]	9.78[-4]	2.82[-3]	4.45[-3]	7.13[-3]	8.20[-3]	9.68[-3]	1.15[-2]	1.34[-2]	1.53[-2]
$2p7p7d^*$	1.65[-4]	9.06[-4]	2.69[-3]	4.32[-3]	7.08[-3]	8.20[-3]	9.76[-3]	1.17[-2]	1.38[-2]	1.60[-2]
$2p7p7d$	2.63[-4]	1.49[-3]	4.61[-3]	7.53[-3]	1.25[-2]	1.44[-2]	1.69[-2]	1.99[-2]	2.26[-2]	2.47[-2]
$2p7d^*7d$	5.48[-4]	2.87[-3]	8.50[-3]	1.36[-2]	2.20[-2]	2.53[-2]	2.95[-2]	3.47[-2]	3.97[-2]	4.41[-2]
$2p7d7d$	3.78[-4]	2.00[-3]	6.00[-3]	9.68[-3]	1.57[-2]	1.79[-2]	2.09[-2]	2.43[-2]	2.76[-2]	3.03[-2]
$2p7d7f^*$	8.37[-7]	7.78[-5]	9.55[-4]	2.59[-3]	6.25[-3]	7.88[-3]	1.03[-2]	1.33[-2]	1.63[-2]	1.91[-2]
$2p7d7f$	7.93[-7]	7.42[-5]	8.99[-4]	2.43[-3]	5.75[-3]	7.18[-3]	9.25[-3]	1.17[-2]	1.40[-2]	1.60[-2]

TABLE V.  $M_1$ -shell Auger rates  $A(n_0j_0l_0, n_1j_1l_1, n_2j_2l_2)$  (in mau) as function of  $Z$  for Zn-like ions.

	$Z=32$	$Z=36$	$Z=42$	$Z=47$	$Z=56$	$Z=60$	$Z=66$	$Z=74$	$Z=83$	$Z=92$
3s4s4s	4.04[-1]	8.32[-1]	1.23[0]	1.57[0]	1.64[0]	1.74[0]	1.84[0]	1.97[0]	0.00[0]	0.00[0]
3s4s4p*	5.05[-1]	1.25[0]	2.01[0]	2.41[0]	2.37[0]	3.09[0]	3.27[0]	3.55[0]	3.84[0]	4.16[0]
3s4s4p	9.94[-1]	2.44[0]	3.90[0]	4.65[0]	5.70[0]	5.05[0]	6.11[0]	6.19[0]	6.59[0]	6.96[0]
3s4s4d*	9.28[-1]	2.59[0]	4.50[0]	5.53[0]	6.69[0]	7.05[0]	5.02[0]	9.73[0]	5.17[0]	8.79[0]
3s4s4d	1.40[0]	3.88[0]	6.71[0]	8.23[0]	9.90[0]	1.04[1]	9.01[0]	7.28[0]	9.65[0]	1.25[1]
3s4s4f*	1.64[-2]	3.86[-1]	1.93[0]	3.39[0]	5.44[0]	6.09[0]	6.84[0]	7.52[0]	1.48[1]	8.82[0]
3s4s4f	2.19[-2]	5.13[-1]	2.55[0]	4.47[0]	7.13[0]	7.97[0]	8.90[0]	9.71[0]	1.07[0]	1.10[1]
3s4p*4p*	3.34[-2]	8.94[-2]	1.36[-1]	1.52[-1]	1.61[-1]	1.30[-1]	1.59[-1]	1.55[-1]	1.52[-1]	1.47[-1]
3s4p*4p	1.20[-1]	2.49[-1]	3.31[-1]	3.63[-1]	3.96[-1]	6.94[-1]	3.96[-1]	3.73[-1]	4.53[-1]	4.97[-1]
3s4p*4d*	6.31[-2]	1.67[-1]	2.55[-1]	2.82[-1]	2.92[-1]	2.89[-1]	2.82[-1]	1.34[-1]	6.99[-1]	2.49[-1]
3s4p*4d	3.85[-2]	7.93[-2]	8.38[-2]	9.74[-2]	1.52[-1]	1.77[-1]	2.05[-1]	3.42[-2]	3.77[-2]	1.72[-1]
3s4p4p	1.28[-1]	3.09[-1]	4.53[-1]	5.12[-1]	5.64[-1]	5.77[-1]	7.05[-1]	1.42[0]	3.48[-1]	5.39[-1]
3s4p4d*	7.00[-2]	1.57[-1]	2.04[-1]	2.50[-1]	3.72[-1]	4.30[-1]	5.12[-1]	6.15[-1]	7.36[-1]	8.07[-1]
3s4p4d	1.55[-1]	3.96[-1]	6.12[-1]	7.36[-1]	9.44[-1]	1.04[0]	1.18[0]	1.37[0]	1.63[0]	1.95[0]
3s4d*4d*	1.16[-2]	5.42[-2]	9.42[-2]	9.97[-2]	9.06[-2]	8.63[-2]	8.22[-2]	8.19[-2]	8.91[-2]	1.05[-1]
3s4d4d	1.96[-2]	9.13[-2]	1.80[-1]	2.17[-1]	2.42[-1]	2.46[-1]	2.47[-1]	2.46[-1]	2.48[-1]	2.59[-1]
3s4s5s	2.17[-1]	5.03[-1]	7.91[-1]	9.43[-1]	1.13[0]	1.19[0]	1.27[0]	1.37[0]	1.48[0]	1.60[0]
3s4s5p*	1.76[-1]	4.85[-1]	8.37[-1]	1.04[0]	1.29[0]	1.37[0]	1.49[0]	1.63[0]	1.78[0]	1.94[0]
3s4s5p	3.48[-1]	9.55[-1]	1.64[0]	2.02[0]	2.47[0]	2.62[0]	2.81[0]	3.00[0]	3.19[0]	3.34[0]
3s4s5d*	3.98[-1]	1.14[0]	2.01[0]	2.48[0]	3.04[0]	3.21[0]	3.43[0]	3.67[0]	3.90[0]	4.11[0]
3s4s5d	6.00[-1]	1.70[0]	3.00[0]	3.70[0]	4.50[0]	4.75[0]	5.05[0]	5.36[0]	5.64[0]	5.86[0]
3s4p5s	2.28[-1]	5.70[-1]	8.91[-1]	1.05[0]	1.23[0]	1.29[0]	1.36[0]	1.44[0]	1.52[0]	1.58[0]
3s4d*5s	2.13[-1]	5.96[-1]	1.01[0]	1.22[0]	1.45[0]	1.52[0]	1.60[0]	1.70[0]	1.79[0]	1.88[0]
3s4d5s	3.21[-1]	8.92[-1]	1.50[0]	1.81[0]	2.14[0]	2.23[0]	2.35[0]	2.47[0]	2.57[0]	2.65[0]
3s4s6p	1.64[-1]	4.75[-1]	8.46[-1]	1.06[0]	1.33[0]	1.41[0]	1.52[0]	1.64[0]	1.76[0]	1.85[0]
3s4s6d*	2.08[-1]	6.03[-1]	1.07[0]	1.34[0]	1.64[0]	1.74[0]	1.87[0]	2.00[0]	2.14[0]	2.26[0]
3s4s6d	3.13[-1]	9.04[-1]	1.60[0]	1.99[0]	2.44[0]	2.58[0]	2.75[0]	2.93[0]	3.09[0]	3.23[0]
3s4s6f*	9.48[-3]	1.97[-1]	8.23[-1]	1.29[0]	1.84[0]	2.00[0]	2.18[0]	2.35[0]	2.47[0]	2.53[0]
3s4s6f	1.26[-2]	2.61[-1]	1.09[0]	1.71[0]	2.42[0]	2.62[0]	2.85[0]	3.04[0]	3.16[0]	3.21[0]
3s4d6s	1.28[-1]	3.60[-1]	6.00[-1]	7.20[-1]	8.45[-1]	8.82[-1]	9.25[-1]	9.70[-1]	1.01[0]	1.04[0]
3s4f*6d	3.49[-4]	2.27[-2]	1.85[-1]	3.82[-1]	6.98[-1]	8.04[-1]	9.23[-1]	1.02[0]	1.05[0]	1.01[0]
3s4s7s	4.81[-2]	1.25[-1]	2.12[-1]	2.61[-1]	3.24[-1]	3.45[-1]	3.73[-1]	4.07[-1]	4.43[-1]	4.80[-1]
3s4s7p*	4.55[-2]	1.37[-1]	2.51[-1]	3.20[-1]	4.09[-1]	4.40[-1]	4.81[-1]	5.29[-1]	5.81[-1]	6.35[-1]
3s4s7p	9.03[-2]	2.71[-1]	4.94[-1]	6.27[-1]	7.93[-1]	8.49[-1]	9.20[-1]	9.97[-1]	1.07[0]	1.13[0]
3s4s7d*	1.22[-1]	3.59[-1]	6.43[-1]	8.02[-1]	9.92[-1]	1.05[0]	1.13[0]	1.22[0]	1.30[0]	1.38[0]
3s4s7d	1.84[-1]	5.37[-1]	9.60[-1]	1.20[0]	1.47[0]	1.56[0]	1.67[0]	1.78[0]	1.88[0]	1.97[0]
3s4p7s	4.62[-2]	1.19[-1]	1.87[-1]	2.20[-1]	2.59[-1]	2.72[-1]	2.87[-1]	3.05[-1]	3.22[-1]	3.36[-1]
3s4d7s	6.45[-2]	1.84[-1]	3.07[-1]	3.67[-1]	4.30[-1]	4.49[-1]	4.71[-1]	4.93[-1]	5.12[-1]	5.28[-1]
3s5s5s	2.82[-2]	7.00[-2]	1.11[-1]	1.33[-1]	1.60[-1]	1.69[-1]	1.82[-1]	1.97[-1]	2.15[-1]	2.34[-1]
3s5s5p*	4.03[-2]	1.12[-1]	1.90[-1]	2.33[-1]	2.87[-1]	3.06[-1]	3.32[-1]	3.63[-1]	3.99[-1]	4.38[-1]
3s5s5p	7.97[-2]	2.22[-1]	3.72[-1]	4.54[-1]	5.52[-1]	5.85[-1]	6.26[-1]	6.71[-1]	7.14[-1]	7.51[-1]
3s5s5d*	9.10[-2]	2.63[-1]	4.51[-1]	5.49[-1]	6.61[-1]	6.97[-1]	7.41[-1]	7.91[-1]	8.41[-1]	8.88[-1]
3s5s5d	1.37[-1]	3.93[-1]	6.73[-1]	8.18[-1]	9.78[-1]	1.03[0]	1.09[0]	1.15[0]	1.21[0]	1.26[0]
3s5p*5p	1.03[-2]	2.17[-2]	2.90[-2]	3.20[-2]	3.56[-2]	3.67[-2]	3.83[-2]	4.01[-2]	4.24[-2]	4.57[-2]
3s5p5p	1.20[-2]	3.00[-2]	4.38[-2]	4.93[-2]	5.47[-2]	5.64[-2]	5.88[-2]	6.15[-2]	6.36[-2]	6.36[-2]
3s5p5d	1.91[-2]	4.66[-2]	6.89[-2]	8.41[-2]	1.10[-1]	1.22[-1]	1.38[-1]	1.61[-1]	1.92[-1]	2.32[-1]
3s5s6s	2.37[-2]	6.19[-2]	1.01[-1]	1.23[-1]	1.49[-1]	1.58[-1]	1.71[-1]	1.86[-1]	2.04[-1]	2.22[-1]
3s5s6p*	1.89[-2]	5.58[-2]	9.78[-2]	1.22[-1]	1.53[-1]	1.64[-1]	1.79[-1]	1.97[-1]	2.18[-1]	2.40[-1]
3s5s6p	3.75[-2]	1.10[-1]	1.92[-1]	2.39[-1]	2.96[-1]	3.16[-1]	3.41[-1]	3.68[-1]	3.94[-1]	4.17[-1]
3s5s6d*	4.75[-2]	1.39[-1]	2.42[-1]	2.96[-1]	3.59[-1]	3.79[-1]	4.05[-1]	4.34[-1]	4.63[-1]	4.90[-1]
3s5s6d	7.15[-2]	2.09[-1]	3.61[-1]	4.41[-1]	5.32[-1]	5.60[-1]	5.95[-1]	6.33[-1]	6.67[-1]	6.96[-1]
3s5p*6s	1.61[-2]	4.55[-2]	7.67[-2]	9.39[-2]	1.16[-1]	1.23[-1]	1.34[-1]	1.47[-1]	1.61[-1]	1.78[-1]
3s5p6s	3.19[-2]	8.99[-2]	1.50[-1]	1.83[-1]	2.23[-1]	2.36[-1]	2.53[-1]	2.71[-1]	2.89[-1]	3.04[-1]
3s5d*6s	3.63[-2]	1.06[-1]	1.81[-1]	2.19[-1]	2.62[-1]	2.76[-1]	2.93[-1]	3.12[-1]	3.32[-1]	3.51[-1]
3s5d6s	5.47[-2]	1.59[-1]	2.70[-1]	3.26[-1]	3.88[-1]	4.07[-1]	4.30[-1]	4.54[-1]	4.76[-1]	4.95[-1]
3s5s7s	1.23[-2]	3.33[-2]	5.56[-2]	6.81[-2]	8.38[-2]	8.93[-2]	9.67[-2]	1.06[-1]	1.16[-1]	1.27[-1]
3s5s7p*	1.04[-2]	3.18[-2]	5.71[-2]	7.21[-2]	9.16[-2]	9.85[-2]	1.08[-1]	1.19[-1]	1.32[-1]	1.45[-1]

	$Z = 32$	$Z = 36$	$Z = 42$	$Z = 47$	$Z = 56$	$Z = 60$	$Z = 66$	$Z = 74$	$Z = 83$	$Z = 92$
$3s5s7p$	2.06[-2]	6.30[-2]	1.12[-1]	1.41[-1]	1.78[-1]	1.90[-1]	2.06[-1]	2.24[-1]	2.41[-1]	2.55[-1]
$3s5s7d^*$	2.79[-2]	8.30[-2]	1.45[-1]	1.78[-1]	2.17[-1]	2.30[-1]	2.46[-1]	2.64[-1]	2.83[-1]	3.00[-1]
$3s5s7d$	4.21[-2]	1.24[-1]	2.16[-1]	2.66[-1]	3.22[-1]	3.40[-1]	3.62[-1]	3.86[-1]	4.08[-1]	4.26[-1]
$3s5p7s$	1.61[-2]	4.62[-2]	7.77[-2]	9.48[-2]	1.15[-1]	1.22[-1]	1.30[-1]	1.40[-1]	1.50[-1]	1.58[-1]
$3s5d^*7s$	1.83[-2]	5.42[-2]	9.26[-2]	1.12[-1]	1.34[-1]	1.41[-1]	1.49[-1]	1.59[-1]	1.69[-1]	1.78[-1]
$3s5d7s$	2.76[-2]	8.11[-2]	1.38[-1]	1.67[-1]	1.98[-1]	2.07[-1]	2.19[-1]	2.31[-1]	2.42[-1]	2.52[-1]
$3s6s6s$	4.96[-3]	1.35[-2]	2.26[-2]	2.75[-2]	3.38[-2]	3.60[-2]	3.90[-2]	4.27[-2]	4.68[-2]	5.13[-2]
$3s6s6p^*$	7.55[-3]	2.26[-2]	3.95[-2]	4.93[-2]	6.18[-2]	6.63[-2]	7.23[-2]	7.97[-2]	8.81[-2]	9.73[-2]
$3s6s6p$	1.50[-2]	4.47[-2]	7.78[-2]	9.64[-2]	1.20[-1]	1.27[-1]	1.38[-1]	1.49[-1]	1.60[-1]	1.69[-1]
$3s6s6d^*$	1.89[-2]	5.63[-2]	9.71[-2]	1.18[-1]	1.43[-1]	1.50[-1]	1.60[-1]	1.72[-1]	1.83[-1]	1.94[-1]
$3s6s6d$	2.85[-2]	8.43[-2]	1.45[-1]	1.76[-1]	2.11[-1]	2.22[-1]	2.36[-1]	2.50[-1]	2.63[-1]	2.75[-1]
$3s6p6p$	2.34[-3]	6.21[-3]	9.17[-3]	1.04[-2]	1.15[-2]	1.19[-2]	1.25[-2]	1.33[-2]	1.41[-2]	1.45[-2]
$3s6p6d$	4.35[-3]	1.04[-2]	1.55[-2]	1.93[-2]	2.54[-2]	2.79[-2]	3.15[-2]	3.66[-2]	4.35[-2]	5.30[-2]
$3s6s7s$	5.12[-3]	1.45[-2]	2.46[-2]	3.03[-2]	3.75[-2]	4.00[-2]	4.34[-2]	4.77[-2]	5.24[-2]	5.75[-2]
$3s6s7p^*$	4.15[-3]	1.29[-2]	2.31[-2]	2.91[-2]	3.69[-2]	3.97[-2]	4.35[-2]	4.82[-2]	5.34[-2]	5.90[-2]
$3s6s7p$	8.24[-3]	2.55[-2]	4.55[-2]	5.71[-2]	7.18[-2]	7.68[-2]	8.32[-2]	9.05[-2]	9.75[-2]	1.04[-1]
$3s6s7d^*$	1.11[-2]	3.35[-2]	5.82[-2]	7.13[-2]	8.64[-2]	9.13[-2]	9.76[-2]	1.05[-1]	1.12[-1]	1.19[-1]
$3s6s7d$	1.68[-2]	5.02[-2]	8.69[-2]	1.06[-1]	1.28[-1]	1.35[-1]	1.43[-1]	1.53[-1]	1.61[-1]	1.68[-1]
$3s6p7s$	7.55[-3]	2.29[-2]	4.00[-2]	4.97[-2]	6.18[-2]	6.59[-2]	7.10[-2]	7.70[-2]	8.26[-2]	8.74[-2]
$3s6d^*7s$	9.55[-3]	2.88[-2]	4.97[-2]	6.05[-2]	7.28[-2]	7.68[-2]	8.18[-2]	8.76[-2]	9.34[-2]	9.89[-2]
$3s6d7s$	1.44[-2]	4.31[-2]	7.42[-2]	9.01[-2]	1.08[-1]	1.13[-1]	1.20[-1]	1.27[-1]	1.34[-1]	1.40[-1]
$3s7s7s$	1.32[-3]	3.86[-3]	6.66[-3]	8.26[-3]	1.03[-2]	1.10[-2]	1.20[-2]	1.32[-2]	1.45[-2]	1.60[-2]
$3s7s7p^*$	2.09[-3]	6.58[-3]	1.18[-2]	1.49[-2]	1.90[-2]	2.05[-2]	2.25[-2]	2.49[-2]	2.76[-2]	3.06[-2]
$3s7s7p$	4.16[-3]	1.31[-2]	2.34[-2]	2.94[-2]	3.70[-2]	3.97[-2]	4.30[-2]	4.68[-2]	5.04[-2]	5.36[-2]
$3s7s7d^*$	5.61[-3]	1.71[-2]	2.98[-2]	3.64[-2]	4.41[-2]	4.66[-2]	4.98[-2]	5.34[-2]	5.71[-2]	6.06[-2]
$3s7s7d$	8.45[-3]	2.56[-2]	4.45[-2]	5.43[-2]	6.54[-2]	6.89[-2]	7.32[-2]	7.78[-2]	8.21[-2]	8.58[-2]
$3s7p7d$	1.35[-3]	3.30[-3]	4.95[-3]	6.17[-3]	8.13[-3]	8.88[-3]	1.01[-2]	1.16[-2]	1.38[-2]	1.69[-2]

TABLE VI.  $M_2$ -shell Auger rates  $A(n_0j_0l_0, n_1j_1l_1, n_2j_2l_2)$  (in mau) as function of  $Z$  for Zn-like ions.

	$Z=32$	$Z=36$	$Z=42$	$Z=47$	$Z=56$	$Z=60$	$Z=66$	$Z=74$	$Z=83$	$Z=92$
$3p^*4s4p^*$	7.64[-1]	1.54[0]	2.17[0]	2.50[0]	2.83[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]
$3p^*4s4p$	5.93[-2]	1.75[-1]	3.31[-1]	4.10[-1]	4.71[-1]	4.83[-1]	4.92[-1]	0.00[0]	0.00[0]	4.79[-1]
$3p^*4s4d^*$	2.22[-1]	1.96[-1]	1.39[-1]	1.19[-1]	1.35[-1]	1.06[-1]	1.07[-1]	1.13[-1]	1.29[-1]	1.55[-1]
$3p^*4s4d$	1.00[-1]	2.17[-1]	2.93[-1]	3.27[-1]	5.79[-1]	4.21[-1]	4.61[-1]	5.04[-1]	5.25[-1]	5.40[-1]
$3p^*4s4f^*$	3.89[-2]	2.49[-1]	2.93[-1]	1.75[-1]	3.55[-2]	1.48[-1]	1.19[-2]	2.96[-2]	4.84[-2]	5.83[-2]
$3p^*4s4f$	2.43[-2]	1.39[-1]	2.04[-1]	2.17[-1]	2.69[-1]	3.13[-1]	3.69[-1]	3.93[-1]	4.20[-1]	4.17[-1]
$3p^*4p^*4p^*$	4.17[-1]	1.02[0]	1.56[0]	1.83[0]	2.16[0]	2.28[0]	2.43[0]	0.00[0]	0.00[0]	0.00[0]
$3p^*4p^*4p$	1.47[0]	3.46[0]	5.19[0]	6.19[0]	6.90[0]	7.28[0]	7.65[0]	8.08[0]	8.46[0]	8.90[0]
$3p^*4p^*4d^*$	1.05[0]	3.06[0]	5.17[0]	6.23[0]	1.59[0]	7.42[0]	8.14[0]	8.98[0]	9.01[0]	9.52[0]
$3p^*4p^*4d$	1.99[0]	5.40[0]	8.82[0]	1.06[1]	2.22[1]	1.07[1]	1.33[1]	1.52[1]	1.57[1]	1.51[1]
$3p^*4p^*4f^*$	3.21[-2]	5.26[-1]	2.06[0]	3.33[0]	5.01[0]	5.54[0]	1.07[1]	4.16[1]	3.52[0]	7.08[0]
$3p^*4p^*4f$	4.08[-2]	8.37[-1]	3.63[0]	5.97[0]	8.96[0]	9.85[0]	1.29[1]	7.59[0]	1.04[1]	1.18[1]
$3p^*4p4p$	4.36[-2]	8.77[-2]	1.30[-1]	1.56[-1]	1.94[-1]	2.03[-1]	2.17[-1]	2.30[-1]	2.35[-1]	2.31[-1]
$3p^*4p4d^*$	4.13[-1]	5.48[-1]	6.18[-1]	6.37[-1]	6.44[-1]	4.13[-1]	6.29[-1]	5.67[-1]	5.26[-1]	5.55[-1]
$3p^*4p4d$	1.01[-1]	2.54[-1]	3.94[-1]	4.52[-1]	4.99[-1]	1.03[0]	5.26[-1]	4.59[-1]	5.66[-1]	5.23[-1]
$3p^*4p4f^*$	2.15[-2]	2.32[-1]	1.09[0]	2.09[0]	3.65[0]	4.16[0]	4.71[0]	4.68[0]	4.96[0]	4.74[0]
$3p^*4p4f$	1.30[-2]	1.29[-1]	4.28[-1]	6.90[-1]	1.06[0]	1.17[0]	1.29[0]	1.38[0]	1.18[0]	1.88[0]
$3p^*4d^*4d^*$	6.89[-2]	2.05[-1]	2.76[-1]	2.78[-1]	2.73[-1]	2.75[-1]	2.81[-1]	2.50[-1]	1.38[-1]	3.48[-1]
$3p^*4d^*4d$	1.89[-1]	3.52[-1]	4.92[-1]	6.29[-1]	8.88[-1]	9.76[-1]	1.06[0]	2.30[-1]	2.03[-1]	8.94[-1]
$3p^*4d^*4f^*$	1.66[-2]	1.20[-1]	2.41[-1]	3.12[-1]	4.54[-1]	5.09[-1]	5.64[-1]	5.76[-1]	5.16[-1]	4.23[-1]
$3p^*4d^*4f$	1.54[-2]	7.40[-2]	2.37[-1]	4.94[-1]	1.01[0]	1.18[0]	1.34[0]	1.34[0]	1.14[0]	8.18[-1]
$3p^*4d4d$	1.47[-2]	5.91[-2]	1.18[-1]	1.55[-1]	2.01[-1]	2.14[-1]	2.27[-1]	2.33[-1]	2.28[-1]	2.44[-1]
$3p^*4p^*5s$	2.38[-1]	5.76[-1]	8.93[-1]	1.05[0]	1.24[0]	1.31[0]	1.40[0]	1.51[0]	1.63[0]	1.77[0]
$3p^*4p^*5p^*$	2.53[-1]	6.48[-1]	1.03[0]	1.24[0]	1.49[0]	1.58[0]	1.70[0]	1.85[0]	2.03[0]	2.22[0]
$3p^*4p^*5p$	5.04[-1]	1.33[0]	2.14[0]	2.57[0]	3.09[0]	3.26[0]	3.47[0]	3.72[0]	3.96[0]	4.19[0]
$3p^*4p^*5d^*$	4.55[-1]	1.35[0]	2.31[0]	2.80[0]	3.35[0]	3.53[0]	3.75[0]	4.01[0]	4.26[0]	4.49[0]
$3p^*4p^*5d$	8.48[-1]	2.33[0]	3.85[0]	4.65[0]	5.54[0]	5.81[0]	6.14[0]	6.48[0]	6.78[0]	7.02[0]
$3p^*4p^*5f^*$	2.52[-2]	3.80[-1]	1.36[0]	2.07[0]	2.92[0]	3.17[0]	3.45[0]	3.71[0]	3.89[0]	3.98[0]
$3p^*4p^*5f$	3.29[-2]	6.15[-1]	2.36[0]	3.61[0]	5.03[0]	5.42[0]	5.84[0]	6.18[0]	6.36[0]	6.38[0]
$3p^*4p5p^*$	3.79[-1]	8.50[-1]	1.22[0]	1.40[0]	1.60[0]	1.67[0]	1.75[0]	1.85[0]	1.96[0]	2.06[0]
$3p^*4d^*5p^*$	2.76[-1]	7.48[-1]	1.20[0]	1.40[0]	1.62[0]	1.69[0]	1.77[0]	1.87[0]	1.97[0]	2.07[0]
$3p^*4d5p^*$	5.20[-1]	1.33[0]	2.08[0]	2.44[0]	2.82[0]	2.93[0]	3.05[0]	3.18[0]	3.28[0]	3.35[0]
$3p^*4p^*6p^*$	1.14[-1]	3.04[-1]	5.00[-1]	6.09[-1]	7.46[-1]	7.95[-1]	8.61[-1]	9.42[-1]	1.03[0]	1.13[0]
$3p^*4p^*6p$	2.35[-1]	6.54[-1]	1.10[0]	1.34[0]	1.64[0]	1.74[0]	1.87[0]	2.02[0]	2.16[0]	2.30[0]
$3p^*4p^*6d^*$	2.38[-1]	7.19[-1]	1.24[0]	1.50[0]	1.81[0]	1.91[0]	2.04[0]	2.19[0]	2.33[0]	2.47[0]
$3p^*4p^*6d$	4.41[-1]	1.22[0]	2.05[0]	2.48[0]	2.98[0]	3.13[0]	3.32[0]	3.53[0]	3.70[0]	3.85[0]
$3p^*4p^*6f^*$	1.75[-2]	2.51[-1]	8.53[-1]	1.27[0]	1.74[0]	1.88[0]	2.03[0]	2.18[0]	2.28[0]	2.33[0]
$3p^*4p^*6f$	2.30[-2]	4.09[-1]	1.47[0]	2.18[0]	2.94[0]	3.15[0]	3.38[0]	3.57[0]	3.67[0]	3.69[0]
$3p^*4d6p^*$	2.20[-1]	5.54[-1]	8.53[-1]	9.94[-1]	1.14[0]	1.18[0]	1.23[0]	1.28[0]	1.31[0]	1.34[0]
$3p^*4f^*6p$	2.16[-3]	2.80[-2]	1.84[-1]	3.86[-1]	7.26[-1]	8.43[-1]	9.76[-1]	1.09[0]	1.14[0]	1.13[0]
$3p^*4f^*6f$	1.60[-3]	1.02[-1]	6.45[-1]	1.11[0]	1.62[0]	1.75[0]	1.87[0]	1.97[0]	2.03[0]	2.06[0]
$3p^*4f6f^*$	1.54[-3]	9.62[-2]	6.04[-1]	1.04[0]	1.52[0]	1.63[0]	1.74[0]	1.81[0]	1.83[0]	1.82[0]
$3p^*4s7p^*$	4.08[-2]	7.74[-2]	1.04[-1]	1.16[-1]	1.30[-1]	1.34[-1]	1.41[-1]	1.51[-1]	1.65[-1]	1.81[-1]
$3p^*4p^*7s$	5.58[-2]	1.54[-1]	2.58[-1]	3.16[-1]	3.87[-1]	4.12[-1]	4.45[-1]	4.85[-1]	5.30[-1]	5.76[-1]
$3p^*4p^*7p^*$	6.15[-2]	1.69[-1]	2.84[-1]	3.50[-1]	4.34[-1]	4.64[-1]	5.04[-1]	5.54[-1]	6.08[-1]	6.67[-1]
$3p^*4p^*7p$	1.29[-1]	3.72[-1]	6.38[-1]	7.89[-1]	9.78[-1]	1.04[0]	1.12[0]	1.22[0]	1.31[0]	1.40[0]
$3p^*4p^*7d^*$	1.41[-1]	4.28[-1]	7.39[-1]	9.03[-1]	1.09[0]	1.16[0]	1.24[0]	1.33[0]	1.42[0]	1.51[0]
$3p^*4p^*7d$	2.59[-1]	7.25[-1]	1.22[0]	1.48[0]	1.79[0]	1.89[0]	2.01[0]	2.14[0]	2.25[0]	2.34[0]
$3p^*4p7p^*$	8.31[-2]	1.85[-1]	2.62[-1]	2.99[-1]	3.41[-1]	3.55[-1]	3.72[-1]	3.94[-1]	4.16[-1]	4.38[-1]
$3p^*4d^*7p^*$	6.13[-2]	1.62[-1]	2.51[-1]	2.90[-1]	3.32[-1]	3.45[-1]	3.59[-1]	3.78[-1]	3.97[-1]	4.15[-1]
$3p^*4d7p^*$	1.15[-1]	2.89[-1]	4.43[-1]	5.15[-1]	5.89[-1]	6.10[-1]	6.33[-1]	6.57[-1]	6.75[-1]	6.87[-1]
$3p^*5s5p^*$	6.00[-2]	1.37[-1]	2.03[-1]	2.36[-1]	2.74[-1]	2.88[-1]	3.07[-1]	3.32[-1]	3.62[-1]	3.98[-1]
$3p^*5s5d^*$	2.10[-2]	1.64[-2]	1.05[-2]	9.06[-3]	9.06[-3]	9.45[-3]	1.02[-2]	1.15[-2]	1.33[-2]	1.57[-2]
$3p^*5p^*5p^*$	3.71[-2]	9.54[-2]	1.51[-1]	1.81[-1]	2.19[-1]	2.32[-1]	2.51[-1]	2.75[-1]	3.03[-1]	3.35[-1]
$3p^*5p^*5p$	1.31[-1]	3.26[-1]	5.06[-1]	6.00[-1]	7.14[-1]	7.52[-1]	8.02[-1]	8.60[-1]	9.19[-1]	9.77[-1]
$3p^*5p^*5d^*$	1.19[-1]	3.30[-1]	5.34[-1]	6.32[-1]	7.40[-1]	7.74[-1]	8.19[-1]	8.71[-1]	9.26[-1]	9.80[-1]
$3p^*5p^*5d$	2.21[-1]	5.76[-1]	9.11[-1]	1.08[0]	1.26[0]	1.32[0]	1.38[0]	1.45[0]	1.51[0]	1.56[0]

	$Z = 32$	$Z = 36$	$Z = 42$	$Z = 47$	$Z = 56$	$Z = 60$	$Z = 66$	$Z = 74$	$Z = 83$	$Z = 92$
$3p^*5p5d^*$	4.33[-2]	5.38[-2]	5.81[-2]	6.03[-2]	6.57[-2]	6.84[-2]	7.21[-2]	7.56[-2]	7.68[-2]	7.47[-2]
$3p^*5p5d$	1.13[-2]	2.69[-2]	3.93[-2]	4.34[-2]	4.67[-2]	4.79[-2]	4.97[-2]	5.26[-2]	5.61[-2]	5.95[-2]
$3p^*5d^*5d^*$	1.14[-2]	2.80[-2]	2.87[-2]	2.59[-2]	2.57[-2]	2.67[-2]	2.84[-2]	3.00[-2]	3.11[-2]	3.29[-2]
$3p^*5d^*5d$	2.75[-2]	4.49[-2]	6.08[-2]	8.58[-2]	1.36[-1]	1.53[-1]	1.70[-1]	1.75[-1]	1.59[-1]	1.27[-1]
$3p^*5s6p^*$	2.51[-2]	5.64[-2]	8.26[-2]	9.52[-2]	1.10[-1]	1.15[-1]	1.23[-1]	1.33[-1]	1.46[-1]	1.61[-1]
$3p^*5p^*6s$	2.66[-2]	6.59[-2]	1.03[-1]	1.22[-1]	1.45[-1]	1.53[-1]	1.64[-1]	1.79[-1]	1.96[-1]	2.16[-1]
$3p^*5p^*6p^*$	3.30[-2]	8.71[-2]	1.40[-1]	1.69[-1]	2.07[-1]	2.20[-1]	2.39[-1]	2.63[-1]	2.90[-1]	3.22[-1]
$3p^*5p^*6p$	6.10[-2]	1.61[-1]	2.60[-1]	3.14[-1]	3.81[-1]	4.04[-1]	4.34[-1]	4.69[-1]	5.04[-1]	5.39[-1]
$3p^*5p^*6d^*$	6.20[-2]	1.75[-1]	2.86[-1]	3.40[-1]	4.02[-1]	4.21[-1]	4.47[-1]	4.78[-1]	5.10[-1]	5.42[-1]
$3p^*5p^*6d$	1.15[-1]	3.03[-1]	4.85[-1]	5.76[-1]	6.79[-1]	7.11[-1]	7.51[-1]	7.92[-1]	8.30[-1]	8.60[-1]
$3p^*5p6p^*$	5.50[-2]	1.36[-1]	2.09[-1]	2.47[-1]	2.92[-1]	3.08[-1]	3.28[-1]	3.52[-1]	3.77[-1]	4.01[-1]
$3p^*5d^*6p^*$	5.01[-2]	1.37[-1]	2.18[-1]	2.55[-1]	2.95[-1]	3.08[-1]	3.25[-1]	3.46[-1]	3.67[-1]	3.89[-1]
$3p^*5d6p^*$	9.34[-2]	2.40[-1]	3.75[-1]	4.40[-1]	5.11[-1]	5.32[-1]	5.58[-1]	5.85[-1]	6.08[-1]	6.27[-1]
$3p^*5p^*7s$	1.41[-2]	3.68[-2]	5.91[-2]	7.10[-2]	8.58[-2]	9.11[-2]	9.83[-2]	1.08[-1]	1.18[-1]	1.30[-1]
$3p^*5p^*7p^*$	1.77[-2]	4.78[-2]	7.81[-2]	9.50[-2]	1.17[-1]	1.25[-1]	1.36[-1]	1.50[-1]	1.66[-1]	1.84[-1]
$3p^*5p^*7p$	3.35[-2]	9.16[-2]	1.52[-1]	1.85[-1]	2.27[-1]	2.42[-1]	2.61[-1]	2.84[-1]	3.06[-1]	3.28[-1]
$3p^*5p^*7d^*$	3.65[-2]	1.04[-1]	1.71[-1]	2.05[-1]	2.43[-1]	2.55[-1]	2.72[-1]	2.91[-1]	3.11[-1]	3.31[-1]
$3p^*5p^*7d$	6.75[-2]	1.80[-1]	2.89[-1]	3.45[-1]	4.09[-1]	4.30[-1]	4.55[-1]	4.81[-1]	5.05[-1]	5.25[-1]
$3p^*5p^*7f$	3.56[-3]	5.79[-2]	1.94[-1]	2.79[-1]	3.66[-1]	3.89[-1]	4.13[-1]	4.33[-1]	4.43[-1]	4.42[-1]
$3p^*5p7p^*$	2.87[-2]	7.09[-2]	1.09[-1]	1.28[-1]	1.52[-1]	1.60[-1]	1.71[-1]	1.84[-1]	1.97[-1]	2.09[-1]
$3p^*5d^*7p^*$	2.62[-2]	7.11[-2]	1.13[-1]	1.32[-1]	1.51[-1]	1.57[-1]	1.66[-1]	1.77[-1]	1.88[-1]	1.99[-1]
$3p^*5d7p^*$	4.87[-2]	1.25[-1]	1.95[-1]	2.28[-1]	2.64[-1]	2.75[-1]	2.88[-1]	3.01[-1]	3.13[-1]	3.22[-1]
$3p^*6s6p^*$	1.10[-2]	2.71[-2]	4.17[-2]	4.91[-2]	5.82[-2]	6.14[-2]	6.60[-2]	7.19[-2]	7.92[-2]	8.75[-2]
$3p^*6p^*6p^*$	7.30[-3]	1.96[-2]	3.19[-2]	3.87[-2]	4.76[-2]	5.08[-2]	5.53[-2]	6.09[-2]	6.76[-2]	7.51[-2]
$3p^*6p^*6p$	2.57[-2]	6.72[-2]	1.07[-1]	1.29[-1]	1.56[-1]	1.66[-1]	1.78[-1]	1.92[-1]	2.07[-1]	2.22[-1]
$3p^*6p^*6d^*$	2.62[-2]	7.28[-2]	1.17[-1]	1.37[-1]	1.61[-1]	1.68[-1]	1.78[-1]	1.90[-1]	2.03[-1]	2.15[-1]
$3p^*6p^*6d$	4.86[-2]	1.26[-1]	2.00[-1]	2.36[-1]	2.76[-1]	2.88[-1]	3.03[-1]	3.19[-1]	3.34[-1]	3.45[-1]
$3p^*6p^*6f$	2.02[-3]	3.33[-2]	1.14[-1]	1.66[-1]	2.19[-1]	2.33[-1]	2.47[-1]	2.58[-1]	2.63[-1]	2.61[-1]
$3p^*6p6d^*$	9.14[-3]	1.13[-2]	1.24[-2]	1.31[-2]	1.50[-2]	1.60[-2]	1.73[-2]	1.87[-2]	1.94[-2]	1.91[-2]
$3p^*6p6d$	2.49[-3]	5.91[-3]	8.44[-3]	9.17[-3]	9.82[-3]	1.01[-2]	1.07[-2]	1.15[-2]	1.26[-2]	1.38[-2]
$3p^*6d^*6d$	6.81[-3]	1.06[-2]	1.52[-2]	2.30[-2]	3.76[-2]	4.26[-2]	4.77[-2]	4.98[-2]	4.61[-2]	3.72[-2]
$3p^*6s7p^*$	5.81[-3]	1.42[-2]	2.17[-2]	2.55[-2]	3.00[-2]	3.16[-2]	3.39[-2]	3.71[-2]	4.09[-2]	4.52[-2]
$3p^*6p^*7s$	5.84[-3]	1.51[-2]	2.40[-2]	2.87[-2]	3.45[-2]	3.66[-2]	3.95[-2]	4.33[-2]	4.77[-2]	5.28[-2]
$3p^*6p^*7p^*$	7.81[-3]	2.14[-2]	3.52[-2]	4.30[-2]	5.32[-2]	5.69[-2]	6.20[-2]	6.86[-2]	7.62[-2]	8.48[-2]
$3p^*6p^*7p$	1.41[-2]	3.82[-2]	6.26[-2]	7.62[-2]	9.34[-2]	9.94[-2]	1.07[-1]	1.17[-1]	1.26[-1]	1.35[-1]
$3p^*6p^*7d^*$	1.54[-2]	4.33[-2]	6.98[-2]	8.26[-2]	9.72[-2]	1.02[-1]	1.08[-1]	1.16[-1]	1.24[-1]	1.32[-1]
$3p^*6p^*7d$	2.85[-2]	7.50[-2]	1.19[-1]	1.41[-1]	1.66[-1]	1.74[-1]	1.84[-1]	1.94[-1]	2.03[-1]	2.11[-1]
$3p^*6p7p^*$	1.34[-2]	3.51[-2]	5.60[-2]	6.73[-2]	8.14[-2]	8.63[-2]	9.27[-2]	1.00[-1]	1.08[-1]	1.16[-1]
$3p^*6p7d^*$	5.04[-3]	6.28[-3]	6.89[-3]	7.39[-3]	8.62[-3]	9.23[-3]	1.01[-2]	1.09[-2]	1.13[-2]	1.11[-2]
$3p^*6d^*7p^*$	1.37[-2]	3.80[-2]	6.08[-2]	7.14[-2]	8.26[-2]	8.62[-2]	9.09[-2]	9.72[-2]	1.04[-1]	1.10[-1]
$3p^*6d^*7p$	4.94[-3]	5.90[-3]	6.23[-3]	6.65[-3]	8.26[-3]	9.03[-3]	1.03[-2]	1.07[-2]	1.14[-2]	1.18[-2]
$3p^*6d7p^*$	2.53[-2]	6.60[-2]	1.04[-1]	1.22[-1]	1.43[-1]	1.49[-1]	1.56[-1]	1.65[-1]	1.72[-1]	1.78[-1]
$3p^*7s7p^*$	3.07[-3]	7.92[-3]	1.24[-2]	1.48[-2]	1.78[-2]	1.89[-2]	2.03[-2]	2.23[-2]	2.46[-2]	2.73[-2]
$3p^*7s7d^*$	1.17[-3]	8.39[-4]	5.46[-4]	5.17[-4]	6.13[-4]	6.81[-4]	7.72[-4]	8.80[-4]	1.02[-3]	1.20[-3]
$3p^*7p^*7p^*$	2.09[-3]	5.82[-3]	9.67[-3]	1.19[-2]	1.48[-2]	1.58[-2]	1.73[-2]	1.91[-2]	2.13[-2]	2.37[-2]
$3p^*7p^*7p$	7.35[-3]	2.00[-2]	3.27[-2]	3.97[-2]	4.87[-2]	5.18[-2]	5.59[-2]	6.08[-2]	6.58[-2]	7.07[-2]
$3p^*7p^*7d^*$	8.04[-3]	2.27[-2]	3.63[-2]	4.28[-2]	4.99[-2]	5.24[-2]	5.54[-2]	5.92[-2]	6.33[-2]	6.74[-2]
$3p^*7p^*7d$	1.49[-2]	3.91[-2]	6.20[-2]	7.33[-2]	8.60[-2]	9.00[-2]	9.48[-2]	1.00[-1]	1.05[-1]	1.09[-1]
$3p^*7p7d^*$	2.71[-3]	3.21[-3]	3.59[-3]	3.92[-3]	4.81[-3]	5.13[-3]	5.79[-3]	6.36[-3]	6.71[-3]	6.67[-3]
$3p^*7d^*7d^*$	9.99[-4]	2.05[-3]	1.78[-3]	1.63[-3]	1.97[-3]	2.12[-3]	2.42[-3]	2.69[-3]	2.68[-3]	2.53[-3]
$3p^*7d^*7d$	2.23[-3]	3.32[-3]	4.92[-3]	7.88[-3]	1.34[-2]	1.50[-2]	1.69[-2]	1.82[-2]	1.70[-2]	1.37[-2]

TABLE VII.  $M_3$ -shell Auger rates  $A(n_0j_0l_0, n_1j_1l_1, n_2j_2l_2)$  (in mau) as function of  $Z$  for Zn-like ions.

	$Z=32$	$Z=36$	$Z=42$	$Z=47$	$Z=56$	$Z=60$	$Z=66$	$Z=74$	$Z=83$	$Z=92$
$3p4s4p^*$	2.95[-2]	7.51[-2]	1.47[-1]	1.85[-1]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]
$3p4s4p$	8.39[-1]	1.69[0]	2.43[0]	2.79[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]
$3p4s4d^*$	8.48[-2]	1.53[-1]	1.88[-1]	2.02[-1]	2.22[-1]	2.30[-1]	0.00[0]	0.00[0]	0.00[0]	0.00[0]
$3p4s4d$	2.46[-1]	2.57[-1]	2.29[-1]	2.28[-1]	2.35[-1]	2.43[-1]	0.00[0]	0.00[0]	0.00[0]	0.00[0]
$3p4s4f^*$	2.83[-2]	1.77[-1]	2.72[-1]	2.66[-1]	2.39[-1]	2.53[-1]	2.58[-1]	2.99[-1]	0.00[0]	0.00[0]
$3p4s4f$	5.47[-2]	3.61[-1]	5.29[-1]	4.61[-1]	2.33[-1]	3.28[-1]	3.49[-1]	4.48[-1]	0.00[0]	0.00[0]
$3p4p^*4p$	8.25[-1]	1.89[0]	2.81[0]	3.28[0]	3.88[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]
$3p4p^*4d^*$	5.25[-2]	9.69[-2]	1.16[-1]	1.16[-1]	1.10[-1]	1.06[-1]	1.01[-1]	0.00[0]	0.00[0]	0.00[0]
$3p4p^*4d$	2.36[-1]	3.64[-1]	4.94[-1]	5.67[-1]	5.88[-1]	6.99[-1]	7.56[-1]	0.00[0]	0.00[0]	0.00[0]
$3p4p^*4f$	1.89[-2]	2.00[-1]	7.95[-1]	1.43[0]	2.45[0]	3.59[0]	3.35[0]	3.79[0]	0.00[0]	0.00[0]
$3p4p4p$	1.22[0]	2.88[0]	4.33[0]	5.11[0]	5.88[0]	6.15[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]
$3p4p4d^*$	1.41[0]	3.83[0]	6.30[0]	7.57[0]	9.90[0]	9.47[0]	1.01[1]	1.07[1]	0.00[0]	0.00[0]
$3p4p4d$	2.04[0]	5.43[0]	8.85[0]	1.06[1]	8.48[0]	1.28[1]	1.37[1]	1.45[1]	0.00[0]	0.00[0]
$3p4p4f^*$	4.42[-2]	7.83[-1]	3.29[0]	5.44[0]	8.38[0]	2.81[0]	1.08[1]	1.15[1]	1.28[1]	1.36[1]
$3p4p4f$	5.90[-2]	9.33[-1]	3.80[0]	6.34[0]	9.91[0]	7.65[1]	1.24[1]	1.37[1]	1.50[1]	1.60[1]
$3p4d^*4d$	1.14[-1]	2.29[-1]	4.27[-1]	6.60[-1]	1.15[0]	2.50[1]	1.72[0]	2.01[0]	2.36[0]	2.62[0]
$3p4d4d$	1.24[-1]	3.15[-1]	4.26[-1]	4.76[-1]	6.04[-1]	1.12[0]	7.93[-1]	8.95[-1]	1.03[0]	1.12[0]
$3p4d4f^*$	1.20[-2]	9.16[-2]	4.16[-1]	8.53[-1]	1.76[0]	2.14[0]	1.04[0]	2.61[0]	4.20[0]	3.94[0]
$3p4d4f$	2.08[-2]	1.65[-1]	4.92[-1]	8.35[-1]	1.55[0]	1.86[0]	1.53[0]	1.46[0]	3.77[0]	3.28[0]
$3p4p^*5p$	2.13[-1]	4.62[-1]	6.61[-1]	7.64[-1]	8.97[-1]	9.47[-1]	1.02[0]	1.12[0]	1.24[0]	1.33[0]
$3p4p5s$	2.59[-1]	6.25[-1]	9.72[-1]	1.15[0]	1.36[0]	1.44[0]	1.55[0]	1.68[0]	1.84[0]	1.94[0]
$3p4p5p^*$	2.77[-1]	7.10[-1]	1.14[0]	1.38[0]	1.69[0]	1.80[0]	1.95[0]	2.15[0]	2.36[0]	2.75[0]
$3p4p5p$	7.34[-1]	1.82[0]	2.82[0]	3.34[0]	3.98[0]	4.19[0]	4.47[0]	4.81[0]	5.15[0]	5.49[0]
$3p4p5d^*$	5.98[-1]	1.65[0]	2.73[0]	3.29[0]	3.95[0]	4.17[0]	4.45[0]	4.78[0]	5.12[0]	5.45[0]
$3p4p5d$	8.56[-1]	2.34[0]	3.86[0]	4.64[0]	5.53[0]	5.81[0]	6.16[0]	6.56[0]	6.95[0]	7.32[0]
$3p4p5f^*$	3.43[-2]	5.52[-1]	2.05[0]	3.12[0]	4.40[0]	4.78[0]	5.23[0]	5.70[0]	6.11[0]	6.46[0]
$3p4p5f$	4.52[-2]	6.56[-1]	2.41[0]	3.71[0]	5.26[0]	5.72[0]	6.25[0]	6.77[0]	7.20[0]	7.53[0]
$3p4d^*5p$	3.69[-1]	9.42[-1]	1.48[0]	1.75[0]	2.05[0]	2.14[0]	2.26[0]	2.40[0]	2.55[0]	2.70[0]
$3p4d5p$	5.47[-1]	1.35[0]	2.07[0]	2.41[0]	2.77[0]	2.88[0]	3.02[0]	3.17[0]	3.33[0]	3.49[0]
$3p4p6p^*$	1.28[-1]	3.48[-1]	5.82[-1]	7.16[-1]	8.90[-1]	9.53[-1]	1.04[0]	1.15[0]	1.26[0]	1.39[0]
$3p4p6p$	3.29[-1]	8.46[-1]	1.35[0]	1.63[0]	1.96[0]	2.08[0]	2.23[0]	2.42[0]	2.60[0]	2.79[0]
$3p4p6d^*$	3.11[-1]	8.65[-1]	1.44[0]	1.75[0]	2.11[0]	2.24[0]	2.40[0]	2.58[0]	2.78[0]	2.97[0]
$3p4p6d$	4.43[-1]	1.23[0]	2.05[0]	2.48[0]	2.97[0]	3.13[0]	3.33[0]	3.56[0]	3.79[0]	4.00[0]
$3p4p6f^*$	2.37[-2]	3.62[-1]	1.26[0]	1.85[0]	2.52[0]	2.72[0]	2.96[0]	3.20[0]	3.43[0]	3.62[0]
$3p4p6f$	3.10[-2]	4.29[-1]	1.49[0]	2.21[0]	3.03[0]	3.26[0]	3.54[0]	3.81[0]	4.04[0]	4.23[0]
$3p4p6g^*$	8.69[-4]	2.66[-2]	1.62[-1]	3.29[-1]	6.49[-1]	7.81[-1]	9.60[-1]	1.16[0]	1.35[0]	1.51[0]
$3p4p6g$	1.17[-3]	3.57[-2]	2.09[-1]	4.15[-1]	7.90[-1]	9.40[-1]	1.14[0]	1.36[0]	1.57[0]	1.72[0]
$3p4d^*6p$	1.56[-1]	3.92[-1]	6.08[-1]	7.14[-1]	8.30[-1]	8.66[-1]	9.13[-1]	9.68[-1]	1.03[0]	1.08[0]
$3p4d6p$	2.34[-1]	5.63[-1]	8.50[-1]	9.80[-1]	1.11[0]	1.16[0]	1.21[0]	1.27[0]	1.33[0]	1.39[0]
$3p4d6g$	3.55[-4]	7.87[-3]	7.39[-2]	1.86[-1]	4.59[-1]	5.84[-1]	7.58[-1]	9.59[-1]	1.14[0]	1.26[0]
$3p4f^*6p$	3.90[-3]	6.35[-2]	2.64[-1]	4.41[-1]	6.92[-1]	7.75[-1]	8.76[-1]	9.79[-1]	1.07[0]	1.13[0]
$3p4f^*6f$	1.58[-3]	9.35[-2]	5.68[-1]	9.69[-1]	1.40[0]	1.50[0]	1.60[0]	1.68[0]	1.72[0]	1.75[0]
$3p4f6p$	5.23[-3]	7.25[-2]	3.11[-1]	5.54[-1]	9.35[-1]	1.07[0]	1.23[0]	1.40[0]	1.53[0]	1.63[0]
$3p4f6f^*$	1.62[-3]	9.70[-2]	5.89[-1]	9.99[-1]	1.42[0]	1.51[0]	1.60[0]	1.66[0]	1.68[0]	1.68[0]
$3p4f6f$	1.15[-3]	7.22[-2]	4.65[-1]	8.26[-1]	1.26[0]	1.37[0]	1.49[0]	1.59[0]	1.66[0]	1.70[0]
$3p4p^*7p$	4.67[-2]	1.00[-1]	1.42[-1]	1.64[-1]	1.92[-1]	2.03[-1]	2.19[-1]	2.41[-1]	2.68[-1]	3.00[-1]
$3p4p7s$	6.04[-2]	1.66[-1]	2.78[-1]	3.40[-1]	4.19[-1]	4.47[-1]	4.85[-1]	5.33[-1]	5.86[-1]	6.42[-1]
$3p4p7p^*$	7.02[-2]	1.97[-1]	3.38[-1]	4.20[-1]	5.28[-1]	5.67[-1]	6.19[-1]	6.84[-1]	7.56[-1]	8.31[-1]
$3p4p7p$	1.77[-1]	4.68[-1]	7.64[-1]	9.28[-1]	1.13[0]	1.21[0]	1.30[0]	1.41[0]	1.53[0]	1.64[0]
$3p4p7d^*$	1.82[-1]	5.11[-1]	8.57[-1]	1.04[0]	1.27[0]	1.35[0]	1.45[0]	1.56[0]	1.68[0]	1.80[0]
$3p4p7d$	2.60[-1]	7.28[-1]	1.22[0]	1.48[0]	1.79[0]	1.89[0]	2.01[0]	2.16[0]	2.30[0]	2.43[0]
$3p4d^*7p$	8.14[-2]	2.05[-1]	3.16[-1]	3.70[-1]	4.30[-1]	4.48[-1]	4.72[-1]	5.00[-1]	5.29[-1]	5.59[-1]
$3p4d7p$	1.23[-1]	2.96[-1]	4.43[-1]	5.08[-1]	5.75[-1]	5.95[-1]	6.20[-1]	6.50[-1]	6.80[-1]	7.13[-1]
$3p5s5p$	6.54[-2]	1.49[-1]	2.24[-1]	2.61[-1]	3.06[-1]	3.22[-1]	3.45[-1]	3.75[-1]	4.11[-1]	4.50[-1]
$3p5s5d$	2.27[-2]	2.14[-2]	1.76[-2]	1.82[-2]	2.15[-2]	2.28[-2]	2.44[-2]	2.59[-2]	2.79[-2]	3.24[-2]
$3p5p^*5p$	7.17[-2]	1.74[-1]	2.70[-1]	3.23[-1]	3.91[-1]	4.17[-1]	4.53[-1]	4.99[-1]	5.53[-1]	6.13[-1]
$3p5p^*5d$	2.42[-2]	3.44[-2]	4.29[-2]	4.65[-2]	5.08[-2]	5.24[-2]	5.44[-2]	5.62[-2]	5.72[-2]	5.75[-2]

	$Z = 32$	$Z = 36$	$Z = 42$	$Z = 47$	$Z = 56$	$Z = 60$	$Z = 66$	$Z = 74$	$Z = 83$	$Z = 92$
$3p5p5p$	1.08[-1]	2.70[-1]	4.19[-1]	4.97[-1]	5.94[-1]	6.27[-1]	6.72[-1]	7.24[-1]	7.80[-1]	8.35[-1]
$3p5p5d^*$	1.56[-1]	4.06[-1]	6.44[-1]	7.63[-1]	8.98[-1]	9.43[-1]	1.00[0]	1.07[0]	1.14[0]	1.22[0]
$3p5p5d$	2.27[-1]	5.76[-1]	9.03[-1]	1.06[0]	1.23[0]	1.29[0]	1.36[0]	1.44[0]	1.52[0]	1.60[0]
$3p5p5f$	1.01[-2]	1.35[-1]	5.07[-1]	7.96[-1]	1.14[0]	1.24[0]	1.34[0]	1.44[0]	1.52[0]	1.58[0]
$3p5d^*5d$	1.66[-2]	3.06[-2]	5.78[-2]	9.45[-2]	1.70[-1]	2.01[-1]	2.44[-1]	2.93[-1]	3.37[-1]	3.71[-1]
$3p5d5d$	1.97[-2]	4.18[-2]	4.65[-2]	5.38[-2]	8.09[-2]	9.52[-2]	1.16[-1]	1.42[-1]	1.65[-1]	1.82[-1]
$3p5s6p$	2.74[-2]	6.18[-2]	9.17[-2]	1.07[-1]	1.24[-1]	1.31[-1]	1.40[-1]	1.52[-1]	1.67[-1]	1.83[-1]
$3p5p^*6p$	3.02[-2]	7.25[-2]	1.11[-1]	1.33[-1]	1.61[-1]	1.71[-1]	1.86[-1]	2.05[-1]	2.28[-1]	2.54[-1]
$3p5p6s$	2.89[-2]	7.18[-2]	1.12[-1]	1.33[-1]	1.60[-1]	1.69[-1]	1.82[-1]	1.99[-1]	2.19[-1]	2.41[-1]
$3p5p6p^*$	3.32[-2]	8.55[-2]	1.38[-1]	1.68[-1]	2.07[-1]	2.21[-1]	2.41[-1]	2.67[-1]	2.96[-1]	3.28[-1]
$3p5p6p$	9.60[-2]	2.46[-1]	3.88[-1]	4.65[-1]	5.60[-1]	5.94[-1]	6.38[-1]	6.91[-1]	7.47[-1]	8.02[-1]
$3p5p6d^*$	8.12[-2]	2.14[-1]	3.41[-1]	4.06[-1]	4.81[-1]	5.07[-1]	5.40[-1]	5.80[-1]	6.23[-1]	6.66[-1]
$3p5p6d$	1.17[-1]	3.03[-1]	4.80[-1]	5.66[-1]	6.64[-1]	6.96[-1]	7.37[-1]	7.84[-1]	8.31[-1]	8.76[-1]
$3p5d^*6p$	6.60[-2]	1.69[-1]	2.65[-1]	3.12[-1]	3.64[-1]	3.82[-1]	4.04[-1]	4.31[-1]	4.60[-1]	4.90[-1]
$3p5d^*6d$	8.21[-3]	1.42[-2]	2.86[-2]	4.85[-2]	8.81[-2]	1.04[-1]	1.27[-1]	1.51[-1]	1.74[-1]	1.92[-1]
$3p5d6p$	9.65[-2]	2.41[-1]	3.70[-1]	4.30[-1]	4.96[-1]	5.16[-1]	5.43[-1]	5.73[-1]	6.05[-1]	6.35[-1]
$3p5d6d^*$	8.33[-3]	1.57[-2]	2.91[-2]	4.72[-2]	8.47[-2]	1.01[-1]	1.22[-1]	1.46[-1]	1.67[-1]	1.84[-1]
$3p5d6d$	1.99[-2]	4.04[-2]	4.40[-2]	5.22[-2]	8.28[-2]	9.86[-2]	1.22[-1]	1.49[-1]	1.74[-1]	1.93[-1]
$3p5p^*7p$	1.57[-2]	3.78[-2]	5.80[-2]	6.91[-2]	8.39[-2]	8.94[-2]	9.72[-2]	1.07[-1]	1.20[-1]	1.33[-1]
$3p5p7s$	1.53[-2]	3.99[-2]	6.43[-2]	7.74[-2]	9.39[-2]	9.99[-2]	1.08[-1]	1.19[-1]	1.31[-1]	1.44[-1]
$3p5p7p^*$	1.82[-2]	4.84[-2]	8.01[-2]	9.84[-2]	1.23[-1]	1.32[-1]	1.44[-1]	1.60[-1]	1.77[-1]	1.96[-1]
$3p5p7p$	5.14[-2]	1.34[-1]	2.16[-1]	2.60[-1]	3.17[-1]	3.36[-1]	3.63[-1]	3.94[-1]	4.27[-1]	4.59[-1]
$3p5p7d^*$	4.76[-2]	1.27[-1]	2.03[-1]	2.43[-1]	2.89[-1]	3.05[-1]	3.26[-1]	3.52[-1]	3.78[-1]	4.05[-1]
$3p5p7d$	6.85[-2]	1.80[-1]	2.86[-1]	3.39[-1]	4.00[-1]	4.21[-1]	4.46[-1]	4.76[-1]	5.06[-1]	5.34[-1]
$3p5p7f^*$	3.68[-3]	5.22[-2]	1.72[-1]	2.46[-1]	3.24[-1]	3.47[-1]	3.73[-1]	4.00[-1]	4.26[-1]	4.48[-1]
$3p5p7f$	4.77[-3]	6.04[-2]	2.05[-1]	3.00[-1]	3.99[-1]	4.26[-1]	4.55[-1]	4.84[-1]	5.08[-1]	5.27[-1]
$3p5d^*7p$	3.45[-2]	8.84[-2]	1.38[-1]	1.62[-1]	1.88[-1]	1.97[-1]	2.09[-1]	2.22[-1]	2.37[-1]	2.52[-1]
$3p5d^*7d$	4.67[-3]	7.82[-3]	1.64[-2]	2.83[-2]	5.19[-2]	6.15[-2]	7.42[-2]	8.86[-2]	1.02[-1]	1.12[-1]
$3p5d7p$	5.06[-2]	1.25[-1]	1.92[-1]	2.22[-1]	2.55[-1]	2.65[-1]	2.79[-1]	2.94[-1]	3.10[-1]	3.26[-1]
$3p5d7d^*$	4.76[-3]	8.98[-3]	1.63[-2]	2.64[-2]	4.90[-2]	5.89[-2]	7.02[-2]	8.44[-2]	9.63[-2]	1.03[-1]
$3p5d7d$	1.15[-2]	2.28[-2]	2.41[-2]	2.93[-2]	4.89[-2]	5.90[-2]	7.19[-2]	8.85[-2]	1.03[-1]	1.13[-1]
$3p6s6p$	1.20[-2]	2.96[-2]	4.59[-2]	5.43[-2]	6.47[-2]	6.84[-2]	7.37[-2]	8.06[-2]	8.89[-2]	9.79[-2]
$3p6p^*6p$	1.40[-2]	3.56[-2]	5.69[-2]	6.90[-2]	8.50[-2]	9.10[-2]	9.93[-2]	1.10[-1]	1.22[-1]	1.36[-1]
$3p6p6p$	2.13[-2]	5.55[-2]	8.86[-2]	1.07[-1]	1.29[-1]	1.37[-1]	1.48[-1]	1.61[-1]	1.74[-1]	1.88[-1]
$3p6p6d^*$	3.43[-2]	8.92[-2]	1.40[-1]	1.66[-1]	1.95[-1]	2.05[-1]	2.18[-1]	2.34[-1]	2.51[-1]	2.68[-1]
$3p6p6d$	4.98[-2]	1.26[-1]	1.96[-1]	2.30[-1]	2.67[-1]	2.79[-1]	2.95[-1]	3.13[-1]	3.31[-1]	3.49[-1]
$3p6p6f^*$	2.13[-3]	3.07[-2]	1.05[-1]	1.53[-1]	2.05[-1]	2.19[-1]	2.35[-1]	2.52[-1]	2.67[-1]	2.80[-1]
$3p6p6f$	2.77[-3]	3.51[-2]	1.27[-1]	1.92[-1]	2.61[-1]	2.80[-1]	2.99[-1]	3.17[-1]	3.30[-1]	3.41[-1]
$3p6d^*6d$	4.15[-3]	7.41[-3]	1.50[-2]	2.52[-2]	4.52[-2]	5.34[-2]	6.46[-2]	7.72[-2]	8.85[-2]	9.74[-2]
$3p6d6d$	5.05[-3]	9.89[-3]	1.07[-2]	1.32[-2]	2.18[-2]	2.61[-2]	3.23[-2]	3.98[-2]	4.65[-2]	5.17[-2]
$3p6s7p$	6.31[-3]	1.55[-2]	2.39[-2]	2.82[-2]	3.35[-2]	3.54[-2]	3.81[-2]	4.18[-2]	4.61[-2]	5.09[-2]
$3p6p^*7p$	7.30[-3]	1.86[-2]	2.97[-2]	3.60[-2]	4.44[-2]	4.75[-2]	5.19[-2]	5.75[-2]	6.41[-2]	7.14[-2]
$3p6p7s$	6.36[-3]	1.65[-2]	2.63[-2]	3.15[-2]	3.81[-2]	4.04[-2]	4.38[-2]	4.81[-2]	5.31[-2]	5.86[-2]
$3p6p7p^*$	7.65[-3]	2.02[-2]	3.31[-2]	4.05[-2]	5.05[-2]	5.42[-2]	5.93[-2]	6.59[-2]	7.33[-2]	8.14[-2]
$3p6p7p$	2.27[-2]	6.05[-2]	9.78[-2]	1.18[-1]	1.45[-1]	1.54[-1]	1.66[-1]	1.81[-1]	1.97[-1]	2.12[-1]
$3p6p7d^*$	2.01[-2]	5.28[-2]	8.37[-2]	9.92[-2]	1.17[-1]	1.24[-1]	1.32[-1]	1.42[-1]	1.52[-1]	1.63[-1]
$3p6p7d$	2.91[-2]	7.49[-2]	1.17[-1]	1.38[-1]	1.61[-1]	1.69[-1]	1.79[-1]	1.90[-1]	2.02[-1]	2.13[-1]
$3p6d^*7p$	1.79[-2]	4.66[-2]	7.31[-2]	8.62[-2]	1.01[-1]	1.06[-1]	1.13[-1]	1.21[-1]	1.29[-1]	1.38[-1]
$3p6d7p$	2.60[-2]	6.59[-2]	1.02[-1]	1.19[-1]	1.38[-1]	1.44[-1]	1.51[-1]	1.61[-1]	1.70[-1]	1.79[-1]
$3p6d7d$	5.82[-3]	1.10[-2]	1.14[-2]	1.45[-2]	2.56[-2]	3.12[-2]	3.92[-2]	4.74[-2]	5.56[-2]	6.23[-2]
$3p7s7p$	3.34[-3]	8.63[-3]	1.37[-2]	1.63[-2]	1.97[-2]	2.09[-2]	2.26[-2]	2.49[-2]	2.76[-2]	3.04[-2]
$3p7p^*7p$	3.99[-3]	1.05[-2]	1.73[-2]	2.12[-2]	2.64[-2]	2.83[-2]	3.10[-2]	3.45[-2]	3.84[-2]	4.27[-2]
$3p7p7p$	6.08[-3]	1.65[-2]	2.69[-2]	3.28[-2]	4.03[-2]	4.29[-2]	4.64[-2]	5.07[-2]	5.52[-2]	5.96[-2]
$3p7p7d^*$	1.05[-2]	2.76[-2]	4.36[-2]	5.15[-2]	6.08[-2]	6.40[-2]	6.82[-2]	7.32[-2]	7.87[-2]	8.42[-2]
$3p7p7d$	1.52[-2]	3.91[-2]	6.10[-2]	7.14[-2]	8.31[-2]	8.70[-2]	9.19[-2]	9.78[-2]	1.04[-1]	1.09[-1]
$3p7p7f$	9.70[-4]	1.21[-2]	4.26[-2]	6.31[-2]	8.36[-2]	8.87[-2]	9.41[-2]	9.89[-2]	1.03[-1]	1.06[-1]
$3p7d7d$	1.68[-3]	3.01[-3]	3.12[-3]	4.17[-3]	7.61[-3]	9.16[-3]	1.17[-2]	1.43[-2]	1.68[-2]	1.90[-2]

TABLE VIII.  $M_4$ -shell Auger rates  $A(n_0j_0l_0, n_1j_1l_1, n_2j_2l_2)$  (in mau) as function of  $Z$  for Zn-like ions.

	$Z=32$	$Z=36$	$Z=42$	$Z=47$	$Z=56$	$Z=60$	$Z=66$	$Z=74$	$Z=83$	$Z=92$
$3d^*4p^*4f^*$	2.75[0]	2.75[0]	1.94[0]	1.46[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]
$3d^*4p^*4f$	3.19[0]	2.81[0]	1.63[0]	1.01[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]
$3d^*4p4f^*$	1.39[0]	1.95[0]	1.68[0]	1.31[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]
$3d^*4p4f$	6.52[-1]	6.49[-1]	5.17[-1]	4.38[-1]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]
$3d^*4d^*4d^*$	4.13[0]	6.03[0]	7.47[0]	8.12[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]
$3d^*4d^*4d$	8.72[0]	1.27[1]	1.57[1]	1.70[1]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]
$3d^*4d^*4f^*$	6.51[-1]	1.93[0]	4.48[0]	6.73[0]	1.01[1]	1.15[1]	1.30[1]	0.00[0]	0.00[0]	0.00[0]
$3d^*4d^*4f$	6.12[-1]	2.81[0]	7.01[0]	9.68[0]	1.35[1]	1.42[1]	1.54[1]	1.66[1]	0.00[0]	0.00[0]
$3d^*4d4d$	1.02[-1]	1.83[-1]	2.39[-1]	2.62[-1]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]
$3d^*4d4f^*$	2.52[-1]	3.17[-1]	2.32[0]	5.20[0]	1.03[1]	1.24[1]	1.50[1]	1.77[1]	0.00[0]	0.00[0]
$3d^*4d4f$	5.83[-2]	1.21[-1]	2.43[-1]	3.70[-1]	5.66[-1]	6.50[-1]	7.42[-1]	8.33[-1]	0.00[0]	0.00[0]
$3d^*4f^*4f^*$	9.89[-2]	8.54[-1]	3.66[0]	6.68[0]	8.13[0]	1.45[1]	1.60[1]	1.79[1]	2.00[1]	2.14[1]
$3d^*4f^*4f$	3.20[-1]	2.71[0]	1.13[1]	2.02[1]	6.54[0]	3.85[1]	4.59[1]	5.19[1]	5.74[1]	6.13[1]
$3d^*4p^*5p$	1.44[0]	2.12[-1]	1.04[-1]	1.40[-1]	1.90[-1]	1.79[-1]	1.81[-1]	1.86[-1]	1.85[-1]	1.87[-1]
$3d^*4p^*5d^*$	1.99[0]	1.05[0]	8.84[-1]	8.85[-1]	5.74[-1]	7.84[-1]	9.92[-1]	1.01[0]	1.04[0]	1.16[0]
$3d^*4p^*5d$	1.82[0]	3.58[-1]	1.03[-1]	1.09[-1]	1.53[-1]	7.16[-2]	1.26[-1]	1.05[-1]	1.09[-1]	1.03[-1]
$3d^*4p^*5f^*$	1.35[0]	1.25[0]	6.56[-1]	4.03[-1]	2.62[-1]	1.31[0]	2.57[-1]	1.08[0]	2.42[-1]	4.20[-1]
$3d^*4p^*5f$	1.58[0]	1.31[0]	5.81[-1]	2.83[-1]	9.05[-2]	2.54[-2]	3.22[-2]	1.06[-1]	6.10[-2]	1.50[-1]
$3d^*4p^*5g$	4.88[-1]	5.71[-1]	5.72[-1]	5.29[-1]	4.73[-1]	1.92[-1]	6.75[-1]	8.66[-1]	3.88[0]	8.72[-1]
$3d^*4p5d^*$	2.19[0]	2.02[0]	2.04[0]	2.10[0]	2.12[0]	8.35[-1]	2.64[0]	3.62[0]	4.25[-1]	2.46[0]
$3d^*4d^*5s$	1.16[0]	1.42[0]	1.60[0]	1.68[0]	1.78[0]	1.56[0]	2.31[0]	2.26[0]	2.78[0]	2.26[0]
$3d^*4d^*5p^*$	1.13[0]	1.29[0]	1.50[0]	1.63[0]	1.81[0]	1.88[0]	2.11[0]	1.27[0]	7.25[-1]	2.51[0]
$3d^*4d^*5p$	2.18[0]	2.82[0]	3.35[0]	3.64[0]	3.99[0]	4.12[0]	4.25[0]	4.43[0]	4.66[0]	5.40[0]
$3d^*4d^*5d^*$	2.88[0]	4.11[0]	5.04[0]	5.48[0]	6.00[0]	6.18[0]	6.41[0]	6.70[0]	7.02[0]	6.61[0]
$3d^*4d^*5d$	3.54[0]	5.22[0]	6.54[0]	7.20[0]	7.94[0]	8.19[0]	8.50[0]	8.86[0]	9.24[0]	1.12[1]
$3d^*4d^*5f^*$	3.98[-1]	1.20[0]	2.77[0]	3.93[0]	5.36[0]	5.80[0]	6.30[0]	6.79[0]	7.19[0]	7.45[0]
$3d^*4d^*5f$	4.12[-1]	1.82[0]	4.21[0]	5.60[0]	7.08[0]	7.49[0]	7.96[0]	8.41[0]	8.78[0]	9.05[0]
$3d^*4d^*5g^*$	3.19[-2]	1.46[-1]	4.04[-1]	6.31[-1]	9.88[-1]	1.12[0]	1.29[0]	1.48[0]	1.65[0]	1.79[0]
$3d^*4d^*5g$	3.03[-2]	1.34[-1]	3.89[-1]	6.31[-1]	1.04[0]	1.20[0]	1.41[0]	1.63[0]	1.83[0]	1.94[0]
$3d^*4d5d^*$	2.48[0]	3.34[0]	3.87[0]	4.09[0]	4.30[0]	4.36[0]	4.44[0]	4.54[0]	4.65[0]	3.62[0]
$3d^*4d5f^*$	1.11[-1]	1.87[-1]	1.48[0]	2.84[0]	4.68[0]	5.26[0]	5.93[0]	6.59[0]	7.11[0]	7.50[0]
$3d^*4f^*5s$	1.13[-1]	3.29[-1]	5.43[-1]	6.58[-1]	8.12[-1]	8.74[-1]	9.73[-1]	1.13[0]	1.35[0]	1.69[0]
$3d^*4f^*5d^*$	1.68[-1]	3.98[-1]	9.88[-1]	1.67[0]	2.83[0]	3.25[0]	3.78[0]	4.30[0]	4.70[0]	4.93[0]
$3d^*4f^*5d$	9.04[-2]	8.51[-2]	8.33[-1]	1.99[0]	4.12[0]	4.93[0]	5.98[0]	7.11[0]	8.09[0]	8.84[0]
$3d^*4f^*5f^*$	1.12[-1]	9.12[-1]	3.48[0]	5.89[0]	9.37[0]	1.05[1]	1.19[1]	1.33[1]	1.45[1]	1.53[1]
$3d^*4f^*5f$	1.91[-1]	1.60[0]	6.02[0]	1.01[1]	1.61[1]	1.81[1]	2.06[1]	2.30[1]	2.49[1]	2.63[1]
$3d^*4f^*5g$	2.95[-2]	3.59[-1]	1.68[0]	3.31[0]	6.48[0]	7.80[0]	9.57[0]	1.15[1]	1.33[1]	1.45[1]
$3d^*4f5d^*$	1.30[-1]	5.82[-1]	1.42[0]	1.97[0]	2.60[0]	2.78[0]	2.98[0]	3.17[0]	3.30[0]	3.39[0]
$3d^*4f5f^*$	1.68[-1]	1.24[0]	4.35[0]	6.93[0]	1.02[1]	1.12[1]	1.23[1]	1.34[1]	1.41[1]	1.45[1]
$3d^*4d^*6s$	4.88[-1]	6.46[-1]	7.69[-1]	8.30[-1]	9.09[-1]	9.40[-1]	9.84[-1]	1.04[0]	1.12[0]	1.20[0]
$3d^*4d^*6p^*$	4.79[-1]	6.21[-1]	7.62[-1]	8.44[-1]	9.57[-1]	9.99[-1]	1.06[0]	1.13[0]	1.22[0]	1.32[0]
$3d^*4d^*6p$	9.77[-1]	1.36[0]	1.69[0]	1.86[0]	2.09[0]	2.17[0]	2.27[0]	2.40[0]	2.54[0]	2.69[0]
$3d^*4d^*6d^*$	1.40[0]	2.00[0]	2.47[0]	2.70[0]	2.98[0]	3.07[0]	3.20[0]	3.35[0]	3.52[0]	3.70[0]
$3d^*4d^*6d$	1.80[0]	2.69[0]	3.41[0]	3.78[0]	4.21[0]	4.35[0]	4.54[0]	4.75[0]	4.97[0]	5.19[0]
$3d^*4d^*6f^*$	2.45[-1]	7.52[-1]	1.70[0]	2.33[0]	3.04[0]	3.24[0]	3.48[0]	3.71[0]	3.90[0]	4.05[0]
$3d^*4d^*6f$	2.65[-1]	1.16[0]	2.56[0]	3.32[0]	4.09[0]	4.31[0]	4.55[0]	4.79[0]	5.00[0]	5.16[0]
$3d^*4d^*6g^*$	2.69[-2]	1.20[-1]	3.13[-1]	4.76[-1]	7.21[-1]	8.10[-1]	9.24[-1]	1.05[0]	1.16[0]	1.24[0]
$3d^*4d^*6g$	2.53[-2]	1.12[-1]	3.12[-1]	4.98[-1]	8.02[-1]	9.16[-1]	1.06[0]	1.22[0]	1.36[0]	1.46[0]
$3d^*4d6d^*$	1.10[0]	1.44[0]	1.63[0]	1.70[0]	1.76[0]	1.78[0]	1.80[0]	1.83[0]	1.87[0]	1.91[0]
$3d^*4d6f^*$	5.62[-2]	1.26[-1]	9.07[-1]	1.60[0]	2.41[0]	2.65[0]	2.91[0]	3.15[0]	3.35[0]	3.49[0]
$3d^*4f^*6d^*$	8.10[-2]	1.59[-1]	4.13[-1]	7.49[-1]	1.33[0]	1.55[0]	1.82[0]	2.09[0]	2.29[0]	2.40[0]
$3d^*4f^*6d$	5.34[-2]	3.89[-2]	4.17[-1]	1.03[0]	2.12[0]	2.55[0]	3.10[0]	3.70[0]	4.21[0]	4.62[0]
$3d^*4f^*6f^*$	7.36[-2]	5.01[-1]	1.94[0]	3.17[0]	4.86[0]	5.42[0]	6.10[0]	6.79[0]	7.34[0]	7.74[0]
$3d^*4f^*6f$	1.34[-1]	8.88[-1]	3.49[0]	5.68[0]	8.67[0]	9.68[0]	1.09[1]	1.21[1]	1.31[1]	1.38[1]
$3d^*4f^*6g^*$	1.89[-2]	1.62[-1]	7.44[-1]	1.40[0]	2.64[0]	3.14[0]	3.80[0]	4.55[0]	5.19[0]	5.67[0]
$3d^*4f^*6g$	3.61[-2]	3.04[-1]	1.38[0]	2.60[0]	4.85[0]	5.75[0]	6.93[0]	8.25[0]	9.36[0]	1.01[1]
$3d^*4f^*6h^*$	9.36[-4]	2.92[-2]	1.25[-1]	2.73[-1]	6.13[-1]	7.64[-1]	9.79[-1]	1.24[0]	1.47[0]	1.66[0]

	$Z = 32$	$Z = 36$	$Z = 42$	$Z = 47$	$Z = 56$	$Z = 60$	$Z = 66$	$Z = 74$	$Z = 83$	$Z = 92$
$3d^*4f6d^*$	5.08[-2]	2.27[-1]	5.48[-1]	7.54[-1]	9.87[-1]	1.05[0]	1.13[0]	1.19[0]	1.24[0]	1.26[0]
$3d^*4f6f^*$	9.49[-2]	6.51[-1]	2.10[0]	3.17[0]	4.40[0]	4.74[0]	5.10[0]	5.41[0]	5.62[0]	5.74[0]
$3d^*4f6g^*$	7.17[-3]	5.68[-2]	2.25[-1]	4.07[-1]	7.28[-1]	8.52[-1]	1.02[0]	1.19[0]	1.34[0]	1.45[0]
$3d^*4s7d^*$	2.77[-1]	2.80[-1]	2.58[-1]	2.42[-1]	2.24[-1]	2.21[-1]	2.20[-1]	2.25[-1]	2.36[-1]	2.54[-1]
$3d^*4s7f^*$	1.25[-1]	1.42[-1]	1.11[-1]	1.04[-1]	1.03[-1]	1.05[-1]	1.10[-1]	1.21[-1]	1.41[-1]	1.71[-1]
$3d^*4p^*7s$	1.53[-1]	4.06[-2]	2.71[-3]	6.26[-3]	1.09[-2]	1.22[-2]	1.36[-2]	1.51[-2]	1.41[-2]	1.08[-2]
$3d^*4p^*7p^*$	1.69[-1]	3.15[-2]	3.54[-3]	9.35[-3]	1.43[-2]	1.54[-2]	1.66[-2]	1.82[-2]	1.81[-2]	1.59[-2]
$3d^*4p^*7p$	2.89[-1]	6.05[-2]	2.23[-2]	3.35[-2]	3.92[-2]	4.02[-2]	4.16[-2]	4.58[-2]	4.71[-2]	4.51[-2]
$3d^*4p^*7d^*$	4.93[-1]	2.58[-1]	1.84[-1]	1.84[-1]	1.92[-1]	1.95[-1]	2.00[-1]	2.07[-1]	2.19[-1]	2.38[-1]
$3d^*4p^*7d$	4.55[-1]	1.01[-1]	2.75[-2]	2.87[-2]	2.79[-2]	2.74[-2]	2.70[-2]	2.76[-2]	2.51[-2]	2.04[-2]
$3d^*4p^*7f^*$	4.87[-1]	3.74[-1]	1.78[-1]	9.26[-2]	5.77[-2]	5.77[-2]	6.19[-2]	6.82[-2]	7.61[-2]	8.89[-2]
$3d^*4p^*7f$	5.76[-1]	4.03[-1]	1.67[-1]	6.48[-2]	1.33[-2]	7.81[-3]	5.60[-3]	6.61[-3]	1.39[-2]	3.40[-2]
$3d^*4p^*7g^*$	1.79[-1]	2.59[-1]	2.22[-1]	1.73[-1]	1.54[-1]	1.49[-1]	1.48[-1]	1.60[-1]	1.91[-1]	2.46[-1]
$3d^*4p^*7g$	2.17[-1]	3.10[-1]	2.78[-1]	2.19[-1]	1.96[-1]	1.90[-1]	1.87[-1]	1.96[-1]	2.35[-1]	3.14[-1]
$3d^*4p^*7h$	4.44[-2]	9.89[-2]	7.83[-2]	8.02[-2]	9.88[-2]	1.05[-1]	1.14[-1]	1.25[-1]	1.56[-1]	2.12[-1]
$3d^*4p7d^*$	5.16[-1]	4.59[-1]	4.45[-1]	4.49[-1]	4.55[-1]	4.58[-1]	4.64[-1]	4.73[-1]	4.87[-1]	5.05[-1]
$3d^*4p7f^*$	2.64[-1]	2.52[-1]	1.12[-1]	5.71[-2]	5.28[-2]	6.28[-2]	7.94[-2]	9.79[-2]	1.12[-1]	1.19[-1]
$3d^*4p7f$	1.15[-1]	8.60[-2]	4.14[-2]	2.52[-2]	2.05[-2]	2.15[-2]	2.38[-2]	2.65[-2]	2.91[-2]	3.06[-2]
$3d^*4p7g^*$	5.08[-2]	7.93[-2]	1.00[-1]	1.27[-1]	1.75[-1]	1.89[-1]	2.04[-1]	2.18[-1]	2.28[-1]	2.34[-1]
$3d^*4d^*7s$	2.52[-1]	3.52[-1]	4.33[-1]	4.75[-1]	5.30[-1]	5.51[-1]	5.79[-1]	6.17[-1]	6.61[-1]	7.10[-1]
$3d^*4d^*7p^*$	2.54[-1]	3.49[-1]	4.41[-1]	4.95[-1]	5.68[-1]	5.95[-1]	6.33[-1]	6.80[-1]	7.34[-1]	7.91[-1]
$3d^*4d^*7p$	5.25[-1]	7.63[-1]	9.71[-1]	1.09[0]	1.23[0]	1.29[0]	1.35[0]	1.44[0]	1.53[0]	1.62[0]
$3d^*4d^*7d^*$	7.92[-1]	1.14[0]	1.42[0]	1.56[0]	1.73[0]	1.79[0]	1.87[0]	1.96[0]	2.06[0]	2.17[0]
$3d^*4d^*7d$	1.05[0]	1.58[0]	2.02[0]	2.25[0]	2.52[0]	2.61[0]	2.72[0]	2.86[0]	3.00[0]	3.13[0]
$3d^*4d^*7f^*$	1.59[-1]	4.93[-1]	1.09[0]	1.47[0]	1.87[0]	1.99[0]	2.12[0]	2.26[0]	2.37[0]	2.46[0]
$3d^*4d^*7f$	1.77[-1]	7.62[-1]	1.64[0]	2.10[0]	2.56[0]	2.69[0]	2.83[0]	2.98[0]	3.11[0]	3.21[0]
$3d^*4d7d^*$	5.91[-1]	7.65[-1]	8.58[-1]	8.90[-1]	9.16[-1]	9.24[-1]	9.34[-1]	9.47[-1]	9.64[-1]	9.84[-1]
$3d^*4f^*7p^*$	4.59[-2]	7.79[-2]	1.21[-1]	1.34[-1]	1.40[-1]	1.47[-1]	1.68[-1]	2.06[-1]	2.51[-1]	3.14[-1]
$3d^*4f^*7p$	6.49[-2]	1.12[-1]	1.80[-1]	1.83[-1]	1.53[-1]	1.47[-1]	1.50[-1]	1.55[-1]	1.44[-1]	1.17[-1]
$3d^*4f^*7f^*$	4.84[-2]	3.25[-1]	1.13[0]	1.87[0]	2.85[0]	3.20[0]	3.64[0]	3.97[0]	4.30[0]	4.63[0]
$3d^*4f^*7f$	9.01[-2]	5.96[-1]	2.03[0]	3.35[0]	5.15[0]	5.80[0]	6.60[0]	7.16[0]	7.75[0]	8.37[0]
$3d^*4f7f^*$	5.83[-2]	3.84[-1]	1.18[0]	1.73[0]	2.32[0]	2.48[0]	2.64[0]	2.77[0]	2.86[0]	2.90[0]
$3d^*5s5p^*$	8.04[-2]	2.75[-2]	9.39[-3]	1.09[-2]	1.43[-2]	1.52[-2]	1.60[-2]	1.63[-2]	1.60[-2]	1.48[-2]
$3d^*5s5p$	6.77[-2]	3.67[-2]	9.05[-3]	6.71[-3]	8.02[-3]	8.67[-3]	9.45[-3]	1.02[-2]	1.07[-2]	1.12[-2]
$3d^*5s5d^*$	3.20[-1]	3.69[-1]	3.91[-1]	3.97[-1]	4.07[-1]	4.13[-1]	4.24[-1]	4.43[-1]	4.70[-1]	5.04[-1]
$3d^*5s5d$	2.87[-2]	3.95[-2]	3.61[-2]	3.20[-2]	2.72[-2]	2.60[-2]	2.50[-2]	2.48[-2]	2.58[-2]	2.78[-2]
$3d^*5s5f^*$	6.65[-2]	1.57[-1]	2.06[-1]	2.20[-1]	2.33[-1]	2.40[-1]	2.53[-1]	2.80[-1]	3.27[-1]	3.96[-1]
$3d^*5s5f$	2.18[-2]	4.13[-2]	3.68[-2]	4.17[-2]	5.28[-2]	5.65[-2]	6.08[-2]	6.49[-2]	6.84[-2]	7.15[-2]
$3d^*5p^*5p^*$	5.19[-2]	2.32[-3]	2.72[-3]	6.49[-3]	9.56[-3]	1.02[-2]	1.07[-2]	1.12[-2]	1.15[-2]	1.13[-2]
$3d^*5p^*5p$	1.13[-1]	2.07[-2]	3.59[-2]	4.42[-2]	4.67[-2]	4.62[-2]	4.53[-2]	4.43[-2]	4.38[-2]	4.40[-2]
$3d^*5p^*5d^*$	3.30[-1]	3.25[-1]	3.53[-1]	3.74[-1]	4.05[-1]	4.17[-1]	4.36[-1]	4.61[-1]	4.94[-1]	5.31[-1]
$3d^*5p^*5d$	1.10[-1]	2.94[-2]	2.50[-2]	2.98[-2]	3.69[-2]	3.90[-2]	4.10[-2]	4.13[-2]	3.89[-2]	3.37[-2]
$3d^*5p^*5f^*$	1.51[-1]	2.05[-1]	1.53[-1]	1.23[-1]	1.15[-1]	1.21[-1]	1.31[-1]	1.47[-1]	1.67[-1]	1.97[-1]
$3d^*5p^*5f$	1.30[-1]	1.46[-1]	7.62[-2]	3.92[-2]	1.60[-2]	1.33[-2]	1.19[-2]	1.20[-2]	1.46[-2]	2.43[-2]
$3d^*5p^*5g^*$	1.29[-2]	3.26[-2]	4.12[-2]	4.79[-2]	6.31[-2]	7.04[-2]	8.15[-2]	9.65[-2]	1.15[-1]	1.38[-1]
$3d^*5p^*5g$	1.49[-2]	3.79[-2]	5.21[-2]	5.58[-2]	5.84[-2]	5.98[-2]	6.33[-2]	7.11[-2]	8.53[-2]	1.08[-1]
$3d^*5p5p$	2.37[-2]	1.23[-2]	1.50[-2]	1.65[-2]	1.72[-2]	1.72[-2]	1.72[-2]	1.70[-2]	1.68[-2]	1.65[-2]
$3d^*5p5d^*$	6.09[-1]	7.20[-1]	8.13[-1]	8.62[-1]	9.23[-1]	9.45[-1]	9.76[-1]	1.02[0]	1.06[0]	1.11[0]
$3d^*5p5d$	3.85[-2]	2.91[-2]	2.43[-2]	2.60[-2]	3.12[-2]	3.34[-2]	3.64[-2]	3.99[-2]	4.35[-2]	4.67[-2]
$3d^*5p5f^*$	1.53[-1]	2.40[-1]	1.83[-1]	1.32[-1]	1.07[-1]	1.09[-1]	1.17[-1]	1.27[-1]	1.29[-1]	1.21[-1]
$3d^*5p5f$	3.25[-2]	4.89[-2]	4.34[-2]	3.34[-2]	2.30[-2]	2.09[-2]	1.94[-2]	1.89[-2]	1.89[-2]	1.89[-2]
$3d^*5d^*5d^*$	4.81[-1]	6.54[-1]	7.76[-1]	8.32[-1]	8.96[-1]	9.17[-1]	9.47[-1]	9.84[-1]	1.03[0]	1.08[0]
$3d^*5d^*5d$	1.01[0]	1.38[0]	1.63[0]	1.74[0]	1.86[0]	1.90[0]	1.95[0]	2.02[0]	2.08[0]	2.15[0]
$3d^*5d^*5f^*$	1.02[-1]	2.51[-1]	6.43[-1]	9.86[-1]	1.44[0]	1.57[0]	1.73[0]	1.88[0]	1.99[0]	2.06[0]
$3d^*5d^*5f$	9.04[-2]	3.92[-1]	8.81[-1]	1.15[0]	1.42[0]	1.50[0]	1.58[0]	1.65[0]	1.70[0]	1.74[0]
$3d^*5d5d$	1.14[-2]	1.84[-2]	2.26[-2]	2.41[-2]	2.57[-2]	2.62[-2]	2.69[-2]	2.79[-2]	2.91[-2]	3.05[-2]
$3d^*5d5f^*$	4.30[-2]	6.04[-2]	5.68[-1]	1.12[0]	1.88[0]	2.13[0]	2.42[0]	2.71[0]	2.94[0]	3.12[0]
$3d^*5f^*5f^*$	3.01[-2]	2.44[-1]	8.27[-1]	1.28[0]	1.82[0]	1.98[0]	2.15[0]	2.31[0]	2.43[0]	2.52[0]

	$Z = 32$	$Z = 36$	$Z = 42$	$Z = 47$	$Z = 56$	$Z = 60$	$Z = 66$	$Z = 74$	$Z = 83$	$Z = 92$
$3d^*5f^*5f$	9.76[-2]	7.63[-1]	2.47[0]	3.74[0]	5.20[0]	5.61[0]	6.05[0]	6.45[0]	6.74[0]	6.93[0]
$3d^*5f^*5g$	1.57[-2]	1.35[-1]	5.22[-1]	8.94[-1]	1.47[0]	1.68[0]	1.94[0]	2.21[0]	2.43[0]	2.58[0]
$3d^*5s6d^*$	1.40[-1]	1.59[-1]	1.64[-1]	1.64[-1]	1.66[-1]	1.68[-1]	1.71[-1]	1.78[-1]	1.88[-1]	2.02[-1]
$3d^*5s6f^*$	3.98[-2]	8.40[-2]	9.85[-2]	9.92[-2]	9.87[-2]	9.97[-2]	1.03[-1]	1.12[-1]	1.30[-1]	1.57[-1]
$3d^*5p^*6d^*$	1.50[-1]	1.39[-1]	1.45[-1]	1.52[-1]	1.63[-1]	1.68[-1]	1.75[-1]	1.84[-1]	1.96[-1]	2.11[-1]
$3d^*5p^*6f^*$	9.29[-2]	1.06[-1]	7.21[-2]	5.31[-2]	4.98[-2]	5.26[-2]	5.76[-2]	6.38[-2]	7.01[-2]	7.91[-2]
$3d^*5p6d^*$	2.67[-1]	3.07[-1]	3.39[-1]	3.57[-1]	3.77[-1]	3.85[-1]	3.96[-1]	4.10[-1]	4.28[-1]	4.48[-1]
$3d^*5p6f^*$	9.15[-2]	1.24[-1]	7.96[-2]	5.27[-2]	4.68[-2]	5.11[-2]	5.91[-2]	6.80[-2]	7.31[-2]	7.28[-2]
$3d^*5d^*6s$	1.34[-1]	1.67[-1]	1.87[-1]	1.96[-1]	2.07[-1]	2.12[-1]	2.20[-1]	2.31[-1]	2.46[-1]	2.64[-1]
$3d^*5d^*6p^*$	1.38[-1]	1.56[-1]	1.80[-1]	1.95[-1]	2.15[-1]	2.23[-1]	2.34[-1]	2.49[-1]	2.67[-1]	2.88[-1]
$3d^*5d^*6p$	2.72[-1]	3.48[-1]	4.10[-1]	4.43[-1]	4.84[-1]	4.99[-1]	5.19[-1]	5.44[-1]	5.73[-1]	6.04[-1]
$3d^*5d^*6d^*$	4.59[-1]	6.21[-1]	7.34[-1]	7.87[-1]	8.47[-1]	8.67[-1]	8.95[-1]	9.31[-1]	9.72[-1]	1.02[0]
$3d^*5d^*6d$	5.18[-1]	7.11[-1]	8.53[-1]	9.19[-1]	9.92[-1]	1.02[0]	1.05[0]	1.08[0]	1.13[0]	1.17[0]
$3d^*5d^*6f^*$	6.31[-2]	1.60[-1]	4.00[-1]	5.82[-1]	7.96[-1]	8.57[-1]	9.26[-1]	9.90[-1]	1.04[0]	1.07[0]
$3d^*5d^*6f$	5.90[-2]	2.51[-1]	5.42[-1]	6.90[-1]	8.31[-1]	8.68[-1]	9.09[-1]	9.47[-1]	9.77[-1]	9.99[-1]
$3d^*5d6d^*$	4.48[-1]	5.93[-1]	6.87[-1]	7.25[-1]	7.65[-1]	7.78[-1]	7.95[-1]	8.15[-1]	8.39[-1]	8.64[-1]
$3d^*5d6f^*$	2.30[-2]	4.30[-2]	3.51[-1]	6.33[-1]	9.76[-1]	1.08[0]	1.19[0]	1.30[0]	1.39[0]	1.46[0]
$3d^*5f^*6s$	2.59[-2]	7.36[-2]	1.03[-1]	1.15[-1]	1.26[-1]	1.30[-1]	1.38[-1]	1.53[-1]	1.79[-1]	2.17[-1]
$3d^*5f^*6p$	5.91[-2]	1.14[-1]	9.06[-2]	7.24[-2]	6.47[-2]	6.68[-2]	7.16[-2]	7.63[-2]	7.67[-2]	7.07[-2]
$3d^*5f^*6d^*$	4.29[-2]	9.98[-2]	2.75[-1]	4.40[-1]	6.63[-1]	7.33[-1]	8.13[-1]	8.87[-1]	9.40[-1]	9.70[-1]
$3d^*5f^*6d$	2.04[-2]	2.62[-2]	2.93[-1]	5.76[-1]	9.76[-1]	1.11[0]	1.26[0]	1.41[0]	1.54[0]	1.64[0]
$3d^*5f^*6f^*$	3.99[-2]	2.82[-1]	9.04[-1]	1.35[0]	1.86[0]	1.99[0]	2.14[0]	2.28[0]	2.38[0]	2.46[0]
$3d^*5f^*6f$	7.06[-2]	4.69[-1]	1.44[0]	2.12[0]	2.89[0]	3.10[0]	3.33[0]	3.53[0]	3.68[0]	3.78[0]
$3d^*5f^*6g$	1.34[-2]	1.35[-1]	4.27[-1]	7.26[-1]	1.18[0]	1.33[0]	1.52[0]	1.71[0]	1.87[0]	1.97[0]
$3d^*5f6d^*$	3.57[-2]	1.55[-1]	3.45[-1]	4.48[-1]	5.48[-1]	5.74[-1]	6.02[-1]	6.26[-1]	6.44[-1]	6.55[-1]
$3d^*5f6f^*$	5.61[-2]	4.06[-1]	1.23[0]	1.77[0]	2.32[0]	2.45[0]	2.60[0]	2.72[0]	2.80[0]	2.85[0]
$3d^*5g6f^*$	9.21[-3]	6.51[-2]	2.27[-1]	3.64[-1]	5.58[-1]	6.24[-1]	7.04[-1]	7.83[-1]	8.46[-1]	8.88[-1]
$3d^*5s7d^*$	7.52[-2]	8.47[-2]	8.67[-2]	8.61[-2]	8.62[-2]	8.69[-2]	8.85[-2]	9.19[-2]	9.71[-2]	1.04[-1]
$3d^*5p^*7d^*$	8.17[-2]	7.21[-2]	7.70[-2]	7.96[-2]	8.46[-2]	8.67[-2]	8.99[-2]	9.46[-2]	1.01[-1]	1.08[-1]
$3d^*5p7d^*$	1.44[-1]	1.62[-1]	1.79[-1]	1.87[-1]	1.96[-1]	2.00[-1]	2.05[-1]	2.12[-1]	2.21[-1]	2.31[-1]
$3d^*5p7g^*$	4.29[-3]	6.81[-3]	2.00[-2]	3.75[-2]	6.42[-2]	7.29[-2]	8.30[-2]	9.25[-2]	9.97[-2]	1.05[-1]
$3d^*5d^*7s$	6.96[-2]	9.08[-2]	1.05[-1]	1.12[-1]	1.21[-1]	1.24[-1]	1.30[-1]	1.37[-1]	1.46[-1]	1.57[-1]
$3d^*5d^*7p^*$	7.24[-2]	8.76[-2]	1.04[-1]	1.14[-1]	1.28[-1]	1.33[-1]	1.41[-1]	1.50[-1]	1.61[-1]	1.73[-1]
$3d^*5d^*7p$	1.46[-1]	1.95[-1]	2.37[-1]	2.59[-1]	2.87[-1]	2.97[-1]	3.10[-1]	3.27[-1]	3.45[-1]	3.65[-1]
$3d^*5d^*7d^*$	2.58[-1]	3.50[-1]	4.15[-1]	4.45[-1]	4.80[-1]	4.92[-1]	5.08[-1]	5.29[-1]	5.53[-1]	5.80[-1]
$3d^*5d^*7d$	3.01[-1]	4.17[-1]	5.05[-1]	5.47[-1]	5.94[-1]	6.09[-1]	6.29[-1]	6.54[-1]	6.80[-1]	7.07[-1]
$3d^*5d^*7f^*$	4.10[-2]	1.06[-1]	2.59[-1]	3.67[-1]	4.85[-1]	5.18[-1]	5.55[-1]	5.89[-1]	6.14[-1]	6.32[-1]
$3d^*5d^*7f$	3.96[-2]	1.67[-1]	3.50[-1]	4.39[-1]	5.23[-1]	5.45[-1]	5.69[-1]	5.92[-1]	6.10[-1]	6.24[-1]
$3d^*5d^*7g^*$	4.51[-3]	1.84[-2]	4.43[-2]	6.36[-2]	8.96[-2]	9.84[-2]	1.09[-1]	1.21[-1]	1.31[-1]	1.38[-1]
$3d^*5d^*7g$	3.47[-3]	1.35[-2]	3.59[-2]	5.63[-2]	8.82[-2]	9.98[-2]	1.15[-1]	1.30[-1]	1.42[-1]	1.51[-1]
$3d^*5d7d^*$	2.42[-1]	3.16[-1]	3.62[-1]	3.81[-1]	3.99[-1]	4.04[-1]	4.12[-1]	4.21[-1]	4.33[-1]	4.45[-1]
$3d^*5d7f^*$	1.36[-2]	3.04[-2]	2.25[-1]	3.87[-1]	5.70[-1]	6.21[-1]	6.78[-1]	7.32[-1]	7.76[-1]	8.11[-1]
$3d^*5f^*7s$	1.52[-2]	4.16[-2]	6.08[-2]	6.52[-2]	7.57[-2]	8.01[-2]	8.49[-2]	9.23[-2]	1.07[-1]	1.30[-1]
$3d^*5f^*7d^*$	2.37[-2]	5.07[-2]	1.46[-1]	2.46[-1]	3.74[-1]	4.14[-1]	4.59[-1]	5.07[-1]	5.37[-1]	5.50[-1]
$3d^*5f^*7d$	1.25[-2]	1.69[-2]	1.67[-1]	3.48[-1]	5.78[-1]	6.50[-1]	7.37[-1]	8.43[-1]	9.19[-1]	9.65[-1]
$3d^*5f^*7f^*$	2.61[-2]	1.73[-1]	5.62[-1]	8.24[-1]	1.10[0]	1.17[0]	1.24[0]	1.32[0]	1.38[0]	1.41[0]
$3d^*5f^*7f$	4.71[-2]	2.91[-1]	9.37[-1]	1.36[0]	1.78[0]	1.89[0]	2.01[0]	2.15[0]	2.23[0]	2.26[0]
$3d^*5f^*7g^*$	5.18[-3]	4.41[-2]	1.83[-1]	2.81[-1]	4.49[-1]	5.10[-1]	5.75[-1]	6.39[-1]	6.93[-1]	7.34[-1]
$3d^*5f^*7g$	1.04[-2]	8.54[-2]	3.46[-1]	5.37[-1]	8.51[-1]	9.64[-1]	1.08[0]	1.20[0]	1.30[0]	1.37[0]
$3d^*5f7d^*$	1.82[-2]	7.89[-2]	1.75[-1]	2.26[-1]	2.76[-1]	2.89[-1]	3.02[-1]	3.13[-1]	3.21[-1]	3.26[-1]
$3d^*5f7f^*$	3.53[-2]	2.42[-1]	7.01[-1]	9.81[-1]	1.25[0]	1.31[0]	1.37[0]	1.42[0]	1.45[0]	1.47[0]
$3d^*5g^*7f^*$	2.96[-3]	1.87[-2]	6.17[-2]	9.57[-2]	1.43[-1]	1.59[-1]	1.78[-1]	1.97[-1]	2.13[-1]	2.24[-1]
$3d^*5g7f^*$	5.76[-3]	3.67[-2]	1.20[-1]	1.86[-1]	2.74[-1]	3.03[-1]	3.38[-1]	3.72[-1]	3.99[-1]	4.16[-1]
$3d^*6s6d^*$	5.87[-2]	7.17[-2]	7.85[-2]	8.09[-2]	8.44[-2]	8.61[-2]	8.88[-2]	9.30[-2]	9.88[-2]	1.06[-1]
$3d^*6s6f^*$	1.58[-2]	3.90[-2]	5.03[-2]	5.30[-2]	5.39[-2]	5.46[-2]	5.67[-2]	6.19[-2]	7.15[-2]	8.62[-2]
$3d^*6s6f$	4.30[-3]	7.74[-3]	7.74[-3]	9.57[-3]	1.23[-2]	1.30[-2]	1.38[-2]	1.46[-2]	1.53[-2]	1.59[-2]
$3d^*6p^*6d^*$	6.07[-2]	6.61[-2]	7.42[-2]	7.96[-2]	8.69[-2]	8.98[-2]	9.40[-2]	9.97[-2]	1.07[-1]	1.15[-1]
$3d^*6p^*6f^*$	3.12[-2]	4.46[-2]	3.26[-2]	2.73[-2]	2.82[-2]	3.02[-2]	3.32[-2]	3.68[-2]	4.05[-2]	4.53[-2]

	$Z = 32$	$Z = 36$	$Z = 42$	$Z = 47$	$Z = 56$	$Z = 60$	$Z = 66$	$Z = 74$	$Z = 83$	$Z = 92$
$3d^*6p^*6g^*$	3.28[-3]	8.27[-3]	1.02[-2]	1.33[-2]	1.93[-2]	2.18[-2]	2.53[-2]	2.97[-2]	3.47[-2]	4.03[-2]
$3d^*6p^*6g$	3.64[-3]	9.70[-3]	1.25[-2]	1.37[-2]	1.44[-2]	1.47[-2]	1.55[-2]	1.73[-2]	2.03[-2]	2.50[-2]
$3d^*6p6d^*$	1.19[-1]	1.48[-1]	1.72[-1]	1.84[-1]	1.98[-1]	2.04[-1]	2.11[-1]	2.20[-1]	2.31[-1]	2.43[-1]
$3d^*6p6f^*$	3.54[-2]	5.85[-2]	4.08[-2]	3.03[-2]	2.84[-2]	3.08[-2]	3.49[-2]	3.92[-2]	4.13[-2]	4.03[-2]
$3d^*6p6g^*$	1.72[-3]	2.94[-3]	1.08[-2]	2.39[-2]	4.70[-2]	5.53[-2]	6.55[-2]	7.56[-2]	8.38[-2]	8.99[-2]
$3d^*6d^*6d^*$	1.09[-1]	1.46[-1]	1.71[-1]	1.83[-1]	1.96[-1]	2.00[-1]	2.06[-1]	2.14[-1]	2.23[-1]	2.34[-1]
$3d^*6d^*6d$	2.29[-1]	3.07[-1]	3.60[-1]	3.83[-1]	4.08[-1]	4.16[-1]	4.26[-1]	4.39[-1]	4.54[-1]	4.69[-1]
$3d^*6d^*6f^*$	2.53[-2]	6.30[-2]	1.71[-1]	2.58[-1]	3.63[-1]	3.93[-1]	4.27[-1]	4.58[-1]	4.80[-1]	4.93[-1]
$3d^*6d^*6f$	2.35[-2]	9.99[-2]	2.13[-1]	2.69[-1]	3.21[-1]	3.34[-1]	3.48[-1]	3.61[-1]	3.70[-1]	3.77[-1]
$3d^*6d^*6g^*$	2.48[-3]	1.04[-2]	2.54[-2]	3.66[-2]	5.17[-2]	5.67[-2]	6.28[-2]	6.91[-2]	7.43[-2]	7.81[-2]
$3d^*6d^*6g$	1.66[-3]	6.37[-3]	1.70[-2]	2.65[-2]	4.18[-2]	4.73[-2]	5.44[-2]	6.16[-2]	6.75[-2]	7.13[-2]
$3d^*6d6f^*$	9.92[-3]	1.97[-2]	1.79[-1]	3.24[-1]	5.06[-1]	5.60[-1]	6.22[-1]	6.82[-1]	7.31[-1]	7.70[-1]
$3d^*6d6f$	2.40[-3]	3.83[-3]	9.41[-3]	1.45[-2]	2.10[-2]	2.30[-2]	2.51[-2]	2.70[-2]	2.82[-2]	2.88[-2]
$3d^*6d6g^*$	2.31[-3]	9.23[-3]	1.93[-2]	2.47[-2]	2.93[-2]	3.02[-2]	3.09[-2]	3.11[-2]	3.07[-2]	3.00[-2]
$3d^*6f^*6f^*$	1.23[-2]	8.43[-2]	2.44[-1]	3.55[-1]	4.66[-1]	4.93[-1]	5.23[-1]	5.49[-1]	5.68[-1]	5.83[-1]
$3d^*6f^*6f$	3.93[-2]	2.62[-1]	7.16[-1]	1.02[0]	1.31[0]	1.38[0]	1.45[0]	1.51[0]	1.55[0]	1.58[0]
$3d^*6f^*6g^*$	3.15[-3]	3.31[-2]	9.84[-2]	1.60[-1]	2.39[-1]	2.65[-1]	2.97[-1]	3.30[-1]	3.55[-1]	3.74[-1]
$3d^*6f^*6g$	6.46[-3]	6.37[-2]	1.91[-1]	3.08[-1]	4.59[-1]	5.09[-1]	5.68[-1]	6.27[-1]	6.72[-1]	7.03[-1]
$3d^*6f6g^*$	2.17[-3]	1.35[-2]	4.29[-2]	6.76[-2]	1.06[-1]	1.20[-1]	1.39[-1]	1.58[-1]	1.76[-1]	1.90[-1]
$3d^*6s7d^*$	3.15[-2]	3.82[-2]	4.14[-2]	4.24[-2]	4.38[-2]	4.46[-2]	4.59[-2]	4.80[-2]	5.09[-2]	5.46[-2]
$3d^*6s7f^*$	1.03[-2]	2.31[-2]	2.85[-2]	2.90[-2]	2.83[-2]	2.84[-2]	2.92[-2]	3.17[-2]	3.64[-2]	4.38[-2]
$3d^*6p^*7d^*$	3.31[-2]	3.51[-2]	3.87[-2]	4.11[-2]	4.49[-2]	4.63[-2]	4.85[-2]	5.12[-2]	5.47[-2]	5.89[-2]
$3d^*6p^*7f^*$	2.03[-2]	2.62[-2]	1.85[-2]	1.49[-2]	1.53[-2]	1.65[-2]	1.82[-2]	2.01[-2]	2.17[-2]	2.36[-2]
$3d^*6p7d^*$	6.39[-2]	7.85[-2]	9.02[-2]	9.61[-2]	1.03[-1]	1.06[-1]	1.09[-1]	1.14[-1]	1.20[-1]	1.26[-1]
$3d^*6p7f^*$	2.26[-2]	3.39[-2]	2.21[-2]	1.57[-2]	1.58[-2]	1.76[-2]	2.05[-2]	2.36[-2]	2.54[-2]	2.54[-2]
$3d^*6d^*7s$	3.04[-2]	3.89[-2]	4.41[-2]	4.63[-2]	4.92[-2]	5.04[-2]	5.23[-2]	5.50[-2]	5.86[-2]	6.28[-2]
$3d^*6d^*7p^*$	3.18[-2]	3.69[-2]	4.32[-2]	4.68[-2]	5.18[-2]	5.37[-2]	5.65[-2]	6.01[-2]	6.43[-2]	6.91[-2]
$3d^*6d^*7p$	6.41[-2]	8.32[-2]	9.91[-2]	1.07[-1]	1.18[-1]	1.21[-1]	1.26[-1]	1.32[-1]	1.39[-1]	1.47[-1]
$3d^*6d^*7f^*$	1.62[-2]	4.18[-2]	1.11[-1]	1.62[-1]	2.20[-1]	2.36[-1]	2.53[-1]	2.69[-1]	2.81[-1]	2.88[-1]
$3d^*6d^*7f$	1.59[-2]	6.65[-2]	1.38[-1]	1.72[-1]	2.02[-1]	2.10[-1]	2.18[-1]	2.26[-1]	2.31[-1]	2.36[-1]
$3d^*6d7f^*$	5.68[-3]	1.46[-2]	1.14[-1]	1.98[-1]	2.96[-1]	3.23[-1]	3.54[-1]	3.84[-1]	4.08[-1]	4.28[-1]
$3d^*6f^*7s$	8.43[-3]	2.39[-2]	2.74[-2]	2.90[-2]	3.18[-2]	3.28[-2]	3.49[-2]	3.71[-2]	4.32[-2]	5.32[-2]
$3d^*6f^*7p^*$	1.62[-2]	2.52[-2]	1.69[-2]	1.46[-2]	1.71[-2]	1.86[-2]	2.09[-2]	2.28[-2]	2.52[-2]	2.88[-2]
$3d^*6f^*7p$	2.11[-2]	3.52[-2]	2.16[-2]	1.63[-2]	1.78[-2]	1.95[-2]	2.22[-2]	2.46[-2]	2.58[-2]	2.46[-2]
$3d^*6f^*7d^*$	1.41[-2]	3.28[-2]	9.29[-2]	1.44[-1]	2.04[-1]	2.22[-1]	2.41[-1]	2.58[-1]	2.71[-1]	2.78[-1]
$3d^*6f^*7d$	6.32[-3]	1.13[-2]	1.09[-1]	1.97[-1]	3.01[-1]	3.34[-1]	3.70[-1]	4.05[-1]	4.34[-1]	4.57[-1]
$3d^*6f^*7f^*$	1.57[-2]	1.03[-1]	3.02[-1]	4.22[-1]	5.42[-1]	5.74[-1]	6.05[-1]	6.27[-1]	6.48[-1]	6.66[-1]
$3d^*6f^*7f$	2.60[-2]	1.60[-1]	4.72[-1]	6.35[-1]	8.05[-1]	8.53[-1]	8.96[-1]	9.18[-1]	9.45[-1]	9.70[-1]
$3d^*6f^*7g$	5.16[-3]	4.48[-2]	1.43[-1]	2.13[-1]	3.29[-1]	3.68[-1]	4.14[-1]	4.45[-1]	4.78[-1]	5.06[-1]
$3d^*6f7d^*$	1.20[-2]	5.11[-2]	1.08[-1]	1.36[-1]	1.62[-1]	1.68[-1]	1.75[-1]	1.81[-1]	1.85[-1]	1.88[-1]
$3d^*6f7f^*$	2.40[-2]	1.58[-1]	4.12[-1]	5.71[-1]	7.09[-1]	7.40[-1]	7.71[-1]	7.96[-1]	8.13[-1]	8.24[-1]
$3d^*7s7d^*$	1.63[-2]	2.07[-2]	2.32[-2]	2.42[-2]	2.55[-2]	2.61[-2]	2.70[-2]	2.84[-2]	3.02[-2]	3.24[-2]
$3d^*7s7f^*$	5.15[-3]	1.45[-2]	1.52[-2]	1.62[-2]	1.68[-2]	1.69[-2]	1.76[-2]	1.92[-2]	2.21[-2]	2.68[-2]
$3d^*7p^*7d^*$	1.73[-2]	1.97[-2]	2.24[-2]	2.42[-2]	2.68[-2]	2.77[-2]	2.91[-2]	3.09[-2]	3.31[-2]	3.55[-2]
$3d^*7p^*7f^*$	1.03[-2]	1.49[-2]	9.38[-3]	8.22[-3]	9.38[-3]	1.00[-2]	1.12[-2]	1.25[-2]	1.35[-2]	1.48[-2]
$3d^*7p^*7g^*$	1.02[-3]	2.50[-3]	3.51[-3]	4.68[-3]	7.14[-3]	8.14[-3]	9.47[-3]	1.09[-2]	1.26[-2]	1.46[-2]
$3d^*7p7d^*$	3.44[-2]	4.42[-2]	5.21[-2]	5.63[-2]	6.13[-2]	6.30[-2]	6.54[-2]	6.85[-2]	7.21[-2]	7.60[-2]
$3d^*7p7f^*$	1.31[-2]	2.11[-2]	1.13[-2]	8.97[-3]	9.95[-3]	1.10[-2]	1.28[-2]	1.47[-2]	1.56[-2]	1.54[-2]
$3d^*7d^*7d^*$	3.41[-2]	4.55[-2]	5.34[-2]	5.70[-2]	6.10[-2]	6.24[-2]	6.43[-2]	6.68[-2]	6.97[-2]	7.29[-2]
$3d^*7d^*7d$	7.19[-2]	9.60[-2]	1.12[-1]	1.20[-1]	1.27[-1]	1.30[-1]	1.33[-1]	1.37[-1]	1.42[-1]	1.47[-1]
$3d^*7d^*7f^*$	9.00[-3]	2.18[-2]	6.05[-2]	8.94[-2]	1.22[-1]	1.32[-1]	1.42[-1]	1.51[-1]	1.57[-1]	1.62[-1]
$3d^*7d^*7f$	8.12[-3]	3.40[-2]	7.02[-2]	8.72[-2]	1.02[-1]	1.06[-1]	1.10[-1]	1.13[-1]	1.16[-1]	1.17[-1]
$3d^*7d7f^*$	3.67[-3]	7.79[-3]	7.02[-2]	1.18[-1]	1.75[-1]	1.93[-1]	2.12[-1]	2.27[-1]	2.43[-1]	2.57[-1]
$3d^*7f^*7f^*$	4.93[-3]	3.15[-2]	9.10[-2]	1.23[-1]	1.56[-1]	1.64[-1]	1.73[-1]	1.78[-1]	1.84[-1]	1.89[-1]
$3d^*7f^*7f$	1.57[-2]	9.68[-2]	2.68[-1]	3.50[-1]	4.35[-1]	4.57[-1]	4.78[-1]	4.87[-1]	4.98[-1]	5.10[-1]
$3d^*7f^*7g^*$	1.46[-3]	1.36[-2]	3.73[-2]	5.65[-2]	8.55[-2]	9.36[-2]	1.05[-1]	1.14[-1]	1.23[-1]	1.29[-1]
$3d^*7f^*7g$	3.00[-3]	2.64[-2]	7.34[-2]	1.11[-1]	1.65[-1]	1.81[-1]	2.01[-1]	2.18[-1]	2.32[-1]	2.42[-1]

TABLE IX.  $M_5$ -shell Auger rates  $A(n_0j_0l_0, n_1j_1l_1, n_2j_2l_2)$  (in mau) as function of  $Z$  for Zn-like ions.

	$Z=32$	$Z=36$	$Z=42$	$Z=47$	$Z=56$	$Z=60$	$Z=66$	$Z=74$	$Z=83$	$Z=92$
$3d4p^*4f^*$	8.19[-2]	1.69[-1]	2.22[-1]	2.33[-1]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]
$3d4p^*4f$	4.86[-1]	8.71[-1]	9.74[-1]	9.39[-1]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]
$3d4p4f^*$	2.87[0]	2.41[0]	1.31[0]	7.71[-1]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]
$3d4p4f$	4.63[0]	4.52[0]	2.95[0]	1.98[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]
$3d4d^*4d^*$	4.53[-2]	7.67[-2]	9.67[-2]	1.04[-1]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]
$3d4d^*4d$	5.97[0]	8.70[0]	1.07[1]	1.17[1]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]
$3d4d^*4f^*$	3.51[-2]	5.87[-2]	1.37[-1]	2.55[-1]	4.73[-1]	5.53[-1]	6.58[-1]	0.00[0]	0.00[0]	0.00[0]
$3d4d^*4f$	1.96[-1]	2.46[-1]	1.45[0]	3.27[0]	6.52[0]	7.75[0]	9.28[0]	0.00[0]	0.00[0]	0.00[0]
$3d4d4d$	7.25[0]	1.05[1]	1.28[1]	1.39[1]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]
$3d4d4f^*$	5.13[-1]	2.21[0]	5.55[0]	7.91[0]	1.11[1]	1.19[1]	1.31[1]	0.00[0]	0.00[0]	0.00[0]
$3d4d4f$	9.16[-1]	2.81[0]	7.12[0]	1.13[1]	1.75[1]	1.96[1]	2.24[1]	0.00[0]	0.00[0]	0.00[0]
$3d4f^*4f$	2.67[-1]	2.21[0]	9.16[0]	1.64[1]	2.23[1]	3.47[1]	3.87[1]	4.46[1]	5.03[1]	0.00[0]
$3d4f4f$	1.80[-1]	1.51[0]	6.38[0]	1.16[1]	1.02[1]	2.32[1]	2.75[1]	3.19[1]	3.54[1]	0.00[0]
$3d4p^*5d$	1.02[0]	1.05[0]	1.10[0]	1.12[0]	1.10[0]	1.18[0]	1.25[0]	1.34[0]	1.37[0]	1.47[0]
$3d4p5s$	1.15[0]	2.71[-1]	5.51[-2]	5.16[-2]	7.36[-2]	8.52[-2]	9.45[-2]	1.06[-1]	1.08[-1]	1.11[-1]
$3d4p5p$	2.15[0]	2.42[-1]	1.50[-1]	2.24[-1]	2.74[-1]	2.87[-1]	2.80[-1]	2.49[-1]	3.09[-1]	2.84[-1]
$3d4p5d^*$	1.43[0]	2.96[-1]	1.17[-1]	1.29[-1]	1.29[0]	1.42[-1]	1.65[-1]	2.05[-1]	1.98[-1]	2.16[-1]
$3d4p5d$	3.95[0]	2.20[0]	1.76[0]	1.96[0]	2.39[0]	2.09[0]	1.89[0]	6.60[0]	1.95[0]	2.25[0]
$3d4p5f^*$	1.41[0]	1.10[0]	4.34[-1]	1.82[-1]	5.15[-2]	4.14[-2]	4.32[-2]	5.92[-1]	2.43[-1]	1.19[-1]
$3d4p5f$	2.29[0]	2.03[0]	9.39[-1]	4.81[-1]	2.47[-1]	2.47[-1]	2.28[-1]	9.91[-2]	6.46[-1]	3.19[-1]
$3d4p5g$	6.20[-1]	7.13[-1]	6.78[-1]	6.30[-1]	5.94[-1]	5.53[-1]	1.06[0]	1.88[-1]	1.06[-1]	7.25[-1]
$3d4d^*5d$	1.69[0]	2.28[0]	2.66[0]	2.81[0]	2.98[0]	3.03[0]	3.11[0]	3.19[0]	6.17[-2]	3.24[0]
$3d4d^*5f$	8.69[-2]	1.30[-1]	9.34[-1]	1.79[0]	2.94[0]	3.29[0]	3.70[0]	4.07[0]	4.34[0]	4.13[0]
$3d4d5s$	1.22[0]	1.48[0]	1.65[0]	1.73[0]	1.76[0]	2.41[0]	1.96[0]	2.02[0]	2.48[0]	2.34[0]
$3d4d5p^*$	1.13[0]	1.48[0]	1.77[0]	1.92[0]	2.13[0]	2.17[0]	2.13[0]	1.96[0]	3.59[0]	2.82[0]
$3d4d5p$	2.39[0]	2.76[0]	3.20[0]	3.46[0]	3.80[0]	3.89[0]	3.77[0]	2.58[-1]	4.30[-1]	4.71[0]
$3d4d5d^*$	2.42[0]	3.56[0]	4.46[0]	4.91[0]	5.45[0]	5.62[0]	5.89[0]	6.12[0]	6.28[0]	7.59[0]
$3d4d5d$	5.02[0]	7.07[0]	8.57[0]	9.28[0]	1.01[1]	1.03[1]	1.07[1]	1.10[1]	1.12[1]	1.13[1]
$3d4d5f^*$	3.37[-1]	1.42[0]	3.31[0]	4.46[0]	5.74[0]	6.12[0]	6.59[0]	7.08[0]	7.54[0]	1.16[1]
$3d4d5f$	5.55[-1]	1.76[0]	4.39[0]	6.36[0]	8.80[0]	9.55[0]	1.04[1]	1.13[1]	1.20[1]	1.40[1]
$3d4d5g^*$	3.04[-2]	1.30[-1]	3.63[-1]	5.83[-1]	9.59[-1]	1.11[0]	1.31[0]	1.55[0]	1.78[0]	1.95[0]
$3d4d5g$	4.67[-2]	2.04[-1]	5.53[-1]	8.59[-1]	1.34[0]	1.53[0]	1.77[0]	2.04[0]	2.28[0]	2.32[0]
$3d4f^*5d$	1.12[-1]	4.62[-1]	1.14[0]	1.63[0]	2.25[0]	2.46[0]	2.70[0]	2.96[0]	3.20[0]	3.26[0]
$3d4f^*5f$	1.41[-1]	1.02[0]	3.59[0]	5.77[0]	8.65[0]	9.57[0]	1.07[1]	1.18[1]	1.27[1]	1.34[1]
$3d4f5s$	1.22[-1]	3.49[-1]	5.58[-1]	6.72[-1]	8.27[-1]	8.90[-1]	9.89[-1]	1.14[0]	1.33[-1]	1.63[0]
$3d4f5d^*$	6.89[-2]	6.53[-2]	5.19[-1]	1.23[0]	2.52[0]	3.00[0]	3.61[0]	4.22[0]	4.70[0]	5.26[0]
$3d4f5d$	2.36[-1]	5.85[-1]	1.65[0]	2.87[0]	4.94[0]	5.71[0]	6.71[0]	7.78[0]	8.72[0]	1.27[1]
$3d4f5f^*$	1.58[-1]	1.28[0]	4.76[0]	7.99[0]	1.27[1]	1.44[1]	1.64[1]	1.86[1]	2.05[1]	2.20[1]
$3d4f5f$	2.02[-1]	1.59[0]	5.95[0]	9.96[0]	1.57[1]	1.77[1]	2.01[1]	2.25[1]	2.46[1]	2.62[1]
$3d4f5g^*$	2.52[-2]	2.97[-1]	1.38[0]	2.73[0]	5.43[0]	6.59[0]	8.21[0]	1.01[1]	1.20[1]	1.36[1]
$3d4f5g$	2.29[-2]	2.77[-1]	1.30[0]	2.57[0]	5.10[0]	6.19[0]	7.69[0]	9.46[0]	1.11[1]	1.25[1]
$3d4p6d$	1.69[0]	9.55[-1]	7.95[-1]	7.97[-1]	8.09[-1]	8.15[-1]	8.27[-1]	8.44[-1]	8.69[-1]	8.97[-1]
$3d4p6f$	1.35[0]	1.12[0]	4.08[-1]	1.85[-1]	1.11[-1]	1.21[-1]	1.47[-1]	1.79[-1]	2.01[-1]	2.04[-1]
$3d4d^*6d$	7.45[-1]	9.81[-1]	1.12[0]	1.17[0]	1.22[0]	1.24[0]	1.26[0]	1.30[0]	1.34[0]	1.38[0]
$3d4d^*6f$	4.42[-2]	8.40[-2]	5.73[-1]	1.01[0]	1.52[0]	1.66[0]	1.82[0]	1.96[0]	2.06[0]	2.12[0]
$3d4d6s$	5.09[-1]	6.68[-1]	7.90[-1]	8.51[-1]	9.32[-1]	9.63[-1]	1.01[0]	1.07[0]	1.14[0]	1.22[0]
$3d4d6p^*$	5.07[-1]	7.09[-1]	8.80[-1]	9.76[-1]	1.10[0]	1.15[0]	1.21[0]	1.29[0]	1.39[0]	1.49[0]
$3d4d6p$	1.02[0]	1.33[0]	1.62[0]	1.78[0]	2.00[0]	2.08[0]	2.19[0]	2.32[0]	2.45[0]	2.58[0]
$3d4d6d^*$	1.23[0]	1.83[0]	2.32[0]	2.58[0]	2.88[0]	2.98[0]	3.11[0]	3.27[0]	3.45[0]	3.62[0]
$3d4d6d$	2.43[0]	3.42[0]	4.18[0]	4.55[0]	4.96[0]	5.10[0]	5.27[0]	5.47[0]	5.68[0]	5.88[0]
$3d4d6f^*$	2.15[-1]	9.01[-1]	2.01[0]	2.63[0]	3.29[0]	3.49[0]	3.73[0]	3.98[0]	4.23[0]	4.46[0]
$3d4d6f$	3.40[-1]	1.11[0]	2.68[0]	3.73[0]	4.92[0]	5.26[0]	5.66[0]	6.05[0]	6.38[0]	6.65[0]
$3d4d6g^*$	2.51[-2]	1.06[-1]	2.84[-1]	4.48[-1]	7.19[-1]	8.24[-1]	9.66[-1]	1.13[0]	1.29[0]	1.42[0]
$3d4d6g$	3.87[-2]	1.65[-1]	4.21[-1]	6.35[-1]	9.63[-1]	1.08[0]	1.24[0]	1.41[0]	1.57[0]	1.70[0]
$3d4f^*6d$	4.50[-2]	1.81[-1]	4.47[-1]	6.39[-1]	8.86[-1]	9.67[-1]	1.07[0]	1.17[0]	1.26[0]	1.34[0]
$3d4f^*6f$	8.07[-2]	5.40[-1]	1.76[0]	2.69[0]	3.80[0]	4.14[0]	4.52[0]	4.90[0]	5.22[0]	5.47[0]
$3d4f^*6g$	7.95[-3]	6.20[-2]	2.55[-1]	4.68[-1]	8.57[-1]	1.01[0]	1.23[0]	1.47[0]	1.69[0]	1.88[0]

	$Z = 32$	$Z = 36$	$Z = 42$	$Z = 47$	$Z = 56$	$Z = 60$	$Z = 66$	$Z = 74$	$Z = 83$	$Z = 92$
$3d4f6d^*$	4.06[-2]	2.93[-2]	2.56[-1]	6.27[-1]	1.29[0]	1.54[0]	1.85[0]	2.17[0]	2.41[0]	2.56[0]
$3d4f6d$	1.15[-1]	2.34[-1]	7.01[-1]	1.30[0]	2.33[0]	2.73[0]	3.24[0]	3.79[0]	4.28[0]	4.67[0]
$3d4f6f^*$	1.09[-1]	7.04[-1]	2.72[0]	4.42[0]	6.76[0]	7.57[0]	8.58[0]	9.63[0]	1.06[1]	1.13[1]
$3d4f6f$	1.31[-1]	8.67[-1]	3.26[0]	5.28[0]	8.01[0]	8.92[0]	1.00[1]	1.12[1]	1.22[1]	1.30[1]
$3d4f6g^*$	3.10[-2]	2.47[-1]	1.13[0]	2.14[0]	4.03[0]	4.81[0]	5.88[0]	7.14[0]	8.31[0]	9.30[0]
$3d4f6g$	2.91[-2]	2.33[-1]	1.07[0]	2.02[0]	3.81[0]	4.55[0]	5.55[0]	6.71[0]	7.79[0]	8.66[0]
$3d4f6h^*$	1.31[-3]	3.63[-2]	1.59[-1]	3.44[-1]	7.75[-1]	9.73[-1]	1.26[0]	1.63[0]	2.00[0]	2.33[0]
$3d4f6h$	1.32[-3]	3.73[-2]	1.61[-1]	3.51[-1]	7.95[-1]	9.99[-1]	1.29[0]	1.67[0]	2.04[0]	2.35[0]
$3d4s7p$	1.04[-1]	1.20[-1]	3.73[-2]	1.91[-2]	1.46[-2]	1.44[-2]	1.43[-2]	1.45[-2]	1.49[-2]	1.54[-2]
$3d4s7d$	3.04[-1]	3.07[-1]	2.81[-1]	2.61[-1]	2.40[-1]	2.36[-1]	2.35[-1]	2.40[-1]	2.53[-1]	2.75[-1]
$3d4s7f$	1.50[-1]	1.51[-1]	1.06[-1]	9.97[-2]	1.00[-1]	1.02[-1]	1.05[-1]	1.12[-1]	1.24[-1]	1.42[-1]
$3d4s7g$	5.80[-2]	1.07[-1]	1.15[-1]	1.13[-1]	1.04[-1]	1.03[-1]	1.03[-1]	1.07[-1]	1.14[-1]	1.25[-1]
$3d4p^*7d$	2.37[-1]	2.36[-1]	2.39[-1]	2.43[-1]	2.50[-1]	2.53[-1]	2.60[-1]	2.70[-1]	2.86[-1]	3.05[-1]
$3d4p^*7f$	9.60[-2]	1.11[-1]	6.53[-2]	4.35[-2]	3.66[-2]	3.82[-2]	4.19[-2]	4.70[-2]	5.33[-2]	6.38[-2]
$3d4p7s$	1.91[-1]	5.53[-2]	9.09[-3]	1.28[-2]	1.93[-2]	2.17[-2]	2.48[-2]	2.89[-2]	3.08[-2]	3.03[-2]
$3d4p7p^*$	1.59[-1]	3.85[-2]	2.08[-2]	2.80[-2]	3.22[-2]	3.34[-2]	3.50[-2]	3.86[-2]	4.08[-2]	4.13[-2]
$3d4p7p$	4.00[-1]	6.99[-2]	3.62[-2]	5.57[-2]	6.49[-2]	6.59[-2]	6.67[-2]	7.04[-2]	7.14[-2]	6.95[-2]
$3d4p7d^*$	3.57[-1]	8.06[-2]	3.15[-2]	3.42[-2]	3.71[-2]	3.84[-2]	4.10[-2]	4.64[-2]	5.05[-2]	5.26[-2]
$3d4p7d$	9.64[-1]	5.25[-1]	4.12[-1]	4.13[-1]	4.19[-1]	4.23[-1]	4.28[-1]	4.34[-1]	4.46[-1]	4.61[-1]
$3d4p7f^*$	5.15[-1]	3.36[-1]	1.19[-1]	3.74[-2]	8.12[-3]	9.90[-3]	1.69[-2]	2.56[-2]	3.47[-2]	4.26[-2]
$3d4p7f$	8.30[-1]	6.06[-1]	2.44[-1]	1.03[-1]	6.53[-2]	7.53[-2]	9.54[-2]	1.15[-1]	1.30[-1]	1.38[-1]
$3d4p7g^*$	2.11[-1]	2.87[-1]	2.44[-1]	1.88[-1]	1.56[-1]	1.44[-1]	1.32[-1]	1.18[-1]	1.14[-1]	1.17[-1]
$3d4p7g$	2.76[-1]	3.83[-1]	3.23[-1]	2.57[-1]	2.32[-1]	2.24[-1]	2.16[-1]	2.14[-1]	2.18[-1]	2.26[-1]
$3d4p7h$	5.46[-2]	1.21[-1]	9.65[-2]	9.96[-2]	1.12[-1]	1.12[-1]	1.12[-1]	1.07[-1]	1.09[-1]	1.18[-1]
$3d4d^*7d$	4.01[-1]	5.22[-1]	5.90[-1]	6.14[-1]	6.37[-1]	6.45[-1]	6.56[-1]	6.71[-1]	6.90[-1]	7.13[-1]
$3d4d7s$	2.63[-1]	3.63[-1]	4.44[-1]	4.87[-1]	5.42[-1]	5.63[-1]	5.92[-1]	6.30[-1]	6.74[-1]	7.21[-1]
$3d4d7p^*$	2.73[-1]	3.97[-1]	5.05[-1]	5.66[-1]	6.47[-1]	6.76[-1]	7.16[-1]	7.66[-1]	8.22[-1]	8.81[-1]
$3d4d7p$	5.43[-1]	7.45[-1]	9.34[-1]	1.04[0]	1.19[0]	1.24[0]	1.31[0]	1.39[0]	1.48[0]	1.56[0]
$3d4d7d^*$	7.14[-1]	1.07[0]	1.37[0]	1.53[0]	1.72[0]	1.78[0]	1.86[0]	1.96[0]	2.07[0]	2.18[0]
$3d4d7d$	1.37[0]	1.95[0]	2.40[0]	2.62[0]	2.87[0]	2.95[0]	3.06[0]	3.18[0]	3.31[0]	3.44[0]
$3d4d7f^*$	1.43[-1]	5.92[-1]	1.29[0]	1.66[0]	2.05[0]	2.17[0]	2.31[0]	2.46[0]	2.61[0]	2.75[0]
$3d4d7f$	2.21[-1]	7.30[-1]	1.72[0]	2.35[0]	3.02[0]	3.21[0]	3.42[0]	3.64[0]	3.82[0]	3.98[0]
$3d4f7p$	8.73[-2]	1.41[-1]	1.98[-1]	2.00[-1]	1.73[-1]	1.71[-1]	1.79[-1]	1.87[-1]	1.77[-1]	1.54[-1]
$3d4f7d$	6.02[-2]	1.13[-1]	3.81[-1]	7.10[-1]	1.33[0]	1.58[0]	1.89[0]	2.19[0]	2.48[0]	2.72[0]
$3d4f7f^*$	7.26[-2]	4.71[-1]	1.58[0]	2.58[0]	3.99[0]	4.52[0]	5.16[0]	5.64[0]	6.17[0]	6.73[0]
$3d4f7f$	8.54[-2]	5.59[-1]	1.89[0]	3.07[0]	4.65[0]	5.22[0]	5.92[0]	6.46[0]	7.03[0]	7.61[0]
$3d5s5p$	1.19[-1]	4.69[-2]	1.51[-2]	1.62[-2]	2.11[-2]	2.26[-2]	2.43[-2]	2.57[-2]	2.68[-2]	2.74[-2]
$3d5s5d^*$	1.97[-2]	2.72[-2]	2.49[-2]	2.20[-2]	1.86[-2]	1.77[-2]	1.70[-2]	1.67[-2]	1.74[-2]	1.89[-2]
$3d5s5d$	3.36[-1]	3.87[-1]	4.07[-1]	4.12[-1]	4.20[-1]	4.26[-1]	4.37[-1]	4.55[-1]	4.81[-1]	5.14[-1]
$3d5s5f^*$	1.93[-2]	3.81[-2]	3.72[-2]	4.13[-2]	5.01[-2]	5.32[-2]	5.72[-2]	6.19[-2]	6.72[-2]	7.35[-2]
$3d5s5f$	7.17[-2]	1.64[-1]	2.08[-1]	2.20[-1]	2.32[-1]	2.38[-1]	2.49[-1]	2.71[-1]	3.09[-1]	3.68[-1]
$3d5p^*5p$	5.62[-2]	2.10[-2]	3.35[-2]	3.83[-2]	4.01[-2]	4.01[-2]	4.04[-2]	4.12[-2]	4.30[-2]	4.57[-2]
$3d5p^*5d$	3.11[-1]	3.77[-1]	4.29[-1]	4.58[-1]	4.96[-1]	5.11[-1]	5.32[-1]	5.62[-1]	5.98[-1]	6.40[-1]
$3d5p^*5f$	7.21[-2]	1.26[-1]	1.19[-1]	1.03[-1]	9.27[-2]	9.41[-2]	9.94[-2]	1.11[-1]	1.31[-1]	1.67[-1]
$3d5p5p$	1.23[-1]	1.30[-2]	2.49[-2]	3.43[-2]	3.84[-2]	3.83[-2]	3.75[-2]	3.64[-2]	3.56[-2]	3.53[-2]
$3d5p5d^*$	9.26[-2]	3.25[-2]	3.14[-2]	3.77[-2]	4.82[-2]	5.23[-2]	5.75[-2]	6.32[-2]	6.82[-2]	7.21[-2]
$3d5p5d$	6.96[-1]	7.00[-1]	7.64[-1]	8.08[-1]	8.66[-1]	8.88[-1]	9.19[-1]	9.57[-1]	1.00[0]	1.05[0]
$3d5p5f^*$	1.25[-1]	1.36[-1]	7.03[-2]	3.71[-2]	2.18[-2]	2.29[-2]	2.75[-2]	3.46[-2]	4.12[-2]	4.54[-2]
$3d5p5f$	2.75[-1]	3.58[-1]	2.34[-1]	1.60[-1]	1.31[-1]	1.37[-1]	1.50[-1]	1.64[-1]	1.66[-1]	1.54[-1]
$3d5p5g^*$	1.54[-2]	3.71[-2]	5.17[-2]	5.84[-2]	6.63[-2]	6.93[-2]	7.36[-2]	7.90[-2]	8.50[-2]	9.09[-2]
$3d5p5g$	2.10[-2]	5.03[-2]	6.95[-2]	9.05[-2]	1.33[-1]	1.51[-1]	1.76[-1]	2.06[-1]	2.36[-1]	2.63[-1]
$3d5d^*5d$	6.89[-1]	9.37[-1]	1.11[0]	1.19[0]	1.28[0]	1.31[0]	1.35[0]	1.40[0]	1.46[0]	1.52[0]
$3d5d^*5f$	3.30[-2]	4.13[-2]	3.55[-1]	6.97[-1]	1.17[0]	1.31[0]	1.48[0]	1.64[0]	1.75[0]	1.82[0]
$3d5d5d$	8.39[-1]	1.13[0]	1.33[0]	1.41[0]	1.51[0]	1.54[0]	1.58[0]	1.62[0]	1.67[0]	1.72[0]
$3d5d5f^*$	7.56[-2]	3.07[-1]	7.05[-1]	9.43[-1]	1.20[0]	1.28[0]	1.37[0]	1.46[0]	1.55[0]	1.63[0]
$3d5d5f$	1.42[-1]	3.77[-1]	1.06[0]	1.66[0]	2.44[0]	2.69[0]	2.97[0]	3.26[0]	3.50[0]	3.68[0]
$3d5f^*5f$	8.11[-2]	6.16[-1]	1.98[0]	3.00[0]	4.19[0]	4.54[0]	4.93[0]	5.31[0]	5.63[0]	5.89[0]
$3d5f5f$	5.44[-2]	4.25[-1]	1.41[0]	2.16[0]	3.06[0]	3.32[0]	3.61[0]	3.88[0]	4.10[0]	4.26[0]

	$Z = 32$	$Z = 36$	$Z = 42$	$Z = 47$	$Z = 56$	$Z = 60$	$Z = 66$	$Z = 74$	$Z = 83$	$Z = 92$
$3d5f5g^*$	1.32[-2]	1.12[-1]	4.27[-1]	7.34[-1]	1.23[0]	1.41[0]	1.65[0]	1.91[0]	2.16[0]	2.36[0]
$3d5f5g$	1.21[-2]	1.04[-1]	3.98[-1]	6.83[-1]	1.14[0]	1.31[0]	1.52[0]	1.76[0]	1.97[0]	2.14[0]
$3d5s6d$	1.47[-1]	1.67[-1]	1.72[-1]	1.71[-1]	1.71[-1]	1.73[-1]	1.76[-1]	1.83[-1]	1.93[-1]	2.06[-1]
$3d5s6f$	4.28[-2]	8.71[-2]	9.82[-2]	9.85[-2]	9.74[-2]	9.77[-2]	9.99[-2]	1.06[-1]	1.19[-1]	1.40[-1]
$3d5p^*6d$	1.35[-1]	1.60[-1]	1.80[-1]	1.90[-1]	2.03[-1]	2.09[-1]	2.17[-1]	2.28[-1]	2.42[-1]	2.59[-1]
$3d5p6d$	3.17[-1]	2.98[-1]	3.17[-1]	3.32[-1]	3.52[-1]	3.60[-1]	3.71[-1]	3.84[-1]	4.01[-1]	4.18[-1]
$3d5p6f$	1.68[-1]	1.85[-1]	1.06[-1]	6.61[-2]	5.95[-2]	6.59[-2]	7.67[-2]	8.78[-2]	9.29[-2]	9.02[-2]
$3d5p6g$	2.44[-2]	4.17[-2]	5.57[-2]	6.88[-2]	9.36[-2]	1.03[-1]	1.16[-1]	1.30[-1]	1.44[-1]	1.56[-1]
$3d5d^*6d$	3.04[-1]	4.04[-1]	4.68[-1]	4.96[-1]	5.26[-1]	5.36[-1]	5.50[-1]	5.67[-1]	5.88[-1]	6.11[-1]
$3d5d^*6f$	1.77[-2]	2.83[-2]	2.20[-1]	3.95[-1]	6.06[-1]	6.66[-1]	7.33[-1]	7.92[-1]	8.34[-1]	8.58[-1]
$3d5d6s$	1.40[-1]	1.74[-1]	1.94[-1]	2.02[-1]	2.13[-1]	2.17[-1]	2.25[-1]	2.36[-1]	2.50[-1]	2.67[-1]
$3d5d6p^*$	1.40[-1]	1.81[-1]	2.15[-1]	2.33[-1]	2.57[-1]	2.66[-1]	2.79[-1]	2.95[-1]	3.15[-1]	3.37[-1]
$3d5d6p$	2.93[-1]	3.35[-1]	3.87[-1]	4.18[-1]	4.58[-1]	4.73[-1]	4.93[-1]	5.17[-1]	5.44[-1]	5.71[-1]
$3d5d6d^*$	3.52[-1]	4.83[-1]	5.80[-1]	6.26[-1]	6.78[-1]	6.96[-1]	7.20[-1]	7.49[-1]	7.81[-1]	8.15[-1]
$3d5d6d$	7.99[-1]	1.07[0]	1.25[0]	1.33[0]	1.42[0]	1.45[0]	1.49[0]	1.53[0]	1.58[0]	1.62[0]
$3d5d6f^*$	4.88[-2]	1.96[-1]	4.32[-1]	5.61[-1]	6.93[-1]	7.30[-1]	7.75[-1]	8.23[-1]	8.68[-1]	9.09[-1]
$3d5d6f$	8.71[-2]	2.42[-1]	6.58[-1]	9.72[-1]	1.34[0]	1.44[0]	1.56[0]	1.68[0]	1.78[0]	1.85[0]
$3d5d6g$	8.67[-3]	3.51[-2]	8.60[-2]	1.24[-1]	1.78[-1]	1.97[-1]	2.20[-1]	2.45[-1]	2.67[-1]	2.84[-1]
$3d5f^*6f$	4.71[-2]	3.31[-1]	9.92[-1]	1.43[0]	1.89[0]	2.01[0]	2.15[0]	2.28[0]	2.38[0]	2.47[0]
$3d5f6s$	2.74[-2]	7.57[-2]	1.03[-1]	1.14[-1]	1.25[-1]	1.29[-1]	1.36[-1]	1.49[-1]	1.71[-1]	2.04[-1]
$3d5f6p$	9.11[-2]	1.50[-1]	1.07[-1]	8.31[-2]	7.76[-2]	8.18[-2]	8.93[-2]	9.59[-2]	9.60[-2]	8.75[-2]
$3d5f6d^*$	1.59[-2]	1.79[-2]	1.82[-1]	3.57[-1]	6.01[-1]	6.77[-1]	7.65[-1]	8.48[-1]	9.07[-1]	9.39[-1]
$3d5f6d$	6.02[-2]	1.50[-1]	4.63[-1]	7.49[-1]	1.13[0]	1.26[0]	1.40[0]	1.55[0]	1.67[0]	1.76[0]
$3d5f6f^*$	5.77[-2]	3.72[-1]	1.14[0]	1.67[0]	2.29[0]	2.46[0]	2.65[0]	2.84[0]	2.99[0]	3.12[0]
$3d5f6f$	7.14[-2]	4.89[-1]	1.53[0]	2.26[0]	3.08[0]	3.31[0]	3.56[0]	3.78[0]	3.96[0]	4.10[0]
$3d5f6g^*$	1.16[-2]	1.10[-1]	3.48[-1]	5.93[-1]	9.74[-1]	1.11[0]	1.28[0]	1.47[0]	1.64[0]	1.78[0]
$3d5f6g$	1.06[-2]	1.03[-1]	3.24[-1]	5.52[-1]	9.06[-1]	1.03[0]	1.19[0]	1.35[0]	1.50[0]	1.62[0]
$3d5g^*6f$	7.65[-3]	5.36[-2]	1.85[-1]	2.98[-1]	4.63[-1]	5.21[-1]	5.96[-1]	6.77[-1]	7.50[-1]	8.12[-1]
$3d5s7d$	7.92[-2]	8.93[-2]	9.07[-2]	8.96[-2]	8.91[-2]	8.96[-2]	9.10[-2]	9.42[-2]	9.93[-2]	1.06[-1]
$3d5p^*7d$	7.24[-2]	8.50[-2]	9.45[-2]	9.95[-2]	1.06[-1]	1.09[-1]	1.12[-1]	1.18[-1]	1.25[-1]	1.34[-1]
$3d5p7d$	1.72[-1]	1.56[-1]	1.67[-1]	1.74[-1]	1.83[-1]	1.86[-1]	1.91[-1]	1.98[-1]	2.06[-1]	2.14[-1]
$3d5p7f$	1.08[-1]	1.14[-1]	5.50[-2]	3.43[-2]	3.40[-2]	3.90[-2]	4.66[-2]	5.39[-2]	5.78[-2]	5.74[-2]
$3d5d^*7d$	1.64[-1]	2.15[-1]	2.47[-1]	2.61[-1]	2.74[-1]	2.79[-1]	2.85[-1]	2.94[-1]	3.04[-1]	3.15[-1]
$3d5d^*7f$	1.05[-2]	1.97[-2]	1.41[-1]	2.42[-1]	3.54[-1]	3.85[-1]	4.18[-1]	4.47[-1]	4.67[-1]	4.78[-1]
$3d5d7s$	7.24[-2]	9.39[-2]	1.08[-1]	1.15[-1]	1.24[-1]	1.27[-1]	1.32[-1]	1.39[-1]	1.48[-1]	1.58[-1]
$3d5d7p^*$	7.53[-2]	1.02[-1]	1.24[-1]	1.36[-1]	1.51[-1]	1.57[-1]	1.65[-1]	1.75[-1]	1.87[-1]	2.00[-1]
$3d5d7p$	1.54[-1]	1.88[-1]	2.24[-1]	2.45[-1]	2.72[-1]	2.82[-1]	2.96[-1]	3.12[-1]	3.29[-1]	3.46[-1]
$3d5d7d^*$	2.04[-1]	2.83[-1]	3.43[-1]	3.72[-1]	4.05[-1]	4.16[-1]	4.31[-1]	4.50[-1]	4.70[-1]	4.91[-1]
$3d5d7d$	4.49[-1]	6.00[-1]	7.07[-1]	7.54[-1]	8.05[-1]	8.22[-1]	8.43[-1]	8.68[-1]	8.94[-1]	9.22[-1]
$3d5d7f^*$	3.25[-2]	1.30[-1]	2.78[-1]	3.56[-1]	4.32[-1]	4.54[-1]	4.80[-1]	5.08[-1]	5.35[-1]	5.61[-1]
$3d5d7f$	5.65[-2]	1.61[-1]	4.26[-1]	6.09[-1]	8.10[-1]	8.66[-1]	9.30[-1]	9.90[-1]	1.04[0]	1.08[0]
$3d5d7g^*$	3.64[-3]	1.37[-2]	3.47[-2]	5.31[-2]	8.22[-2]	9.32[-2]	1.08[-1]	1.24[-1]	1.40[-1]	1.54[-1]
$3d5d7g$	6.52[-3]	2.56[-2]	6.01[-2]	8.56[-2]	1.20[-1]	1.32[-1]	1.47[-1]	1.63[-1]	1.77[-1]	1.88[-1]
$3d5f^*7d$	1.55[-2]	6.21[-2]	1.43[-1]	1.92[-1]	2.44[-1]	2.59[-1]	2.76[-1]	2.95[-1]	3.12[-1]	3.26[-1]
$3d5f^*7f$	2.96[-2]	1.97[-1]	5.71[-1]	8.03[-1]	1.03[0]	1.09[0]	1.15[0]	1.20[0]	1.25[0]	1.29[0]
$3d5f^*7g$	2.85[-3]	1.96[-2]	6.79[-2]	1.10[-1]	1.75[-1]	1.99[-1]	2.29[-1]	2.61[-1]	2.90[-1]	3.12[-1]
$3d5f7s$	1.62[-2]	4.20[-2]	6.12[-2]	6.55[-2]	7.55[-2]	7.93[-2]	8.31[-2]	9.03[-2]	1.03[-1]	1.22[-1]
$3d5f7d^*$	9.56[-3]	1.13[-2]	1.02[-1]	2.14[-1]	3.54[-1]	3.96[-1]	4.46[-1]	5.03[-1]	5.38[-1]	5.53[-1]
$3d5f7d$	3.30[-2]	7.76[-2]	2.48[-1]	4.20[-1]	6.41[-1]	7.09[-1]	7.92[-1]	8.86[-1]	9.57[-1]	1.00[0]
$3d5f7f^*$	3.83[-2]	2.31[-1]	7.32[-1]	1.07[0]	1.40[0]	1.48[0]	1.58[0]	1.71[0]	1.79[0]	1.84[0]
$3d5f7f$	4.66[-2]	2.98[-1]	9.45[-1]	1.37[0]	1.81[0]	1.92[0]	2.04[0]	2.18[0]	2.27[0]	2.32[0]
$3d5f7g^*$	8.92[-3]	6.97[-2]	2.82[-1]	4.41[-1]	7.02[-1]	7.98[-1]	9.05[-1]	1.03[0]	1.14[0]	1.22[0]
$3d5f7g$	8.15[-3]	6.47[-2]	2.64[-1]	4.11[-1]	6.54[-1]	7.43[-1]	8.40[-1]	9.48[-1]	1.04[0]	1.10[0]
$3d6s6d$	6.13[-2]	7.47[-2]	8.13[-2]	8.35[-2]	8.66[-2]	8.81[-2]	9.06[-2]	9.47[-2]	1.00[-1]	1.07[-1]
$3d6s6f^*$	3.92[-3]	7.61[-3]	8.13[-3]	9.56[-3]	1.15[-2]	1.21[-2]	1.29[-2]	1.37[-2]	1.47[-2]	1.59[-2]
$3d6s6f$	1.67[-2]	4.00[-2]	5.01[-2]	5.26[-2]	5.32[-2]	5.36[-2]	5.51[-2]	5.89[-2]	6.65[-2]	7.84[-2]
$3d6p^*6d$	6.10[-2]	7.72[-2]	9.01[-2]	9.69[-2]	1.06[-1]	1.09[-1]	1.14[-1]	1.20[-1]	1.28[-1]	1.36[-1]
$3d6p^*6f$	1.71[-2]	3.18[-2]	2.73[-2]	2.30[-2]	2.09[-2]	2.14[-2]	2.28[-2]	2.52[-2]	2.87[-2]	3.48[-2]

	$Z = 32$	$Z = 36$	$Z = 42$	$Z = 47$	$Z = 56$	$Z = 60$	$Z = 66$	$Z = 74$	$Z = 83$	$Z = 92$
$3d6p6d^*$	1.35[-2]	5.74[-3]	6.64[-3]	8.28[-3]	1.10[-2]	1.19[-2]	1.32[-2]	1.45[-2]	1.56[-2]	1.64[-2]
$3d6p6d$	1.29[-1]	1.42[-1]	1.61[-1]	1.72[-1]	1.87[-1]	1.92[-1]	1.99[-1]	2.08[-1]	2.18[-1]	2.28[-1]
$3d6p6f^*$	2.39[-2]	2.65[-2]	1.26[-2]	6.34[-3]	4.53[-3]	5.24[-3]	6.72[-3]	8.70[-3]	1.04[-2]	1.14[-2]
$3d6p6f$	5.75[-2]	7.89[-2]	4.91[-2]	3.56[-2]	3.53[-2]	3.88[-2]	4.43[-2]	4.98[-2]	5.17[-2]	4.92[-2]
$3d6p6g$	5.47[-3]	1.28[-2]	1.86[-2]	2.75[-2]	4.34[-2]	4.94[-2]	5.73[-2]	6.60[-2]	7.43[-2]	8.18[-2]
$3d6d^*6d$	1.56[-1]	2.08[-1]	2.45[-1]	2.61[-1]	2.79[-1]	2.85[-1]	2.94[-1]	3.04[-1]	3.16[-1]	3.28[-1]
$3d6d^*6f^*$	1.44[-3]	1.95[-3]	8.50[-3]	1.51[-2]	2.36[-2]	2.61[-2]	2.89[-2]	3.13[-2]	3.28[-2]	3.34[-2]
$3d6d^*6f$	7.78[-3]	1.28[-2]	1.12[-1]	2.01[-1]	3.13[-1]	3.45[-1]	3.80[-1]	4.11[-1]	4.34[-1]	4.46[-1]
$3d6d6d$	1.89[-1]	2.50[-1]	2.92[-1]	3.10[-1]	3.29[-1]	3.35[-1]	3.43[-1]	3.52[-1]	3.62[-1]	3.72[-1]
$3d6d6f^*$	1.95[-2]	7.81[-2]	1.72[-1]	2.22[-1]	2.74[-1]	2.88[-1]	3.05[-1]	3.23[-1]	3.40[-1]	3.55[-1]
$3d6d6f$	3.53[-2]	9.64[-2]	2.87[-1]	4.35[-1]	6.14[-1]	6.67[-1]	7.28[-1]	7.85[-1]	8.33[-1]	8.71[-1]
$3d6d6g$	3.63[-3]	1.47[-2]	3.51[-2]	5.00[-2]	7.02[-2]	7.69[-2]	8.52[-2]	9.36[-2]	1.01[-1]	1.06[-1]
$3d6f^*6f$	3.25[-2]	2.10[-1]	5.71[-1]	8.09[-1]	1.05[0]	1.10[0]	1.17[0]	1.23[0]	1.28[0]	1.32[0]
$3d6f^*6g$	2.13[-3]	1.41[-2]	4.37[-2]	6.91[-2]	1.07[-1]	1.21[-1]	1.38[-1]	1.57[-1]	1.73[-1]	1.87[-1]
$3d6f6f$	2.21[-2]	1.46[-1]	4.11[-1]	5.92[-1]	7.72[-1]	8.17[-1]	8.65[-1]	9.07[-1]	9.40[-1]	9.67[-1]
$3d6f6g^*$	5.60[-3]	5.23[-2]	1.55[-1]	2.51[-1]	3.79[-1]	4.23[-1]	4.78[-1]	5.37[-1]	5.90[-1]	6.34[-1]
$3d6f6g$	5.09[-3]	4.88[-2]	1.44[-1]	2.33[-1]	3.52[-1]	3.92[-1]	4.42[-1]	4.94[-1]	5.38[-1]	5.73[-1]
$3d6s7d$	3.29[-2]	3.99[-2]	4.29[-2]	4.37[-2]	4.50[-2]	4.56[-2]	4.68[-2]	4.88[-2]	5.16[-2]	5.50[-2]
$3d6s7f$	1.08[-2]	2.36[-2]	2.83[-2]	2.87[-2]	2.79[-2]	2.78[-2]	2.82[-2]	2.98[-2]	3.33[-2]	3.90[-2]
$3d6p^*7d$	3.26[-2]	4.09[-2]	4.74[-2]	5.08[-2]	5.52[-2]	5.68[-2]	5.91[-2]	6.23[-2]	6.62[-2]	7.06[-2]
$3d6p^*7f$	1.09[-2]	1.85[-2]	1.48[-2]	1.18[-2]	1.06[-2]	1.09[-2]	1.16[-2]	1.27[-2]	1.42[-2]	1.67[-2]
$3d6p7d$	7.03[-2]	7.54[-2]	8.42[-2]	8.95[-2]	9.68[-2]	9.94[-2]	1.03[-1]	1.07[-1]	1.12[-1]	1.18[-1]
$3d6p7f$	3.72[-2]	4.62[-2]	2.72[-2]	1.90[-2]	1.99[-2]	2.25[-2]	2.63[-2]	3.00[-2]	3.17[-2]	3.09[-2]
$3d6p7g$	4.18[-3]	8.52[-3]	1.42[-2]	1.93[-2]	2.90[-2]	3.25[-2]	3.68[-2]	4.13[-2]	4.56[-2]	4.96[-2]
$3d6d^*7d$	8.39[-2]	1.11[-1]	1.29[-1]	1.37[-1]	1.46[-1]	1.49[-1]	1.52[-1]	1.57[-1]	1.63[-1]	1.69[-1]
$3d6d^*7f$	4.47[-3]	9.37[-3]	7.13[-2]	1.23[-1]	1.83[-1]	1.99[-1]	2.17[-1]	2.32[-1]	2.43[-1]	2.49[-1]
$3d6d7s$	3.16[-2]	4.04[-2]	4.55[-2]	4.76[-2]	5.03[-2]	5.14[-2]	5.32[-2]	5.58[-2]	5.92[-2]	6.31[-2]
$3d6d7p^*$	3.29[-2]	4.33[-2]	5.18[-2]	5.64[-2]	6.22[-2]	6.44[-2]	6.74[-2]	7.13[-2]	7.59[-2]	8.09[-2]
$3d6d7p$	6.79[-2]	7.98[-2]	9.32[-2]	1.01[-1]	1.11[-1]	1.15[-1]	1.20[-1]	1.26[-1]	1.32[-1]	1.39[-1]
$3d6d7d^*$	9.03[-2]	1.22[-1]	1.45[-1]	1.55[-1]	1.67[-1]	1.71[-1]	1.76[-1]	1.83[-1]	1.90[-1]	1.98[-1]
$3d6d7f^*$	1.30[-2]	5.20[-2]	1.11[-1]	1.41[-1]	1.71[-1]	1.79[-1]	1.89[-1]	1.99[-1]	2.09[-1]	2.18[-1]
$3d6d7f$	2.25[-2]	6.45[-2]	1.85[-1]	2.72[-1]	3.70[-1]	3.97[-1]	4.28[-1]	4.58[-1]	4.82[-1]	5.01[-1]
$3d6f^*7d$	1.01[-2]	4.01[-2]	8.82[-2]	1.14[-1]	1.40[-1]	1.48[-1]	1.56[-1]	1.65[-1]	1.73[-1]	1.81[-1]
$3d6f^*7f$	1.99[-2]	1.27[-1]	3.31[-1]	4.57[-1]	5.71[-1]	5.99[-1]	6.28[-1]	6.54[-1]	6.77[-1]	6.96[-1]
$3d6f7s$	8.97[-3]	2.42[-2]	2.74[-2]	2.88[-2]	3.15[-2]	3.24[-2]	3.40[-2]	3.55[-2]	4.03[-2]	4.87[-2]
$3d6f7p^*$	1.05[-2]	1.90[-2]	1.48[-2]	1.24[-2]	1.29[-2]	1.36[-2]	1.49[-2]	1.59[-2]	1.83[-2]	2.28[-2]
$3d6f7p$	3.05[-2]	4.44[-2]	2.56[-2]	1.91[-2]	2.19[-2]	2.43[-2]	2.80[-2]	3.07[-2]	3.18[-2]	3.00[-2]
$3d6f7d^*$	4.88[-3]	7.42[-3]	6.74[-2]	1.22[-1]	1.86[-1]	2.05[-1]	2.24[-1]	2.44[-1]	2.56[-1]	2.62[-1]
$3d6f7d$	1.95[-2]	5.04[-2]	1.57[-1]	2.44[-1]	3.46[-1]	3.77[-1]	4.11[-1]	4.45[-1]	4.72[-1]	4.92[-1]
$3d6f7f^*$	2.14[-2]	1.28[-1]	3.73[-1]	5.03[-1]	6.38[-1]	6.77[-1]	7.13[-1]	7.39[-1]	7.68[-1]	7.95[-1]
$3d6f7f$	2.81[-2]	1.77[-1]	5.09[-1]	7.04[-1]	8.96[-1]	9.47[-1]	9.96[-1]	1.03[0]	1.07[0]	1.09[0]
$3d6f7g^*$	4.43[-3]	3.64[-2]	1.17[-1]	1.74[-1]	2.71[-1]	3.06[-1]	3.47[-1]	3.79[-1]	4.16[-1]	4.51[-1]
$3d6f7g$	4.03[-3]	3.40[-2]	1.08[-1]	1.61[-1]	2.51[-1]	2.83[-1]	3.21[-1]	3.48[-1]	3.79[-1]	4.09[-1]
$3d7s7d$	1.70[-2]	2.15[-2]	2.40[-2]	2.49[-2]	2.61[-2]	2.66[-2]	2.75[-2]	2.88[-2]	3.05[-2]	3.25[-2]
$3d7s7f$	5.49[-3]	1.46[-2]	1.51[-2]	1.60[-2]	1.66[-2]	1.66[-2]	1.71[-2]	1.81[-2]	2.04[-2]	2.42[-2]
$3d7p^*7d$	1.76[-2]	2.30[-2]	2.73[-2]	2.96[-2]	3.25[-2]	3.35[-2]	3.50[-2]	3.70[-2]	3.93[-2]	4.19[-2]
$3d7p^*7f$	6.50[-3]	1.15[-2]	7.74[-3]	6.63[-3]	6.60[-3]	6.79[-3]	7.40[-3]	8.12[-3]	9.12[-3]	1.09[-2]
$3d7p7d$	3.68[-2]	4.24[-2]	4.87[-2]	5.26[-2]	5.76[-2]	5.94[-2]	6.19[-2]	6.48[-2]	6.80[-2]	7.13[-2]
$3d7p7f$	1.93[-2]	2.65[-2]	1.38[-2]	1.06[-2]	1.24[-2]	1.39[-2]	1.62[-2]	1.84[-2]	1.93[-2]	1.85[-2]
$3d7d^*7d$	4.87[-2]	6.51[-2]	7.65[-2]	8.16[-2]	8.71[-2]	8.90[-2]	9.15[-2]	9.47[-2]	9.83[-2]	1.02[-1]
$3d7d7d$	5.92[-2]	7.82[-2]	9.11[-2]	9.67[-2]	1.03[-1]	1.04[-1]	1.07[-1]	1.10[-1]	1.13[-1]	1.16[-1]
$3d7d7f^*$	6.74[-3]	2.66[-2]	5.71[-2]	7.26[-2]	8.76[-2]	9.18[-2]	9.67[-2]	1.02[-1]	1.07[-1]	1.11[-1]
$3d7d7f$	1.25[-2]	3.36[-2]	1.02[-1]	1.51[-1]	2.07[-1]	2.23[-1]	2.42[-1]	2.57[-1]	2.72[-1]	2.84[-1]
$3d7f^*7f$	1.30[-2]	7.76[-2]	2.13[-1]	2.79[-1]	3.47[-1]	3.66[-1]	3.84[-1]	3.94[-1]	4.08[-1]	4.23[-1]
$3d7f7f$	8.85[-3]	5.42[-2]	1.54[-1]	2.04[-1]	2.57[-1]	2.71[-1]	2.85[-1]	2.92[-1]	3.01[-1]	3.10[-1]
$3d7f7g^*$	2.57[-3]	2.14[-2]	6.01[-2]	9.01[-2]	1.36[-1]	1.50[-1]	1.69[-1]	1.86[-1]	2.02[-1]	2.17[-1]
$3d7f7g$	2.34[-3]	2.00[-2]	5.54[-2]	8.33[-2]	1.26[-1]	1.39[-1]	1.56[-1]	1.71[-1]	1.85[-1]	1.97[-1]

TABLE X. Coster-Kronig rates  $A(n_0j_0l_0, n_1j_1l_1, n_2j_2l_2)$  (in mau) as function of  $Z$  for Cu-like ions.

	$Z=32$	$Z=36$	$Z=42$	$Z=47$	$Z=56$	$Z=60$	$Z=66$	$Z=74$	$Z=83$	$Z=92$
$2s2p^*4s$	2.34[0]	4.12[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]
$2s2p^*4p^*$	1.29[0]	2.65[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]
$2s2p^*4p$	1.76[0]	3.65[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]
$2s2p^*4d^*$	1.30[0]	2.07[0]	2.61[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]
$2s2p^*4d$	2.20[0]	3.59[0]	4.62[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]
$2s2p^*4f^*$	2.20[-2]	5.85[-1]	3.43[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]
$2s2p^*4f$	2.94[-2]	7.83[-1]	4.73[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]
$2s2p4s$	4.11[0]	6.93[0]	9.72[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]
$2s2p4p^*$	1.50[0]	2.99[0]	4.42[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]
$2s2p4p$	3.37[0]	6.53[0]	9.30[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]
$2s2p4d^*$	3.41[0]	6.20[0]	9.14[0]	1.12[1]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]
$2s2p4d$	4.87[0]	8.65[0]	1.24[1]	1.49[1]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]
$2s2p4f^*$	3.27[-2]	8.91[-1]	5.40[0]	1.05[1]	1.85[1]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]
$2s2p4f$	4.34[-2]	1.18[0]	7.12[0]	1.37[1]	2.40[1]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]
$3s3p^*4f^*$	1.62[0]	1.72[1]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]
$3s3p^*4f$	2.23[0]	2.41[1]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]
$3s3p4f^*$	3.01[0]	3.33[1]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]
$3s3p4f$	3.95[0]	4.32[1]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]
$3s3d^*4s$	1.01[1]	1.49[1]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]
$3s3d^*4p^*$	1.26[0]	2.44[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]
$3s3d^*4p$	1.21[0]	2.06[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]
$3s3d^*4d^*$	3.86[-1]	1.80[0]	4.28[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]
$3s3d^*4d$	2.40[-1]	1.48[0]	4.81[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]
$3s3d^*4f^*$	8.25[-2]	1.27[0]	4.60[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]
$3s3d^*4f$	1.28[-1]	1.79[0]	5.69[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]
$3s3d4s$	1.50[1]	2.22[1]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]
$3s3d4p^*$	6.33[-1]	9.63[-1]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]
$3s3d4p$	2.85[0]	5.28[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]
$3s3d4d^*$	2.38[-1]	1.51[0]	4.93[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]
$3s3d4d$	6.74[-1]	3.34[0]	8.60[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]
$3s3d4f^*$	1.44[-1]	2.02[0]	6.52[0]	8.97[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]
$3s3d4f$	1.72[-1]	2.58[0]	9.01[0]	1.32[1]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]
$3p^*3d^*4p^*$	1.26[1]	2.07[1]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]
$3p^*3d^*4p$	1.94[1]	3.31[1]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]
$3p^*3d^*4d^*$	2.01[0]	5.14[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]
$3p^*3d^*4d$	1.90[0]	3.13[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]
$3p^*3d^*4f^*$	1.20[0]	1.62[1]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]
$3p^*3d^*4f$	1.89[0]	2.56[1]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]
$3p^*3d4p^*$	2.07[1]	3.08[1]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]
$3p^*3d4p$	2.02[0]	3.33[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]
$3p^*3d4d^*$	4.26[0]	3.56[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]
$3p^*3d4d$	3.68[-1]	9.56[-1]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]
$3p^*3d4f^*$	5.68[-2]	6.21[-1]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]
$3p^*3d4f$	5.21[-2]	5.41[-1]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]
$3p3d^*4p^*$	1.52[0]	2.79[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]
$3p3d^*4p$	1.62[1]	2.44[1]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]
$3p3d^*4d^*$	4.21[-1]	1.32[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]
$3p3d^*4d$	2.56[0]	2.02[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]
$3p3d^*4f^*$	1.54[-1]	1.99[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]
$3p3d^*4f$	2.59[-1]	3.32[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]
$3p3d4p^*$	1.08[1]	1.88[1]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]
$3p3d4p$	2.96[1]	4.79[1]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]
$3p3d4d^*$	1.17[0]	1.97[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]
$3p3d4d$	3.66[0]	7.46[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]
$3p3d4f^*$	1.42[0]	1.90[1]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]
$3p3d4f$	1.69[0]	2.25[1]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]

	$Z = 32$	$Z = 36$	$Z = 42$	$Z = 47$	$Z = 56$	$Z = 60$	$Z = 66$	$Z = 74$	$Z = 83$	$Z = 92$
$2s2p^*5s$	7.15[-1]	1.47[0]	2.32[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]
$2s2p^*5p^*$	4.37[-1]	9.81[-1]	1.63[0]	2.05[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]
$2s2p^*5p$	5.98[-1]	1.34[0]	2.22[0]	2.77[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]
$2s2p^*5d^*$	5.26[-1]	8.56[-1]	1.15[0]	1.34[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]
$2s2p^*5d$	8.96[-1]	1.51[0]	2.09[0]	2.42[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]
$2s2p^*5f^*$	1.82[-2]	4.10[-1]	1.92[0]	3.05[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]
$2s2p^*5f$	2.44[-2]	5.50[-1]	2.58[0]	4.12[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]
$2s2p5s$	1.26[0]	2.49[0]	3.78[0]	4.46[0]	4.93[0]	4.72[0]	5.33[0]	1.64[1]	5.18[0]	5.02[0]
$2s2p5p^*$	5.08[-1]	1.11[0]	1.74[0]	2.07[0]	2.03[0]	2.14[0]	2.53[0]	1.27[0]	2.29[0]	2.21[0]
$2s2p5p$	1.15[0]	2.46[0]	3.73[0]	4.29[0]	7.58[0]	3.40[0]	4.19[0]	4.04[0]	3.60[0]	3.18[0]
$2s2p5d^*$	1.40[0]	2.57[0]	3.90[0]	4.84[0]	6.37[0]	5.36[0]	6.94[0]	9.33[0]	1.08[1]	1.21[1]
$2s2p5d$	1.99[0]	3.55[0]	5.21[0]	6.32[0]	8.09[0]	8.67[0]	1.56[1]	1.14[1]	1.30[1]	1.43[1]
$2s2p5f^*$	2.66[-2]	6.62[-1]	3.34[0]	5.79[0]	9.08[0]	1.01[1]	1.13[1]	1.23[1]	1.28[1]	1.25[1]
$2s2p5f$	3.54[-2]	8.75[-1]	4.40[0]	7.58[0]	1.18[1]	1.31[1]	1.45[1]	1.57[1]	1.60[1]	1.53[1]
$2p^*2p5s$	2.14[-1]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	5.35[-1]	5.65[-1]
$2p^*2p5p^*$	6.78[-1]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	4.15[0]	4.67[0]
$2p^*2p5p$	2.61[-1]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	1.39[0]	1.29[0]
$2p^*2p5d^*$	1.04[0]	2.27[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	6.80[0]	6.21[0]	6.67[0]
$2p^*2p5d$	4.82[-1]	9.28[-1]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	2.06[0]	1.19[0]	1.77[0]
$3s3p^*5s$	3.97[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]
$3s3p^*5p^*$	2.92[0]	6.11[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]
$3s3p^*5p$	7.56[0]	1.35[1]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]
$3s3p^*5d^*$	8.77[-1]	4.13[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]
$3s3p^*5d$	5.94[-1]	4.30[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]
$3s3p^*5f^*$	1.07[0]	8.95[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]
$3s3p^*5f$	1.47[0]	1.27[1]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]
$3s3p^*5g^*$	9.88[-2]	2.58[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]
$3s3p^*5g$	1.24[-1]	3.23[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]
$3s3p5s$	7.34[0]	1.24[1]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]
$3s3p5p^*$	7.26[0]	1.29[1]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]
$3s3p5p$	1.21[1]	2.25[1]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]
$3s3p5d^*$	6.96[-1]	4.67[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]
$3s3p5d$	1.64[0]	8.57[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]
$3s3p5f^*$	2.06[0]	1.81[1]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]
$3s3p5f$	2.69[0]	2.33[1]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]
$3s3p5g^*$	1.85[-1]	4.36[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]
$3s3p5g$	2.31[-1]	5.44[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]
$3s3d^*5s$	2.37[0]	3.60[0]	4.17[0]	4.31[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]
$3s3d^*5p^*$	3.97[-1]	7.75[-1]	1.07[0]	1.20[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]
$3s3d^*5p$	3.59[-1]	6.05[-1]	7.89[-1]	9.06[-1]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]
$3s3d^*5d^*$	1.90[-1]	8.28[-1]	1.74[0]	2.25[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]
$3s3d^*5d$	1.14[-1]	7.87[-1]	2.23[0]	3.23[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]
$3s3d^*5f^*$	6.35[-2]	7.90[-1]	2.18[0]	2.65[0]	3.46[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]
$3s3d^*5f$	9.92[-2]	1.12[0]	2.62[0]	3.07[0]	3.02[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]
$3s3d5s$	3.51[0]	5.34[0]	6.14[0]	6.32[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]
$3s3d5p^*$	1.83[-1]	2.69[-1]	3.02[-1]	3.25[-1]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]
$3s3d5p$	8.84[-1]	1.63[0]	2.16[0]	2.39[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]
$3s3d5d^*$	1.14[-1]	8.04[-1]	2.28[0]	3.30[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]
$3s3d5d$	3.30[-1]	1.60[0]	3.67[0]	4.98[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]
$3s3d5f^*$	1.11[-1]	1.26[0]	3.00[0]	3.55[0]	3.55[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]
$3s3d5f$	1.33[-1]	1.61[0]	4.23[0]	5.53[0]	6.12[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]
$3p^*3d^*5s$	3.48[0]	6.51[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]
$3p^*3d^*5p^*$	3.68[0]	6.32[0]	8.46[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]
$3p^*3d^*5p$	6.37[0]	1.17[1]	1.59[1]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]
$3p^*3d^*5d^*$	8.13[-1]	2.19[0]	4.40[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]
$3p^*3d^*5d$	6.44[-1]	1.69[0]	4.90[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]
$3p^*3d^*5f^*$	8.50[-1]	9.78[0]	2.58[1]	3.28[1]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]
$3p^*3d^*5f$	1.35[0]	1.58[1]	4.27[1]	5.55[1]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]

	$Z = 32$	$Z = 36$	$Z = 42$	$Z = 47$	$Z = 56$	$Z = 60$	$Z = 66$	$Z = 74$	$Z = 83$	$Z = 92$
$3p^*3d^*5g^*$	4.42[-2]	1.71[0]	1.08[1]	2.19[1]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]
$3p^*3d^*5g$	5.73[-2]	2.21[0]	1.41[1]	2.81[1]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]
$3p^*3d5s$	4.56[-1]	7.06[-1]	9.22[-1]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]
$3p^*3d5p^*$	5.48[0]	7.77[0]	8.44[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]
$3p^*3d5p$	6.24[-1]	1.06[0]	1.31[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]
$3p^*3d5d^*$	1.46[0]	9.13[-1]	3.07[-1]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]
$3p^*3d5d$	1.53[-1]	3.95[-1]	6.65[-1]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]
$3p^*3d5f^*$	4.33[-2]	4.42[-1]	1.49[0]	2.29[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]
$3p^*3d5f$	3.79[-2]	3.36[-1]	9.18[-1]	1.24[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]
$3p3d^*5s$	6.69[-1]	1.14[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]
$3p3d^*5p^*$	4.89[-1]	9.60[-1]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]
$3p3d^*5p$	4.43[0]	6.52[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]
$3p3d^*5d^*$	1.81[-1]	5.67[-1]	1.10[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]
$3p3d^*5d$	8.64[-1]	5.69[-1]	5.66[-1]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]
$3p3d^*5f^*$	1.11[-1]	1.18[0]	3.04[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]
$3p3d^*5f$	1.90[-1]	2.05[0]	5.62[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]
$3p3d5s$	3.51[0]	6.50[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]
$3p3d5p^*$	3.47[0]	6.53[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]
$3p3d5p$	8.73[0]	1.47[1]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]
$3p3d5d^*$	3.93[-1]	1.04[0]	3.22[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]
$3p3d5d$	1.39[0]	3.19[0]	6.72[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]
$3p3d5f^*$	1.03[0]	1.15[1]	3.08[1]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]
$3p3d5f$	1.22[0]	1.35[1]	3.54[1]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]
$3p3d5g^*$	4.54[-2]	1.83[0]	1.17[1]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]
$3p3d5g$	5.53[-2]	2.23[0]	1.43[1]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]
$2s2p^*6s$	3.14[-1]	6.96[-1]	1.18[0]	1.52[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]
$2s2p^*6p^*$	2.03[-1]	4.74[-1]	8.18[-1]	1.03[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]
$2s2p^*6p$	2.77[-1]	6.48[-1]	1.11[0]	1.41[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]
$2s2p^*6d^*$	2.72[-1]	4.48[-1]	6.18[-1]	6.85[-1]	8.73[-1]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]
$2s2p^*6d$	4.64[-1]	7.95[-1]	1.13[0]	1.29[0]	1.57[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]
$2s2p^*6f^*$	1.22[-2]	2.69[-1]	1.10[0]	1.67[0]	2.07[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]
$2s2p^*6f$	1.63[-2]	3.60[-1]	1.49[0]	2.18[0]	2.82[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]
$2s2p6s$	5.54[-1]	1.19[0]	1.87[0]	2.25[0]	2.62[0]	2.70[0]	2.76[0]	2.76[0]	2.71[0]	2.63[0]
$2s2p6p^*$	2.38[-1]	5.46[-1]	8.73[-1]	1.06[0]	1.23[0]	1.26[0]	1.28[0]	1.27[0]	1.24[0]	1.20[0]
$2s2p6p$	5.41[-1]	1.22[0]	1.88[0]	2.22[0]	2.43[0]	2.43[0]	2.37[0]	2.21[0]	2.00[0]	1.78[0]
$2s2p6d^*$	7.10[-1]	1.32[0]	2.06[0]	2.57[0]	3.39[0]	3.74[0]	4.26[0]	4.94[0]	5.70[0]	6.41[0]
$2s2p6d$	1.01[0]	1.82[0]	2.74[0]	3.33[0]	4.27[0]	4.66[0]	5.24[0]	6.00[0]	6.82[0]	7.55[0]
$2s2p6f^*$	1.97[-2]	4.41[-1]	2.05[0]	3.38[0]	5.04[0]	5.59[0]	6.23[0]	6.81[0]	7.14[0]	7.11[0]
$2s2p6f$	2.61[-2]	5.82[-1]	2.70[0]	4.42[0]	6.54[0]	7.21[0]	7.97[0]	8.62[0]	8.90[0]	8.68[0]
$2p^*2p6s$	9.15[-2]	1.70[-1]	0.00[0]	0.00[0]	0.00[0]	2.86[-1]	2.86[-1]	2.03[-1]	2.72[-1]	2.58[-1]
$2p^*2p6p^*$	3.17[-1]	7.01[-1]	1.11[0]	0.00[0]	1.64[0]	1.74[0]	1.88[0]	2.47[0]	2.21[0]	2.37[0]
$2p^*2p6p$	1.22[-1]	2.65[-1]	4.26[-1]	0.00[0]	6.53[-1]	6.93[-1]	7.35[-1]	4.11[-1]	7.54[-1]	7.04[-1]
$2p^*2p6d^*$	5.35[-1]	1.19[0]	2.04[0]	2.56[0]	3.16[0]	3.32[0]	3.55[0]	5.13[0]	3.65[0]	3.58[0]
$2p^*2p6d$	2.47[-1]	4.83[-1]	7.49[-1]	9.01[-1]	1.06[0]	1.10[0]	1.13[0]	6.83[-1]	1.06[0]	9.70[-1]
$3s3p^*6s$	1.66[0]	3.18[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]
$3s3p^*6p^*$	1.30[0]	2.95[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]
$3s3p^*6p$	3.30[0]	6.36[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]
$3s3p^*6d^*$	4.56[-1]	2.20[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]
$3s3p^*6d$	3.12[-1]	2.36[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]
$3s3p^*6f^*$	7.37[-1]	4.98[0]	8.68[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]
$3s3p^*6f$	1.02[0]	7.14[0]	1.30[1]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]
$3s3p^*6g^*$	8.11[-2]	2.07[0]	7.50[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]
$3s3p^*6g$	1.01[-1]	2.60[0]	9.50[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]
$3s3p6s$	3.12[0]	5.69[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]
$3s3p6p^*$	3.19[0]	6.05[0]	8.33[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]
$3s3p6p$	5.40[0]	1.07[1]	1.50[1]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]
$3s3p6d^*$	3.79[-1]	2.51[0]	5.15[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]
$3s3p6d$	8.90[-1]	4.55[0]	8.50[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]

	$Z = 32$	$Z = 36$	$Z = 42$	$Z = 47$	$Z = 56$	$Z = 60$	$Z = 66$	$Z = 74$	$Z = 83$	$Z = 92$
$3s3p6f^*$	1.37[0]	1.07[1]	2.02[1]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]
$3s3p6f$	1.79[0]	1.36[1]	2.52[1]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]
$3s3p6g^*$	1.26[-1]	3.73[0]	1.43[1]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]
$3s3p6g$	1.58[-1]	4.65[0]	1.77[1]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]
$3s3d^*6s$	9.53[-1]	1.48[0]	1.70[0]	1.76[0]	1.78[0]	1.81[0]	1.83[0]	0.00[0]	0.00[0]	0.00[0]
$3s3d^*6p^*$	1.79[-1]	3.55[-1]	4.95[-1]	5.63[-1]	6.34[-1]	6.76[-1]	7.11[-1]	0.00[0]	0.00[0]	0.00[0]
$3s3d^*6p$	1.59[-1]	2.70[-1]	3.64[-1]	4.32[-1]	5.55[-1]	6.08[-1]	6.95[-1]	0.00[0]	0.00[0]	1.27[0]
$3s3d^*6d^*$	1.05[-1]	4.44[-1]	9.02[-1]	1.14[0]	1.50[0]	1.44[0]	1.51[0]	1.56[0]	1.61[0]	1.63[0]
$3s3d^*6d$	6.37[-2]	4.50[-1]	1.22[0]	1.74[0]	2.67[0]	2.52[0]	2.72[0]	2.87[0]	2.92[0]	2.84[0]
$3s3d^*6f^*$	4.29[-2]	4.85[-1]	1.19[0]	1.49[0]	2.78[0]	1.95[0]	2.02[0]	2.12[0]	2.16[0]	2.12[0]
$3s3d^*6f$	6.73[-2]	6.86[-1]	1.41[0]	1.52[0]	3.79[0]	1.56[0]	1.60[0]	1.64[0]	1.65[0]	1.63[0]
$3s3d6s$	1.41[0]	2.19[0]	2.51[0]	2.57[0]	2.56[0]	2.58[0]	2.59[0]	0.00[0]	0.00[0]	2.64[0]
$3s3d6p^*$	7.98[-2]	1.18[-1]	1.43[-1]	1.67[-1]	2.27[-1]	2.33[-1]	2.60[-1]	2.90[-1]	3.17[-1]	3.37[-1]
$3s3d6p$	3.96[-1]	7.41[-1]	9.96[-1]	1.12[0]	1.22[0]	1.33[0]	1.40[0]	1.47[0]	1.54[0]	1.63[0]
$3s3d6d^*$	6.42[-2]	4.59[-1]	1.25[0]	1.79[0]	2.41[0]	2.63[0]	2.88[0]	3.07[0]	3.19[0]	3.17[0]
$3s3d6d$	1.83[-1]	8.73[-1]	1.93[0]	2.55[0]	2.84[0]	3.37[0]	3.58[0]	3.73[0]	3.77[0]	3.68[0]
$3s3d6f^*$	7.53[-2]	7.75[-1]	1.61[0]	1.77[0]	3.95[0]	1.86[0]	1.89[0]	1.95[0]	1.95[0]	1.95[0]
$3s3d6f$	9.00[-2]	9.87[-1]	2.30[0]	2.77[0]	2.02[0]	3.31[0]	3.39[0]	3.47[0]	3.45[0]	3.27[0]
$3p^*3d^*6s$	1.49[0]	3.11[0]	4.57[0]	5.67[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]
$3p^*3d^*6p^*$	1.61[0]	2.91[0]	3.82[0]	4.62[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]
$3p^*3d^*6p$	2.86[0]	5.64[0]	7.76[0]	8.83[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]
$3p^*3d^*6d^*$	3.93[-1]	1.20[0]	2.32[0]	3.24[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]
$3p^*3d^*6d$	2.82[-1]	1.05[0]	2.71[0]	4.09[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]
$3p^*3d^*6f^*$	6.26[-1]	5.71[0]	1.40[1]	1.66[1]	1.71[1]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]
$3p^*3d^*6f$	9.96[-1]	9.34[0]	2.37[1]	2.86[1]	3.02[1]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]
$3p^*3d^*6g^*$	5.32[-2]	1.36[0]	7.70[0]	1.41[1]	2.22[1]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]
$3p^*3d^*6g$	6.89[-2]	1.77[0]	1.00[1]	1.83[1]	2.90[1]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]
$3p^*3d6s$	1.87[-1]	3.02[-1]	3.88[-1]	4.44[-1]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]
$3p^*3d6p^*$	2.32[0]	3.25[0]	3.25[0]	3.48[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]
$3p^*3d6p$	2.81[-1]	4.90[-1]	6.08[-1]	6.49[-1]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]
$3p^*3d6d^*$	6.87[-1]	3.74[-1]	1.14[-1]	1.04[-1]	1.97[-1]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]
$3p^*3d6d$	7.88[-2]	2.06[-1]	3.47[-1]	4.17[-1]	4.86[-1]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]
$3p^*3d6f^*$	2.96[-2]	2.93[-1]	9.45[-1]	1.42[0]	1.95[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	2.77[0]
$3p^*3d6f$	2.53[-2]	2.09[-1]	5.32[-1]	6.95[-1]	8.11[-1]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	1.02[0]
$3p3d^*6s$	2.82[-1]	5.18[-1]	7.49[-1]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]
$3p3d^*6p^*$	2.22[-1]	4.54[-1]	6.75[-1]	8.09[-1]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]
$3p3d^*6p$	1.90[0]	2.80[0]	3.20[0]	3.36[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]
$3p3d^*6d^*$	9.16[-2]	3.01[-1]	5.70[-1]	7.53[-1]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]
$3p3d^*6d$	4.01[-1]	2.52[-1]	2.93[-1]	5.09[-1]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]
$3p3d^*6f^*$	7.88[-2]	6.95[-1]	1.64[0]	1.86[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]
$3p3d^*6f$	1.35[-1]	1.24[0]	3.32[0]	3.78[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]
$3p3d^*6g$	1.03[-2]	2.17[-1]	1.30[0]	2.24[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]
$3p3d6s$	1.50[0]	3.06[0]	4.67[0]	5.76[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]
$3p3d6p^*$	1.57[0]	3.08[0]	4.53[0]	5.48[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]
$3p3d6p$	3.85[0]	6.71[0]	8.97[0]	1.02[1]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]
$3p3d6d^*$	1.65[-1]	6.18[-1]	1.77[0]	2.82[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]
$3p3d6d$	6.61[-1]	1.71[0]	3.40[0]	5.20[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]
$3p3d6f^*$	7.45[-1]	6.84[0]	1.68[1]	1.94[1]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]
$3p3d6f$	8.81[-1]	7.95[0]	1.91[1]	2.18[1]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]
$3p3d6g^*$	6.47[-2]	1.41[0]	8.34[0]	1.50[1]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]
$3p3d6g$	7.89[-2]	1.71[0]	1.01[1]	1.81[1]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]
$2s2p^*7s$	1.65[-1]	3.87[-1]	6.58[-1]	8.62[-1]	1.13[0]	1.25[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]
$2s2p^*7p^*$	1.10[-1]	2.70[-1]	4.56[-1]	5.99[-1]	7.73[-1]	8.68[-1]	0.00[0]	0.00[0]	0.00[0]	0.00[0]
$2s2p^*7p$	1.51[-1]	3.70[-1]	6.16[-1]	8.09[-1]	1.01[0]	1.13[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]
$2s2p^*7d^*$	1.57[-1]	2.58[-1]	3.71[-1]	4.29[-1]	5.31[-1]	5.67[-1]	6.23[-1]	0.00[0]	0.00[0]	0.00[0]
$2s2p^*7d$	2.69[-1]	4.60[-1]	6.88[-1]	7.98[-1]	9.39[-1]	1.01[0]	1.06[0]	0.00[0]	0.00[0]	0.00[0]
$2s2p^*7f$	1.13[-2]	2.44[-1]	9.50[-1]	1.41[0]	1.58[0]	1.68[0]	1.62[0]	0.00[0]	0.00[0]	0.00[0]
$2s2p7s$	2.93[-1]	6.53[-1]	1.08[0]	1.32[0]	1.53[0]	1.59[0]	1.63[0]	1.62[0]	1.60[0]	1.54[0]

	$Z = 32$	$Z = 36$	$Z = 42$	$Z = 47$	$Z = 56$	$Z = 60$	$Z = 66$	$Z = 74$	$Z = 83$	$Z = 92$
$2s2p7p^*$	1.30[-1]	3.03[-1]	5.17[-1]	6.31[-1]	7.19[-1]	7.50[-1]	7.71[-1]	7.54[-1]	7.45[-1]	7.15[-1]
$2s2p7p$	2.96[-1]	6.79[-1]	1.12[0]	1.33[0]	1.44[0]	1.46[0]	1.44[0]	1.33[0]	1.23[0]	1.09[0]
$2s2p7d^*$	4.15[-1]	7.90[-1]	1.21[0]	1.53[0]	2.04[0]	2.24[0]	2.54[0]	2.96[0]	3.41[0]	3.85[0]
$2s2p7d$	5.88[-1]	1.08[0]	1.60[0]	1.97[0]	2.55[0]	2.77[0]	3.11[0]	3.57[0]	4.06[0]	4.52[0]
$2s2p7f^*$	1.40[-2]	2.95[-1]	1.32[0]	2.05[0]	3.12[0]	3.43[0]	3.80[0]	4.15[0]	4.37[0]	4.39[0]
$2s2p7f$	1.85[-2]	3.90[-1]	1.74[0]	2.67[0]	4.03[0]	4.42[0]	4.85[0]	5.25[0]	5.44[0]	5.36[0]
$2p^*2p7s$	4.76[-2]	9.22[-2]	1.32[-1]	1.49[-1]	1.74[-1]	1.68[-1]	1.71[-1]	1.63[-1]	1.58[-1]	1.51[-1]
$2p^*2p7p^*$	1.74[-1]	3.98[-1]	6.38[-1]	7.76[-1]	8.97[-1]	1.10[0]	9.46[-1]	1.19[0]	1.29[0]	1.38[0]
$2p^*2p7p$	6.67[-2]	1.50[-1]	2.48[-1]	3.10[-1]	3.96[-1]	4.12[-1]	5.74[-1]	4.60[-1]	4.55[-1]	4.26[-1]
$2p^*2p7d^*$	3.13[-1]	7.07[-1]	1.22[0]	1.53[0]	1.38[0]	2.39[0]	1.30[0]	2.17[0]	2.19[0]	2.15[0]
$2p^*2p7d$	1.44[-1]	2.85[-1]	4.44[-1]	5.37[-1]	5.34[-1]	6.44[-1]	6.94[-1]	6.76[-1]	6.45[-1]	5.92[-1]
$3s3p^*7s$	8.76[-1]	1.76[0]	2.39[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]
$3s3p^*7p^*$	7.33[-1]	1.65[0]	2.38[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]
$3s3p^*7p$	1.85[0]	3.48[0]	4.53[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]
$3s3p^*7d^*$	2.86[-1]	1.26[0]	1.99[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]
$3s3p^*7d$	2.02[-1]	1.35[0]	2.48[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]
$3s3p^*7f^*$	4.94[-1]	3.06[0]	5.24[0]	5.35[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]
$3s3p^*7f$	6.84[-1]	4.41[0]	7.97[0]	8.40[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]
$3s3p^*7g^*$	6.46[-2]	1.25[0]	4.58[0]	7.30[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]
$3s3p^*7g$	8.06[-2]	1.57[0]	5.80[0]	9.33[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]
$3s3p7s$	1.58[0]	3.30[0]	4.40[0]	4.86[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]
$3s3p7p^*$	1.75[0]	3.47[0]	4.50[0]	4.89[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]
$3s3p7p$	2.96[0]	6.24[0]	8.19[0]	8.73[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]
$3s3p7d^*$	2.40[-1]	1.58[0]	2.88[0]	3.29[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	2.97[0]
$3s3p7d$	5.53[-1]	2.84[0]	4.78[0]	5.33[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	6.01[0]
$3s3p7f^*$	9.15[-1]	6.45[0]	1.19[1]	1.33[1]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	1.57[1]
$3s3p7f$	1.19[0]	8.24[0]	1.47[1]	1.63[1]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	1.86[1]
$3s3p7g^*$	1.04[-1]	2.34[0]	8.17[0]	1.31[1]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	2.51[1]
$3s3p7g$	1.30[-1]	2.91[0]	1.01[1]	1.60[1]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	2.92[1]
$3s3d^*7s$	4.83[-1]	7.63[-1]	8.81[-1]	9.08[-1]	2.20[-1]	8.63[-1]	9.42[-1]	9.70[-1]	9.78[-1]	1.04[0]
$3s3d^*7p^*$	9.66[-2]	1.95[-1]	2.73[-1]	3.13[-1]	3.67[-1]	3.14[-1]	4.17[-1]	4.18[-1]	4.25[-1]	4.59[-1]
$3s3d^*7p$	8.47[-2]	1.47[-1]	2.02[-1]	2.45[-1]	3.22[-1]	3.95[-1]	4.05[-1]	4.91[-1]	5.78[-1]	7.23[-1]
$3s3d^*7d^*$	6.32[-2]	2.65[-1]	5.30[-1]	6.66[-1]	8.00[-1]	7.99[-1]	8.63[-1]	8.85[-1]	9.14[-1]	9.49[-1]
$3s3d^*7d$	3.89[-2]	2.77[-1]	7.42[-1]	1.05[0]	1.42[0]	1.48[0]	1.67[0]	1.66[0]	1.71[0]	1.72[0]
$3s3d^*7f^*$	2.94[-2]	3.12[-1]	7.27[-1]	8.84[-1]	1.07[0]	1.33[0]	1.19[0]	1.23[0]	1.31[0]	1.26[0]
$3s3d^*7f$	4.62[-2]	4.41[-1]	8.50[-1]	8.87[-1]	9.11[-1]	1.29[0]	1.03[0]	1.01[0]	1.10[0]	9.69[-1]
$3s3d7s$	7.16[-1]	1.13[0]	1.30[0]	1.33[0]	1.33[0]	1.07[0]	1.35[0]	1.35[0]	1.30[0]	1.37[0]
$3s3d7p^*$	4.24[-2]	6.38[-2]	8.13[-2]	9.90[-2]	1.34[-1]	3.86[-1]	1.65[-1]	1.83[-1]	2.06[-1]	2.19[-1]
$3s3d7p$	2.13[-1]	4.06[-1]	5.50[-1]	6.25[-1]	7.31[-1]	9.84[-1]	8.23[-1]	8.75[-1]	8.75[-1]	9.49[-1]
$3s3d7d^*$	3.93[-2]	2.83[-1]	7.59[-1]	1.08[0]	1.47[0]	1.20[0]	1.82[0]	3.06[0]	1.95[0]	1.97[0]
$3s3d7d$	1.11[-1]	5.26[-1]	1.15[0]	1.51[0]	1.89[0]	2.40[0]	2.19[0]	2.18[0]	1.69[0]	2.23[0]
$3s3d7f^*$	5.17[-2]	4.98[-1]	9.74[-1]	1.03[0]	1.07[0]	9.80[-1]	9.50[-1]	1.26[0]	7.45[-1]	1.21[0]
$3s3d7f$	6.17[-2]	6.35[-1]	1.40[0]	1.63[0]	1.86[0]	2.21[0]	2.15[0]	2.44[0]	1.48[0]	1.91[0]
$3p^*3d^*7s$	8.49[-1]	1.58[0]	2.78[0]	3.51[0]	3.96[0]	4.25[0]	4.51[0]	0.00[0]	0.00[0]	4.84[0]
$3p^*3d^*7p^*$	8.79[-1]	1.52[0]	2.30[0]	2.83[0]	3.08[0]	3.29[0]	3.48[0]	0.00[0]	3.64[0]	3.80[0]
$3p^*3d^*7p$	1.64[0]	2.94[0]	4.65[0]	5.52[0]	5.60[0]	5.81[0]	5.80[0]	5.28[0]	4.57[0]	3.97[0]
$3p^*3d^*7d^*$	2.35[-1]	6.31[-1]	1.46[0]	2.17[0]	2.66[0]	2.96[0]	3.23[0]	3.24[0]	3.21[0]	3.21[0]
$3p^*3d^*7d$	1.63[-1]	5.55[-1]	1.77[0]	2.81[0]	3.56[0]	3.95[0]	4.34[0]	4.38[0]	4.48[0]	4.79[0]
$3p^*3d^*7f^*$	4.33[-1]	3.81[0]	8.40[0]	9.10[0]	9.65[0]	9.56[0]	9.43[0]	9.66[0]	1.00[1]	1.03[1]
$3p^*3d^*7f$	6.91[-1]	6.27[0]	1.43[1]	1.57[1]	1.77[1]	1.71[1]	1.69[1]	1.74[1]	1.81[1]	1.87[1]
$3p^*3d^*7g^*$	4.21[-2]	1.06[0]	5.67[0]	9.08[0]	1.38[1]	1.47[1]	1.56[1]	1.70[1]	1.76[1]	1.75[1]
$3p^*3d^*7g$	5.46[-2]	1.37[0]	7.38[0]	1.16[1]	1.74[1]	1.96[1]	2.08[1]	2.26[1]	2.35[1]	2.35[1]
$3p^*3d7s$	9.58[-2]	1.59[-1]	2.10[-1]	2.35[-1]	2.64[-1]	2.72[-1]	2.80[-1]	2.85[-1]	2.87[-1]	2.83[-1]
$3p^*3d7p^*$	1.21[0]	1.70[0]	1.81[0]	1.84[0]	1.76[0]	1.77[0]	1.76[0]	1.76[0]	1.78[0]	1.77[0]
$3p^*3d7p$	1.51[-1]	2.69[-1]	3.41[-1]	3.62[-1]	3.78[-1]	3.76[-1]	3.74[-1]	3.65[-1]	3.51[-1]	3.29[-1]
$3p^*3d7d^*$	3.81[-1]	1.92[-1]	5.87[-2]	6.53[-2]	1.33[-1]	1.59[-1]	1.80[-1]	1.81[-1]	1.55[-1]	1.16[-1]
$3p^*3d7d$	4.61[-2]	1.21[-1]	2.05[-1]	2.44[-1]	2.84[-1]	2.96[-1]	3.06[-1]	3.11[-1]	3.14[-1]	3.14[-1]
$3p^*3d7f^*$	2.03[-2]	1.98[-1]	6.20[-1]	9.07[-1]	1.07[0]	1.28[0]	1.37[0]	1.46[0]	1.56[0]	1.61[0]

	$Z = 32$	$Z = 36$	$Z = 42$	$Z = 47$	$Z = 56$	$Z = 60$	$Z = 66$	$Z = 74$	$Z = 83$	$Z = 92$
$3p^*3d7f$	1.71[-2]	1.36[-1]	3.34[-1]	3.96[-1]	4.82[-1]	4.93[-1]	5.07[-1]	5.27[-1]	5.63[-1]	5.90[-1]
$3p3d^*7s$	1.53[-1]	2.70[-1]	4.37[-1]	5.13[-1]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]
$3p3d^*7p^*$	1.24[-1]	2.45[-1]	4.01[-1]	4.73[-1]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]
$3p3d^*7p$	1.01[0]	1.48[0]	1.75[0]	1.82[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]
$3p3d^*7d^*$	5.48[-2]	1.69[-1]	3.60[-1]	4.74[-1]	5.85[-1]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]
$3p3d^*7d$	2.23[-1]	1.30[-1]	2.09[-1]	3.47[-1]	5.78[-1]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]
$3p3d^*7f^*$	5.43[-2]	4.58[-1]	9.52[-1]	1.04[0]	1.03[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]
$3p3d^*7f$	9.35[-2]	8.28[-1]	1.87[0]	2.18[0]	2.31[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]
$3p3d7s$	8.52[-1]	1.58[0]	2.83[0]	3.44[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]
$3p3d7p^*$	8.82[-1]	1.65[0]	2.75[0]	3.26[0]	3.96[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]
$3p3d7p$	2.10[0]	3.55[0]	5.27[0]	5.99[0]	6.71[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]
$3p3d7d^*$	9.75[-2]	3.27[-1]	1.23[0]	1.94[0]	2.67[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]
$3p3d7d$	3.87[-1]	9.21[-1]	2.39[0]	3.46[0]	4.55[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]	0.00[0]
$3p3d7f^*$	5.16[-1]	4.56[0]	9.82[0]	1.09[1]	1.10[1]	1.06[1]	0.00[0]	0.00[0]	0.00[0]	0.00[0]
$3p3d7f$	6.10[-1]	5.28[0]	1.11[1]	1.23[1]	1.22[1]	1.18[1]	0.00[0]	0.00[0]	0.00[0]	0.00[0]
$3p3d7g^*$	5.00[-2]	1.16[0]	5.81[0]	8.93[0]	1.39[1]	1.47[1]	0.00[0]	0.00[0]	0.00[0]	0.00[0]
$3p3d7g$	6.10[-2]	1.41[0]	7.03[0]	1.06[1]	1.66[1]	1.74[1]	0.00[0]	0.00[0]	0.00[0]	0.00[0]