Relativistic many-body calculations of electric-dipole lifetimes, transition rates, and oscillator strengths for $n = 3$ states in Al-like ions

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October 12, 2001

Abstract

Transition rates, oscillator strengths, and line strengths are calculated for electric-dipole (E1) transitions between even-parity $3s3p^2$, $3s^23d$, $3p^23d$, $3d^23s$ and $3d^3$ states and odd-parity $3s^23p$, $3p^3$, $3s3p3d$, and $3d^23p$ states in Al-like ions with the nuclear charges ranging from $Z = 15$ to 100. Relativistic many-body perturbation theory (MBPT), including the Breit interaction, is used to evaluate retarded E1 matrix elements in length and velocity forms. The calculations start from a $1s^22s^22p^6$ Dirac-Fock potential. First-order MBPT is used to obtain intermediate coupling coefficients and second-order MBPT is used to calculate transition matrix elements. Contributions from negative-energy states are included in the second-order E1 matrix elements to ensure gauge-independence of transition amplitudes. Transition energies used in the calculation of oscillator strengths and transition rates are from second-order MBPT. Transition rates, line strengths, and oscillator strengths are compared with critically evaluated experimental values and with results from other recent calculations. We present data for selected transitions between 10 of the possible 73 even-parity $3s3p^2$, $3s^23d$ states and 29 of the possible 75 odd-parity $3s^23p$, $3p^3$, and $3s3p3d$ states in Al-like ions. Trends of the transition rates as function of Z are illustrated graphically for 220 of the 3220 possible transitions. Lifetimes of the 10 even-parity lower levels and the 27 odd-parity upper levels are given for $Z = 15$–100.

Contents

INTRODUCTION

Many theoretical studies of transitions in Al-like ions have been made during the past 30-40 years, especially for electric-dipole (E1) transitions within the $n = 3$ complex of states. Transition rates and oscillator strengths for Al-like ions have been calculated using multi-configuration Dirac-Fock (MCDF) [1], multi-configuration Hartree-Fock (MCHF) [2, 3, 4, 5, 6], R-matrix [7], model potential [8, 9, 10], and configuration interaction (CI) [11, 12, 13] methods. A correspondingly large number of experimental studies of lifetimes of $n = 3$ states has been made using beam foil techniques. Most of these investigations concerned low-Z ions: Si^{1+}[14, 15], P^{2+} and S^{3+},[15], Cl^{4+} and Ar^{5+}[14], K^{6+} [15], Ti^{9+}[14, 16, 17, 18, 19], Fe^{13+} and Ni^{14+}[14, 15, 16, 18, 19], and Cu^{15+} [16]. Lifetime measurements for the high-Z ions, Br^{22+} [20], Xe^{41+} [21] and Au^{66+} [21, 22] have also been reported. Critical data compilations based on available theoretical and experimental sources are given in [23, 24, 25, 26, 27, 28, 29]. We refer to these compilations as recommended National Institute of Standards and Technology (NIST) data later in the following sections.

In the present paper, relativistic many-body perturbation theory (MBPT) is used to determine matrix elements, oscillator strengths, and transition rates for allowed and forbidden electric-dipole transitions within the $n = 3$ complex of states in Al-like ions with nuclear charges ranging from $Z = 15$ to 100. Retarded E1 matrix elements are evaluated in both length and velocity forms. These calculations start from a $1s^2 2s^2 2p^6$ Dirac-Fock potential. First-order perturbation theory is used to obtain intermediate coupling coefficients and second-order MBPT is used to determine transition matrix elements. Contributions from negative-energy states are included in the second-order E1 matrix elements to ensure agreement between length-form and velocity-form amplitudes. The transition energies used in the calculation of oscillator strengths and transition rates are obtained from second-order MBPT.

METHOD

The evaluation of the first- and second-order reduced dipole matrix elements $Z^{(1)}$ and $Z^{(2)}$ for Al-like ions follows the pattern of the corresponding calculation for boronlike ions given in Ref. [30]. We recouple second-order one- and two-particle matrix elements for Mg-like ions calculated in [31] to obtain the contributions to transition matrix elements for Al-like ions from first- and second-order perturbation theory. The reader is referred to [31] for a discussion of the how the basic one- and two-particle matrix elements were evaluated. It should be noted that the uncoupled one- and two-particle matrix elements calculated in [31] are the only data needed in the present second-order MBPT calculation for Al-like ions. This is in contrast to calculations of the second-order energy $E^{(2)}$ for systems with three valence electrons where additional three-particle diagrams must be evaluated [32, 33].

The model space for $n = 3$ states of aluminiumlike ions includes 75 odd-parity states consisting of 13 $J=1/2$ states, 22 $J=3/2$ states, 19 $J=5/2$ states, 13 $J=7/2$ states, 6 $J=9/2$ states, and two $J=11/2$ states. Additionally, there are 73 even-parity states consisting of 13 $J=1/2$ states, 21 $J=3/2$ states, 20 $J=5/2$ states, 11 $J=7/2$ states, 7 $J=9/2$ states, and one $J=11/2$ states.

In this paper, we present results for the low-lying states. This set of states includes 40 levels: $3s_{1/2}3s_{1/2}[0]3p_j(J)$, $3s_{1/2}3p_j[J_{12}]3d_{j'}(J)$, $3s_{1/2}3s_{1/2}[0]3d_j(J)$, and $3s_{1/2}3p_j[J_{12}]3p_{j'}(J)$. The second set of states includes the other 108 levels: $3d_j3d_{j'}[J_{12}]3p_{j''}(J)$, $3p_j3p_{j'}[J_{12}]3d_{j''}(J)$, and $3d_j3d_{j'}[J_{12}]3d_{j''}(J)$. The first group is studied experimentally; however, there are no experimental data for the second group. Below, we discuss the first group of levels only. For these 40 levels, we use not only jj designations but also LS designations. When starting calculations from rela-

tivistic Dirac-Fock wavefunctions, it is natural to use jj designations for uncoupled energy matrix elements; however, neither jj nor LS coupling describes the *physical* states properly, except for the single-configuration state $3d_{5/2}3d_{5/2}(4)3d_{3/2} \equiv 3d^3\ ^3G_{11/2}$. Both designations are given in Table A for 40 low-lying levels of Al-like ions.

In Table B, we present values of line strengths calculated in length L and velocity V forms for the 42 transitions between odd-parity stares with $J=1/2$ and even-parity states with $J=1/2$ and $3/2$ for the special case of Al-like iron, $Z = 26$. Although we use an intermediate-coupling scheme, it is nevertheless convenient to label the physical states using the LS scheme for low-Z ions and the jj scheme for high-Z ions. Both designations are given for transitions considered in Table B. The last two columns in Table B show L and V values of line strengths calculated in first order only. The $L-V$ differences in first-order line strengths range from about 10% for LS-allowed transitions to about 50% for LS-forbidden transitions. Including second-order contribution (columns headed MBPT in Table B) decreases the $L-V$ difference to 0.2% for the LS-allowed transitions to about 1% for forbidden transitions. This small residual $L-V$ difference arises because we start our MBPT calculations using the non-local Dirac-Fock (DF) potential. If we were to replace the DF potential by a local potential, the differences would disappear completely. It should be notes that we include negative energy state (NES) contributions to sums over intermediate states (see Ref. [34] for details). Neglecting the NES contributions leads to small changes in the L-form matrix elements but substantial changes in some of the V-form matrix elements with a consequent loss of gauge $(L-V)$ independence. In Fig. 1, we illustrate the Z-dependence of the differences between line strengths calculated in length S_L and velocity S_V forms. We plot the ratio $(S_L-S_V)/S_L$ in percent. One can see that the ratio $(S_L-S_V)/S_L$ is about 0.2-0.7% for the transitions shown on Fig. 1.

In view of the gauge independence discussed above, our results are presented in L form only. Uncertainties in the recommended values given in [35] were estimated to be less than 10% based on comparisons with experimental results from lifetime and emission measurements. The agreement between theoretical L-form and V-form results were also used in [35] as an indicator of accuracy. Since the present transition data are obtained using a single method for all Z, and improve in accuracy with increasing Z, we expect that our data for high Z to be very reliable.

COMPARISON AND DISCUSSION

In Table C, we compare our results for wavelengths λ, transition probabilities A, oscillator strengths f, and line strengths S for selected transitions for Al-like Fe (Z=26) with recommended NIST data presented in Ref. [28]. We also compare our results with theoretical results obtained by Huang [1] who used the multiconfiguration Dirac-Fock method (MCDF) to calculate energies for 40 low-lying levels and transition probabilities, oscillator strengths, and line strengths for the 87 transitions. The 17 E1 allowed transitions:

$[3s^23p\ ^2P_J–3p^23s\ ^4P_{J'}^2, S_{1/2},\ ^2P_{J'},\ ^2D_{J'}]$
$[3s^23p\ ^2P_J - 3s^23d\ ^2D_{J'}]$

and the 70 E1 allowed transitions:

$[3p^23s\ ^4P_J,\ ^2P_{3/2},\ ^2D_J– 3s3p(^{1,3}P)3d\ ^2D_{J'},\ ^2P_{3/2},\ ^2F_{J'},\ ^4P_{J'},\ ^4D_{J'},\ ^4F_{J'}]$
$[3p^23s\ ^4P_J,\ ^2P_{3/2},\ ^2D_J–3p^3\ ^4S_{3/2},\ ^2P_{3/2},\ ^2D_{J'}]$
$[3s^23d\ ^2D_J–3s3p(^{1,3}P)3d\ ^2D_{J'},\ ^2P_{3/2},\ ^2F_{J'},\ ^4P_{J'},\ ^4D_{J'},\ ^4F_{J'}]$
$[3s^23d\ ^2D_J– 3p^3\ ^4S_{3/2},\ ^2P_{3/2},\ ^2D_J]$

with J=3/2, 5/2 and J'=3/2–7/2 were evaluated in Ref. [1]. We see from Table C that our MBPT data for wavelengths agree better with the recommended values given in [28] than with data from Ref. [1]. The difference between our values of the transition probabilities, oscillator

strengths, and line strengths and values from Ref. [1] is about 5-10% (see Table C). The differences between our MBPT results and the MCDF results from Ref. [1] are explained by second-order contributions to the dipole matrix elements. This conclusion follows from comparison of data given in columns headed 'MBPT' and 'First order'. Our first-order calculation is essentially equivalent to the MCDF approximation since we used Dirac-Fock functions to calculate the first-order matrix elements. Finally, we expect our values to be more accurate than the recommended data from [28] for the transitions presented in Table C since Coulomb and Breit correlation corrections as well as retardation are included in our calculations.

In Tables D and E, wavelengths and electric dipole transition rates are presented for transitions in Al-like Ti and Fe. We limit the table to those transitions given in Refs. [18] and [19]. The doublet - doublet transitions ($3p^23s\ ^2S$, ^2P, ^2D + $3s^23d\ ^2D$ – $3p^3\ ^2P$, ^2D + $3s3p3d\ ^2P$, ^2D, ^2F) are listed in Table D and transitions from $3s3p3d\ ^4F_J$ levels into $3p^23s\ ^4P_J$ and $3s^23d\ ^2D_J$ levels are listed in Tables E. We see from Tables D and E that the agreement between our MBPT wavelengths and the experimental values is about 0.04-0.4% for Ti^{9+} and decreases with the increasing Z to 0.01-0.03% for Ni^{15+}. We found disagreement between our MBPT results and experimental wavelengths from Ref. [18] for the $3p^2(^3P)3s\ ^2P_{3/2}$ – $3s3p(^1P)3d\ ^2P_{3/2}$ transition in Ti^{9+}, Fe^{13+}, and Ni^{15+} and experimental wavelengths from Ref. [19] for $3p^2(^3P)3s\ ^2D_{3/2,5/2}$ – $3s3p(^3P)3d\ ^4F_{3/2}$ in Ti^{9+}. This disagreement could be caused by the difference in identification of levels. To avoid future level identification problems, we include in Tables D and E not only wavelengths but also transition rates.

A subset of our lifetime calculations for intermediate Z ions is presented in Table F to compare with available experimental data from Refs. [18] and [19] for Al-like Ti, Fe, and Ni. We see from this table that our MBPT lifetimes are in reasonable agreement with experimental values. Lifetimes for Al-like ions from P^{2+} through K^{4+} are presented in Table G. The experimental measurements are taken from Ref. [10]. In that paper, the Multiconfiguration Optimized Potential Model (MCOMP) method was used to determine the lifetimes of 14 low-lying excited terms along the sequence. There was no discussion of relativistic effects in Ref. [10] and lifetimes were presented without term splitting. We average our MBPT lifetimes obtained for each level to compare with the lifetimes of 11 low-lying excited terms. (We omitted the three terms from [10] with n=4). Our theoretical lifetimes agree with measured lifetimes to within one or two times the experimental uncertainties for most cases.

Results of the present calculations for lifetimes are obtained by taking into account E1 transition rates from each upper level to all possible lower levels. The contributions of different channels to the lifetimes of the $3p^3\ ^4S_{3/2}$ and $3p^3\ ^2P_{1/2}$ levels are shown in Figs. 2 and 3, respectively. The curves represent the ratios of individual transition probabilities A to the sum of all transition probabilities $\sum A$ for the level considered. As we see from Fig. 2, the largest contribution for the lifetime of the $3p^3\ ^4S_{3/2}$ level comes from the $A(3p^23s\ ^4P_{5/2} - 3p^3\ ^4S_{3/2})$ channel for low-Z ions and $A(3p^23s\ ^4P_{1/2} - 3p^3\ ^4S_{3/2})$ channel for high-Z ions. The largest contribution for the lifetime of the $3p^3\ ^2P_{1/2}$ level comes from the $A(3p^23s\ ^2D_{3/2} - 3p^3\ ^2P_{1/2})$ channel for low-Z ions and from the $A(3p^23s\ ^4P_{1/2} - 3p^3\ ^2P_{1/2})$ channel for high-Z ions.

Our lifetimes are compared with experimental measurements from Refs. [20] and [22] for high-Z ions, Br^{22+} and Au^{66+}, in Table H. Our theoretical lifetimes agree with measured lifetimes to within one or two times the experimental uncertainties. We also compare wavelength data in Table H. We find excellent agreement between our MBPT theoretical results and measurements by Träbert et al. [20] for Br^{22+}. We include an additional column in Table H with transition rate data. We see from these data that the lifetime values of $3p^23s\ ^4P_{1/2}$ and $3p^23s\ ^4P_{3/2}$ levels are obtained by taking into account contributions from two transitions for each level, with the dominant transition contributing 90% of the total. The contribution the $3s^23p\ ^2P_{3/2^-}\ 3p^23s\ ^4P_{1/2}$ and $3s^23p\ ^2P_{1/2^-}$

$3p^23s\ ^4P_{3/2}$ transitions to the lifetimes of $3p^23s\ ^4P_{1/2}$ and $3p^23s\ ^4P_{3/2}$ levels, respectively, is about 10%. There is no similar contribution for the lifetime of $3p^23s\ ^4P_{1/2}$ level in Au^{66+}, since this level lies below the $3s^23p\ ^2P_{3/2}$ level. This inversion of $3p^23s\ ^4P_{1/2}$ and $3s^23p\ ^2P_{3/2}$ levels occurs for ions with $Z \geq 57$.

We remind the reader that (for low-Z ions) among the 40 levels considered in this paper, the lowest levels are the two odd-parity levels $3s^23p\ ^2P_J$; the 10 even-parity levels lie between the ground-state doublet, and the remaining 28 odd-parity levels. Level inversions occur at the interface between the upper even- and odd-parity groups at high Z where the four even-parity levels $3p^23s\ ^2P_{1/2}$, $3p^23s\ ^2D_{5/2}$ and $3s^23d\ ^2D_{3/2,5/2}$ cross various levels of the upper odd-parity group as Z increases. We list below the values of Z for which each of these four even-parity levels cross a given level of the odd-parity group:

	1 odd	2 odd	3 odd	4 odd	5 odd	6 odd	7 odd	8 odd	9 odd
1 even	58	58	60	62	68	67	63	65	66
2 even	63	63	64	66	72	71	67	69	70
3 even	59	59	60	63	68	68	63	65	67
4 even	88	88	90	95			97		

Here, we use the following labels for the levels:

1 even=$3s^2(^1S)3d\ ^2D_{3/2}$ 2 even=$3s^2(^1S)3d\ ^2D_{3/2}$

3 even=$3p^2(^3P)3s\ ^2P_{1/2}$ 4 even=$3p^2(^1D)3s\ ^2D_{5/2}$

1 odd=$3p^2(^3P)3p\ ^4S_{3/2}$ 2 odd=$3p^2(^3P)3p\ ^2D_{3/2}$ 3 odd=$3p^2(^3P)3p\ ^2D_{5/2}$

4 odd=$3p^2(^3P)3p\ ^2P_{1/2}$ 5 odd=$3p^2(^3P)3p\ ^2P_{3/2}$ 6 odd=$3s3p(^3P)3d\ ^4P_{5/2}$

7 odd=$3s3p(^3P)3d\ ^4F_{3/2}$ 8 odd=$3s3p(^3P)3d\ ^4F_{5/2}$ 9 odd=$3s3p(^3P)3d\ ^4F_{7/2}$

We, of course, take into account these changes in level position when we sum transitions rates to calculate the lifetimes of levels.

Let us consider theoretical rates A_J for $3s^23p\ ^2P_J$–$3s3p^2\ ^2S_{1/2}$ and $3s^23p\ ^2P_J$–$3s3p^2\ ^2P_{1/2}$ transitions for $J=1/2$ and $3/2$. The branching ratio $A_{3/2}/A_{1/2}$ for the former transition is equal to two in the LS-coupling limit, as is the ratio $A_{1/2}/A_{3/2}$ for the later one. Deviation of either ratio from 2 indicates the presence of relativistic (spin-orbit) effects. The model space for even-parity states with $J=1/2$ includes three states without 3d electrons: $3p_{1/2}3p_{1/2}[0]3s_{1/2}$, $3p_{1/2}3p_{3/2}[1]3s_{1/2}$, and $3p_{3/2}3p_{3/2}[0]3s_{1/2}$. The $3p_{1/2}3p_{3/2}[1]3s_{1/2}$ state gives the largest contribution to the eigenvector of $3s3p^2\ ^2S_{1/2}$ level for small Z values up to $Z=23$ and the $3p_{3/2}3p_{3/2}[0]3s_{1/2}$ state gives the largest contribution for ions with $Z >35$. The situation is reversed for the $3s3p^2\ ^2P_{1/2}$ level. The $3p_{1/2}3p_{1/2}[0]3s_{1/2}$ state contributes about 20-30% to the eigenvector of this level in the range of $15 \leq Z \leq 45$. The change of these three contributions of with Z leads to rather complicated Z-dependence of transition rates for the $3s3p^2\ ^2S_{1/2}$ and $3s3p^2\ ^2P_{1/2}$ levels.

The branching ratio $A_{3/2}/A_{1/2}$ including $3s^23p\ ^2P_J$–$3s3p^2\ ^2S_{1/2}$ and $3s^23p\ ^2P_J$–$3s3p^2\ ^2P_{1/2}$ transitions for $J=1/2$ and $3/2$ are presented in Table I for Al-like ions from P^{2+} through Ni^{15+}. We limit the table to those ions given in Ref. [15]. We find that for some ions we obtain excellent agreement between our calculations and experimental data (Cl^{4+}) but for some ions disagreement is about 30% (P^{2+} and Fe^{13+}). The trend of the experiments follows the theoretical calculations fairly well. The theoretical and experimental values for one branching ratio almost coincide but for the other differ by 20-40% (S^{3+}, Ar^{5+}, and Ti^{9+}). The fact that the measurements of intensity ratios presented in Ref. [15] were a compilation of the laboratory and solar observations may explain such irregularities in the comparison.

RESULTS

In Table I, we present our results for wavelengths λ, transition probabilities A, oscillator strengths f, and line strengths S for selected transitions in Al-like from $Z=15$ up to $Z=100$. These transitions are selected from the 3220 possible transitions by choosing the only the 220 transitions between low-lying excited states. We list only transitions with large values of rates A. We change the minimum value of A with Z to maintain an equal number of transitions for each of ion. The character of the transitions change with Z from LS allowed transitions for low-Z ions to the doublet-quartet transitions for high-Z ions.

The general trends of the Z-dependence of transition rates are presented for the 220 transitions in Graphs I-XXIII. The $3s^23p\ ^2P_J$–$3p^23s\ ^2D_{J'}$, $^2P_{J'}$, $^2S_{1/2}$, $^4P_{J'}$ and $3s^23p\ ^2P_J$–$3s^23d\ ^2D_{J'}$ transitions are presented in Graph I. The remaining figures are organized from the transitions between the 27 $3p^3$, $3s3p(^{1,3}P)3d$ upper levels and the 10 $3s3p^2$, $3s^23d$ lower levels. We consider all transitions from all upper levels to a particular lower level. Among the 27 upper levels, there are the 5, 10, 8, and 4 levels with $J=1/2$, $3/2$, $5/2$, and $7/2$, respectively. There are no transitions from $3s3p(^3P)3d\ ^4F_{9/2}$ level. The set with $J=1/2$ includes $3p^3\ ^2P$, $3s3p(^3P)3d\ ^2P$, $3s3p(^1P)3d\ ^2P$, $3s3p(^3P)3d\ ^4P$, and $3s3p(^3P)3d\ ^4D$ levels; the set with $J=3/2$ includes the five levels from the set with $J=1/2$ and additionally $3p^3\ ^4S$, $3p^3\ ^2D$, $3s3p(^3P)3d\ ^2D$, $3s3p(^1P)3d\ ^2D$, and $3s3p(^3P)3d\ ^4F$ levels; the set with $J=5/2$ includes the three ^2D levels from the set with $J=3/2$, the three quartet levels with $L=1$–3 and $3s3p(^3P)3d\ ^2F$, $3s3p(^1P)3d\ ^2F$ levels; the set with $J=7/2$ includes the two quartet levels with $L=2$, 3 and two ^2F levels from set with $J=5/2$. In Graphs II–VI, we present the Z-dependence of transition rates for the 60 transitions between the 27 upper levels and $3p^23s\ ^4P_J$ levels. The 24 quartet-quartet transitions are shown in Graphs II and III; the 36 intercombination transitions are shown in Graphs IV-VI. The 45 $3p^23s\ ^2D_{J'}$–$3p^3\ ^{2S+1}L_J$, $3s3p(^{1,3}P)3d\ ^{2S+1}L_J$, 15 $3p^23s\ ^2S_{1/2}$–$3p^3\ ^{2S+1}L_J$, $3s3p(^{1,3}P)3d\ ^{2S+1}L_J$, 38 $3p^23s\ ^2P_{J'}$–$3p^3\ ^{2S+1}L_J$, $3s3p(^{1,3}P)3d\ ^{2S+1}L_J$, and 45 $3s^23d\ ^2D_{J'}$–$3p^3\ ^{2S+1}L_J$, $3s3p(^{1,3}P)3d\ ^{2S+1}L_J$, transitions are presented in Graphs VII - X, Graphs XII - XII, Graphs XIII - XVI and Graphs XVII - XXIII, respectively.

We see from the graphs that transitions with smooth Z dependence are rarer than transitions with sharp features typically associated with level crossings. Smooth Z-dependence occurs for all transition types: doublet-doublet, quartet-quartet, and doublet-quartet, and include transitions with both small J and large J. One general conclusion that can be derived from thse graphs is that the smooth Z-dependence occurs more frequently for transitions to the two ground state levels (9 among 17) than for transitions between excited states (25 among 203).

In Table II, we present our lifetime calculations for the 37 excited levels in Al-like ions with Z from 15 to 100. The difference in lifetimes of the individual multiplet levels is about 10% up to $Z=20$.

The general trends of the Z-dependence of lifetimes for the $3p^23s\ ^2D_J$, $^{2,4}P_J$, $3s^23d\ ^2D_J$, $3p^3\ ^4S_{3/2}$, ^2P_J, ^2D_J, and $3s3p(^{1,3}P)3d\ ^{2,4}P_J$, $^{2,4}D_J$, $^{2,4}F_J$, levels in Al-like ions are presented in Graphs XXIV-XXVII. We did not include lifetimes for $3s^23p\ ^2P_{3/2}$ since we did not consider magnetic-dipole transitions. There is a sudden decrease in the lifetime of the $3s^23p\ ^2P_{3/2}$ level when it crosses the $3p^23s\ ^4P_{1/2}$ level. There is no E1 transition from the odd-parity $3s3p(^3P)3d\ ^3F_{9/2}$ level into any even-parity levels. It can be seen from Graphs XXIV–XXVII that the Z-dependence of lifetimes looks smoother than the Z-dependence of the transition rates presented in Graphs I - XXIII. The sharp maximum in the curve of the $3p^23s\ ^2D_{5/2}$ lifetime is due to the strong mixing the $3p_{3/2}3p_{3/2}[2]3s_{1/2}$ and $3s_{1/2}3s_{1/2}[0]3d_{5/2}$ states with $J=5/2$. The largest contribution of these states from the eigenvectors of $3p^23s\ ^2D_{5/2}$ and $3s^23d\ ^2D_{5/2}$ levels changes at $Z=50$. The $3s^23p\ ^2P_{3/2}$–$3p^23s\ ^2D_{5/2}$ transition rate is smaller than the $3s^23p\ ^2P_{3/2}$–$3s^23d\ ^2D_{5/2}$ transition rate by a factor of 100. This is why the strong mixing of $3p_{3/2}3p_{3/2}[2]3s_{1/2}$ and $3s_{1/2}3s_{1/2}[0]3d_{5/2}$

states affects only the first transition with small transition rate. The $3s^23p$ $^2P_{3/2}$–$3p^23s$ $^2D_{5/2}$ transition rate becomes very small at Z=50 which leads to a sharp increase of the lifetime for the $3p^23s$ $^2D_{5/2}$ level in the region of Z=50. We can see the sharp feature in the curves describing the Z-dependence of lifetimes for $3s^23d$ $^2D_{3/2}$ and $3s^23d$ $^2D_{5/2}$ levels in the region of Z=74-75 and Z=83-84, respectively. This sharp change of transition rates can also be explained by strong mixing of different states. We already mentioned above that the largest contribution to the eigenvector of the $3s^23d$ $^2D_{5/2}$ level comes from the $3s_{1/2}3s_{1/2}[0]3d_{5/2}$ state in the interval of Z=15-50 and from the $3p_{3/2}3p_{3/2}[2]3s_{1/2}$ state for Z >50. The contribution of the third state, $3p_{1/2}3p_{1/2}[0]3d_{5/2}$, becomes the largest one for the eigenvector of the $3s^23d$ $^2D_{5/2}$ level for Z >84. The inclusion of the $3p_{1/2}3p_{1/2}[0]3d_{5/2}$ state brings about the sharp change in the curve for the lifetime of the $3s^23d$ $^2D_{5/2}$ level shown in Graph XXIV.

CONCLUSION

We have presented a systematic second-order relativistic MBPT study of reduced matrix elements, oscillator strengths, and transition rates for $3s$-$3p$ and $3p$-$3d$ electric-dipole transitions in aluminiumlike ions with the nuclear charges Z ranging from 15 to 100. Our retarded $E1$ matrix elements included correlation corrections from Coulomb and Breit interactions; contributions from negative energy states were also included to insure gauge independence. Both length and velocity forms of the matrix elements were evaluated and small differences, caused by the non locality of the starting HF potential, were found between the two forms. Second-order MBPT transition energies were used in our evaluation of oscillator strengths and transition rates. These calculations were compared with other calculations and with available experimental data. For $Z \geq 20$, we believe that the present theoretical data is more accurate than other theoretical or experimental data for transitions between $n = 3$ states in Al-like ions. We hope that these results will be useful in analyzing older experiments and planning new ones. Additionally, these calculations provide basic theoretical input amplitudes for calculations of reduced matrix elements, oscillator strengths and transition rates in four-valence atomic systems.

Acknowledgments

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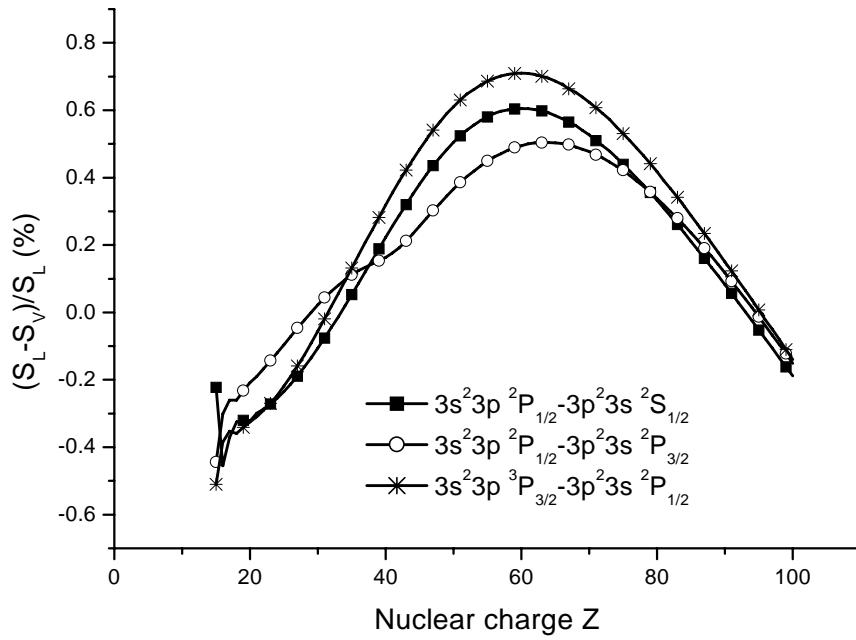
FIG. 1. Z-dependence of the ratio $(S_L - S_V)/S_L$ in %, where line strengths S are calculated in length S_L and velocity S_V forms.
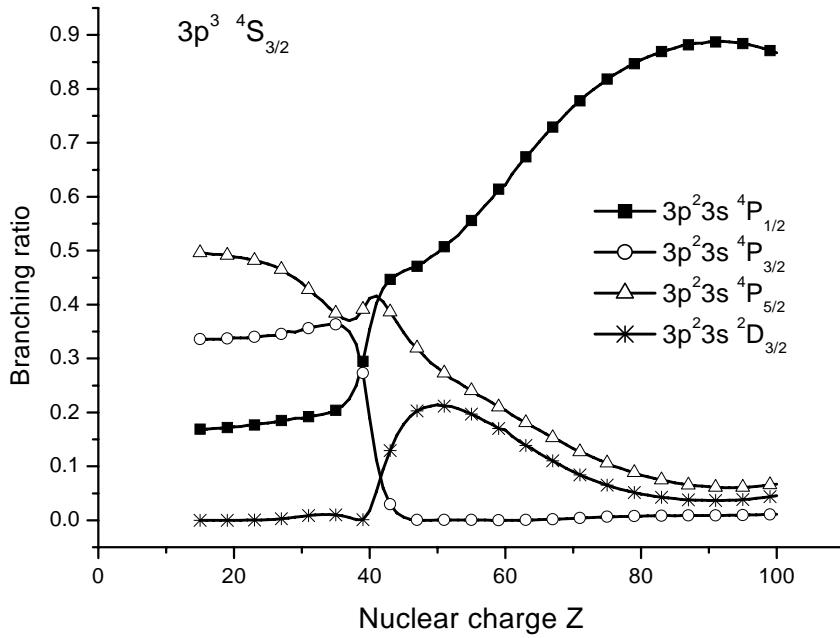
FIG. 2. Channel contribution to the $3p^3$ $^4S_{3/2}$ lifetime as functions of Z
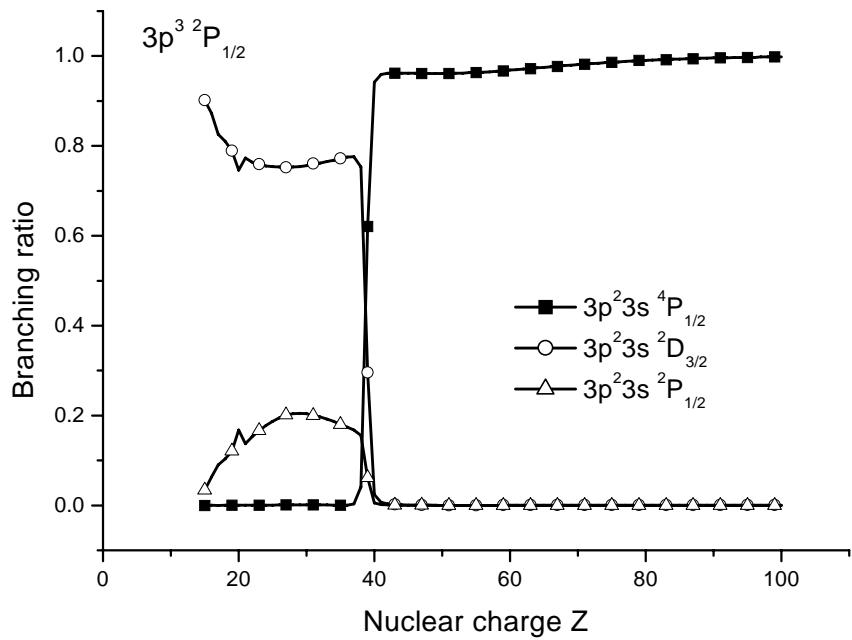
FIG. 3. Channel contribution to the $3p^3\ ^2P_{1/2}$ lifetime as functions of Z

Table A: Comparison of the jj- and LS-coupling schemes for three-particle states in the $n=3$ complex.

jj scheme	LS scheme	J	jj scheme	LS scheme	J
$3p_{1/2}3p_{1/2}[0]3s_{1/2}$	$3p^2[^3P]3s\ ^4P$	1/2	$3s_{1/2}3s_{1/2}[0]3p_{1/2}$	$3s^2[^1S]3p\ ^2P$	1/2
$3p_{1/2}3p_{3/2}[1]3s_{1/2}$	$3p^2[^1S]3s\ ^2P$	1/2	$3p_{3/2}3p_{3/2}[0]3p_{1/2}$	$3p^2[^3P]3p\ ^2P$	1/2
$3p_{3/2}3p_{3/2}[0]3s_{1/2}$	$3p^2[^3P]3s\ ^2P$	1/2	$3s_{1/2}3p_{1/2}[1]3d_{3/2}$	$3s3p[^3P]3d\ ^4P$	1/2
			$3s_{1/2}3p_{3/2}[1]3d_{3/2}$	$3s3p[^3P]3d\ ^4D$	1/2
$3p_{1/2}3p_{3/2}[1]3s_{1/2}$	$3p^2[^3P]3s\ ^4P$	3/2	$3s_{1/2}3p_{3/2}[2]3d_{3/2}$	$3s3p[^3P]3d\ ^2P$	1/2
$3p_{1/2}3p_{3/2}[2]3s_{1/2}$	$3p^2[^1D]3s\ ^2D$	3/2	$3s_{1/2}3p_{3/2}[2]3d_{5/2}$	$3s3p[^1P]3d\ ^2P$	1/2
$3p_{3/2}3p_{3/2}[2]3s_{1/2}$	$3p^2[^3P]3s\ ^2P$	3/2			
$3s_{1/2}3s_{1/2}[0]3d_{3/2}$	$3s^2[^1S]3d\ ^2D$	3/2	$3p_{3/2}3p_{3/2}[2]3p_{1/2}$	$3p^2[^3P]3p\ ^2D$	5/2
			$3s_{1/2}3p_{1/2}[0]3d_{5/2}$	$3s3p[^3P]3d\ ^4F$	5/2
$3p_{1/2}3p_{3/2}[2]3s_{1/2}$	$3p^2[^3P]3s\ ^4P$	5/2	$3s_{1/2}3p_{1/2}[1]3d_{3/2}$	$3s3p[^3P]3d\ ^4P$	5/2
$3p_{3/2}3p_{3/2}[2]3s_{1/2}$	$3p^2[^1D]3s\ ^2D$	5/2	$3s_{1/2}3p_{1/2}[1]3d_{5/2}$	$3s3p[^3P]3d\ ^4D$	5/2
$3s_{1/2}3s_{1/2}[0]3d_{5/2}$	$3s^2[^1S]3d\ ^2D$	5/2	$3s_{1/2}3p_{3/2}[1]3d_{3/2}$	$3s3p[^3P]3d\ ^2D$	5/2
			$3s_{1/2}3p_{3/2}[1]3d_{5/2}$	$3s3p[^3P]3d\ ^2F$	5/2
$3s_{1/2}3s_{1/2}[0]3p_{3/2}$	$3s^2[^1S]3p\ ^2P$	3/2	$3s_{1/2}3p_{3/2}[2]3d_{3/2}$	$3s3p[^1P]3d\ ^2F$	5/2
$3p_{1/2}3p_{1/2}[0]3p_{3/2}$	$3p^2[^3P]3p\ ^4S$	3/2	$3s_{1/2}3p_{3/2}[2]3d_{5/2}$	$3s3p[^1P]3d\ ^2D$	5/2
$3p_{3/2}3p_{3/2}[2]3p_{1/2}$	$3p^2[^3P]3p\ ^2D$	3/2			
$3p_{3/2}3p_{3/2}[0]3p_{3/2}$	$3s3p[^3P]3d\ ^4F$	3/2	$3s_{1/2}3p_{1/2}[1]3d_{5/2}$	$3s3p[^3P]3d\ ^4F$	7/2
$3s_{1/2}3p_{1/2}[0]3d_{3/2}$	$3p^2[^3P]3p\ ^2P$	3/2	$3s_{1/2}3p_{3/2}[1]3d_{5/2}$	$3s3p[^3P]3d\ ^4D$	7/2
$3s_{1/2}3p_{1/2}[1]3d_{3/2}$	$3s3p[^3P]3d\ ^4P$	3/2	$3s_{1/2}3p_{3/2}[2]3d_{3/2}$	$3s3p[^3P]3d\ ^2F$	7/2
$3s_{1/2}3p_{1/2}[1]3d_{5/2}$	$3s3p[^3P]3d\ ^4D$	3/2	$3s_{1/2}3p_{3/2}[2]3d_{5/2}$	$3s3p[^1P]3d\ ^2F$	7/2
$3s_{1/2}3p_{3/2}[1]3d_{3/2}$	$3s3p[^3P]3d\ ^2D$	3/2			
$3s_{1/2}3p_{3/2}[1]3d_{5/2}$	$3s3p[^3P]3d\ ^2P$	3/2	$3s_{1/2}3p_{3/2}[2]3d_{5/2}$	$3s3p[^3P]3d\ ^4F$	9/2
$3s_{1/2}3p_{3/2}[2]3d_{3/2}$	$3s3p[^1P]3d\ ^2P$	3/2			
$3s_{1/2}3p_{3/2}[2]3d_{5/2}$	$3s3p[^1P]3d\ ^2D$	3/2			

Table B: Line strengths in length L and velocity V forms in Fe^{13+} (a.u.).

LS designations		MBPT		First order	
Low level	Upper level	L	V	L	V
$3s^2(^1S)3p\ ^2P_{1/2}$	$3p^2(^3P)3s\ ^4P_{1/2}$	1.86[-3]	1.86[-3]	1.77[-3]	1.91[-3]
$3s^2(^1S)3p\ ^2P_{1/2}$	$3p^2(^1S)3s\ ^2S_{1/2}$	3.43[-1]	3.43[-1]	3.31[-1]	3.40[-1]
$3s^2(^1S)3p\ ^2P_{1/2}$	$3p^2(^3P)3s\ ^2P_{1/2}$	2.27[-1]	2.28[-1]	2.24[-1]	2.32[-1]
$3p^2(^3P)3s\ ^4P_{1/2}$	$3p^2(^3P)3p\ ^2P_{1/2}$	1.94[-4]	1.94[-4]	2.05[-4]	1.89[-4]
$3p^2(^1S)3s\ ^2S_{1/2}$	$3p^2(^3P)3p\ ^2P_{1/2}$	5.32[-3]	5.32[-3]	6.00[-3]	6.31[-3]
$3p^2(^3P)3s\ ^2P_{1/2}$	$3p^2(^3P)3p\ ^2P_{1/2}$	1.90[-1]	1.90[-1]	1.89[-1]	1.89[-1]
$3p^2(^3P)3s\ ^4P_{1/2}$	$3s3p(^3P)3d\ ^4P_{1/2}$	3.70[-1]	3.73[-1]	3.54[-1]	3.88[-1]
$3p^2(^1S)3s\ ^2S_{1/2}$	$3s3p(^3P)3d\ ^4P_{1/2}$	5.08[-4]	5.11[-4]	4.84[-4]	5.67[-4]
$3p^2(^3P)3s\ ^2P_{1/2}$	$3s3p(^3P)3d\ ^4P_{1/2}$	4.64[-6]	4.85[-6]	4.56[-6]	8.04[-6]
$3p^2(^3P)3s\ ^4P_{1/2}$	$3s3p(^3P)3d\ ^4D_{1/2}$	5.79[-4]	5.89[-4]	5.86[-4]	6.69[-4]
$3p^2(^1S)3s\ ^2S_{1/2}$	$3s3p(^3P)3d\ ^4D_{1/2}$	3.45[-6]	3.49[-6]	3.57[-6]	4.35[-6]
$3p^2(^3P)3s\ ^2P_{1/2}$	$3s3p(^3P)3d\ ^4D_{1/2}$	4.23[-6]	4.19[-6]	4.14[-6]	4.22[-6]
$3p^2(^3P)3s\ ^4P_{1/2}$	$3s3p(^3P)3d\ ^2P_{1/2}$	6.39[-4]	6.41[-4]	6.01[-4]	6.00[-4]
$3p^2(^1S)3s\ ^2S_{1/2}$	$3s3p(^3P)3d\ ^2P_{1/2}$	1.38[-1]	1.39[-1]	1.32[-1]	1.44[-1]
$3p^2(^3P)3s\ ^2P_{1/2}$	$3s3p(^3P)3d\ ^2P_{1/2}$	3.49[-1]	3.51[-1]	3.32[-1]	3.54[-1]
$3p^2(^3P)3s\ ^4P_{1/2}$	$3s3p(^1P)3d\ ^2P_{1/2}$	1.85[-6]	1.86[-6]	1.17[-6]	2.00[-6]
$3p^2(^1S)3s\ ^2S_{1/2}$	$3s3p(^1P)3d\ ^2P_{1/2}$	1.56[-1]	1.56[-1]	1.48[-1]	1.61[-1]
$3p^2(^3P)3s\ ^2P_{1/2}$	$3s3p(^1P)3d\ ^2P_{1/2}$	7.62[-2]	7.66[-2]	7.34[-2]	7.76[-2]
$3s^2(^1S)3p\ ^2P_{1/2}$	$3p^2(^3P)3s\ ^4P_{3/2}$	6.34[-5]	6.33[-5]	6.66[-5]	6.54[-5]
$3s^2(^1S)3p\ ^2P_{1/2}$	$3p^2(^1D)3s\ ^2D_{3/2}$	1.56[-1]	1.56[-1]	1.58[-1]	1.56[-1]
$3s^2(^1S)3p\ ^2P_{1/2}$	$3p^2(^3P)3s\ ^2P_{3/2}$	2.35[-1]	2.36[-1]	2.30[-1]	2.38[-1]
$3s^2(^1S)3p\ ^2P_{1/2}$	$3s^2(^1S)3d\ ^2D_{3/2}$	6.43[-1]	6.46[-1]	6.15[-1]	6.64[-1]
$3p^2(^3P)3s\ ^4P_{3/2}$	$3p^2(^3P)3p\ ^2P_{1/2}$	3.04[-4]	3.05[-4]	2.96[-4]	3.02[-4]
$3p^2(^1D)3s\ ^2D_{3/2}$	$3p^2(^3P)3p\ ^2P_{1/2}$	2.96[-1]	2.97[-1]	2.89[-1]	2.96[-1]
$3p^2(^3P)3s\ ^2P_{3/2}$	$3p^2(^3P)3p\ ^2P_{1/2}$	4.58[-2]	4.59[-2]	4.52[-2]	4.45[-2]
$3s^2(^1S)3d\ ^2D_{3/2}$	$3p^2(^3P)3p\ ^2P_{1/2}$	3.46[-4]	3.41[-4]	1.15[-4]	1.03[-4]
$3p^2(^3P)3s\ ^4P_{3/2}$	$3s3p(^3P)3d\ ^4P_{1/2}$	5.89[-3]	5.95[-3]	5.72[-3]	6.37[-3]
$3p^2(^1D)3s\ ^2D_{3/2}$	$3s3p(^3P)3d\ ^4P_{1/2}$	1.37[-7]	1.27[-7]	8.38[-8]	1.92[-8]
$3p^2(^3P)3s\ ^2P_{3/2}$	$3s3p(^3P)3d\ ^4P_{1/2}$	9.81[-6]	9.93[-6]	9.79[-6]	1.27[-5]
$3s^2(^1S)3d\ ^2D_{3/2}$	$3s3p(^3P)3d\ ^4P_{1/2}$	1.28[-3]	1.29[-3]	1.40[-3]	1.53[-3]
$3p^2(^3P)3s\ ^4P_{3/2}$	$3s3p(^3P)3d\ ^4D_{1/2}$	2.59[-1]	2.60[-1]	2.46[-1]	2.68[-1]
$3p^2(^1D)3s\ ^2D_{3/2}$	$3s3p(^3P)3d\ ^4D_{1/2}$	5.07[-4]	5.10[-4]	4.83[-4]	5.38[-4]
$3p^2(^3P)3s\ ^2P_{3/2}$	$3s3p(^3P)3d\ ^4D_{1/2}$	1.52[-4]	1.52[-4]	1.43[-4]	1.66[-4]
$3s^2(^1S)3d\ ^2D_{3/2}$	$3s3p(^3P)3d\ ^4D_{1/2}$	1.84[-5]	1.83[-5]	1.80[-5]	2.09[-5]
$3p^2(^3P)3s\ ^4P_{3/2}$	$3s3p(^3P)3d\ ^2P_{1/2}$	6.43[-5]	6.48[-5]	6.50[-5]	6.78[-5]
$3p^2(^1D)3s\ ^2D_{3/2}$	$3s3p(^3P)3d\ ^2P_{1/2}$	1.10[-3]	1.09[-3]	7.83[-4]	6.64[-4]
$3p^2(^3P)3s\ ^2P_{3/2}$	$3s3p(^3P)3d\ ^2P_{1/2}$	6.47[-2]	6.51[-2]	6.14[-2]	6.48[-2]
$3s^2(^1S)3d\ ^2D_{3/2}$	$3s3p(^3P)3d\ ^2P_{1/2}$	1.01[-3]	1.02[-3]	1.52[-3]	1.74[-3]
$3p^2(^3P)3s\ ^4P_{3/2}$	$3s3p(^1P)3d\ ^2P_{1/2}$	1.62[-6]	1.61[-6]	1.32[-6]	1.34[-6]
$3p^2(^1D)3s\ ^2D_{3/2}$	$3s3p(^1P)3d\ ^2P_{1/2}$	8.20[-4]	8.28[-4]	8.89[-4]	9.02[-4]
$3p^2(^3P)3s\ ^2P_{3/2}$	$3s3p(^1P)3d\ ^2P_{1/2}$	1.06[-1]	1.07[-1]	1.03[-1]	1.10[-1]
$3s^2(^1S)3d\ ^2D_{3/2}$	$3s3p(^1P)3d\ ^2P_{1/2}$	5.43[-1]	5.45[-1]	5.69[-1]	5.90[-1]

Table C: Wavelengths λ (Å), transition probabilities A (s^{-1}), oscillator strengths f, and line strengths S (a.u.) for Al-like Fe, Z=26: ( )-present, ( )-MCDF data Ref. [1], ( ) NIST data Ref. [28]. Numbers in brackets represent powers of 10.

Lower level	Upper level	λ	A	f	S
$3s^2(^1S)3p\ ^2P_{1/2}$	$3p^2(^3P)3s\ ^4P_{1/2}$	444.076	2.15[07]	6.35[-4]	1.86[-3]
		447.690	2.48[07]	7.45[-4]	2.20[-3]
		444.25			
$3s^2(^1S)3p\ ^2P_{1/2}$	$3p^2(^3P)3s\ ^4P_{3/2}$	429.389	4.05[05]	2.25[-5]	6.34[-5]
		432.907	5.14[05]	8.23[-5]	6.34[-5]
$3s^2(^1S)3p\ ^2P_{3/2}$	$3p^2(^3P)3s\ ^4P_{1/2}$	484.600	8.41[06]	1.49[-4]	9.45[-4]
		488.927	9.18[06]	1.64[-4]	1.06[-3]
		484.60			
$3s^2(^1S)3p\ ^2P_{3/2}$	$3p^2(^3P)3s\ ^4P_{3/2}$	467.163	4.99[06]	1.64[-4]	1.01[-3]
		471.347	6.03[06]	2.01[-4]	1.24[-3]
		467.40			
$3s^2(^1S)3p\ ^2P_{3/2}$	$3p^2(^3P)3s\ ^4P_{5/2}$	447.187	1.97[07]	8.89[-4]	5.24[-3]
		450.925	2.45[07]	1.12[-3]	6.65[-3]
		447.36			
$3s^2(^1S)3p\ ^2P_{1/2}$	$3p^2(^1S)3s\ ^2S_{1/2}$	274.524	1.68[10]	1.89[-1]	3.43[-1]
		269.790	1.86[10]	2.03[-1]	3.60[-1]
		274.203	2.1 [10]	2.4 [-1]	
$3s^2(^1S)3p\ ^2P_{3/2}$	$3p^2(^1S)3s\ ^2S_{1/2}$	289.489	1.39[09]	8.77[-3]	3.35[-2]
		284.239	1.23[09]	7.48[-3]	2.80[-2]
		289.160	1.1 [09]	6.9 [-3]	
$3s^2(^1S)3p\ ^2P_{1/2}$	$3p^2(^3P)3s\ ^2P_{1/2}$	257.694	1.34[10]	1.34[-1]	2.27[-1]
		253.694	1.46[10]	1.40[-1]	2.34[-1]
		257.392	1.8 [10]	1.8 [-1]	
$3s^2(^1S)3p\ ^2P_{1/2}$	$3p^2(^3P)3s\ ^2P_{3/2}$	252.492	7.38[09]	1.42[-1]	2.35[-1]
		247.913	7.97[09]	1.47[-1]	2.40[-1]
		252.197	1.1 [10]	2.1 [-1]	
$3s^2(^1S)3p\ ^2P_{3/2}$	$3p^2(^3P)3s\ ^2P_{1/2}$	270.837	2.02[10]	1.11[-1]	3.97[-1]
		265.724	2.24[10]	1.19[-1]	4.15[-1]
		270.524	2.6 [10]	1.4 [-1]	
$3s^2(^1S)3p\ ^2P_{3/2}$	$3p^2(^3P)3s\ ^2P_{3/2}$	265.097	3.18[10]	3.34[-1]	1.17[0]
		260.058	3.57[10]	3.62[-1]	1.24[0]
		264.787	4.3 [07]	4.5 [-1]	
$3s^2(^1S)3p\ ^2P_{1/2}$	$3p^2(^1D)3s\ ^2D_{3/2}$	334.557	2.11[09]	7.08[-2]	1.56[-1]
		332.557	2.36[09]	7.84[-2]	1.72[-1]
		334.171	2.49[09]	7.9 [-2]	
$3s^2(^1S)3p\ ^2P_{1/2}$	$3s^2(^1S)3d\ ^2D_{3/2}$	211.739	3.43[10]	4.61[-1]	6.43[-1]
		207.154	3.83[10]	4.93[-1]	6.72[-1]
		211.316	3.7[10]	5.0 [-1]	
$3s^2(^1S)3p\ ^2P_{3/2}$	$3p^2(^1D)3s\ ^2D_{3/2}$	357.051	7.32[07]	1.40[-3]	6.60[-3]
		354.695	7.60[07]	1.43[-3]	6.70[-3]
		356.60	6.3[07]	1.2 [-3]	
$3s^2(^1S)3p\ ^2P_{3/2}$	$3p^2(^1D)3s\ ^2D_{5/2}$	354.239	1.72[09]	4.84[-2]	2.26[-1]
		351.924	1.91[09]	5.33[-2]	2.47[-1]
		353.833	1.9 [09]	5.4 [-2]	

Table D: Wavelengths λ (nm) and transition probabilities A (s^{-1}) for LS-allowed transitions in Ti^{9+} and Fe^{13+}: ( )-present, ( )-measurements from Ref. [18]. Numbers in brackets represent powers of 10.

Lower level	Upper level	Ti^{9+}			Fe^{13+}		
		λ	λ^b	A	λ	λ^b	A
$3p^2(^1S)3s\ ^2S_{1/2}$	$3p^2(^3P)3p\ ^2P_{1/2}$	50.65	50.60	3.46[08]	36.05		1.15[08]
$3p^2(^1S)3s\ ^2S_{1/2}$	$3p^2(^3P)3p\ ^2P_{3/2}$	50.12	50.47	9.82[08]	35.59	35.63	1.77[09]
$3p^2(^1S)3s\ ^2S_{1/2}$	$3p^2(^3P)3p\ ^2D_{3/2}$	67.17		4.27[07]	47.21		3.07[08]
$3p^2(^3P)3s\ ^2P_{1/2}$	$3p^2(^3P)3p\ ^2P_{1/2}$	55.26	55.20	1.48[09]	39.43	39.39	3.13[09]
$3p^2(^3P)3s\ ^2P_{1/2}$	$3p^2(^3P)3p\ ^2D_{3/2}$	75.53	75.57	2.79[08]	53.19		4.45[08]
$3p^2(^3P)3s\ ^2P_{3/2}$	$3p^2(^3P)3p\ ^2P_{3/2}$	55.90	56.33	1.41[09]	40.13	40.17	2.57[09]
$3p^2(^3P)3s\ ^2P_{3/2}$	$3p^2(^3P)3p\ ^2D_{3/2}$	77.98	78.02	3.12[07]	55.55		2.69[07]
$3p^2(^3P)3s\ ^2P_{3/2}$	$3p^2(^3P)3p\ ^2D_{5/2}$	77.40	77.42	3.06[08]	54.39	54.43	5.96[08]
$3p^2(^1D)3s\ ^2D_{3/2}$	$3p^2(^3P)3p\ ^2P_{1/2}$	40.03	39.983	7.39[09]	29.17	29.15	1.21[10]
$3p^2(^1D)3s\ ^2D_{3/2}$	$3p^2(^3P)3p\ ^2P_{3/2}$	39.69	39.912	7.19[08]	28.87		1.13[09]
$3p^2(^1D)3s\ ^2D_{3/2}$	$3p^2(^3P)3p\ ^2D_{3/2}$	49.68	49.67	1.33[09]	36.08		2.01[09]
$3p^2(^1D)3s\ ^2D_{3/2}$	$3p^2(^3P)3p\ ^2D_{5/2}$	49.45		1.33[08]	35.59	35.59	2.73[08]
$3p^2(^1D)3s\ ^2D_{5/2}$	$3p^2(^3P)3p\ ^2P_{3/2}$	39.78	39.985	6.39[09]	29.06	29.07	9.67[09]
$3p^2(^1D)3s\ ^2D_{5/2}$	$3p^2(^3P)3p\ ^2D_{3/2}$	49.82	49.801	3.20[08]	36.37		8.10[08]
$3p^2(^1D)3s\ ^2D_{5/2}$	$3p^2(^3P)3p\ ^2D_{5/2}$	49.58	49.57	1.57[09]	35.87	35.88	2.74[09]
$3p^2(^1S)3s\ ^2S_{1/2}$	$3s3p(^3P)3d\ ^2P_{1/2}$	30.50	30.42	1.44[10]	22.23		1.27[10]
$3p^2(^1S)3s\ ^2S_{1/2}$	$3s3p(^3P)3d\ ^2P_{3/2}$	30.75	30.676	2.33[10]	22.63	22.60	3.78[10]
$3p^2(^3P)3s\ ^2P_{3/2}$	$3s3p(^3P)3d\ ^2P_{3/2}$	32.83		8.60[09]	24.39	24.36	1.06[10]
$3p^2(^1D)3s\ ^2D_{3/2}$	$3s3p(^3P)3d\ ^2D_{3/2}$	32.61	32.573	2.08[10]	23.94	23.93	3.04[10]
$3p^2(^1D)3s\ ^2D_{3/2}$	$3s3p(^3P)3d\ ^2D_{5/2}$	32.61		1.89[09]	23.91		3.56[09]
$3p^2(^1D)3s\ ^2D_{3/2}$	$3s3p(^3P)3d\ ^2F_{5/2}$	30.30	30.205	8.93[09]	22.48	22.44	1.25[10]
$3p^2(^1D)3s\ ^2D_{5/2}$	$3s3p(^3P)3d\ ^2D_{3/2}$	32.67		2.03[09]	24.07		2.64[09]
$3p^2(^1D)3s\ ^2D_{5/2}$	$3s3p(^3P)3d\ ^2D_{5/2}$	32.66	32.626	2.10[10]	24.04	24.016	2.93[10]
$3p^2(^1D)3s\ ^2D_{5/2}$	$3s3p(^3P)3d\ ^2F_{5/2}$	30.35		1.01[09]	22.59		2.31[09]
$3p^2(^1D)3s\ ^2D_{5/2}$	$3s3p(^3P)3d\ ^2F_{7/2}$	29.81	29.72	1.02[10]	21.86	21.82	1.55[10]
$3p^2(^1S)3s\ ^2S_{1/2}$	$3s3p(^1P)3d\ ^2P_{1/2}$	28.85	28.72	8.98[09]	21.12	21.07	1.67[10]
$3p^2(^1S)3s\ ^2S_{1/2}$	$3s3p(^1P)3d\ ^2P_{3/2}$	28.81	28.66	1.45[09]	21.06	20.87	7.35[08]
$3p^2(^1S)3s\ ^2S_{1/2}$	$3s3p(^1P)3d\ ^2D_{3/2}$	28.50		3.76[09]	20.92		6.24[09]
$3p^2(^3P)3s\ ^2P_{1/2}$	$3s3p(^1P)3d\ ^2P_{3/2}$	30.24	30.129	2.44[10]	22.17	21.97	4.62[10]
$3p^2(^3P)3s\ ^2P_{1/2}$	$3s3p(^1P)3d\ ^2D_{3/2}$	29.90	29.83	9.72[09]	22.01	22.11	6.32[07]
$3p^2(^3P)3s\ ^2P_{3/2}$	$3s3p(^1P)3d\ ^2P_{1/2}$	30.68		5.49[09]	22.64	22.58	9.23[09]
$3p^2(^3P)3s\ ^2P_{3/2}$	$3s3p(^1P)3d\ ^2P_{3/2}$	30.63	30.488	7.42[08]	22.57	22.36	3.99[09]
$3p^2(^3P)3s\ ^2P_{3/2}$	$3s3p(^1P)3d\ ^2D_{5/2}$	30.19	30.129	3.96[10]	22.36	22.32	5.60[10]
$3p^2(^1D)3s\ ^2D_{3/2}$	$3s3p(^1P)3d\ ^2F_{5/2}$	26.11	26.01	1.81[10]	19.23	19.18	2.43[10]
$3p^2(^1D)3s\ ^2D_{5/2}$	$3s3p(^1P)3d\ ^2F_{7/2}$	26.25	26.15	1.94[10]	19.42	19.37	2.53[10]
$3s^2(^1S)3d\ ^2D_{3/2}$	$3s3p(^1P)3d\ ^2P_{1/2}$	37.56	37.40	1.70[10]	27.36	27.30	2.68[10]
$3s^2(^1S)3d\ ^2D_{3/2}$	$3s3p(^1P)3d\ ^2P_{3/2}$	37.48	37.33	8.51[08]	27.26	26.99	9.79[09]
$3s^2(^1S)3d\ ^2D_{3/2}$	$3s3p(^1P)3d\ ^2D_{3/2}$	36.96	36.90	1.19[10]	27.03	27.21	1.04[10]
$3s^2(^1S)3d\ ^2D_{3/2}$	$3s3p(^1P)3d\ ^2F_{5/2}$	39.97	39.818	1.33[10]	28.85	28.78	2.23[10]
$3s^2(^1S)3d\ ^2D_{5/2}$	$3s3p(^1P)3d\ ^2D_{3/2}$	37.03		2.70[09]	27.18	27.35	1.74[10]
$3s^2(^1S)3d\ ^2D_{5/2}$	$3s3p(^1P)3d\ ^2D_{5/2}$	36.91	36.85	1.14[10]	27.10	27.08	1.83[10]
$3s^2(^1S)3d\ ^2D_{5/2}$	$3s3p(^1P)3d\ ^2F_{7/2}$	40.28	40.134	1.35[10]	29.27	29.30	2.20[10]

4

Table E: Wavelengths λ (nm) and transition probabilities, A (s^{-1}) for LS-allowed transitions in Ti^{9+} and Fe^{13+}: ( )-present, ( )-measurements from Ref. [19]. Numbers in brackets represent powers of 10.

Lower level	Upper level	Ti^{9+}			Fe^{13+}		
		λ	λ^b	A	λ	λ^b	A
$3p^2(^3P)3s\ ^4P_{3/2}$	$3s3p(^3P)3d\ ^4F_{5/2}$	33.14	33.06	2.68[07]	24.25	24.20	1.37[08]
$3p^2(^3P)3s\ ^4P_{5/2}$	$3s3p(^3P)3d\ ^4F_{7/2}$	33.33	33.26	4.41[07]	24.46	24.41	2.44[08]
$3p^2(^3P)3s\ ^4P_{3/2}$	$3s3p(^3P)3d\ ^4F_{3/2}$	33.48		1.20[07]	24.49		7.52[07]
$3p^2(^3P)3s\ ^4P_{5/2}$	$3s3p(^3P)3d\ ^4F_{5/2}$	33.59	33.51	1.25[07]	24.82	24.78	7.10[07]
$3p^2(^1D)3s\ ^2D_{5/2}$	$3s3p(^3P)3d\ ^4F_{5/2}$	39.54	39.50	1.33[07]	29.05	29.04	6.82[07]
$3p^2(^1D)3s\ ^2D_{3/2}$	$3s3p(^3P)3d\ ^4F_{3/2}$	39.94	39.63	1.64[07]	29.21	29.16	8.87[07]
$3p^2(^1D)3s\ ^2D_{5/2}$	$3s3p(^3P)3d\ ^4F_{3/2}$	40.02	39.79	1.84[07]	29.40	29.35	9.30[07]

Table F: Lifetimes   of the low-lying levels in Ti^{9+}, Fe^{13+}, and Ni^{15+}: ( )-present, ( )-expt. data from [18], ( )-expt. data from [19].

Level	Ti^{9+}			Fe^{13+}			Ni^{15+}		
	ps	^{b} ps		ps	^{b} ps		ps	^{b} ps	
$3p^2(^1S)3s\ ^2S_{1/2}$	108	109	10	55.0	61	6	40.3	38	4
$3p^2(^3P)3s\ ^2P_{1/2}$	42.2	43	5	29.8	35	7	26.5	24	6
$3p^2(^3P)3s\ ^2P_{3/2}$	40.2	34	5	25.5	34	7	21.0	21	2
$3p^2(^1D)3s\ ^2D_{3/2}$	921	850	60	458	340	60	340	290	20
$3p^2(^1D)3s\ ^2D_{5/2}$	1050	950	50	581	530	40	472	400	30
$3s^2(^1S)3d\ ^2D_{3/2}$	35.2	37	5	23.9	32	6	20.2	25	3
$3s^2(^1S)3d\ ^2D_{5/2}$	37.2	44	6	26.3	32	6	22.8	30	5
	ns	ns		ns	ns		ns	ns	
$3s3p(^3P)3d\ ^4F_{3/2}$	17.7	16	1.5	3.32	1.5	0.2	1.84	1.8	0.2
$3s3p(^3P)3d\ ^4F_{5/2}$	18.8	13	1.5	3.55	1.9	0.1	1.81	1.98	0.2
$3s3p(^3P)3d\ ^4F_{7/2}$	22.0	18.5	2	4.00	2.8	0.2	1.98	2.2	0.2

Table G: Lifetimes (ns) of the low-lying levels in P^{2+} – K^{4+}: ( )-present, ( )-measurements from Ref. [10].

Level	P^{2+}		b	S^{3+}		b	K^{4+}		b
$3p^2(^3P)3p\ ^4S$	0.189			0.134	0.15	0.02	0.104	0.11	0.01
$3s3p(^3P)3d\ ^4P$	0.262			0.172	0.19	0.01	0.129	0.10	0.01
$3s3p(^3P)3d\ ^4D$	0.151	0.16	0.02	0.100	0.099	0.006	0.0758		
$3p^2(^1D)3s\ ^2D$	106	18	2	10.2	6.95	0.36	4.55	4.0	0.1
$3p^2(^1S)3s\ ^2S$	0.551	0.45	0.07	0.329	0.428	0.08	0.262	0.33	0.02
$3p^2(^3P)3s\ ^2P$	0.180	0.21	0.02	0.125	0.15	0.04	0.0957	0.11	0.01
$3s^2(^1S)3d\ ^2D$	0.171	0.19	0.02	0.108	0.12	0.02	0.0794		
$3p^2(^3P)3p\ ^2D$	12.1	10	1	4.32	3.8	0.2	2.19		
$3p^2(^3P)3p\ ^2P$	0.643			0.363	0.83	0.1	0.264		
$3s3p(^3P)3d\ ^2D$	0.178			0.120	0.12	0.02	0.0918		
$3s3p(^3P)3d\ ^2P$	0.160			0.0988			0.0700		

Table H: Wavelengths λ (nm) and transition probabilities A (s^{-1}), and lifetimes results (ns) for low-lying levels in Br^{22+} and Au^{66+}: ( )-present, ( )-expt. data from[20], ( )-expt. data from [22]. Numbers in brackets represent powers of 10.

			Br^{22+}					
Lower level	Upper level	λ	λ^b		A			b
$3s^2(^1S)3p\ ^2P_{1/2}$	$3p^2(^3P)3s\ ^4P_{1/2}$	25.51	25.56	0.03	4.74[08]	1.88	1.9	0.2
$3s^2(^1S)3p\ ^2P_{3/2}$	$3p^2(^3P)3s\ ^4P_{1/2}$	32.54			5.69[07]			
$3s^2(^1S)3p\ ^2P_{1/2}$	$3p^2(^3P)3s\ ^4P_{3/2}$	22.92			8.74[06]			
$3s^2(^1S)3p\ ^2P_{3/2}$	$3p^2(^3P)3s\ ^4P_{3/2}$	28.45	28.74	0.15	6.24[07]	14.1	12	5
$3s^2(^1S)3p\ ^2P_{3/2}$	$3p^2(^3P)3s\ ^4P_{5/2}$	26.01	26.01	0.03	4.27[08]	2.34	2.05	0.10
$3s^2(^1S)3p\ ^2P_{3/2}$	$3p^2(^1D)3s\ ^2D_{5/2}$	20.53	20.58	0.03	3.45[09]	0.290	0.235	0.02
			Au^{66+}					
Lower level	Upper level	λ	λ		A			
$3s^2(^1S)3p\ ^2P_{1/2}$	$3p^2(^3P)3s\ ^4P_{1/2}$	6.65	6.60	0.02	4.58[10]	0.0218	0.022	0.004
$3p^2(^3P)3s\ ^4P_{1/2}$	$3s^2(^1S)3p\ ^2P_{3/2}$	3.99			7.45[08]			
$3s^2(^1S)3p\ ^2P_{3/2}$	$3p^2(^3P)3s\ ^4P_{5/2}$	7.18	7.27	0.01	1.66[10]	0.0602	0.0505	0.002

Table I: Branching ratios: $A(^2P_{3/2} - {}^2S_{1/2})/A(^2P_{1/2} - {}^2S_{1/2})$ for transitions $3s^23p\ ^2P_J$–$3s3p^2\ ^2S_{1/2}$ and $A(^2P_{3/2} - {}^2P_{1/2})/A(^2P_{1/2} - {}^2P_{1/2})$ for transitions $3s^23p\ ^2P_J$–$3s3p^2\ ^2P_{1/2}$. The experimental ratios are from Ref. [15].

Ion	$^2P_J - {}^2S_{1/2}$			$^2P_J - {}^2P_{1/2}$		
	MBPT	Expt.		MBPT	Expt.	
P^{2+}	1.65	1.40	0.08	0.545	0.60	0.10
S^{3+}	1.47	1.12	0.1	0.559	0.52	0.02
Cl^{4+}	1.29	1.29	0.13	0.584	0.58	0.02
Ar^{5+}	1.12	0.87	0.05	0.620	0.61	0.03
K^{6+}	0.944	0.75	0.10	0.664		
Ca^{7+}	0.918			0.791		
Sc^{+}	0.563	0.46	0.04	0.770		
Ti^{9+}	0.430	0.43	0.08	0.852	0.75	0.15
Fe^{13+}	0.0827	0.060	0.01	1.51	1.2	0.4
Ni^{15+}	0.0223			2.12	1.6	0.4

EXPLANATION OF GRAPHS

GRAPHS I–XXIII:
Transitions probabilities $A[3l_13l_2(^{2S_1+1}L_1)3l_3 \ ^{2S+1}L_J \ -3l_1'3l_2'(^{2S_1'+1}L_1')3l_3' \ ^{2S'+1}L_{J'}']$ as functions of Z.

The calculated transition probabilities, for given transitions as included at the inside of each figure, are plotted as functions of nuclear charge Z. Configurations $3l_13l_23l_3$ and $3l_1'3l_2'3l_3'$, intermediate angular momenta L_1S_1 and $L_1'S_1'$, and the resultant angular momenta LSJ and $L'S'J'$ for lower and upper state, respectively, are used to label each transition.

Transition probabilities, A are plotted in s^{-1} units.

GRAPHS XXIV–XXVII:
Lifetimes of $3l_13l_2(^{2S_1+1}L_1)3l_3 \ ^{2S+1}L_J$ levels as functions of Z.

The calculated lifetimes, for given levels as included at the inside of each figure, are plotted as functions of nuclear charge Z. The designation of levels are the same as in GRAPHS I–XXII. Lifetimes are plotted in 10^{-9} sec units.

EXPLANATION OF TABLES

TABLE I:
Wavelengths λ (Å), transition rates A (s^{-1}), oscillator strengths f, and line strengths S (a.u.) for Al-like ions with nuclear charges Z=15-100.

The following notation is used: $s=3s$, $p=3p$, $d=3d$ We also use a[-b]=a^{-b}, a[b]=a^{+b}, and a[0]=a to represent powers of ten.

In the first two columns, we give the configuration, intermediate angular momenta L_1S_1, the resultant angular momenta LSJ: $l_1l_2(^{2S_1+1}L_1)l_3 \ ^{2S+1}L_J$ for lower and upper states, respectively.

The rows contain the wavelengths in Å transition rates in s^{-1}, oscillator strengths, and line strengths in a.u. for two ions, from Z=15 and Z=16 to Z=99 and Z=100 on the last page of table. Only those rates satisfying the restriction $A > 10^9$ s^{-1} are tabulated.

TABLE II:
Lifetimes (10^{-9} sec) for excited levels in Al-like ions, Z=15-100.

We use a[-b]=a^{-b}, a[b]=a^{+b}, and a[0]=a to represent powers of ten.

Configurations $3l_13l_23l_3$, intermediate angular momenta L_1S_1, and resultant angular momenta LSJ are given as columns headings.

The rows contain the nuclear charges Z and lifetimes in 10^{-9} sec.
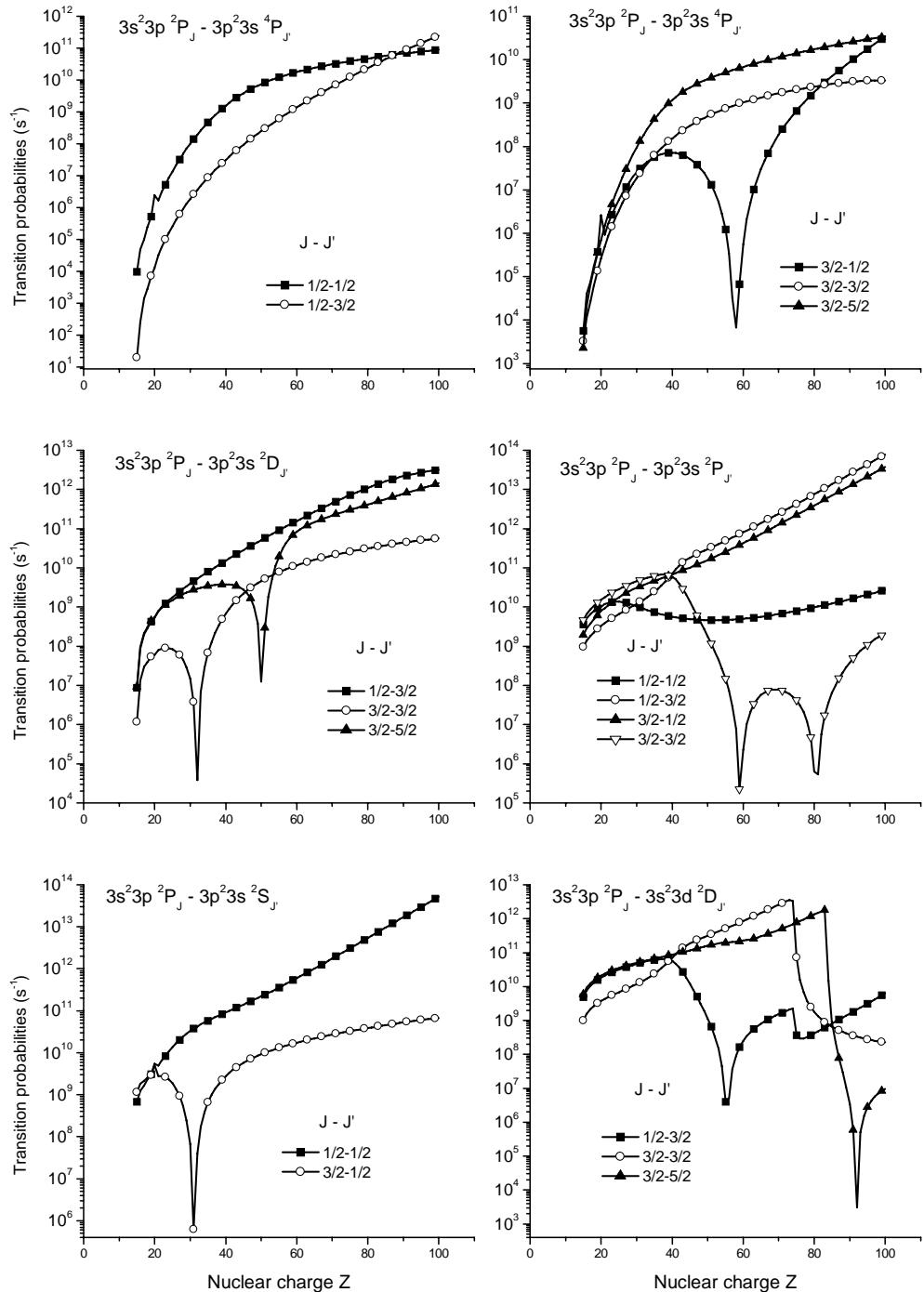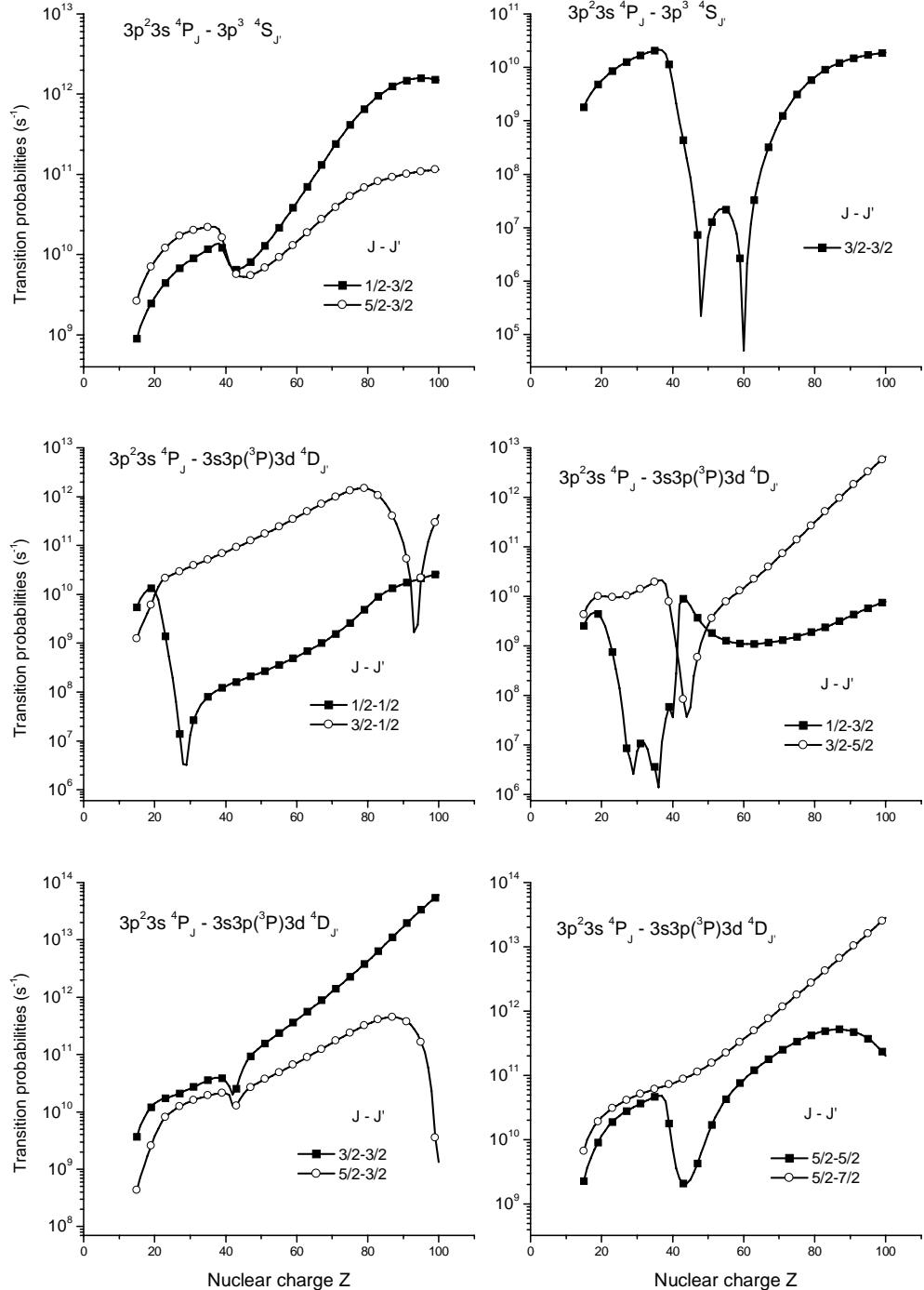
3s^{2}3p ^{2}P$_J$ - 3p^{2}3s ^{4}P$_{J'}$

3s^{2}3p ^{2}P$_J$ - 3p^{2}3s ^{4}P$_{J'}$

3s^{2}3p ^{2}P$_J$ - 3p^{2}3s ^{2}D$_{J'}$

3s^{2}3p ^{2}P$_J$ - 3p^{2}3s ^{2}P$_{J'}$

3s^{2}3p ^{2}P$_J$ - 3p^{2}3s ^{2}S$_{J'}$

3s^{2}3p ^{2}P$_J$ - 3s^{2}3d ^{2}D$_{J'}$

Transition probabilities (s^{-1})

Nuclear charge Z

J - J'

1/2-1/2
1/2-3/2

3/2-1/2
3/2-3/2
3/2-5/2

1/2-3/2
3/2-3/2
3/2-5/2

1/2-1/2
1/2-3/2
3/2-1/2
3/2-3/2

1/2-1/2
3/2-1/2

1/2-3/2
3/2-3/2
3/2-5/2

FIG. I. ransition probabilities $3\ ^23p\ ^2P\ -3p^23\ ^2\ ^1$ and $3\ ^23p\ ^2P\ -3\ ^23\ ^2$ as functions of Z.

1

FIG. II. ransition probabilities $3p^23$ ^4P $- 3p^3$ ^4S and $3p^23$ ^4P $- 3$ $3p(^3P)3$ ^{4} as functions of Z.

FIG. III. ransition probabilities $3p^2 3$ ^4P $- 3$ $3p(^3P)3$ ^{4} ^4P as functions of Z.

3
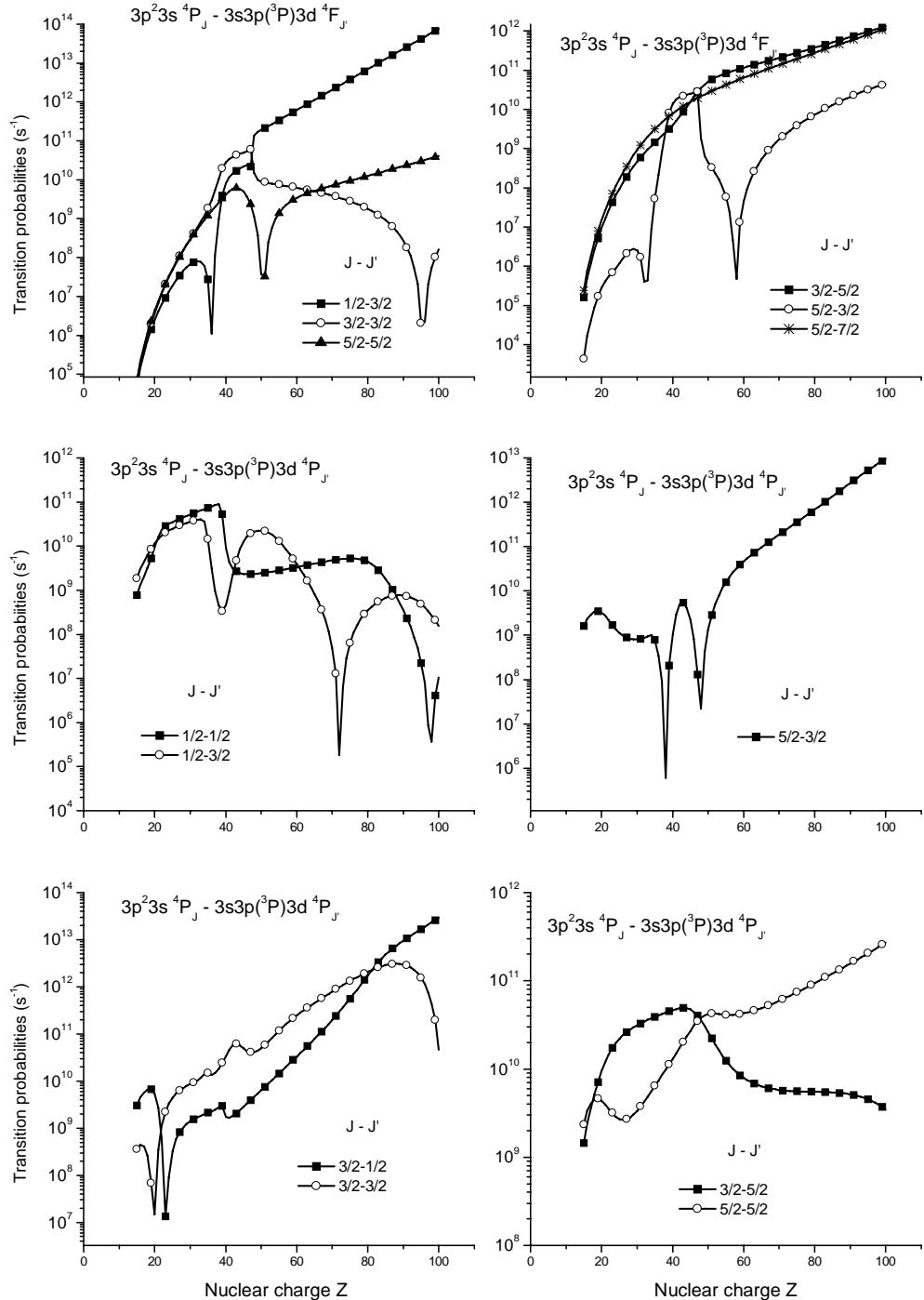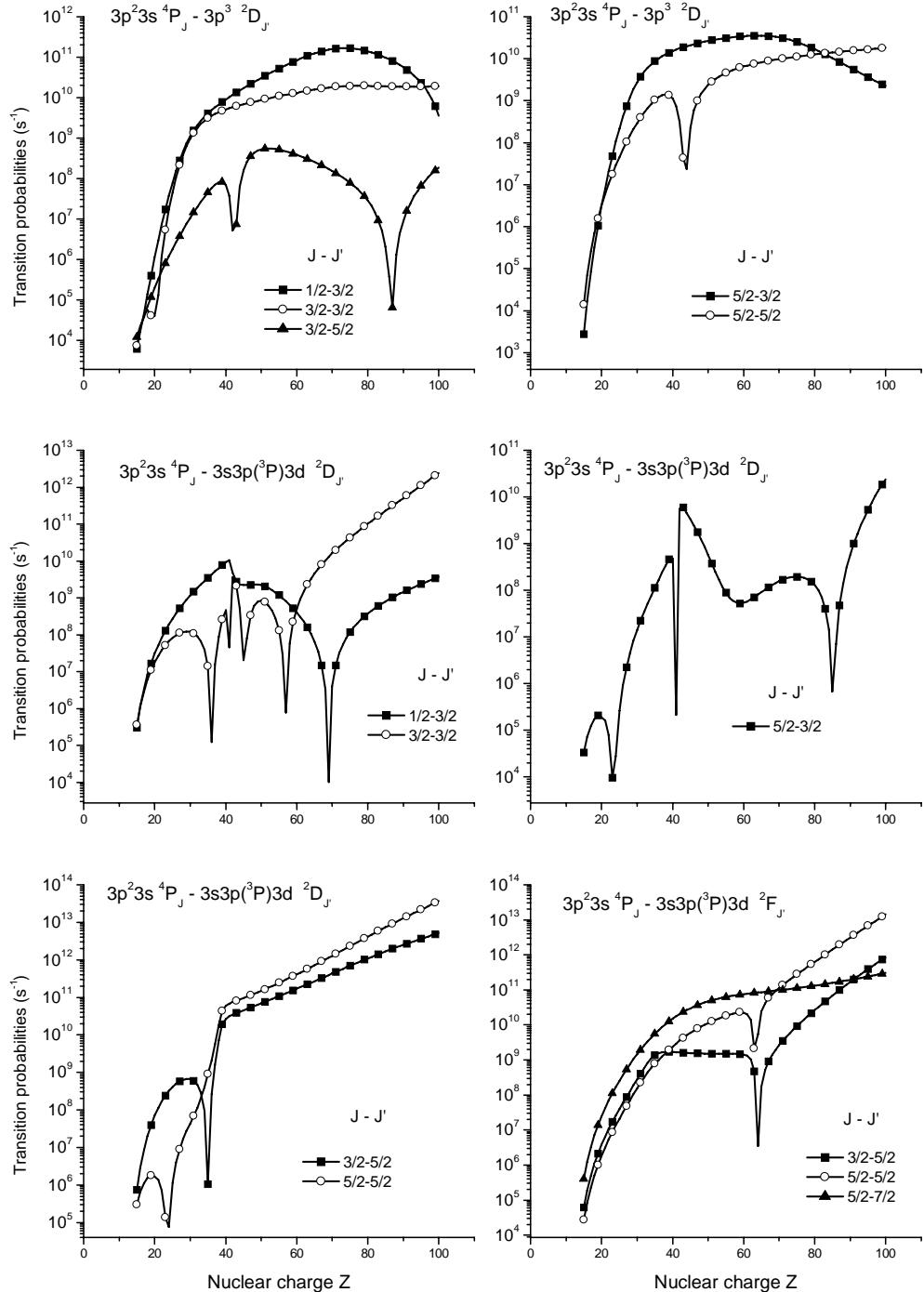
FIG. I . ransition probabilities $3p^23$ ^4P $- 3p^3$ ^{2} and $3p^23$ ^4P $- 3$ $3p(^3P)3$ ^{2} ^{2} as functions of Z.

4
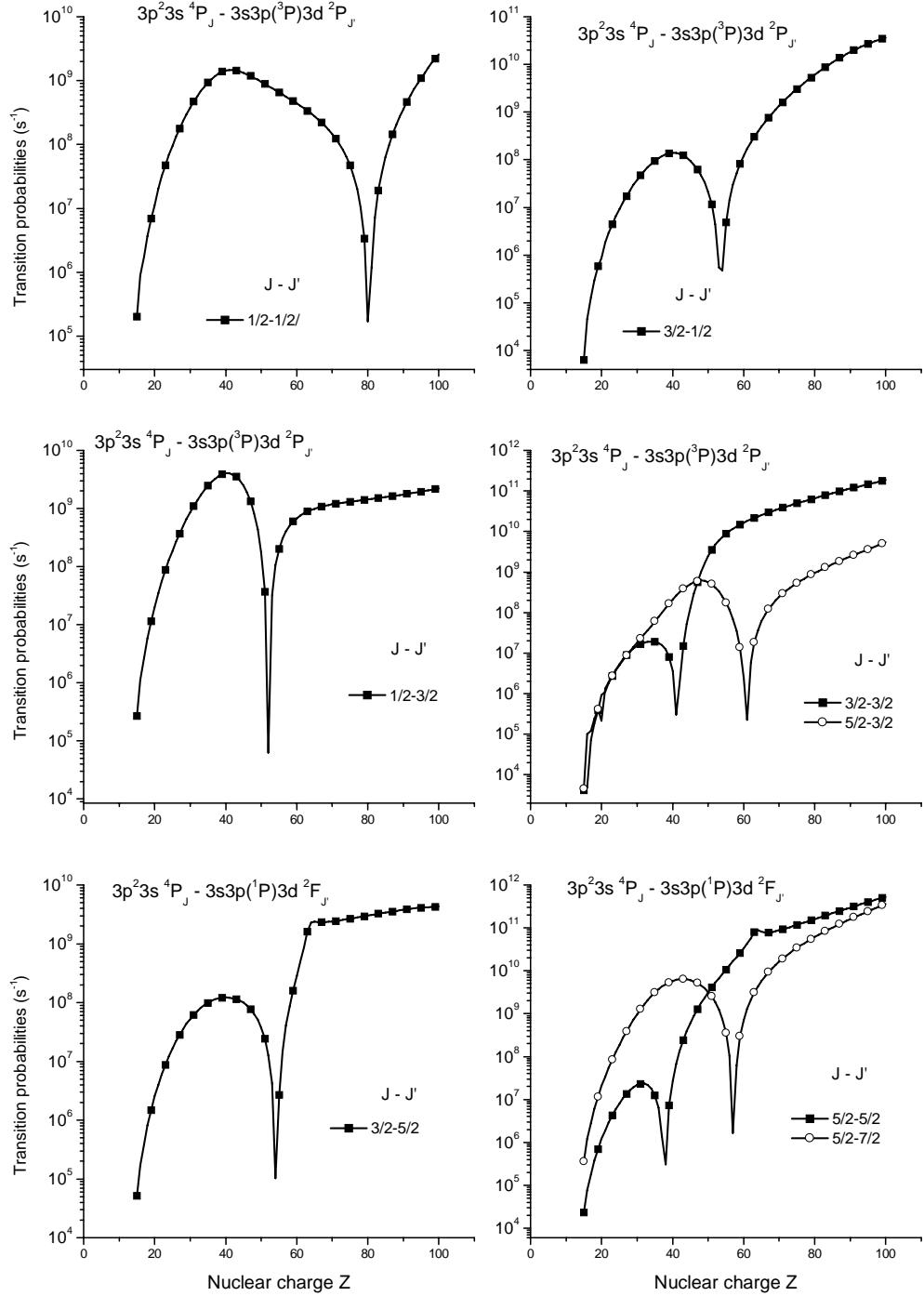
FIG. . ransition probabilities $3p^23$ ^4P -3 $3p(^3P)3$ ^2P and $3p^23$ ^4P -3 $3p(^1P)3$ ^{2} as functions of Z.
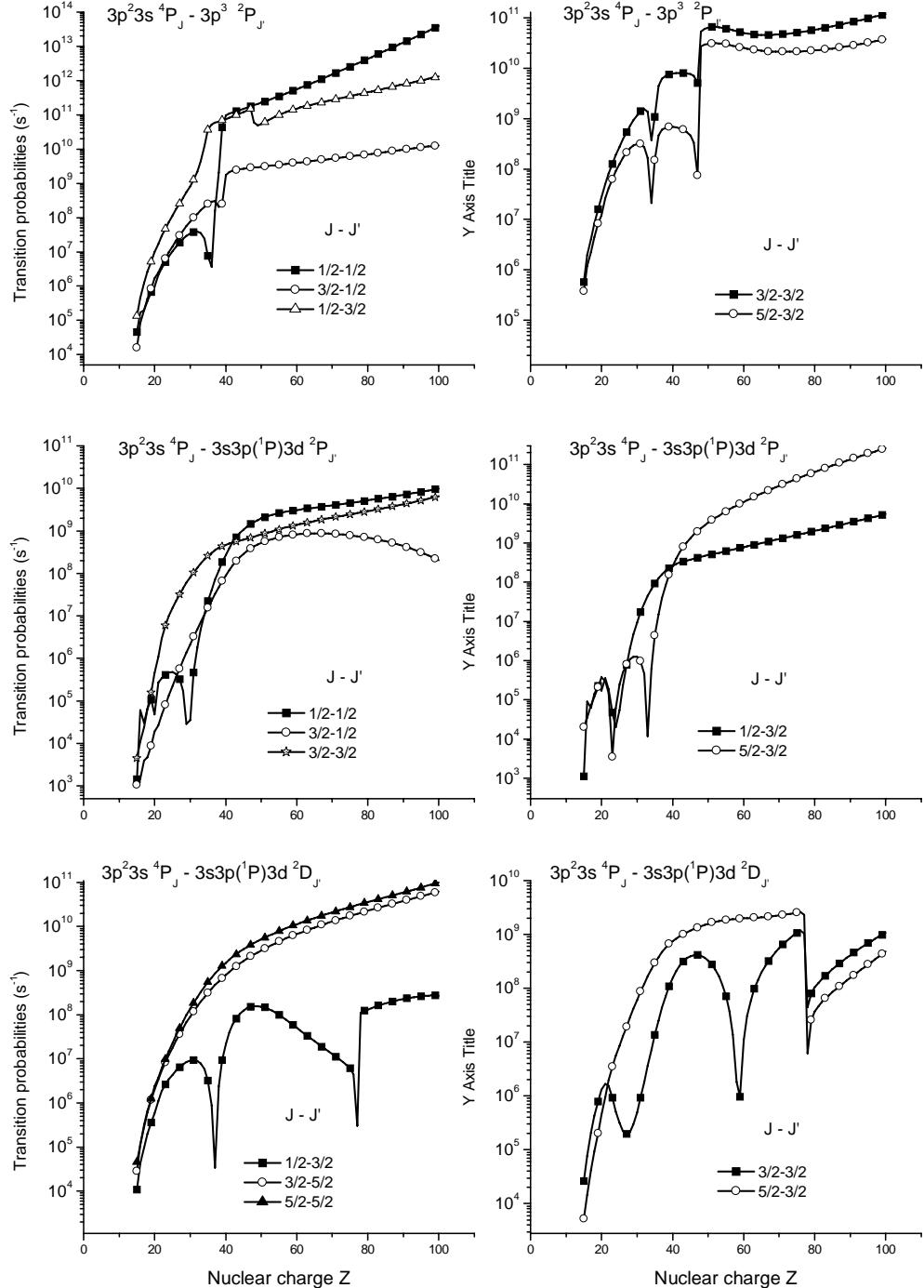
FIG. I. ransition probabilities $3p^23 \ ^4P \ - 3p^3 \ ^2P$ and $3p^23 \ ^4P \ - 3 \ 3p(^1P)3 \ ^2P \ ^2$ as functions of Z.

6

FIG. II. ransition probabilities $3p^23$ ^{2} $-3p^3$ ^{2} and $3p^23$ 2 -3 $3p(^1$ $^3P)3$ ^{2} as functions of Z.

FIG. III. ransition probabilities $3p^2 3\ ^2 - 3p^3\ ^2P$ and $3p^2 3\ 2 - 3\ 3p(^1\ ^3P)3\ ^2P$ as functions of Z.

8

$3p^23s\ ^2D_J - 3s3p(^1P)3d\ ^2F_{J'}$

$3p^23s\ ^2D_J - 3s3p(^3P)3d\ ^2F_{J'}$

Transition probabilities (s^{-1})

J - J'

■ 3/2-5/2
○ 5/2-5/2
✳ 5/2-7/2

J - J'

■ 3/2-5/2
○ 5/2-5/2
✳ 5/2-7/2

$3p^23s\ ^2D_J - 3p^3\ ^4S_{J'}$

$3p^23s\ ^2D_J - 3s3p(^3P)3d\ ^4F_{J'}$

J - J'

■ 3/2-3/2
○ 5/2-3/2

J - J'

■ 3/2-3/2
○ 5/2-3/2

$3p^23s\ ^2D_J - 3s3p(^3P)3d\ ^4F_{J'}$

$3p^23s\ ^2D_J - 3s3p(^3P)3d\ ^4F_{J'}$

J - J'

■ 3/2-5/2

J - J'

■ 5/2-5/2
○ 5/2-7/7

Nuclear charge Z

Nuclear charge Z
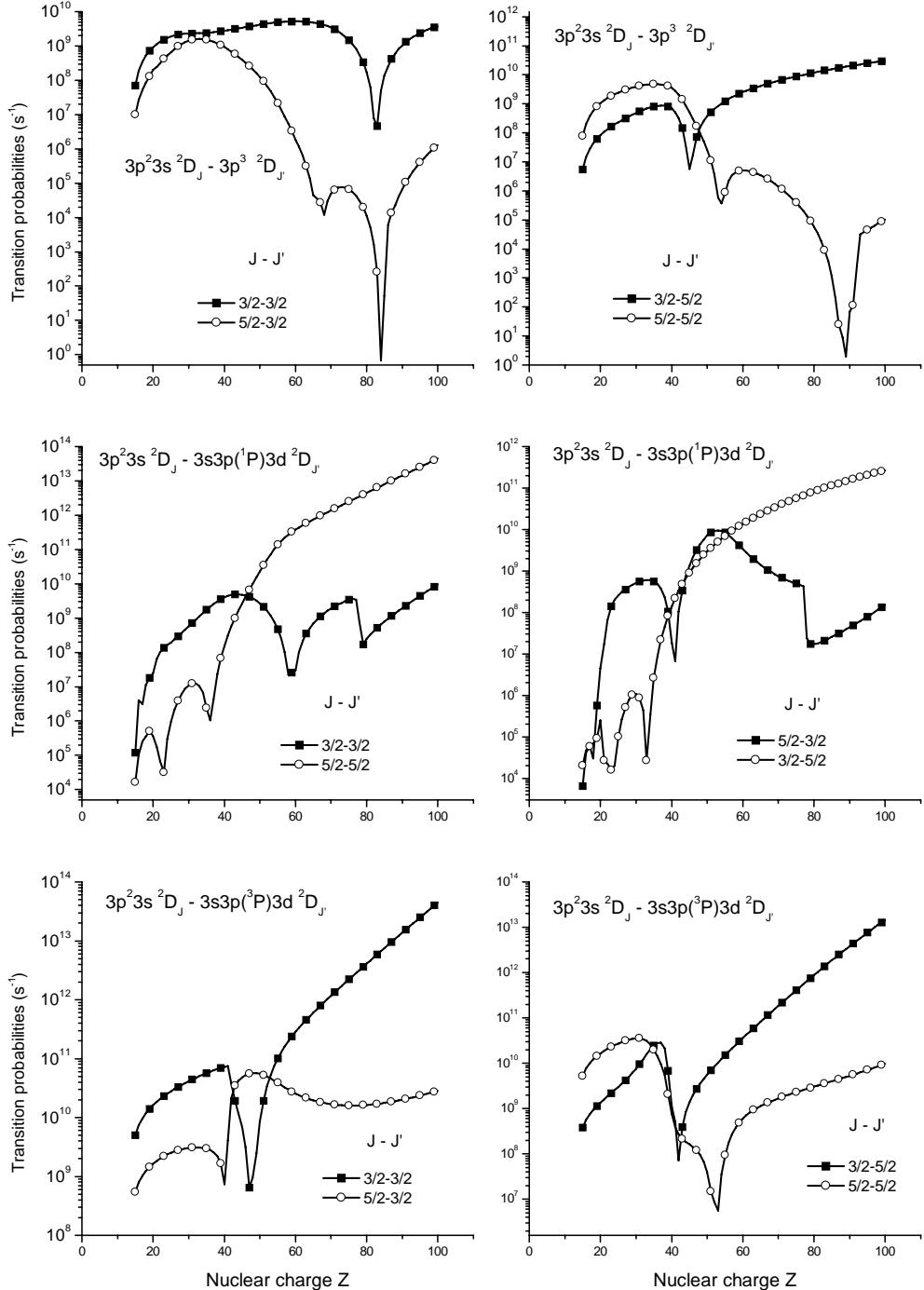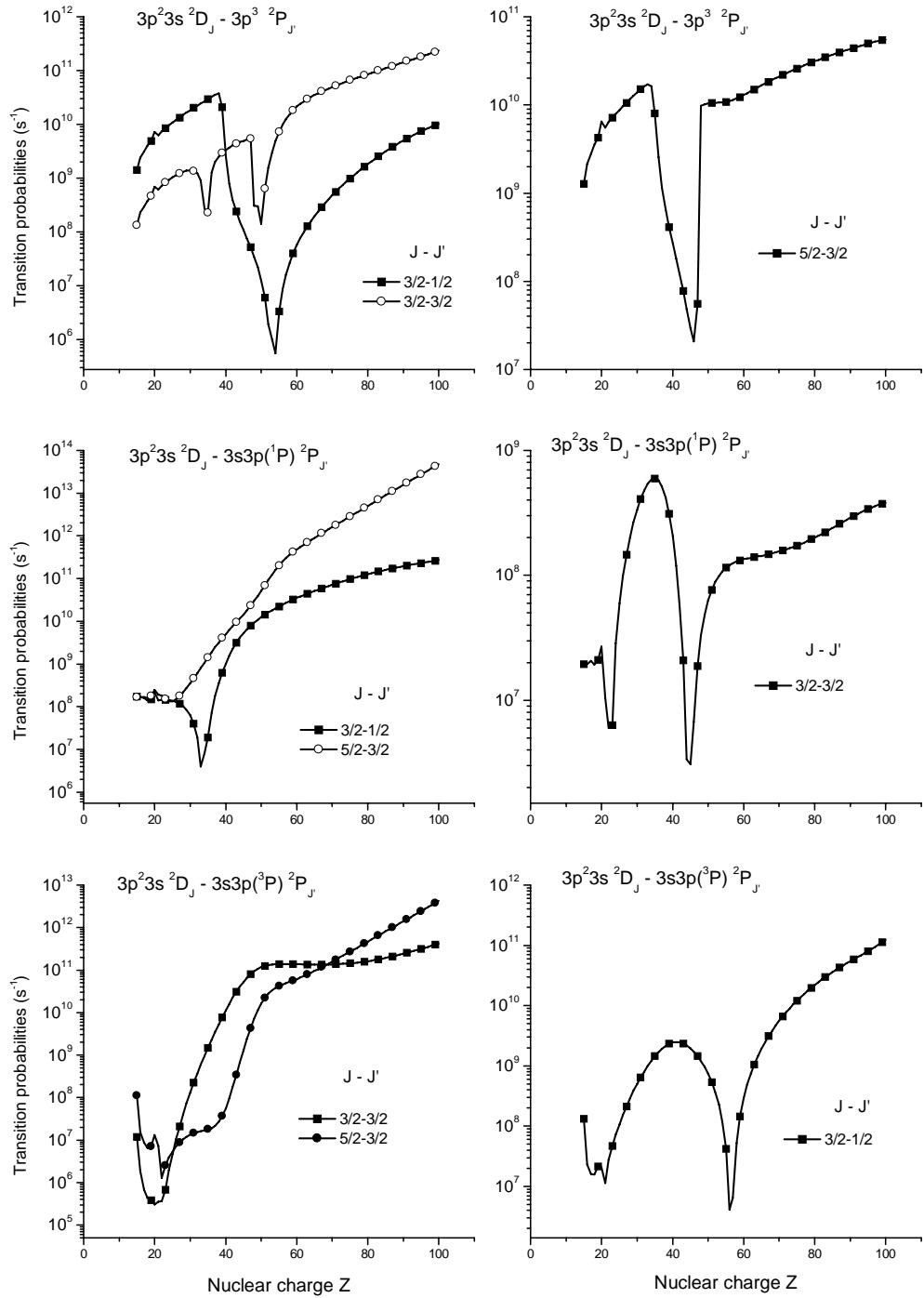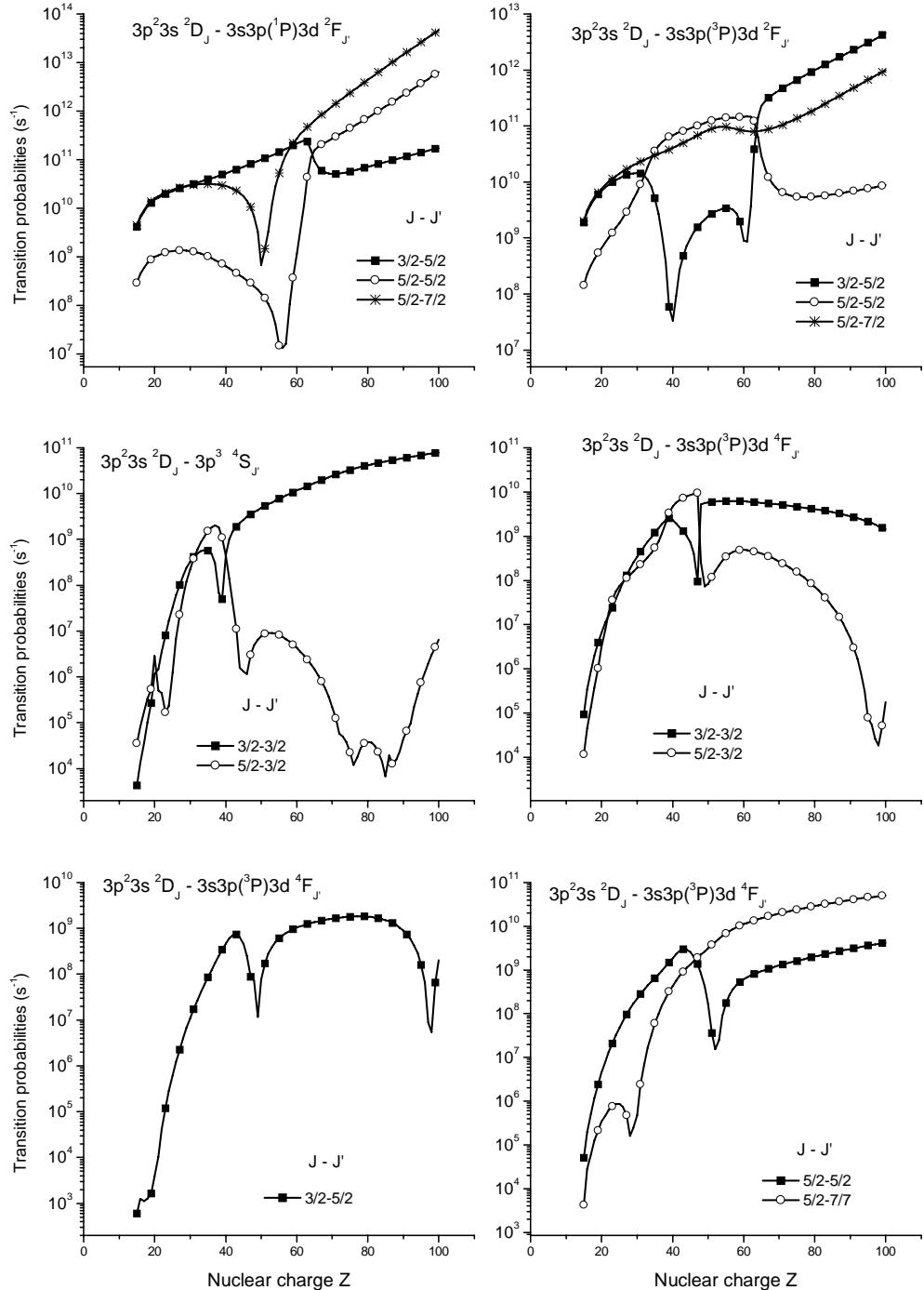
FIG. I . ransition probabilities $\quad 3p^23\ ^2\quad - 3\ 3p(^{1\ 3}P)3\ ^2\quad , \quad 3p^23\ ^2\quad - 3p^3\ ^4S$
and $\quad 3p^23\ ^2\quad - 3\ 3p(^3P)3\ ^4\quad$ as functions of Z.
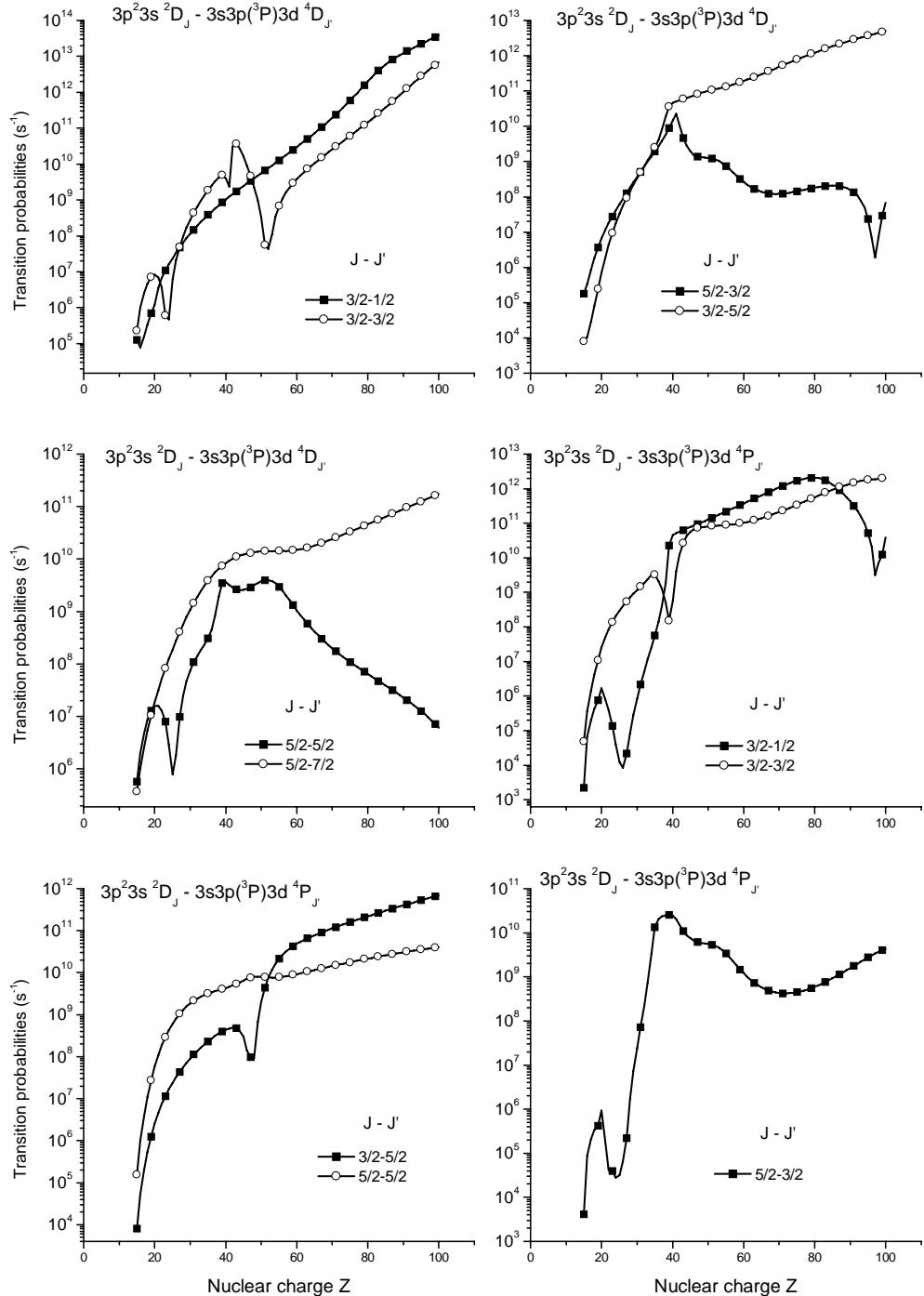
9

FIG. . ransition probabilities $3p^2 3\ ^2\ - 3\ 3p(^3P)3\ ^4\ \ ^4P$ as functions of Z.
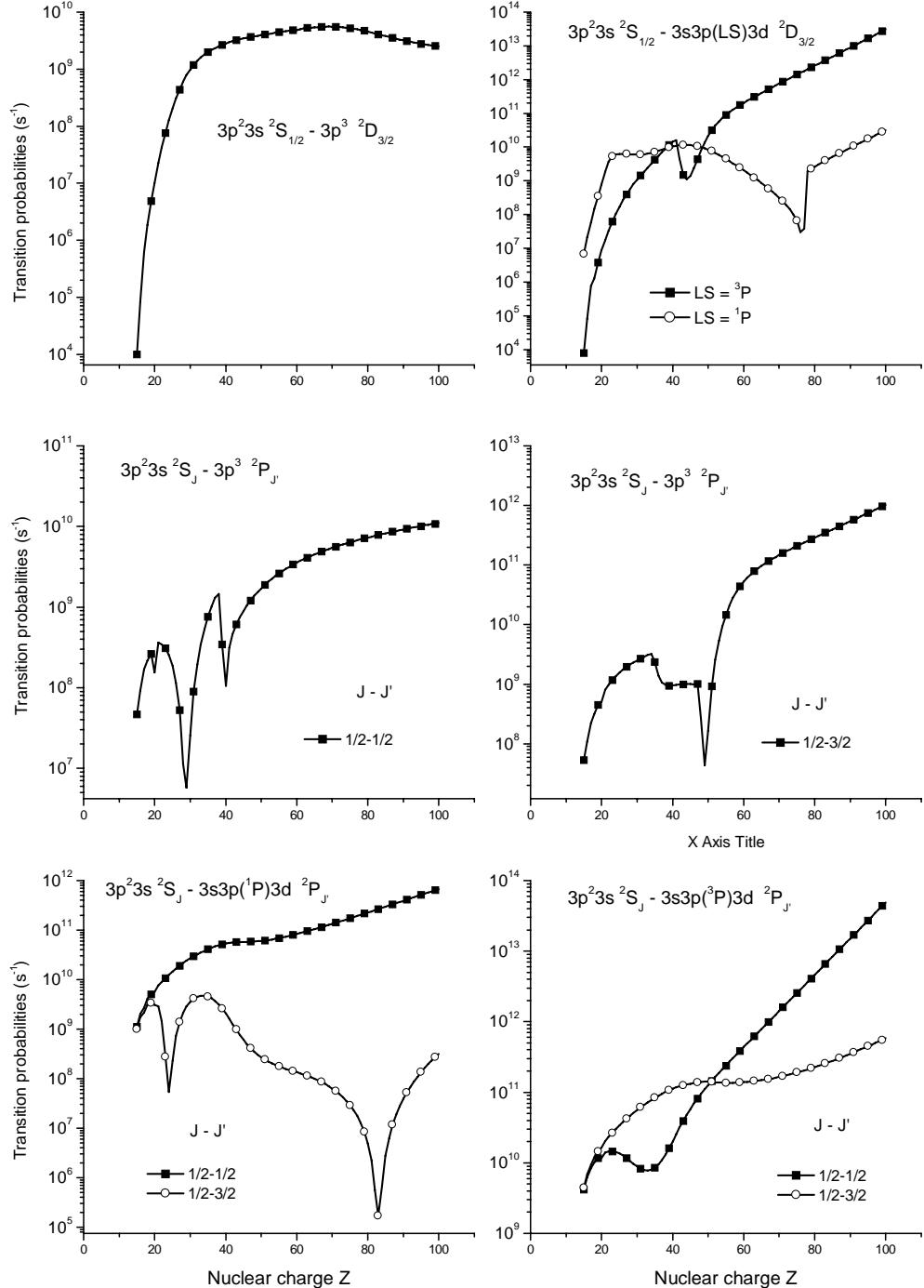
FIG. I. ransition probabilities $3p^23$ $^2S_{1/2} - 3p^3$ ^{2} $_{3/2}$, $3p^23$ $^2S_{1/2} - 3p^3$ ^2P , and $3p^23$ $^2S_{1/2}$- 3 $3p(^{1\,3}P)3$ ^{2} $_{3/2}$ ^2P as functions of Z.

11
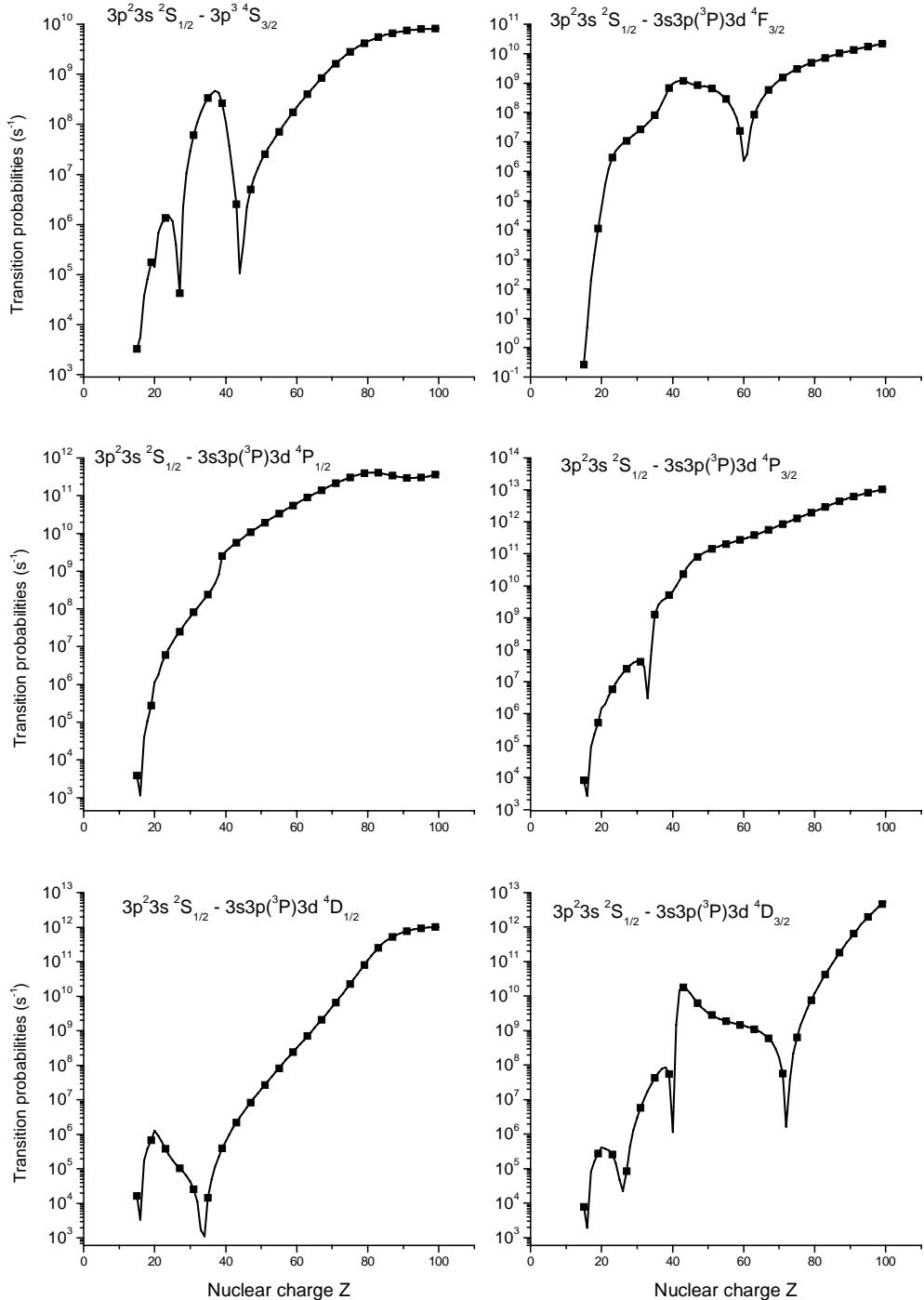
FIG. II. ransition probabilities $3p^2 3$ $^2S_{1/2} - 3p^3$ $^4S_{3/2}$, and $3p^2 3$ $^2S_{1/2}$- 3 $3p(^3P)3$ ^4P ^{4} as functions of Z.

3p²3s ²P_J - 3p³ ²P_J'

3p²3s ²P_J - 3p³ ²P_J'

Transition probabilities (s⁻¹)

J - J'
■ 1/2-1-2
○ 1/2-3/2

J - J'
■ 3/2-1/2
○ 3/2-3/2

3p²3s ²P_J - 3s3p(¹P)3d ²P_J'

3p²3s ²P_J - 3s3p(¹P)3d ²P_J'

Transition probabilities (s⁻¹)

J - J'
■ 1/2-1-2
○ 1/2-3/2

J - J'
■ 3/2-1/2
○ 3/2-3/2

3p²3s ²P_J - 3s3p(³P)3d ²P_J'

3p²3s ²P_J - 3s3p(³P)3d ²P_J'

Transition probabilities (s⁻¹)

J - J'
■ 1/2-1-2
○ 1/2-3/2

J - J'
■ 3/2-1/2
○ 3/2-3/2

Nuclear charge Z

Nuclear charge Z

FIG. III. ransition probabilities $3p^23\ ^2P\ -3p^3\ ^2P$ and $3p^23\ ^2P\ -3\ 3p(^{1\ 3}P)3\ ^2P$ as functions of Z.

13

FIG. 1. Transition probabilities $3p^23s\ ^2P - 3p^3\ ^2D$ and $3p^23s\ ^2P - 3s3p(^1{^3}P)3d\ ^2D$ as functions of Z.

14
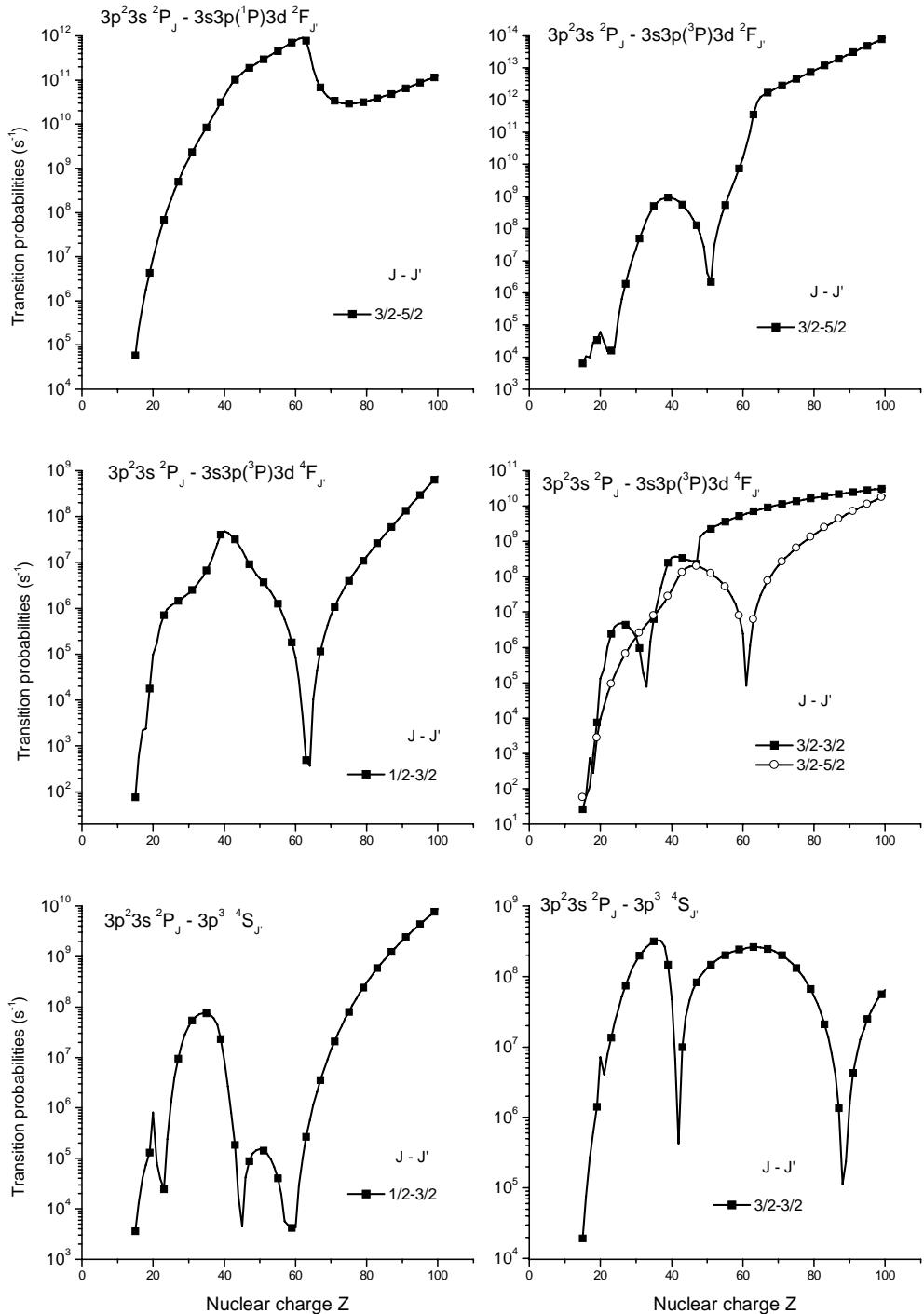
FIG. . ransition probabilities $3p^23$ ^2P -3 $3p(^{1\ 3}P)3$ $^{2\ 4}$ and $3p^23$ ^2P $-3p^3$ $^4S_{3/2}$ as functions of Z.
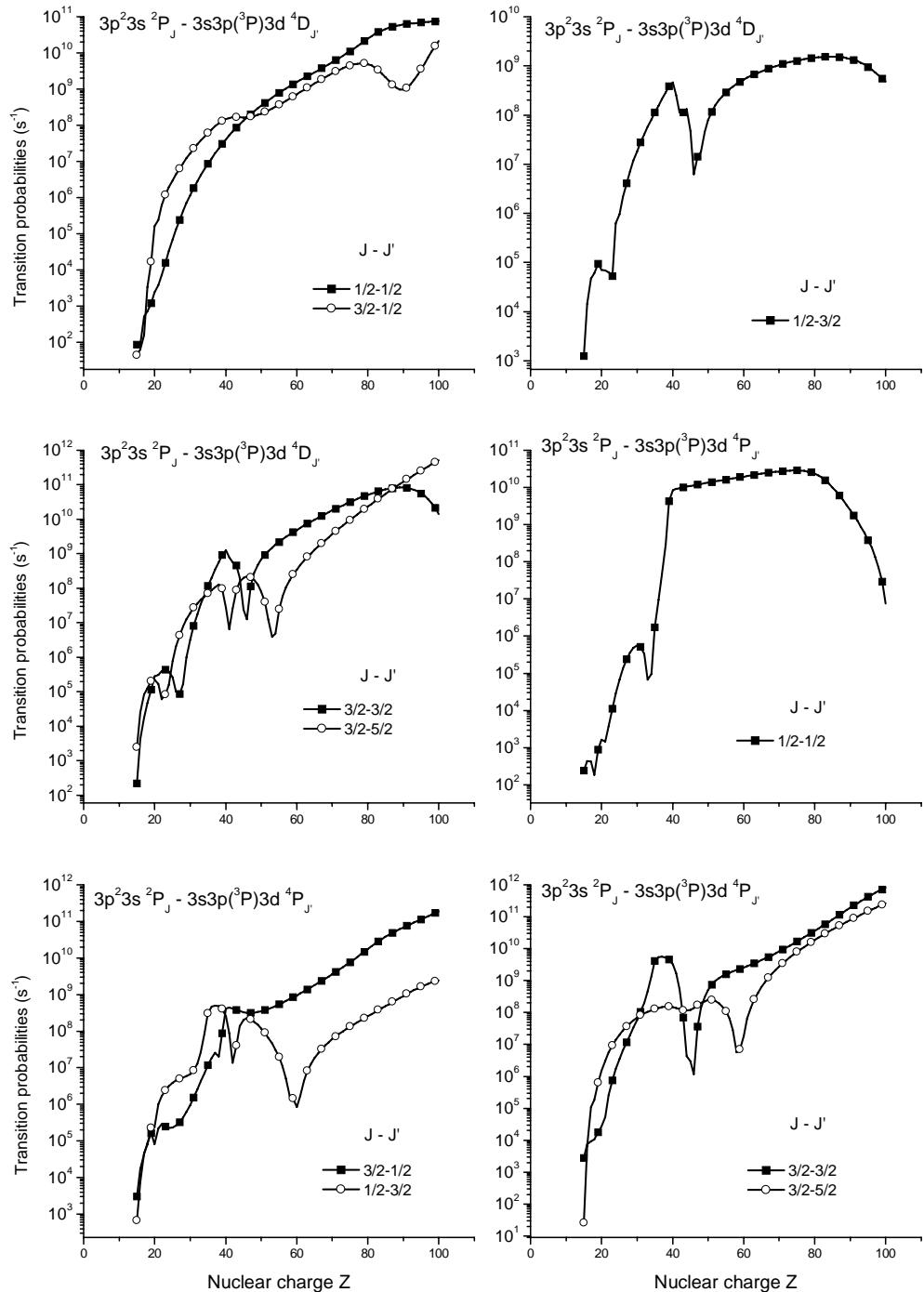
15

FIG. I. ransition probabilities $3p^2 3$ ^2P $-$ 3 $3p(^3P)3$ ^{4} ^4P as functions of Z.

FIG. II. ransition probabilities $3\,^23\,^2 - 3p^{3\,2}$ and $3\,^23\,^2 - 3\,3p(^1P)3\,^2$ as functions of Z.

FIG. III. ransition probabilities $3\ ^23\ ^2\ \ ^2\ -3\ 3p(^3P)3\ ^2\ $ and $3\ ^23\ ^2\ \ ^2\ -3\ 3p(^1P)3\ ^2\ $ as functions of Z.

18
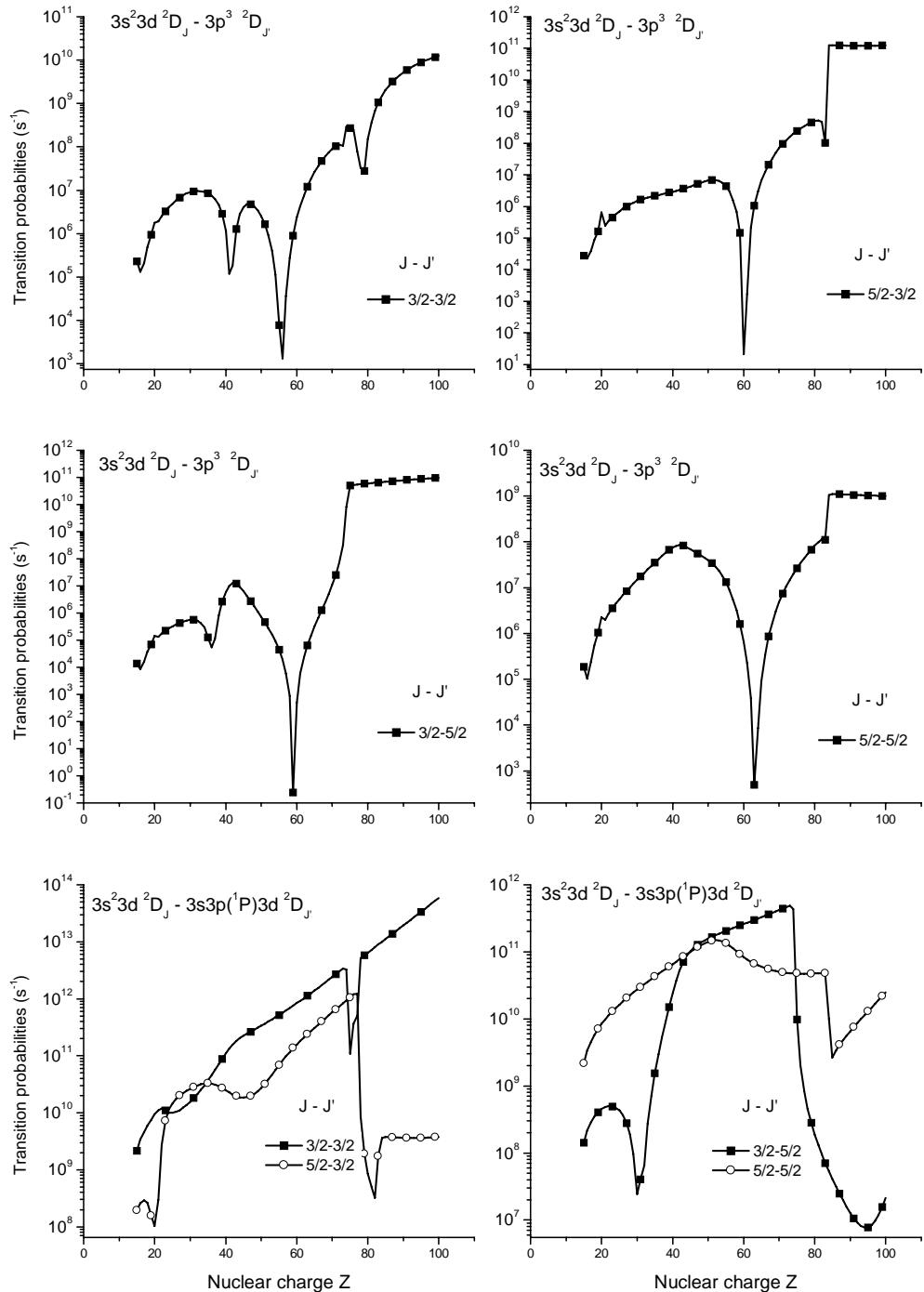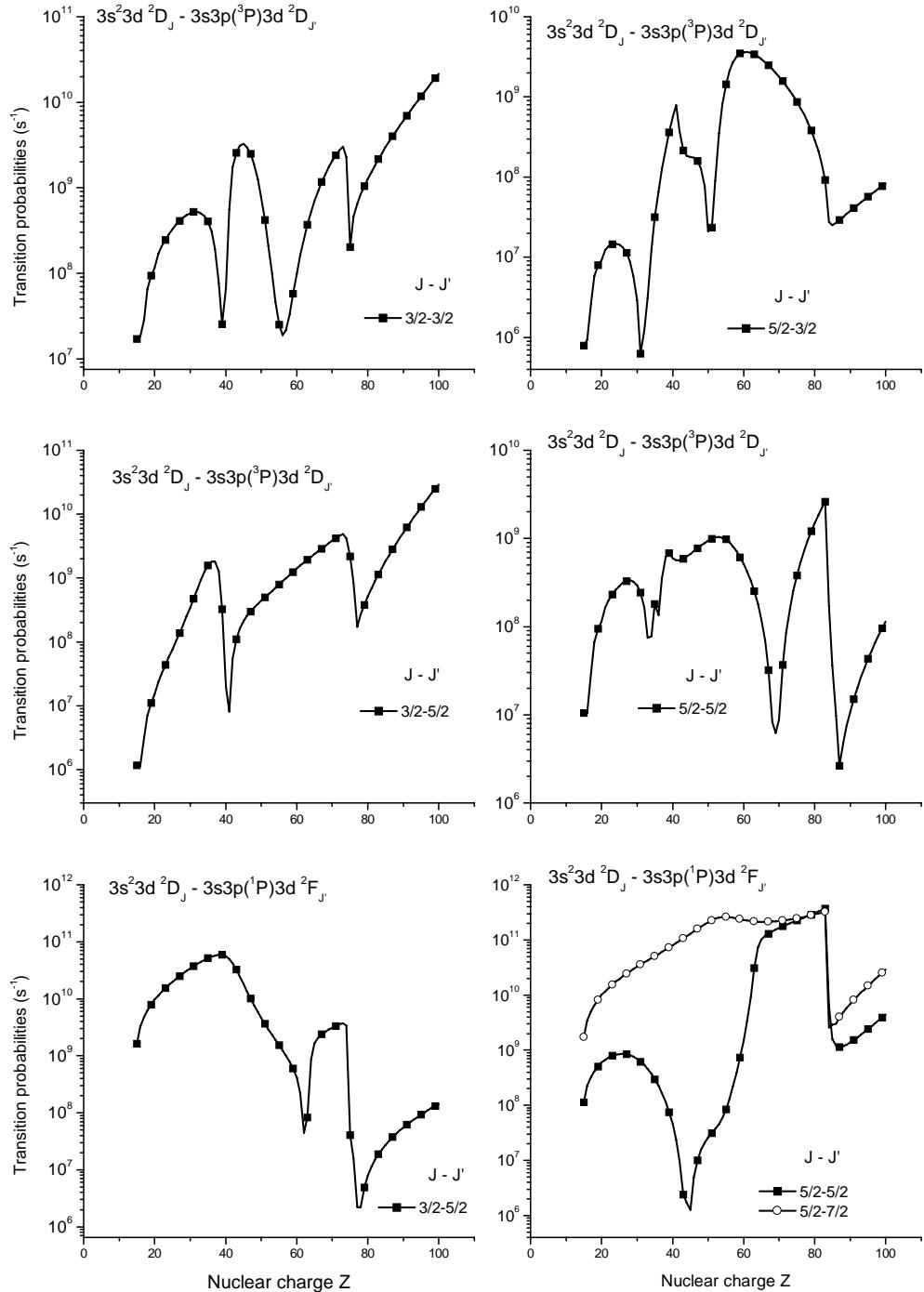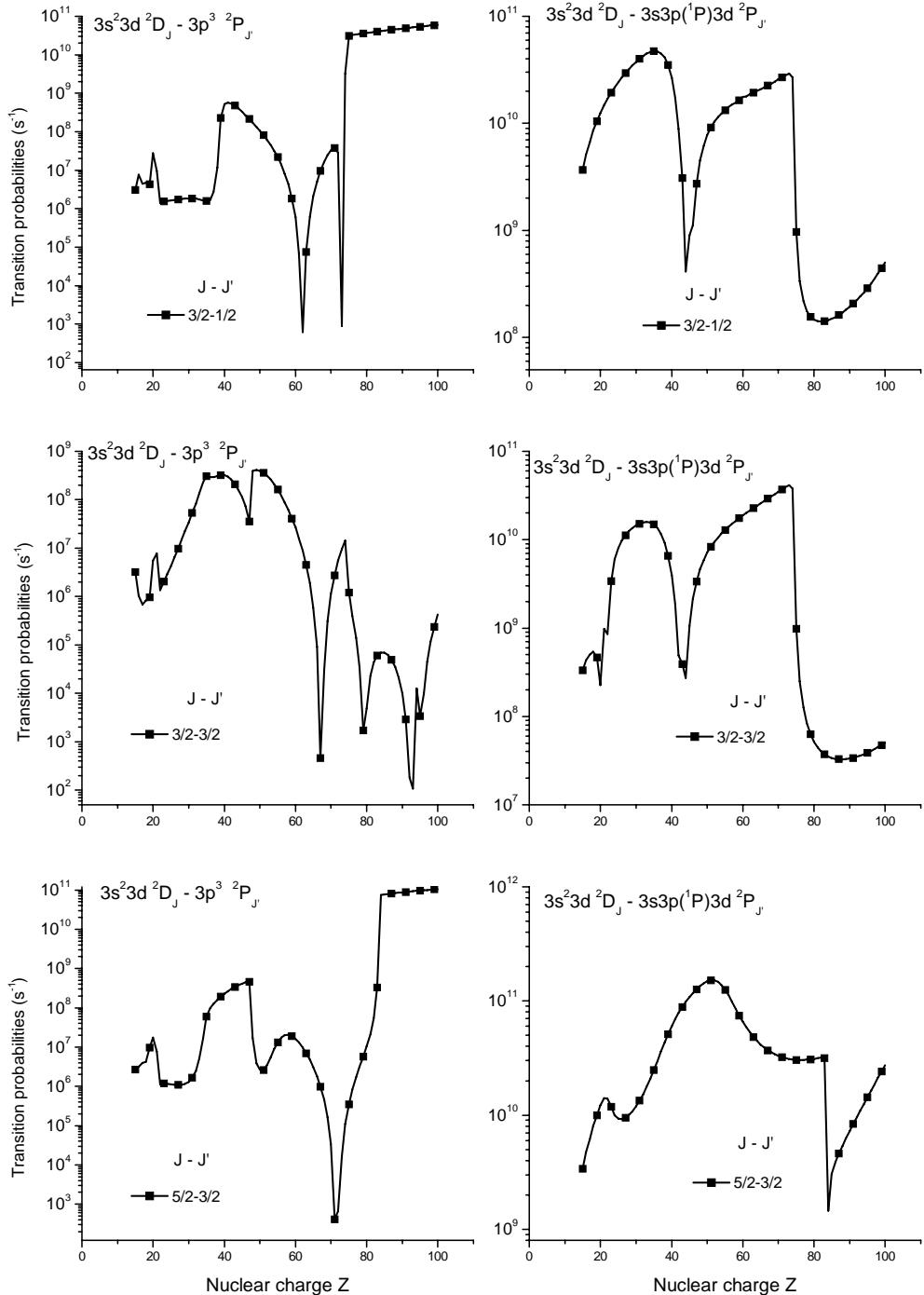
FIG. I . ransition probabilities $3\ ^23\ ^2 - 3p^3\ ^2P$ and $3\ ^23\ ^2 - 3\ 3p(^1P)3\ ^2P$ as functions of Z.

19

$3s^23d\ ^2D_J - 3s3p(^3P)3d\ ^2P_{J'}$

Transition probabilities (s^{-1})

J - J'
■ 3/2-1/2

$3s^23d\ ^2D_J - 3s3p(^3P)3d\ ^2F_{J'}$

J - J'
■ 3/2-5/2

$3s^23d\ ^2D_J - 3s3p(^3P)3d\ ^2P_{J'}$

Transition probabilities (s^{-1})

J - J'
■ 3/2-3/2

$3s^23d\ ^2D_J - 3s3p(^3P)3d\ ^2F_{J'}$

J - J'
■ 5/2-5/2

$3s^23d\ ^2D_J - 3s3p(^3P)3d\ ^2P_{J'}$

Transition probabilities (s^{-1})

J - J'
■ 5/2-3/2

Nuclear charge Z

$3s^23d\ ^2D_J - 3s3p(^3P)3d\ ^2F_{J'}$

J - J'
■ 5/2-7/2

Nuclear charge Z
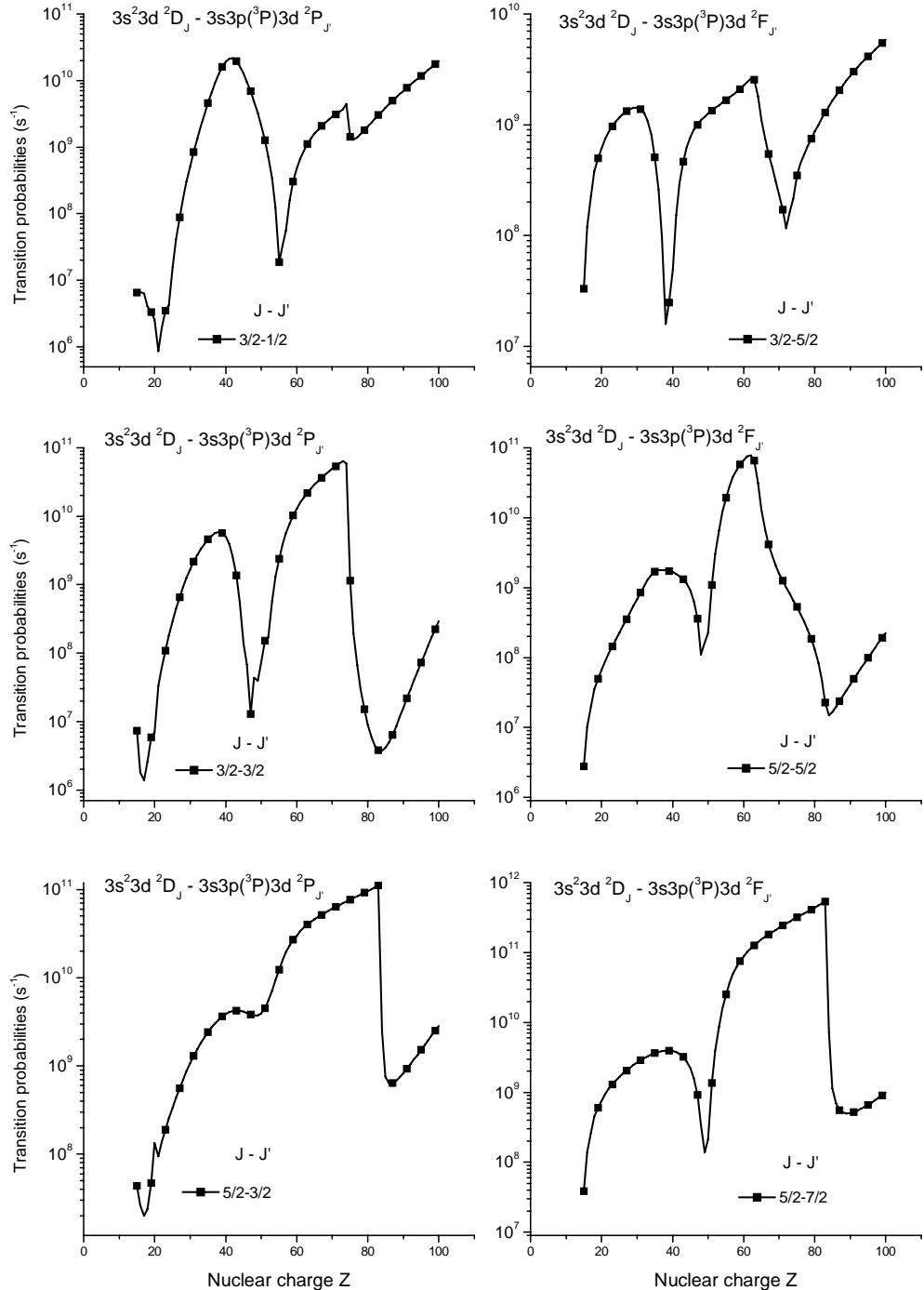
FIG. . ransition probabilities $3\ ^23\ ^2\ - 3\ 3p(^3P)3\ ^2P\ ^2$ as functions of Z.

20
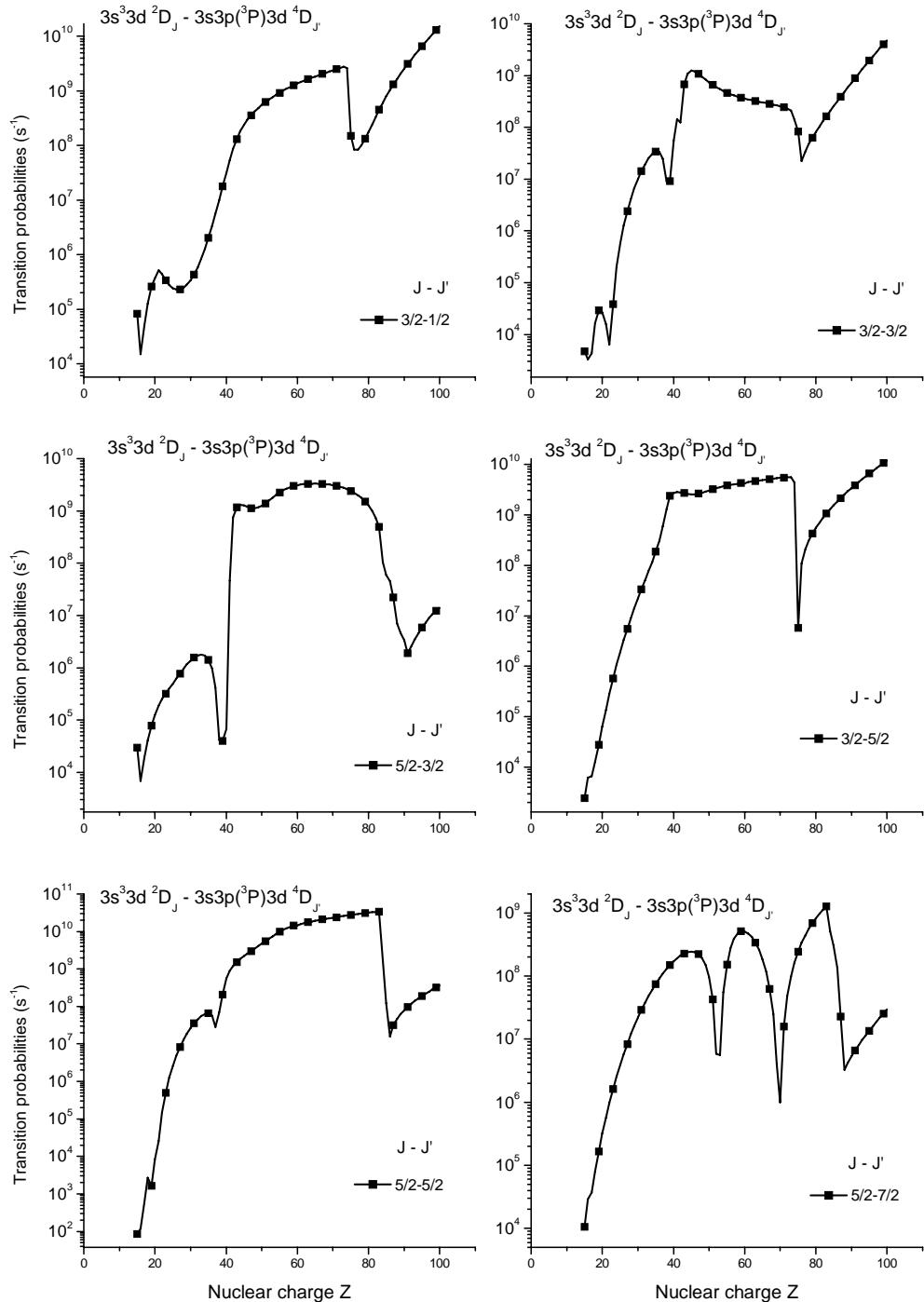
FIG. I. ransition probabilities $3\ ^23\ ^2\ -3\ 3p(^3P)3\ ^4$ as functions of Z.
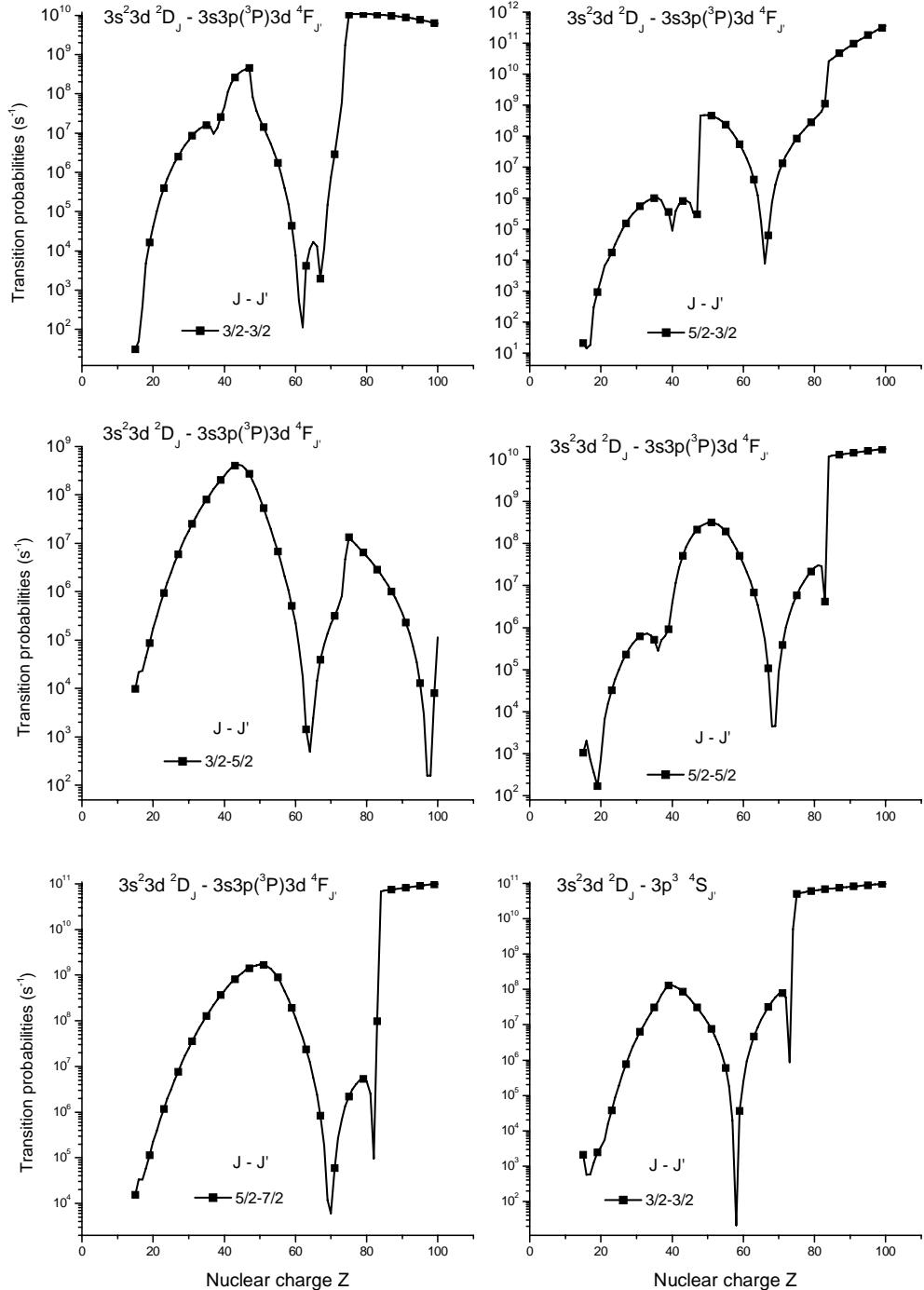
FIG. II. ransition probabilities $3\ ^23\ ^2\quad ^2\quad -3\ 3p(^3P)3\ ^4\quad$ and $3\ ^23\ ^2\quad ^2_{3/2}-3p^3\ ^4S_{3/2}$ as functions of Z.

22
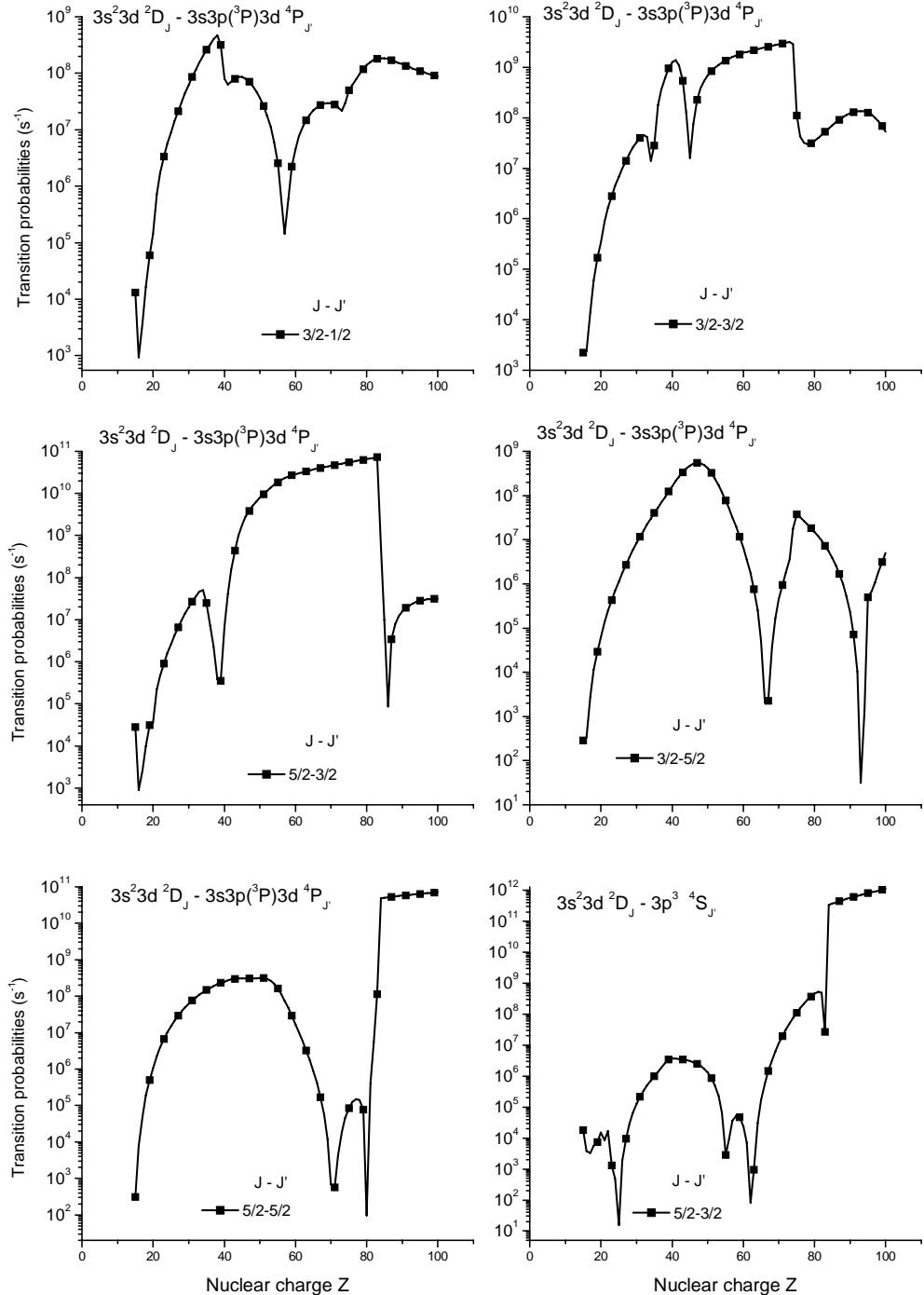
FIG. III. ransition probabilities $3\ ^2 3\ ^2\quad - 3\ 3p(^3P)3\ ^4P$ and $3\ ^2 3\ ^2\quad _{/2} - 3p^3\ ^4S_{3/2}$ as functions of Z.
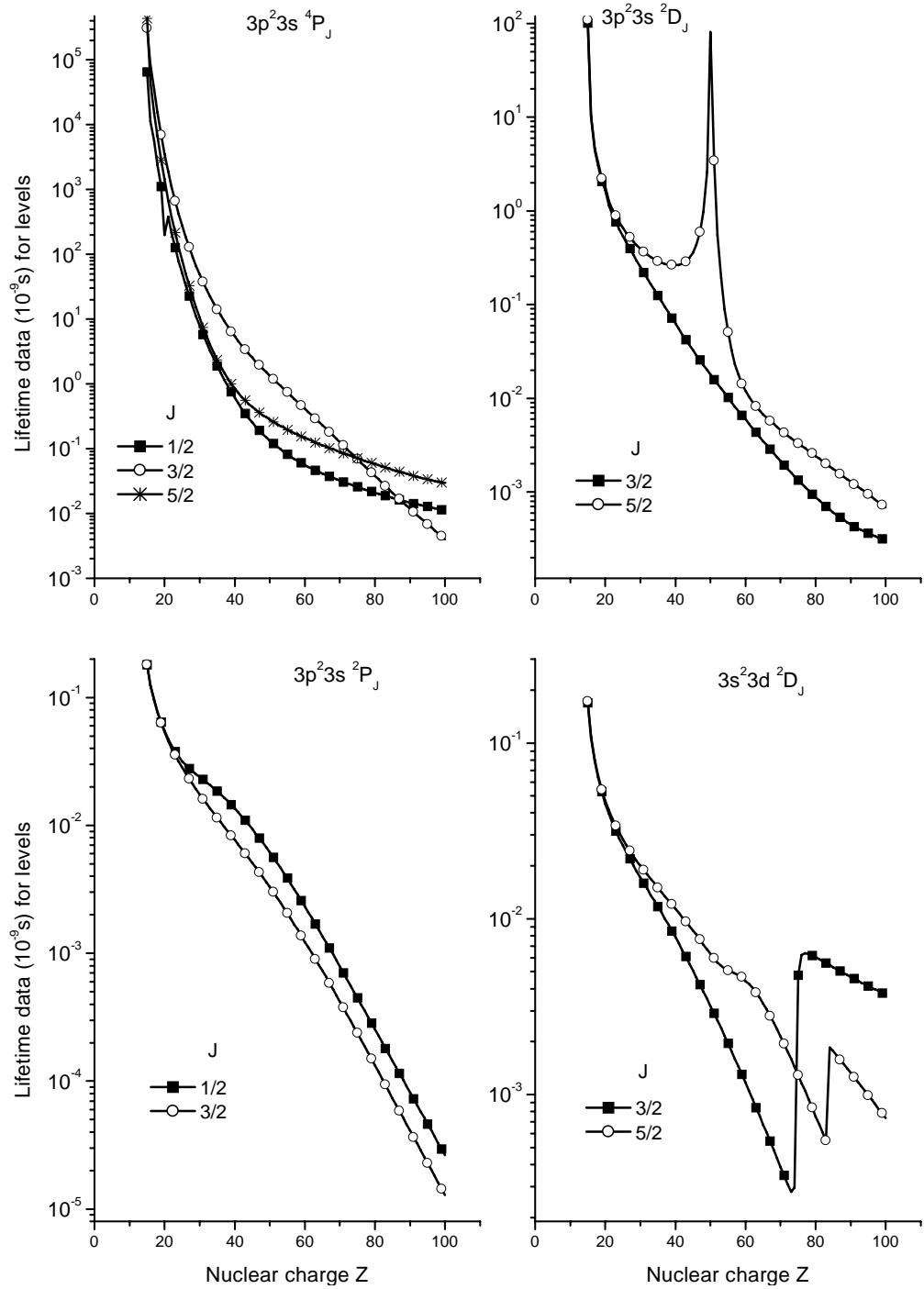
FIG. I . ifetimes of 3 $p^2 3$ $^{2\,4}P$ ^{2} and 3 $^2 3$ ^{2} levels as functions of Z.
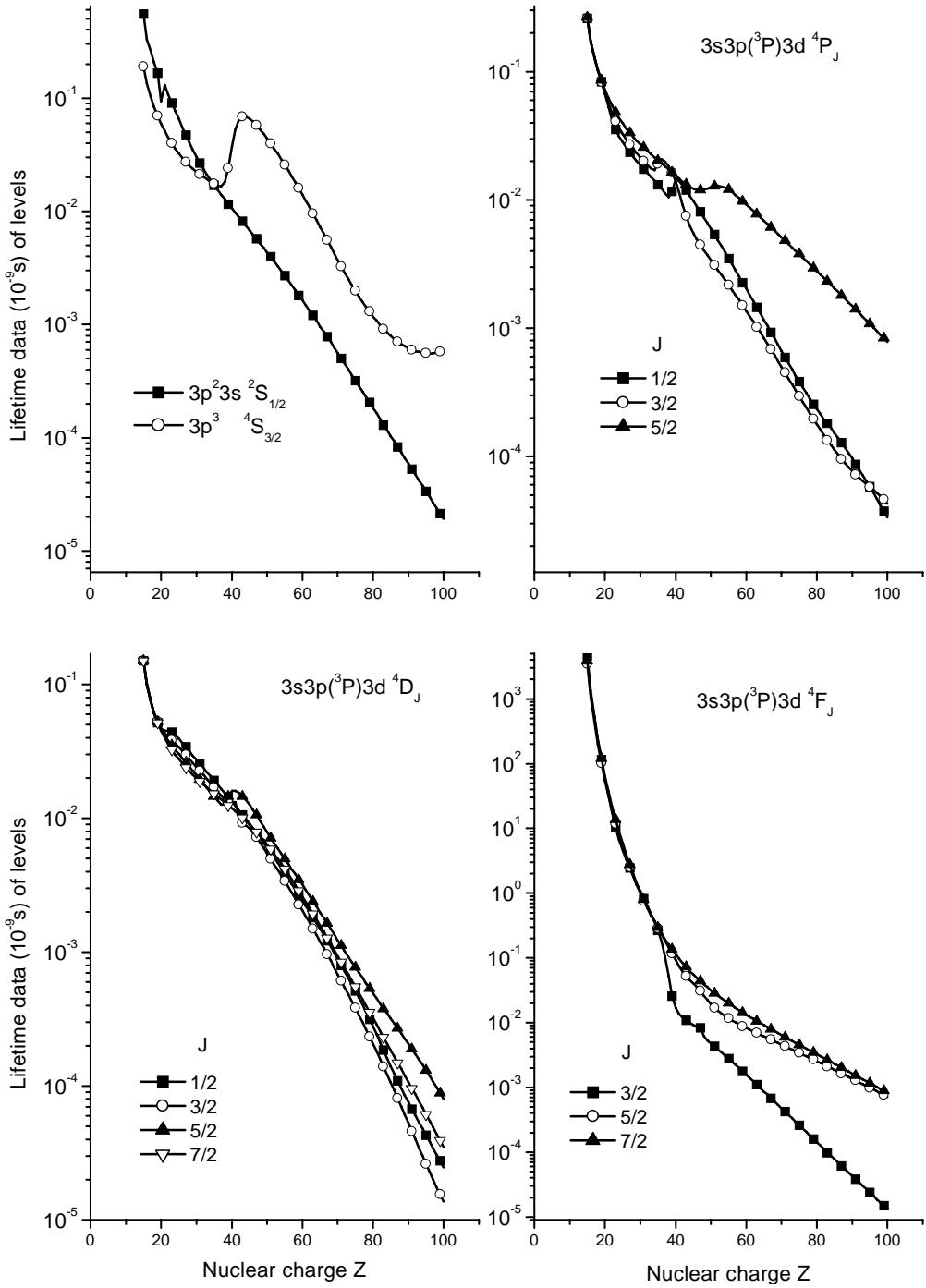
FIG. . ifetimes of 3 $p^2 3$ $^2S_{1/2}$, $3p^3$ $^4S_{3/2}$, and 3 $3p(^3P)3$ ^4P ^{4} ^{4} levels as functions of Z.
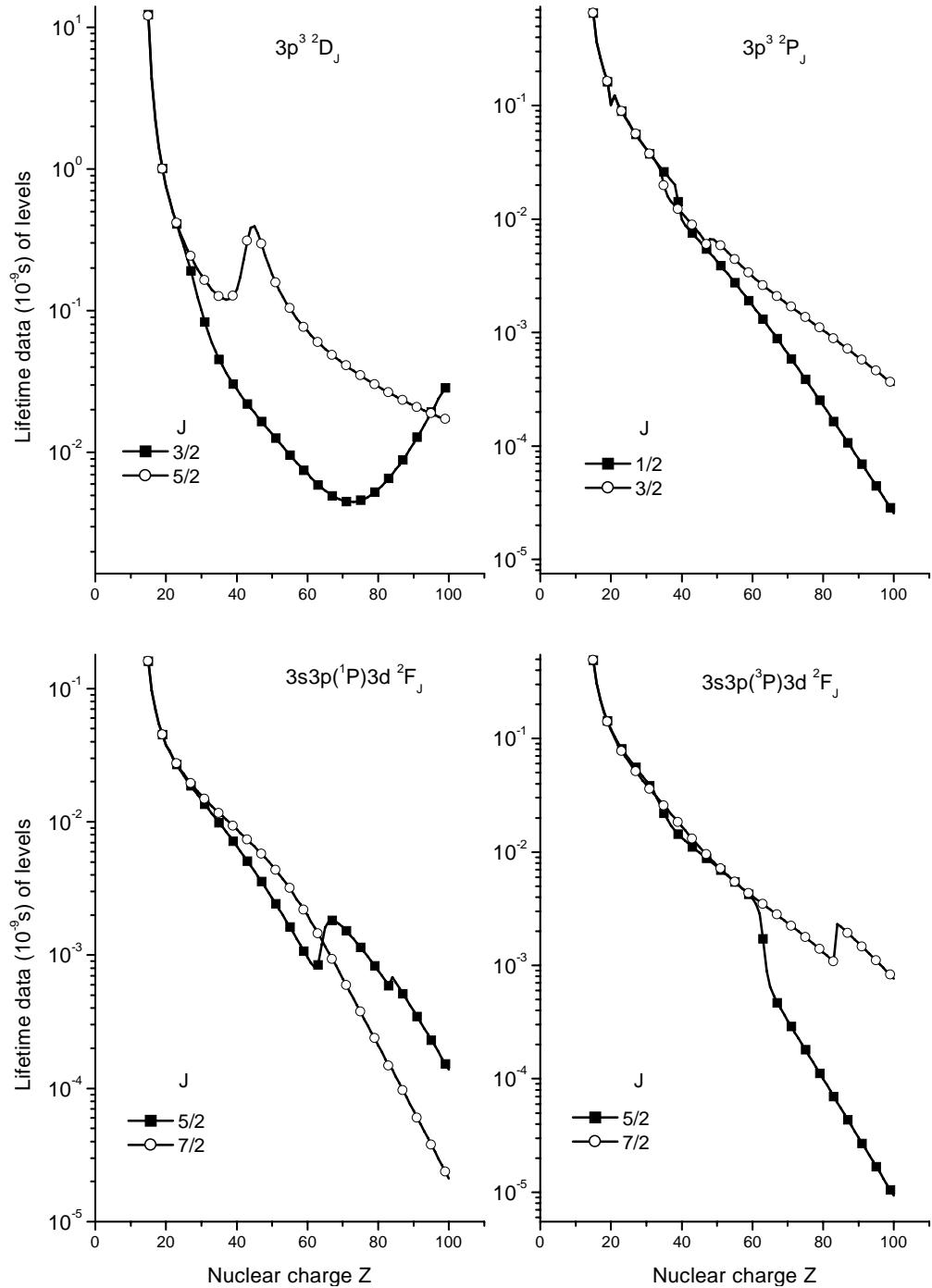
FIG. I. ifetimes of 3 $p^{3\ 2}$ ^2P , and 3 $3p(^{1\ 3}P)3$ ^{2} levels as functions of Z.
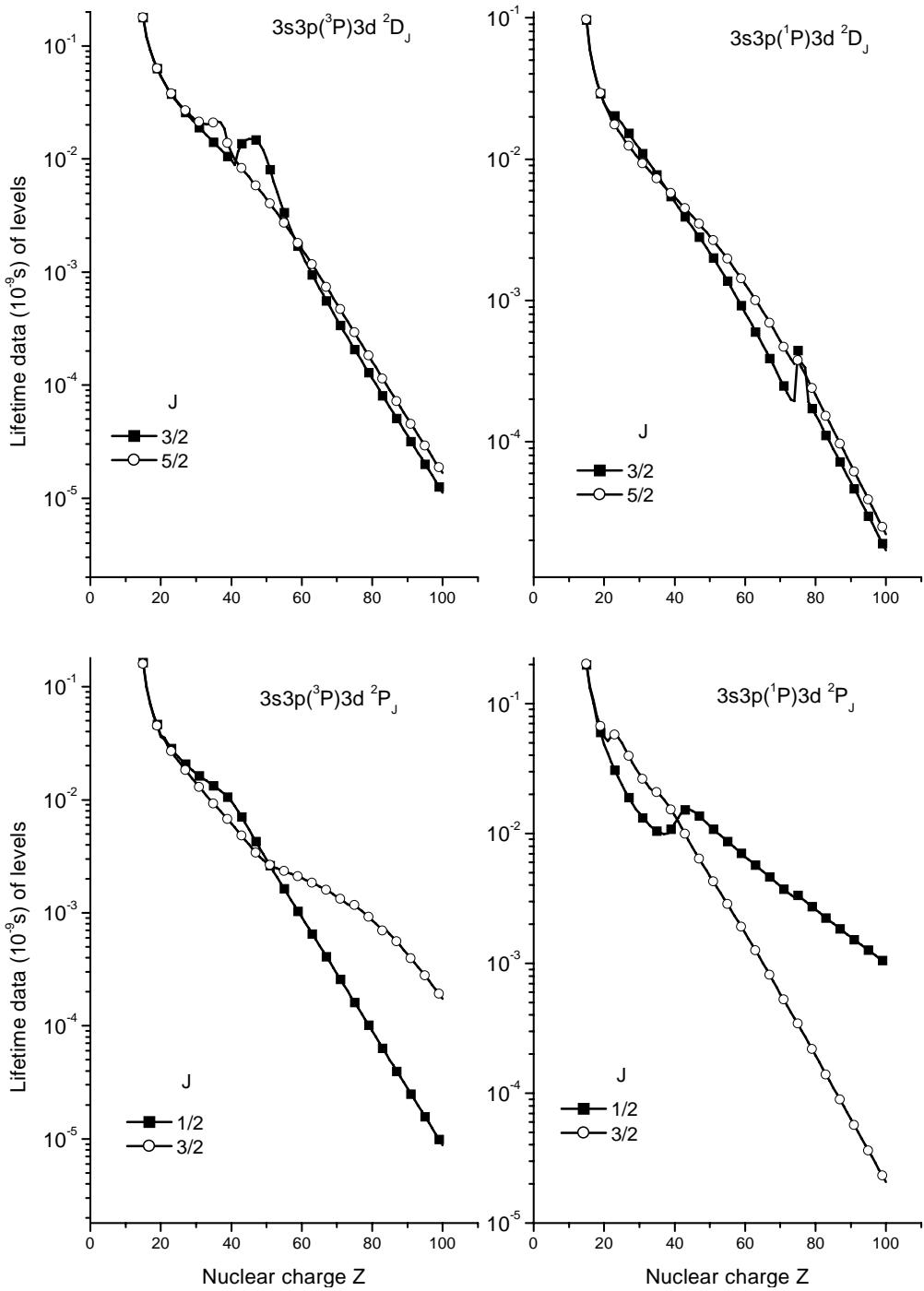
FIG.　II.　ifetimes of 3　　$3p(^{1\,3}P)3$　^{2}　　^2P　levels as functions of Z.

Table I: Wavelengths λ (Å) , transition rates A (s^{-1}), oscillator strengths f, and line strengths S (a.u.) for Al-like ions with nuclear charge Z=15-100. Numbers in brackets represent powers of 10.

Lower level	Upper level	λ	A	f	S	λ	A	f	S
					Z=15				Z=16
$s^2(^1S)d\ ^2D_{5/2}$	$sp(^1P)d\ ^2F_{7/2}$	1144.737	1.74[09]	4.56[-1]	1.03[1]	901.173	3.46[09]	5.63[-1]	1.00[1]
$s^2(^1S)d\ ^2D_{3/2}$	$sp(^1P)d\ ^2F_{5/2}$	1143.095	1.63[09]	4.78[-1]	7.23[0]	899.337	3.26[09]	5.96[-1]	7.04[0]
$p^2(^1D)s\ ^2D_{5/2}$	$p^2(^3P)p\ ^2P_{3/2}$	1108.233	1.27[09]	1.55[-1]	3.41[0]	842.376	2.16[09]	1.53[-1]	2.55[0]
$p^2(^1D)s\ ^2D_{3/2}$	$p^2(^3P)p\ ^2P_{1/2}$	1108.060	1.40[09]	1.29[-1]	1.89[0]	842.241	2.41[09]	1.29[-1]	1.43[0]
$p^2(^3P)s\ ^2P_{3/2}$	$sp(^3P)d\ ^2P_{1/2}$	1063.192	5.54[08]	4.72[-2]	6.60[-1]	761.875	1.10[09]	4.78[-2]	4.80[-1]
$p^2(^3P)s\ ^2P_{3/2}$	$sp(^3P)d\ ^2P_{3/2}$	1063.026	1.40[09]	2.37[-1]	3.33[0]	761.985	2.75[09]	2.39[-1]	2.40[0]
$s^2(^1S)p\ ^2P_{3/2}$	$p^2(^1S)s\ ^2S_{1/2}$	1059.560	1.13[09]	9.47[-2]	1.32[0]	794.524	1.81[09]	8.58[-2]	8.98[-1]
$p^2(^3P)s\ ^2P_{1/2}$	$sp(^3P)d\ ^2P_{1/2}$	1059.384	1.24[09]	2.09[-1]	1.46[0]	758.384	2.58[09]	2.22[-1]	1.11[0]
$s^2(^1S)p\ ^2P_{1/2}$	$p^2(^1S)s\ ^2S_{1/2}$	1053.270	6.84[08]	1.14[-1]	7.92[-1]	788.571	1.23[09]	1.15[-1]	5.96[-1]
$p^2(^3P)s\ ^4S_{5/2}$	$p^2(^3P)p\ ^4S_{3/2}$	989.096	2.63[09]	2.58[-1]	5.03[0]	799.699	3.69[09]	2.36[-1]	3.73[0]
$p^2(^3P)s\ ^4S_{3/2}$	$p^2(^3P)p\ ^4S_{3/2}$	985.980	1.78[09]	2.59[-1]	3.36[0]	796.346	2.50[09]	2.37[-1]	2.49[0]
$p^2(^3P)s\ ^4P_{1/2}$	$p^2(^3P)p\ ^4S_{3/2}$	984.054	8.94[08]	2.60[-1]	1.68[0]	794.252	1.26[09]	2.38[-1]	1.24[0]
$s^2(^1S)d\ ^2D_{3/2}$	$sp(^1P)d\ ^2P_{3/2}$	957.431	3.31[08]	4.55[-2]	5.74[-1]	790.479	4.30[08]	4.04[-2]	4.20[-1]
$s^2(^1S)d\ ^2D_{5/2}$	$sp(^1P)d\ ^2P_{3/2}$	957.074	3.38[09]	3.10[-1]	5.85[0]	790.458	4.75[09]	2.96[-1]	4.62[0]
$s^2(^1S)d\ ^2D_{3/2}$	$sp(^1P)d\ ^2P_{1/2}$	955.837	3.66[09]	2.51[-1]	3.15[0]	789.310	5.13[09]	2.40[-1]	2.49[0]
$s^2(^1S)d\ ^2D_{3/2}$	$sp(^1P)d\ ^2D_{3/2}$	933.498	2.16[09]	2.82[-1]	3.47[0]	764.657	3.40[09]	2.98[-1]	3.00[0]
$s^2(^1S)d\ ^2D_{5/2}$	$sp(^1P)d\ ^2D_{5/2}$	932.553	2.18[09]	2.85[-1]	5.25[0]	763.860	3.40[09]	2.97[-1]	4.49[0]
$p^2(^3P)s\ ^2P_{3/2}$	$sp(^1P)d\ ^2P_{3/2}$	909.232	2.51[09]	3.11[-1]	3.73[0]	696.949	3.82[09]	2.79[-1]	2.56[0]
$p^2(^3P)s\ ^2P_{3/2}$	$sp(^1P)d\ ^2P_{1/2}$	907.795	1.11[09]	6.84[-2]	8.18[-1]	696.040	1.74[09]	6.33[-2]	5.79[-1]
$p^2(^3P)s\ ^2P_{1/2}$	$sp(^1P)d\ ^2P_{3/2}$	906.446	6.84[08]	1.69[-1]	1.01[0]	694.026	1.21[09]	1.73[-1]	7.93[-1]
$p^2(^3P)s\ ^2P_{1/2}$	$sp(^1P)d\ ^2P_{1/2}$	905.018	2.09[09]	2.58[-1]	1.54[0]	693.125	3.20[09]	2.30[-1]	1.05[0]
$s^2(^1S)p\ ^2P_{3/2}$	$p^2(^3P)s\ ^2P_{1/2}$	903.971	1.95[09]	1.19[-1]	1.42[0]	751.821	2.85[09]	1.21[-1]	1.20[0]
$p^2(^1S)s\ ^2S_{1/2}$	$sp(^3P)d\ ^2P_{1/2}$	903.843	4.20[09]	5.14[-1]	3.06[0]	719.382	6.30[09]	4.90[-1]	2.32[0]
$p^2(^1S)s\ ^2S_{1/2}$	$sp(^3P)d\ ^2P_{3/2}$	903.723	4.45[09]	1.09[0]	6.48[0]	719.480	6.86[09]	1.06[0]	5.02[0]
$s^2(^1S)p\ ^2P_{3/2}$	$p^2(^3P)s\ ^2P_{3/2}$	901.217	4.59[09]	5.58[-1]	6.64[0]	748.421	6.63[09]	5.59[-1]	5.49[0]
$s^2(^1S)p\ ^2P_{1/2}$	$p^2(^3P)s\ ^2P_{1/2}$	899.389	3.58[09]	4.34[-1]	2.57[0]	746.489	5.10[09]	4.27[-1]	2.10[0]
$s^2(^1S)p\ ^2P_{1/2}$	$p^2(^3P)s\ ^2P_{3/2}$	896.662	9.56[08]	2.31[-1]	1.36[0]	743.137	1.38[09]	2.28[-1]	1.12[0]
$p^2(^1D)s\ ^2D_{5/2}$	$sp(^3P)d\ ^2D_{3/2}$	892.498	5.47[08]	4.35[-2]	7.66[-1]	713.846	7.93[08]	4.03[-2]	5.69[-1]
$p^2(^1D)s\ ^2D_{5/2}$	$sp(^3P)d\ ^2D_{5/2}$	892.471	5.23[09]	6.25[-1]	1.10[1]	713.947	7.67[09]	5.87[-1]	8.26[0]
$p^2(^1D)s\ ^2D_{3/2}$	$sp(^3P)d\ ^2D_{3/2}$	892.275	5.04[09]	6.06[-1]	7.10[0]	713.656	7.45[09]	5.71[-1]	5.35[0]
$p^2(^3P)s\ ^2P_{3/2}$	$sp(^1P)d\ ^2D_{3/2}$	887.621	1.48[09]	1.75[-1]	2.05[0]	676.797	2.57[09]	1.77[-1]	1.58[0]
$p^2(^3P)s\ ^2P_{3/2}$	$sp(^1P)d\ ^2D_{5/2}$	887.073	7.96[09]	1.41[0]	1.64[1]	676.189	1.32[10]	1.36[0]	1.21[1]
$p^2(^3P)s\ ^2P_{1/2}$	$sp(^1P)d\ ^2D_{3/2}$	884.965	6.49[09]	1.52[0]	8.86[0]	674.041	1.06[10]	1.45[0]	6.41[0]
$p^2(^1D)s\ ^2D_{3/2}$	$sp(^3P)d\ ^2F_{5/2}$	879.340	1.87[09]	3.25[-1]	3.77[0]	683.711	2.89[09]	3.03[-1]	2.73[0]
$p^2(^1D)s\ ^2D_{5/2}$	$sp(^3P)d\ ^2F_{7/2}$	875.977	2.01[09]	3.09[-1]	5.37[0]	680.265	3.12[09]	2.88[-1]	3.87[0]
$s^2(^1S)p\ ^2P_{3/2}$	$s^2(^1S)d\ ^2D_{5/2}$	858.672	5.83[09]	9.63[-1]	1.10[1]	664.063	9.20[09]	9.14[-1]	7.99[0]
$s^2(^1S)p\ ^2P_{3/2}$	$s^2(^1S)d\ ^2D_{3/2}$	858.385	9.99[08]	1.11[-1]	1.25[0]	664.047	1.58[09]	1.05[-1]	9.14[-1]
$p^2(^3P)s\ ^4P_{5/2}$	$sp(^3P)d\ ^4P_{5/2}$	855.610	2.35[09]	2.58[-1]	4.37[0]	670.209	3.36[09]	2.26[-1]	2.99[0]
$p^2(^3P)s\ ^4P_{5/2}$	$sp(^3P)d\ ^4P_{3/2}$	854.268	1.61[09]	1.18[-1]	1.98[0]	668.883	2.36[09]	1.06[-1]	1.39[0]
$s^2(^1S)p\ ^2P_{1/2}$	$s^2(^1S)d\ ^2D_{3/2}$	854.253	4.91[09]	1.08[0]	6.04[0]	659.884	7.73[09]	1.01[0]	4.40[0]
$p^2(^3P)s\ ^4P_{3/2}$	$sp(^3P)d\ ^4P_{5/2}$	853.277	1.44[09]	2.37[-1]	2.66[0]	667.853	2.41[09]	2.43[-1]	2.13[0]
$p^2(^3P)s\ ^4P_{3/2}$	$sp(^3P)d\ ^4P_{1/2}$	851.078	3.05[09]	1.66[-1]	1.86[0]	665.642	4.51[09]	1.50[-1]	1.32[0]
$p^2(^3P)s\ ^4P_{1/2}$	$sp(^3P)d\ ^4P_{3/2}$	850.504	1.86[09]	4.02[-1]	2.25[0]	665.068	3.02[09]	4.00[-1]	1.75[0]
$p^2(^3P)s\ ^4P_{1/2}$	$sp(^3P)d\ ^4P_{1/2}$	849.642	7.79[08]	8.45[-2]	4.72[-1]	664.179	1.31[09]	8.69[-2]	3.80[-1]
$p^2(^3P)s\ ^4P_{5/2}$	$sp(^3P)d\ ^4D_{3/2}$	841.946	4.27[08]	3.02[-2]	5.02[-1]	659.233	7.24[08]	3.14[-2]	4.09[-1]
$p^2(^3P)s\ ^4P_{5/2}$	$sp(^3P)d\ ^4D_{5/2}$	841.512	2.28[09]	2.42[-1]	4.02[0]	658.784	3.64[09]	2.37[-1]	3.08[0]
$p^2(^3P)s\ ^4P_{5/2}$	$sp(^3P)d\ ^4D_{7/2}$	841.151	6.61[09]	9.38[-1]	1.55[1]	658.441	9.96[09]	8.60[-1]	1.12[1]
$p^2(^3P)s\ ^4P_{3/2}$	$sp(^3P)d\ ^4D_{1/2}$	840.039	1.24[09]	6.57[-2]	7.28[-1]	657.340	1.99[09]	6.48[-2]	5.60[-1]
$p^2(^3P)s\ ^4P_{3/2}$	$sp(^3P)d\ ^4D_{3/2}$	839.688	3.69[09]	3.90[-1]	4.32[0]	656.953	5.67[09]	3.67[-1]	3.17[0]
$p^2(^3P)s\ ^4P_{3/2}$	$sp(^3P)d\ ^4D_{5/2}$	839.256	4.33[09]	6.85[-1]	7.60[0]	656.507	6.30[09]	6.11[-1]	5.28[0]

1

Lower level	Upper level	λ	A	f	S	λ	A	f	S
					Z=17				Z=18
$s^2(^1S)d\ ^2D_{5/2}$	$sp(^1P)d\ ^2F_{7/2}$	738.759	5.06[09]	5.50[-1]	8.06[0]	636.428	6.53[09]	5.28[-1]	6.64[0]
$s^2(^1S)d\ ^2D_{3/2}$	$sp(^1P)d\ ^2F_{5/2}$	736.811	4.80[09]	5.85[-1]	5.68[0]	634.254	6.21[09]	5.64[-1]	4.70[0]
$p^2(^1D)s\ ^2D_{5/2}$	$p^2(^3P)p\ ^2P_{3/2}$	716.930	2.80[09]	1.44[-1]	2.04[0]	620.929	3.52[09]	1.36[-1]	1.66[0]
$p^2(^1D)s\ ^2D_{3/2}$	$p^2(^3P)p\ ^2P_{1/2}$	716.354	3.14[09]	1.21[-1]	1.14[0]	620.439	3.98[09]	1.15[-1]	9.39[-1]
$s^2(^1S)p\ ^2P_{3/2}$	$p^2(^1S)s\ ^2S_{1/2}$	686.474	2.15[09]	7.60[-2]	6.88[-1]	596.643	2.56[09]	6.81[-2]	5.37[-1]
$p^2(^3P)s\ ^4P_{5/2}$	$p^2(^3P)p\ ^4S_{3/2}$	683.868	4.72[09]	2.22[-1]	2.99[0]	595.150	5.86[09]	2.08[-1]	2.44[0]
$p^2(^3P)s\ ^4P_{3/2}$	$p^2(^3P)p\ ^4S_{3/2}$	679.963	3.22[09]	2.23[-1]	2.00[0]	590.822	4.00[09]	2.09[-1]	1.63[0]
$s^2(^1S)p\ ^2P_{1/2}$	$p^2(^1S)s\ ^2S_{1/2}$	679.509	1.67[09]	1.16[-1]	5.18[-1]	588.883	2.29[09]	1.19[-1]	4.62[-1]
$p^2(^3P)s\ ^4P_{1/2}$	$p^2(^3P)p\ ^4S_{3/2}$	677.494	1.63[09]	2.24[-1]	1.00[0]	588.050	2.03[09]	2.11[-1]	8.15[-1]
$s^2(^1S)d\ ^2D_{5/2}$	$sp(^1P)d\ ^2P_{3/2}$	673.314	6.17[09]	2.81[-1]	3.73[0]	581.182	8.08[09]	2.73[-1]	3.13[0]
$s^2(^1S)d\ ^2D_{3/2}$	$sp(^1P)d\ ^2P_{1/2}$	673.127	6.64[09]	2.26[-1]	2.00[0]	580.699	8.63[09]	2.18[-1]	1.66[0]
$s^2(^1S)d\ ^2D_{3/2}$	$sp(^1P)d\ ^2D_{3/2}$	649.587	4.59[09]	2.92[-1]	2.50[0]	564.487	5.95[09]	2.84[-1]	2.11[0]
$s^2(^1S)d\ ^2D_{5/2}$	$sp(^1P)d\ ^2D_{5/2}$	648.779	4.55[09]	2.88[-1]	3.69[0]	563.672	5.76[09]	2.75[-1]	3.06[0]
$s^2(^1S)p\ ^2P_{3/2}$	$p^2(^3P)s\ ^2P_{1/2}$	639.709	3.84[09]	1.18[-1]	9.93[-1]	556.395	4.92[09]	1.14[-1]	8.36[-1]
$s^2(^1S)p\ ^2P_{3/2}$	$p^2(^3P)s\ ^2P_{3/2}$	635.827	8.66[09]	5.27[-1]	4.41[0]	552.132	1.08[10]	4.91[-1]	3.57[0]
$s^2(^1S)p\ ^2P_{1/2}$	$p^2(^3P)s\ ^2P_{1/2}$	633.657	6.57[09]	3.95[-1]	1.65[0]	549.640	7.94[09]	3.60[-1]	1.30[0]
$s^2(^1S)p\ ^2P_{1/2}$	$p^2(^3P)s\ ^2P_{3/2}$	629.848	1.81[09]	2.16[-1]	8.97[-1]	545.480	2.26[09]	2.02[-1]	7.25[-1]
$p^2(^3P)s\ ^2P_{3/2}$	$sp(^3P)d\ ^2P_{3/2}$	617.557	4.11[09]	2.36[-1]	1.92[0]	519.099	5.22[09]	2.12[-1]	1.44[0]
$p^2(^3P)s\ ^2P_{3/2}$	$sp(^3P)d\ ^2P_{1/2}$	616.283	1.66[09]	4.73[-2]	3.85[-1]	517.823	2.13[09]	4.28[-2]	2.92[-1]
$p^2(^3P)s\ ^2P_{1/2}$	$sp(^3P)d\ ^2P_{3/2}$	613.939	7.79[08]	8.78[-2]	3.55[-1]	515.386	9.57[08]	7.64[-2]	2.59[-1]
$p^2(^3P)s\ ^2P_{1/2}$	$sp(^3P)d\ ^2P_{1/2}$	612.680	4.09[09]	2.30[-1]	9.29[-1]	514.128	5.56[09]	2.21[-1]	7.46[-1]
$p^2(^1D)s\ ^2D_{5/2}$	$sp(^3P)d\ ^2D_{5/2}$	597.842	9.93[09]	5.30[-1]	6.26[0]	508.492	1.21[10]	4.70[-1]	4.72[0]
$p^2(^1D)s\ ^2D_{5/2}$	$sp(^3P)d\ ^2D_{3/2}$	597.734	1.02[09]	3.62[-2]	4.29[-1]	508.379	1.23[09]	3.18[-2]	3.20[-1]
$p^2(^1D)s\ ^2D_{3/2}$	$sp(^3P)d\ ^2D_{5/2}$	597.611	7.51[08]	6.05[-2]	4.74[-1]	508.226	9.35[08]	5.45[-2]	3.64[-1]
$p^2(^1D)s\ ^2D_{3/2}$	$sp(^3P)d\ ^2D_{3/2}$	597.504	9.67[09]	5.14[-1]	4.06[0]	508.113	1.19[10]	4.57[-1]	3.06[0]
$p^2(^1S)s\ ^2S_{1/2}$	$sp(^3P)d\ ^2P_{3/2}$	576.264	9.43[09]	9.40[-1]	3.57[0]	485.076	1.20[10]	8.43[-1]	2.69[0]
$p^2(^1S)s\ ^2S_{1/2}$	$sp(^3P)d\ ^2P_{1/2}$	575.154	8.36[09]	4.16[-1]	1.58[0]	483.961	1.01[10]	3.56[-1]	1.13[0]
$p^2(^3P)s\ ^2P_{3/2}$	$sp(^1P)d\ ^2P_{3/2}$	574.803	4.95[09]	2.46[-1]	1.86[0]	483.633	5.29[09]	1.86[-1]	1.18[0]
$p^2(^3P)s\ ^2P_{3/2}$	$sp(^1P)d\ ^2P_{1/2}$	574.708	2.36[09]	5.85[-2]	4.42[-1]	483.416	2.75[09]	4.82[-2]	3.07[-1]
$p^2(^3P)s\ ^2P_{1/2}$	$sp(^1P)d\ ^2P_{3/2}$	571.667	1.86[09]	1.81[-1]	6.84[-1]	480.409	2.69[09]	1.85[-1]	5.88[-1]
$p^2(^3P)s\ ^2P_{1/2}$	$sp(^1P)d\ ^2P_{1/2}$	571.573	4.22[09]	2.07[-1]	7.78[-1]	480.195	4.66[09]	1.61[-1]	5.10[-1]
$p^2(^1D)s\ ^2D_{3/2}$	$sp(^3P)d\ ^2F_{5/2}$	562.832	3.97[09]	2.82[-1]	2.09[0]	473.279	4.89[09]	2.47[-1]	1.54[0]
$p^2(^1D)s\ ^2D_{5/2}$	$sp(^3P)d\ ^2F_{7/2}$	559.264	4.31[09]	2.69[-1]	2.97[0]	469.602	5.35[09]	2.36[-1]	2.19[0]
$p^2(^3P)s\ ^2P_{3/2}$	$sp(^1P)d\ ^2D_{3/2}$	557.461	3.80[09]	1.77[-1]	1.30[0]	472.128	5.11[09]	1.70[-1]	1.06[0]
$p^2(^3P)s\ ^2P_{3/2}$	$sp(^1P)d\ ^2D_{5/2}$	556.826	1.81[10]	1.27[0]	9.27[0]	471.446	2.22[10]	1.12[0]	6.92[0]
$p^2(^3P)s\ ^2P_{1/2}$	$sp(^1P)d\ ^2D_{3/2}$	554.511	1.43[10]	1.32[0]	4.82[0]	469.055	1.71[10]	1.13[0]	3.48[0]
$p^2(^3P)s\ ^4P_{5/2}$	$sp(^3P)d\ ^4P_{5/2}$	549.961	4.07[09]	1.85[-1]	2.01[0]	468.713	4.48[09]	1.48[-1]	1.37[0]
$p^2(^3P)s\ ^4P_{5/2}$	$sp(^3P)d\ ^4P_{3/2}$	548.618	2.95[09]	8.89[-2]	9.64[-1]	467.337	3.36[09]	7.36[-2]	6.78[-1]
$p^2(^3P)s\ ^4P_{3/2}$	$sp(^3P)d\ ^4P_{5/2}$	547.433	3.61[09]	2.44[-1]	1.75[0]	466.024	5.16[09]	2.52[-1]	1.54[0]
$s^2(^1S)p\ ^2P_{3/2}$	$s^2(^1S)d\ ^2D_{3/2}$	547.297	2.16[09]	9.65[-2]	6.98[-1]	463.454	2.67[09]	8.57[-2]	5.24[-1]
$s^2(^1S)p\ ^2P_{3/2}$	$s^2(^1S)d\ ^2D_{5/2}$	547.259	1.25[10]	8.41[-1]	6.07[0]	463.346	1.53[10]	7.40[-1]	4.52[0]
$p^2(^3P)s\ ^4P_{3/2}$	$sp(^3P)d\ ^4P_{1/2}$	545.151	5.74[09]	1.28[-1]	9.19[-1]	463.619	6.61[09]	1.07[-1]	6.51[-1]
$p^2(^3P)s\ ^4P_{1/2}$	$sp(^3P)d\ ^4P_{3/2}$	544.509	4.41[09]	3.93[-1]	1.41[0]	462.948	6.21[09]	4.00[-1]	1.22[0]
$p^2(^3P)s\ ^4P_{1/2}$	$sp(^3P)d\ ^4P_{1/2}$	543.563	2.03[09]	9.01[-2]	3.23[-1]	461.910	3.17[09]	1.01[-1]	3.09[-1]
$s^2(^1S)p\ ^2P_{1/2}$	$s^2(^1S)d\ ^2D_{3/2}$	542.861	1.06[10]	9.39[-1]	3.35[0]	458.758	1.30[10]	8.24[-1]	2.49[0]
$p^2(^3P)s\ ^4P_{5/2}$	$sp(^3P)d\ ^4D_{3/2}$	541.297	1.12[09]	3.31[-2]	3.53[-1]	461.639	1.71[09]	3.62[-2]	3.31[-1]
$p^2(^3P)s\ ^4P_{5/2}$	$sp(^3P)d\ ^4D_{5/2}$	540.823	5.22[09]	2.29[-1]	2.44[0]	461.136	7.03[09]	2.24[-1]	2.04[0]
$p^2(^3P)s\ ^4P_{5/2}$	$sp(^3P)d\ ^4D_{7/2}$	540.504	1.32[10]	7.69[-1]	8.22[0]	460.855	1.63[10]	6.93[-1]	6.31[0]
$p^2(^3P)s\ ^4P_{3/2}$	$sp(^3P)d\ ^4D_{1/2}$	539.297	2.92[09]	6.38[-2]	4.52[-1]	459.576	4.17[09]	6.63[-2]	4.01[-1]
$p^2(^1S)s\ ^2S_{1/2}$	$sp(^1P)d\ ^2P_{3/2}$	538.862	2.18[09]	1.90[-1]	6.73[-1]	453.967	3.09[09]	1.90[-1]	5.70[-1]

Lower level	Upper level	λ	A	f	S	λ	A	f	S
					Z=19				Z=20
$s^2(^1S)d\ ^2D_{5/2}$	$sp(^1P)d\ ^2F_{7/2}$	554.799	8.19[09]	5.06[-1]	5.53[0]	484.034	1.02[10]	4.76[-1]	4.54[0]
$s^2(^1S)d\ ^2D_{3/2}$	$sp(^1P)d\ ^2F_{5/2}$	552.418	7.84[09]	5.37[-1]	3.92[0]	481.935	9.79[09]	5.11[-1]	3.24[0]
$p^2(^1D)s\ ^2D_{5/2}$	$p^2(^3P)p\ ^2P_{3/2}$	547.040	4.28[09]	1.28[-1]	1.38[0]	485.907	6.49[09]	1.53[-1]	1.47[0]
$p^2(^1D)s\ ^2D_{3/2}$	$p^2(^3P)p\ ^2P_{1/2}$	546.661	4.88[09]	1.10[-1]	7.87[-1]	492.263	7.18[09]	1.30[-1]	8.46[-1]
$s^2(^1S)p\ ^2P_{3/2}$	$p^2(^1S)s\ ^2S_{1/2}$	526.655	2.92[09]	6.07[-2]	4.21[-1]	461.961	5.09[09]	8.17[-2]	4.96[-1]
$p^2(^3P)s\ ^4P_{5/2}$	$p^2(^3P)p\ ^4S_{3/2}$	526.564	7.02[09]	1.95[-1]	2.03[0]	472.055	8.23[09]	1.84[-1]	1.72[0]
$p^2(^3P)s\ ^4P_{3/2}$	$p^2(^3P)p\ ^4S_{3/2}$	521.810	4.81[09]	1.97[-1]	1.35[0]	466.867	5.69[09]	1.86[-1]	1.14[0]
$p^2(^3P)s\ ^4P_{1/2}$	$p^2(^3P)p\ ^4S_{3/2}$	518.720	2.46[09]	1.99[-1]	6.78[-1]	463.434	2.92[09]	1.88[-1]	5.73[-1]
$s^2(^1S)p\ ^2P_{1/2}$	$p^2(^1S)s\ ^2S_{1/2}$	518.102	3.09[09]	1.24[-1]	4.25[-1]	452.774	5.54[09]	1.71[-1]	5.09[-1]
$s^2(^1S)d\ ^2D_{5/2}$	$sp(^1P)d\ ^2P_{3/2}$	511.811	1.00[10]	2.63[-1]	2.66[0]	449.142	1.22[10]	2.45[-1]	2.17[0]
$s^2(^1S)d\ ^2D_{3/2}$	$sp(^1P)d\ ^2P_{1/2}$	511.588	1.05[10]	2.06[-1]	1.39[0]	449.330	1.25[10]	1.89[-1]	1.12[0]
$s^2(^1S)d\ ^2D_{3/2}$	$sp(^1P)d\ ^2D_{3/2}$	498.770	7.48[09]	2.79[-1]	1.83[0]	440.195	9.37[09]	2.72[-1]	1.57[0]
$s^2(^1S)d\ ^2D_{5/2}$	$sp(^1P)d\ ^2D_{5/2}$	497.963	7.06[09]	2.63[-1]	2.58[0]	439.083	8.49[09]	2.46[-1]	2.13[0]
$s^2(^1S)p\ ^2P_{3/2}$	$p^2(^3P)s\ ^2P_{1/2}$	492.047	6.18[09]	1.12[-1]	7.27[-1]	431.702	7.99[09]	1.12[-1]	6.35[-1]
$s^2(^1S)p\ ^2P_{3/2}$	$p^2(^3P)s\ ^2P_{3/2}$	487.432	1.30[10]	4.62[-1]	2.97[0]	426.944	1.53[10]	4.17[-1]	2.35[0]
$s^2(^1S)p\ ^2P_{1/2}$	$p^2(^3P)s\ ^2P_{1/2}$	484.574	9.32[09]	3.28[-1]	1.04[0]	423.669	1.01[10]	2.74[-1]	7.65[-1]
$s^2(^1S)p\ ^2P_{1/2}$	$p^2(^3P)s\ ^2P_{3/2}$	480.097	2.76[09]	1.91[-1]	6.02[-1]	419.086	3.27[09]	1.72[-1]	4.75[-1]
$p^2(^3P)s\ ^2P_{3/2}$	$sp(^3P)d\ ^2P_{3/2}$	451.282	6.42[09]	1.96[-1]	1.17[0]	400.118	9.40[09]	2.26[-1]	1.19[0]
$p^2(^3P)s\ ^2P_{3/2}$	$sp(^3P)d\ ^2P_{1/2}$	449.576	2.64[09]	4.01[-2]	2.37[-1]	397.863	3.85[09]	4.57[-2]	2.39[-1]
$p^2(^3P)s\ ^2P_{1/2}$	$sp(^3P)d\ ^2P_{3/2}$	447.396	1.14[09]	6.82[-2]	2.01[-1]	396.027	1.64[09]	7.74[-2]	2.02[-1]
$p^2(^1D)s\ ^2D_{5/2}$	$sp(^3P)d\ ^2D_{5/2}$	446.187	1.43[10]	4.29[-1]	3.78[0]	396.731	1.65[10]	3.89[-1]	3.06[0]
$p^2(^1D)s\ ^2D_{5/2}$	$sp(^3P)d\ ^2D_{3/2}$	446.116	1.45[09]	2.87[-2]	2.53[-1]	396.704	1.64[09]	2.58[-2]	2.02[-1]
$p^2(^1D)s\ ^2D_{3/2}$	$sp(^3P)d\ ^2D_{5/2}$	445.867	1.14[09]	5.13[-2]	3.00[-1]	396.395	1.36[09]	4.80[-2]	2.51[-1]
$p^2(^1D)s\ ^2D_{3/2}$	$sp(^3P)d\ ^2D_{3/2}$	445.796	1.40[10]	4.18[-1]	2.46[0]	396.368	1.63[10]	3.83[-1]	2.00[0]
$p^2(^3P)s\ ^2P_{1/2}$	$sp(^3P)d\ ^2P_{1/2}$	445.720	7.38[09]	2.20[-1]	6.46[-1]	393.819	1.12[10]	2.59[-1]	6.71[-1]
$p^2(^1S)s\ ^2S_{1/2}$	$sp(^3P)d\ ^2P_{3/2}$	422.172	1.45[10]	7.78[-1]	2.16[0]	373.580	1.65[10]	6.92[-1]	1.70[0]
$p^2(^3P)s\ ^2P_{3/2}$	$sp(^1P)d\ ^2P_{1/2}$	421.868	3.37[09]	4.51[-2]	2.50[-1]	374.239	3.69[09]	3.88[-2]	1.91[-1]
$p^2(^3P)s\ ^2P_{3/2}$	$sp(^1P)d\ ^2P_{3/2}$	421.822	5.71[09]	1.52[-1]	8.47[-1]	374.083	4.80[09]	1.01[-1]	4.95[-1]
$p^2(^1S)s\ ^2S_{1/2}$	$sp(^3P)d\ ^2P_{1/2}$	420.679	1.16[10]	3.08[-1]	8.53[-1]	371.614	1.17[10]	2.43[-1]	5.93[-1]
$p^2(^3P)s\ ^2P_{1/2}$	$sp(^1P)d\ ^2P_{1/2}$	418.470	5.44[09]	1.43[-1]	3.94[-1]	370.658	5.60[09]	1.15[-1]	2.82[-1]
$p^2(^3P)s\ ^2P_{1/2}$	$sp(^1P)d\ ^2P_{3/2}$	418.425	4.25[09]	2.23[-1]	6.16[-1]	370.505	6.90[09]	2.85[-1]	6.94[-1]
$p^2(^1D)s\ ^2D_{3/2}$	$sp(^3P)d\ ^2F_{5/2}$	413.973	5.93[09]	2.29[-1]	1.25[0]	367.735	6.89[09]	2.10[-1]	1.01[0]
$p^2(^3P)s\ ^2P_{3/2}$	$sp(^1P)d\ ^2D_{3/2}$	413.113	6.96[09]	1.79[-1]	9.70[-1]	367.880	9.64[09]	1.96[-1]	9.48[-1]
$p^2(^3P)s\ ^2P_{3/2}$	$sp(^1P)d\ ^2D_{5/2}$	412.371	2.68[10]	1.02[0]	5.57[0]	367.079	3.10[10]	9.42[-1]	4.56[0]
$p^2(^1D)s\ ^2D_{5/2}$	$sp(^3P)d\ ^2F_{7/2}$	410.027	6.53[09]	2.19[-1]	1.78[0]	363.462	7.63[09]	2.02[-1]	1.45[0]
$p^2(^3P)s\ ^2P_{1/2}$	$sp(^1P)d\ ^2D_{3/2}$	409.855	1.95[10]	9.74[-1]	2.64[0]	364.420	2.02[10]	8.02[-1]	1.93[0]
$p^2(^3P)s\ ^4P_{5/2}$	$sp(^3P)d\ ^4P_{5/2}$	409.583	4.58[09]	1.15[-1]	9.31[-1]	364.480	4.37[09]	8.68[-2]	6.25[-1]
$p^2(^3P)s\ ^4P_{5/2}$	$sp(^3P)d\ ^4P_{3/2}$	408.178	3.49[09]	5.79[-2]	4.68[-1]	363.072	3.25[09]	4.27[-2]	3.07[-1]
$p^2(^3P)s\ ^4P_{3/2}$	$sp(^3P)d\ ^4P_{5/2}$	406.701	7.07[09]	2.64[-1]	1.41[0]	361.379	9.43[09]	2.76[-1]	1.31[0]
$s^2(^1S)p\ ^2P_{3/2}$	$s^2(^1S)d\ ^2D_{3/2}$	405.304	3.22[09]	7.94[-2]	4.23[-1]	358.580	3.76[09]	7.27[-2]	3.43[-1]
$s^2(^1S)p\ ^2P_{3/2}$	$s^2(^1S)d\ ^2D_{5/2}$	405.122	1.84[10]	6.80[-1]	3.62[0]	358.557	2.12[10]	6.17[-1]	2.90[0]
$p^2(^3P)s\ ^4P_{3/2}$	$sp(^3P)d\ ^4P_{1/2}$	404.159	6.74[09]	8.27[-2]	4.40[-1]	358.771	5.48[09]	5.31[-2]	2.50[-1]
$p^2[^3P)s\ ^4P_{5/2}$	$sp(^3P)d\ ^4D_{3/2}$	403.526	2.55[09]	4.15[-2]	3.31[-1]	358.982	3.72[09]	4.79[-2]	3.39[-1]
$p^2(^3P)s\ ^4P_{1/2}$	$sp(^3P)d\ ^4P_{3/2}$	403.449	8.53[09]	4.17[-1]	1.11[0]	357.951	1.14[10]	4.38[-1]	1.03[0]
$p^2(^3P)s\ ^4P_{5/2}$	$sp(^3P)d\ ^4D_{5/2}$	403.013	9.10[09]	2.23[-1]	1.77[0]	358.496	1.15[10]	2.21[-1]	1.57[0]
$p^2(^3P)s\ ^4P_{5/2}$	$sp(^3P)d\ ^4D_{7/2}$	402.791	1.93[10]	6.26[-1]	4.99[0]	358.355	2.22[10]	5.71[-1]	4.04[0]
$p^2(^3P)s\ ^4P_{1/2}$	$sp(^3P)d\ ^4P_{1/2}$	402.303	5.23[09]	1.27[-1]	3.37[-1]	356.740	9.27[09]	1.78[-1]	4.17[-1]
$p^2(^3P)s\ ^4P_{3/2}$	$sp(^3P)d\ ^4D_{1/2}$	401.380	6.14[09]	7.44[-2]	3.92[-1]	356.689	9.50[09]	9.06[-2]	4.25[-1]
$p^2(^3P)s\ ^4P_{3/2}$	$sp(^3P)d\ ^4D_{3/2}$	400.728	1.19[10]	2.88[-1]	1.52[0]	355.974	1.39[10]	2.64[-1]	1.24[0]
$p^2(^3P)s\ ^4P_{3/2}$	$sp(^3P)d\ ^4D_{5/2}$	400.223	9.91[09]	3.56[-1]	1.88[0]	355.496	1.01[10]	2.88[-1]	1.35[0]
$s^2(^1S)p\ ^2P_{1/2}$	$s^2(^1S)d\ ^2D_{3/2}$	400.220	1.57[10]	7.56[-1]	1.99[0]	353.020	1.84[10]	6.86[-1]	1.59[0]

3

Lower level	Upper level	λ	A	f	S	λ	A	f	S
					Z=21				Z=22
$p^2(^1D)s\ ^2D_{5/2}$	$p^2(^3P)p\ ^2D_{5/2}$	546.636	1.31[09]	5.85[-2]	6.32[-1]	495.805	1.57[09]	5.82[-2]	5.69[-1]
$s^2(^1S)d\ ^2D_{5/2}$	$sp(^1P)d\ ^2F_{7/2}$	443.824	1.17[10]	4.63[-1]	4.05[0]	402.848	1.35[10]	4.40[-1]	3.51[0]
$s^2(^1S)d\ ^2D_{3/2}$	$sp(^1P)d\ ^2F_{5/2}$	440.932	1.14[10]	5.00[-1]	2.89[0]	399.692	1.33[10]	4.78[-1]	2.52[0]
$p^2(^1D)s\ ^2D_{3/2}$	$p^2(^3P)p\ ^2P_{1/2}$	439.392	6.30[09]	9.14[-2]	5.28[-1]	400.277	7.39[09]	8.90[-2]	4.68[-1]
$p^2(^1D)s\ ^2D_{5/2}$	$p^2(^3P)p\ ^2P_{3/2}$	437.749	5.49[09]	1.05[-1]	9.10[-1]	397.807	6.39[09]	1.01[-1]	7.95[-1]
$s^2(^1S)p\ ^2P_{3/2}$	$p^2(^1S)s\ ^2S_{1/2}$	427.531	2.76[09]	3.78[-2]	2.13[-1]	390.142	2.80[09]	3.20[-2]	1.64[-1]
$p^2(^3P)s\ ^4P_{5/2}$	$p^2(^3P)p\ ^4S_{3/2}$	427.512	9.50[09]	1.74[-1]	1.47[0]	390.535	1.08[10]	1.64[-1]	1.27[0]
$p^2(^3P)s\ ^4P_{3/2}$	$p^2(^3P)p\ ^4S_{3/2}$	421.885	6.59[09]	1.76[-1]	9.79[-1]	384.467	7.53[09]	1.67[-1]	8.47[-1]
$p^2(^3P)s\ ^4P_{1/2}$	$p^2(^3P)p\ ^4S_{3/2}$	418.099	3.40[09]	1.78[-1]	4.91[-1]	380.298	3.91[09]	1.69[-1]	4.25[-1]
$s^2(^1S)p\ ^2P_{1/2}$	$p^2(^1S)s\ ^2S_{1/2}$	417.264	4.90[09]	1.28[-1]	3.51[-1]	379.003	6.50[09]	1.40[-1]	3.50[-1]
$s^2(^1S)d\ ^2D_{5/2}$	$sp(^1P)d\ ^2P_{3/2}$	413.010	1.41[10]	2.40[-1]	1.96[0]	375.583	1.40[10]	1.96[-1]	1.46[0]
$s^2(^1S)d\ ^2D_{3/2}$	$sp(^1P)d\ ^2P_{1/2}$	412.940	1.48[10]	1.89[-1]	1.03[0]	375.570	1.70[10]	1.80[-1]	8.90[-1]
$s^2(^1S)d\ ^2D_{3/2}$	$sp(^1P)d\ ^2D_{3/2}$	405.213	1.11[10]	2.73[-1]	1.46[0]	369.597	1.19[10]	2.44[-1]	1.18[0]
$s^2(^1S)d\ ^2D_{5/2}$	$sp(^1P)d\ ^2D_{5/2}$	404.547	9.87[09]	2.42[-1]	1.93[0]	369.064	1.14[10]	2.31[-1]	1.69[0]
$s^2(^1S)p\ ^2P_{3/2}$	$p^2(^3P)s\ ^2P_{1/2}$	401.366	9.16[09]	1.10[-1]	5.83[-1]	366.566	1.09[10]	1.11[-1]	5.33[-1]
$s^2(^1S)p\ ^2P_{3/2}$	$p^2(^3P)s\ ^2P_{3/2}$	396.105	1.79[10]	4.22[-1]	2.20[0]	361.066	2.04[10]	3.99[-1]	1.90[0]
$s^2(^1S)p\ ^2P_{1/2}$	$p^2(^3P)s\ ^2P_{1/2}$	392.305	1.19[10]	2.75[-1]	7.10[-1]	356.715	1.28[10]	2.44[-1]	5.72[-1]
$s^2(^1S)p\ ^2P_{1/2}$	$p^2(^3P)s\ ^2P_{3/2}$	387.277	3.87[09]	1.74[-1]	4.44[-1]	351.504	4.46[09]	1.65[-1]	3.82[-1]
$p^2(^3P)s\ ^2P_{3/2}$	$sp(^3P)d\ ^2P_{3/2}$	360.460	7.73[09]	1.51[-1]	7.16[-1]	328.285	8.60[09]	1.40[-1]	6.02[-1]
$p^2(^1D)s\ ^2D_{5/2}$	$sp(^3P)d\ ^2D_{3/2}$	358.668	1.85[09]	2.37[-2]	1.68[-1]	326.724	2.03[09]	2.16[-2]	1.40[-1]
$p^2(^1D)s\ ^2D_{5/2}$	$sp(^3P)d\ ^2D_{5/2}$	358.646	1.88[10]	3.63[-1]	2.57[0]	326.646	2.10[10]	3.34[-1]	2.17[0]
$p^2(^1D)s\ ^2D_{3/2}$	$sp(^3P)d\ ^2D_{3/2}$	358.194	1.86[10]	3.57[-1]	1.69[0]	326.144	2.08[10]	3.32[-1]	1.43[0]
$p^2(^1D)s\ ^2D_{3/2}$	$sp(^3P)d\ ^2D_{5/2}$	358.172	1.61[09]	4.66[-2]	2.20[-1]	326.066	1.89[09]	4.52[-2]	1.94[-1]
$p^2(^3P)s\ ^2P_{3/2}$	$sp(^3P)d\ ^2P_{1/2}$	358.077	3.25[09]	3.13[-2]	1.48[-1]	325.499	3.68[09]	2.92[-2]	1.25[-1]
$p^2(^3P)s\ ^2P_{1/2}$	$sp(^3P)d\ ^2P_{1/2}$	353.883	1.10[10]	2.07[-1]	4.81[-1]	321.155	1.36[10]	2.11[-1]	4.47[-1]
$p^2(^1S)s\ ^2S_{1/2}$	$sp(^3P)d\ ^2P_{3/2}$	337.860	2.03[10]	6.95[-1]	1.55[0]	307.452	2.33[10]	6.60[-1]	1.34[0]
$p^2(^3P)s\ ^2P_{3/2}$	$sp(^1P)d\ ^2P_{1/2}$	337.180	4.78[09]	4.08[-2]	1.81[-1]	306.777	5.49[09]	3.88[-2]	1.57[-1]
$p^2(^1S)s\ ^2S_{1/2}$	$sp(^3P)d\ ^2P_{1/2}$	335.766	1.40[10]	2.37[-1]	5.25[-1]	305.007	1.44[10]	2.02[-1]	4.05[-1]
$p^2(^3P)s\ ^2P_{1/2}$	$sp(^1P)d\ ^2P_{1/2}$	333.459	6.70[09]	1.12[-1]	2.45[-1]	302.915	7.03[09]	9.71[-2]	1.93[-1]
$p^2(^3P)s\ ^2P_{1/2}$	$sp(^1P)d\ ^2P_{3/2}$	333.127	1.36[10]	4.52[-1]	9.92[-1]	302.441	2.44[10]	6.69[-1]	1.33[0]
$p^2(^1D)s\ ^2D_{3/2}$	$sp(^3P)d\ ^2F_{5/2}$	332.357	7.97[09]	1.98[-1]	8.68[-1]	302.981	8.93[09]	1.85[-1]	7.39[-1]
$p^2(^3P)s\ ^2P_{3/2}$	$sp(^1P)d\ ^2D_{3/2}$	332.011	1.40[10]	2.30[-1]	1.01[0]	302.780	1.92[10]	2.63[-1]	1.05[0]
$p^2(^3P)s\ ^2P_{3/2}$	$sp(^1P)d\ ^2D_{5/2}$	331.190	3.52[10]	8.70[-1]	3.80[0]	301.941	3.96[10]	8.11[-1]	3.22[0]
$p^2(^3P)s\ ^4P_{5/2}$	$sp(^3P)d\ ^4P_{5/2}$	328.867	3.98[09]	6.45[-2]	4.18[-1]	299.981	3.53[09]	4.78[-2]	2.83[-1]
$p^2(^3P)s\ ^2P_{1/2}$	$sp(^1P)d\ ^2D_{3/2}$	328.403	1.73[10]	5.59[-1]	1.21[0]	299.018	9.72[09]	2.61[-1]	5.13[-1]
$p^2(^1D)s\ ^2D_{5/2}$	$sp(^3P)d\ ^2F_{7/2}$	327.789	8.92[09]	1.92[-1]	1.25[0]	298.080	1.02[10]	1.82[-1]	1.07[0]
$p^2(^3P)s\ ^4P_{5/2}$	$sp(^3P)d\ ^4P_{3/2}$	327.491	2.76[09]	2.96[-2]	1.91[-1]	298.655	2.19[09]	1.95[-2]	1.15[-1]
$s^2(^1S)p\ ^2P_{3/2}$	$s^2(^1S)d\ ^2D_{3/2}$	325.871	4.34[09]	6.92[-2]	2.96[-1]	297.031	4.89[09]	6.52[-2]	2.54[-1]
$p^2(^3P)s\ ^4P_{3/2}$	$sp(^3P)d\ ^4P_{5/2}$	325.527	1.20[10]	2.86[-1]	1.22[0]	296.388	1.46[10]	2.89[-1]	1.13[0]
$s^2(^1S)p\ ^2P_{3/2}$	$s^2(^1S)d\ ^2D_{5/2}$	325.510	2.41[10]	5.78[-1]	2.47[0]	296.567	2.69[10]	5.32[-1]	2.08[0]
$p^2[^3P)s\ ^4P_{5/2}$	$sp(^3P)d\ ^4D_{3/2}$	323.576	5.11[09]	5.39[-2]	3.43[-1]	294.643	6.62[09]	5.72[-2]	3.34[-1]
$p^2(^3P)s\ ^4P_{5/2}$	$sp(^3P)d\ ^4D_{5/2}$	323.155	1.39[10]	2.19[-1]	1.40[0]	294.313	1.64[10]	2.13[-1]	1.24[0]
$p^2(^3P)s\ ^4P_{5/2}$	$sp(^3P)d\ ^4D_{7/2}$	323.110	2.51[10]	5.22[-1]	3.34[0]	294.370	2.78[10]	4.82[-1]	2.80[0]
$p^2(^3P)s\ ^4P_{1/2}$	$sp(^3P)d\ ^4P_{3/2}$	321.939	1.45[10]	4.51[-1]	9.57[-1]	292.631	1.76[10]	4.50[-1]	8.67[-1]
$p^2(^3P)s\ ^4P_{3/2}$	$sp(^3P)d\ ^4D_{1/2}$	321.011	1.43[10]	1.11[-1]	4.68[-1]	291.719	1.86[10]	1.18[-1]	4.55[-1]
$p^2(^3P)s\ ^4P_{1/2}$	$sp(^3P)d\ ^4P_{1/2}$	320.773	1.62[10]	2.51[-1]	5.30[-1]	291.585	2.33[10]	2.98[-1]	5.72[-1]
$p^2(^3P)s\ ^4P_{3/2}$	$sp(^3P)d\ ^4D_{3/2}$	320.343	1.54[10]	2.37[-1]	1.00[0]	291.176	1.66[10]	2.10[-1]	8.04[-1]
$p^2(^3P)s\ ^4P_{3/2}$	$sp(^3P)d\ ^4D_{5/2}$	319.930	1.01[10]	2.32[-1]	9.78[-1]	290.854	9.87[09]	1.88[-1]	7.18[-1]
$s^2(^1S)p\ ^2P_{1/2}$	$s^2(^1S)d\ ^2D_{3/2}$	319.873	2.09[10]	6.42[-1]	1.35[0]	290.530	2.35[10]	5.95[-1]	1.14[0]
$p^2(^3P)s\ ^4P_{1/2}$	$sp(^3P)d\ ^4D_{1/2}$	318.814	7.86[09]	1.20[-1]	2.52[-1]	289.312	3.57[09]	4.48[-2]	8.52[-2]
$p^2(^3P)s\ ^4P_{1/2}$	$sp(^3P)d\ ^4D_{3/2}$	318.155	2.49[09]	7.55[-2]	1.58[-1]	288.778	1.46[09]	3.65[-2]	6.94[-2]

Lower level	Upper level	λ	A	f	S	λ	A	f	S
				$Z=23$				$Z=24$	
$p^2(^3P)s\ ^2P_{1/2}$	$p^2(^3P)p\ ^2P_{1/2}$	503.096	1.85[09]	7.04[-2]	2.33[-1]	461.162	2.25[09]	7.19[-2]	2.18[-1]
$p^2(^1D)s\ ^2D_{5/2}$	$p^2(^3P)p\ ^2D_{5/2}$	453.257	1.85[09]	5.71[-2]	5.12[-1]	417.063	2.15[09]	5.61[-2]	4.61[-1]
$s^2(^1S)d\ ^2D_{5/2}$	$sp(^1P)d\ ^2F_{7/2}$	368.677	1.55[10]	4.22[-1]	3.07[0]	339.623	1.76[10]	4.04[-1]	2.72[0]
$p^2(^1D)s\ ^2D_{3/2}$	$p^2(^3P)p\ ^2P_{1/2}$	367.013	8.46[09]	8.52[-2]	4.13[-1]	338.429	9.56[09]	8.24[-2]	3.67[-1]
$s^2(^1S)d\ ^2D_{3/2}$	$sp(^1P)d\ ^2F_{5/2}$	365.254	1.53[10]	4.60[-1]	2.22[0]	335.934	1.75[10]	4.45[-1]	1.97[0]
$p^2(^1D)s\ ^2D_{5/2}$	$p^2(^3P)p\ ^2P_{3/2}$	364.920	7.20[09]	9.57[-2]	6.90[-1]	337.284	7.96[09]	9.03[-2]	6.03[-1]
$p^2(^3P)s\ ^4P_{5/2}$	$p^2(^3P)p\ ^4S_{3/2}$	359.269	1.21[10]	1.56[-1]	1.11[0]	332.451	1.34[10]	1.48[-1]	9.72[-1]
$s^2(^1S)p\ ^2P_{3/2}$	$p^2(^1S)s\ ^2S_{1/2}$	358.848	2.62[09]	2.54[-2]	1.20[-1]	332.240	2.29[09]	1.90[-2]	8.32[-2]
$p^2(^3P)s\ ^4P_{3/2}$	$p^2(^3P)p\ ^4S_{3/2}$	352.762	8.53[09]	1.60[-1]	7.40[-1]	325.513	9.53[09]	1.52[-1]	6.50[-1]
$p^2(^3P)s\ ^4P_{1/2}$	$p^2(^3P)p\ ^4S_{3/2}$	348.185	4.44[09]	1.62[-1]	3.71[-1]	320.503	5.01[09]	1.54[-1]	3.26[-1]
$s^2(^1S)p\ ^2P_{1/2}$	$p^2(^1S)s\ ^2S_{1/2}$	346.799	8.42[09]	1.52[-1]	3.47[-1]	319.250	1.07[10]	1.65[-1]	3.46[-1]
$s^2(^1S)d\ ^2D_{5/2}$	$sp(^1P)d\ ^2P_{3/2}$	344.192	1.18[10]	1.39[-1]	9.47[-1]	317.406	1.00[10]	1.01[-1]	6.36[-1]
$s^2(^1S)d\ ^2D_{3/2}$	$sp(^1P)d\ ^2P_{1/2}$	344.169	1.94[10]	1.71[-1]	7.79[-1]	317.312	2.17[10]	1.64[-1]	6.86[-1]
$s^2(^1S)d\ ^2D_{3/2}$	$sp(^1P)d\ ^2P_{3/2}$	343.279	3.42[09]	6.04[-2]	2.73[-1]	316.315	6.01[09]	9.04[-2]	3.77[-1]
$s^2(^1S)d\ ^2D_{5/2}$	$sp(^1P)d\ ^2D_{3/2}$	340.299	7.29[09]	8.45[-2]	5.69[-1]	314.412	1.15[10]	1.13[-1]	7.02[-1]
$s^2(^1S)d\ ^2D_{5/2}$	$sp(^1P)d\ ^2D_{3/2}$	340.299	7.29[09]	8.45[-2]	5.69[-1]	314.412	1.15[10]	1.13[-1]	7.02[-1]
$s^2(^1S)d\ ^2D_{3/2}$	$sp(^1P)d\ ^2D_{3/2}$	339.406	1.10[10]	1.90[-1]	8.47[-1]	313.341	1.01[10]	1.50[-1]	6.17[-1]
$s^2(^1S)d\ ^2D_{5/2}$	$sp(^1P)d\ ^2D_{5/2}$	339.066	1.29[10]	2.23[-1]	1.49[0]	313.267	1.46[10]	2.15[-1]	1.33[0]
$s^2(^1S)p\ ^2P_{3/2}$	$p^2(^3P)s\ ^2P_{1/2}$	337.281	1.30[10]	1.11[-1]	4.92[-1]	312.123	1.52[10]	1.11[-1]	4.57[-1]
$s^2(^1S)p\ ^2P_{3/2}$	$p^2(^3P)s\ ^2P_{3/2}$	331.603	2.31[10]	3.81[-1]	1.66[0]	306.341	2.59[10]	3.64[-1]	1.47[0]
$s^2(^1S)p\ ^2P_{1/2}$	$p^2(^3P)s\ ^2P_{1/2}$	326.616	1.34[10]	2.14[-1]	4.61[-1]	300.632	1.37[10]	1.86[-1]	3.68[-1]
$s^2(^1S)p\ ^2P_{1/2}$	$p^2(^3P)s\ ^2P_{3/2}$	321.288	5.09[09]	1.58[-1]	3.34[-1]	295.264	5.81[09]	1.52[-1]	2.95[-1]
$p^2(^3P)s\ ^2P_{3/2}$	$sp(^3P)d\ ^2P_{3/2}$	301.727	9.29[09]	1.28[-1]	5.04[-1]	279.395	9.83[09]	1.15[-1]	4.24[-1]
$p^2(^1D)s\ ^2D_{5/2}$	$sp(^3P)d\ ^2D_{3/2}$	300.028	2.20[09]	1.98[-2]	1.17[-1]	277.336	2.36[09]	1.82[-2]	9.95[-2]
$p^2(^1D)s\ ^2D_{5/2}$	$sp(^3P)d\ ^2D_{5/2}$	299.887	2.31[10]	3.12[-1]	1.85[0]	277.126	2.52[10]	2.91[-1]	1.59[0]
$p^2(^1D)s\ ^2D_{3/2}$	$sp(^3P)d\ ^2D_{3/2}$	299.317	2.32[10]	3.11[-1]	1.23[0]	276.467	2.55[10]	2.92[-1]	1.07[0]
$p^2(^1D)s\ ^2D_{3/2}$	$sp(^3P)d\ ^2D_{5/2}$	299.178	2.21[09]	4.45[-2]	1.75[-1]	276.259	2.57[09]	4.43[-2]	1.61[-1]
$p^2(^3P)s\ ^2P_{3/2}$	$sp(^3P)d\ ^2P_{1/2}$	298.527	4.02[09]	2.69[-2]	1.06[-1]	275.755	4.32[09]	2.47[-2]	8.95[-2]
$p^2(^3P)s\ ^2P_{1/2}$	$sp(^3P)d\ ^2P_{1/2}$	294.070	1.66[10]	2.16[-1]	4.16[-1]	271.232	1.99[10]	2.19[-1]	3.91[-1]
$p^2(^1S)s\ ^2S_{1/2}$	$sp(^3P)d\ ^2P_{3/2}$	282.230	2.65[10]	6.34[-1]	1.18[0]	260.850	3.00[10]	6.13[-1]	1.05[0]
$p^2(^3P)s\ ^2P_{3/2}$	$sp(^1P)d\ ^2P_{1/2}$	281.596	6.29[09]	3.75[-2]	1.39[-1]	260.356	7.17[09]	3.65[-2]	1.25[-1]
$p^2(^1S)s\ ^2S_{1/2}$	$sp(^3P)d\ ^2P_{1/2}$	279.428	1.45[10]	1.70[-1]	3.13[-1]	257.675	1.43[10]	1.42[-1]	2.41[-1]
$p^2(^1D)s\ ^2D_{3/2}$	$sp(^3P)d\ ^2F_{5/2}$	278.585	9.92[09]	1.73[-1]	6.36[-1]	257.948	1.08[10]	1.62[-1]	5.52[-1]
$p^2(^1D)s\ ^2D_{3/2}$	$sp(^3P)d\ ^2F_{5/2}$	278.585	9.92[09]	1.73[-1]	6.36[-1]	257.948	1.08[10]	1.62[-1]	5.52[-1]
$p^2(^3P)s\ ^2P_{3/2}$	$sp(^1P)d\ ^2D_{3/2}$	278.400	2.22[10]	2.58[-1]	9.45[-1]	257.676	2.35[10]	2.33[-1]	7.93[-1]
$p^2(^3P)s\ ^2P_{1/2}$	$sp(^1P)d\ ^2P_{1/2}$	277.627	7.23[09]	8.36[-2]	1.53[-1]	256.320	7.28[09]	7.17[-2]	1.21[-1]
$p^2(^3P)s\ ^2P_{3/2}$	$sp(^1P)d\ ^2D_{5/2}$	277.575	4.36[10]	7.56[-1]	2.76[0]	256.906	4.78[10]	7.10[-1]	2.40[0]
$p^2(^3P)s\ ^2P_{1/2}$	$sp(^1P)d\ ^2P_{3/2}$	277.048	3.42[10]	7.88[-1]	1.44[0]	255.669	3.99[10]	7.84[-1]	1.32[0]
$p^2(^3P)s\ ^4P_{5/2}$	$sp(^3P)d\ ^4P_{5/2}$	276.043	3.15[09]	3.60[-2]	1.97[-1]	255.854	2.88[09]	2.82[-2]	1.43[-1]
$p^2(^1D)s\ ^2D_{5/2}$	$sp(^3P)d\ ^2F_{7/2}$	273.347	1.15[10]	1.72[-1]	9.25[-1]	252.376	1.27[10]	1.62[-1]	8.11[-1]
$s^2(^1S)p\ ^2P_{3/2}$	$s^2(^1S)d\ ^2D_{3/2}$	273.127	5.52[09]	6.16[-2]	2.22[-1]	252.923	6.15[09]	5.88[-2]	1.97[-1]
$s^2(^1S)p\ ^2P_{3/2}$	$s^2(^1S)d\ ^2D_{5/2}$	272.552	2.97[10]	4.96[-1]	1.78[0]	252.230	3.24[10]	4.65[-1]	1.54[0]
$p^2(^3P)s\ ^4P_{3/2}$	$sp(^3P)d\ ^4P_{5/2}$	272.186	1.73[10]	2.88[-1]	1.03[0]	251.725	1.97[10]	2.82[-1]	9.33[-1]
$p^2(^3P)s\ ^4P_{3/2}$	$sp(^3P)d\ ^4P_{3/2}$	270.947	2.22[09]	2.44[-2]	8.69[-2]	250.534	3.35[09]	3.16[-2]	1.04[-1]
$p^2(^3P)s\ ^4P_{5/2}$	$sp(^3P)d\ ^4D_{3/2}$	270.487	8.00[09]	5.83[-2]	3.12[-1]	249.969	9.21[09]	5.78[-2]	2.85[-1]
$p^2(^3P)s\ ^4P_{5/2}$	$sp(^3P)d\ ^4D_{7/2}$	270.413	3.06[10]	4.47[-1]	2.39[0]	250.079	3.33[10]	4.16[-1]	2.05[0]
$p^2(^3P)s\ ^4P_{5/2}$	$sp(^3P)d\ ^4D_{5/2}$	270.257	1.89[10]	2.07[-1]	1.11[0]	249.836	2.13[10]	1.99[-1]	9.83[-1]
$p^2(^3P)s\ ^4P_{1/2}$	$sp(^3P)d\ ^4D_{3/2}$	268.239	2.03[10]	4.36[-1]	7.70[-1]	247.556	2.26[10]	4.15[-1]	6.77[-1]
$p^2(^3P)s\ ^4P_{1/2}$	$sp(^3P)d\ ^4P_{1/2}$	267.316	2.83[10]	3.04[-1]	5.35[-1]	246.733	3.21[10]	2.93[-1]	4.76[-1]
$p^2(^3P)s\ ^4P_{3/2}$	$sp(^3P)d\ ^4D_{1/2}$	267.198	2.12[10]	1.14[-1]	4.00[-1]	246.338	2.33[10]	1.05[-1]	3.44[-1]
$p^2(^3P)s\ ^4P_{3/2}$	$sp(^3P)d\ ^4D_{3/2}$	266.782	1.73[10]	1.85[-1]	6.48[-1]	246.026	1.81[10]	1.64[-1]	5.30[-1]

Lower level	Upper level	λ	A	f	S	λ	A	f	S
				Z=25				Z=26	
$p^2(^3P)s\ ^2P_{3/2}$	$p^2(^3P)p\ ^2P_{3/2}$	433.643	2.25[09]	6.33[-2]	3.62[-1]	401.297	2.57[09]	6.18[-2]	3.27[-1]
$p^2(^3P)s\ ^2P_{1/2}$	$p^2(^3P)p\ ^2P_{1/2}$	425.276	2.68[09]	7.29[-2]	2.04[-1]	394.261	3.13[09]	7.30[-2]	1.90[-1]
$p^2(^1D)s\ ^2D_{5/2}$	$p^2(^3P)p\ ^2D_{5/2}$	385.871	2.43[09]	5.43[-2]	4.15[-1]	358.699	2.74[09]	5.27[-2]	3.74[-1]
$s^2(^1S)p\ ^2P_{1/2}$	$p^2(^1D)s\ ^2D_{3/2}$	362.171	1.78[09]	6.99[-2]	1.67[-1]	334.557	2.11[09]	7.08[-2]	1.56[-1]
$s^2(^1S)d\ ^2D_{5/2}$	$sp(^1P)d\ ^2F_{7/2}$	314.554	1.97[10]	3.89[-1]	2.42[0]	292.657	2.20[10]	3.77[-1]	2.18[0]
$p^2(^1D)s\ ^2D_{3/2}$	$p^2(^3P)p\ ^2P_{1/2}$	313.572	1.08[10]	7.96[-2]	3.28[-1]	291.721	1.21[10]	7.67[-2]	2.96[-1]
$p^2(^1D)s\ ^2D_{5/2}$	$p^2(^3P)p\ ^2P_{3/2}$	312.692	8.75[09]	8.58[-2]	5.29[-1]	290.599	9.67[09]	8.16[-2]	4.68[-1]
$s^2(^1S)d\ ^2D_{3/2}$	$sp(^1P)d\ ^2F_{5/2}$	310.606	1.98[10]	4.31[-1]	1.76[0]	288.461	2.23[10]	4.18[-1]	1.59[0]
$p^2(^3P)s\ ^4P_{5/2}$	$p^2(^3P)p\ ^4S_{3/2}$	309.156	1.47[10]	1.40[-1]	8.57[-1]	288.690	1.59[10]	1.33[-1]	7.56[-1]
$p^2(^3P)s\ ^4P_{3/2}$	$p^2(^3P)p\ ^4S_{3/2}$	301.800	1.06[10]	1.44[-1]	5.75[-1]	280.935	1.16[10]	1.38[-1]	5.10[-1]
$p^2(^3P)s\ ^4P_{1/2}$	$p^2(^3P)p\ ^4S_{3/2}$	296.332	5.58[09]	1.47[-1]	2.87[-1]	274.984	6.16[09]	1.41[-1]	2.54[-1]
$s^2(^1S)p\ ^2P_{1/2}$	$p^2(^1S)s\ ^2S_{1/2}$	295.395	1.35[10]	1.77[-1]	3.45[-1]	274.524	1.68[10]	1.89[-1]	3.43[-1]
$s^2(^1S)d\ ^2D_{5/2}$	$sp(^1P)d\ ^2P_{3/2}$	294.260	9.33[09]	8.07[-2]	4.70[-1]	274.025	9.23[09]	6.93[-2]	3.74[-1]
$s^2(^1S)d\ ^2D_{3/2}$	$sp(^1P)d\ ^2P_{1/2}$	294.034	2.43[10]	1.58[-1]	6.09[-1]	273.628	2.68[10]	1.51[-1]	5.43[-1]
$s^2(^1S)d\ ^2D_{3/2}$	$sp(^1P)d\ ^2P_{3/2}$	292.983	8.09[09]	1.04[-1]	4.03[-1]	272.560	9.79[09]	1.09[-1]	3.92[-1]
$s^2(^1S)d\ ^2D_{5/2}$	$sp(^1P)d\ ^2D_{3/2}$	291.772	1.46[10]	1.24[-1]	7.20[-1]	271.751	1.74[10]	1.28[-1]	6.89[-1]
$s^2(^1S)d\ ^2D_{5/2}$	$sp(^1P)d\ ^2D_{5/2}$	290.786	1.64[10]	2.07[-1]	1.19[0]	270.980	1.83[10]	2.02[-1]	1.08[0]
$s^2(^1S)d\ ^2D_{3/2}$	$sp(^1P)d\ ^2D_{3/2}$	290.517	9.99[09]	1.26[-1]	4.84[-1]	270.309	1.04[10]	1.13[-1]	4.05[-1]
$s^2(^1S)p\ ^2P_{3/2}$	$p^2(^3P)s\ ^2P_{1/2}$	290.192	1.77[10]	1.11[-1]	4.26[-1]	270.837	2.02[10]	1.11[-1]	3.97[-1]
$s^2(^1S)p\ ^2P_{3/2}$	$p^2(^3P)s\ ^2P_{3/2}$	284.389	2.87[10]	3.48[-1]	1.31[0]	265.097	3.18[10]	3.34[-1]	1.17[0]
$s^2(^1S)p\ ^2P_{1/2}$	$p^2(^3P)s\ ^2P_{1/2}$	277.872	1.38[10]	1.59[-1]	2.91[-1]	257.694	1.34[10]	1.34[-1]	2.27[-1]
$s^2(^1S)p\ ^2P_{1/2}$	$p^2(^3P)s\ ^2P_{3/2}$	272.547	6.57[09]	1.46[-1]	2.62[-1]	252.492	7.38[09]	1.42[-1]	2.35[-1]
$p^2(^3P)s\ ^2P_{3/2}$	$sp(^3P)d\ ^2P_{3/2}$	260.334	1.03[10]	1.04[-1]	3.58[-1]	243.866	1.06[10]	9.49[-2]	3.04[-1]
$p^2(^1D)s\ ^2D_{5/2}$	$sp(^3P)d\ ^2D_{3/2}$	257.778	2.51[09]	1.66[-2]	8.49[-2]	240.725	2.64[09]	1.53[-2]	7.28[-2]
$p^2(^1D)s\ ^2D_{5/2}$	$sp(^3P)d\ ^2D_{5/2}$	257.494	2.73[10]	2.72[-1]	1.38[0]	240.364	2.93[10]	2.54[-1]	1.21[0]
$p^2(^1D)s\ ^2D_{3/2}$	$sp(^3P)d\ ^2D_{3/2}$	256.721	2.80[10]	2.76[-1]	9.34[-1]	239.444	3.04[10]	2.62[-1]	8.25[-1]
$p^2(^1D)s\ ^2D_{3/2}$	$sp(^3P)d\ ^2D_{5/2}$	256.439	3.02[09]	4.47[-2]	1.51[-1]	239.086	3.56[09]	4.57[-2]	1.44[-1]
$p^2(^3P)s\ ^2P_{3/2}$	$sp(^3P)d\ ^2P_{1/2}$	256.224	4.58[09]	2.25[-2]	7.61[-2]	239.254	4.78[09]	2.05[-2]	6.47[-2]
$p^2(^3P)s\ ^2P_{1/2}$	$sp(^3P)d\ ^2P_{1/2}$	251.689	2.35[10]	2.23[-1]	3.70[-1]	234.763	2.73[10]	2.26[-1]	3.49[-1]
$p^2(^1S)s\ ^2S_{1/2}$	$sp(^3P)d\ ^2P_{3/2}$	242.423	3.38[10]	5.95[-1]	9.51[-1]	226.324	3.78[10]	5.81[-1]	8.65[-1]
$p^2(^3P)s\ ^2P_{3/2}$	$sp(^1P)d\ ^2P_{1/2}$	242.170	8.16[09]	3.59[-2]	1.14[-1]	226.404	9.23[09]	3.57[-2]	1.06[-1]
$p^2(^3P)s\ ^2P_{3/2}$	$sp(^1P)d\ ^2P_{3/2}$	241.457	2.67[09]	2.33[-2]	7.42[-2]	225.673	3.99[09]	3.05[-2]	9.04[-2]
$p^2(^1D)s\ ^2D_{3/2}$	$sp(^3P)d\ ^2F_{5/2}$	240.224	1.17[10]	1.53[-1]	4.82[-1]	224.805	1.25[10]	1.43[-1]	4.23[-1]
$p^2(^3P)s\ ^2P_{3/2}$	$sp(^1P)d\ ^2D_{3/2}$	239.779	2.46[10]	2.13[-1]	6.71[-1]	224.128	2.61[10]	1.96[-1]	5.80[-1]
$p^2(^3P)s\ ^2P_{3/2}$	$sp(^1P)d\ ^2D_{5/2}$	239.113	5.18[10]	6.68[-1]	2.10[0]	223.603	5.60[10]	6.31[-1]	1.86[0]
$p^2(^1S)s\ ^2S_{1/2}$	$sp(^3P)d\ ^2P_{1/2}$	238.856	1.37[10]	1.17[-1]	1.83[-1]	222.345	1.27[10]	9.46[-2]	1.38[-1]
$p^2(^3P)s\ ^4P_{5/2}$	$sp(^3P)d\ ^4P_{5/2}$	238.575	2.71[09]	2.31[-2]	1.09[-1]	223.600	2.65[09]	1.99[-2]	8.78[-2]
$p^2(^3P)s\ ^2P_{1/2}$	$sp(^1P)d\ ^2P_{1/2}$	238.115	7.19[09]	6.12[-2]	9.59[-2]	222.379	7.02[09]	5.21[-2]	7.62[-2]
$p^2(^3P)s\ ^2P_{1/2}$	$sp(^1P)d\ ^2P_{3/2}$	237.426	4.36[10]	7.37[-1]	1.15[0]	221.673	4.62[10]	6.84[-1]	9.98[-1]
$s^2(^1S)p\ ^2P_{3/2}$	$s^2(^1S)d\ ^2D_{3/2}$	235.589	6.83[09]	5.71[-2]	1.77[-1]	220.532	7.60[09]	5.52[-2]	1.61[-1]
$s^2(^1S)p\ ^2P_{3/2}$	$s^2(^1S)d\ ^2D_{5/2}$	234.771	3.53[10]	4.37[-1]	1.35[0]	219.582	3.80[10]	4.13[-1]	1.19[0]
$p^2(^1D)s\ ^2D_{5/2}$	$sp(^3P)d\ ^2F_{7/2}$	234.330	1.41[10]	1.55[-1]	7.18[-1]	218.608	1.55[10]	1.49[-1]	6.40[-1]
$p^2(^3P)s\ ^4P_{3/2}$	$sp(^3P)d\ ^4P_{5/2}$	234.170	2.20[10]	2.72[-1]	8.39[-1]	218.919	2.42[10]	2.61[-1]	7.52[-1]
$p^2(^3P)s\ ^4P_{3/2}$	$sp(^3P)d\ ^4P_{3/2}$	233.015	4.43[09]	3.61[-2]	1.11[-1]	217.788	5.41[09]	3.85[-2]	1.10[-1]
$p^2(^3P)s\ ^4P_{5/2}$	$sp(^3P)d\ ^4D_{7/2}$	232.556	3.60[10]	3.87[-1]	1.78[0]	217.261	3.85[10]	3.65[-1]	1.56[0]
$p^2[^3P)s\ ^4P_{5/2}$	$sp(^3P)d\ ^4D_{3/2}$	232.287	1.03[10]	5.59[-2]	2.56[-1]	216.859	1.14[10]	5.35[-2]	2.29[-1]
$p^2(^3P)s\ ^4P_{5/2}$	$sp(^3P)d\ ^4D_{5/2}$	232.244	2.35[10]	1.90[-1]	8.74[-1]	216.897	2.58[10]	1.82[-1]	7.78[-1]
$p^2(^3P)s\ ^4P_{1/2}$	$sp(^3P)d\ ^4D_{3/2}$	229.742	2.48[10]	3.93[-1]	5.94[-1]	214.195	2.70[10]	3.71[-1]	5.23[-1]
$p^2(^3P)s\ ^4P_{1/2}$	$sp(^3P)d\ ^4P_{1/2}$	228.995	3.53[10]	2.78[-1]	4.19[-1]	213.506	3.85[10]	2.64[-1]	3.70[-1]
$p^2(^3P)s\ ^4P_{3/2}$	$sp(^3P)d\ ^4D_{1/2}$	228.343	2.53[10]	9.87[-2]	2.97[-1]	212.627	2.73[10]	9.25[-2]	2.59[-1]
$p^2(^3P)s\ ^4P_{3/2}$	$sp(^3P)d\ ^4D_{3/2}$	228.109	1.89[10]	1.47[-1]	4.42[-1]	212.453	1.98[10]	1.35[-1]	3.76[-1]

Lower level	Upper level	λ	A	f	S	λ	A	f	S
					Z=27				Z=28
$p^2(^3P)s\ ^2P_{3/2}$	$p^2(^3P)p\ ^2P_{3/2}$	372.591	2.89[09]	6.03[-2]	2.96[-1]	346.919	3.24[09]	5.83[-2]	2.67[-1]
$p^2(^3P)s\ ^2P_{1/2}$	$p^2(^3P)p\ ^2P_{1/2}$	367.218	3.59[09]	7.26[-2]	1.75[-1]	343.450	4.04[09]	7.15[-2]	1.62[-1]
$p^2(^1D)s\ ^2D_{5/2}$	$p^2(^3P)p\ ^2D_{5/2}$	334.813	3.03[09]	5.10[-2]	3.37[-1]	313.656	3.31[09]	4.89[-2]	3.04[-1]
$s^2(^1S)d\ ^2D_{5/2}$	$sp(^1P)d\ ^2F_{7/2}$	273.329	2.44[10]	3.65[-1]	1.97[0]	256.111	2.70[10]	3.52[-1]	1.79[0]
$p^2(^1D)s\ ^2D_{3/2}$	$p^2(^3P)p\ ^2P_{1/2}$	272.329	1.34[10]	7.49[-2]	2.68[-1]	254.971	1.49[10]	7.25[-2]	2.44[-1]
$p^2(^1D)s\ ^2D_{5/2}$	$p^2(^3P)p\ ^2P_{3/2}$	270.913	1.06[10]	7.77[-2]	4.16[-1]	253.251	1.16[10]	7.43[-2]	3.72[-1]
$p^2(^3P)s\ ^4P_{5/2}$	$p^2(^3P)p\ ^4S_{3/2}$	270.521	1.71[10]	1.25[-1]	6.67[-1]	254.239	1.80[10]	1.16[-1]	5.86[-1]
$s^2(^1S)d\ ^2D_{3/2}$	$sp(^1P)d\ ^2F_{5/2}$	268.899	2.50[10]	4.06[-1]	1.44[0]	251.468	2.78[10]	3.95[-1]	1.31[0]
$p^2(^3P)s\ ^4P_{3/2}$	$p^2(^3P)p\ ^4S_{3/2}$	262.394	1.27[10]	1.32[-1]	4.53[-1]	245.775	1.38[10]	1.25[-1]	4.03[-1]
$s^2(^1S)d\ ^2D_{5/2}$	$sp(^1P)d\ ^2P_{3/2}$	256.133	9.47[09]	6.20[-2]	3.14[-1]	240.139	1.01[10]	5.76[-2]	2.74[-1]
$s^2(^1S)p\ ^2P_{1/2}$	$p^2(^1S)s\ ^2S_{1/2}$	256.098	2.03[10]	2.00[-1]	3.38[-1]	239.695	2.43[10]	2.09[-1]	3.31[-1]
$p^2(^3P)s\ ^4P_{1/2}$	$p^2(^3P)p\ ^4S_{3/2}$	255.939	6.79[09]	1.33[-1]	2.24[-1]	238.792	7.33[09]	1.25[-1]	1.98[-1]
$s^2(^1S)d\ ^2D_{3/2}$	$sp(^1P)d\ ^2P_{1/2}$	255.564	2.94[10]	1.44[-1]	4.86[-1]	239.433	3.21[10]	1.38[-1]	4.36[-1]
$s^2(^1S)d\ ^2D_{3/2}$	$sp(^1P)d\ ^2P_{3/2}$	254.475	1.12[10]	1.10[-1]	3.66[-1]	238.290	1.25[10]	1.07[-1]	3.34[-1]
$s^2(^1S)d\ ^2D_{5/2}$	$sp(^1P)d\ ^2D_{3/2}$	253.900	1.99[10]	1.28[-1]	6.42[-1]	237.880	2.21[10]	1.26[-1]	5.89[-1]
$s^2(^1S)p\ ^2P_{3/2}$	$p^2(^3P)s\ ^2P_{1/2}$	253.577	2.29[10]	1.11[-1]	3.69[-1]	238.046	2.56[10]	1.09[-1]	3.41[-1]
$s^2(^1S)d\ ^2D_{5/2}$	$sp(^1P)d\ ^2D_{5/2}$	253.364	2.03[10]	1.95[-1]	9.79[-1]	237.563	2.25[10]	1.91[-1]	8.94[-1]
$s^2(^1S)d\ ^2D_{3/2}$	$sp(^1P)d\ ^2D_{3/2}$	252.271	1.11[10]	1.06[-1]	3.53[-1]	236.065	1.23[10]	1.02[-1]	3.18[-1]
$s^2(^1S)p\ ^2P_{3/2}$	$p^2(^3P)s\ ^2P_{3/2}$	247.980	3.49[10]	3.22[-1]	1.05[0]	232.663	3.82[10]	3.10[-1]	9.50[-1]
$s^2(^1S)p\ ^2P_{1/2}$	$p^2(^3P)s\ ^2P_{1/2}$	239.624	1.29[10]	1.11[-1]	1.75[-1]	223.305	1.21[10]	9.10[-2]	1.34[-1]
$s^2(^1S)p\ ^2P_{1/2}$	$p^2(^3P)s\ ^2P_{3/2}$	234.620	8.33[09]	1.37[-1]	2.13[-1]	218.562	9.43[09]	1.34[-1]	1.93[-1]
$p^2(^3P)s\ ^2P_{3/2}$	$sp(^3P)d\ ^2P_{3/2}$	229.494	1.09[10]	8.58[-2]	2.60[-1]	216.843	1.11[10]	7.81[-2]	2.23[-1]
$p^2(^1D)s\ ^2D_{5/2}$	$sp(^3P)d\ ^2D_{3/2}$	225.710	2.76[09]	1.41[-2]	6.27[-2]	212.380	2.86[09]	1.30[-2]	5.42[-2]
$p^2(^1D)s\ ^2D_{5/2}$	$sp(^3P)d\ ^2D_{5/2}$	225.272	3.12[10]	2.37[-1]	1.06[0]	211.871	3.29[10]	2.21[-1]	9.26[-1]
$p^2(^3P)s\ ^2P_{3/2}$	$sp(^3P)d\ ^2P_{1/2}$	224.346	4.93[09]	1.86[-2]	5.50[-2]	211.128	5.01[09]	1.68[-2]	4.66[-2]
$p^2(^1D)s\ ^2D_{3/2}$	$sp(^3P)d\ ^2D_{3/2}$	224.165	3.30[10]	2.49[-1]	7.34[-1]	210.526	3.56[10]	2.37[-1]	6.57[-1]
$p^2(^1D)s\ ^2D_{3/2}$	$sp(^3P)d\ ^2D_{5/2}$	223.732	4.19[09]	4.74[-2]	1.40[-1]	210.027	5.03[09]	5.01[-2]	1.38[-1]
$p^2(^3P)s\ ^2P_{1/2}$	$sp(^3P)d\ ^2P_{1/2}$	219.954	3.13[10]	2.27[-1]	3.29[-1]	206.882	3.53[10]	2.27[-1]	3.09[-1]
$p^2(^1D)s\ ^2D_{5/2}$	$sp(^3P)d\ ^2F_{5/2}$	212.610	2.91[09]	1.97[-2]	8.29[-2]	200.837	3.71[09]	2.26[-2]	8.96[-2]
$p^2(^3P)s\ ^2P_{3/2}$	$sp(^1P)d\ ^2P_{1/2}$	212.589	1.06[10]	3.57[-2]	9.99[-2]	200.370	1.20[10]	3.61[-2]	9.51[-2]
$p^2(^1S)s\ ^2S_{1/2}$	$sp(^3P)d\ ^2P_{3/2}$	212.096	4.20[10]	5.68[-1]	7.92[-1]	199.401	4.65[10]	5.55[-1]	7.29[-1]
$p^2(^3P)s\ ^2P_{3/2}$	$sp(^1P)d\ ^2P_{3/2}$	211.836	5.16[09]	3.46[-2]	9.66[-2]	199.569	6.15[09]	3.67[-2]	9.65[-2]
$p^2(^1D)s\ ^2D_{3/2}$	$sp(^3P)d\ ^2F_{5/2}$	211.238	1.33[10]	1.34[-1]	3.72[-1]	199.179	1.40[10]	1.25[-1]	3.26[-1]
$p^2(^3P)s\ ^4P_{5/2}$	$sp(^3P)d\ ^4P_{5/2}$	210.481	2.69[09]	1.79[-2]	7.43[-2]	198.879	2.81[09]	1.67[-2]	6.57[-2]
$p^2(^3P)s\ ^2P_{3/2}$	$sp(^1P)d\ ^2D_{3/2}$	210.306	2.78[10]	1.84[-1]	5.10[-1]	198.006	2.97[10]	1.75[-1]	4.55[-1]
$p^2(^3P)s\ ^2P_{3/2}$	$sp(^1P)d\ ^2D_{5/2}$	209.938	6.00[10]	5.98[-1]	1.65[0]	197.787	6.44[10]	5.65[-1]	1.48[0]
$p^2(^3P)s\ ^2P_{1/2}$	$sp(^1P)d\ ^2P_{1/2}$	208.641	6.80[09]	4.45[-2]	6.10[-2]	196.542	6.62[09]	3.83[-2]	4.97[-2]
$p^2(^3P)s\ ^2P_{1/2}$	$sp(^1P)d\ ^2P_{3/2}$	207.915	4.88[10]	6.33[-1]	8.66[-1]	195.772	5.10[10]	5.87[-1]	7.57[-1]
$p^2(^1S)s\ ^2S_{1/2}$	$sp(^3P)d\ ^2P_{1/2}$	207.691	1.17[10]	7.58[-2]	1.04[-1]	194.558	1.06[10]	6.06[-2]	7.76[-2]
$s^2(^1S)p\ ^2P_{3/2}$	$s^2(^1S)d\ ^2D_{3/2}$	207.315	8.41[09]	5.44[-2]	1.49[-1]	195.607	9.37[09]	5.40[-2]	1.39[-1]
$s^2(^1S)p\ ^2P_{3/2}$	$s^2(^1S)d\ ^2D_{5/2}$	206.228	4.10[10]	3.92[-1]	1.06[0]	194.378	4.39[10]	3.73[-1]	9.54[-1]
$p^2(^3P)s\ ^4P_{3/2}$	$sp(^3P)d\ ^4P_{5/2}$	205.529	2.61[10]	2.48[-1]	6.73[-1]	193.662	2.80[10]	2.36[-1]	6.02[-1]
$p^2(^1D)s\ ^2D_{5/2}$	$sp(^3P)d\ ^2F_{7/2}$	204.769	1.69[10]	1.42[-1]	5.75[-1]	192.479	1.84[10]	1.36[-1]	5.19[-1]
$p^2(^3P)s\ ^4P_{3/2}$	$sp(^3P)d\ ^4P_{3/2}$	204.411	6.27[09]	3.94[-2]	1.06[-1]	192.552	7.09[09]	3.95[-2]	1.00[-1]
$p^2(^3P)s\ ^4P_{5/2}$	$sp(^3P)d\ ^4D_{7/2}$	203.757	4.12[10]	3.43[-1]	1.38[0]	191.717	4.38[10]	3.21[-1]	1.22[0]
$p^2(^3P)s\ ^4P_{5/2}$	$sp(^3P)d\ ^4D_{5/2}$	203.361	2.79[10]	1.73[-1]	6.96[-1]	191.307	3.00[10]	1.65[-1]	6.24[-1]
$p^2(^3P)s\ ^4P_{5/2}$	$sp(^3P)d\ ^4D_{3/2}$	203.250	1.24[10]	5.12[-2]	2.05[-1]	191.130	1.33[10]	4.87[-2]	1.83[-1]
$p^2(^3P)s\ ^4P_{1/2}$	$sp(^3P)d\ ^4P_{3/2}$	200.472	2.91[10]	3.51[-1]	4.63[-1]	188.239	3.13[10]	3.32[-1]	4.11[-1]
$p^2(^3P)s\ ^4P_{1/2}$	$sp(^3P)d\ ^4P_{1/2}$	199.831	4.17[10]	2.50[-1]	3.29[-1]	187.638	4.50[10]	2.38[-1]	2.94[-1]
$p^2(^3P)s\ ^4P_{3/2}$	$sp(^3P)d\ ^4D_{1/2}$	198.755	2.93[10]	8.67[-2]	2.28[-1]	186.396	3.15[10]	8.24[-2]	2.02[-1]
$p^2(^3P)s\ ^4P_{3/2}$	$sp(^3P)d\ ^4D_{5/2}$	198.734	1.03[10]	9.20[-2]	2.40[-1]	186.475	1.09[10]	8.58[-2]	2.11[-1]

Lower level	Upper level	λ	A	f	S	λ	A	f	S
				$Z=29$				$Z=30$	
$p^2(^3P)s\ ^2P_{3/2}$	$p^2(^3P)p\ ^2P_{3/2}$	323.790	3.58[09]	5.63[-2]	2.40[-1]	302.819	3.92[09]	5.38[-2]	2.15[-1]
$p^2(^3P)s\ ^2P_{1/2}$	$p^2(^3P)p\ ^2P_{1/2}$	322.408	4.48[09]	6.98[-2]	1.48[-1]	303.652	4.91[09]	6.79[-2]	1.36[-1]
$p^2(^1D)s\ ^2D_{5/2}$	$p^2(^3P)p\ ^2D_{5/2}$	294.795	3.61[09]	4.72[-2]	2.74[-1]	277.894	3.87[09]	4.49[-2]	2.47[-1]
$s^2(^1S)p\ ^2P_{1/2}$	$p^2(^1D)s\ ^2D_{3/2}$	268.809	3.38[09]	7.33[-2]	1.30[-1]	251.129	3.93[09]	7.42[-2]	1.23[-1]
$s^2(^1S)d\ ^2D_{5/2}$	$sp(^1P)d\ ^2F_{7/2}$	240.649	2.97[10]	3.43[-1]	1.63[0]	226.662	3.26[10]	3.34[-1]	1.50[0]
$p^2(^3P)s\ ^4P_{5/2}$	$p^2(^3P)p\ ^4S_{3/2}$	239.523	1.89[10]	1.09[-1]	5.14[-1]	226.121	1.97[10]	9.99[-2]	4.48[-1]
$p^2(^1D)s\ ^2D_{3/2}$	$p^2(^3P)p\ ^2P_{1/2}$	239.318	1.65[10]	7.11[-2]	2.23[-1]	225.106	1.82[10]	6.92[-2]	2.06[-1]
$p^2(^1D)s\ ^2D_{5/2}$	$p^2(^3P)p\ ^2P_{3/2}$	237.305	1.27[10]	7.14[-2]	3.34[-1]	222.828	1.38[10]	6.85[-2]	3.02[-1]
$s^2(^1S)d\ ^2D_{3/2}$	$sp(^1P)d\ ^2F_{5/2}$	235.814	3.07[10]	3.86[-1]	1.20[0]	221.662	3.39[10]	3.76[-1]	1.10[0]
$p^2(^3P)s\ ^4P_{3/2}$	$p^2(^3P)p\ ^4S_{3/2}$	230.764	1.47[10]	1.18[-1]	3.58[-1]	217.116	1.58[10]	1.12[-1]	3.19[-1]
$s^2(^1S)d\ ^2D_{5/2}$	$sp(^1P)d\ ^2P_{3/2}$	225.710	1.08[10]	5.51[-2]	2.46[-1]	212.589	1.19[10]	5.38[-2]	2.26[-1]
$s^2(^1S)p\ ^2P_{1/2}$	$p^2(^1S)s\ ^2S_{1/2}$	224.980	2.85[10]	2.16[-1]	3.21[-1]	211.685	3.30[10]	2.22[-1]	3.09[-1]
$s^2(^1S)d\ ^2D_{3/2}$	$sp(^1P)d\ ^2P_{1/2}$	224.917	3.49[10]	1.33[-1]	3.92[-1]	211.763	3.75[10]	1.26[-1]	3.52[-1]
$s^2(^1S)p\ ^2P_{3/2}$	$p^2(^3P)s\ ^2P_{1/2}$	223.966	2.84[10]	1.07[-1]	3.15[-1]	211.116	3.12[10]	1.04[-1]	2.90[-1]
$s^2(^1S)d\ ^2D_{3/2}$	$sp(^1P)d\ ^2P_{3/2}$	223.671	1.36[10]	1.01[-1]	3.00[-1]	210.366	1.45[10]	9.60[-2]	2.67[-1]
$s^2(^1S)d\ ^2D_{5/2}$	$sp(^1P)d\ ^2D_{3/2}$	223.415	2.44[10]	1.21[-1]	5.37[-1]	210.277	2.64[10]	1.17[-1]	4.86[-1]
$s^2(^1S)d\ ^2D_{5/2}$	$sp(^1P)d\ ^2D_{5/2}$	223.288	2.48[10]	1.86[-1]	8.19[-1]	210.304	2.73[10]	1.81[-1]	7.53[-1]
$p^2(^3P)s\ ^4P_{1/2}$	$p^2(^3P)p\ ^4S_{3/2}$	223.234	7.93[09]	1.19[-1]	1.74[-1]	209.022	8.48[09]	1.11[-1]	1.53[-1]
$s^2(^1S)d\ ^2D_{3/2}$	$sp(^1P)d\ ^2D_{3/2}$	221.417	1.37[10]	1.01[-1]	2.94[-1]	208.102	1.56[10]	1.01[-1]	2.78[-1]
$s^2(^1S)p\ ^2P_{3/2}$	$p^2(^3P)s\ ^2P_{3/2}$	218.855	4.16[10]	2.99[-1]	8.61[-1]	206.324	4.51[10]	2.87[-1]	7.82[-1]
$s^2(^1S)p\ ^2P_{1/2}$	$p^2(^3P)s\ ^2P_{1/2}$	208.464	1.13[10]	7.42[-2]	1.02[-1]	194.889	1.05[10]	6.02[-2]	7.72[-2]
$p^2(^3P)s\ ^2P_{3/2}$	$sp(^3P)d\ ^2P_{3/2}$	205.624	1.12[10]	7.09[-2]	1.92[-1]	195.608	1.14[10]	6.51[-2]	1.67[-1]
$s^2(^1S)p\ ^2P_{1/2}$	$p^2(^3P)s\ ^2P_{3/2}$	204.030	1.06[10]	1.32[-1]	1.77[-1]	190.798	1.19[10]	1.31[-1]	1.64[-1]
$p^2(^1D)s\ ^2D_{5/2}$	$sp(^3P)d\ ^2D_{5/2}$	199.899	3.42[10]	2.05[-1]	8.10[-1]	189.159	3.51[10]	1.89[-1]	7.05[-1]
$p^2(^3P)s\ ^2P_{3/2}$	$sp(^3P)d\ ^2P_{1/2}$	199.313	5.01[09]	1.50[-2]	3.92[-2]	188.677	4.90[09]	1.31[-2]	3.25[-2]
$p^2(^1D)s\ ^2D_{3/2}$	$sp(^3P)d\ ^2D_{3/2}$	198.253	3.84[10]	2.26[-1]	5.90[-1]	187.127	4.11[10]	2.16[-1]	5.33[-1]
$p^2(^1D)s\ ^2D_{3/2}$	$sp(^3P)d\ ^2D_{5/2}$	197.703	6.12[09]	5.36[-2]	1.40[-1]	186.560	7.56[09]	5.91[-2]	1.46[-1]
$p^2(^3P)s\ ^2P_{1/2}$	$sp(^3P)d\ ^2P_{1/2}$	195.255	3.93[10]	2.25[-1]	2.89[-1]	184.840	4.31[10]	2.21[-1]	2.69[-1]
$p^2(^1D)s\ ^2D_{5/2}$	$sp(^3P)d\ ^2F_{5/2}$	190.348	4.88[09]	2.65[-2]	9.98[-2]	180.928	6.57[09]	3.22[-2]	1.15[-1]
$p^2(^3P)s\ ^2P_{3/2}$	$sp(^1P)d\ ^2P_{1/2}$	189.473	1.36[10]	3.68[-2]	9.17[-2]	179.683	1.56[10]	3.79[-2]	8.95[-2]
$p^2(^3P)s\ ^2P_{3/2}$	$sp(^1P)d\ ^2P_{3/2}$	188.588	6.97[09]	3.72[-2]	9.24[-2]	178.676	7.56[09]	3.63[-2]	8.54[-2]
$p^2(^3P)s\ ^4P_{5/2}$	$sp(^3P)d\ ^4P_{5/2}$	188.531	3.04[09]	1.62[-2]	6.03[-2]	179.228	3.33[09]	1.62[-2]	5.71[-2]
$p^2(^1D)s\ ^2D_{3/2}$	$sp(^3P)d\ ^2F_{5/2}$	188.356	1.43[10]	1.14[-1]	2.84[-1]	178.549	1.45[10]	1.04[-1]	2.43[-1]
$p^2(^1S)s\ ^2S_{1/2}$	$sp(^3P)d\ ^2P_{3/2}$	187.982	5.10[10]	5.43[-1]	6.72[-1]	177.639	5.59[10]	5.32[-1]	6.22[-1]
$p^2(^3P)s\ ^2P_{3/2}$	$sp(^1P)d\ ^2D_{3/2}$	186.983	3.19[10]	1.67[-1]	4.12[-1]	177.040	3.43[10]	1.61[-1]	3.76[-1]
$p^2(^3P)s\ ^2P_{3/2}$	$sp(^1P)d\ ^2D_{5/2}$	186.894	6.86[10]	5.41[-1]	1.33[0]	177.059	7.29[10]	5.13[-1]	1.20[0]
$p^2(^3P)s\ ^2P_{1/2}$	$sp(^1P)d\ ^2P_{1/2}$	185.802	6.53[09]	3.38[-2]	4.14[-2]	176.200	6.58[09]	3.07[-2]	3.56[-2]
$s^2(^1S)p\ ^2P_{3/2}$	$s^2(^1S)d\ ^2D_{3/2}$	185.153	1.05[10]	5.40[-2]	1.31[-1]	175.752	1.18[10]	5.46[-2]	1.26[-1]
$p^2(^3P)s\ ^2P_{1/2}$	$sp(^1P)d\ ^2P_{3/2}$	184.951	5.30[10]	5.46[-1]	6.66[-1]	175.232	5.56[10]	5.12[-1]	5.91[-1]
$s^2(^1S)p\ ^2P_{3/2}$	$s^2(^1S)d\ ^2D_{5/2}$	183.779	4.69[10]	3.56[-1]	8.61[-1]	174.230	4.99[10]	3.40[-1]	7.81[-1]
$p^2(^3P)s\ ^4P_{3/2}$	$sp(^3P)d\ ^4P_{5/2}$	183.062	2.98[10]	2.24[-1]	5.40[-1]	173.524	3.13[10]	2.12[-1]	4.86[-1]
$p^2(^1S)s\ ^2S_{1/2}$	$sp(^3P)d\ ^2P_{1/2}$	182.693	9.66[09]	4.86[-2]	5.84[-2]	171.904	8.88[09]	3.94[-2]	4.46[-2]
$p^2(^3P)s\ ^4P_{3/2}$	$sp(^3P)d\ ^4P_{3/2}$	181.952	7.86[09]	3.90[-2]	9.34[-2]	172.411	8.59[09]	3.83[-2]	8.68[-2]
$p^2(^1D)s\ ^2D_{5/2}$	$sp(^3P)d\ ^2F_{7/2}$	181.484	2.00[10]	1.32[-1]	4.71[-1]	171.583	2.15[10]	1.27[-1]	4.29[-1]
$p^2(^3P)s\ ^4P_{5/2}$	$sp(^3P)d\ ^4D_{7/2}$	180.884	4.63[10]	3.03[-1]	1.08[0]	171.058	4.88[10]	2.86[-1]	9.67[-1]
$p^2(^3P)s\ ^4P_{5/2}$	$sp(^3P)d\ ^4D_{5/2}$	180.478	3.21[10]	1.58[-1]	5.62[-1]	170.674	3.44[10]	1.50[-1]	5.07[-1]
$p^2(^3P)s\ ^4P_{5/2}$	$sp(^3P)d\ ^4D_{3/2}$	180.241	1.43[10]	4.61[-2]	1.64[-1]	170.380	1.51[10]	4.39[-2]	1.48[-1]
$p^2(^3P)s\ ^4P_{1/2}$	$sp(^3P)d\ ^4P_{3/2}$	177.238	3.35[10]	3.15[-1]	3.67[-1]	167.268	3.57[10]	2.99[-1]	3.29[-1]
$p^2(^3P)s\ ^4P_{1/2}$	$sp(^3P)d\ ^4P_{1/2}$	176.676	4.84[10]	2.27[-1]	2.64[-1]	166.745	5.20[10]	2.17[-1]	2.38[-1]
$p^2(^3P)s\ ^4P_{3/2}$	$sp(^3P)d\ ^4D_{5/2}$	175.460	1.18[10]	8.14[-2]	1.88[-1]	165.493	1.27[10]	7.86[-2]	1.71[-1]
$p^2(^3P)s\ ^4P_{3/2}$	$sp(^3P)d\ ^4D_{1/2}$	175.295	3.39[10]	7.81[-2]	1.80[-1]	165.251	3.64[10]	7.47[-2]	1.62[-1]

8

Lower level	Upper level	λ	A	f	S	λ	A	f	S
				Z=31				Z=32	
$p^2(^3P)s\ ^2P_{1/2}$	$p^2(^3P)p\ ^2P_{1/2}$	286.829	5.33[09]	6.58[-2]	1.24[-1]	271.656	5.73[09]	6.35[-2]	1.14[-1]
$p^2(^3P)s\ ^2P_{3/2}$	$p^2(^3P)p\ ^2P_{3/2}$	283.712	4.24[09]	5.12[-2]	1.91[-1]	266.250	4.51[09]	4.79[-2]	1.68[-1]
$p^2(^1D)s\ ^2D_{5/2}$	$p^2(^3P)p\ ^2D_{5/2}$	262.681	4.13[09]	4.29[-2]	2.22[-1]	248.942	4.35[09]	4.06[-2]	1.99[-1]
$s^2(^1S)p\ ^2P_{1/2}$	$p^2(^1D)s\ ^2D_{3/2}$	235.057	4.54[09]	7.52[-2]	1.16[-1]	220.377	5.26[09]	7.63[-2]	1.11[-1]
$s^2(^1S)d\ ^2D_{5/2}$	$sp(^1P)d\ ^2F_{7/2}$	213.926	3.56[10]	3.25[-1]	1.38[0]	202.261	3.90[10]	3.19[-1]	1.28[0]
$p^2(^3P)s\ ^4P_{5/2}$	$p^2(^3P)p\ ^4S_{3/2}$	213.835	2.02[10]	9.25[-2]	3.90[-1]	202.508	2.07[10]	8.51[-2]	3.40[-1]
$p^2(^1D)s\ ^2D_{3/2}$	$p^2(^3P)p\ ^2P_{1/2}$	212.122	2.02[10]	6.77[-2]	1.90[-1]	200.196	2.22[10]	6.68[-2]	1.76[-1]
$p^2(^1D)s\ ^2D_{5/2}$	$p^2(^3P)p\ ^2P_{3/2}$	209.631	1.51[10]	6.59[-2]	2.73[-1]	197.573	1.62[10]	6.33[-2]	2.47[-1]
$s^2(^1S)d\ ^2D_{3/2}$	$sp(^1P)d\ ^2F_{5/2}$	208.793	3.74[10]	3.67[-1]	1.01[0]	197.030	4.10[10]	3.56[-1]	9.27[-1]
$p^2(^3P)s\ ^4P_{3/2}$	$p^2(^3P)p\ ^4S_{3/2}$	204.638	1.68[10]	1.05[-1]	2.84[-1]	193.178	1.78[10]	1.00[-1]	2.53[-1]
$s^2(^1S)d\ ^2D_{5/2}$	$sp(^1P)d\ ^2P_{3/2}$	200.579	1.34[10]	5.39[-2]	2.13[-1]	189.526	1.52[10]	5.46[-2]	2.05[-1]
$s^2(^1S)d\ ^2D_{3/2}$	$sp(^1P)d\ ^2P_{1/2}$	199.769	4.01[10]	1.20[-1]	3.16[-1]	188.773	4.26[10]	1.14[-1]	2.83[-1]
$s^2(^1S)p\ ^2P_{1/2}$	$p^2(^1S)s\ ^2S_{1/2}$	199.592	3.75[10]	2.25[-1]	2.95[-1]	188.524	4.24[10]	2.26[-1]	2.80[-1]
$s^2(^1S)p\ ^2P_{3/2}$	$p^2(^3P)s\ ^2P_{1/2}$	199.323	3.40[10]	1.01[-1]	2.66[-1]	188.447	3.70[10]	9.87[-2]	2.45[-1]
$s^2(^1S)d\ ^2D_{5/2}$	$sp(^1P)d\ ^2D_{5/2}$	198.427	3.00[10]	1.77[-1]	6.94[-1]	187.505	3.29[10]	1.73[-1]	6.42[-1]
$s^2(^1S)d\ ^2D_{5/2}$	$sp(^1P)d\ ^2D_{3/2}$	198.274	2.84[10]	1.12[-1]	4.37[-1]	187.251	3.01[10]	1.06[-1]	3.91[-1]
$s^2(^1S)d\ ^2D_{3/2}$	$sp(^1P)d\ ^2P_{3/2}$	198.182	1.52[10]	8.98[-2]	2.34[-1]	186.968	1.57[10]	8.21[-2]	2.03[-1]
$p^2(^3P)s\ ^4P_{1/2}$	$p^2(^3P)p\ ^4S_{3/2}$	195.967	9.03[09]	1.04[-1]	1.34[-1]	183.918	9.63[09]	9.74[-2]	1.18[-1]
$s^2(^1S)d\ ^2D_{3/2}$	$sp(^1P)d\ ^2D_{3/2}$	195.932	1.81[10]	1.04[-1]	2.68[-1]	184.754	2.12[10]	1.08[-1]	2.63[-1]
$s^2(^1S)p\ ^2P_{3/2}$	$p^2(^3P)s\ ^2P_{3/2}$	194.886	4.87[10]	2.77[-1]	7.12[-1]	184.390	5.21[10]	2.67[-1]	6.48[-1]
$p^2(^3P)s\ ^2P_{3/2}$	$sp(^3P)d\ ^2P_{3/2}$	186.613	1.15[10]	5.98[-2]	1.47[-1]	178.487	1.17[10]	5.59[-2]	1.31[-1]
$s^2(^1S)p\ ^2P_{1/2}$	$p^2(^3P)s\ ^2P_{1/2}$	182.409	9.75[09]	4.88[-2]	5.86[-2]	170.892	9.06[09]	3.97[-2]	4.47[-2]
$p^2(^1D)s\ ^2D_{5/2}$	$sp(^3P)d\ ^2D_{5/2}$	179.504	3.52[10]	1.70[-1]	6.04[-1]	170.835	3.39[10]	1.49[-1]	5.03[-1]
$p^2(^3P)s\ ^2P_{3/2}$	$sp(^3P)d\ ^2P_{1/2}$	179.043	4.68[09]	1.13[-2]	2.65[-2]	170.268	4.31[09]	9.38[-3]	2.10[-2]
$s^2(^1S)p\ ^2P_{1/2}$	$p^2(^3P)s\ ^2P_{3/2}$	178.686	1.36[10]	1.30[-1]	1.53[-1]	167.549	1.55[10]	1.30[-1]	1.44[-1]
$p^2(^1D)s\ ^2D_{3/2}$	$sp(^3P)d\ ^2D_{3/2}$	176.978	4.41[10]	2.07[-1]	4.83[-1]	167.669	4.71[10]	1.99[-1]	4.38[-1]
$p^2(^1D)s\ ^2D_{3/2}$	$sp(^3P)d\ ^2D_{5/2}$	176.446	9.55[09]	6.70[-2]	1.55[-1]	167.258	1.22[10]	7.73[-2]	1.70[-1]
$p^2(^3P)s\ ^2P_{1/2}$	$sp(^3P)d\ ^2P_{1/2}$	175.455	4.66[10]	2.16[-1]	2.49[-1]	166.949	4.99[10]	2.09[-1]	2.29[-1]
$p^2(^1D)s\ ^2D_{5/2}$	$sp(^3P)d\ ^2F_{5/2}$	172.394	9.08[09]	4.04[-2]	1.38[-1]	164.581	1.29[10]	5.26[-2]	1.70[-1]
$p^2(^3P)s\ ^2P_{3/2}$	$sp(^1P)d\ ^2P_{1/2}$	170.827	1.80[10]	3.93[-2]	8.84[-2]	162.765	2.07[10]	4.12[-2]	8.84[-2]
$p^2(^3P)s\ ^2P_{3/2}$	$sp(^1P)d\ ^2P_{3/2}$	169.665	7.91[09]	3.42[-2]	7.63[-2]	161.422	7.89[09]	3.09[-2]	6.56[-2]
$p^2(^1D)s\ ^2D_{3/2}$	$sp(^3P)d\ ^2F_{5/2}$	169.572	1.41[10]	9.10[-2]	2.03[-1]	161.259	1.29[10]	7.60[-2]	1.61[-1]
$p^2(^1S)s\ ^2S_{1/2}$	$sp(^3P)d\ ^2P_{3/2}$	168.212	6.13[10]	5.21[-1]	5.77[-1]	159.573	6.67[10]	5.10[-1]	5.35[-1]
$p^2(^3P)s\ ^2P_{3/2}$	$sp(^1P)d\ ^2D_{5/2}$	168.122	7.69[10]	4.89[-1]	1.08[0]	159.953	8.12[10]	4.67[-1]	9.84[-1]
$p^2(^3P)s\ ^2P_{3/2}$	$sp(^1P)d\ ^2D_{3/2}$	168.013	3.70[10]	1.57[-1]	3.47[-1]	159.769	3.99[10]	1.53[-1]	3.21[-1]
$p^2(^3P)s\ ^2P_{1/2}$	$sp(^1P)d\ ^2P_{1/2}$	167.557	6.82[09]	2.87[-2]	3.17[-2]	159.730	7.30[09]	2.79[-2]	2.94[-2]
$s^2(^1S)p\ ^2P_{3/2}$	$s^2(^1S)d\ ^2D_{3/2}$	167.243	1.33[10]	5.56[-2]	1.22[-1]	159.497	1.50[10]	5.71[-2]	1.20[-1]
$p^2(^3P)s\ ^2P_{1/2}$	$sp(^1P)d\ ^2P_{3/2}$	166.439	5.81[10]	4.82[-1]	5.29[-1]	158.436	6.06[10]	4.58[-1]	4.77[-1]
$s^2(^1S)p\ ^2P_{3/2}$	$s^2(^1S)d\ ^2D_{5/2}$	165.573	5.28[10]	3.27[-1]	7.12[-1]	157.681	5.61[10]	3.15[-1]	6.52[-1]
$p^2(^3P)s\ ^4P_{3/2}$	$sp(^3P)d\ ^4P_{5/2}$	164.887	3.28[10]	2.01[-1]	4.38[-1]	157.022	3.44[10]	1.92[-1]	3.96[-1]
$p^2(^3P)s\ ^4P_{3/2}$	$sp(^3P)d\ ^4P_{3/2}$	163.766	9.37[09]	3.76[-2]	8.11[-2]	155.880	1.03[10]	3.75[-2]	7.69[-2]
$p^2(^1D)s\ ^2D_{5/2}$	$sp(^3P)d\ ^2F_{7/2}$	162.618	2.31[10]	1.22[-1]	3.92[-1]	154.462	2.47[10]	1.18[-1]	3.60[-1]
$p^2(^3P)s\ ^4P_{5/2}$	$sp(^3P)d\ ^4D_{7/2}$	162.079	5.13[10]	2.70[-1]	8.65[-1]	153.819	5.39[10]	2.55[-1]	7.75[-1]
$p^2(^1S)s\ ^2S_{1/2}$	$sp(^3P)d\ ^2P_{1/2}$	162.037	8.28[09]	3.26[-2]	3.48[-2]	152.972	7.90[09]	2.77[-2]	2.79[-2]
$p^2(^3P)s\ ^4P_{5/2}$	$sp(^3P)d\ ^4D_{5/2}$	161.732	3.67[10]	1.44[-1]	4.60[-1]	153.524	3.90[10]	1.38[-1]	4.19[-1]
$p^2[^3P)s\ ^4P_{5/2}$	$sp(^3P)d\ ^4D_{3/2}$	161.385	1.60[10]	4.16[-2]	1.33[-1]	153.127	1.68[10]	3.94[-2]	1.19[-1]
$p^2(^3P)s\ ^4P_{1/2}$	$sp(^3P)d\ ^4P_{3/2}$	158.165	3.78[10]	2.83[-1]	2.95[-1]	149.795	3.97[10]	2.68[-1]	2.64[-1]
$p^2(^3P)s\ ^4P_{1/2}$	$sp(^3P)d\ ^4P_{1/2}$	157.689	5.58[10]	2.08[-1]	2.16[-1]	149.381	5.98[10]	2.01[-1]	1.97[-1]
$p^2(^3P)s\ ^4P_{3/2}$	$sp(^3P)d\ ^4D_{5/2}$	156.415	1.39[10]	7.62[-2]	1.57[-1]	148.101	1.50[10]	7.43[-2]	1.45[-1]
$p^2(^3P)s\ ^4P_{3/2}$	$sp(^3P)d\ ^4D_{1/2}$	156.105	3.90[10]	7.13[-2]	1.47[-1]	147.728	4.19[10]	6.84[-2]	1.33[-1]
$p^2(^3P)s\ ^4P_{3/2}$	$sp(^3P)d\ ^4D_{3/2}$	156.091	2.73[10]	1.00[-1]	2.05[-1]	147.731	2.92[10]	9.55[-2]	1.86[-1]

Lower level	Upper level	λ	A	f	S	λ	A	f	S
				Z=33				Z=34	
$p^2(^3P)s\ ^2P_{1/2}$	$p^2(^3P)p\ ^2P_{1/2}$	257.899	6.13[09]	6.12[-2]	1.04[-1]	245.370	6.52[09]	5.90[-2]	9.52[-2]
$s^2(^1S)p\ ^2P_{1/2}$	$p^2(^1D)s\ ^2D_{3/2}$	206.911	6.04[09]	7.74[-2]	1.05[-1]	194.513	6.92[09]	7.85[-2]	1.01[-1]
$p^2(^3P)s\ ^4P_{5/2}$	$p^2(^3P)p\ ^2D_{3/2}$	206.048	6.15[09]	2.61[-2]	1.06[-1]	197.373	7.43[09]	2.90[-2]	1.13[-1]
$p^2(^3P)s\ ^4P_{5/2}$	$p^2(^3P)p\ ^4S_{3/2}$	192.013	2.12[10]	7.79[-2]	2.96[-1]	182.251	2.16[10]	7.18[-2]	2.58[-1]
$s^2(^1S)d\ ^2D_{5/2}$	$sp(^1P)d\ ^2F_{7/2}$	191.518	4.27[10]	3.13[-1]	1.18[0]	181.578	4.66[10]	3.07[-1]	1.10[0]
$p^2(^1D)s\ ^2D_{3/2}$	$p^2(^3P)p\ ^2P_{1/2}$	189.188	2.44[10]	6.54[-2]	1.63[-1]	178.984	2.68[10]	6.44[-2]	1.52[-1]
$p^2(^1D)s\ ^2D_{5/2}$	$p^2(^3P)p\ ^2P_{3/2}$	186.565	1.72[10]	5.98[-2]	2.20[-1]	176.657	1.62[10]	5.06[-2]	1.76[-1]
$s^2(^1S)d\ ^2D_{3/2}$	$sp(^1P)d\ ^2F_{5/2}$	186.231	4.46[10]	3.47[-1]	8.52[-1]	176.280	4.81[10]	3.37[-1]	7.82[-1]
$p^2(^3P)s\ ^4P_{3/2}$	$p^2(^3P)p\ ^4S_{3/2}$	182.610	1.88[10]	9.39[-2]	2.26[-1]	172.835	1.99[10]	8.90[-2]	2.02[-1]
$s^2(^1S)d\ ^2D_{5/2}$	$sp(^1P)d\ ^2P_{3/2}$	179.304	1.77[10]	5.67[-2]	2.01[-1]	169.814	2.08[10]	5.99[-2]	2.01[-1]
$s^2(^1S)d\ ^2D_{3/2}$	$sp(^1P)d\ ^2P_{1/2}$	178.640	4.47[10]	1.07[-1]	2.52[-1]	169.264	4.63[10]	9.96[-2]	2.22[-1]
$s^2(^1S)p\ ^2P_{3/2}$	$p^2(^3P)s\ ^2P_{1/2}$	178.371	4.00[10]	9.58[-2]	2.25[-1]	169.001	4.32[10]	9.25[-2]	2.06[-1]
$s^2(^1S)p\ ^2P_{1/2}$	$p^2(^1S)s\ ^2S_{1/2}$	178.337	4.74[10]	2.26[-1]	2.65[-1]	168.914	5.26[10]	2.25[-1]	2.50[-1]
$s^2(^1S)d\ ^2D_{5/2}$	$sp(^1P)d\ ^2D_{5/2}$	177.414	3.58[10]	1.70[-1]	5.95[-1]	168.055	3.94[10]	1.66[-1]	5.52[-1]
$s^2(^1S)d\ ^2D_{5/2}$	$sp(^1P)d\ ^2D_{3/2}$	177.074	3.16[10]	9.84[-2]	3.46[-1]	167.632	3.25[10]	9.14[-2]	3.03[-1]
$s^2(^1S)d\ ^2D_{3/2}$	$sp(^1P)d\ ^2P_{3/2}$	176.602	1.59[10]	7.43[-2]	1.72[-1]	166.992	1.57[10]	6.51[-2]	1.44[-1]
$s^2(^1S)p\ ^2P_{3/2}$	$p^2(^3P)s\ ^2P_{3/2}$	174.716	5.60[10]	2.57[-1]	5.90[-1]	165.766	5.94[10]	2.45[-1]	5.35[-1]
$s^2(^1S)d\ ^2D_{3/2}$	$sp(^1P)d\ ^2D_{3/2}$	174.438	2.51[10]	1.14[-1]	2.63[-1]	164.882	3.02[10]	1.23[-1]	2.68[-1]
$p^2(^3P)s\ ^4P_{1/2}$	$p^2(^3P)p\ ^4S_{3/2}$	172.755	1.02[10]	9.15[-2]	1.04[-1]	162.383	1.09[10]	8.64[-2]	9.24[-2]
$p^2(^3P)s\ ^2P_{3/2}$	$sp(^3P)d\ ^2P_{3/2}$	171.101	1.20[10]	5.25[-2]	1.18[-1]	164.346	1.24[10]	5.06[-2]	1.09[-1]
$p^2(^1D)s\ ^2D_{5/2}$	$sp(^3P)d\ ^2D_{5/2}$	163.079	3.10[10]	1.24[-1]	3.99[-1]	156.176	2.60[10]	9.53[-2]	2.94[-1]
$s^2(^1S)p\ ^2P_{1/2}$	$p^2(^3P)s\ ^2P_{1/2}$	160.224	8.41[09]	3.24[-2]	3.42[-2]	150.316	7.84[09]	2.66[-2]	2.63[-2]
$p^2(^3P)s\ ^2P_{1/2}$	$sp(^3P)d\ ^2P_{1/2}$	159.205	5.28[10]	2.01[-1]	2.11[-1]	152.123	5.53[10]	1.92[-1]	1.92[-1]
$p^2(^1D)s\ ^2D_{3/2}$	$sp(^3P)d\ ^2D_{3/2}$	159.089	5.03[10]	1.91[-1]	3.99[-1]	151.149	5.32[10]	1.82[-1]	3.64[-1]
$p^2(^1D)s\ ^2D_{3/2}$	$sp(^3P)d\ ^2D_{5/2}$	158.917	1.60[10]	9.06[-2]	1.89[-1]	151.356	2.03[10]	1.04[-1]	2.09[-1]
$p^2(^1D)s\ ^2D_{5/2}$	$sp(^3P)d\ ^2F_{5/2}$	157.343	1.86[10]	6.93[-2]	2.15[-1]	150.557	2.64[10]	9.00[-2]	2.67[-1]
$s^2(^1S)p\ ^2P_{1/2}$	$p^2(^3P)s\ ^2P_{3/2}$	157.269	1.78[10]	1.32[-1]	1.37[-1]	147.751	2.08[10]	1.35[-1]	1.32[-1]
$p^2(^3P)s\ ^4P_{5/2}$	$sp(^3P)d\ ^4P_{5/2}$	156.093	4.85[09]	1.78[-2]	5.48[-2]	149.600	5.59[09]	1.88[-2]	5.54[-2]
$p^2(^3P)s\ ^2P_{3/2}$	$sp(^1P)d\ ^2P_{1/2}$	155.382	2.41[10]	4.37[-2]	8.93[-2]	148.578	2.82[10]	4.67[-2]	9.14[-2]
$p^2(^3P)s\ ^2P_{3/2}$	$sp(^1P)d\ ^2P_{3/2}$	153.838	7.49[09]	2.65[-2]	5.37[-2]	146.824	6.62[09]	2.14[-2]	4.14[-2]
$p^2(^1D)s\ ^2D_{3/2}$	$sp(^3P)d\ ^2F_{5/2}$	153.465	1.10[10]	5.80[-2]	1.17[-1]	146.073	8.13[09]	3.92[-2]	7.52[-2]
$p^2(^3P)s\ ^2P_{1/2}$	$sp(^1P)d\ ^2P_{1/2}$	152.601	8.07[09]	2.82[-2]	2.83[-2]	146.071	9.21[09]	2.95[-2]	2.84[-2]
$p^2(^3P)s\ ^2P_{3/2}$	$sp(^1P)d\ ^2D_{5/2}$	152.445	8.52[10]	4.46[-1]	8.95[-1]	145.507	8.92[10]	4.24[-1]	8.13[-1]
$s^2(^1S)p\ ^2P_{3/2}$	$s^2(^1S)d\ ^2D_{3/2}$	152.404	1.73[10]	6.01[-2]	1.21[-1]	145.876	2.00[10]	6.41[-2]	1.23[-1]
$p^2(^3P)s\ ^2P_{3/2}$	$sp(^1P)d\ ^2D_{3/2}$	152.193	4.30[10]	1.49[-1]	2.99[-1]	145.190	4.61[10]	1.46[-1]	2.79[-1]
$p^2(^1S)s\ ^2S_{1/2}$	$sp(^3P)d\ ^2P_{3/2}$	151.614	7.21[10]	4.98[-1]	4.97[-1]	144.245	7.80[10]	4.87[-1]	4.62[-1]
$p^2(^3P)s\ ^2P_{1/2}$	$sp(^1P)d\ ^2P_{3/2}$	151.111	6.35[10]	4.36[-1]	4.34[-1]	144.376	6.70[10]	4.18[-1]	3.97[-1]
$s^2(^1S)p\ ^2P_{3/2}$	$s^2(^1S)d\ ^2D_{5/2}$	150.448	5.93[10]	3.02[-1]	6.00[-1]	143.788	6.30[10]	2.93[-1]	5.55[-1]
$p^2(^3P)s\ ^4P_{3/2}$	$sp(^3P)d\ ^4P_{5/2}$	149.821	3.61[10]	1.82[-1]	3.59[-1]	143.197	3.74[10]	1.73[-1]	3.26[-1]
$p^2(^3P)s\ ^4P_{3/2}$	$sp(^3P)d\ ^4P_{3/2}$	148.623	1.17[10]	3.86[-2]	7.55[-2]	141.807	1.40[10]	4.22[-2]	7.88[-2]
$p^2(^1D)s\ ^2D_{5/2}$	$sp(^3P)d\ ^2F_{7/2}$	147.010	2.63[10]	1.14[-1]	3.31[-1]	140.175	2.81[10]	1.11[-1]	3.06[-1]
$p^2(^3P)s\ ^4P_{1/2}$	$p^2(^3P)p\ ^2P_{3/2}$	146.407	4.40[09]	2.83[-2]	2.73[-2]	137.258	1.26[10]	7.10[-2]	6.42[-2]
$p^2(^3P)s\ ^4P_{5/2}$	$sp(^3P)d\ ^4D_{7/2}$	146.173	5.64[10]	2.41[-1]	6.96[-1]	139.057	5.88[10]	2.28[-1]	6.25[-1]
$p^2(^3P)s\ ^4P_{5/2}$	$sp(^3P)d\ ^4D_{5/2}$	145.946	4.13[10]	1.33[-1]	3.82[-1]	138.915	4.40[10]	1.27[-1]	3.49[-1]
$p^2[^3P)s\ ^4P_{5/2}$	$sp(^3P)d\ ^4D_{3/2}$	145.497	1.76[10]	3.74[-2]	1.07[-1]	138.408	1.84[10]	3.52[-2]	9.64[-2]
$p^2(^1S)s\ ^2S_{1/2}$	$sp(^3P)d\ ^2P_{1/2}$	144.611	7.79[09]	2.45[-2]	2.33[-2]	136.872	8.00[09]	2.24[-2]	2.02[-2]
$p^2(^3P)s\ ^4P_{1/2}$	$sp(^3P)d\ ^4P_{3/2}$	142.029	4.05[10]	2.45[-1]	2.29[-1]	134.694	3.55[10]	1.93[-1]	1.72[-1]
$p^2(^3P)s\ ^4P_{1/2}$	$sp(^3P)d\ ^4P_{1/2}$	141.719	6.42[10]	1.93[-1]	1.80[-1]	134.617	6.87[10]	1.87[-1]	1.66[-1]
$p^2(^3P)s\ ^4P_{3/2}$	$sp(^3P)d\ ^4D_{5/2}$	140.449	1.64[10]	7.28[-2]	1.35[-1]	133.377	1.79[10]	7.19[-2]	1.26[-1]
$p^2(^3P)s\ ^4P_{3/2}$	$sp(^3P)d\ ^4D_{3/2}$	140.033	3.13[10]	9.21[-2]	1.70[-1]	132.909	3.34[10]	8.82[-2]	1.55[-1]
$p^2(^3P)s\ ^4P_{3/2}$	$sp(^3P)d\ ^4D_{1/2}$	140.016	4.49[10]	6.60[-2]	1.22[-1]	132.883	4.82[10]	6.36[-2]	1.12[-1]
$p^2(^1S)s\ ^2S_{1/2}$	$sp(^1P)d\ ^2P_{1/2}$	139.141	3.51[10]	1.02[-1]	9.35[-2]	131.953	3.80[10]	9.98[-2]	8.63[-2]

10

Lower level	Upper level	λ	A	f	S	λ	A	f	S
					Z=35				Z=36
$p^2(^3P)s\ ^2P_{1/2}$	$p^2(^3P)p\ ^2P_{1/2}$	233.911	6.91[09]	5.68[-2]	8.74[-2]	223.614	7.27[09]	5.46[-2]	8.04[-2]
$p^2(^3P)s\ ^4P_{5/2}$	$p^2(^3P)p\ ^2D_{3/2}$	189.404	8.72[09]	3.13[-2]	1.17[-1]	182.195	1.00[10]	3.34[-2]	1.20[-1]
$s^2(^1S)p\ ^2P_{1/2}$	$p^2(^1D)s\ ^2D_{3/2}$	183.061	7.94[09]	7.97[-2]	9.61[-2]	172.577	9.05[09]	8.09[-2]	9.19[-2]
$p^2(^3P)s\ ^4P_{5/2}$	$p^2(^3P)p\ ^4S_{3/2}$	173.146	2.20[10]	6.60[-2]	2.25[-1]	164.766	2.23[10]	6.04[-2]	1.97[-1]
$s^2(^1S)d\ ^2D_{5/2}$	$sp(^1P)d\ ^2F_{7/2}$	172.338	5.09[10]	3.02[-1]	1.03[0]	163.833	5.54[10]	2.98[-1]	9.64[-1]
$p^2(^1D)s\ ^2D_{3/2}$	$p^2(^3P)p\ ^2P_{1/2}$	169.487	2.96[10]	6.35[-2]	1.42[-1]	160.739	3.23[10]	6.25[-2]	1.33[-1]
$p^2(^1D)s\ ^2D_{5/2}$	$p^2(^3P)p\ ^2P_{3/2}$	168.441	7.98[09]	2.27[-2]	7.54[-2]	162.350	2.57[09]	6.74[-3]	2.17[-2]
$s^2(^1S)d\ ^2D_{3/2}$	$sp(^1P)d\ ^2F_{5/2}$	167.084	5.17[10]	3.25[-1]	7.15[-1]	158.673	5.48[10]	3.11[-1]	6.49[-1]
$p^2(^1D)s\ ^2D_{5/2}$	$sp(^3P)d\ ^4P_{3/2}$	165.146	1.33[10]	3.62[-2]	1.18[-1]	157.222	2.04[10]	5.03[-2]	1.56[-1]
$p^2(^3P)s\ ^4P_{3/2}$	$p^2(^3P)p\ ^4S_{3/2}$	163.776	2.08[10]	8.37[-2]	1.80[-1]	155.478	2.14[10]	7.73[-2]	1.59[-1]
$s^2(^1S)d\ ^2D_{5/2}$	$sp(^1P)d\ ^2P_{3/2}$	160.974	2.48[10]	6.43[-2]	2.05[-1]	152.825	2.99[10]	6.98[-2]	2.10[-1]
$s^2(^1S)d\ ^2D_{3/2}$	$sp(^1P)d\ ^2P_{1/2}$	160.558	4.72[10]	9.14[-2]	1.93[-1]	152.557	4.69[10]	8.17[-2]	1.65[-1]
$s^2(^1S)p\ ^2P_{3/2}$	$p^2(^3P)s\ ^2P_{1/2}$	160.257	4.66[10]	9.01[-2]	1.90[-1]	152.184	5.02[10]	8.72[-2]	1.75[-1]
$s^2(^1S)p\ ^2P_{1/2}$	$p^2(^1S)s\ ^2S_{1/2}$	160.155	5.81[10]	2.23[-1]	2.36[-1]	152.096	6.38[10]	2.21[-1]	2.22[-1]
$s^2(^1S)d\ ^2D_{5/2}$	$sp(^1P)d\ ^2D_{5/2}$	159.340	4.29[10]	1.64[-1]	5.14[-1]	151.313	4.67[10]	1.60[-1]	4.78[-1]
$s^2(^1S)d\ ^2D_{5/2}$	$sp(^1P)d\ ^2D_{3/2}$	158.833	3.29[10]	8.30[-2]	2.60[-1]	150.715	3.25[10]	7.40[-2]	2.20[-1]
$p^2(^3P)s\ ^2P_{3/2}$	$sp(^3P)d\ ^2P_{3/2}$	158.123	1.32[10]	4.91[-2]	1.02[-1]	152.376	1.41[10]	4.91[-2]	9.88[-2]
$s^2(^1S)d\ ^2D_{3/2}$	$sp(^1P)d\ ^2P_{3/2}$	158.062	1.49[10]	5.58[-2]	1.16[-1]	149.847	1.36[10]	4.55[-2]	8.97[-2]
$s^2(^1S)p\ ^2P_{3/2}$	$p^2(^3P)s\ ^2P_{3/2}$	157.462	6.28[10]	2.33[-1]	4.83[-1]	149.846	6.52[10]	2.20[-1]	4.33[-1]
$s^2(^1S)d\ ^2D_{3/2}$	$sp(^1P)d\ ^2D_{3/2}$	155.997	3.70[10]	1.35[-1]	2.77[-1]	147.819	4.54[10]	1.49[-1]	2.90[-1]
$p^2(^3P)s\ ^4P_{1/2}$	$p^2(^3P)p\ ^4S_{3/2}$	152.725	1.17[10]	8.20[-2]	8.25[-2]	143.809	1.26[10]	7.82[-2]	7.40[-2]
$p^2(^1D)s\ ^2D_{5/2}$	$sp(^3P)d\ ^2D_{5/2}$	150.034	1.99[10]	6.70[-2]	1.99[-1]	144.541	1.41[10]	4.42[-2]	1.26[-1]
$p^2(^3P)s\ ^2P_{3/2}$	$sp(^1P)d\ ^2F_{5/2}$	147.369	8.53[09]	4.16[-2]	8.08[-2]	141.269	1.17[10]	5.24[-2]	9.77[-2]
$p^2(^3P)s\ ^2P_{1/2}$	$sp(^3P)d\ ^2P_{1/2}$	145.624	5.74[10]	1.83[-1]	1.75[-1]	139.653	5.88[10]	1.72[-1]	1.58[-1]
$p^2(^1D)s\ ^2D_{3/2}$	$sp(^3P)d\ ^2D_{5/2}$	144.478	2.47[10]	1.16[-1]	2.21[-1]	138.168	2.80[10]	1.20[-1]	2.19[-1]
$p^2(^1D)s\ ^2D_{5/2}$	$sp(^3P)d\ ^2F_{5/2}$	144.149	3.55[10]	1.11[-1]	3.15[-1]	138.111	4.42[10]	1.27[-1]	3.46[-1]
$p^2(^1D)s\ ^2D_{3/2}$	$sp(^3P)d\ ^2D_{3/2}$	143.775	5.67[10]	1.76[-1]	3.33[-1]	136.939	6.01[10]	1.69[-1]	3.04[-1]
$p^2(^3P)s\ ^4P_{5/2}$	$sp(^3P)d\ ^4P_{5/2}$	143.578	6.43[09]	1.99[-2]	5.64[-2]	137.977	7.39[09]	2.12[-2]	5.76[-2]
$p^2(^3P)s\ ^2P_{3/2}$	$sp(^1P)d\ ^2P_{1/2}$	142.268	3.32[10]	5.04[-2]	9.45[-2]	136.400	3.94[10]	5.48[-2]	9.87[-2]
$s^2(^1S)p\ ^2P_{1/2}$	$p^2(^3P)s\ ^2P_{1/2}$	141.089	7.34[09]	2.19[-2]	2.04[-2]	132.559	6.90[09]	1.82[-2]	1.59[-2]
$p^2(^3P)s\ ^2P_{1/2}$	$sp(^1P)d\ ^2P_{1/2}$	140.061	1.08[10]	3.19[-2]	2.94[-2]	134.519	1.30[10]	3.53[-2]	3.13[-2]
$s^2(^1S)p\ ^2P_{3/2}$	$s^2(^1S)d\ ^2D_{3/2}$	139.832	2.36[10]	6.95[-2]	1.28[-1]	134.229	2.84[10]	7.69[-2]	1.36[-1]
$p^2(^3P)s\ ^2P_{3/2}$	$sp(^1P)d\ ^2D_{5/2}$	139.062	9.25[10]	4.03[-1]	7.38[-1]	133.063	9.55[10]	3.81[-1]	6.68[-1]
$s^2(^1S)p\ ^2P_{1/2}$	$p^2(^3P)s\ ^2P_{3/2}$	138.918	2.44[10]	1.41[-1]	1.29[-1]	130.782	2.92[10]	1.49[-1]	1.29[-1]
$p^2(^3P)s\ ^2P_{3/2}$	$sp(^1P)d\ ^2D_{3/2}$	138.676	4.92[10]	1.41[-1]	2.58[-1]	132.600	5.12[10]	1.36[-1]	2.37[-1]
$p^2(^3P)s\ ^2P_{1/2}$	$sp(^1P)d\ ^2P_{3/2}$	138.158	6.99[10]	4.00[-1]	3.65[-1]	132.408	7.29[10]	3.84[-1]	3.34[-1]
$s^2(^1S)p\ ^2P_{3/2}$	$s^2(^1S)d\ ^2D_{5/2}$	137.629	6.66[10]	2.83[-1]	5.14[-1]	131.927	7.05[10]	2.76[-1]	4.79[-1]
$p^2(^1S)s\ ^2S_{1/2}$	$sp(^3P)d\ ^2P_{3/2}$	137.387	8.39[10]	4.74[-1]	4.29[-1]	130.989	8.94[10]	4.61[-1]	3.98[-1]
$p^2(^3P)s\ ^4P_{3/2}$	$sp(^3P)d\ ^4P_{5/2}$	137.076	3.91[10]	1.65[-1]	2.98[-1]	131.404	4.04[10]	1.58[-1]	2.72[-1]
$p^2(^3P)s\ ^4P_{3/2}$	$sp(^3P)d\ ^4P_{3/2}$	134.917	1.49[10]	4.07[-2]	7.23[-2]	127.662	1.36[10]	3.33[-2]	5.59[-2]
$p^2(^1D)s\ ^2D_{5/2}$	$sp(^3P)d\ ^2F_{7/2}$	133.884	3.00[10]	1.07[-1]	2.83[-1]	128.089	3.16[10]	1.04[-1]	2.63[-1]
$p^2(^3P)s\ ^4P_{5/2}$	$sp(^3P)d\ ^4D_{7/2}$	132.402	6.14[10]	2.15[-1]	5.62[-1]	126.154	6.39[10]	2.04[-1]	5.06[-1]
$p^2(^3P)s\ ^4P_{5/2}$	$sp(^3P)d\ ^4D_{5/2}$	132.372	4.63[10]	1.22[-1]	3.19[-1]	126.298	4.82[10]	1.15[-1]	2.88[-1]
$p^2[^3P)s\ ^4P_{5/2}$	$sp(^3P)d\ ^4D_{3/2}$	131.789	1.92[10]	3.33[-2]	8.67[-2]	125.584	1.99[10]	3.13[-2]	7.78[-2]
$p^2(^1S)s\ ^2S_{1/2}$	$sp(^3P)d\ ^2P_{1/2}$	129.689	8.54[09]	2.16[-2]	1.84[-2]	123.007	9.51[09]	2.16[-2]	1.75[-2]
$p^2(^3P)s\ ^4P_{1/2}$	$p^2(^3P)p\ ^2P_{3/2}$	129.277	3.74[10]	1.87[-1]	1.59[-1]	122.637	5.24[10]	2.37[-1]	1.91[-1]
$p^2(^3P)s\ ^4P_{1/2}$	$sp(^3P)d\ ^4P_{1/2}$	128.006	7.38[10]	1.81[-1]	1.53[-1]	121.830	7.90[10]	1.76[-1]	1.41[-1]
$p^2(^3P)s\ ^4P_{1/2}$	$sp(^3P)d\ ^4P_{3/2}$	127.327	1.43[10]	6.93[-2]	5.81[-2]	119.688	3.15[09]	1.35[-2]	1.07[-2]
$p^2(^3P)s\ ^4P_{3/2}$	$sp(^3P)d\ ^4D_{5/2}$	126.825	1.94[10]	7.05[-2]	1.17[-1]	120.768	2.07[10]	6.80[-2]	1.08[-1]
$p^2(^3P)s\ ^4P_{3/2}$	$sp(^3P)d\ ^4D_{3/2}$	126.289	3.55[10]	8.48[-2]	1.41[-1]	120.115	3.75[10]	8.09[-2]	1.28[-1]
$p^2(^3P)s\ ^4P_{3/2}$	$sp(^3P)d\ ^4D_{1/2}$	126.258	5.16[10]	6.17[-2]	1.03[-1]	120.084	5.54[10]	5.97[-2]	9.47[-2]

Lower level	Upper level	λ	A	f	S	λ	A	f	S
				$Z=37$				$Z=38$	
$p^2(^3P)s\ ^4P_{5/2}$	$p^2(^3P)p\ ^2D_{3/2}$	175.373	1.14[10]	3.50[-2]	1.21[-1]	169.020	1.27[10]	3.60[-2]	1.21[-1]
$s^2(^1S)p\ ^2P_{1/2}$	$p^2(^1D)s\ ^2D_{3/2}$	162.719	1.03[10]	8.21[-2]	8.80[-2]	153.541	1.18[10]	8.33[-2]	8.43[-2]
$p^2(^3P)s\ ^4P_{5/2}$	$p^2(^3P)p\ ^4S_{3/2}$	156.853	2.22[10]	5.45[-2]	1.69[-1]	149.591	2.07[10]	4.64[-2]	1.37[-1]
$s^2(^1S)d\ ^2D_{5/2}$	$sp(^1P)d\ ^2F_{7/2}$	155.754	6.07[10]	2.94[-1]	9.06[-1]	148.162	6.63[10]	2.91[-1]	8.53[-1]
$p^2(^1D)s\ ^2D_{3/2}$	$p^2(^3P)p\ ^2P_{1/2}$	152.435	3.53[10]	6.15[-2]	1.24[-1]	144.656	3.75[10]	5.86[-2]	1.12[-1]
$s^2(^1S)d\ ^2D_{3/2}$	$sp(^3P)d\ ^2P_{1/2}$	151.022	9.23[09]	1.58[-2]	3.14[-2]	143.472	1.25[10]	1.93[-2]	3.64[-2]
$s^2(^1S)d\ ^2D_{3/2}$	$sp(^1P)d\ ^2F_{5/2}$	150.778	5.75[10]	2.94[-1]	5.84[-1]	143.469	5.89[10]	2.73[-1]	5.16[-1]
$p^2(^1D)s\ ^2D_{5/2}$	$sp(^3P)d\ ^4P_{3/2}$	149.366	2.34[10]	5.20[-2]	1.54[-1]	142.012	2.51[10]	5.06[-2]	1.42[-1]
$p^2(^3P)s\ ^4P_{3/2}$	$p^2(^3P)p\ ^4S_{3/2}$	147.706	2.10[10]	6.85[-2]	1.34[-1]	140.609	1.80[10]	5.32[-2]	9.89[-2]
$p^2(^3P)s\ ^2P_{3/2}$	$sp(^3P)d\ ^2P_{3/2}$	146.946	1.56[10]	5.06[-2]	9.78[-2]	141.776	1.77[10]	5.31[-2]	9.96[-2]
$s^2(^1S)d\ ^2D_{5/2}$	$sp(^1P)d\ ^2P_{3/2}$	145.090	3.60[10]	7.57[-2]	2.17[-1]	137.833	4.33[10]	8.23[-2]	2.24[-1]
$s^2(^1S)d\ ^2D_{3/2}$	$sp(^1P)d\ ^2P_{1/2}$	144.994	4.51[10]	7.10[-2]	1.36[-1]	137.943	4.13[10]	5.88[-2]	1.07[-1]
$s^2(^1S)p\ ^2P_{3/2}$	$p^2(^3P)s\ ^2P_{1/2}$	144.496	5.41[10]	8.48[-2]	1.61[-1]	137.261	5.84[10]	8.24[-2]	1.49[-1]
$s^2(^1S)p\ ^2P_{1/2}$	$p^2(^1S)s\ ^2S_{1/2}$	144.437	6.99[10]	2.19[-1]	2.08[-1]	137.240	7.66[10]	2.17[-1]	1.95[-1]
$s^2(^1S)d\ ^2D_{5/2}$	$sp(^1P)d\ ^2D_{5/2}$	143.687	5.09[10]	1.57[-1]	4.46[-1]	136.527	5.54[10]	1.55[-1]	4.17[-1]
$s^2(^1S)d\ ^2D_{5/2}$	$sp(^1P)d\ ^2D_{3/2}$	142.975	3.14[10]	6.42[-2]	1.81[-1]	135.675	2.95[10]	5.45[-2]	1.46[-1]
$s^2(^1S)p\ ^2P_{3/2}$	$p^2(^3P)s\ ^2P_{3/2}$	142.658	6.67[10]	2.04[-1]	3.83[-1]	135.974	6.69[10]	1.85[-1]	3.32[-1]
$s^2(^1S)d\ ^2D_{3/2}$	$sp(^1P)d\ ^2P_{3/2}$	142.112	1.16[10]	3.51[-2]	6.57[-2]	134.925	9.17[09]	2.51[-2]	4.45[-2]
$p^2(^3P)s\ ^4P_{3/2}$	$sp(^3P)d\ ^4F_{3/2}$	141.879	5.30[09]	1.61[-2]	3.00[-2]	136.305	1.05[10]	2.93[-2]	5.26[-2]
$s^2(^1S)d\ ^2D_{3/2}$	$sp(^1P)d\ ^2D_{3/2}$	140.083	5.64[10]	1.67[-1]	3.07[-1]	132.856	7.07[10]	1.87[-1]	3.28[-1]
$p^2(^3P)s\ ^2P_{3/2}$	$sp(^1P)d\ ^2F_{5/2}$	135.555	1.61[10]	6.67[-2]	1.19[-1]	130.172	2.24[10]	8.54[-2]	1.46[-1]
$p^2(^3P)s\ ^4P_{1/2}$	$p^2(^3P)p\ ^4S_{3/2}$	135.439	1.35[10]	7.42[-2]	6.62[-2]	127.727	1.38[10]	6.74[-2]	5.66[-2]
$p^2(^3P)s\ ^2P_{1/2}$	$sp(^3P)d\ ^2P_{1/2}$	134.129	5.96[10]	1.61[-1]	1.42[-1]	129.018	5.94[10]	1.49[-1]	1.26[-1]
$p^2(^1D)s\ ^2D_{3/2}$	$sp(^3P)d\ ^4D_{5/2}$	133.830	8.09[09]	3.26[-2]	5.74[-2]	128.061	1.90[10]	7.01[-2]	1.18[-1]
$p^2(^1D)s\ ^2D_{5/2}$	$sp(^3P)d\ ^2F_{5/2}$	132.393	5.20[10]	1.36[-1]	3.57[-1]	127.006	5.82[10]	1.41[-1]	3.53[-1]
$p^2(^1D)s\ ^2D_{3/2}$	$sp(^3P)d\ ^2D_{5/2}$	132.174	2.83[10]	1.11[-1]	1.94[-1]	126.278	2.13[10]	7.67[-2]	1.27[-1]
$p^2(^3P)s\ ^2P_{3/2}$	$sp(^1P)d\ ^2P_{1/2}$	130.862	4.69[10]	6.03[-2]	1.04[-1]	125.607	5.62[10]	6.67[-2]	1.10[-1]
$p^2(^1D)s\ ^2D_{3/2}$	$sp(^3P)d\ ^2D_{3/2}$	130.528	6.30[10]	1.62[-1]	2.78[-1]	124.529	6.64[10]	1.55[-1]	2.53[-1]
$p^2(^3P)s\ ^2P_{1/2}$	$sp(^1P)d\ ^2P_{1/2}$	129.353	1.59[10]	3.99[-2]	3.40[-2]	124.529	1.97[10]	4.58[-2]	3.75[-2]
$s^2(^1S)p\ ^2P_{3/2}$	$s^2(^1S)d\ ^2D_{3/2}$	128.956	3.47[10]	8.67[-2]	1.47[-1]	123.973	4.34[10]	1.00[-1]	1.63[-1]
$p^2(^3P)s\ ^2P_{3/2}$	$sp(^1P)d\ ^2D_{5/2}$	127.408	9.76[10]	3.57[-1]	5.99[-1]	122.057	9.87[10]	3.31[-1]	5.31[-1]
$p^2(^3P)s\ ^2P_{1/2}$	$sp(^1P)d\ ^2P_{3/2}$	127.054	7.54[10]	3.66[-1]	3.06[-1]	122.064	7.74[10]	3.46[-1]	2.78[-1]
$p^2(^3P)s\ ^2P_{3/2}$	$sp(^1P)d\ ^2D_{3/2}$	126.848	5.22[10]	1.26[-1]	2.11[-1]	121.376	5.14[10]	1.14[-1]	1.81[-1]
$s^2(^1S)p\ ^2P_{3/2}$	$s^2(^1S)d\ ^2D_{5/2}$	126.598	7.44[10]	2.68[-1]	4.47[-1]	121.615	7.86[10]	2.61[-1]	4.18[-1]
$p^2(^3P)s\ ^4P_{3/2}$	$sp(^3P)d\ ^4P_{5/2}$	126.111	4.21[10]	1.50[-1]	2.50[-1]	121.160	4.34[10]	1.44[-1]	2.30[-1]
$p^2(^1S)s\ ^2S_{1/2}$	$sp(^3P)d\ ^2P_{3/2}$	124.960	9.54[10]	4.48[-1]	3.68[-1]	119.265	1.02[11]	4.32[-1]	3.40[-1]
$s^2(^1S)p\ ^2P_{1/2}$	$p^2(^3P)s\ ^2P_{3/2}$	123.142	3.55[10]	1.62[-1]	1.31[-1]	116.038	4.42[10]	1.78[-1]	1.36[-1]
$p^2(^1D)s\ ^2D_{5/2}$	$sp(^3P)d\ ^2F_{7/2}$	122.710	3.36[10]	1.01[-1]	2.46[-1]	117.713	3.58[10]	9.92[-2]	2.30[-1]
$p^2(^3P)s\ ^4P_{5/2}$	$sp(^3P)d\ ^4D_{5/2}$	120.711	4.81[10]	1.04[-1]	2.50[-1]	115.710	3.89[10]	7.83[-2]	1.79[-1]
$p^2(^3P)s\ ^4P_{3/2}$	$sp(^3P)d\ ^4P_{3/2}$	120.555	1.48[10]	3.22[-2]	5.11[-2]	113.868	1.81[10]	3.52[-2]	5.28[-2]
$p^2(^3P)s\ ^4P_{5/2}$	$sp(^3P)d\ ^4D_{7/2}$	120.261	6.65[10]	1.92[-1]	4.57[-1]	114.689	6.93[10]	1.82[-1]	4.12[-1]
$p^2[^3P]s\ ^4P_{5/2}$	$sp(^3P)d\ ^4D_{3/2}$	119.731	2.05[10]	2.94[-2]	6.95[-2]	114.186	2.10[10]	2.74[-2]	6.17[-2]
$p^2(^3P)s\ ^4P_{5/2}$	$sp(^3P)d\ ^2D_{5/2}$	119.363	5.56[09]	1.19[-2]	2.79[-2]	114.252	1.80[10]	3.52[-2]	7.95[-2]
$p^2(^1S)s\ ^2S_{1/2}$	$sp(^3P)d\ ^2P_{1/2}$	116.773	1.10[10]	2.26[-2]	1.73[-2]	110.948	1.32[10]	2.44[-2]	1.78[-2]
$p^2(^3P)s\ ^4P_{1/2}$	$p^2(^3P)p\ ^2P_{3/2}$	116.678	5.88[10]	2.40[-1]	1.85[-1]	111.140	6.42[10]	2.38[-1]	1.74[-1]
$p^2(^3P)s\ ^4P_{1/2}$	$sp(^3P)d\ ^4P_{1/2}$	116.034	8.47[10]	1.71[-1]	1.31[-1]	110.571	8.89[10]	1.63[-1]	1.19[-1]
$p^2(^3P)s\ ^4P_{3/2}$	$sp(^3P)d\ ^4D_{5/2}$	115.220	2.11[10]	6.30[-2]	9.56[-2]	110.261	1.75[10]	4.79[-2]	6.95[-2]
$p^2(^3P)s\ ^4P_{3/2}$	$sp(^3P)d\ ^4D_{3/2}$	114.327	3.90[10]	7.65[-2]	1.15[-1]	108.877	3.95[10]	7.01[-2]	1.01[-1]
$p^2(^3P)s\ ^4P_{3/2}$	$sp(^3P)d\ ^4D_{1/2}$	114.307	5.94[10]	5.83[-2]	8.76[-2]	108.888	6.38[10]	5.68[-2]	8.13[-2]
$p^2(^1S)s\ ^2S_{1/2}$	$sp(^1P)d\ ^2P_{1/2}$	113.136	4.68[10]	8.98[-2]	6.69[-2]	107.612	4.95[10]	8.60[-2]	6.09[-2]

Lower level	Upper level	λ	A	f	S	λ	A	f	S
				Z=39				Z=40	
$p^2(^3P)s\ ^4P_{5/2}$	$p^2(^3P)p\ ^2D_{3/2}$	163.081	1.39[10]	3.70[-2]	1.19[-1]	157.512	1.52[10]	3.76[-2]	1.17[-1]
$s^2(^1S)p\ ^2P_{1/2}$	$p^2(^1D)s\ ^2D_{3/2}$	144.980	1.34[10]	8.46[-2]	8.08[-2]	136.980	1.53[10]	8.58[-2]	7.74[-2]
$p^2(^3P)s\ ^4P_{5/2}$	$p^2(^3P)p\ ^4S_{3/2}$	143.170	1.62[10]	3.33[-2]	9.40[-2]	137.730	1.09[10]	2.08[-2]	5.66[-2]
$s^2(^1S)d\ ^2D_{5/2}$	$sp(^1P)d\ ^2F_{7/2}$	141.009	7.26[10]	2.90[-1]	8.05[-1]	134.252	7.96[10]	2.88[-1]	7.62[-1]
$p^2(^1D)s\ ^2D_{3/2}$	$p^2(^3P)p\ ^2P_{1/2}$	137.444	2.08[10]	2.94[-2]	5.33[-2]	131.808	2.42[09]	3.15[-3]	5.47[-3]
$p^2(^3P)s\ ^2P_{3/2}$	$sp(^3P)d\ ^2P_{3/2}$	136.771	2.06[10]	5.76[-2]	1.04[-1]	131.832	2.45[10]	6.36[-2]	1.11[-1]
$s^2(^1S)d\ ^2D_{3/2}$	$sp(^1P)d\ ^2F_{5/2}$	136.723	5.87[10]	2.46[-1]	4.44[-1]	130.533	5.57[10]	2.13[-1]	3.67[-1]
$s^2(^1S)d\ ^2D_{3/2}$	$sp(^3P)d\ ^2P_{1/2}$	136.523	1.61[10]	2.25[-2]	4.04[-2]	130.165	1.94[10]	2.46[-2]	4.22[-2]
$p^2(^1D)s\ ^2D_{3/2}$	$sp(^3P)d\ ^4P_{1/2}$	136.205	2.28[10]	3.18[-2]	5.70[-2]	130.072	4.53[10]	5.72[-2]	9.84[-2]
$p^2(^1D)s\ ^2D_{5/2}$	$sp(^3P)d\ ^4P_{3/2}$	135.228	2.57[10]	4.71[-2]	1.25[-1]	129.068	2.44[10]	4.05[-2]	1.03[-1]
$p^2(^3P)s\ ^4P_{3/2}$	$p^2(^3P)p\ ^4S_{3/2}$	134.339	1.13[10]	3.04[-2]	5.37[-2]	129.006	5.01[09]	1.25[-2]	2.13[-2]
$s^2(^1S)d\ ^2D_{3/2}$	$sp(^1P)d\ ^2P_{1/2}$	131.383	3.51[10]	4.54[-2]	7.85[-2]	125.310	2.67[10]	3.14[-2]	5.19[-2]
$s^2(^1S)d\ ^2D_{5/2}$	$sp(^1P)d\ ^2P_{3/2}$	131.014	5.13[10]	8.85[-2]	2.29[-1]	124.596	6.04[10]	9.39[-2]	2.31[-1]
$p^2(^1S)s\ ^2S_{1/2}$	$sp(^3P)d\ ^2D_{3/2}$	130.846	1.16[10]	5.92[-2]	5.10[-2]	124.339	1.44[10]	6.67[-2]	5.46[-2]
$p^2(^3P)s\ ^4P_{3/2}$	$sp(^3P)d\ ^4F_{3/2}$	130.730	1.97[10]	5.08[-2]	8.71[-2]	124.967	2.85[10]	6.66[-2]	1.10[-1]
$s^2(^1S)p\ ^2P_{1/2}$	$p^2(^1S)s\ ^2S_{1/2}$	130.458	8.36[10]	2.14[-1]	1.83[-1]	124.052	9.12[10]	2.11[-1]	1.72[-1]
$s^2(^1S)p\ ^2P_{3/2}$	$p^2(^3P)s\ ^2P_{1/2}$	130.438	6.29[10]	8.05[-2]	1.38[-1]	123.991	6.80[10]	7.86[-2]	1.28[-1]
$s^2(^1S)d\ ^2D_{5/2}$	$sp(^1P)d\ ^2D_{5/2}$	129.792	6.02[10]	1.52[-1]	3.90[-1]	123.445	6.53[10]	1.50[-1]	3.65[-1]
$s^2(^1S)p\ ^2P_{3/2}$	$p^2(^3P)s\ ^2P_{3/2}$	129.780	6.47[10]	1.64[-1]	2.79[-1]	124.073	5.91[10]	1.37[-1]	2.23[-1]
$s^2(^1S)d\ ^2D_{5/2}$	$sp(^1P)d\ ^2D_{3/2}$	128.769	2.74[10]	4.54[-2]	1.15[-1]	122.216	2.49[10]	3.73[-2]	8.97[-2]
$s^2(^1S)d\ ^2D_{3/2}$	$sp(^1P)d\ ^2D_{5/2}$	127.097	1.51[10]	5.51[-2]	9.21[-2]	121.031	2.43[10]	8.02[-2]	1.28[-1]
$s^2(^1S)d\ ^2D_{3/2}$	$sp(^1P)d\ ^2D_{3/2}$	126.115	8.84[10]	2.11[-1]	3.50[-1]	119.849	1.10[11]	2.36[-1]	3.72[-1]
$p^2(^3P)s\ ^2P_{3/2}$	$sp(^1P)d\ ^2F_{5/2}$	125.049	3.12[10]	1.10[-1]	1.81[-1]	120.112	4.36[10]	1.40[-1]	2.23[-1]
$p^2(^3P)s\ ^2P_{1/2}$	$sp(^3P)d\ ^2P_{1/2}$	124.279	5.84[10]	1.36[-1]	1.11[-1]	119.877	5.65[10]	1.22[-1]	9.62[-2]
$p^2(^3P)s\ ^4P_{5/2}$	$sp(^3P)d\ ^4P_{5/2}$	123.096	1.13[10]	2.57[-2]	6.24[-2]	118.658	1.30[10]	2.75[-2]	6.44[-2]
$p^2(^1D)s\ ^2D_{3/2}$	$sp(^3P)d\ ^4D_{5/2}$	122.909	3.66[10]	1.25[-1]	2.02[-1]	118.167	4.58[10]	1.44[-1]	2.24[-1]
$p^2(^1D)s\ ^2D_{5/2}$	$sp(^3P)d\ ^2F_{5/2}$	121.937	6.34[10]	1.41[-1]	3.41[-1]	117.163	6.83[10]	1.40[-1]	3.25[-1]
$p^2(^3P)s\ ^4P_{1/2}$	$p^2(^3P)p\ ^4S_{3/2}$	120.785	1.22[10]	5.31[-2]	4.22[-2]	114.677	9.37[09]	3.69[-2]	2.79[-2]
$p^2(^3P)s\ ^2P_{3/2}$	$sp(^1P)d\ ^2P_{1/2}$	120.567	6.70[10]	7.31[-2]	1.16[-1]	115.676	7.92[10]	7.96[-2]	1.21[-1]
$p^2(^3P)s\ ^2P_{1/2}$	$sp(^1P)d\ ^2P_{1/2}$	120.005	2.44[10]	5.28[-2]	4.17[-2]	115.747	3.02[10]	6.07[-2]	4.62[-2]
$s^2(^1S)p\ ^2P_{3/2}$	$s^2(^1S)d\ ^2D_{3/2}$	119.216	5.52[10]	1.17[-1]	1.84[-1]	114.621	7.09[10]	1.39[-1]	2.10[-1]
$p^2(^1D)s\ ^2D_{3/2}$	$sp(^3P)d\ ^2D_{3/2}$	118.900	6.93[10]	1.47[-1]	2.30[-1]	113.594	7.23[10]	1.40[-1]	2.10[-1]
$p^2(^3P)s\ ^2P_{1/2}$	$sp(^1P)d\ ^2P_{3/2}$	117.402	7.84[10]	3.25[-1]	2.51[-1]	113.035	7.90[10]	3.02[-1]	2.25[-1]
$p^2(^3P)s\ ^2P_{3/2}$	$sp(^1P)d\ ^2D_{5/2}$	116.949	9.69[10]	2.99[-1]	4.61[-1]	112.020	9.30[10]	2.63[-1]	3.88[-1]
$s^2(^1S)p\ ^2P_{3/2}$	$s^2(^1S)d\ ^2D_{5/2}$	116.939	8.28[10]	2.55[-1]	3.93[-1]	112.537	8.77[10]	2.50[-1]	3.70[-1]
$p^2(^3P)s\ ^4P_{3/2}$	$sp(^3P)d\ ^4P_{5/2}$	116.510	4.51[10]	1.38[-1]	2.11[-1]	112.126	4.64[10]	1.31[-1]	1.94[-1]
$p^2(^3P)s\ ^2P_{3/2}$	$sp(^1P)d\ ^2D_{3/2}$	116.117	4.73[10]	9.57[-2]	1.46[-1]	111.007	4.00[10]	7.41[-2]	1.08[-1]
$p^2(^1S)s\ ^2S_{1/2}$	$sp(^3P)d\ ^2P_{3/2}$	113.856	1.07[11]	4.16[-1]	3.12[-1]	108.695	1.13[11]	3.98[-1]	2.85[-1]
$p^2(^1D)s\ ^2D_{5/2}$	$sp(^3P)d\ ^2F_{7/2}$	113.057	3.79[10]	9.73[-2]	2.17[-1]	108.704	4.06[10]	9.56[-2]	2.06[-1]
$p^2(^3P)s\ ^4P_{5/2}$	$sp(^3P)d\ ^4D_{5/2}$	111.213	1.79[10]	3.31[-2]	7.29[-2]	107.055	6.99[09]	1.20[-2]	2.54[-2]
$s^2(^1S)p\ ^2P_{1/2}$	$p^2(^3P)s\ ^2P_{3/2}$	109.447	5.59[10]	2.01[-1]	1.45[-1]	103.351	7.13[10]	2.29[-1]	1.56[-1]
$p^2(^3P)s\ ^4P_{5/2}$	$sp(^3P)d\ ^4D_{7/2}$	109.408	7.21[10]	1.72[-1]	3.73[-1]	104.393	7.54[10]	1.64[-1]	3.39[-1]
$p^2(^3P)s\ ^4P_{5/2}$	$sp(^3P)d\ ^2D_{5/2}$	109.213	4.34[10]	7.81[-2]	1.68[-1]	104.344	5.94[10]	9.70[-2]	2.00[-1]
$p^2[^3P)s\ ^4P_{5/2}$	$sp(^3P)d\ ^4D_{3/2}$	108.902	2.12[10]	2.51[-2]	5.40[-2]	103.820	2.08[10]	2.24[-2]	4.59[-2]
$p^2(^3P)s\ ^4P_{3/2}$	$sp(^3P)d\ ^4P_{3/2}$	107.644	2.40[10]	4.17[-2]	5.92[-2]	101.911	3.36[10]	5.23[-2]	7.01[-2]
$p^2(^3P)s\ ^4P_{1/2}$	$p^2(^3P)p\ ^2P_{1/2}$	106.092	4.38[10]	7.39[-2]	5.17[-2]	100.759	9.58[10]	1.46[-1]	9.68[-2]
$p^2(^3P)s\ ^4P_{1/2}$	$p^2(^3P)p\ ^2P_{3/2}$	105.937	6.97[10]	2.34[-1]	1.63[-1]	101.026	7.56[10]	2.32[-1]	1.54[-1]
$p^2(^1S)s\ ^2S_{1/2}$	$sp(^3P)d\ ^2P_{1/2}$	105.496	1.62[10]	2.71[-2]	1.88[-2]	100.384	2.02[10]	3.06[-2]	2.02[-2]
$p^2(^3P)s\ ^4P_{1/2}$	$sp(^3P)d\ ^4P_{1/2}$	105.352	5.33[10]	8.88[-2]	6.16[-2]	99.741	9.06[09]	1.35[-2]	8.88[-3]
$p^2(^1D)s\ ^2D_{5/2}$	$sp(^1P)d\ ^2F_{7/2}$	104.198	3.00[10]	6.51[-2]	1.34[-1]	100.453	2.88[10]	5.83[-2]	1.15[-1]
$p^2(^3P)s\ ^4P_{3/2}$	$sp(^3P)d\ ^2D_{5/2}$	103.998	1.90[10]	4.62[-2]	6.33[-2]	99.259	2.68[10]	5.93[-2]	7.76[-2]
$p^2(^3P)s\ ^4P_{3/2}$	$sp(^3P)d\ ^4D_{1/2}$	103.791	6.84[10]	5.54[-2]	7.56[-2]	98.984	7.36[10]	5.39[-2]	7.05[-2]

13

Lower level	Upper level	λ	A	f	S	λ	A	f	S
					Z=41			Z=42	
$p^2(^3P)s\ ^4P_{5/2}$	$p^2(^3P)p\ ^2D_{3/2}$	152.276	1.65[10]	3.80[-2]	1.15[-1]	147.340	1.77[10]	3.83[-2]	1.12[-1]
$s^2(^1S)p\ ^2P_{1/2}$	$p^2(^1D)s\ ^2D_{3/2}$	129.491	1.73[10]	8.71[-2]	7.42[-2]	122.471	1.97[10]	8.83[-2]	7.12[-2]
$s^2(^1S)d\ ^2D_{5/2}$	$sp(^1P)d\ ^2F_{7/2}$	127.857	8.77[10]	2.86[-1]	7.23[-1]	121.795	9.61[10]	2.85[-1]	6.87[-1]
$p^2(^3P)s\ ^4P_{5/2}$	$sp(^3P)d\ ^4F_{3/2}$	127.091	1.81[10]	2.91[-2]	7.30[-2]	121.181	2.05[10]	3.00[-2]	7.18[-2]
$p^2(^3P)s\ ^2P_{3/2}$	$sp(^3P)d\ ^2P_{3/2}$	126.862	2.93[10]	7.05[-2]	1.18[-1]	121.790	3.49[10]	7.75[-2]	1.25[-1]
$s^2(^1S)d\ ^2D_{3/2}$	$sp(^1P)d\ ^2F_{5/2}$	124.901	4.97[10]	1.74[-1]	2.87[-1]	119.824	4.16[10]	1.35[-1]	2.12[-1]
$s^2(^1S)d\ ^2D_{3/2}$	$sp(^3P)d\ ^2P_{1/2}$	124.400	2.14[10]	2.49[-2]	4.08[-2]	119.216	2.15[10]	2.29[-2]	3.59[-2]
$p^2(^1D)s\ ^2D_{5/2}$	$sp(^3P)d\ ^4P_{3/2}$	123.629	2.04[10]	3.11[-2]	7.60[-2]	118.996	1.50[10]	2.13[-2]	5.01[-2]
$p^2(^1D)s\ ^2D_{3/2}$	$sp(^3P)d\ ^4P_{1/2}$	123.607	5.16[10]	5.92[-2]	9.63[-2]	117.424	5.73[10]	5.92[-2]	9.17[-2]
$p^2(^3P)s\ ^4P_{1/2}$	$p^2(^3P)p\ ^2D_{3/2}$	121.834	1.03[10]	4.57[-2]	3.67[-2]	115.919	1.17[10]	4.72[-2]	3.60[-2]
$s^2(^1S)d\ ^2D_{3/2}$	$sp(^1P)d\ ^2P_{1/2}$	119.729	1.73[10]	1.87[-2]	2.94[-2]	114.638	8.89[09]	8.77[-3]	1.32[-2]
$p^2(^1D)s\ ^2D_{5/2}$	$sp(^3P)d\ ^4D_{3/2}$	119.389	2.24[10]	3.18[-2]	7.50[-2]	115.476	1.06[10]	1.41[-2]	3.22[-2]
$p^2(^3P)s\ ^4P_{3/2}$	$sp(^3P)d\ ^4F_{3/2}$	119.178	3.43[10]	7.30[-2]	1.15[-1]	113.565	3.86[10]	7.45[-2]	1.12[-1]
$s^2(^1S)p\ ^2P_{3/2}$	$p^2(^3P)s\ ^2P_{3/2}$	118.859	5.07[10]	1.08[-1]	1.68[-1]	114.137	4.02[10]	7.86[-2]	1.18[-1]
$s^2(^1S)d\ ^2D_{5/2}$	$sp(^1P)d\ ^2P_{3/2}$	118.547	6.95[10]	9.79[-2]	2.29[-1]	112.838	7.86[10]	1.00[-1]	2.24[-1]
$p^2(^1S)s\ ^2S_{1/2}$	$sp(^3P)d\ ^2D_{3/2}$	118.065	1.58[10]	6.58[-2]	5.12[-2]	111.385	4.51[09]	1.68[-2]	1.23[-2]
$s^2(^1S)p\ ^2P_{1/2}$	$p^2(^1S)s\ ^2S_{1/2}$	117.989	9.96[10]	2.08[-1]	1.62[-1]	112.241	1.08[11]	2.05[-1]	1.52[-1]
$s^2(^1S)p\ ^2P_{3/2}$	$p^2(^3P)s\ ^2P_{1/2}$	117.891	7.34[10]	7.67[-2]	1.19[-1]	112.112	7.95[10]	7.47[-2]	1.11[-1]
$s^2(^1S)d\ ^2D_{5/2}$	$sp(^1P)d\ ^2D_{5/2}$	117.456	7.12[10]	1.47[-1]	3.42[-1]	111.798	7.76[10]	1.46[-1]	3.21[-1]
$s^2(^1S)d\ ^2D_{5/2}$	$sp(^1P)d\ ^2D_{3/2}$	115.985	2.27[10]	3.05[-2]	6.98[-2]	110.049	2.08[10]	2.52[-2]	5.48[-2]
$p^2(^3P)s\ ^2P_{1/2}$	$sp(^3P)d\ ^2P_{1/2}$	115.780	5.36[10]	1.08[-1]	8.22[-2]	111.959	4.99[10]	9.40[-2]	6.93[-2]
$s^2(^1S)d\ ^2D_{3/2}$	$sp(^1P)d\ ^2D_{5/2}$	115.477	3.70[10]	1.11[-1]	1.69[-1]	110.426	5.29[10]	1.45[-1]	2.11[-1]
$p^2(^3P)s\ ^2P_{3/2}$	$sp(^1P)d\ ^2F_{5/2}$	115.289	5.95[10]	1.78[-1]	2.71[-1]	110.527	7.91[10]	2.17[-1]	3.16[-1]
$p^2(^3P)s\ ^4P_{5/2}$	$sp(^3P)d\ ^4P_{5/2}$	114.428	1.50[10]	2.94[-2]	6.66[-2]	110.379	1.74[10]	3.17[-2]	6.92[-2]
$s^2(^1S)d\ ^2D_{3/2}$	$sp(^1P)d\ ^2D_{3/2}$	114.054	1.33[11]	2.61[-1]	3.91[-1]	108.719	1.58[11]	2.80[-1]	4.01[-1]
$p^2(^1D)s\ ^2D_{3/2}$	$sp(^3P)d\ ^4D_{5/2}$	113.721	5.06[10]	1.47[-1]	2.21[-1]	109.510	5.47[10]	1.48[-1]	2.13[-1]
$p^2(^1D)s\ ^2D_{5/2}$	$sp(^3P)d\ ^2F_{5/2}$	112.660	7.29[10]	1.38[-1]	3.08[-1]	108.406	7.71[10]	1.36[-1]	2.91[-1]
$p^2(^3P)s\ ^2P_{1/2}$	$sp(^1P)d\ ^2P_{1/2}$	111.724	3.70[10]	6.92[-2]	5.09[-2]	107.912	4.46[10]	7.79[-2]	5.53[-2]
$p^2(^3P)s\ ^2P_{3/2}$	$sp(^1P)d\ ^2P_{1/2}$	110.868	9.10[10]	8.41[-2]	1.23[-1]	106.100	1.01[11]	8.51[-2]	1.19[-1]
$s^2(^1S)p\ ^2P_{3/2}$	$s^2(^1S)d\ ^2D_{3/2}$	110.122	9.03[10]	1.65[-1]	2.39[-1]	105.671	1.14[11]	1.90[-1]	2.64[-1]
$p^2(^3P)s\ ^2P_{1/2}$	$sp(^1P)d\ ^2P_{3/2}$	108.934	7.91[10]	2.81[-1]	2.02[-1]	105.074	7.88[10]	2.61[-1]	1.81[-1]
$p^2(^1D)s\ ^2D_{3/2}$	$sp(^3P)d\ ^4D_{3/2}$	108.667	2.38[10]	4.21[-2]	6.02[-2]	103.797	3.06[10]	4.95[-2]	6.76[-2]
$p^2(^1D)s\ ^2D_{3/2}$	$sp(^3P)d\ ^2D_{3/2}$	108.427	7.55[10]	1.34[-1]	1.90[-1]	102.859	3.81[10]	6.05[-2]	8.20[-2]
$s^2(^1S)p\ ^2P_{3/2}$	$s^2(^1S)d\ ^2D_{5/2}$	108.381	9.26[10]	2.45[-1]	3.49[-1]	104.444	9.82[10]	2.40[-1]	3.31[-1]
$p^2(^3P)s\ ^4P_{3/2}$	$sp(^3P)d\ ^4P_{5/2}$	107.974	4.78[10]	1.25[-1]	1.78[-1]	104.024	4.88[10]	1.18[-1]	1.62[-1]
$p^2(^3P)s\ ^2P_{3/2}$	$sp(^1P)d\ ^2D_{5/2}$	107.213	8.54[10]	2.21[-1]	3.12[-1]	102.482	7.47[10]	1.76[-1]	2.38[-1]
$p^2(^3P)s\ ^2P_{1/2}$	$sp(^1P)d\ ^2D_{3/2}$	106.767	1.50[10]	5.13[-2]	3.60[-2]	102.651	2.04[10]	6.45[-2]	4.36[-2]
$p^2(^3P)s\ ^2P_{3/2}$	$sp(^1P)d\ ^2D_{3/2}$	105.985	3.01[10]	5.06[-2]	7.07[-2]	101.010	1.95[10]	2.99[-2]	3.97[-2]
$p^2(^1D)s\ ^2D_{5/2}$	$sp(^3P)d\ ^2F_{7/2}$	104.623	4.32[10]	9.47[-2]	1.96[-1]	100.785	4.64[10]	9.41[-2]	1.88[-1]
$p^2(^1S)s\ ^2S_{1/2}$	$sp(^3P)d\ ^2P_{3/2}$	103.749	1.17[11]	3.79[-1]	2.59[-1]	98.991	1.21[11]	3.58[-1]	2.33[-1]
$p^2(^3P)s\ ^4P_{5/2}$	$sp(^3P)d\ ^2D_{5/2}$	99.679	6.80[10]	1.01[-1]	2.00[-1]	95.223	7.50[10]	1.02[-1]	1.92[-1]
$p^2(^3P)s\ ^4P_{5/2}$	$sp(^3P)d\ ^4D_{7/2}$	99.622	7.89[10]	1.57[-1]	3.09[-1]	95.079	8.30[10]	1.50[-1]	2.82[-1]
$p^2[^3P)s\ ^4P_{5/2}$	$sp(^3P)d\ ^4D_{3/2}$	98.969	1.99[10]	1.95[-2]	3.82[-2]	94.697	1.29[10]	1.16[-2]	2.16[-2]
$s^2(^1S)p\ ^2P_{1/2}$	$p^2(^3P)s\ ^2P_{3/2}$	97.738	9.07[10]	2.60[-1]	1.67[-1]	92.589	1.13[11]	2.90[-1]	1.77[-1]
$p^2(^1D)s\ ^2D_{5/2}$	$sp(^1P)d\ ^2F_{7/2}$	96.926	2.73[10]	5.15[-2]	9.85[-2]	93.593	2.55[10]	4.47[-2]	8.28[-2]
$p^2(^3P)s\ ^4P_{3/2}$	$sp(^3P)d\ ^4P_{3/2}$	96.718	4.63[10]	6.52[-2]	8.28[-2]	92.104	5.77[10]	7.31[-2]	8.88[-2]
$p^2(^3P)s\ ^4P_{1/2}$	$p^2(^3P)p\ ^2P_{3/2}$	96.376	8.20[10]	2.29[-1]	1.45[-1]	91.965	8.94[10]	2.27[-1]	1.38[-1]
$p^2(^1D)s\ ^2D_{3/2}$	$sp(^3P)d\ ^2P_{3/2}$	96.233	1.60[10]	2.23[-2]	2.82[-2]	92.199	2.25[10]	2.86[-2]	3.47[-2]
$p^2(^3P)s\ ^4P_{1/2}$	$p^2(^3P)p\ ^2P_{1/2}$	96.111	1.09[11]	1.50[-1]	9.52[-2]	91.740	1.18[11]	1.50[-1]	9.04[-2]
$p^2(^1S)s\ ^2S_{1/2}$	$sp(^3P)d\ ^2P_{1/2}$	95.582	2.54[10]	3.48[-2]	2.19[-2]	91.065	3.18[10]	3.95[-2]	2.37[-2]
$p^2(^3P)s\ ^4P_{3/2}$	$sp(^3P)d\ ^2D_{5/2}$	94.746	3.12[10]	6.28[-2]	7.85[-2]	90.456	3.46[10]	6.38[-2]	7.61[-2]

14

Lower level	Upper level	λ	A	f	S	λ	A	f	S
					$Z=43$				$Z=44$
$p^2(^3P)s\ ^2P_{3/2}$	$sp(^3P)d\ ^2P_{3/2}$	116.591	4.09[10]	8.34[-2]	1.28[-1]	111.296	4.71[10]	8.75[-2]	1.28[-1]
$s^2(^1S)d\ ^2D_{5/2}$	$sp(^1P)d\ ^2F_{7/2}$	116.042	1.06[11]	2.85[-1]	6.55[-1]	110.578	1.17[11]	2.86[-1]	6.25[-1]
$s^2(^1S)p\ ^2P_{1/2}$	$p^2(^1D)s\ ^2D_{3/2}$	115.881	2.22[10]	8.95[-2]	6.83[-2]	109.687	2.51[10]	9.06[-2]	6.54[-2]
$p^2(^3P)s\ ^4P_{5/2}$	$sp(^3P)d\ ^4F_{3/2}$	115.506	2.22[10]	2.97[-2]	6.76[-2]	110.100	2.37[10]	2.87[-2]	6.25[-2]
$s^2(^1S)d\ ^2D_{3/2}$	$sp(^1P)d\ ^2F_{5/2}$	115.268	3.27[10]	9.75[-2]	1.48[-1]	111.173	2.46[10]	6.84[-2]	1.00[-1]
$s^2(^1S)d\ ^2D_{3/2}$	$sp(^3P)d\ ^2P_{1/2}$	114.577	1.95[10]	1.92[-2]	2.89[-2]	110.417	1.62[10]	1.49[-2]	2.16[-2]
$p^2(^1D)s\ ^2D_{3/2}$	$sp(^3P)d\ ^4P_{1/2}$	111.550	6.33[10]	5.92[-2]	8.69[-2]	105.975	7.00[10]	5.92[-2]	8.23[-2]
$p^2(^1S)s\ ^2S_{1/2}$	$sp(^3P)d\ ^4P_{3/2}$	109.996	2.34[10]	8.48[-2]	6.14[-2]	104.835	3.58[10]	1.17[-1]	8.14[-2]
$s^2(^1S)p\ ^2P_{3/2}$	$p^2(^3P)s\ ^2P_{3/2}$	109.882	2.95[10]	5.36[-2]	7.73[-2]	106.041	2.06[10]	3.47[-2]	4.85[-2]
$p^2(^1D)s\ ^2D_{5/2}$	$sp(^3P)d\ ^2D_{3/2}$	109.507	3.46[10]	4.15[-2]	8.96[-2]	104.847	4.23[10]	4.64[-2]	9.64[-2]
$p^2(^3P)s\ ^2P_{1/2}$	$sp(^3P)d\ ^2P_{1/2}$	108.388	4.58[10]	8.08[-2]	5.77[-2]	105.041	4.16[10]	6.88[-2]	4.76[-2]
$p^2(^3P)s\ ^4P_{3/2}$	$sp(^3P)d\ ^4F_{3/2}$	108.207	4.25[10]	7.45[-2]	1.06[-1]	103.128	4.63[10]	7.41[-2]	1.00[-1]
$p^2(^3P)s\ ^4P_{3/2}$	$sp(^3P)d\ ^4F_{5/2}$	108.044	8.70[09]	2.29[-2]	3.26[-2]	103.654	1.17[10]	2.81[-2]	3.84[-2]
$s^2(^1S)d\ ^2D_{5/2}$	$sp(^1P)d\ ^2P_{3/2}$	107.443	8.82[10]	1.02[-1]	2.16[-1]	102.343	9.79[10]	1.02[-1]	2.07[-1]
$p^2(^1S)s\ ^2S_{1/2}$	$sp(^3P)d\ ^4D_{3/2}$	106.950	1.79[10]	6.10[-2]	4.30[-2]	101.651	1.57[10]	4.87[-2]	3.26[-2]
$s^2(^1S)p\ ^2P_{1/2}$	$p^2(^1S)s\ ^2S_{1/2}$	106.784	1.18[11]	2.03[-1]	1.42[-1]	101.598	1.29[11]	2.00[-1]	1.34[-1]
$s^2(^1S)p\ ^2P_{3/2}$	$p^2(^3P)s\ ^2P_{1/2}$	106.628	8.61[10]	7.33[-2]	1.03[-1]	101.422	9.35[10]	7.24[-2]	9.64[-2]
$p^2(^3P)s\ ^4P_{5/2}$	$sp(^3P)d\ ^4P_{5/2}$	106.481	2.01[10]	3.43[-2]	7.20[-2]	102.710	2.33[10]	3.69[-2]	7.50[-2]
$s^2(^1S)d\ ^2D_{5/2}$	$sp(^1P)d\ ^2D_{5/2}$	106.449	8.44[10]	1.44[-1]	3.02[-1]	101.389	9.18[10]	1.42[-1]	2.83[-1]
$s^2(^1S)d\ ^2D_{3/2}$	$sp(^1P)d\ ^2D_{5/2}$	105.848	7.03[10]	1.76[-1]	2.47[-1]	101.687	8.70[10]	2.02[-1]	2.71[-1]
$p^2(^3P)s\ ^2P_{3/2}$	$sp(^1P)d\ ^2F_{5/2}$	105.802	1.01[11]	2.54[-1]	3.52[-1]	101.132	1.22[11]	2.81[-1]	3.75[-1]
$p^2(^1D)s\ ^2D_{3/2}$	$sp(^3P)d\ ^4D_{5/2}$	105.491	5.93[10]	1.48[-1]	2.06[-1]	101.630	6.39[10]	1.49[-1]	1.99[-1]
$p^2(^3P)s\ ^2P_{3/2}$	$sp(^3P)d\ ^2P_{1/2}$	105.220	3.30[10]	2.75[-2]	3.81[-2]	100.506	5.06[10]	3.84[-2]	5.08[-2]
$s^2(^1S)d\ ^2D_{5/2}$	$sp(^1P)d\ ^2D_{3/2}$	104.385	1.95[10]	2.12[-2]	4.38[-2]	98.976	1.87[10]	1.83[-2]	3.58[-2]
$p^2(^1D)s\ ^2D_{5/2}$	$sp(^3P)d\ ^2F_{5/2}$	104.376	8.17[10]	1.33[-1]	2.75[-1]	100.548	8.61[10]	1.30[-1]	2.60[-1]
$p^2(^3P)s\ ^2P_{1/2}$	$sp(^1P)d\ ^2P_{1/2}$	104.292	5.27[10]	8.61[-2]	5.91[-2]	100.847	6.13[10]	9.35[-2]	6.21[-2]
$s^2(^1S)d\ ^2D_{3/2}$	$sp(^1P)d\ ^2D_{3/2}$	103.807	1.82[11]	2.93[-1]	4.01[-1]	99.260	2.04[11]	3.00[-1]	3.93[-1]
$p^2(^1D)s\ ^2D_{3/2}$	$sp(^3P)d\ ^4P_{3/2}$	101.767	2.64[10]	4.10[-2]	5.49[-2]	97.421	4.27[10]	6.08[-2]	7.79[-2]
$p^2(^3P)s\ ^2P_{1/2}$	$sp(^1P)d\ ^2P_{3/2}$	101.431	7.89[10]	2.43[-1]	1.62[-1]	97.984	7.90[10]	2.27[-1]	1.47[-1]
$p^2(^3P)s\ ^2P_{3/2}$	$sp(^1P)d\ ^2P_{1/2}$	101.356	1.06[11]	8.22[-2]	1.09[-1]	96.660	1.08[11]	7.59[-2]	9.65[-2]
$s^2(^1S)p\ ^2P_{3/2}$	$s^2(^1S)d\ ^2D_{3/2}$	101.247	1.37[11]	2.11[-1]	2.82[-1]	96.867	1.61[11]	2.28[-1]	2.90[-1]
$s^2(^1S)p\ ^2P_{3/2}$	$s^2(^1S)d\ ^2D_{5/2}$	100.704	1.04[11]	2.36[-1]	3.14[-1]	97.139	1.10[11]	2.33[-1]	2.99[-1]
$p^2(^3P)s\ ^4P_{3/2}$	$sp(^3P)d\ ^4P_{5/2}$	100.248	4.91[10]	1.12[-1]	1.46[-1]	96.617	4.89[10]	1.02[-1]	1.30[-1]
$p^2(^1D)s\ ^2D_{3/2}$	$sp(^3P)d\ ^4D_{3/2}$	99.155	3.64[10]	5.35[-2]	6.99[-2]	94.666	2.70[10]	3.63[-2]	4.52[-2]
$p^2(^3P)s\ ^2P_{1/2}$	$sp(^1P)d\ ^2D_{3/2}$	98.701	2.62[10]	7.67[-2]	4.98[-2]	94.893	3.23[10]	8.73[-2]	5.46[-2]
$p^2(^3P)s\ ^2P_{3/2}$	$sp(^1P)d\ ^2D_{5/2}$	97.813	6.30[10]	1.36[-1]	1.74[-1]	93.221	5.19[10]	1.01[-1]	1.24[-1]
$p^2(^1D)s\ ^2D_{3/2}$	$sp(^3P)d\ ^2D_{3/2}$	97.354	1.92[10]	2.73[-2]	3.50[-2]	92.068	1.18[10]	1.49[-2]	1.81[-2]
$p^2(^1D)s\ ^2D_{5/2}$	$sp(^3P)d\ ^2F_{7/2}$	97.161	4.98[10]	9.41[-2]	1.81[-1]	93.730	5.37[10]	9.42[-2]	1.75[-1]
$p^2(^3P)s\ ^2P_{3/2}$	$sp(^1P)d\ ^2D_{3/2}$	96.067	1.07[10]	1.48[-2]	1.87[-2]	91.177	4.73[09]	5.90[-3]	7.09[-3]
$p^2(^1S)s\ ^2S_{1/2}$	$sp(^3P)d\ ^2P_{3/2}$	94.402	1.26[11]	3.36[-1]	2.09[-1]	89.969	1.29[11]	3.13[-1]	1.86[-1]
$p^2(^3P)s\ ^4P_{5/2}$	$sp(^3P)d\ ^2D_{5/2}$	90.965	8.16[10]	1.01[-1]	1.82[-1]	86.898	8.86[10]	1.00[-1]	1.72[-1]
$p^2(^3P)s\ ^4P_{5/2}$	$sp(^3P)d\ ^4D_{7/2}$	90.749	8.78[10]	1.44[-1]	2.59[-1]	86.619	9.28[10]	1.39[-1]	2.39[-1]
$p^2(^1D)s\ ^2D_{5/2}$	$sp(^1P)d\ ^2F_{7/2}$	90.430	2.34[10]	3.81[-2]	6.84[-2]	87.417	2.08[10]	3.18[-2]	5.50[-2]
$p^2(^1D)s\ ^2D_{3/2}$	$sp(^3P)d\ ^2P_{3/2}$	88.276	3.06[10]	3.58[-2]	4.16[-2]	84.454	4.07[10]	4.36[-2]	4.84[-2]
$p^2(^3P)s\ ^4P_{3/2}$	$sp(^3P)d\ ^4P_{3/2}$	88.021	6.14[10]	7.10[-2]	8.25[-2]	84.355	5.68[10]	6.06[-2]	6.75[-2]
$s^2(^1S)p\ ^2P_{1/2}$	$p^2(^3P)s\ ^2P_{3/2}$	87.868	1.37[11]	3.16[-1]	1.83[-1]	83.524	1.59[11]	3.33[-1]	1.83[-1]
$p^2(^3P)s\ ^4P_{1/2}$	$p^2(^3P)p\ ^2P_{3/2}$	87.773	9.83[10]	2.26[-1]	1.31[-1]	83.785	1.08[11]	2.27[-1]	1.25[-1]
$p^2(^3P)s\ ^4P_{1/2}$	$p^2(^3P)p\ ^2P_{1/2}$	87.596	1.28[11]	1.48[-1]	8.53[-2]	83.657	1.39[11]	1.46[-1]	8.04[-2]
$p^2(^1S)s\ ^2S_{1/2}$	$sp(^3P)d\ ^2P_{1/2}$	86.807	3.93[10]	4.45[-2]	2.54[-2]	82.785	4.82[10]	4.95[-2]	2.70[-2]
$p^2(^3P)s\ ^4P_{3/2}$	$sp(^3P)d\ ^2D_{5/2}$	86.377	3.82[10]	6.39[-2]	7.28[-2]	82.497	4.15[10]	6.39[-2]	6.93[-2]
$p^2(^3P)s\ ^4P_{3/2}$	$sp(^3P)d\ ^4D_{1/2}$	86.065	9.17[10]	5.10[-2]	5.78[-2]	82.192	9.84[10]	5.01[-2]	5.43[-2]

Lower level	Upper level	λ	A	f	S	λ	A	f	S
					Z=45				Z=46
$p^2(^3P)s\ ^4P_{5/2}$	$p^2(^3P)p\ ^2D_{3/2}$	134.081	2.11[10]	3.80[-2]	1.01[-1]	130.110	2.23[10]	3.76[-2]	9.69[-2]
$s^2(^1S)d\ ^2D_{3/2}$	$sp(^1P)d\ ^2F_{5/2}$	107.465	1.83[10]	4.75[-2]	6.72[-2]	104.075	1.35[10]	3.30[-2]	4.52[-2]
$s^2(^1S)d\ ^2D_{3/2}$	$sp(^3P)d\ ^2P_{1/2}$	106.658	1.28[10]	1.08[-2]	1.53[-2]	103.226	9.53[09]	7.60[-3]	1.04[-2]
$p^2(^3P)s\ ^2P_{3/2}$	$sp(^3P)d\ ^2P_{3/2}$	105.966	5.32[10]	9.00[-2]	1.25[-1]	100.662	5.96[10]	9.06[-2]	1.20[-1]
$s^2(^1S)d\ ^2D_{5/2}$	$sp(^1P)d\ ^2F_{7/2}$	105.388	1.29[11]	2.87[-1]	5.97[-1]	100.459	1.43[11]	2.88[-1]	5.71[-1]
$p^2(^3P)s\ ^4P_{5/2}$	$sp(^3P)d\ ^4F_{3/2}$	104.973	2.51[10]	2.77[-2]	5.74[-2]	100.126	2.65[10]	2.65[-2]	5.25[-2]
$p^2(^1D)s\ ^2D_{5/2}$	$sp(^3P)d\ ^4D_{7/2}$	104.529	1.21[10]	2.65[-2]	5.47[-2]	101.063	1.26[10]	2.58[-2]	5.15[-2]
$s^2(^1S)p\ ^2P_{1/2}$	$p^2(^1D)s\ ^2D_{3/2}$	103.860	2.83[10]	9.18[-2]	6.27[-2]	98.373	3.20[10]	9.29[-2]	6.01[-2]
$s^2(^1S)p\ ^2P_{3/2}$	$p^2(^3P)s\ ^2P_{3/2}$	102.549	1.39[10]	2.19[-2]	2.96[-2]	99.343	9.30[09]	1.38[-2]	1.80[-2]
$p^2(^3P)s\ ^2P_{1/2}$	$sp(^3P)d\ ^2P_{1/2}$	101.897	3.73[10]	5.81[-2]	3.89[-2]	98.936	3.32[10]	4.87[-2]	3.18[-2]
$p^2(^3P)s\ ^4P_{5/2}$	$sp(^3P)d\ ^4F_{7/2}$	101.364	1.55[10]	3.19[-2]	6.39[-2]	97.757	1.75[10]	3.34[-2]	6.45[-2]
$p^2(^1D)s\ ^2D_{3/2}$	$sp(^3P)d\ ^4P_{1/2}$	100.681	7.74[10]	5.88[-2]	7.80[-2]	95.653	8.56[10]	5.88[-2]	7.40[-2]
$p^2(^1D)s\ ^2D_{5/2}$	$sp(^3P)d\ ^2D_{3/2}$	100.413	4.80[10]	4.84[-2]	9.59[-2]	96.237	5.22[10]	4.84[-2]	9.18[-2]
$p^2(^1S)s\ ^2S_{1/2}$	$sp(^3P)d\ ^4P_{3/2}$	100.160	5.05[10]	1.52[-1]	1.00[-1]	95.846	6.59[10]	1.82[-1]	1.15[-1]
$p^2(^3P)s\ ^4P_{1/2}$	$p^2(^3P)p\ ^2D_{3/2}$	99.863	1.71[10]	5.12[-2]	3.36[-2]	95.013	1.93[10]	5.23[-2]	3.27[-2]
$p^2(^3P)s\ ^4P_{3/2}$	$sp(^3P)d\ ^4F_{5/2}$	99.458	1.57[10]	3.50[-2]	4.58[-2]	95.509	2.11[10]	4.35[-2]	5.46[-2]
$p^2(^3P)s\ ^4P_{5/2}$	$sp(^3P)d\ ^4P_{5/2}$	99.041	2.70[10]	3.99[-2]	7.79[-2]	95.458	3.11[10]	4.23[-2]	8.00[-2]
$p^2(^3P)s\ ^4P_{3/2}$	$sp(^3P)d\ ^4F_{3/2}$	98.329	5.01[10]	7.31[-2]	9.44[-2]	93.805	5.45[10]	7.21[-2]	8.88[-2]
$p^2(^1D)s\ ^2D_{3/2}$	$sp(^3P)d\ ^4D_{5/2}$	97.898	6.90[10]	1.49[-1]	1.92[-1]	94.264	7.49[10]	1.50[-1]	1.86[-1]
$s^2(^1S)d\ ^2D_{3/2}$	$sp(^1P)d\ ^2D_{5/2}$	97.876	1.02[11]	2.20[-1]	2.84[-1]	94.353	1.15[11]	2.31[-1]	2.87[-1]
$p^2(^3P)s\ ^2P_{1/2}$	$sp(^1P)d\ ^2P_{1/2}$	97.564	6.98[10]	9.95[-2]	6.41[-2]	94.430	7.84[10]	1.05[-1]	6.52[-2]
$s^2(^1S)d\ ^2D_{5/2}$	$sp(^1P)d\ ^2P_{3/2}$	97.518	1.08[11]	1.02[-1]	1.97[-1]	92.956	1.17[11]	1.01[-1]	1.85[-1]
$p^2(^1D)s\ ^2D_{5/2}$	$sp(^3P)d\ ^2F_{5/2}$	96.899	9.10[10]	1.28[-1]	2.45[-1]	93.408	9.59[10]	1.26[-1]	2.32[-1]
$s^2(^1S)p\ ^2P_{1/2}$	$p^2(^1S)s\ ^2S_{1/2}$	96.665	1.41[11]	1.97[-1]	1.26[-1]	91.971	1.54[11]	1.95[-1]	1.18[-1]
$s^2(^1S)d\ ^2D_{5/2}$	$sp(^1P)d\ ^2D_{5/2}$	96.603	9.93[10]	1.40[-1]	2.66[-1]	92.077	1.08[11]	1.37[-1]	2.50[-1]
$p^2(^3P)s\ ^2P_{3/2}$	$sp(^1P)d\ ^2F_{5/2}$	96.550	1.44[11]	3.02[-1]	3.84[-1]	92.089	1.66[11]	3.17[-1]	3.84[-1]
$s^2(^1S)p\ ^2P_{3/2}$	$p^2(^3P)s\ ^2P_{1/2}$	96.474	1.01[11]	7.09[-2]	9.01[-2]	91.771	1.11[11]	7.00[-2]	8.45[-2]
$p^2(^3P)s\ ^2P_{3/2}$	$sp(^3P)d\ ^2P_{1/2}$	95.897	7.04[10]	4.86[-2]	6.14[-2]	91.424	9.17[10]	5.77[-2]	6.92[-2]
$s^2(^1S)d\ ^2D_{3/2}$	$sp(^1P)d\ ^2D_{3/2}$	95.007	2.24[11]	3.03[-1]	3.78[-1]	90.985	2.43[11]	3.02[-1]	3.62[-1]
$p^2(^3P)s\ ^2P_{1/2}$	$sp(^1P)d\ ^2P_{3/2}$	94.716	7.96[10]	2.14[-1]	1.33[-1]	91.610	8.02[10]	2.02[-1]	1.22[-1]
$s^2(^1S)p\ ^2P_{3/2}$	$s^2(^1S)d\ ^2D_{5/2}$	93.731	1.17[11]	2.31[-1]	2.85[-1]	90.459	1.23[11]	2.29[-1]	2.72[-1]
$p^2(^1D)s\ ^2D_{3/2}$	$sp(^3P)d\ ^4P_{3/2}$	93.452	5.67[10]	7.45[-2]	9.16[-2]	89.758	6.62[10]	8.04[-2]	9.49[-2]
$p^2(^3P)s\ ^4P_{3/2}$	$sp(^3P)d\ ^4P_{5/2}$	93.106	4.73[10]	9.24[-2]	1.13[-1]	89.696	4.44[10]	8.06[-2]	9.53[-2]
$s^2(^1S)p\ ^2P_{3/2}$	$s^2(^1S)d\ ^2D_{3/2}$	92.562	1.85[11]	2.37[-1]	2.89[-1]	88.364	2.08[11]	2.43[-1]	2.83[-1]
$p^2(^3P)s\ ^2P_{3/2}$	$sp(^1P)d\ ^2P_{1/2}$	92.050	1.06[11]	6.80[-2]	8.24[-2]	87.563	1.04[11]	5.97[-2]	6.89[-2]
$p^2(^3P)s\ ^2P_{1/2}$	$sp(^1P)d\ ^2D_{3/2}$	91.211	3.86[10]	9.65[-2]	5.80[-2]	87.636	4.53[10]	1.04[-1]	6.02[-2]
$p^2(^1D)s\ ^2D_{5/2}$	$sp(^3P)d\ ^2F_{7/2}$	90.467	5.80[10]	9.48[-2]	1.69[-1]	87.351	6.25[10]	9.55[-2]	1.65[-1]
$p^2(^3P)s\ ^2P_{3/2}$	$sp(^1P)d\ ^2D_{5/2}$	88.739	4.24[10]	7.54[-2]	8.82[-2]	84.395	3.55[10]	5.67[-2]	6.30[-2]
$p^2(^1S)s\ ^2S_{1/2}$	$sp(^3P)d\ ^2P_{3/2}$	85.685	1.32[11]	2.92[-1]	1.64[-1]	81.543	1.35[11]	2.70[-1]	1.45[-1]
$p^2(^1D)s\ ^2D_{5/2}$	$sp(^1P)d\ ^2F_{7/2}$	84.533	1.78[10]	2.56[-2]	4.26[-2]	81.762	1.45[10]	1.94[-2]	3.13[-2]
$p^2(^3P)s\ ^4P_{5/2}$	$sp(^3P)d\ ^2D_{5/2}$	83.011	9.61[10]	9.92[-2]	1.63[-1]	79.295	1.05[11]	9.90[-2]	1.55[-1]
$p^2(^3P)s\ ^4P_{5/2}$	$sp(^3P)d\ ^4D_{3/2}$	82.845	2.05[10]	1.41[-2]	2.30[-2]	79.177	2.41[10]	1.51[-2]	2.36[-2]
$p^2(^3P)s\ ^4P_{1/2}$	$sp(^3P)d\ ^4F_{3/2}$	82.769	2.18[10]	4.48[-2]	2.44[-2]	77.964	2.38[10]	4.35[-2]	2.23[-2]
$p^2(^3P)s\ ^4P_{5/2}$	$sp(^3P)d\ ^4D_{7/2}$	82.678	9.90[10]	1.35[-1]	2.21[-1]	78.916	1.06[11]	1.31[-1]	2.05[-1]
$p^2(^3P)s\ ^4P_{3/2}$	$sp(^3P)d\ ^4P_{3/2}$	80.998	4.95[10]	4.87[-2]	5.19[-2]	77.871	4.35[10]	3.96[-2]	4.06[-2]
$p^2(^1D)s\ ^2D_{3/2}$	$sp(^3P)d\ ^2P_{3/2}$	80.728	5.24[10]	5.13[-2]	5.47[-2]	77.095	6.61[10]	5.88[-2]	5.97[-2]
$p^2(^3P)s\ ^4P_{1/2}$	$p^2(^3P)p\ ^2P_{3/2}$	79.986	1.19[11]	2.28[-1]	1.20[-1]	76.364	1.33[11]	2.31[-1]	1.16[-1]
$p^2(^3P)s\ ^4P_{1/2}$	$p^2(^3P)p\ ^2P_{1/2}$	79.908	1.50[11]	1.44[-1]	7.58[-2]	76.335	1.63[11]	1.43[-1]	7.16[-2]
$s^2(^1S)p\ ^2P_{1/2}$	$p^2(^3P)s\ ^2P_{3/2}$	79.500	1.82[11]	3.44[-1]	1.80[-1]	75.745	2.03[11]	3.50[-1]	1.74[-1]
$p^2(^1D)s\ ^2D_{5/2}$	$sp(^1P)d\ ^2P_{3/2}$	79.394	1.44[10]	9.07[-3]	1.42[-2]	76.721	1.81[10]	1.07[-2]	1.61[-2]
$p^2(^1S)s\ ^2S_{1/2}$	$sp(^3P)d\ ^2P_{1/2}$	78.980	5.81[10]	5.44[-2]	2.83[-2]	75.373	6.92[10]	5.90[-2]	2.93[-2]

Lower level	Upper level	λ	A	f	S	λ	A	f	S
					Z=47				Z=48
$p^2(^3P)s\ ^4P_{5/2}$	$p^2(^3P)p\ ^2D_{3/2}$	126.330	2.34[10]	3.73[-2]	9.31[-2]	122.735	2.44[10]	3.66[-2]	8.93[-2]
$p^2(^3P)s\ ^2P_{1/2}$	$sp(^3P)d\ ^2P_{1/2}$	96.141	2.95[10]	4.09[-2]	2.59[-2]	93.496	2.61[10]	3.43[-2]	2.11[-2]
$s^2(^1S)d\ ^2D_{5/2}$	$sp(^1P)d\ ^2F_{7/2}$	95.784	1.58[11]	2.89[-1]	5.47[-1]	91.358	1.73[11]	2.90[-1]	5.23[-1]
$p^2(^3P)s\ ^4P_{5/2}$	$sp(^3P)d\ ^4F_{3/2}$	95.554	2.80[10]	2.55[-2]	4.82[-2]	91.890	1.88[09]	1.58[-3]	2.88[-3]
$p^2(^3P)s\ ^2P_{3/2}$	$sp(^3P)d\ ^2P_{3/2}$	95.440	6.56[10]	8.96[-2]	1.13[-1]	90.339	7.15[10]	8.72[-2]	1.04[-1]
$p^2(^3P)s\ ^4P_{5/2}$	$p^2(^3P)p\ ^2P_{3/2}$	94.627	7.40[07]	6.62[-5]	1.24[-4]	91.264	2.73[10]	2.28[-2]	4.10[-2]
$p^2(^3P)s\ ^4P_{5/2}$	$sp(^3P)d\ ^4F_{7/2}$	94.330	1.95[10]	3.47[-2]	6.48[-2]	91.070	2.18[10]	3.60[-2]	6.50[-2]
$s^2(^1S)p\ ^2P_{1/2}$	$p^2(^1D)s\ ^2D_{3/2}$	93.201	3.60[10]	9.39[-2]	5.76[-2]	88.323	4.06[10]	9.50[-2]	5.52[-2]
$p^2(^1D)s\ ^2D_{5/2}$	$sp(^3P)d\ ^2D_{3/2}$	92.324	5.51[10]	4.68[-2]	8.56[-2]	88.664	5.66[10]	4.45[-2]	7.79[-2]
$p^2(^3P)s\ ^4P_{5/2}$	$sp(^3P)d\ ^4P_{5/2}$	91.958	3.50[10]	4.43[-2]	8.04[-2]	88.553	3.82[10]	4.49[-2]	7.86[-2]
$p^2(^3P)s\ ^4P_{3/2}$	$sp(^3P)d\ ^4F_{5/2}$	91.833	2.79[10]	5.30[-2]	6.41[-2]	88.433	3.53[10]	6.24[-2]	7.28[-2]
$p^2(^1S)s\ ^2S_{1/2}$	$sp(^3P)d\ ^4P_{3/2}$	91.807	8.09[10]	2.04[-1]	1.24[-1]	87.981	9.58[10]	2.23[-1]	1.29[-1]
$p^2(^3P)s\ ^2P_{1/2}$	$sp(^1P)d\ ^2P_{1/2}$	91.435	8.67[10]	1.09[-1]	6.55[-2]	88.569	9.49[10]	1.12[-1]	6.51[-2]
$s^2(^1S)d\ ^2D_{3/2}$	$sp(^1P)d\ ^2D_{5/2}$	91.069	1.27[11]	2.37[-1]	2.85[-1]	87.987	1.38[11]	2.40[-1]	2.78[-1]
$p^2(^1D)s\ ^2D_{3/2}$	$sp(^3P)d\ ^4P_{1/2}$	90.875	9.46[10]	5.88[-2]	7.02[-2]	86.335	1.05[11]	5.88[-2]	6.66[-2]
$p^2(^1D)s\ ^2D_{3/2}$	$sp(^3P)d\ ^4D_{5/2}$	90.702	8.10[10]	1.50[-1]	1.80[-1]	87.187	8.76[10]	1.50[-1]	1.72[-1]
$p^2(^3P)s\ ^4P_{1/2}$	$p^2(^3P)p\ ^2D_{3/2}$	90.392	2.18[10]	5.33[-2]	3.17[-2]	85.987	2.45[10]	5.42[-2]	3.07[-2]
$p^2(^1D)s\ ^2D_{5/2}$	$sp(^3P)d\ ^2F_{5/2}$	90.054	1.01[11]	1.24[-1]	2.19[-1]	86.816	1.07[11]	1.21[-1]	2.08[-1]
$p^2(^3P)s\ ^4P_{3/2}$	$sp(^3P)d\ ^4F_{3/2}$	89.549	5.99[10]	7.21[-2]	8.51[-2]	86.110	1.51[10]	1.68[-2]	1.90[-2]
$p^2(^3P)s\ ^4P_{3/2}$	$p^2(^3P)p\ ^2P_{3/2}$	88.734	5.10[09]	6.02[-3]	7.04[-3]	85.561	5.31[10]	5.83[-2]	6.58[-2]
$p^2(^3P)s\ ^2P_{1/2}$	$sp(^1P)d\ ^2P_{3/2}$	88.653	8.13[10]	1.92[-1]	1.12[-1]	85.832	8.28[10]	1.83[-1]	1.04[-1]
$s^2(^1S)d\ ^2D_{5/2}$	$sp(^1P)d\ ^2P_{3/2}$	88.643	1.26[11]	9.95[-2]	1.74[-1]	84.573	1.35[11]	9.66[-2]	1.61[-1]
$s^2(^1S)d\ ^2D_{5/2}$	$sp(^1P)d\ ^2D_{5/2}$	87.800	1.17[11]	1.35[-1]	2.34[-1]	83.766	1.26[11]	1.32[-1]	2.18[-1]
$p^2(^3P)s\ ^2P_{3/2}$	$sp(^1P)d\ ^2F_{5/2}$	87.774	1.88[11]	3.27[-1]	3.77[-1]	83.620	2.11[11]	3.34[-1]	3.67[-1]
$s^2(^1S)p\ ^2P_{1/2}$	$p^2(^1S)s\ ^2S_{1/2}$	87.501	1.68[11]	1.93[-1]	1.11[-1]	83.244	1.84[11]	1.91[-1]	1.05[-1]
$s^2(^1S)p\ ^2P_{3/2}$	$s^2(^1S)d\ ^2D_{5/2}$	87.306	1.31[11]	2.26[-1]	2.60[-1]	84.252	1.40[11]	2.24[-1]	2.48[-1]
$s^2(^1S)p\ ^2P_{3/2}$	$p^2(^3P)s\ ^2P_{1/2}$	87.296	1.21[11]	6.90[-2]	7.93[-2]	83.040	1.31[11]	6.80[-2]	7.45[-2]
$s^2(^1S)d\ ^2D_{3/2}$	$sp(^1P)d\ ^2D_{3/2}$	87.146	2.64[11]	3.00[-1]	3.44[-1]	83.454	2.85[11]	2.98[-1]	3.28[-1]
$p^2(^3P)s\ ^2P_{3/2}$	$sp(^3P)d\ ^2P_{1/2}$	87.106	1.14[11]	6.51[-2]	7.46[-2]	82.955	1.38[11]	7.10[-2]	7.77[-2]
$p^2(^3P)s\ ^4P_{3/2}$	$sp(^3P)d\ ^4P_{5/2}$	86.383	4.06[10]	6.82[-2]	7.76[-2]	83.174	3.58[10]	5.59[-2]	6.11[-2]
$p^2(^1D)s\ ^2D_{3/2}$	$sp(^3P)d\ ^4P_{3/2}$	86.271	7.23[10]	8.08[-2]	9.17[-2]	82.940	7.60[10]	7.83[-2]	8.57[-2]
$p^2(^1D)s\ ^2D_{5/2}$	$sp(^3P)d\ ^2F_{7/2}$	84.362	6.78[10]	9.65[-2]	1.61[-1]	81.478	7.31[10]	9.72[-2]	1.56[-1]
$s^2(^1S)p\ ^2P_{3/2}$	$s^2(^1S)d\ ^2D_{3/2}$	84.297	2.32[11]	2.47[-1]	2.74[-1]	80.374	2.57[11]	2.48[-1]	2.63[-1]
$p^2(^3P)s\ ^2P_{1/2}$	$sp(^1P)d\ ^2D_{3/2}$	84.156	5.20[10]	1.11[-1]	6.14[-2]	80.762	5.92[10]	1.16[-1]	6.18[-2]
$s^2(^1S)d\ ^2D_{5/2}$	$sp(^1P)d\ ^2D_{3/2}$	84.147	1.96[10]	1.39[-2]	2.31[-2]	79.647	2.12[10]	1.35[-2]	2.12[-2]
$p^2(^3P)s\ ^2P_{3/2}$	$sp(^1P)d\ ^2P_{1/2}$	83.225	1.00[11]	5.23[-2]	5.71[-2]	79.054	9.64[10]	4.53[-2]	4.71[-2]
$p^2(^3P)s\ ^2P_{3/2}$	$sp(^1P)d\ ^2D_{5/2}$	80.211	2.99[10]	4.33[-2]	4.57[-2]	76.198	2.58[10]	3.37[-2]	3.38[-2]
$p^2(^1S)s\ ^2S_{1/2}$	$sp(^3P)d\ ^2P_{3/2}$	77.544	1.37[11]	2.48[-1]	1.27[-1]	73.686	1.40[11]	2.28[-1]	1.10[-1]
$p^2(^3P)s\ ^4P_{5/2}$	$sp(^3P)d\ ^2D_{5/2}$	75.744	1.14[11]	9.83[-2]	1.47[-1]	72.346	1.25[11]	9.77[-2]	1.40[-1]
$p^2[^3P)s\ ^4P_{5/2}$	$sp(^3P)d\ ^4D_{3/2}$	75.662	2.70[10]	1.55[-2]	2.31[-2]	72.294	2.96[10]	1.55[-2]	2.21[-2]
$p^2(^3P)s\ ^4P_{5/2}$	$sp(^3P)d\ ^4D_{7/2}$	75.326	1.13[11]	1.28[-1]	1.91[-1]	71.898	1.22[11]	1.26[-1]	1.79[-1]
$p^2(^3P)s\ ^4P_{3/2}$	$sp(^3P)d\ ^4P_{3/2}$	74.920	4.08[10]	3.44[-2]	3.39[-2]	72.106	4.11[10]	3.20[-2]	3.04[-2]
$p^2(^1D)s\ ^2D_{5/2}$	$sp(^1P)d\ ^2P_{3/2}$	74.153	2.31[10]	1.26[-2]	1.86[-2]	71.673	2.97[10]	1.53[-2]	2.16[-2]
$p^2(^1D)s\ ^2D_{3/2}$	$sp(^3P)d\ ^2P_{3/2}$	73.558	8.03[10]	6.53[-2]	6.31[-2]	70.117	9.40[10]	6.98[-2]	6.42[-2]
$p^2(^3P)s\ ^4P_{1/2}$	$sp(^3P)d\ ^4F_{3/2}$	73.462	2.16[10]	3.50[-2]	1.69[-2]	69.615	1.35[11]	1.97[-1]	9.00[-2]
$p^2(^3P)s\ ^4P_{1/2}$	$p^2(^3P)p\ ^2P_{1/2}$	72.930	1.77[11]	1.41[-1]	6.77[-2]	69.679	1.92[11]	1.40[-1]	6.40[-2]
$p^2(^3P)s\ ^4P_{1/2}$	$p^2(^3P)p\ ^2P_{3/2}$	72.913	1.53[11]	2.43[-1]	1.17[-1]	69.256	5.94[10]	8.55[-2]	3.90[-2]
$p^2(^3P)s\ ^4P_{1/2}$	$p^2(^3P)p\ ^2P_{3/2}$	72.913	1.53[11]	2.43[-1]	1.17[-1]	69.256	5.94[10]	8.55[-2]	3.90[-2]
$s^2(^1S)p\ ^2P_{1/2}$	$p^2(^3P)s\ ^2P_{3/2}$	72.221	2.26[11]	3.52[-1]	1.68[-1]	68.896	2.49[11]	3.54[-1]	1.61[-1]
$p^2(^1S)s\ ^2S_{1/2}$	$sp(^3P)d\ ^2P_{1/2}$	71.951	8.15[10]	6.34[-2]	3.00[-2]	68.698	9.51[10]	6.73[-2]	3.04[-2]
$p^2(^3P)s\ ^4P_{3/2}$	$sp(^3P)d\ ^2D_{5/2}$	71.920	5.36[10]	6.25[-2]	5.92[-2]	68.715	5.86[10]	6.20[-2]	5.62[-2]

Lower level	Upper level	λ	A	f	S	λ	A	f	S
					Z=49				Z=50
$p^2(^3P)s\ ^4P_{5/2}$	$p^2(^3P)p\ ^2D_{3/2}$	119.307	2.55[10]	3.63[-2]	8.55[-2]	116.037	2.65[10]	3.56[-2]	8.18[-2]
$p^2(^3P)s\ ^2P_{1/2}$	$sp(^3P)d\ ^2P_{1/2}$	90.988	2.31[10]	2.88[-2]	1.72[-2]	88.606	2.05[10]	2.41[-2]	1.41[-2]
$p^2(^3P)s\ ^4P_{5/2}$	$sp(^3P)d\ ^4F_{7/2}$	87.966	2.42[10]	3.74[-2]	6.51[-2]	85.007	2.67[10]	3.87[-2]	6.50[-2]
$p^2(^3P)s\ ^4P_{5/2}$	$p^2(^3P)p\ ^2P_{3/2}$	87.242	2.95[10]	2.25[-2]	3.87[-2]	83.491	3.05[10]	2.13[-2]	3.51[-2]
$s^2(^1S)d\ ^2D_{5/2}$	$sp(^1P)d\ ^2F_{7/2}$	87.177	1.91[11]	2.90[-1]	5.00[-1]	83.245	2.08[11]	2.90[-1]	4.76[-1]
$p^2(^3P)s\ ^2P_{1/2}$	$sp(^1P)d\ ^2P_{1/2}$	85.824	1.03[11]	1.14[-1]	6.42[-2]	83.192	1.11[11]	1.15[-1]	6.29[-2]
$p^2(^3P)s\ ^2P_{3/2}$	$sp(^3P)d\ ^2P_{3/2}$	85.394	7.60[10]	8.33[-2]	9.37[-2]	80.634	8.00[10]	7.79[-2]	8.29[-2]
$p^2(^3P)s\ ^4P_{3/2}$	$sp(^3P)d\ ^4F_{5/2}$	85.287	4.35[10]	7.09[-2]	7.98[-2]	82.360	5.10[10]	7.78[-2]	8.45[-2]
$p^2(^3P)s\ ^4P_{5/2}$	$sp(^3P)d\ ^4P_{5/2}$	85.273	4.06[10]	4.43[-2]	7.46[-2]	82.147	4.21[10]	4.26[-2]	6.90[-2]
$p^2(^1D)s\ ^2D_{5/2}$	$sp(^3P)d\ ^2D_{3/2}$	85.234	5.66[10]	4.12[-2]	6.92[-2]	82.000	5.51[10]	3.73[-2]	6.01[-2]
$s^2(^1S)d\ ^2D_{3/2}$	$sp(^1P)d\ ^2D_{5/2}$	85.078	1.48[11]	2.41[-1]	2.70[-1]	82.321	1.57[11]	2.40[-1]	2.60[-1]
$p^2(^1S)s\ ^2S_{1/2}$	$sp(^3P)d\ ^4P_{3/2}$	84.320	1.12[11]	2.37[-1]	1.32[-1]	80.785	1.26[11]	2.48[-1]	1.32[-1]
$s^2(^1S)p\ ^2P_{1/2}$	$p^2(^1D)s\ ^2D_{3/2}$	83.718	4.56[10]	9.58[-2]	5.29[-2]	79.370	5.11[10]	9.68[-2]	5.06[-2]
$p^2(^1D)s\ ^2D_{3/2}$	$sp(^3P)d\ ^4D_{5/2}$	83.699	9.42[10]	1.48[-1]	1.64[-1]	80.229	1.00[11]	1.45[-1]	1.54[-1]
$p^2(^1D)s\ ^2D_{5/2}$	$sp(^3P)d\ ^2F_{5/2}$	83.671	1.13[11]	1.19[-1]	1.96[-1]	80.597	1.19[11]	1.16[-1]	1.84[-1]
$p^2(^3P)s\ ^2P_{1/2}$	$sp(^1P)d\ ^2P_{3/2}$	83.136	8.48[10]	1.75[-1]	9.62[-2]	80.555	8.68[10]	1.70[-1]	8.98[-2]
$p^2(^1D)s\ ^2D_{3/2}$	$sp(^3P)d\ ^4P_{1/2}$	82.019	1.16[11]	5.83[-2]	6.32[-2]	77.917	1.28[11]	5.88[-2]	6.01[-2]
$p^2(^3P)s\ ^4P_{3/2}$	$p^2(^3P)p\ ^2P_{3/2}$	81.826	6.13[10]	6.13[-2]	6.62[-2]	78.344	6.38[10]	5.88[-2]	6.08[-2]
$p^2(^3P)s\ ^4P_{1/2}$	$p^2(^3P)p\ ^2D_{3/2}$	81.786	2.74[10]	5.50[-2]	2.96[-2]	77.783	3.07[10]	5.57[-2]	2.85[-2]
$s^2(^1S)p\ ^2P_{3/2}$	$s^2(^1S)d\ ^2D_{5/2}$	81.279	1.49[11]	2.22[-1]	2.37[-1]	78.365	1.58[11]	2.19[-1]	2.26[-1]
$s^2(^1S)d\ ^2D_{5/2}$	$sp(^1P)d\ ^2P_{3/2}$	80.740	1.43[11]	9.30[-2]	1.48[-1]	77.142	1.49[11]	8.85[-2]	1.35[-1]
$p^2(^3P)s\ ^4P_{3/2}$	$sp(^3P)d\ ^4P_{5/2}$	80.091	3.09[10]	4.47[-2]	4.71[-2]	77.160	2.63[10]	3.53[-2]	3.58[-2]
$s^2(^1S)d\ ^2D_{5/2}$	$sp(^1P)d\ ^2D_{5/2}$	79.967	1.33[11]	1.28[-1]	2.02[-1]	76.404	1.41[11]	1.23[-1]	1.86[-1]
$s^2(^1S)d\ ^2D_{3/2}$	$sp(^1P)d\ ^2D_{3/2}$	79.885	3.10[11]	2.96[-1]	3.12[-1]	76.425	3.36[11]	2.94[-1]	2.96[-1]
$p^2(^1D)s\ ^2D_{3/2}$	$sp(^3P)d\ ^4P_{3/2}$	79.726	7.84[10]	7.49[-2]	7.87[-2]	76.599	8.08[10]	7.09[-2]	7.17[-2]
$p^2(^3P)s\ ^2P_{3/2}$	$sp(^1P)d\ ^2F_{5/2}$	79.631	2.38[11]	3.39[-1]	3.55[-1]	75.811	2.66[11]	3.43[-1]	3.43[-1]
$s^2(^1S)p\ ^2P_{1/2}$	$p^2(^1S)s\ ^2S_{1/2}$	79.189	2.01[11]	1.89[-1]	9.88[-2]	75.326	2.21[11]	1.88[-1]	9.32[-2]
$s^2(^1S)p\ ^2P_{3/2}$	$p^2(^3P)s\ ^2P_{1/2}$	78.988	1.44[11]	6.76[-2]	7.01[-2]	75.131	1.57[11]	6.66[-2]	6.61[-2]
$p^2(^3P)s\ ^2P_{3/2}$	$sp(^3P)d\ ^2P_{1/2}$	78.976	1.63[11]	7.64[-2]	7.93[-2]	75.168	1.89[11]	8.04[-2]	7.96[-2]
$p^2(^1D)s\ ^2D_{5/2}$	$sp(^3P)d\ ^2F_{7/2}$	78.678	7.89[10]	9.76[-2]	1.52[-1]	75.940	8.43[10]	9.73[-2]	1.46[-1]
$p^2(^3P)s\ ^2P_{1/2}$	$sp(^1P)d\ ^2D_{3/2}$	77.445	6.70[10]	1.21[-1]	6.16[-2]	74.204	7.52[10]	1.24[-1]	6.07[-2]
$s^2(^1S)p\ ^2P_{3/2}$	$s^2(^1S)d\ ^2D_{3/2}$	76.602	2.83[11]	2.49[-1]	2.51[-1]	72.984	3.12[11]	2.49[-1]	2.39[-1]
$p^2(^3P)s\ ^4P_{5/2}$	$sp(^3P)d\ ^4D_{5/2}$	76.595	8.73[09]	7.69[-3]	1.17[-2]	73.532	1.23[10]	9.97[-3]	1.45[-2]
$s^2(^1S)d\ ^2D_{5/2}$	$sp(^1P)d\ ^2D_{3/2}$	75.362	2.36[10]	1.34[-2]	2.00[-2]	71.298	2.71[10]	1.38[-2]	1.94[-2]
$p^2(^3P)s\ ^2P_{3/2}$	$sp(^1P)d\ ^2P_{1/2}$	75.056	9.32[10]	3.94[-2]	3.89[-2]	71.236	9.02[10]	3.43[-2]	3.22[-2]
$p^2(^1S)s\ ^2S_{1/2}$	$sp(^3P)d\ ^2D_{3/2}$	73.657	1.35[10]	2.20[-2]	1.07[-2]	69.744	2.15[10]	3.14[-2]	1.44[-2]
$p^2(^3P)s\ ^2P_{3/2}$	$sp(^1P)d\ ^2D_{5/2}$	72.359	2.26[10]	2.67[-2]	2.54[-2]	68.697	2.02[10]	2.15[-2]	1.95[-2]
$p^2(^1S)s\ ^2S_{1/2}$	$sp(^3P)d\ ^2P_{3/2}$	69.971	1.41[11]	2.07[-1]	9.52[-2]	66.406	1.41[11]	1.86[-1]	8.13[-2]
$p^2(^3P)s\ ^4P_{3/2}$	$sp(^3P)d\ ^4P_{3/2}$	69.397	4.41[10]	3.18[-2]	2.91[-2]	66.769	4.99[10]	3.32[-2]	2.92[-2]
$p^2(^1D)s\ ^2D_{5/2}$	$sp(^1P)d\ ^2P_{3/2}$	69.264	3.89[10]	1.86[-2]	2.55[-2]	66.910	5.14[10]	2.30[-2]	3.05[-2]
$p^2(^3P)s\ ^4P_{5/2}$	$sp(^3P)d\ ^2D_{5/2}$	69.096	1.36[11]	9.74[-2]	1.33[-1]	65.987	1.49[11]	9.74[-2]	1.27[-1]
$p^2(^3P)s\ ^4P_{5/2}$	$sp(^3P)d\ ^4D_{3/2}$	69.071	3.20[10]	1.53[-2]	2.08[-2]	65.986	3.44[10]	1.50[-2]	1.95[-2]
$p^2(^3P)s\ ^4P_{5/2}$	$sp(^3P)d\ ^4D_{7/2}$	68.624	1.32[11]	1.24[-1]	1.69[-1]	65.498	1.44[11]	1.23[-1]	1.59[-1]
$p^2(^1D)s\ ^2D_{3/2}$	$sp(^3P)d\ ^2P_{3/2}$	66.778	1.07[11]	7.18[-2]	6.30[-2]	63.551	1.18[11]	7.14[-2]	5.97[-2]
$p^2(^3P)s\ ^4P_{1/2}$	$p^2(^3P)p\ ^2P_{1/2}$	66.574	2.08[11]	1.38[-1]	6.06[-2]	63.609	2.26[11]	1.37[-1]	5.75[-2]
$p^2(^3P)s\ ^4P_{1/2}$	$sp(^3P)d\ ^4F_{3/2}$	66.470	1.69[11]	2.24[-1]	9.76[-2]	63.467	1.90[11]	2.31[-1]	9.62[-2]
$s^2(^1S)p\ ^2P_{1/2}$	$p^2(^3P)s\ ^2P_{3/2}$	65.749	2.74[11]	3.54[-1]	1.54[-1]	62.763	3.01[11]	3.56[-1]	1.47[-1]
$p^2(^3P)s\ ^4P_{3/2}$	$sp(^3P)d\ ^2D_{5/2}$	65.654	6.35[10]	6.15[-2]	5.34[-2]	62.730	6.94[10]	6.15[-2]	5.07[-2]
$p^2(^3P)s\ ^4P_{3/2}$	$sp(^3P)d\ ^4D_{3/2}$	65.631	1.23[11]	7.94[-2]	6.86[-2]	62.729	1.38[11]	8.14[-2]	6.74[-2]
$p^2(^1S)s\ ^2S_{1/2}$	$sp(^3P)d\ ^2P_{1/2}$	65.603	1.10[11]	7.10[-2]	3.07[-2]	62.654	1.26[11]	7.44[-2]	3.07[-2]
$p^2(^3P)s\ ^4P_{3/2}$	$sp(^3P)d\ ^4D_{1/2}$	65.440	1.46[11]	4.71[-2]	4.05[-2]	62.538	1.59[11]	4.66[-2]	3.83[-2]

Lower level	Upper level	λ	A	f	S	λ	A	f	S
				$Z=51$				$Z=52$	
$p^2(^3P)s\ ^4P_{5/2}$	$sp(^3P)d\ ^4F_{7/2}$	82.183	2.96[10]	4.00[-2]	6.47[-2]	79.485	3.26[10]	4.10[-2]	6.44[-2]
$p^2(^3P)s\ ^2P_{3/2}$	$sp(^3P)d\ ^2D_{3/2}$	80.680	1.71[10]	1.68[-2]	1.77[-2]	76.114	2.65[10]	2.30[-2]	2.31[-2]
$p^2(^3P)s\ ^2P_{1/2}$	$sp(^1P)d\ ^2P_{1/2}$	80.665	1.18[11]	1.16[-1]	6.13[-2]	78.236	1.26[11]	1.16[-1]	5.95[-2]
$p^2(^3P)s\ ^4P_{5/2}$	$p^2(^3P)p\ ^2P_{3/2}$	80.005	3.12[10]	1.99[-2]	3.15[-2]	76.774	3.14[10]	1.85[-2]	2.81[-2]
$s^2(^1S)d\ ^2D_{3/2}$	$sp(^1P)d\ ^2D_{5/2}$	79.700	1.67[11]	2.38[-1]	2.50[-1]	77.200	1.76[11]	2.36[-1]	2.40[-1]
$p^2(^3P)s\ ^4P_{3/2}$	$sp(^3P)d\ ^4F_{5/2}$	79.621	5.82[10]	8.33[-2]	8.71[-2]	77.039	6.50[10]	8.68[-2]	8.81[-2]
$s^2(^1S)d\ ^2D_{5/2}$	$sp(^1P)d\ ^2F_{7/2}$	79.564	2.26[11]	2.87[-1]	4.50[-1]	76.141	2.42[11]	2.81[-1]	4.22[-1]
$p^2(^3P)s\ ^4P_{5/2}$	$sp(^3P)d\ ^4P_{5/2}$	79.194	4.25[10]	3.99[-2]	6.26[-2]	76.418	4.25[10]	3.74[-2]	5.62[-2]
$p^2(^1D)s\ ^2D_{5/2}$	$sp(^3P)d\ ^2D_{3/2}$	78.916	5.27[10]	3.28[-2]	5.12[-2]	75.935	4.98[10]	2.86[-2]	4.29[-2]
$p^2(^3P)s\ ^2P_{1/2}$	$sp(^1P)d\ ^2P_{3/2}$	78.082	8.93[10]	1.64[-1]	8.41[-2]	75.707	9.23[10]	1.59[-1]	7.90[-2]
$p^2(^1S)s\ ^2S_{1/2}$	$sp(^3P)d\ ^4P_{1/2}$	77.882	1.93[10]	1.76[-2]	9.03[-3]	73.762	2.23[10]	1.82[-2]	8.82[-3]
$p^2(^1D)s\ ^2D_{5/2}$	$sp(^3P)d\ ^2F_{5/2}$	77.571	1.25[11]	1.13[-1]	1.72[-1]	74.567	1.30[11]	1.08[-1]	1.59[-1]
$p^2(^1S)s\ ^2S_{1/2}$	$sp(^3P)d\ ^4P_{3/2}$	77.349	1.42[11]	2.53[-1]	1.29[-1]	73.991	1.57[11]	2.57[-1]	1.25[-1]
$p^2(^1D)s\ ^2D_{3/2}$	$sp(^3P)d\ ^4D_{5/2}$	76.780	1.07[11]	1.41[-1]	1.43[-1]	73.363	1.13[11]	1.38[-1]	1.32[-1]
$p^2(^3P)s\ ^2P_{3/2}$	$sp(^3P)d\ ^2P_{3/2}$	76.084	8.30[10]	7.19[-2]	7.21[-2]	71.763	8.46[10]	6.55[-2]	6.19[-2]
$s^2(^1S)p\ ^2P_{3/2}$	$s^2(^1S)d\ ^2D_{5/2}$	75.489	1.68[11]	2.15[-1]	2.14[-1]	72.628	1.77[11]	2.10[-1]	2.01[-1]
$s^2(^1S)p\ ^2P_{1/2}$	$p^2(^1D)s\ ^2D_{3/2}$	75.261	5.75[10]	9.77[-2]	4.84[-2]	71.377	6.43[10]	9.86[-2]	4.64[-2]
$p^2(^3P)s\ ^4P_{3/2}$	$p^2(^3P)p\ ^2P_{3/2}$	75.109	6.57[10]	5.54[-2]	5.49[-2]	72.110	6.57[10]	5.14[-2]	4.88[-2]
$p^2(^1D)s\ ^2D_{5/2}$	$sp(^3P)d\ ^2P_{3/2}$	74.514	2.20[10]	1.22[-2]	1.80[-2]	71.604	2.79[10]	1.43[-2]	2.02[-2]
$p^2(^3P)s\ ^4P_{3/2}$	$sp(^3P)d\ ^4P_{5/2}$	74.394	2.23[10]	2.78[-2]	2.72[-2]	71.796	1.90[10]	2.21[-2]	2.08[-2]
$p^2(^1D)s\ ^2D_{3/2}$	$sp(^3P)d\ ^4P_{1/2}$	74.018	1.43[11]	5.88[-2]	5.72[-2]	70.312	1.59[11]	5.88[-2]	5.44[-2]
$p^2(^3P)s\ ^4P_{1/2}$	$p^2(^3P)p\ ^2D_{3/2}$	73.967	3.44[10]	5.63[-2]	2.74[-2]	70.330	3.83[10]	5.67[-2]	2.63[-2]
$s^2(^1S)d\ ^2D_{5/2}$	$sp(^1P)d\ ^2P_{3/2}$	73.780	1.52[11]	8.29[-2]	1.21[-1]	70.656	1.52[11]	7.57[-2]	1.06[-1]
$p^2(^1D)s\ ^2D_{3/2}$	$sp(^3P)d\ ^4P_{3/2}$	73.536	8.23[10]	6.70[-2]	6.48[-2]	70.521	8.43[10]	6.26[-2]	5.82[-2]
$p^2(^1D)s\ ^2D_{5/2}$	$sp(^3P)d\ ^2F_{7/2}$	73.240	8.94[10]	9.59[-2]	1.39[-1]	70.557	9.36[10]	9.30[-2]	1.30[-1]
$s^2(^1S)d\ ^2D_{5/2}$	$sp(^1P)d\ ^2D_{5/2}$	73.075	1.46[11]	1.17[-1]	1.69[-1]	69.983	1.49[11]	1.10[-1]	1.51[-1]
$s^2(^1S)d\ ^2D_{3/2}$	$sp(^1P)d\ ^2D_{3/2}$	73.066	3.65[11]	2.92[-1]	2.81[-1]	69.804	3.98[11]	2.90[-1]	2.67[-1]
$p^2(^3P)s\ ^2P_{3/2}$	$sp(^1P)d\ ^2F_{5/2}$	72.158	2.96[11]	3.46[-1]	3.30[-1]	68.667	3.30[11]	3.50[-1]	3.17[-1]
$s^2(^1S)p\ ^2P_{1/2}$	$p^2(^1S)s\ ^2S_{1/2}$	71.646	2.42[11]	1.86[-1]	8.80[-2]	68.142	2.66[11]	1.86[-1]	8.33[-2]
$p^2(^3P)s\ ^2P_{3/2}$	$sp(^3P)d\ ^2P_{1/2}$	71.530	2.18[11]	8.39[-2]	7.90[-2]	68.057	2.49[11]	8.69[-2]	7.77[-2]
$s^2(^1S)p\ ^2P_{3/2}$	$p^2(^3P)s\ ^2P_{1/2}$	71.461	1.73[11]	6.61[-2]	6.24[-2]	67.967	1.90[11]	6.61[-2]	5.90[-2]
$p^2(^3P)s\ ^2P_{1/2}$	$sp(^1P)d\ ^2D_{3/2}$	71.037	8.39[10]	1.27[-1]	5.94[-2]	67.947	9.31[10]	1.29[-1]	5.78[-2]
$s^2(^1S)p\ ^2P_{3/2}$	$s^2(^1S)d\ ^2D_{3/2}$	69.519	3.44[11]	2.49[-1]	2.28[-1]	66.205	3.79[11]	2.49[-1]	2.17[-1]
$p^2(^3P)s\ ^2P_{3/2}$	$sp(^1P)d\ ^2P_{1/2}$	67.591	8.76[10]	3.01[-2]	2.67[-2]	64.120	8.56[10]	2.64[-2]	2.23[-2]
$s^2(^1S)d\ ^2D_{5/2}$	$sp(^1P)d\ ^2D_{3/2}$	67.459	3.18[10]	1.45[-2]	1.93[-2]	63.850	3.81[10]	1.55[-2]	1.96[-2]
$p^2(^1S)s\ ^2S_{1/2}$	$sp(^3P)d\ ^2D_{3/2}$	66.117	3.17[10]	4.16[-2]	1.81[-2]	62.741	4.39[10]	5.18[-2]	2.14[-2]
$p^2(^1D)s\ ^2D_{5/2}$	$sp(^1P)d\ ^2P_{3/2}$	64.591	6.85[10]	2.87[-2]	3.66[-2]	62.290	9.18[10]	3.56[-2]	4.38[-2]
$p^2(^3P)s\ ^4P_{3/2}$	$sp(^3P)d\ ^4P_{3/2}$	64.202	5.80[10]	3.58[-2]	3.02[-2]	61.682	6.85[10]	3.93[-2]	3.18[-2]
$p^2(^1D)s\ ^2D_{5/2}$	$sp(^1P)d\ ^2D_{5/2}$	64.050	3.43[10]	2.12[-2]	2.68[-2]	61.767	5.05[10]	2.90[-2]	3.54[-2]
$p^2[^3P)s\ ^4P_{5/2}$	$sp(^3P)d\ ^4D_{3/2}$	63.033	3.69[10]	1.46[-2]	1.83[-2]	60.208	3.96[10]	1.43[-2]	1.71[-2]
$p^2(^3P)s\ ^4P_{5/2}$	$sp(^3P)d\ ^2D_{5/2}$	63.012	1.64[11]	9.74[-2]	1.21[-1]	60.167	1.80[11]	9.78[-2]	1.16[-1]
$p^2(^1S)s\ ^2S_{1/2}$	$sp(^3P)d\ ^2P_{3/2}$	62.998	1.40[11]	1.66[-1]	6.90[-2]	59.755	1.38[11]	1.48[-1]	5.83[-2]
$p^2(^3P)s\ ^4P_{5/2}$	$sp(^3P)d\ ^4D_{7/2}$	62.513	1.56[11]	1.21[-1]	1.50[-1]	59.664	1.71[11]	1.21[-1]	1.43[-1]
$p^2(^3P)s\ ^4P_{1/2}$	$p^2(^3P)p\ ^2P_{1/2}$	60.775	2.46[11]	1.36[-1]	5.46[-2]	58.066	2.69[11]	1.36[-1]	5.19[-2]
$p^2(^3P)s\ ^4P_{1/2}$	$sp(^3P)d\ ^4F_{3/2}$	60.599	2.14[11]	2.36[-1]	9.40[-2]	57.859	2.40[11]	2.42[-1]	9.18[-2]
$p^2(^1D)s\ ^2D_{3/2}$	$sp(^3P)d\ ^2P_{3/2}$	60.446	1.26[11]	6.89[-2]	5.48[-2]	57.471	1.31[11]	6.50[-2]	4.91[-2]
$p^2(^3P)s\ ^4P_{3/2}$	$sp(^3P)d\ ^4D_{3/2}$	59.954	1.55[11]	8.34[-2]	6.58[-2]	57.302	1.73[11]	8.50[-2]	6.40[-2]
$p^2(^3P)s\ ^4P_{3/2}$	$sp(^3P)d\ ^2D_{5/2}$	59.936	7.56[10]	6.11[-2]	4.82[-2]	57.265	8.22[10]	6.06[-2]	4.58[-2]
$s^2(^1S)p\ ^2P_{1/2}$	$p^2(^3P)s\ ^2P_{3/2}$	59.925	3.31[11]	3.57[-1]	1.41[-1]	57.223	3.64[11]	3.58[-1]	1.35[-1]
$p^2(^1S)s\ ^2S_{1/2}$	$sp(^3P)d\ ^2P_{1/2}$	59.843	1.44[11]	7.77[-2]	3.06[-2]	57.163	1.65[11]	8.07[-2]	3.04[-2]
$p^2(^3P)s\ ^4P_{3/2}$	$sp(^3P)d\ ^4D_{1/2}$	59.766	1.73[11]	4.62[-2]	3.63[-2]	57.117	1.88[11]	4.58[-2]	3.45[-2]

Lower level	Upper level	λ	A	f	S	λ	A	f	S
				Z=53				Z=54	
$p^2(^3P)s\ ^4P_{5/2}$	$sp(^3P)d\ ^4F_{7/2}$	76.904	3.57[10]	4.20[-2]	6.40[-2]	74.434	3.89[10]	4.30[-2]	6.35[-2]
$p^2(^3P)s\ ^2P_{1/2}$	$sp(^1P)d\ ^2P_{1/2}$	75.900	1.33[11]	1.16[-1]	5.76[-2]	73.649	1.41[11]	1.15[-1]	5.56[-2]
$s^2(^1S)d\ ^2D_{3/2}$	$sp(^1P)d\ ^2D_{5/2}$	74.811	1.86[11]	2.33[-1]	2.30[-1]	72.523	1.95[11]	2.31[-1]	2.20[-1]
$p^2(^3P)s\ ^4P_{3/2}$	$sp(^3P)d\ ^4F_{5/2}$	74.593	7.15[10]	8.92[-2]	8.79[-2]	72.263	7.77[10]	9.12[-2]	8.69[-2]
$p^2(^3P)s\ ^4P_{5/2}$	$sp(^3P)d\ ^4P_{5/2}$	73.810	4.21[10]	3.44[-2]	5.02[-2]	71.357	4.15[10]	3.18[-2]	4.49[-2]
$p^2(^3P)s\ ^4P_{5/2}$	$p^2(^3P)p\ ^2P_{3/2}$	73.787	3.12[10]	1.70[-2]	2.48[-2]	71.026	3.07[10]	1.55[-2]	2.18[-2]
$p^2(^3P)s\ ^2P_{1/2}$	$sp(^1P)d\ ^2P_{3/2}$	73.425	9.53[10]	1.54[-1]	7.45[-2]	71.230	9.93[10]	1.50[-1]	7.04[-2]
$p^2(^1D)s\ ^2D_{5/2}$	$sp(^3P)d\ ^2D_{3/2}$	73.011	4.61[10]	2.45[-2]	3.54[-2]	70.117	4.24[10]	2.09[-2]	2.89[-2]
$s^2(^1S)d\ ^2D_{5/2}$	$sp(^1P)d\ ^2F_{7/2}$	72.977	2.55[11]	2.71[-1]	3.90[-1]	70.071	2.61[11]	2.56[-1]	3.55[-1]
$p^2(^3P)s\ ^2P_{3/2}$	$sp(^3P)d\ ^2D_{3/2}$	71.865	3.77[10]	2.92[-2]	2.77[-2]	67.900	5.09[10]	3.51[-2]	3.13[-2]
$p^2(^1D)s\ ^2D_{5/2}$	$sp(^3P)d\ ^2F_{5/2}$	71.568	1.34[11]	1.03[-1]	1.45[-1]	68.564	1.37[11]	9.63[-2]	1.31[-1]
$p^2(^1S)s\ ^2S_{1/2}$	$sp(^3P)d\ ^4P_{3/2}$	70.700	1.72[11]	2.57[-1]	1.20[-1]	67.477	1.87[11]	2.55[-1]	1.13[-1]
$p^2(^1D)s\ ^2D_{3/2}$	$sp(^3P)d\ ^4D_{5/2}$	69.997	1.19[11]	1.32[-1]	1.21[-1]	66.705	1.26[11]	1.27[-1]	1.11[-1]
$p^2(^1S)s\ ^2S_{1/2}$	$sp(^3P)d\ ^4P_{1/2}$	69.872	2.55[10]	1.87[-2]	8.59[-3]	66.203	2.91[10]	1.92[-2]	8.36[-3]
$s^2(^1S)p\ ^2P_{3/2}$	$s^2(^1S)d\ ^2D_{5/2}$	69.766	1.85[11]	2.02[-1]	1.86[-1]	66.893	1.92[11]	1.94[-1]	1.70[-1]
$p^2(^3P)s\ ^4P_{3/2}$	$p^2(^3P)p\ ^2P_{3/2}$	69.335	6.52[10]	4.70[-2]	4.29[-2]	66.769	6.37[10]	4.25[-2]	3.74[-2]
$p^2(^1D)s\ ^2D_{5/2}$	$sp(^3P)d\ ^2P_{3/2}$	68.694	3.33[10]	1.58[-2]	2.13[-2]	65.789	3.81[10]	1.65[-2]	2.14[-2]
$p^2(^1D)s\ ^2D_{5/2}$	$sp(^3P)d\ ^2F_{7/2}$	67.869	9.61[10]	8.85[-2]	1.19[-1]	65.168	9.72[10]	8.22[-2]	1.06[-1]
$s^2(^1S)d\ ^2D_{5/2}$	$sp(^1P)d\ ^2P_{3/2}$	67.769	1.47[11]	6.74[-2]	9.03[-2]	65.117	1.38[11]	5.83[-2]	7.51[-2]
$s^2(^1S)p\ ^2P_{1/2}$	$p^2(^1D)s\ ^2D_{3/2}$	67.703	7.21[10]	9.91[-2]	4.43[-2]	64.228	8.08[10]	1.00[-1]	4.24[-2]
$p^2(^3P)s\ ^2P_{3/2}$	$sp(^3P)d\ ^2P_{3/2}$	67.678	8.61[10]	5.91[-2]	5.27[-2]	63.833	8.72[10]	5.31[-2]	4.48[-2]
$p^2(^1D)s\ ^2D_{3/2}$	$sp(^3P)d\ ^4P_{3/2}$	67.544	8.53[10]	5.87[-2]	5.21[-2]	64.610	8.69[10]	5.47[-2]	4.64[-2]
$s^2(^1S)d\ ^2D_{5/2}$	$sp(^1P)d\ ^2D_{5/2}$	67.127	1.48[11]	9.97[-2]	1.33[-1]	64.505	1.42[11]	8.92[-2]	1.14[-1]
$p^2(^3P)s\ ^4P_{1/2}$	$p^2(^3P)p\ ^2D_{3/2}$	66.865	4.26[10]	5.72[-2]	2.52[-2]	63.566	4.74[10]	5.74[-2]	2.40[-2]
$p^2(^1D)s\ ^2D_{3/2}$	$sp(^3P)d\ ^4P_{1/2}$	66.788	1.76[11]	5.88[-2]	5.18[-2]	63.441	1.95[11]	5.93[-2]	4.94[-2]
$s^2(^1S)d\ ^2D_{3/2}$	$sp(^1P)d\ ^2D_{3/2}$	66.638	4.34[11]	2.89[-1]	2.54[-1]	63.572	4.74[11]	2.87[-1]	2.40[-1]
$p^2(^3P)s\ ^2P_{3/2}$	$sp(^1P)d\ ^2F_{5/2}$	65.334	3.68[11]	3.53[-1]	3.04[-1]	62.156	4.11[11]	3.56[-1]	2.92[-1]
$p^2(^3P)s\ ^2P_{1/2}$	$sp(^1P)d\ ^2D_{3/2}$	64.936	1.04[11]	1.30[-1]	5.59[-2]	62.011	1.14[11]	1.32[-1]	5.39[-2]
$s^2(^1S)p\ ^2P_{1/2}$	$p^2(^1S)s\ ^2S_{1/2}$	64.804	2.93[11]	1.85[-1]	7.88[-2]	61.626	3.23[11]	1.84[-1]	7.47[-2]
$p^2(^3P)s\ ^2P_{3/2}$	$sp(^3P)d\ ^2P_{1/2}$	64.742	2.83[11]	8.94[-2]	7.60[-2]	61.583	3.21[11]	9.14[-2]	7.41[-2]
$s^2(^1S)p\ ^2P_{3/2}$	$p^2(^3P)s\ ^2P_{1/2}$	64.640	2.10[11]	6.57[-2]	5.59[-2]	61.474	2.31[11]	6.57[-2]	5.30[-2]
$p^2(^3P)s\ ^4P_{5/2}$	$sp(^3P)d\ ^4D_{5/2}$	64.504	2.83[10]	1.77[-2]	2.26[-2]	61.595	3.52[10]	2.00[-2]	2.43[-2]
$s^2(^1S)p\ ^2P_{3/2}$	$s^2(^1S)d\ ^2D_{3/2}$	63.037	4.18[11]	2.49[-1]	2.07[-1]	60.013	4.63[11]	2.50[-1]	1.97[-1]
$p^2(^3P)s\ ^2P_{3/2}$	$sp(^1P)d\ ^2P_{1/2}$	60.815	8.40[10]	2.34[-2]	1.87[-2]	57.674	8.29[10]	2.07[-2]	1.57[-2]
$s^2(^1S)d\ ^2D_{5/2}$	$sp(^1P)d\ ^2D_{3/2}$	60.472	4.63[10]	1.69[-2]	2.02[-2]	57.326	5.62[10]	1.86[-2]	2.10[-2]
$p^2(^1D)s\ ^2D_{5/2}$	$sp(^1P)d\ ^2P_{3/2}$	59.993	1.22[11]	4.39[-2]	5.19[-2]	57.690	1.59[11]	5.28[-2]	6.02[-2]
$p^2(^1S)s\ ^2S_{1/2}$	$sp(^3P)d\ ^2D_{3/2}$	59.585	5.75[10]	6.14[-2]	2.41[-2]	56.622	7.29[10]	7.01[-2]	2.61[-2]
$p^2(^1D)s\ ^2D_{5/2}$	$sp(^1P)d\ ^2D_{5/2}$	59.489	7.27[10]	3.86[-2]	4.54[-2]	57.208	1.02[11]	4.98[-2]	5.63[-2]
$p^2(^3P)s\ ^4P_{3/2}$	$sp(^3P)d\ ^4P_{3/2}$	59.200	8.20[10]	4.33[-2]	3.37[-2]	56.758	9.83[10]	4.76[-2]	3.55[-2]
$p^2[^3P)s\ ^4P_{5/2}$	$sp(^3P)d\ ^4D_{3/2}$	57.505	4.24[10]	1.40[-2]	1.59[-2]	54.919	4.55[10]	1.37[-2]	1.49[-2]
$p^2(^3P)s\ ^4P_{5/2}$	$sp(^3P)d\ ^2D_{5/2}$	57.446	1.99[11]	9.82[-2]	1.12[-1]	54.843	2.20[11]	9.88[-2]	1.07[-1]
$p^2(^1D)s\ ^2D_{3/2}$	$sp(^3P)d\ ^2D_{3/2}$	57.327	5.28[10]	2.60[-2]	1.96[-2]	54.590	7.50[10]	3.35[-2]	2.40[-2]
$p^2(^3P)s\ ^4P_{5/2}$	$sp(^3P)d\ ^4D_{7/2}$	56.943	1.86[11]	1.20[-1]	1.36[-1]	54.345	2.04[11]	1.20[-1]	1.30[-1]
$p^2(^1S)s\ ^2S_{1/2}$	$sp(^3P)d\ ^2P_{3/2}$	56.678	1.38[11]	1.33[-1]	4.93[-2]	53.766	1.37[11]	1.18[-1]	4.18[-2]
$p^2(^3P)s\ ^4P_{1/2}$	$p^2(^3P)p\ ^2P_{1/2}$	55.477	2.92[11]	1.35[-1]	4.94[-2]	53.001	3.20[11]	1.35[-1]	4.70[-2]
$p^2(^3P)s\ ^4P_{1/2}$	$sp(^3P)d\ ^4F_{3/2}$	55.243	2.69[11]	2.47[-1]	8.97[-2]	52.744	3.03[11]	2.53[-1]	8.77[-2]
$p^2(^3P)s\ ^4P_{3/2}$	$sp(^3P)d\ ^4D_{3/2}$	54.765	1.91[11]	8.65[-2]	6.22[-2]	52.338	2.13[11]	8.75[-2]	6.03[-2]
$p^2(^3P)s\ ^4P_{3/2}$	$sp(^3P)d\ ^2D_{5/2}$	54.711	8.98[10]	6.06[-2]	4.36[-2]	52.269	9.80[10]	6.06[-2]	4.16[-2]
$s^2(^1S)p\ ^2P_{1/2}$	$p^2(^3P)s\ ^2P_{3/2}$	54.648	4.01[11]	3.59[-1]	1.29[-1]	52.192	4.42[11]	3.61[-1]	1.24[-1]
$p^2(^1D)s\ ^2D_{3/2}$	$sp(^3P)d\ ^2P_{3/2}$	54.631	1.35[11]	6.01[-2]	4.33[-2]	51.930	1.37[11]	5.51[-2]	3.78[-2]

Lower level	Upper level	λ	A	f	S	λ	A	f	S
				$Z=55$				$Z=56$	
$p^2(^3P)s\ ^4P_{5/2}$	$sp(^3P)d\ ^4F_{7/2}$	72.066	4.26[10]	4.44[-2]	6.29[-2]	69.795	4.63[10]	4.50[-2]	6.23[-2]
$p^2(^3P)s\ ^2P_{1/2}$	$sp(^1P)d\ ^2P_{1/2}$	71.480	1.48[11]	1.14[-1]	5.36[-2]	69.387	1.56[11]	1.13[-1]	5.16[-2]
$s^2(^1S)d\ ^2D_{3/2}$	$sp(^1P)d\ ^2D_{5/2}$	70.327	2.04[11]	2.29[-1]	2.11[-1]	68.218	2.15[11]	2.26[-1]	2.02[-1]
$p^2(^3P)s\ ^4P_{3/2}$	$sp(^3P)d\ ^4F_{5/2}$	70.038	8.39[10]	9.27[-2]	8.53[-2]	67.905	8.98[10]	9.32[-2]	8.35[-2]
$p^2(^3P)s\ ^2P_{1/2}$	$sp(^1P)d\ ^2P_{3/2}$	69.115	1.02[11]	1.46[-1]	6.67[-2]	67.076	1.06[11]	1.43[-1]	6.33[-2]
$s^2(^1S)d\ ^2D_{5/2}$	$sp(^1P)d\ ^2F_{7/2}$	67.408	2.61[11]	2.38[-1]	3.18[-1]	64.967	2.60[11]	2.19[-1]	2.81[-1]
$p^2(^1D)s\ ^2D_{5/2}$	$sp(^3P)d\ ^2D_{3/2}$	67.238	3.89[10]	1.76[-2]	2.33[-2]	64.379	3.55[10]	1.47[-2]	1.87[-2]
$p^2(^1D)s\ ^2D_{5/2}$	$sp(^3P)d\ ^2F_{5/2}$	65.557	1.39[11]	8.94[-2]	1.16[-1]	62.566	1.39[11]	8.19[-2]	1.01[-1]
$p^2(^3P)s\ ^4P_{3/2}$	$p^2(^3P)p\ ^2P_{3/2}$	64.391	6.13[10]	3.82[-2]	3.24[-2]	62.180	5.89[10]	3.42[-2]	2.80[-2]
$p^2(^1S)s\ ^2S_{1/2}$	$sp(^3P)d\ ^4P_{3/2}$	64.325	2.01[11]	2.51[-1]	1.06[-1]	61.255	2.17[11]	2.45[-1]	9.87[-2]
$p^2(^3P)s\ ^2P_{3/2}$	$sp(^3P)d\ ^2D_{3/2}$	64.187	6.52[10]	4.04[-2]	3.42[-2]	60.704	8.19[10]	4.53[-2]	3.62[-2]
$s^2(^1S)p\ ^2P_{3/2}$	$s^2(^1S)d\ ^2D_{5/2}$	64.013	1.97[11]	1.81[-1]	1.53[-1]	61.141	2.01[11]	1.69[-1]	1.36[-1]
$p^2(^1D)s\ ^2D_{3/2}$	$sp(^3P)d\ ^4D_{5/2}$	63.503	1.34[11]	1.21[-1]	1.02[-1]	60.407	1.42[11]	1.17[-1]	9.31[-2]
$s^2(^1S)d\ ^2D_{5/2}$	$sp(^1P)d\ ^2P_{3/2}$	62.687	1.25[11]	4.94[-2]	6.10[-2]	60.457	1.12[11]	4.08[-2]	4.87[-2]
$p^2(^1D)s\ ^2D_{5/2}$	$sp(^3P)d\ ^2F_{7/2}$	62.455	9.57[10]	7.48[-2]	9.22[-2]	59.742	9.31[10]	6.65[-2]	7.86[-2]
$s^2(^1S)d\ ^2D_{5/2}$	$sp(^1P)d\ ^2D_{5/2}$	62.101	1.34[11]	7.77[-2]	9.52[-2]	59.897	1.23[11]	6.64[-2]	7.86[-2]
$p^2(^1D)s\ ^2D_{3/2}$	$sp(^3P)d\ ^4P_{3/2}$	61.724	8.84[10]	5.08[-2]	4.12[-2]	58.897	9.05[10]	4.71[-2]	3.65[-2]
$s^2(^1S)p\ ^2P_{1/2}$	$p^2(^1D)s\ ^2D_{3/2}$	60.939	9.06[10]	1.01[-1]	4.05[-2]	57.826	1.01[11]	1.02[-1]	3.87[-2]
$s^2(^1S)d\ ^2D_{3/2}$	$sp(^1P)d\ ^2D_{3/2}$	60.607	5.17[11]	2.86[-1]	2.28[-1]	57.746	5.66[11]	2.84[-1]	2.16[-1]
$p^2(^3P)s\ ^4P_{1/2}$	$p^2(^3P)p\ ^2D_{3/2}$	60.424	5.26[10]	5.75[-2]	2.29[-2]	57.434	5.79[10]	5.74[-2]	2.17[-2]
$p^2(^1D)s\ ^2D_{3/2}$	$sp(^3P)d\ ^4P_{1/2}$	60.260	2.18[11]	5.94[-2]	4.71[-2]	57.238	2.42[11]	5.94[-2]	4.49[-2]
$p^2(^3P)s\ ^2P_{3/2}$	$sp(^3P)d\ ^2P_{3/2}$	60.217	8.82[10]	4.80[-2]	3.80[-2]	56.822	8.88[10]	4.31[-2]	3.22[-2]
$p^2(^3P)s\ ^2P_{1/2}$	$sp(^1P)d\ ^2D_{3/2}$	59.173	1.26[11]	1.32[-1]	5.17[-2]	56.429	1.40[11]	1.33[-1]	4.96[-2]
$p^2(^3P)s\ ^2P_{3/2}$	$sp(^1P)d\ ^2F_{5/2}$	59.124	4.56[11]	3.59[-1]	2.80[-1]	56.235	5.11[11]	3.63[-1]	2.69[-1]
$p^2(^1D)s\ ^2D_{5/2}$	$sp(^1P)d\ ^2F_{7/2}$	59.035	5.33[10]	3.71[-2]	4.34[-2]	56.523	8.60[10]	5.49[-2]	6.14[-2]
$p^2(^3P)s\ ^4P_{5/2}$	$sp(^3P)d\ ^4D_{5/2}$	58.763	4.24[10]	2.19[-2]	2.54[-2]	56.019	4.98[10]	2.35[-2]	2.60[-2]
$s^2(^1S)p\ ^2P_{1/2}$	$p^2(^1S)s\ ^2S_{1/2}$	58.600	3.56[11]	1.84[-1]	7.09[-2]	55.720	3.94[11]	1.84[-1]	6.73[-2]
$p^2(^3P)s\ ^2P_{3/2}$	$sp(^3P)d\ ^2P_{1/2}$	58.572	3.62[11]	9.34[-2]	7.19[-2]	55.704	4.07[11]	9.49[-2]	6.96[-2]
$s^2(^1S)p\ ^2P_{3/2}$	$p^2(^3P)s\ ^2P_{1/2}$	58.461	2.54[11]	6.52[-2]	5.03[-2]	55.593	2.82[11]	6.52[-2]	4.78[-2]
$p^2(^3P)s\ ^4P_{5/2}$	$sp(^3P)d\ ^4P_{3/2}$	57.236	1.58[10]	5.20[-3]	5.86[-3]	54.717	2.08[10]	6.22[-3]	6.71[-3]
$s^2(^1S)p\ ^2P_{3/2}$	$s^2(^1S)d\ ^2D_{3/2}$	57.125	5.09[11]	2.51[-1]	1.88[-1]	54.371	5.67[11]	2.51[-1]	1.80[-1]
$p^2(^3P)s\ ^4P_{1/2}$	$p^2(^3P)p\ ^4S_{3/2}$	56.581	2.16[10]	2.07[-2]	7.72[-3]	53.946	2.48[10]	2.16[-2]	7.69[-3]
$p^2(^1D)s\ ^2D_{3/2}$	$sp(^3P)d\ ^2D_{5/2}$	56.083	1.50[10]	1.07[-2]	7.86[-3]	53.435	1.80[10]	1.16[-2]	8.13[-3]
$p^2(^1D)s\ ^2D_{3/2}$	$sp(^3P)d\ ^4D_{1/2}$	55.974	1.27[10]	2.99[-3]	2.21[-3]	53.350	1.51[10]	3.22[-3]	2.26[-3]
$p^2(^1D)s\ ^2D_{5/2}$	$sp(^1P)d\ ^2P_{3/2}$	55.381	2.03[11]	6.20[-2]	6.79[-2]	53.078	2.51[11]	7.09[-2]	7.41[-2]
$p^2(^1D)s\ ^2D_{5/2}$	$sp(^1P)d\ ^2D_{5/2}$	54.924	1.37[11]	6.20[-2]	6.71[-2]	52.646	1.77[11]	7.35[-2]	7.65[-2]
$p^2(^3P)s\ ^2P_{3/2}$	$sp(^1P)d\ ^2P_{1/2}$	54.690	8.22[10]	1.85[-2]	1.33[-2]	51.856	8.18[10]	1.65[-2]	1.13[-2]
$s^2(^1S)d\ ^2D_{5/2}$	$sp(^1P)d\ ^2D_{3/2}$	54.397	6.83[10]	2.02[-2]	2.18[-2]	51.670	8.22[10]	2.20[-2]	2.25[-2]
$p^2(^3P)s\ ^4P_{3/2}$	$sp(^3P)d\ ^4P_{3/2}$	54.358	1.18[11]	5.17[-2]	3.72[-2]	52.006	1.39[11]	5.62[-2]	3.84[-2]
$p^2(^1S)s\ ^2S_{1/2}$	$sp(^3P)d\ ^2D_{3/2}$	53.833	8.93[10]	7.78[-2]	2.76[-2]	51.202	1.08[11]	8.49[-2]	2.86[-2]
$p^2[^3P)s\ ^4P_{5/2}$	$sp(^3P)d\ ^4D_{3/2}$	52.444	4.89[10]	1.34[-2]	1.39[-2]	50.077	5.24[10]	1.31[-2]	1.30[-2]
$p^2(^3P)s\ ^4P_{5/2}$	$sp(^3P)d\ ^2D_{5/2}$	52.353	2.42[11]	9.95[-2]	1.03[-1]	49.972	2.68[11]	1.01[-1]	9.93[-2]
$p^2(^1D)s\ ^2D_{3/2}$	$sp(^3P)d\ ^2D_{3/2}$	52.000	1.01[11]	4.07[-2]	2.79[-2]	49.544	1.29[11]	4.76[-2]	3.10[-2]
$p^2(^3P)s\ ^4P_{5/2}$	$sp(^3P)d\ ^4D_{7/2}$	51.865	2.24[11]	1.20[-1]	1.24[-1]	49.498	2.47[11]	1.22[-1]	1.18[-1]
$p^2(^1S)s\ ^2S_{1/2}$	$sp(^3P)d\ ^2P_{3/2}$	51.013	1.36[11]	1.06[-1]	3.56[-2]	48.412	1.36[11]	9.53[-2]	3.04[-2]
$p^2(^3P)s\ ^4P_{1/2}$	$p^2(^3P)p\ ^2P_{1/2}$	50.633	3.50[11]	1.34[-1]	4.49[-2]	48.369	3.83[11]	1.34[-1]	4.28[-2]
$p^2(^3P)s\ ^4P_{1/2}$	$sp(^3P)d\ ^4F_{3/2}$	50.357	3.41[11]	2.59[-1]	8.58[-2]	48.077	3.83[11]	2.66[-1]	8.40[-2]
$p^2(^3P)s\ ^4P_{3/2}$	$sp(^3P)d\ ^4D_{3/2}$	50.017	2.37[11]	8.90[-2]	5.85[-2]	47.796	2.63[11]	9.00[-2]	5.67[-2]
$p^2(^3P)s\ ^4P_{3/2}$	$sp(^3P)d\ ^2D_{5/2}$	49.934	1.07[11]	6.01[-2]	3.96[-2]	47.701	1.18[11]	6.01[-2]	3.78[-2]
$s^2(^1S)p\ ^2P_{1/2}$	$p^2(^3P)s\ ^2P_{3/2}$	49.848	4.87[11]	3.63[-1]	1.19[-1]	47.610	5.37[11]	3.65[-1]	1.15[-1]
$p^2(^3P)s\ ^4P_{3/2}$	$sp(^3P)d\ ^4D_{1/2}$	49.848	2.42[11]	4.51[-2]	2.96[-2]	47.633	2.64[11]	4.49[-2]	2.81[-2]
$p^2(^1S)s\ ^2S_{1/2}$	$sp(^3P)d\ ^2P_{1/2}$	49.827	2.39[11]	8.92[-2]	2.93[-2]	47.598	2.71[11]	9.20[-2]	2.88[-2]

Lower level	Upper level	λ	A	f	S	λ	A	f	S
				Z=57				Z=58	
$p^2(^3P)s\ ^4P_{5/2}$	$sp(^3P)d\ ^4F_{7/2}$	67.745	5.01[10]	4.59[-2]	6.16[-2]	65.519	5.48[10]	4.70[-2]	6.08[-2]
$p^2(^3P)s\ ^2P_{1/2}$	$sp(^1P)d\ ^2P_{1/2}$	67.364	1.64[11]	1.12[-1]	4.96[-2]	65.412	1.73[11]	1.11[-1]	4.77[-2]
$s^2(^1S)d\ ^2D_{5/2}$	$sp(^3P)d\ ^2F_{7/2}$	66.619	4.93[10]	4.38[-2]	5.76[-2]	64.581	6.19[10]	5.16[-2]	6.58[-2]
$s^2(^1S)d\ ^2D_{3/2}$	$sp(^1P)d\ ^2D_{5/2}$	66.171	2.25[11]	2.23[-1]	1.94[-1]	64.234	2.36[11]	2.20[-1]	1.86[-1]
$p^2(^3P)s\ ^4P_{3/2}$	$sp(^3P)d\ ^4F_{5/2}$	65.882	9.59[10]	9.37[-2]	8.14[-2]	63.887	1.03[11]	9.43[-2]	7.92[-2]
$p^2(^3P)s\ ^2P_{1/2}$	$sp(^1P)d\ ^2P_{3/2}$	65.108	1.11[11]	1.40[-1]	6.02[-2]	63.208	1.15[11]	1.37[-1]	5.74[-2]
$p^2(^3P)s\ ^4P_{5/2}$	$sp(^3P)d\ ^4P_{5/2}$	64.801	4.11[10]	2.59[-2]	3.32[-2]	62.765	4.16[10]	2.45[-2]	3.04[-2]
$s^2(^1S)d\ ^2D_{5/2}$	$sp(^1P)d\ ^2F_{7/2}$	62.556	2.54[11]	1.99[-1]	2.47[-1]	60.630	2.45[11]	1.80[-1]	2.16[-1]
$p^2(^3P)s\ ^4P_{3/2}$	$p^2(^3P)p\ ^2P_{3/2}$	60.115	5.64[10]	3.06[-2]	2.42[-2]	58.178	5.40[10]	2.75[-2]	2.10[-2]
$p^2(^1D)s\ ^2D_{5/2}$	$sp(^3P)d\ ^2F_{5/2}$	59.602	1.40[11]	7.46[-2]	8.80[-2]	56.725	1.41[11]	6.84[-2]	7.65[-2]
$s^2(^1S)d\ ^2D_{5/2}$	$sp(^1P)d\ ^2P_{3/2}$	58.402	9.82[10]	3.33[-2]	3.85[-2]	56.492	8.52[10]	2.73[-2]	3.04[-2]
$s^2(^1S)p\ ^2P_{3/2}$	$s^2(^1S)d\ ^2D_{5/2}$	58.301	2.05[11]	1.57[-1]	1.20[-1]	55.519	2.09[11]	1.45[-1]	1.06[-1]
$p^2(^1S)s\ ^2S_{1/2}$	$sp(^3P)d\ ^4P_{3/2}$	58.278	2.34[11]	2.38[-1]	9.15[-2]	55.405	2.52[11]	2.32[-1]	8.47[-2]
$s^2(^1S)d\ ^2D_{5/2}$	$sp(^1P)d\ ^2D_{5/2}$	57.853	1.13[11]	5.63[-2]	6.45[-2]	55.979	1.02[11]	4.77[-2]	5.28[-2]
$p^2(^3P)s\ ^2P_{3/2}$	$sp(^3P)d\ ^2D_{3/2}$	57.435	1.01[11]	4.97[-2]	3.75[-2]	54.358	1.21[11]	5.37[-2]	3.84[-2]
$p^2(^1D)s\ ^2D_{3/2}$	$sp(^3P)d\ ^4D_{5/2}$	57.429	1.53[11]	1.13[-1]	8.56[-2]	54.567	1.64[11]	1.10[-1]	7.90[-2]
$p^2(^1D)s\ ^2D_{5/2}$	$sp(^3P)d\ ^2P_{3/2}$	57.214	4.91[10]	1.61[-2]	1.82[-2]	54.470	5.31[10]	1.57[-2]	1.69[-2]
$p^2(^1D)s\ ^2D_{5/2}$	$sp(^3P)d\ ^2F_{7/2}$	56.900	9.09[10]	5.88[-2]	6.61[-2]	54.408	8.69[10]	5.14[-2]	5.53[-2]
$p^2(^1S)s\ ^2S_{1/2}$	$sp(^3P)d\ ^4P_{1/2}$	56.369	4.31[10]	2.06[-2]	7.62[-3]	53.446	4.89[10]	2.10[-2]	7.37[-3]
$p^2(^1D)s\ ^2D_{3/2}$	$sp(^3P)d\ ^4P_{3/2}$	56.141	9.30[10]	4.39[-2]	3.24[-2]	53.468	9.55[10]	4.10[-2]	2.89[-2]
$s^2(^1S)d\ ^2D_{3/2}$	$sp(^1P)d\ ^2D_{3/2}$	54.992	6.24[11]	2.83[-1]	2.05[-1]	52.346	6.88[11]	2.82[-1]	1.94[-1]
$s^2(^1S)p\ ^2P_{1/2}$	$p^2(^1D)s\ ^2D_{3/2}$	54.880	1.14[11]	1.02[-1]	3.70[-2]	52.089	1.27[11]	1.03[-1]	3.54[-2]
$p^2(^3P)s\ ^4P_{1/2}$	$p^2(^3P)p\ ^2D_{3/2}$	54.588	6.38[10]	5.72[-2]	2.06[-2]	51.882	7.02[10]	5.68[-2]	1.94[-2]
$p^2(^1D)s\ ^2D_{3/2}$	$sp(^3P)d\ ^4P_{1/2}$	54.367	2.70[11]	5.99[-2]	4.29[-2]	51.641	3.00[11]	6.04[-2]	4.09[-2]
$p^2(^1D)s\ ^2D_{5/2}$	$sp(^1P)d\ ^2F_{7/2}$	53.909	1.27[11]	7.34[-2]	7.82[-2]	51.577	1.71[11]	9.08[-2]	9.25[-2]
$p^2(^3P)s\ ^2P_{1/2}$	$sp(^1P)d\ ^2D_{3/2}$	53.781	1.54[11]	1.33[-1]	4.74[-2]	51.234	1.71[11]	1.34[-1]	4.53[-2]
$p^2(^3P)s\ ^2P_{3/2}$	$sp(^3P)d\ ^2P_{3/2}$	53.635	8.98[10]	3.88[-2]	2.73[-2]	50.642	9.03[10]	3.48[-2]	2.32[-2]
$p^2(^3P)s\ ^2P_{3/2}$	$sp(^1P)d\ ^2F_{5/2}$	53.418	5.71[11]	3.67[-1]	2.58[-1]	50.859	6.34[11]	3.70[-1]	2.48[-1]
$p^2(^3P)s\ ^4P_{5/2}$	$sp(^3P)d\ ^4D_{5/2}$	53.373	5.80[10]	2.48[-2]	2.61[-2]	50.826	6.69[10]	2.59[-2]	2.59[-2]
$s^2(^1S)p\ ^2P_{1/2}$	$p^2(^1S)s\ ^2S_{1/2}$	52.980	4.36[11]	1.84[-1]	6.40[-2]	50.374	4.82[11]	1.84[-1]	6.09[-2]
$p^2(^3P)s\ ^2P_{3/2}$	$sp(^3P)d\ ^2P_{1/2}$	52.973	4.59[11]	9.64[-2]	6.73[-2]	50.373	5.15[11]	9.79[-2]	6.50[-2]
$s^2(^1S)p\ ^2P_{3/2}$	$p^2(^3P)s\ ^2P_{1/2}$	52.865	3.12[11]	6.52[-2]	4.55[-2]	50.270	3.46[11]	6.52[-2]	4.33[-2]
$s^2(^1S)p\ ^2P_{3/2}$	$s^2(^1S)d\ ^2D_{3/2}$	51.746	6.25[11]	2.52[-1]	1.72[-1]	49.243	6.93[11]	2.53[-1]	1.64[-1]
$p^2(^1D)s\ ^2D_{5/2}$	$sp(^1P)d\ ^2P_{3/2}$	50.795	3.04[11]	7.85[-2]	7.86[-2]	48.551	3.60[11]	8.47[-2]	8.14[-2]
$p^2(^1D)s\ ^2D_{5/2}$	$sp(^1P)d\ ^2D_{5/2}$	50.379	2.22[11]	8.44[-2]	8.41[-2]	48.172	2.70[11]	9.39[-2]	8.94[-2]
$p^2(^3P)s\ ^4P_{3/2}$	$sp(^3P)d\ ^4P_{3/2}$	49.712	1.62[11]	6.02[-2]	3.92[-2]	47.484	1.87[11]	6.36[-2]	3.96[-2]
$p^2(^3P)s\ ^2P_{3/2}$	$sp(^1P)d\ ^2P_{1/2}$	49.168	8.19[10]	1.49[-2]	9.62[-3]	46.617	8.23[10]	1.35[-2]	8.23[-3]
$s^2(^1S)d\ ^2D_{5/2}$	$sp(^1P)d\ ^2D_{3/2}$	49.122	9.81[10]	2.37[-2]	2.30[-2]	46.731	1.16[11]	2.53[-2]	2.33[-2]
$p^2(^1S)s\ ^2S_{1/2}$	$sp(^3P)d\ ^2D_{3/2}$	48.716	1.29[11]	9.13[-2]	2.93[-2]	46.362	1.51[11]	9.72[-2]	2.97[-2]
$p^2[^3P)s\ ^4P_{5/2}$	$sp(^3P)d\ ^4D_{3/2}$	47.813	5.64[10]	1.30[-2]	1.22[-2]	45.647	6.08[10]	1.27[-2]	1.14[-2]
$p^2(^3P)s\ ^4P_{5/2}$	$sp(^3P)d\ ^2D_{5/2}$	47.715	2.97[11]	1.01[-1]	9.58[-2]	45.520	3.32[11]	1.03[-1]	9.25[-2]
$p^2(^3P)s\ ^4P_{5/2}$	$sp(^3P)d\ ^4D_{7/2}$	47.281	2.71[11]	1.21[-1]	1.13[-1]	45.081	3.02[11]	1.23[-1]	1.09[-1]
$p^2(^1D)s\ ^2D_{3/2}$	$sp(^3P)d\ ^2D_{3/2}$	47.213	1.62[11]	5.43[-2]	3.36[-2]	44.998	1.98[11]	6.02[-2]	3.56[-2]
$p^2(^3P)s\ ^4P_{1/2}$	$p^2(^3P)p\ ^2P_{1/2}$	46.204	4.20[11]	1.34[-1]	4.09[-2]	44.133	4.61[11]	1.34[-1]	3.91[-2]
$p^2(^1S)s\ ^2S_{1/2}$	$sp(^3P)d\ ^2P_{3/2}$	45.955	1.36[11]	8.61[-2]	2.60[-2]	43.631	1.37[11]	7.80[-2]	2.24[-2]
$p^2(^3P)s\ ^4P_{1/2}$	$sp(^3P)d\ ^4F_{3/2}$	45.900	4.31[11]	2.73[-1]	8.24[-2]	43.820	4.86[11]	2.80[-1]	8.07[-2]
$p^2(^3P)s\ ^4P_{3/2}$	$sp(^3P)d\ ^4D_{3/2}$	45.672	2.92[11]	9.15[-2]	5.50[-2]	43.639	3.25[11]	9.30[-2]	5.33[-2]
$p^2(^3P)s\ ^4P_{3/2}$	$sp(^3P)d\ ^2D_{5/2}$	45.582	1.28[11]	6.01[-2]	3.60[-2]	43.523	1.40[11]	6.01[-2]	3.44[-2]
$p^2(^3P)s\ ^4P_{3/2}$	$sp(^3P)d\ ^4D_{1/2}$	45.515	2.88[11]	4.48[-2]	2.68[-2]	43.489	3.14[11]	4.46[-2]	2.55[-2]
$s^2(^1S)p\ ^2P_{1/2}$	$p^2(^3P)s\ ^2P_{3/2}$	45.473	5.96[11]	3.68[-1]	1.10[-1]	43.432	6.55[11]	3.72[-1]	1.06[-1]

Lower level	Upper level	λ	A	f	S	λ	A	f	S
				$Z{=}59$				$Z{=}60$	
$s^2(^1S)d\ ^2D_{5/2}$	$sp(^3P)d\ ^2F_{5/2}$	65.556	5.81[10]	3.75[-2]	4.84[-2]	63.544	6.67[10]	4.04[-2]	5.07[-2]
$s^2(^1S)p\ ^2P_{3/2}$	$p^2(^1D)s\ ^2D_{5/2}$	63.923	6.98[10]	6.40[-2]	5.40[-2]	61.809	8.33[10]	7.15[-2]	5.82[-2]
$p^2(^3P)s\ ^2P_{1/2}$	$sp(^1P)d\ ^2P_{1/2}$	63.523	1.81[11]	1.10[-1]	4.58[-2]	61.323	1.93[11]	1.09[-1]	4.40[-2]
$p^2(^3P)s\ ^4P_{5/2}$	$sp(^3P)d\ ^4F_{7/2}$	63.503	5.95[10]	4.80[-2]	6.01[-2]	61.420	6.49[10]	4.88[-2]	5.93[-2]
$s^2(^1S)d\ ^2D_{5/2}$	$sp(^3P)d\ ^2F_{7/2}$	62.486	7.50[10]	5.85[-2]	7.23[-2]	60.690	8.75[10]	6.43[-2]	7.72[-2]
$s^2(^1S)d\ ^2D_{3/2}$	$sp(^1P)d\ ^2D_{5/2}$	62.349	2.48[11]	2.16[-1]	1.78[-1]	60.249	2.63[11]	2.15[-1]	1.70[-1]
$p^2(^3P)s\ ^4P_{3/2}$	$sp(^3P)d\ ^4F_{5/2}$	61.989	1.09[11]	9.43[-2]	7.70[-2]	60.168	1.16[11]	9.43[-2]	7.48[-2]
$p^2(^3P)s\ ^2P_{1/2}$	$sp(^1P)d\ ^2P_{3/2}$	61.371	1.20[11]	1.36[-1]	5.48[-2]	59.586	1.25[11]	1.34[-1]	5.23[-2]
$s^2(^1S)d\ ^2D_{5/2}$	$sp(^1P)d\ ^2F_{7/2}$	58.678	2.37[11]	1.63[-1]	1.89[-1]	57.054	2.28[11]	1.48[-1]	1.67[-1]
$s^2(^1S)d\ ^2D_{5/2}$	$sp(^1P)d\ ^2P_{3/2}$	54.707	7.47[10]	2.24[-2]	2.42[-2]	53.159	6.55[10]	1.85[-2]	1.95[-2]
$s^2(^1S)d\ ^2D_{5/2}$	$sp(^1P)d\ ^2D_{5/2}$	54.216	9.21[10]	4.05[-2]	4.35[-2]	52.546	8.38[10]	3.49[-2]	3.61[-2]
$p^2(^1D)s\ ^2D_{5/2}$	$sp(^3P)d\ ^2F_{5/2}$	53.924	1.43[11]	6.25[-2]	6.66[-2]	51.163	1.47[11]	5.76[-2]	5.83[-2]
$s^2(^1S)p\ ^2P_{3/2}$	$s^2(^1S)d\ ^2D_{5/2}$	52.814	2.15[11]	1.36[-1]	9.43[-2]	50.032	2.27[11]	1.28[-1]	8.40[-2]
$p^2(^1S)s\ ^2S_{1/2}$	$sp(^3P)d\ ^4P_{3/2}$	52.641	2.72[11]	2.26[-1]	7.84[-2]	49.839	2.97[11]	2.22[-1]	7.27[-2]
$p^2(^1D)s\ ^2D_{3/2}$	$sp(^3P)d\ ^4D_{5/2}$	51.833	1.78[11]	1.07[-1]	7.31[-2]	49.239	1.92[11]	1.04[-1]	6.79[-2]
$p^2(^1D)s\ ^2D_{5/2}$	$sp(^3P)d\ ^2F_{7/2}$	51.830	8.41[10]	4.52[-2]	4.63[-2]	49.296	8.21[10]	3.99[-2]	3.89[-2]
$p^2(^1D)s\ ^2D_{5/2}$	$sp(^3P)d\ ^2P_{3/2}$	51.813	5.65[10]	1.52[-2]	1.56[-2]	49.383	6.05[10]	1.48[-2]	1.44[-2]
$p^2(^3P)s\ ^2P_{3/2}$	$sp(^3P)d\ ^2D_{3/2}$	51.465	1.44[11]	5.72[-2]	3.88[-2]	48.951	1.68[11]	6.04[-2]	3.88[-2]
$p^2(^1D)s\ ^2D_{3/2}$	$sp(^3P)d\ ^4P_{3/2}$	50.886	9.94[10]	3.85[-2]	2.58[-2]	48.090	1.05[11]	3.66[-2]	2.32[-2]
$p^2(^1S)s\ ^2S_{1/2}$	$sp(^3P)d\ ^4P_{1/2}$	50.683	5.53[10]	2.13[-2]	7.11[-3]	48.256	6.17[10]	2.16[-2]	6.86[-3]
$s^2(^1S)d\ ^2D_{3/2}$	$sp(^1P)d\ ^2D_{3/2}$	49.809	7.56[11]	2.81[-1]	1.84[-1]	47.083	8.50[11]	2.82[-1]	1.75[-1]
$s^2(^1S)p\ ^2P_{1/2}$	$p^2(^1D)s\ ^2D_{3/2}$	49.447	1.41[11]	1.04[-1]	3.37[-2]	47.137	1.56[11]	1.04[-1]	3.22[-2]
$p^2(^3P)s\ ^4P_{1/2}$	$p^2(^3P)p\ ^2D_{3/2}$	49.309	7.71[10]	5.63[-2]	1.83[-2]	47.109	8.31[10]	5.54[-2]	1.72[-2]
$p^2(^1D)s\ ^2D_{5/2}$	$sp(^1P)d\ ^2F_{7/2}$	49.182	2.20[11]	1.07[-1]	1.04[-1]	46.870	2.74[11]	1.21[-1]	1.12[-1]
$p^2(^1D)s\ ^2D_{3/2}$	$sp(^3P)d\ ^4P_{1/2}$	49.053	3.35[11]	6.04[-2]	3.91[-2]	46.615	3.73[11]	6.08[-2]	3.73[-2]
$p^2(^3P)s\ ^2P_{1/2}$	$sp(^1P)d\ ^2D_{3/2}$	48.786	1.89[11]	1.34[-1]	4.33[-2]	46.204	2.12[11]	1.36[-1]	4.13[-2]
$p^2(^3P)s\ ^4P_{5/2}$	$sp(^3P)d\ ^4D_{5/2}$	48.384	7.60[10]	2.67[-2]	2.55[-2]	46.204	8.49[10]	2.72[-2]	2.48[-2]
$p^2(^3P)s\ ^2P_{3/2}$	$sp(^1P)d\ ^2F_{5/2}$	48.362	7.08[11]	3.73[-1]	2.37[-1]	46.059	7.79[11]	3.73[-1]	2.26[-1]
$p^2(^3P)s\ ^2P_{3/2}$	$sp(^3P)d\ ^2P_{1/2}$	47.900	5.77[11]	9.99[-2]	6.27[-2]	45.668	6.43[11]	1.01[-1]	6.05[-2]
$s^2(^1S)p\ ^2P_{1/2}$	$p^2(^1S)s\ ^2S_{1/2}$	47.895	5.35[11]	1.84[-1]	5.80[-2]	45.569	5.93[11]	1.85[-1]	5.54[-2]
$p^2(^3P)s\ ^2P_{3/2}$	$sp(^3P)d\ ^2P_{3/2}$	47.831	9.08[10]	3.13[-2]	1.97[-2]	45.483	9.01[10]	2.80[-2]	1.67[-2]
$s^2(^1S)p\ ^2P_{3/2}$	$p^2(^3P)s\ ^2P_{1/2}$	47.802	3.83[11]	6.57[-2]	4.13[-2]	45.421	4.26[11]	6.58[-2]	3.94[-2]
$s^2(^1S)p\ ^2P_{3/2}$	$s^2(^1S)d\ ^2D_{3/2}$	46.859	7.70[11]	2.55[-1]	1.57[-1]	44.603	8.57[11]	2.56[-1]	1.50[-1]
$p^2(^1D)s\ ^2D_{5/2}$	$sp(^1P)d\ ^2P_{3/2}$	46.361	4.20[11]	9.00[-2]	8.26[-2]	44.209	4.85[11]	9.47[-2]	8.26[-2]
$p^2(^1D)s\ ^2D_{5/2}$	$sp(^1P)d\ ^2D_{5/2}$	46.008	3.23[11]	1.03[-1]	9.29[-2]	43.784	3.80[11]	1.10[-1]	9.47[-2]
$p^2(^3P)s\ ^4P_{3/2}$	$sp(^3P)d\ ^4P_{3/2}$	45.326	2.16[11]	6.66[-2]	3.97[-2]	43.186	2.48[11]	6.92[-2]	3.94[-2]
$s^2(^1S)d\ ^2D_{5/2}$	$sp(^1P)d\ ^2D_{3/2}$	44.479	1.36[11]	2.68[-2]	2.35[-2]	42.244	1.58[11]	2.82[-2]	2.35[-2]
$p^2(^3P)s\ ^2P_{3/2}$	$sp(^1P)d\ ^2P_{1/2}$	44.200	8.29[10]	1.22[-2]	7.07[-3]	41.874	8.41[10]	1.11[-2]	6.10[-3]
$p^2(^1S)s\ ^2S_{1/2}$	$sp(^3P)d\ ^2D_{3/2}$	44.133	1.76[11]	1.03[-1]	2.99[-2]	41.988	2.05[11]	1.08[-1]	2.99[-2]
$p^2(^3P)s\ ^4P_{5/2}$	$sp(^3P)d\ ^4D_{3/2}$	43.576	6.58[10]	1.25[-2]	1.07[-2]	41.525	7.11[10]	1.23[-2]	1.01[-2]
$p^2(^3P)s\ ^4P_{5/2}$	$sp(^3P)d\ ^2D_{5/2}$	43.440	3.68[11]	1.05[-1]	8.94[-2]	41.346	4.15[11]	1.06[-1]	8.66[-2]
$p^2(^3P)s\ ^4P_{5/2}$	$sp(^3P)d\ ^4D_{7/2}$	43.022	3.31[11]	1.23[-1]	1.05[-1]	40.988	3.71[11]	1.24[-1]	1.00[-1]
$p^2(^1D)s\ ^2D_{3/2}$	$sp(^3P)d\ ^2D_{3/2}$	42.893	2.39[11]	6.57[-2]	3.72[-2]	40.740	2.87[11]	7.14[-2]	3.83[-2]
$p^2(^3P)s\ ^4P_{1/2}$	$p^2(^3P)p\ ^2P_{1/2}$	42.153	5.06[11]	1.35[-1]	3.74[-2]	40.251	5.56[11]	1.35[-1]	3.59[-2]
$p^2(^3P)s\ ^4P_{1/2}$	$sp(^3P)d\ ^4F_{3/2}$	41.834	5.47[11]	2.88[-1]	7.92[-2]	39.906	6.18[11]	2.96[-1]	7.77[-2]
$p^2(^3P)s\ ^4P_{3/2}$	$sp(^3P)d\ ^4D_{3/2}$	41.695	3.62[11]	9.45[-2]	5.18[-2]	39.826	4.04[11]	9.61[-2]	5.03[-2]
$p^2(^3P)s\ ^4P_{3/2}$	$sp(^3P)d\ ^2D_{5/2}$	41.570	1.54[11]	6.02[-2]	3.28[-2]	39.662	1.70[11]	6.02[-2]	3.14[-2]
$p^2(^3P)s\ ^4P_{3/2}$	$sp(^3P)d\ ^4D_{1/2}$	41.551	3.43[11]	4.45[-2]	2.43[-2]	39.686	3.76[11]	4.44[-2]	2.32[-2]
$p^2(^1S)s\ ^2S_{1/2}$	$sp(^3P)d\ ^2P_{1/2}$	41.486	3.87[11]	1.00[-1]	2.73[-2]	39.549	4.39[11]	1.03[-1]	2.68[-2]
$s^2(^1S)p\ ^2P_{1/2}$	$p^2(^3P)s\ ^2P_{3/2}$	41.482	7.29[11]	3.76[-1]	1.03[-1]	39.475	8.17[11]	3.82[-1]	9.93[-2]
$p^2(^1S)s\ ^2S_{1/2}$	$sp(^3P)d\ ^2P_{3/2}$	41.434	1.38[11]	7.08[-2]	1.93[-2]	39.410	1.39[11]	6.44[-2]	1.67[-2]

Lower level	Upper level	λ	A	f	S	λ	A	f	S
				Z=61				Z=62	
$p^2(^3P)s\ ^2P_{1/2}$	$sp(^1P)d\ ^2P_{1/2}$	59.924	1.98[11]	1.07[-1]	4.23[-2]	58.208	2.08[11]	1.06[-1]	4.06[-2]
$s^2(^1S)p\ ^2P_{3/2}$	$p^2(^1D)s\ ^2D_{5/2}$	59.855	9.62[10]	7.74[-2]	6.11[-2]	57.979	1.10[11]	8.24[-2]	6.30[-2]
$s^2(^1S)p\ ^2P_{3/2}$	$p^2(^1D)s\ ^2D_{5/2}$	59.855	9.62[10]	7.74[-2]	6.11[-2]	57.979	1.10[11]	8.24[-2]	6.30[-2]
$p^2(^3P)s\ ^4P_{5/2}$	$sp(^3P)d\ ^4F_{7/2}$	59.692	6.95[10]	4.96[-2]	5.84[-2]	57.889	7.52[10]	5.03[-2]	5.76[-2]
$s^2(^1S)d\ ^2D_{3/2}$	$sp(^1P)d\ ^2D_{5/2}$	58.772	2.72[11]	2.11[-1]	1.64[-1]	57.072	2.85[11]	2.09[-1]	1.57[-1]
$s^2(^1S)d\ ^2D_{5/2}$	$sp(^3P)d\ ^2F_{7/2}$	58.652	1.02[11]	6.95[-2]	8.06[-2]	56.877	1.14[11]	7.37[-2]	8.30[-2]
$p^2(^3P)s\ ^4P_{3/2}$	$sp(^3P)d\ ^4F_{5/2}$	58.390	1.23[11]	9.43[-2]	7.26[-2]	56.682	1.31[11]	9.43[-2]	7.05[-2]
$p^2(^3P)s\ ^2P_{1/2}$	$sp(^1P)d\ ^2P_{3/2}$	57.876	1.31[11]	1.32[-1]	5.00[-2]	56.211	1.37[11]	1.30[-1]	4.79[-2]
$s^2(^1S)d\ ^2D_{5/2}$	$sp(^1P)d\ ^2F_{7/2}$	55.094	2.24[11]	1.37[-1]	1.48[-1]	53.432	2.19[11]	1.26[-1]	1.32[-1]
$s^2(^1S)d\ ^2D_{5/2}$	$sp(^1P)d\ ^2D_{5/2}$	50.981	7.70[10]	3.00[-2]	3.03[-2]	49.482	7.13[10]	2.63[-2]	2.57[-2]
$p^2(^1D)s\ ^2D_{5/2}$	$sp(^3P)d\ ^2F_{5/2}$	48.647	1.49[11]	5.29[-2]	5.08[-2]	46.224	1.47[11]	4.73[-2]	4.30[-2]
$s^2(^1S)p\ ^2P_{3/2}$	$s^2(^1S)d\ ^2D_{5/2}$	47.686	2.34[11]	1.20[-1]	7.53[-2]	45.281	2.47[11]	1.14[-1]	6.80[-2]
$p^2(^1S)s\ ^2S_{1/2}$	$sp(^3P)d\ ^4P_{3/2}$	47.459	3.20[11]	2.16[-1]	6.76[-2]	45.045	3.49[11]	2.12[-1]	6.30[-2]
$p^2(^1D)s\ ^2D_{5/2}$	$sp(^3P)d\ ^2F_{7/2}$	46.920	8.06[10]	3.53[-2]	3.29[-2]	44.606	8.00[10]	3.18[-2]	2.80[-2]
$p^2(^1D)s\ ^2D_{5/2}$	$sp(^3P)d\ ^2P_{3/2}$	46.799	6.63[10]	1.45[-2]	1.34[-2]	44.454	7.22[10]	1.43[-2]	1.25[-2]
$p^2(^1D)s\ ^2D_{3/2}$	$sp(^3P)d\ ^4D_{5/2}$	46.732	2.09[11]	1.02[-1]	6.33[-2]	44.365	2.28[11]	1.01[-1]	5.91[-2]
$p^2(^3P)s\ ^2P_{3/2}$	$sp(^3P)d\ ^2D_{3/2}$	46.172	1.99[11]	6.36[-2]	3.86[-2]	43.753	2.30[11]	6.61[-2]	3.81[-2]
$p^2(^1D)s\ ^2D_{3/2}$	$sp(^3P)d\ ^4P_{3/2}$	46.014	1.09[11]	3.45[-2]	2.09[-2]	43.732	1.15[11]	3.30[-2]	1.90[-2]
$p^2(^1S)s\ ^2S_{1/2}$	$sp(^3P)d\ ^4P_{1/2}$	45.597	7.05[10]	2.20[-2]	6.60[-3]	43.260	7.94[10]	2.23[-2]	6.35[-3]
$s^2(^1S)d\ ^2D_{3/2}$	$sp(^1P)d\ ^2D_{3/2}$	45.056	9.21[11]	2.80[-1]	1.67[-1]	42.839	1.02[12]	2.81[-1]	1.58[-1]
$p^2(^1D)s\ ^2D_{5/2}$	$sp(^1P)d\ ^2F_{7/2}$	44.615	3.36[11]	1.33[-1]	1.18[-1]	42.459	4.01[11]	1.44[-1]	1.21[-1]
$s^2(^1S)p\ ^2P_{1/2}$	$p^2(^1D)s\ ^2D_{3/2}$	44.572	1.75[11]	1.05[-1]	3.07[-2]	42.326	1.96[11]	1.05[-1]	2.93[-2]
$p^2(^3P)s\ ^4P_{1/2}$	$p^2(^3P)p\ ^2D_{3/2}$	44.538	9.18[10]	5.48[-2]	1.61[-2]	42.330	9.97[10]	5.37[-2]	1.50[-2]
$p^2(^1D)s\ ^2D_{3/2}$	$sp(^3P)d\ ^4P_{1/2}$	44.262	4.16[11]	6.14[-2]	3.57[-2]	42.048	4.65[11]	6.14[-2]	3.41[-2]
$p^2(^3P)s\ ^2P_{3/2}$	$sp(^3P)d\ ^2F_{5/2}$	44.236	3.73[10]	1.63[-2]	9.53[-3]	41.820	1.05[11]	4.12[-2]	2.27[-2]
$p^2(^3P)s\ ^2P_{1/2}$	$sp(^1P)d\ ^2D_{3/2}$	44.191	2.32[11]	1.35[-1]	3.95[-2]	42.043	2.57[11]	1.36[-1]	3.78[-2]
$p^2(^3P)s\ ^4P_{5/2}$	$sp(^3P)d\ ^4D_{5/2}$	43.814	9.65[10]	2.78[-2]	2.41[-2]	41.683	1.08[11]	2.82[-2]	2.32[-2]
$p^2(^3P)s\ ^2P_{3/2}$	$sp(^1P)d\ ^2F_{5/2}$	43.705	8.61[11]	3.70[-1]	2.13[-1]	41.508	9.02[11]	3.50[-1]	1.92[-1]
$p^2(^3P)s\ ^2P_{3/2}$	$sp(^3P)d\ ^2P_{1/2}$	43.309	7.27[11]	1.02[-1]	5.83[-2]	41.181	8.15[11]	1.04[-1]	5.62[-2]
$s^2(^1S)p\ ^2P_{1/2}$	$p^2(^1S)s\ ^2S_{1/2}$	43.295	6.59[11]	1.86[-1]	5.28[-2]	41.164	7.33[11]	1.86[-1]	5.05[-2]
$s^2(^1S)p\ ^2P_{3/2}$	$p^2(^3P)s\ ^2P_{1/2}$	43.223	4.73[11]	6.63[-2]	3.77[-2]	41.101	5.25[11]	6.68[-2]	3.61[-2]
$p^2(^3P)s\ ^2P_{3/2}$	$sp(^3P)d\ ^2P_{3/2}$	42.703	9.24[10]	2.53[-2]	1.42[-2]	40.366	9.29[10]	2.27[-2]	1.20[-2]
$s^2(^1S)p\ ^2P_{3/2}$	$s^2(^1S)d\ ^2D_{3/2}$	42.426	9.54[11]	2.58[-1]	1.44[-1]	40.368	1.06[12]	2.60[-1]	1.38[-1]
$p^2(^1D)s\ ^2D_{5/2}$	$sp(^1P)d\ ^2P_{3/2}$	42.181	5.52[11]	9.84[-2]	8.18[-2]	40.205	6.25[11]	1.02[-1]	8.05[-2]
$p^2(^1D)s\ ^2D_{5/2}$	$sp(^1P)d\ ^2D_{5/2}$	41.879	4.39[11]	1.15[-1]	9.54[-2]	39.927	5.03[11]	1.20[-1]	9.51[-2]
$p^2(^3P)s\ ^4P_{3/2}$	$sp(^3P)d\ ^4P_{3/2}$	41.239	2.81[11]	7.16[-2]	3.89[-2]	39.315	3.18[11]	7.36[-2]	3.82[-2]
$s^2(^1S)d\ ^2D_{5/2}$	$sp(^1P)d\ ^2D_{3/2}$	40.331	1.81[11]	2.94[-2]	2.34[-2]	38.416	2.08[11]	3.06[-2]	2.32[-2]
$p^2(^1S)s\ ^2S_{1/2}$	$sp(^3P)d\ ^2D_{3/2}$	40.017	2.36[11]	1.13[-1]	2.98[-2]	38.115	2.71[11]	1.18[-1]	2.96[-2]
$p^2(^3P)s\ ^2P_{3/2}$	$sp(^1P)d\ ^2P_{1/2}$	39.735	8.53[10]	1.01[-2]	5.28[-3]	37.679	8.68[10]	9.23[-3]	4.59[-3]
$p^2[^3P)s\ ^4P_{5/2}$	$sp(^3P)d\ ^4D_{3/2}$	39.704	7.67[10]	1.21[-2]	9.49[-3]	37.895	8.32[10]	1.20[-2]	8.93[-3]
$p^2(^3P)s\ ^4P_{5/2}$	$sp(^3P)d\ ^2D_{5/2}$	39.553	4.57[11]	1.08[-1]	8.39[-2]	37.739	5.10[11]	1.10[-1]	8.14[-2]
$p^2(^3P)s\ ^4P_{5/2}$	$sp(^3P)d\ ^4D_{7/2}$	39.181	4.06[11]	1.25[-1]	9.67[-2]	37.390	4.50[11]	1.26[-1]	9.31[-2]
$p^2(^1D)s\ ^2D_{3/2}$	$sp(^3P)d\ ^2D_{3/2}$	38.984	3.34[11]	7.62[-2]	3.91[-2]	37.171	3.91[11]	8.11[-2]	3.96[-2]
$p^2(^3P)s\ ^4P_{1/2}$	$p^2(^3P)p\ ^2P_{1/2}$	38.450	6.12[11]	1.36[-1]	3.44[-2]	36.720	6.75[11]	1.36[-1]	3.30[-2]
$p^2(^3P)s\ ^4P_{1/2}$	$sp(^3P)d\ ^4F_{3/2}$	38.125	6.95[11]	3.04[-1]	7.63[-2]	36.395	7.84[11]	3.13[-1]	7.49[-2]
$p^2(^3P)s\ ^4P_{3/2}$	$sp(^3P)d\ ^4D_{3/2}$	38.055	4.49[11]	9.76[-2]	4.89[-2]	36.354	4.98[11]	9.91[-2]	4.75[-2]
$p^2(^3P)s\ ^4P_{3/2}$	$sp(^3P)d\ ^4D_{1/2}$	37.924	4.11[11]	4.43[-2]	2.21[-2]	36.229	4.49[11]	4.43[-2]	2.11[-2]
$p^2(^3P)s\ ^4P_{3/2}$	$sp(^3P)d\ ^2D_{5/2}$	37.917	1.86[11]	6.02[-2]	3.00[-2]	36.210	2.04[11]	6.02[-2]	2.87[-2]
$p^2(^1S)s\ ^2S_{1/2}$	$sp(^3P)d\ ^2P_{1/2}$	37.848	4.91[11]	1.05[-1]	2.63[-2]	36.149	5.52[11]	1.08[-1]	2.58[-2]
$s^2(^1S)p\ ^2P_{1/2}$	$p^2(^3P)s\ ^2P_{3/2}$	37.837	8.96[11]	3.85[-1]	9.60[-2]	36.136	1.00[12]	3.90[-1]	9.29[-2]
$p^2(^1S)s\ ^2S_{1/2}$	$sp(^3P)d\ ^2P_{3/2}$	37.385	1.40[11]	5.88[-2]	1.45[-2]	35.519	1.42[11]	5.37[-2]	1.25[-2]

Lower level	Upper level	λ	A	f	S	λ	A	f	S
				$Z{=}63$				$Z{=}64$	
$p^2(^3P)s\ ^2P_{1/2}$	$sp(^1P)d\ ^2P_{1/2}$	56.545	2.18[11]	1.05[-1]	3.90[-2]	54.932	2.28[11]	1.03[-1]	3.74[-2]
$s^2(^1S)p\ ^2P_{3/2}$	$p^2(^1D)s\ ^2D_{5/2}$	56.189	1.22[11]	8.69[-2]	6.41[-2]	54.476	1.35[11]	8.98[-2]	6.46[-2]
$p^2(^3P)s\ ^4P_{5/2}$	$sp(^3P)d\ ^4F_{7/2}$	56.149	8.11[10]	5.13[-2]	5.68[-2]	54.470	8.76[10]	5.19[-2]	5.59[-2]
$s^2(^1S)d\ ^2D_{3/2}$	$sp(^1P)d\ ^2D_{5/2}$	55.428	2.99[11]	2.06[-1]	1.51[-1]	53.835	3.14[11]	2.04[-1]	1.45[-1]
$s^2(^1S)d\ ^2D_{5/2}$	$sp(^3P)d\ ^2F_{7/2}$	55.180	1.27[11]	7.74[-2]	8.44[-2]	53.551	1.40[11]	8.04[-2]	8.50[-2]
$p^2(^3P)s\ ^4P_{3/2}$	$sp(^3P)d\ ^4F_{5/2}$	55.029	1.39[11]	9.43[-2]	6.84[-2]	53.429	1.47[11]	9.43[-2]	6.64[-2]
$p^2(^3P)s\ ^2P_{1/2}$	$sp(^1P)d\ ^2P_{3/2}$	54.599	1.43[11]	1.28[-1]	4.59[-2]	53.035	1.50[11]	1.27[-1]	4.41[-2]
$s^2(^1S)d\ ^2D_{5/2}$	$sp(^1P)d\ ^2F_{7/2}$	51.842	2.16[11]	1.16[-1]	1.19[-1]	50.316	2.13[11]	1.08[-1]	1.07[-1]
$p^2(^1D)s\ ^2D_{5/2}$	$sp(^3P)d\ ^2F_{5/2}$	44.029	1.22[11]	3.53[-2]	3.08[-2]	42.026	6.26[10]	1.66[-2]	1.38[-2]
$p^2(^1D)s\ ^2D_{5/2}$	$sp(^1P)d\ ^2F_{5/2}$	43.639	4.40[10]	1.25[-2]	1.08[-2]	41.433	1.13[11]	2.91[-2]	2.38[-2]
$s^2(^1S)p\ ^2P_{3/2}$	$s^2(^1S)d\ ^2D_{5/2}$	42.984	2.63[11]	1.09[-1]	6.18[-2]	40.795	2.81[11]	1.05[-1]	5.65[-2]
$p^2(^1S)s\ ^2S_{1/2}$	$sp(^3P)d\ ^4P_{3/2}$	42.746	3.82[11]	2.09[-1]	5.89[-2]	40.560	4.18[11]	2.06[-1]	5.51[-2]
$p^2(^1D)s\ ^2D_{5/2}$	$sp(^3P)d\ ^2F_{7/2}$	42.390	8.00[10]	2.87[-2]	2.41[-2]	40.274	8.07[10]	2.63[-2]	2.09[-2]
$p^2(^1D)s\ ^2D_{5/2}$	$sp(^3P)d\ ^2P_{3/2}$	42.216	7.91[10]	1.41[-2]	1.17[-2]	40.086	8.64[10]	1.39[-2]	1.10[-2]
$p^2(^1D)s\ ^2D_{3/2}$	$sp(^3P)d\ ^4D_{5/2}$	42.113	2.50[11]	1.00[-1]	5.53[-2]	39.974	2.74[11]	9.87[-2]	5.19[-2]
$p^2(^1D)s\ ^2D_{3/2}$	$sp(^3P)d\ ^4P_{3/2}$	41.552	1.22[11]	3.16[-2]	1.73[-2]	39.473	1.31[11]	3.06[-2]	1.59[-2]
$p^2(^3P)s\ ^2P_{3/2}$	$sp(^3P)d\ ^2D_{3/2}$	41.470	2.66[11]	6.86[-2]	3.74[-2]	39.318	3.05[11]	7.06[-2]	3.66[-2]
$p^2(^1S)s\ ^2S_{1/2}$	$sp(^3P)d\ ^4P_{1/2}$	41.048	8.93[10]	2.25[-2]	6.10[-3]	38.956	9.98[10]	2.28[-2]	5.85[-3]
$s^2(^1S)d\ ^2D_{3/2}$	$sp(^1P)d\ ^2D_{3/2}$	40.724	1.14[12]	2.81[-1]	1.51[-1]	38.709	1.26[12]	2.82[-1]	1.44[-1]
$p^2(^1D)s\ ^2D_{5/2}$	$sp(^1P)d\ ^2F_{7/2}$	40.393	4.72[11]	1.54[-1]	1.23[-1]	38.417	5.51[11]	1.63[-1]	1.24[-1]
$p^2(^3P)s\ ^4P_{1/2}$	$p^2(^3P)p\ ^2D_{3/2}$	40.231	1.09[11]	5.24[-2]	1.39[-2]	38.239	1.16[11]	5.09[-2]	1.28[-2]
$s^2(^1S)p\ ^2P_{1/2}$	$p^2(^1D)s\ ^2D_{3/2}$	40.197	2.17[11]	1.05[-1]	2.79[-2]	38.180	2.42[11]	1.06[-1]	2.66[-2]
$p^2(^3P)s\ ^2P_{1/2}$	$sp(^1P)d\ ^2D_{3/2}$	39.992	2.86[11]	1.37[-1]	3.61[-2]	38.036	3.18[11]	1.38[-1]	3.45[-2]
$p^2(^1D)s\ ^2D_{3/2}$	$sp(^3P)d\ ^4P_{1/2}$	39.946	5.17[11]	6.19[-2]	3.26[-2]	37.952	5.76[11]	6.24[-2]	3.11[-2]
$p^2(^3P)s\ ^4P_{5/2}$	$sp(^3P)d\ ^4D_{5/2}$	39.651	1.20[11]	2.84[-2]	2.22[-2]	37.716	1.33[11]	2.85[-2]	2.12[-2]
$p^2(^3P)s\ ^2P_{3/2}$	$sp(^3P)d\ ^2F_{5/2}$	39.641	3.53[11]	1.25[-1]	6.54[-2]	37.660	8.73[11]	2.79[-1]	1.38[-1]
$p^2(^3P)s\ ^2P_{3/2}$	$sp(^1P)d\ ^2F_{5/2}$	39.324	7.85[11]	2.73[-1]	1.41[-1]	37.183	4.01[11]	1.25[-1]	6.12[-2]
$p^2(^3P)s\ ^2P_{3/2}$	$sp(^3P)d\ ^2P_{1/2}$	39.158	9.13[11]	1.05[-1]	5.42[-2]	37.236	1.03[12]	1.06[-1]	5.22[-2]
$s^2(^1S)p\ ^2P_{1/2}$	$p^2(^1S)s\ ^2S_{1/2}$	39.139	8.15[11]	1.88[-1]	4.83[-2]	37.215	9.08[11]	1.89[-1]	4.62[-2]
$s^2(^1S)p\ ^2P_{3/2}$	$p^2(^3P)s\ ^2P_{1/2}$	39.084	5.85[11]	6.73[-2]	3.45[-2]	37.168	6.52[11]	6.78[-2]	3.31[-2]
$s^2(^1S)p\ ^2P_{3/2}$	$s^2(^1S)d\ ^2D_{3/2}$	38.410	1.19[12]	2.62[-1]	1.33[-1]	36.546	1.32[12]	2.65[-1]	1.27[-1]
$p^2(^1D)s\ ^2D_{5/2}$	$sp(^1P)d\ ^2P_{3/2}$	38.308	7.08[11]	1.04[-1]	7.87[-2]	36.491	8.00[11]	1.07[-1]	7.67[-2]
$p^2(^3P)s\ ^2P_{3/2}$	$sp(^3P)d\ ^2P_{3/2}$	38.166	9.29[10]	2.04[-2]	1.02[-2]	36.095	9.35[10]	1.83[-2]	8.69[-3]
$p^2(^1D)s\ ^2D_{5/2}$	$sp(^1P)d\ ^2D_{5/2}$	38.052	5.77[11]	1.25[-1]	9.41[-2]	36.257	6.58[11]	1.29[-1]	9.27[-2]
$p^2(^3P)s\ ^4P_{3/2}$	$sp(^3P)d\ ^4P_{3/2}$	37.471	3.60[11]	7.56[-2]	3.74[-2]	35.706	4.06[11]	7.76[-2]	3.64[-2]
$s^2(^1S)d\ ^2D_{5/2}$	$sp(^1P)d\ ^2D_{3/2}$	36.595	2.38[11]	3.18[-2]	2.30[-2]	34.863	2.71[11]	3.29[-2]	2.27[-2]
$p^2(^1S)s\ ^2S_{1/2}$	$sp(^3P)d\ ^2D_{3/2}$	36.309	3.10[11]	1.23[-1]	2.93[-2]	34.594	3.54[11]	1.27[-1]	2.90[-2]
$p^2[^3P)s\ ^4P_{5/2}$	$sp(^3P)d\ ^4D_{3/2}$	36.166	9.02[10]	1.18[-2]	8.41[-3]	34.514	9.76[10]	1.17[-2]	7.93[-3]
$p^2(^3P)s\ ^4P_{5/2}$	$sp(^3P)d\ ^2D_{5/2}$	36.006	5.70[11]	1.12[-1]	7.90[-2]	34.351	6.39[11]	1.14[-1]	7.68[-2]
$p^2(^3P)s\ ^2P_{3/2}$	$sp(^1P)d\ ^2P_{1/2}$	35.730	8.87[10]	8.49[-3]	4.00[-3]	33.885	9.10[10]	7.84[-3]	3.50[-3]
$p^2(^3P)s\ ^4P_{5/2}$	$sp(^3P)d\ ^4D_{7/2}$	35.682	5.00[11]	1.28[-1]	8.97[-2]	34.051	5.55[11]	1.29[-1]	8.64[-2]
$p^2(^1D)s\ ^2D_{3/2}$	$sp(^3P)d\ ^2D_{3/2}$	35.444	4.54[11]	8.56[-2]	4.00[-2]	33.800	5.23[11]	9.01[-2]	4.01[-2]
$p^2(^3P)s\ ^4P_{1/2}$	$p^2(^3P)p\ ^2P_{1/2}$	35.066	7.44[11]	1.37[-1]	3.17[-2]	33.485	8.22[11]	1.38[-1]	3.05[-2]
$p^2(^3P)s\ ^4P_{1/2}$	$sp(^3P)d\ ^4F_{3/2}$	34.744	8.88[11]	3.22[-1]	7.35[-2]	33.167	1.01[12]	3.31[-1]	7.22[-2]
$p^2(^3P)s\ ^4P_{3/2}$	$sp(^3P)d\ ^4D_{3/2}$	34.726	5.58[11]	1.02[-1]	4.63[-2]	33.169	6.27[11]	1.03[-1]	4.51[-2]
$p^2(^3P)s\ ^4P_{3/2}$	$sp(^3P)d\ ^4D_{1/2}$	34.607	4.92[11]	4.42[-2]	2.01[-2]	33.057	5.39[11]	4.41[-2]	1.92[-2]
$p^2(^3P)s\ ^4P_{3/2}$	$sp(^3P)d\ ^2D_{5/2}$	34.578	2.23[11]	6.02[-2]	2.74[-2]	33.019	2.46[11]	6.02[-2]	2.62[-2]
$p^2(^1S)s\ ^2S_{1/2}$	$sp(^3P)d\ ^2P_{1/2}$	34.525	6.21[11]	1.11[-1]	2.53[-2]	32.972	6.99[11]	1.14[-1]	2.48[-2]
$s^2(^1S)p\ ^2P_{1/2}$	$p^2(^3P)s\ ^2P_{3/2}$	34.510	1.11[12]	3.96[-1]	9.00[-2]	32.956	1.24[12]	4.02[-1]	8.73[-2]
$p^2(^1D)s\ ^2D_{3/2}$	$sp(^3P)d\ ^2F_{5/2}$	34.099	3.87[10]	1.01[-2]	4.56[-3]	32.568	1.44[11]	3.45[-2]	1.48[-2]
$p^2(^1D)s\ ^2D_{3/2}$	$sp(^1P)d\ ^2F_{5/2}$	33.865	2.38[11]	6.11[-2]	2.74[-2]	32.211	1.55[11]	3.64[-2]	1.54[-2]
$p^2(^1S)s\ ^2S_{1/2}$	$sp(^3P)d\ ^2P_{3/2}$	33.751	1.44[11]	4.91[-2]	1.09[-2]	32.074	1.46[11]	4.50[-2]	9.50[-3]

Lower level	Upper level	λ	A	f	S	λ	A	f	S
				Z=65				Z=66	
$p^2(^1S)s\ ^2S_{1/2}$	$p^2(^3P)p\ ^2P_{3/2}$	56.063	9.71[10]	9.14[-2]	3.37[-2]	54.349	1.07[11]	9.43[-2]	3.37[-2]
$s^2(^1S)d\ ^2D_{5/2}$	$sp(^1P)d\ ^2F_{5/2}$	53.953	1.02[11]	4.47[-2]	4.76[-2]	52.329	1.19[11]	4.87[-2]	5.02[-2]
$p^2(^3P)s\ ^2P_{1/2}$	$sp(^1P)d\ ^2P_{1/2}$	53.366	2.39[11]	1.02[-1]	3.59[-2]	51.846	2.51[11]	1.01[-1]	3.45[-2]
$p^2(^3P)s\ ^4P_{5/2}$	$sp(^3P)d\ ^4F_{7/2}$	52.904	9.42[10]	5.26[-2]	5.50[-2]	51.330	1.02[11]	5.36[-2]	5.42[-2]
$s^2(^1S)p\ ^2P_{3/2}$	$p^2(^1D)s\ ^2D_{5/2}$	52.833	1.48[11]	9.28[-2]	6.46[-2]	51.252	1.60[11]	9.53[-2]	6.42[-2]
$s^2(^1S)d\ ^2D_{3/2}$	$sp(^1P)d\ ^2D_{5/2}$	52.280	3.28[11]	2.02[-1]	1.39[-1]	50.786	3.44[11]	2.00[-1]	1.34[-1]
$p^2(^3P)s\ ^4P_{3/2}$	$sp(^3P)d\ ^4F_{5/2}$	51.891	1.56[11]	9.43[-2]	6.44[-2]	50.389	1.64[11]	9.43[-2]	6.25[-2]
$s^2(^1S)d\ ^2D_{5/2}$	$sp(^3P)d\ ^2F_{7/2}$	51.876	1.54[11]	8.32[-2]	8.51[-2]	50.374	1.68[11]	8.52[-2]	8.48[-2]
$p^2(^3P)s\ ^2P_{1/2}$	$sp(^1P)d\ ^2P_{3/2}$	51.520	1.57[11]	1.25[-1]	4.24[-2]	50.050	1.64[11]	1.24[-1]	4.07[-2]
$s^2(^1S)d\ ^2D_{5/2}$	$sp(^1P)d\ ^2F_{7/2}$	48.764	2.14[11]	1.01[-1]	9.78[-2]	47.355	2.14[11]	9.55[-2]	8.94[-2]
$p^2(^1D)s\ ^2D_{5/2}$	$sp(^1P)d\ ^2F_{5/2}$	39.311	1.59[11]	3.70[-2]	2.86[-2]	37.285	1.85[11]	3.87[-2]	2.84[-2]
$s^2(^1S)p\ ^2P_{3/2}$	$s^2(^1S)d\ ^2D_{5/2}$	38.713	3.03[11]	1.02[-1]	5.20[-2]	36.735	3.28[11]	9.91[-2]	4.81[-2]
$p^2(^1S)s\ ^2S_{1/2}$	$sp(^3P)d\ ^4P_{3/2}$	38.484	4.60[11]	2.04[-1]	5.17[-2]	36.514	5.08[11]	2.02[-1]	4.87[-2]
$p^2(^1D)s\ ^2D_{5/2}$	$sp(^3P)d\ ^2P_{3/2}$	38.059	9.52[10]	1.38[-2]	1.04[-2]	36.133	1.05[11]	1.38[-2]	9.79[-3]
$p^2(^1D)s\ ^2D_{3/2}$	$sp(^3P)d\ ^4D_{5/2}$	37.944	3.01[11]	9.77[-2]	4.87[-2]	36.017	3.32[11]	9.67[-2]	4.58[-2]
$p^2(^1D)s\ ^2D_{3/2}$	$sp(^3P)d\ ^4P_{3/2}$	37.492	1.40[11]	2.96[-2]	1.46[-2]	35.608	1.51[11]	2.88[-2]	1.35[-2]
$p^2(^3P)s\ ^2P_{3/2}$	$sp(^3P)d\ ^2D_{3/2}$	37.286	3.48[11]	7.25[-2]	3.57[-2]	35.367	3.97[11]	7.45[-2]	3.47[-2]
$p^2(^1S)s\ ^2S_{1/2}$	$sp(^3P)d\ ^4P_{1/2}$	36.975	1.13[11]	2.30[-2]	5.61[-3]	35.101	1.25[11]	2.32[-2]	5.36[-3]
$s^2(^1S)d\ ^2D_{3/2}$	$sp(^1P)d\ ^2D_{3/2}$	36.791	1.40[12]	2.83[-1]	1.37[-1]	34.965	1.55[12]	2.85[-1]	1.31[-1]
$p^2(^1D)s\ ^2D_{5/2}$	$sp(^1P)d\ ^2F_{7/2}$	36.483	6.41[11]	1.71[-1]	1.23[-1]	34.689	7.41[11]	1.78[-1]	1.22[-1]
$p^2(^3P)s\ ^4P_{1/2}$	$p^2(^3P)p\ ^2D_{3/2}$	36.347	1.24[11]	4.93[-2]	1.18[-2]	34.550	1.32[11]	4.74[-2]	1.08[-2]
$s^2(^1S)p\ ^2P_{1/2}$	$p^2(^1D)s\ ^2D_{3/2}$	36.268	2.69[11]	1.06[-1]	2.53[-2]	34.456	2.99[11]	1.06[-1]	2.41[-2]
$p^2(^3P)s\ ^2P_{1/2}$	$sp(^1P)d\ ^2D_{3/2}$	36.171	3.54[11]	1.39[-1]	3.31[-2]	34.395	3.94[11]	1.40[-1]	3.17[-2]
$p^2(^1D)s\ ^2D_{3/2}$	$sp(^3P)d\ ^4P_{1/2}$	36.059	6.42[11]	6.29[-2]	2.97[-2]	34.263	7.15[11]	6.29[-2]	2.84[-2]
$p^2(^3P)s\ ^4P_{5/2}$	$sp(^3P)d\ ^4D_{5/2}$	35.874	1.48[11]	2.85[-2]	2.02[-2]	34.120	1.62[11]	2.84[-2]	1.91[-2]
$p^2(^3P)s\ ^2P_{3/2}$	$sp(^3P)d\ ^2F_{5/2}$	35.774	1.25[12]	3.60[-1]	1.70[-1]	34.016	1.50[12]	3.91[-1]	1.75[-1]
$p^2(^3P)s\ ^4P_{5/2}$	$sp(^3P)d\ ^4P_{3/2}$	35.470	9.64[10]	1.22[-2]	8.52[-3]	33.753	1.11[11]	1.26[-2]	8.40[-3]
$p^2(^3P)s\ ^2P_{3/2}$	$sp(^3P)d\ ^2P_{1/2}$	35.409	1.14[12]	1.08[-1]	5.03[-2]	33.672	1.29[12]	1.10[-1]	4.85[-2]
$s^2(^1S)p\ ^2P_{1/2}$	$p^2(^1S)s\ ^2S_{1/2}$	35.386	1.02[12]	1.90[-1]	4.43[-2]	33.649	1.13[12]	1.92[-1]	4.25[-2]
$s^2(^1S)p\ ^2P_{3/2}$	$p^2(^3P)s\ ^2P_{1/2}$	35.346	7.27[11]	6.83[-2]	3.17[-2]	33.615	8.12[11]	6.88[-2]	3.04[-2]
$p^2(^3P)s\ ^2P_{3/2}$	$sp(^1P)d\ ^2F_{5/2}$	35.148	1.79[11]	4.97[-2]	2.30[-2]	33.224	9.97[10]	2.49[-2]	1.09[-2]
$p^2(^3P)s\ ^4P_{1/2}$	$p^2(^3P)p\ ^4S_{3/2}$	34.958	9.61[10]	3.52[-2]	8.10[-3]	33.302	1.12[11]	3.73[-2]	8.18[-3]
$s^2(^1S)p\ ^2P_{3/2}$	$s^2(^1S)d\ ^2D_{3/2}$	34.774	1.48[12]	2.68[-1]	1.22[-1]	33.087	1.64[12]	2.71[-1]	1.18[-1]
$p^2(^1D)s\ ^2D_{5/2}$	$sp(^1P)d\ ^2P_{3/2}$	34.754	8.97[11]	1.09[-1]	7.46[-2]	33.093	1.01[12]	1.11[-1]	7.24[-2]
$p^2(^1D)s\ ^2D_{5/2}$	$sp(^1P)d\ ^2D_{5/2}$	34.534	7.45[11]	1.33[-1]	9.10[-2]	32.892	8.46[11]	1.37[-1]	8.91[-2]
$p^2(^3P)s\ ^2P_{3/2}$	$sp(^3P)d\ ^2P_{3/2}$	34.144	9.40[10]	1.64[-2]	7.38[-3]	32.306	9.45[10]	1.48[-2]	6.28[-3]
$p^2(^3P)s\ ^4P_{3/2}$	$sp(^3P)d\ ^4P_{3/2}$	34.018	4.56[11]	7.91[-2]	3.54[-2]	32.406	5.13[11]	8.06[-2]	3.44[-2]
$s^2(^1S)d\ ^2D_{5/2}$	$sp(^1P)d\ ^2D_{3/2}$	33.215	3.09[11]	3.39[-2]	2.23[-2]	31.644	3.50[11]	3.53[-2]	2.19[-2]
$p^2(^1S)s\ ^2S_{1/2}$	$sp(^3P)d\ ^2D_{3/2}$	32.965	4.04[11]	1.32[-1]	2.86[-2]	31.416	4.60[11]	1.36[-1]	2.82[-2]
$p^2[^3P)s\ ^4P_{5/2}$	$sp(^3P)d\ ^4D_{3/2}$	32.937	1.06[11]	1.15[-2]	7.47[-3]	31.430	1.15[11]	1.14[-2]	7.05[-3]
$p^2(^3P)s\ ^4P_{5/2}$	$sp(^3P)d\ ^2D_{5/2}$	32.781	7.13[11]	1.15[-1]	7.47[-2]	31.271	8.02[11]	1.17[-1]	7.26[-2]
$p^2(^3P)s\ ^4P_{5/2}$	$sp(^3P)d\ ^4D_{7/2}$	32.508	6.13[11]	1.30[-1]	8.33[-2]	31.021	6.81[11]	1.32[-1]	8.04[-2]
$p^2(^1D)s\ ^2D_{3/2}$	$sp(^3P)d\ ^2D_{3/2}$	32.235	6.07[11]	9.41[-2]	4.00[-2]	30.743	6.95[11]	9.85[-2]	3.98[-2]
$p^2(^3P)s\ ^2P_{3/2}$	$sp(^1P)d\ ^2P_{1/2}$	32.138	9.35[10]	7.25[-3]	3.07[-3]	30.485	9.64[10]	6.70[-3]	2.70[-3]
$p^2(^3P)s\ ^4P_{1/2}$	$p^2(^3P)p\ ^2P_{1/2}$	31.974	9.07[11]	1.39[-1]	2.93[-2]	30.530	9.98[11]	1.40[-1]	2.82[-2]
$p^2(^3P)s\ ^4P_{3/2}$	$sp(^3P)d\ ^4D_{3/2}$	31.681	7.02[11]	1.06[-1]	4.39[-2]	30.259	7.81[11]	1.08[-1]	4.29[-2]
$p^2(^3P)s\ ^4P_{1/2}$	$sp(^3P)d\ ^4D_{3/2}$	31.661	1.14[12]	3.40[-1]	7.09[-2]	30.223	1.27[12]	3.50[-1]	6.96[-2]
$p^2(^3P)s\ ^4P_{3/2}$	$sp(^3P)d\ ^4D_{1/2}$	31.575	5.89[11]	4.41[-2]	1.83[-2]	30.158	6.45[11]	4.40[-2]	1.75[-2]
$p^2(^3P)s\ ^4P_{3/2}$	$sp(^3P)d\ ^2D_{5/2}$	31.537	2.70[11]	6.07[-2]	2.51[-2]	30.112	2.97[11]	6.07[-2]	2.40[-2]
$p^2(^1S)s\ ^2S_{1/2}$	$sp(^3P)d\ ^2P_{1/2}$	31.489	7.86[11]	1.17[-1]	2.42[-2]	30.071	8.84[11]	1.20[-1]	2.38[-2]
$s^2(^1S)p\ ^2P_{1/2}$	$p^2(^3P)s\ ^2P_{3/2}$	31.471	1.37[12]	4.08[-1]	8.47[-2]	30.052	1.53[12]	4.15[-1]	8.23[-2]

Lower level	Upper level	λ	A	f	S	λ	A	f	S
				Z=67				Z=68	
$p^2(^1S)s\ ^2S_{1/2}$	$p^2(^3P)p\ ^2P_{3/2}$	52.700	1.16[11]	9.67[-2]	3.35[-2]	51.110	1.27[11]	9.88[-2]	3.32[-2]
$s^2(^1S)d\ ^2D_{5/2}$	$sp(^1P)d\ ^2F_{5/2}$	50.759	1.30[11]	5.07[-2]	5.07[-2]	49.247	1.42[11]	5.17[-2]	5.03[-2]
$p^2(^3P)s\ ^2P_{1/2}$	$sp(^1P)d\ ^2P_{1/2}$	50.371	2.62[11]	1.00[-1]	3.31[-2]	48.938	2.75[11]	9.88[-2]	3.18[-2]
$p^2(^3P)s\ ^4P_{5/2}$	$sp(^3P)d\ ^4F_{7/2}$	49.762	1.10[11]	5.43[-2]	5.33[-2]	48.294	1.17[11]	5.49[-2]	5.25[-2]
$s^2(^1S)p\ ^2P_{3/2}$	$p^2(^1D)s\ ^2D_{5/2}$	49.729	1.74[11]	9.68[-2]	6.35[-2]	48.259	1.88[11]	9.88[-2]	6.26[-2]
$s^2(^1S)d\ ^2D_{3/2}$	$sp(^1P)d\ ^2D_{5/2}$	49.347	3.61[11]	1.98[-1]	1.29[-1]	47.940	3.80[11]	1.97[-1]	1.24[-1]
$s^2(^1S)d\ ^2D_{5/2}$	$sp(^3P)d\ ^2F_{7/2}$	49.013	1.81[11]	8.71[-2]	8.41[-2]	47.601	1.96[11]	8.83[-2]	8.32[-2]
$p^2(^3P)s\ ^4P_{3/2}$	$sp(^3P)d\ ^4F_{5/2}$	48.925	1.74[11]	9.43[-2]	6.06[-2]	47.514	1.85[11]	9.38[-2]	5.89[-2]
$p^2(^3P)s\ ^2P_{1/2}$	$sp(^1P)d\ ^2P_{3/2}$	48.624	1.73[11]	1.23[-1]	3.92[-2]	47.239	1.81[11]	1.21[-1]	3.77[-2]
$s^2(^1S)d\ ^2D_{5/2}$	$sp(^1P)d\ ^2F_{7/2}$	46.068	2.13[11]	9.04[-2]	8.22[-2]	44.748	2.15[11]	8.59[-2]	7.59[-2]
$p^2(^1D)s\ ^2D_{5/2}$	$sp(^1P)d\ ^2F_{5/2}$	35.363	2.06[11]	3.87[-2]	2.70[-2]	33.538	2.27[11]	3.84[-2]	2.54[-2]
$s^2(^1S)p\ ^2P_{3/2}$	$s^2(^1S)d\ ^2D_{5/2}$	34.860	3.57[11]	9.71[-2]	4.46[-2]	33.077	3.89[11]	9.56[-2]	4.16[-2]
$p^2(^1S)s\ ^2S_{1/2}$	$sp(^3P)d\ ^4P_{3/2}$	34.648	5.57[11]	2.01[-1]	4.59[-2]	32.876	6.15[11]	2.00[-1]	4.34[-2]
$p^2(^1D)s\ ^2D_{5/2}$	$sp(^3P)d\ ^2P_{3/2}$	34.307	1.17[11]	1.37[-2]	9.26[-3]	32.570	1.28[11]	1.37[-2]	8.78[-3]
$p^2(^1D)s\ ^2D_{3/2}$	$sp(^3P)d\ ^4D_{5/2}$	34.192	3.64[11]	9.58[-2]	4.31[-2]	32.458	4.01[11]	9.53[-2]	4.06[-2]
$p^2(^1D)s\ ^2D_{3/2}$	$sp(^3P)d\ ^4P_{3/2}$	33.820	1.64[11]	2.81[-2]	1.25[-2]	32.117	1.78[11]	2.76[-2]	1.16[-2]
$p^2(^3P)s\ ^2P_{3/2}$	$sp(^3P)d\ ^2D_{3/2}$	33.557	4.51[11]	7.60[-2]	3.36[-2]	31.843	5.10[11]	7.75[-2]	3.25[-2]
$p^2(^1S)s\ ^2S_{1/2}$	$sp(^3P)d\ ^4P_{1/2}$	33.328	1.40[11]	2.33[-2]	5.12[-3]	31.647	1.56[11]	2.34[-2]	4.88[-3]
$s^2(^1S)d\ ^2D_{3/2}$	$sp(^1P)d\ ^2D_{3/2}$	33.231	1.74[12]	2.87[-1]	1.26[-1]	31.580	1.93[12]	2.89[-1]	1.20[-1]
$p^2(^1D)s\ ^2D_{5/2}$	$sp(^1P)d\ ^2F_{7/2}$	33.020	8.48[11]	1.85[-1]	1.21[-1]	31.389	9.69[11]	1.91[-1]	1.19[-1]
$p^2(^3P)s\ ^4P_{1/2}$	$p^2(^3P)p\ ^2D_{3/2}$	32.846	1.40[11]	4.53[-2]	9.80[-3]	31.227	1.47[11]	4.29[-2]	8.83[-3]
$s^2(^1S)p\ ^2P_{1/2}$	$p^2(^1D)s\ ^2D_{3/2}$	32.740	3.31[11]	1.06[-1]	2.29[-2]	31.111	3.66[11]	1.06[-1]	2.17[-2]
$p^2(^3P)s\ ^2P_{1/2}$	$sp(^1P)d\ ^2D_{3/2}$	32.706	4.40[11]	1.42[-1]	3.04[-2]	31.097	4.90[11]	1.43[-1]	2.92[-2]
$p^2(^1D)s\ ^2D_{3/2}$	$sp(^3P)d\ ^4P_{1/2}$	32.562	7.94[11]	6.34[-2]	2.71[-2]	30.944	8.82[11]	6.34[-2]	2.58[-2]
$p^2(^3P)s\ ^4P_{5/2}$	$sp(^3P)d\ ^4D_{5/2}$	32.454	1.78[11]	2.82[-2]	1.81[-2]	30.867	1.96[11]	2.79[-2]	1.70[-2]
$p^2(^3P)s\ ^2P_{3/2}$	$sp(^3P)d\ ^2F_{5/2}$	32.369	1.73[12]	4.07[-1]	1.74[-1]	30.781	1.97[12]	4.20[-1]	1.70[-1]
$p^2(^3P)s\ ^4P_{5/2}$	$sp(^3P)d\ ^4P_{3/2}$	32.119	1.26[11]	1.30[-2]	8.26[-3]	30.559	1.44[11]	1.35[-2]	8.11[-3]
$p^2(^3P)s\ ^2P_{3/2}$	$sp(^3P)d\ ^2P_{1/2}$	32.025	1.45[12]	1.11[-1]	4.68[-2]	30.457	1.62[12]	1.13[-1]	4.52[-2]
$s^2(^1S)p\ ^2P_{1/2}$	$p^2(^1S)s\ ^2S_{1/2}$	32.000	1.26[12]	1.94[-1]	4.08[-2]	30.432	1.40[12]	1.96[-1]	3.92[-2]
$s^2(^1S)p\ ^2P_{3/2}$	$p^2(^3P)s\ ^2P_{1/2}$	31.972	9.06[11]	6.93[-2]	2.92[-2]	30.408	1.01[12]	7.03[-2]	2.81[-2]
$p^2(^3P)s\ ^4P_{1/2}$	$p^2(^3P)p\ ^4S_{3/2}$	31.723	1.31[11]	3.95[-2]	8.24[-3]	30.218	1.52[11]	4.18[-2]	8.31[-3]
$p^2(^1D)s\ ^2D_{5/2}$	$sp(^1P)d\ ^2P_{3/2}$	31.511	1.14[12]	1.13[-1]	7.01[-2]	30.000	1.28[12]	1.15[-1]	6.79[-2]
$s^2(^1S)p\ ^2P_{3/2}$	$s^2(^1S)d\ ^2D_{3/2}$	31.486	1.84[12]	2.74[-1]	1.13[-1]	29.960	2.06[12]	2.77[-1]	1.09[-1]
$p^2(^1D)s\ ^2D_{3/2}$	$sp(^3P)d\ ^4D_{1/2}$	31.356	1.07[11]	7.88[-3]	3.26[-3]	29.872	1.30[11]	8.73[-3]	3.43[-3]
$p^2(^1D)s\ ^2D_{5/2}$	$sp(^1P)d\ ^2D_{5/2}$	31.332	9.55[11]	1.40[-1]	8.70[-2]	29.837	1.08[12]	1.44[-1]	8.49[-2]
$p^2(^1D)s\ ^2D_{3/2}$	$sp(^3P)d\ ^2D_{5/2}$	31.285	1.15[11]	2.52[-2]	1.04[-2]	29.796	1.34[11]	2.69[-2]	1.05[-2]
$p^2(^3P)s\ ^4P_{3/2}$	$sp(^3P)d\ ^4P_{3/2}$	30.870	5.71[11]	8.16[-2]	3.33[-2]	29.402	6.39[11]	8.31[-2]	3.21[-2]
$s^2(^1S)d\ ^2D_{5/2}$	$sp(^1P)d\ ^2D_{3/2}$	30.151	3.98[11]	3.63[-2]	2.15[-2]	28.727	4.51[11]	3.73[-2]	2.11[-2]
$p^2(^3P)s\ ^4P_{5/2}$	$sp(^3P)d\ ^4D_{3/2}$	29.990	1.25[11]	1.13[-2]	6.65[-3]	28.616	1.36[11]	1.11[-2]	6.27[-3]
$p^2(^1S)s\ ^2S_{1/2}$	$sp(^3P)d\ ^2D_{3/2}$	29.943	5.22[11]	1.41[-1]	2.77[-2]	28.542	5.91[11]	1.45[-1]	2.72[-2]
$p^2(^3P)s\ ^4P_{5/2}$	$sp(^3P)d\ ^2D_{5/2}$	29.824	8.99[11]	1.21[-1]	7.07[-2]	28.450	1.01[12]	1.22[-1]	6.89[-2]
$p^2(^3P)s\ ^4P_{3/2}$	$sp(^3P)d\ ^4P_{1/2}$	29.818	1.12[11]	7.52[-3]	2.96[-3]	28.416	1.36[11]	8.22[-3]	3.08[-3]
$p^2(^3P)s\ ^4P_{5/2}$	$sp(^3P)d\ ^4D_{7/2}$	29.592	7.58[11]	1.33[-1]	7.76[-2]	28.240	8.42[11]	1.35[-1]	7.49[-2]
$p^2(^1D)s\ ^2D_{3/2}$	$sp(^3P)d\ ^2D_{3/2}$	29.323	7.94[11]	1.03[-1]	3.95[-2]	27.969	9.07[11]	1.07[-1]	3.92[-2]
$p^2(^3P)s\ ^4P_{1/2}$	$p^2(^3P)p\ ^2P_{1/2}$	29.150	1.11[12]	1.41[-1]	2.72[-2]	27.832	1.23[12]	1.42[-1]	2.62[-2]
$p^2(^3P)s\ ^2P_{3/2}$	$sp(^1P)d\ ^2P_{1/2}$	28.921	9.99[10]	6.26[-3]	2.38[-3]	27.438	1.03[11]	5.81[-3]	2.11[-3]
$p^2(^3P)s\ ^4P_{3/2}$	$sp(^3P)d\ ^4D_{3/2}$	28.899	8.80[11]	1.11[-1]	4.19[-2]	27.599	9.84[11]	1.13[-1]	4.09[-2]
$p^2(^3P)s\ ^4P_{1/2}$	$sp(^3P)d\ ^4F_{3/2}$	28.851	1.44[12]	3.59[-1]	6.84[-2]	27.541	1.63[12]	3.70[-1]	6.71[-2]
$p^2(^3P)s\ ^4P_{3/2}$	$sp(^3P)d\ ^4D_{1/2}$	28.803	7.04[11]	4.38[-2]	1.66[-2]	27.509	7.69[11]	4.37[-2]	1.58[-2]
$p^2(^3P)s\ ^4P_{3/2}$	$sp(^3P)d\ ^2D_{5/2}$	28.744	3.27[11]	6.07[-2]	2.30[-2]	27.444	3.58[11]	6.07[-2]	2.20[-2]
$p^2(^1S)s\ ^2S_{1/2}$	$sp(^3P)d\ ^2P_{1/2}$	28.717	9.94[11]	1.23[-1]	2.33[-2]	27.423	1.12[12]	1.26[-1]	2.28[-2]

Lower level	Upper level	λ	A	f	S	λ	A	f	S
				Z=69				Z=70	
$p^2(^1S)s\ ^2S_{1/2}$	$p^2(^3P)p\ ^2P_{3/2}$	49.576	1.36[11]	1.00[-1]	3.28[-2]	48.093	1.47[11]	1.02[-1]	3.23[-2]
$p^2(^1D)s\ ^2D_{3/2}$	$sp(^3P)d\ ^4P_{5/2}$	48.760	1.06[11]	5.65[-2]	3.64[-2]	47.314	1.14[11]	5.75[-2]	3.57[-2]
$s^2(^1S)d\ ^2D_{5/2}$	$sp(^1P)d\ ^2F_{5/2}$	47.785	1.53[11]	5.24[-2]	4.95[-2]	46.373	1.64[11]	5.30[-2]	4.85[-2]
$p^2(^3P)s\ ^2P_{1/2}$	$sp(^1P)d\ ^2P_{1/2}$	47.546	2.88[11]	9.77[-2]	3.06[-2]	46.193	3.02[11]	9.67[-2]	2.94[-2]
$p^2(^3P)s\ ^4P_{5/2}$	$sp(^3P)d\ ^4F_{7/2}$	46.874	1.27[11]	5.56[-2]	5.16[-2]	45.532	1.36[11]	5.66[-2]	5.08[-2]
$s^2(^1S)p\ ^2P_{3/2}$	$p^2(^1D)s\ ^2D_{5/2}$	46.839	2.02[11]	1.00[-1]	6.16[-2]	45.467	2.17[11]	1.01[-1]	6.05[-2]
$s^2(^1S)d\ ^2D_{3/2}$	$sp(^1P)d\ ^2D_{5/2}$	46.575	4.00[11]	1.95[-1]	1.20[-1]	45.240	4.20[11]	1.93[-1]	1.15[-1]
$s^2(^1S)d\ ^2D_{5/2}$	$sp(^3P)d\ ^2F_{7/2}$	46.234	2.10[11]	9.00[-2]	8.21[-2]	44.838	2.27[11]	9.12[-2]	8.08[-2]
$p^2(^3P)s\ ^4P_{3/2}$	$sp(^3P)d\ ^4F_{5/2}$	46.146	1.96[11]	9.38[-2]	5.72[-2]	44.826	2.08[11]	9.38[-2]	5.55[-2]
$p^2(^3P)s\ ^2P_{1/2}$	$sp(^1P)d\ ^2P_{3/2}$	45.895	1.91[11]	1.20[-1]	3.64[-2]	44.590	2.01[11]	1.19[-1]	3.51[-2]
$s^2(^1S)d\ ^2D_{5/2}$	$sp(^1P)d\ ^2F_{7/2}$	43.471	2.17[11]	8.19[-2]	7.03[-2]	42.174	2.21[11]	7.87[-2]	6.54[-2]
$p^2(^1D)s\ ^2D_{5/2}$	$sp(^1P)d\ ^2F_{5/2}$	31.812	2.49[11]	3.77[-2]	2.38[-2]	30.177	2.73[11]	3.74[-2]	2.22[-2]
$s^2(^1S)p\ ^2P_{3/2}$	$s^2(^1S)d\ ^2D_{5/2}$	31.390	4.26[11]	9.42[-2]	3.90[-2]	29.791	4.68[11]	9.32[-2]	3.66[-2]
$p^2(^1S)s\ ^2S_{1/2}$	$sp(^3P)d\ ^4P_{3/2}$	31.199	6.84[11]	1.99[-1]	4.10[-2]	29.610	7.57[11]	1.99[-1]	3.89[-2]
$p^2(^1D)s\ ^2D_{5/2}$	$sp(^3P)d\ ^2F_{7/2}$	31.117	9.50[10]	1.83[-2]	1.13[-2]	29.520	1.01[11]	1.75[-2]	1.02[-2]
$p^2(^1D)s\ ^2D_{5/2}$	$sp(^3P)d\ ^2P_{3/2}$	30.924	1.43[11]	1.37[-2]	8.33[-3]	29.364	1.59[11]	1.37[-2]	7.92[-3]
$p^2(^1D)s\ ^2D_{3/2}$	$sp(^3P)d\ ^4D_{5/2}$	30.817	4.40[11]	9.43[-2]	3.83[-2]	29.262	4.86[11]	9.38[-2]	3.61[-2]
$p^2(^1D)s\ ^2D_{3/2}$	$sp(^3P)d\ ^4P_{3/2}$	30.504	1.94[11]	2.71[-2]	1.09[-2]	28.972	2.12[11]	2.67[-2]	1.02[-2]
$p^2(^3P)s\ ^2P_{3/2}$	$sp(^3P)d\ ^2D_{3/2}$	30.226	5.73[11]	7.90[-2]	3.14[-2]	28.697	6.47[11]	8.00[-2]	3.02[-2]
$p^2(^1S)s\ ^2S_{1/2}$	$sp(^3P)d\ ^4P_{1/2}$	30.058	1.73[11]	2.35[-2]	4.65[-3]	28.552	1.92[11]	2.35[-2]	4.41[-3]
$s^2(^1S)d\ ^2D_{3/2}$	$sp(^1P)d\ ^2D_{3/2}$	30.014	2.16[12]	2.91[-1]	1.15[-1]	28.526	2.41[12]	2.94[-1]	1.11[-1]
$p^2(^1D)s\ ^2D_{5/2}$	$sp(^1P)d\ ^2F_{7/2}$	29.841	1.11[12]	1.97[-1]	1.16[-1]	28.341	1.26[12]	2.03[-1]	1.14[-1]
$p^2(^3P)s\ ^4P_{1/2}$	$p^2(^3P)p\ ^2D_{3/2}$	29.692	1.53[11]	4.06[-2]	7.92[-3]	28.234	1.59[11]	3.79[-2]	7.05[-3]
$p^2(^3P)s\ ^2P_{1/2}$	$sp(^1P)d\ ^2D_{3/2}$	29.570	5.48[11]	1.44[-1]	2.80[-2]	28.117	6.11[11]	1.46[-1]	2.69[-2]
$s^2(^1S)p\ ^2P_{1/2}$	$p^2(^1D)s\ ^2D_{3/2}$	29.569	4.04[11]	1.06[-1]	2.06[-2]	28.106	4.46[11]	1.06[-1]	1.96[-2]
$p^2(^1D)s\ ^2D_{3/2}$	$sp(^3P)d\ ^4P_{1/2}$	29.412	9.81[11]	6.34[-2]	2.46[-2]	27.958	1.08[12]	6.34[-2]	2.34[-2]
$p^2(^3P)s\ ^4P_{5/2}$	$sp(^3P)d\ ^4D_{5/2}$	29.361	2.13[11]	2.76[-2]	1.60[-2]	27.930	2.32[11]	2.71[-2]	1.50[-2]
$p^2(^3P)s\ ^2P_{3/2}$	$sp(^3P)d\ ^2F_{5/2}$	29.276	2.22[12]	4.30[-1]	1.66[-1]	27.833	2.52[12]	4.40[-1]	1.61[-1]
$p^2(^3P)s\ ^4P_{5/2}$	$sp(^3P)d\ ^4P_{3/2}$	29.077	1.64[11]	1.39[-2]	7.95[-3]	27.666	1.86[11]	1.43[-2]	7.80[-3]
$p^2(^3P)s\ ^2P_{3/2}$	$sp(^3P)d\ ^2P_{1/2}$	28.969	1.82[12]	1.15[-1]	4.36[-2]	27.556	2.04[12]	1.16[-1]	4.21[-2]
$s^2(^1S)p\ ^2P_{1/2}$	$p^2(^1S)s\ ^2S_{1/2}$	28.944	1.57[12]	1.98[-1]	3.76[-2]	27.531	1.75[12]	2.00[-1]	3.62[-2]
$s^2(^1S)p\ ^2P_{3/2}$	$p^2(^3P)s\ ^2P_{1/2}$	28.925	1.13[12]	7.08[-2]	2.70[-2]	27.515	1.26[12]	7.18[-2]	2.60[-2]
$p^2(^3P)s\ ^4P_{1/2}$	$p^2(^3P)p\ ^4S_{3/2}$	28.784	1.78[11]	4.41[-2]	8.36[-3]	27.418	2.07[11]	4.65[-2]	8.39[-3]
$p^2(^1D)s\ ^2D_{5/2}$	$sp(^1P)d\ ^2P_{3/2}$	28.562	1.43[12]	1.17[-1]	6.57[-2]	27.192	1.61[12]	1.19[-1]	6.36[-2]
$s^2(^1S)p\ ^2P_{3/2}$	$s^2(^1S)d\ ^2D_{3/2}$	28.512	2.30[12]	2.80[-1]	1.05[-1]	27.135	2.57[12]	2.84[-1]	1.01[-1]
$p^2(^1D)s\ ^2D_{3/2}$	$sp(^3P)d\ ^4D_{1/2}$	28.459	1.59[11]	9.62[-3]	3.62[-3]	27.114	1.94[11]	1.08[-2]	3.83[-3]
$p^2(^1D)s\ ^2D_{5/2}$	$sp(^1P)d\ ^2D_{5/2}$	28.414	1.22[12]	1.47[-1]	8.27[-2]	27.054	1.37[12]	1.50[-1]	8.06[-2]
$p^2(^1D)s\ ^2D_{3/2}$	$sp(^3P)d\ ^2D_{5/2}$	28.378	1.58[11]	2.86[-2]	1.07[-2]	27.034	1.85[11]	3.05[-2]	1.08[-2]
$p^2(^3P)s\ ^4P_{3/2}$	$sp(^3P)d\ ^4P_{3/2}$	28.005	7.12[11]	8.41[-2]	3.10[-2]	26.673	7.95[11]	8.51[-2]	2.98[-2]
$s^2(^1S)d\ ^2D_{5/2}$	$sp(^1P)d\ ^2D_{3/2}$	27.372	5.12[11]	3.83[-2]	2.07[-2]	26.082	5.75[11]	3.93[-2]	2.02[-2]
$p^2[^3P)s\ ^4P_{5/2}$	$sp(^3P)d\ ^4D_{3/2}$	27.304	1.48[11]	1.10[-2]	5.92[-3]	26.052	1.60[11]	1.09[-2]	5.58[-3]
$p^2(^1S)s\ ^2S_{1/2}$	$sp(^3P)d\ ^2D_{3/2}$	27.210	6.71[11]	1.50[-1]	2.68[-2]	25.942	7.60[11]	1.54[-1]	2.63[-2]
$p^2(^3P)s\ ^4P_{5/2}$	$sp(^3P)d\ ^2D_{5/2}$	27.139	1.14[12]	1.25[-1]	6.72[-2]	25.894	1.27[12]	1.28[-1]	6.55[-2]
$p^2(^3P)s\ ^4P_{3/2}$	$sp(^3P)d\ ^4P_{1/2}$	27.082	1.64[11]	9.01[-3]	3.22[-3]	25.812	1.98[11]	9.90[-3]	3.37[-3]
$p^2(^3P)s\ ^4P_{5/2}$	$sp(^3P)d\ ^4D_{7/2}$	26.949	9.37[11]	1.36[-1]	7.24[-2]	25.725	1.04[12]	1.38[-1]	7.00[-2]
$p^2(^1D)s\ ^2D_{3/2}$	$sp(^3P)d\ ^2D_{3/2}$	26.680	1.04[12]	1.10[-1]	3.87[-2]	25.451	1.17[12]	1.14[-1]	3.83[-2]
$p^2(^3P)s\ ^4P_{1/2}$	$p^2(^3P)p\ ^2P_{1/2}$	26.573	1.37[12]	1.44[-1]	2.52[-2]	25.371	1.50[12]	1.45[-1]	2.43[-2]
$p^2(^3P)s\ ^4P_{3/2}$	$sp(^3P)d\ ^4D_{3/2}$	26.357	1.11[12]	1.16[-1]	4.01[-2]	25.170	1.25[12]	1.19[-1]	3.92[-2]
$p^2(^3P)s\ ^4P_{1/2}$	$sp(^3P)d\ ^4F_{3/2}$	26.291	1.84[12]	3.80[-1]	6.59[-2]	25.097	2.07[12]	3.91[-1]	6.47[-2]
$p^2(^3P)s\ ^4P_{3/2}$	$sp(^3P)d\ ^4D_{1/2}$	26.272	8.39[11]	4.34[-2]	1.50[-2]	25.090	9.13[11]	4.31[-2]	1.43[-2]
$p^2(^3P)s\ ^4P_{3/2}$	$sp(^3P)d\ ^2D_{5/2}$	26.203	3.94[11]	6.12[-2]	2.11[-2]	25.022	4.33[11]	6.12[-2]	2.01[-2]

Lower level	Upper level	λ	A	f	S	λ	A	f	S
				Z=71				Z=72	
$p^2(^1S)s\ ^2S_{1/2}$	$p^2(^3P)p\ ^2P_{3/2}$	46.661	1.58[11]	1.03[-1]	3.17[-2]	45.274	1.70[11]	1.04[-1]	3.11[-2]
$p^2(^1D)s\ ^2D_{3/2}$	$sp(^3P)d\ ^4P_{5/2}$	45.883	1.22[11]	5.80[-2]	3.50[-2]	44.511	1.30[11]	5.85[-2]	3.42[-2]
$s^2(^1S)d\ ^2D_{5/2}$	$sp(^1P)d\ ^2F_{5/2}$	45.005	1.76[11]	5.34[-2]	4.74[-2]	43.681	1.87[11]	5.37[-2]	4.63[-2]
$p^2(^3P)s\ ^2P_{1/2}$	$sp(^1P)d\ ^2P_{1/2}$	44.879	3.16[11]	9.57[-2]	2.83[-2]	43.601	3.32[11]	9.48[-2]	2.72[-2]
$p^2(^3P)s\ ^4P_{5/2}$	$sp(^3P)d\ ^4F_{7/2}$	44.166	1.47[11]	5.73[-2]	4.99[-2]	42.875	1.58[11]	5.79[-2]	4.91[-2]
$s^2(^1S)p\ ^2P_{3/2}$	$p^2(^1D)s\ ^2D_{5/2}$	44.138	2.33[11]	1.01[-1]	5.93[-2]	42.852	2.49[11]	1.02[-1]	5.80[-2]
$s^2(^1S)d\ ^2D_{3/2}$	$sp(^1P)d\ ^2D_{5/2}$	43.960	4.42[11]	1.92[-1]	1.11[-1]	42.707	4.62[11]	1.90[-1]	1.07[-1]
$s^2(^1S)d\ ^2D_{5/2}$	$sp(^3P)d\ ^2F_{7/2}$	43.625	2.43[11]	9.23[-2]	7.95[-2]	42.378	2.59[11]	9.33[-2]	7.80[-2]
$p^2(^3P)s\ ^4P_{3/2}$	$sp(^3P)d\ ^4F_{5/2}$	43.531	2.20[11]	9.39[-2]	5.39[-2]	42.281	2.34[11]	9.44[-2]	5.24[-2]
$p^2(^3P)s\ ^2P_{1/2}$	$sp(^1P)d\ ^2P_{3/2}$	43.323	2.10[11]	1.19[-1]	3.38[-2]	42.092	2.22[11]	1.18[-1]	3.27[-2]
$s^2(^1S)d\ ^2D_{5/2}$	$sp(^1P)d\ ^2F_{7/2}$	41.036	2.24[11]	7.53[-2]	6.11[-2]	39.874	2.29[11]	7.26[-2]	5.72[-2]
$p^2(^1D)s\ ^2D_{5/2}$	$sp(^1P)d\ ^2F_{5/2}$	28.628	3.00[11]	3.70[-2]	2.09[-2]	27.163	3.29[11]	3.64[-2]	1.96[-2]
$s^2(^1S)p\ ^2P_{3/2}$	$s^2(^1S)d\ ^2D_{5/2}$	28.275	5.13[11]	9.27[-2]	3.45[-2]	26.840	5.68[11]	9.22[-2]	3.25[-2]
$p^2(^1S)s\ ^2S_{1/2}$	$sp(^3P)d\ ^4P_{3/2}$	28.106	8.40[11]	1.99[-1]	3.69[-2]	26.681	9.33[11]	1.99[-1]	3.51[-2]
$p^2(^1D)s\ ^2D_{5/2}$	$sp(^3P)d\ ^2F_{7/2}$	28.063	1.05[11]	1.66[-2]	9.20[-3]	26.653	1.12[11]	1.59[-2]	8.36[-3]
$p^2(^1D)s\ ^2D_{5/2}$	$sp(^3P)d\ ^2P_{3/2}$	27.884	1.76[11]	1.37[-2]	7.53[-3]	26.481	1.96[11]	1.37[-2]	7.18[-3]
$p^2(^1D)s\ ^2D_{3/2}$	$sp(^3P)d\ ^4D_{5/2}$	27.787	5.35[11]	9.28[-2]	3.40[-2]	26.391	5.90[11]	9.23[-2]	3.21[-2]
$p^2(^1D)s\ ^2D_{3/2}$	$sp(^3P)d\ ^4P_{3/2}$	27.519	2.33[11]	2.64[-2]	9.57[-3]	26.141	2.56[11]	2.62[-2]	9.01[-3]
$p^2(^3P)s\ ^2P_{3/2}$	$sp(^3P)d\ ^2D_{3/2}$	27.251	7.25[11]	8.09[-2]	2.91[-2]	25.883	8.13[11]	8.19[-2]	2.79[-2]
$p^2(^1S)s\ ^2S_{1/2}$	$sp(^3P)d\ ^4P_{1/2}$	27.126	2.13[11]	2.34[-2]	4.18[-3]	25.776	2.34[11]	2.33[-2]	3.95[-3]
$s^2(^1S)d\ ^2D_{3/2}$	$sp(^1P)d\ ^2D_{3/2}$	27.113	2.69[12]	2.97[-1]	1.06[-1]	25.771	3.02[12]	3.00[-1]	1.02[-1]
$p^2(^1D)s\ ^2D_{5/2}$	$sp(^1P)d\ ^2F_{7/2}$	26.969	1.44[12]	2.09[-1]	1.11[-1]	25.641	1.63[12]	2.15[-1]	1.09[-1]
$p^2(^3P)s\ ^4P_{1/2}$	$p^2(^3P)p\ ^2D_{3/2}$	26.852	1.63[11]	3.52[-2]	6.22[-3]	25.540	1.65[11]	3.24[-2]	5.45[-3]
$p^2(^3P)s\ ^2P_{1/2}$	$sp(^1P)d\ ^2D_{3/2}$	26.737	6.84[11]	1.48[-1]	2.59[-2]	25.426	7.67[11]	1.49[-1]	2.49[-2]
$s^2(^1S)p\ ^2P_{1/2}$	$p^2(^1D)s\ ^2D_{3/2}$	26.719	4.93[11]	1.05[-1]	1.86[-2]	25.404	5.42[11]	1.05[-1]	1.76[-2]
$p^2(^1D)s\ ^2D_{3/2}$	$sp(^3P)d\ ^4P_{1/2}$	26.579	1.20[12]	6.34[-2]	2.22[-2]	25.271	1.31[12]	6.29[-2]	2.10[-2]
$p^2(^3P)s\ ^4P_{5/2}$	$sp(^3P)d\ ^4D_{5/2}$	26.570	2.52[11]	2.66[-2]	1.40[-2]	25.278	2.72[11]	2.61[-2]	1.30[-2]
$p^2(^3P)s\ ^2P_{3/2}$	$sp(^3P)d\ ^2F_{5/2}$	26.487	2.84[12]	4.49[-1]	1.57[-1]	25.197	3.21[12]	4.59[-1]	1.52[-1]
$p^2(^3P)s\ ^4P_{5/2}$	$sp(^3P)d\ ^4P_{3/2}$	26.324	2.12[11]	1.47[-2]	7.64[-3]	25.049	2.41[11]	1.52[-2]	7.49[-3]
$p^2(^3P)s\ ^2P_{3/2}$	$sp(^3P)d\ ^2P_{1/2}$	26.214	2.28[12]	1.18[-1]	4.07[-2]	24.939	2.57[12]	1.20[-1]	3.93[-2]
$s^2(^1S)p\ ^2P_{1/2}$	$p^2(^1S)s\ ^2S_{1/2}$	26.188	1.97[12]	2.02[-1]	3.48[-2]	24.914	2.19[12]	2.05[-1]	3.36[-2]
$s^2(^1S)p\ ^2P_{3/2}$	$p^2(^3P)s\ ^2P_{1/2}$	26.176	1.42[12]	7.28[-2]	2.51[-2]	24.905	1.58[12]	7.38[-2]	2.42[-2]
$p^2(^3P)s\ ^4P_{1/2}$	$p^2(^3P)p\ ^4S_{3/2}$	26.116	2.39[11]	4.89[-2]	8.40[-3]	24.877	2.76[11]	5.12[-2]	8.38[-3]
$p^2(^1D)s\ ^2D_{5/2}$	$sp(^1P)d\ ^2P_{3/2}$	25.887	1.80[12]	1.21[-1]	6.15[-2]	24.646	2.01[12]	1.23[-1]	5.95[-2]
$p^2(^1D)s\ ^2D_{3/2}$	$sp(^3P)d\ ^4D_{1/2}$	25.832	2.40[11]	1.21[-2]	4.08[-3]	24.612	2.97[11]	1.36[-2]	4.38[-3]
$s^2(^1S)p\ ^2P_{3/2}$	$s^2(^1S)d\ ^2D_{3/2}$	25.826	2.88[12]	2.87[-1]	9.78[-2]	24.583	3.22[12]	2.91[-1]	9.42[-2]
$p^2(^1D)s\ ^2D_{5/2}$	$sp(^1P)d\ ^2D_{5/2}$	25.765	1.55[12]	1.54[-1]	7.84[-2]	24.535	1.74[12]	1.57[-1]	7.62[-2]
$p^2(^1D)s\ ^2D_{3/2}$	$sp(^3P)d\ ^2D_{5/2}$	25.744	2.17[11]	3.25[-2]	1.10[-2]	24.521	2.54[11]	3.44[-2]	1.11[-2]
$p^2(^3P)s\ ^4P_{3/2}$	$sp(^3P)d\ ^4P_{3/2}$	25.405	8.82[11]	8.56[-2]	2.86[-2]	24.198	9.80[11]	8.61[-2]	2.75[-2]
$p^2[^3P)s\ ^4P_{5/2}$	$sp(^3P)d\ ^4D_{3/2}$	24.857	1.74[11]	1.07[-2]	5.26[-3]	23.717	1.89[11]	1.06[-2]	4.96[-3]
$s^2(^1S)d\ ^2D_{5/2}$	$sp(^1P)d\ ^2D_{3/2}$	24.853	6.53[11]	4.02[-2]	1.98[-2]	23.683	7.35[11]	4.12[-2]	1.93[-2]
$p^2(^1S)s\ ^2S_{1/2}$	$sp(^3P)d\ ^2D_{3/2}$	24.735	8.64[11]	1.59[-1]	2.58[-2]	23.587	9.73[11]	1.63[-1]	2.53[-2]
$p^2(^3P)s\ ^4P_{5/2}$	$sp(^3P)d\ ^2D_{5/2}$	24.695	1.43[12]	1.31[-1]	6.39[-2]	23.557	1.61[12]	1.34[-1]	6.24[-2]
$p^2(^3P)s\ ^4P_{3/2}$	$sp(^3P)d\ ^4P_{1/2}$	24.602	2.41[11]	1.10[-2]	3.55[-3]	23.451	2.95[11]	1.22[-2]	3.76[-3]
$p^2(^3P)s\ ^4P_{5/2}$	$sp(^3P)d\ ^4D_{7/2}$	24.543	1.16[12]	1.40[-1]	6.76[-2]	23.423	1.29[12]	1.42[-1]	6.54[-2]
$p^2(^1D)s\ ^2D_{3/2}$	$sp(^3P)d\ ^2D_{3/2}$	24.280	1.34[12]	1.17[-1]	3.77[-2]	23.163	1.52[12]	1.21[-1]	3.72[-2]
$p^2(^3P)s\ ^4P_{1/2}$	$p^2(^3P)p\ ^2P_{1/2}$	24.223	1.67[12]	1.47[-1]	2.35[-2]	23.126	1.86[12]	1.49[-1]	2.27[-2]
$p^2(^3P)s\ ^4P_{3/2}$	$sp(^3P)d\ ^4D_{3/2}$	24.036	1.41[12]	1.22[-1]	3.85[-2]	22.953	1.58[12]	1.26[-1]	3.78[-2]
$p^2(^3P)s\ ^4P_{3/2}$	$sp(^3P)d\ ^4D_{1/2}$	23.961	9.90[11]	4.28[-2]	1.35[-2]	22.882	1.07[12]	4.23[-2]	1.27[-2]
$p^2(^3P)s\ ^4P_{1/2}$	$sp(^3P)d\ ^4F_{3/2}$	23.958	2.34[12]	4.03[-1]	6.36[-2]	22.871	2.65[12]	4.14[-1]	6.24[-2]
$p^2(^3P)s\ ^4P_{3/2}$	$sp(^3P)d\ ^2D_{5/2}$	23.885	4.76[11]	6.12[-2]	1.93[-2]	22.803	5.25[11]	6.12[-2]	1.84[-2]

Lower level	Upper level	λ	A	f	S	λ	A	f	S
				Z=73				Z=74	
$p^2(^1S)s\ ^2S_{1/2}$	$p^2(^3P)p\ ^2P_{3/2}$	43.932	1.82[11]	1.05[-1]	3.05[-2]	42.632	1.95[11]	1.06[-1]	2.98[-2]
$p^2(^1D)s\ ^2D_{3/2}$	$sp(^3P)d\ ^4P_{5/2}$	43.180	1.40[11]	5.90[-2]	3.34[-2]	41.890	1.50[11]	5.90[-2]	3.26[-2]
$s^2(^1S)d\ ^2D_{5/2}$	$sp(^1P)d\ ^2F_{5/2}$	42.399	2.00[11]	5.40[-2]	4.51[-2]	41.157	2.13[11]	5.40[-2]	4.39[-2]
$p^2(^3P)s\ ^2P_{1/2}$	$sp(^1P)d\ ^2P_{1/2}$	42.359	3.49[11]	9.39[-2]	2.62[-2]	41.151	3.67[11]	9.31[-2]	2.52[-2]
$p^2(^3P)s\ ^4P_{5/2}$	$sp(^3P)d\ ^4F_{7/2}$	41.624	1.69[11]	5.86[-2]	4.83[-2]	40.411	1.82[11]	5.96[-2]	4.75[-2]
$s^2(^1S)p\ ^2P_{3/2}$	$p^2(^1D)s\ ^2D_{5/2}$	41.606	2.66[11]	1.03[-1]	5.67[-2]	40.398	2.84[11]	1.04[-1]	5.54[-2]
$s^2(^1S)d\ ^2D_{3/2}$	$sp(^1P)d\ ^2D_{5/2}$	41.480	4.85[11]	1.89[-1]	1.03[-1]	40.080	4.38[11]	1.58[-1]	8.36[-2]
$s^2(^1S)d\ ^2D_{5/2}$	$sp(^3P)d\ ^2F_{7/2}$	41.169	2.77[11]	9.40[-2]	7.65[-2]	39.994	2.97[11]	9.50[-2]	7.50[-2]
$p^2(^3P)s\ ^4P_{3/2}$	$sp(^3P)d\ ^4F_{5/2}$	41.067	2.48[11]	9.44[-2]	5.09[-2]	39.889	2.64[11]	9.44[-2]	4.95[-2]
$p^2(^3P)s\ ^2P_{1/2}$	$sp(^1P)d\ ^2P_{3/2}$	40.896	2.34[11]	1.17[-1]	3.16[-2]	39.734	2.47[11]	1.17[-1]	3.05[-2]
$s^2(^1S)d\ ^2D_{5/2}$	$sp(^1P)d\ ^2F_{7/2}$	38.747	2.33[11]	7.00[-2]	5.37[-2]	37.653	2.39[11]	6.81[-2]	5.05[-2]
$p^2(^1D)s\ ^2D_{5/2}$	$sp(^1P)d\ ^2F_{5/2}$	25.776	3.64[11]	3.60[-2]	1.84[-2]	24.464	4.00[11]	3.60[-2]	1.74[-2]
$s^2(^1S)p\ ^2P_{3/2}$	$s^2(^1S)d\ ^2D_{5/2}$	25.481	6.26[11]	9.17[-2]	3.08[-2]	24.194	6.95[11]	9.17[-2]	2.92[-2]
$p^2(^1S)s\ ^2S_{1/2}$	$sp(^3P)d\ ^4P_{3/2}$	25.332	1.04[12]	1.99[-1]	3.33[-2]	24.055	1.15[12]	2.00[-1]	3.17[-2]
$p^2(^1D)s\ ^2D_{5/2}$	$sp(^3P)d\ ^2F_{7/2}$	25.316	1.19[11]	1.53[-2]	7.62[-3]	24.048	1.27[11]	1.47[-2]	6.98[-3]
$p^2(^1D)s\ ^2D_{5/2}$	$sp(^3P)d\ ^2P_{3/2}$	25.152	2.18[11]	1.38[-2]	6.84[-3]	23.892	2.42[11]	1.39[-2]	6.53[-3]
$p^2(^1D)s\ ^2D_{3/2}$	$sp(^3P)d\ ^4D_{5/2}$	25.068	6.48[11]	9.18[-2]	3.02[-2]	23.814	7.11[11]	9.08[-2]	2.85[-2]
$p^2(^1D)s\ ^2D_{3/2}$	$sp(^3P)d\ ^4P_{3/2}$	24.834	2.81[11]	2.60[-2]	8.50[-3]	23.595	3.09[11]	2.58[-2]	8.03[-3]
$p^2(^3P)s\ ^2P_{3/2}$	$sp(^3P)d\ ^2D_{3/2}$	24.588	9.11[11]	8.29[-2]	2.68[-2]	23.364	1.02[12]	8.34[-2]	2.57[-2]
$p^2(^1S)s\ ^2S_{1/2}$	$sp(^3P)d\ ^4P_{1/2}$	24.496	2.57[11]	2.30[-2]	3.72[-3]	23.284	2.80[11]	2.28[-2]	3.50[-3]
$s^2(^1S)d\ ^2D_{3/2}$	$sp(^1P)d\ ^2D_{3/2}$	24.494	3.36[12]	3.02[-1]	9.75[-2]	23.213	3.25[12]	2.63[-1]	8.04[-2]
$p^2(^1D)s\ ^2D_{5/2}$	$sp(^1P)d\ ^2F_{7/2}$	24.379	1.85[12]	2.21[-1]	1.06[-1]	23.182	2.11[12]	2.26[-1]	1.03[-1]
$p^2(^3P)s\ ^4P_{1/2}$	$p^2(^3P)p\ ^2D_{3/2}$	24.295	1.68[11]	2.96[-2]	4.73[-3]	23.114	1.68[11]	2.68[-2]	4.08[-3]
$p^2(^3P)s\ ^2P_{1/2}$	$sp(^1P)d\ ^2D_{3/2}$	24.181	8.59[11]	1.51[-1]	2.40[-2]	22.999	9.62[11]	1.53[-1]	2.31[-2]
$s^2(^1S)p\ ^2P_{1/2}$	$p^2(^1D)s\ ^2D_{3/2}$	24.157	5.96[11]	1.04[-1]	1.66[-2]	22.975	6.55[11]	1.03[-1]	1.57[-2]
$p^2(^3P)s\ ^4P_{5/2}$	$sp(^3P)d\ ^4D_{5/2}$	24.051	2.93[11]	2.54[-2]	1.21[-2]	22.886	3.15[11]	2.47[-2]	1.12[-2]
$p^2(^1D)s\ ^2D_{3/2}$	$sp(^3P)d\ ^4P_{1/2}$	24.030	1.44[12]	6.24[-2]	1.98[-2]	22.853	1.58[12]	6.14[-2]	1.85[-2]
$p^2(^3P)s\ ^2P_{3/2}$	$sp(^3P)d\ ^2F_{5/2}$	23.971	3.63[12]	4.68[-1]	1.48[-1]	22.808	4.09[12]	4.78[-1]	1.43[-1]
$p^2(^3P)s\ ^4P_{5/2}$	$sp(^3P)d\ ^4P_{3/2}$	23.836	2.74[11]	1.56[-2]	7.34[-3]	22.683	3.12[11]	1.60[-2]	7.20[-3]
$p^2(^3P)s\ ^2P_{3/2}$	$sp(^3P)d\ ^2P_{1/2}$	23.729	2.88[12]	1.22[-1]	3.80[-2]	22.580	3.23[12]	1.24[-1]	3.68[-2]
$s^2(^1S)p\ ^2P_{1/2}$	$p^2(^1S)s\ ^2S_{1/2}$	23.703	2.45[12]	2.07[-1]	3.23[-2]	22.555	2.75[12]	2.10[-1]	3.12[-2]
$s^2(^1S)p\ ^2P_{3/2}$	$p^2(^3P)s\ ^2P_{1/2}$	23.697	1.78[12]	7.48[-2]	2.33[-2]	22.550	1.98[12]	7.58[-2]	2.25[-2]
$p^2(^3P)s\ ^4P_{1/2}$	$p^2(^3P)p\ ^4S_{3/2}$	23.696	3.17[11]	5.34[-2]	8.33[-3]	22.571	3.63[11]	5.54[-2]	8.24[-3]
$p^2(^1D)s\ ^2D_{5/2}$	$sp(^1P)d\ ^2P_{3/2}$	23.465	2.26[12]	1.25[-1]	5.76[-2]	22.342	2.53[12]	1.27[-1]	5.57[-2]
$p^2(^1D)s\ ^2D_{3/2}$	$sp(^3P)d\ ^4D_{1/2}$	23.450	3.70[11]	1.54[-2]	4.72[-3]	22.344	4.63[11]	1.74[-2]	5.11[-3]
$s^2(^1S)p\ ^2P_{3/2}$	$s^2(^1S)d\ ^2D_{3/2}$	23.404	3.57[12]	2.94[-1]	9.05[-2]	22.348	3.37[12]	2.53[-1]	7.43[-2]
$p^2(^1D)s\ ^2D_{5/2}$	$sp(^1P)d\ ^2D_{5/2}$	23.364	1.96[12]	1.60[-1]	7.41[-2]	22.251	2.21[12]	1.64[-1]	7.21[-2]
$p^2(^1D)s\ ^2D_{3/2}$	$sp(^3P)d\ ^2D_{5/2}$	23.357	2.98[11]	3.66[-2]	1.13[-2]	22.250	3.48[11]	3.89[-2]	1.14[-2]
$p^2(^3P)s\ ^4P_{3/2}$	$sp(^3P)d\ ^4P_{3/2}$	23.049	1.09[12]	8.66[-2]	2.63[-2]	21.955	1.20[12]	8.71[-2]	2.52[-2]
$p^2[^3P)s\ ^4P_{5/2}$	$sp(^3P)d\ ^4D_{3/2}$	22.629	2.04[11]	1.05[-2]	4.67[-3]	21.590	2.21[11]	1.03[-2]	4.40[-3]
$s^2(^1S)d\ ^2D_{5/2}$	$sp(^1P)d\ ^2D_{3/2}$	22.569	8.32[11]	4.22[-2]	1.89[-2]	21.509	9.39[11]	4.32[-2]	1.84[-2]
$p^2(^1S)s\ ^2S_{1/2}$	$sp(^3P)d\ ^2D_{3/2}$	22.493	1.10[12]	1.68[-1]	2.48[-2]	21.452	1.25[12]	1.73[-1]	2.43[-2]
$p^2(^3P)s\ ^4P_{5/2}$	$sp(^3P)d\ ^2D_{5/2}$	22.472	1.81[12]	1.37[-1]	6.09[-2]	21.437	2.03[12]	1.40[-1]	5.94[-2]
$p^2(^3P)s\ ^4P_{3/2}$	$sp(^3P)d\ ^4P_{1/2}$	22.354	3.63[11]	1.36[-2]	4.00[-3]	21.311	4.48[11]	1.53[-2]	4.28[-3]
$p^2(^3P)s\ ^4P_{5/2}$	$sp(^3P)d\ ^4D_{7/2}$	22.353	1.44[12]	1.44[-1]	6.33[-2]	21.333	1.60[12]	1.46[-1]	6.13[-2]
$p^2(^1D)s\ ^2D_{3/2}$	$sp(^3P)d\ ^2D_{3/2}$	22.100	1.72[12]	1.26[-1]	3.66[-2]	21.086	1.95[12]	1.30[-1]	3.61[-2]
$p^2(^3P)s\ ^4P_{1/2}$	$p^2(^3P)p\ ^2P_{1/2}$	22.079	2.06[12]	1.51[-1]	2.19[-2]	21.079	2.29[12]	1.53[-1]	2.12[-2]
$p^2(^3P)s\ ^4P_{3/2}$	$sp(^3P)d\ ^4D_{3/2}$	21.918	1.78[12]	1.29[-1]	3.71[-2]	20.930	2.02[12]	1.33[-1]	3.65[-2]
$p^2(^3P)s\ ^4P_{3/2}$	$sp(^3P)d\ ^4D_{1/2}$	21.852	1.16[12]	4.15[-2]	1.19[-2]	20.868	1.24[12]	4.06[-2]	1.11[-2]
$p^2(^3P)s\ ^4P_{1/2}$	$sp(^3P)d\ ^4F_{3/2}$	21.833	2.98[12]	4.26[-1]	6.13[-2]	20.843	3.37[12]	4.39[-1]	6.02[-2]

Lower level	Upper level	λ	A	f	S	λ	A	f	S
				$Z{=}75$				$Z{=}76$	
$p^2(^1S)s\ ^2S_{1/2}$	$p^2(^3P)p\ ^2P_{3/2}$	41.373	2.08[11]	1.07[-1]	2.91[-2]	40.151	2.23[11]	1.07[-1]	2.84[-2]
$p^2(^1D)s\ ^2D_{3/2}$	$sp(^3P)d\ ^4P_{5/2}$	40.638	1.59[11]	5.94[-2]	3.18[-2]	39.432	1.71[11]	5.99[-2]	3.10[-2]
$p^2(^3P)s\ ^2P_{1/2}$	$sp(^1P)d\ ^2P_{1/2}$	39.977	3.84[11]	9.22[-2]	2.43[-2]	38.835	4.04[11]	9.15[-2]	2.34[-2]
$s^2(^1S)d\ ^2D_{5/2}$	$sp(^1P)d\ ^2F_{5/2}$	39.954	2.27[11]	5.44[-2]	4.28[-2]	38.786	2.40[11]	5.44[-2]	4.16[-2]
$p^2(^3P)s\ ^4P_{5/2}$	$sp(^3P)d\ ^4F_{7/2}$	39.234	1.96[11]	6.03[-2]	4.67[-2]	38.112	2.10[11]	6.08[-2]	4.59[-2]
$s^2(^1S)p\ ^2P_{3/2}$	$p^2(^1D)s\ ^2D_{5/2}$	39.227	3.02[11]	1.04[-1]	5.41[-2]	38.092	3.22[11]	1.05[-1]	5.28[-2]
$s^2(^1S)d\ ^2D_{5/2}$	$sp(^3P)d\ ^2F_{7/2}$	38.853	3.16[11]	9.56[-2]	7.34[-2]	37.702	3.39[11]	9.64[-2]	7.19[-2]
$p^2(^3P)s\ ^4P_{3/2}$	$sp(^3P)d\ ^4F_{5/2}$	38.745	2.79[11]	9.44[-2]	4.82[-2]	37.637	2.97[11]	9.43[-2]	4.69[-2]
$p^2(^3P)s\ ^2P_{1/2}$	$sp(^1P)d\ ^2P_{3/2}$	38.604	2.60[11]	1.16[-1]	2.95[-2]	37.507	2.74[11]	1.16[-1]	2.86[-2]
$s^2(^1S)d\ ^2D_{5/2}$	$sp(^1P)d\ ^2F_{7/2}$	36.592	2.46[11]	6.61[-2]	4.77[-2]	35.519	2.54[11]	6.42[-2]	4.50[-2]
$p^2(^1D)s\ ^2D_{5/2}$	$sp(^1P)d\ ^2F_{5/2}$	23.221	4.42[11]	3.57[-2]	1.64[-2]	22.046	4.88[11]	3.57[-2]	1.55[-2]
$s^2(^1S)p\ ^2P_{3/2}$	$s^2(^1S)d\ ^2D_{5/2}$	22.974	7.73[11]	9.17[-2]	2.78[-2]	21.820	8.58[11]	9.22[-2]	2.65[-2]
$p^2(^1S)s\ ^2S_{1/2}$	$sp(^3P)d\ ^4P_{3/2}$	22.846	1.29[12]	2.00[-1]	3.02[-2]	21.700	1.43[12]	2.01[-1]	2.88[-2]
$p^2(^1D)s\ ^2D_{5/2}$	$sp(^3P)d\ ^2F_{7/2}$	22.845	1.36[11]	1.42[-2]	6.40[-3]	21.691	1.47[11]	1.38[-2]	5.89[-3]
$p^2(^1D)s\ ^2D_{5/2}$	$sp(^3P)d\ ^2P_{3/2}$	22.698	2.70[11]	1.39[-2]	6.24[-3]	21.566	3.01[11]	1.40[-2]	5.96[-3]
$p^2(^1D)s\ ^2D_{3/2}$	$sp(^3P)d\ ^4D_{5/2}$	22.626	7.82[11]	8.98[-2]	2.68[-2]	21.501	8.58[11]	8.93[-2]	2.53[-2]
$p^2(^1D)s\ ^2D_{3/2}$	$sp(^3P)d\ ^4P_{3/2}$	22.420	3.41[11]	2.58[-2]	7.61[-3]	21.307	3.77[11]	2.57[-2]	7.21[-3]
$p^2(^3P)s\ ^2P_{3/2}$	$sp(^3P)d\ ^2D_{3/2}$	22.204	1.14[12]	8.39[-2]	2.45[-2]	21.105	1.26[12]	8.44[-2]	2.35[-2]
$p^2(^1S)s\ ^2S_{1/2}$	$sp(^3P)d\ ^4P_{1/2}$	22.135	3.05[11]	2.24[-2]	3.26[-3]	21.046	3.29[11]	2.19[-2]	3.03[-3]
$p^2(^1D)s\ ^2D_{5/2}$	$sp(^1P)d\ ^2F_{7/2}$	22.044	2.38[12]	2.32[-1]	1.01[-1]	20.951	2.71[12]	2.37[-1]	9.82[-2]
$p^2(^3P)s\ ^4P_{1/2}$	$p^2(^3P)p\ ^2D_{3/2}$	21.993	1.66[11]	2.40[-2]	3.48[-3]	20.929	1.63[11]	2.14[-2]	2.95[-3]
$p^2(^3P)s\ ^2P_{1/2}$	$sp(^1P)d\ ^2D_{3/2}$	21.876	1.08[12]	1.55[-1]	2.23[-2]	20.811	1.20[12]	1.56[-1]	2.15[-2]
$s^2(^1S)p\ ^2P_{1/2}$	$p^2(^1D)s\ ^2D_{3/2}$	21.853	7.18[11]	1.03[-1]	1.48[-2]	20.788	7.87[11]	1.02[-1]	1.39[-2]
$p^2(^3P)s\ ^4P_{5/2}$	$sp(^3P)d\ ^4D_{5/2}$	21.778	3.36[11]	2.39[-2]	1.03[-2]	20.727	3.60[11]	2.32[-2]	9.46[-3]
$p^2(^1D)s\ ^2D_{3/2}$	$sp(^3P)d\ ^4P_{1/2}$	21.735	1.70[12]	6.05[-2]	1.73[-2]	20.675	1.82[12]	5.85[-2]	1.59[-2]
$p^2(^3P)s\ ^2P_{3/2}$	$sp(^3P)d\ ^2F_{5/2}$	21.703	4.60[12]	4.88[-1]	1.39[-1]	20.648	5.19[12]	4.96[-1]	1.35[-1]
$p^2(^3P)s\ ^4P_{5/2}$	$sp(^3P)d\ ^4P_{3/2}$	21.587	3.56[11]	1.65[-2]	7.06[-3]	20.546	4.05[11]	1.70[-2]	6.94[-3]
$p^2(^3P)s\ ^4P_{1/2}$	$p^2(^3P)p\ ^4S_{3/2}$	21.500	4.13[11]	5.72[-2]	8.11[-3]	20.481	4.68[11]	5.88[-2]	7.94[-3]
$p^2(^3P)s\ ^2P_{3/2}$	$sp(^3P)d\ ^2P_{1/2}$	21.487	3.63[12]	1.26[-1]	3.56[-2]	20.450	4.08[12]	1.28[-1]	3.44[-2]
$s^2(^1S)p\ ^2P_{1/2}$	$p^2(^1S)s\ ^2S_{1/2}$	21.463	3.08[12]	2.13[-1]	3.01[-2]	20.426	3.45[12]	2.16[-1]	2.90[-2]
$s^2(^1S)p\ ^2P_{3/2}$	$p^2(^3P)s\ ^2P_{1/2}$	21.461	2.22[12]	7.67[-2]	2.17[-2]	20.426	2.49[12]	7.77[-2]	2.10[-2]
$s^2(^1S)d\ ^2D_{3/2}$	$sp(^1P)d\ ^2D_{3/2}$	21.353	1.09[11]	7.39[-3]	2.08[-3]	19.747	5.64[10]	3.32[-3]	8.62[-4]
$p^2(^1D)s\ ^2D_{3/2}$	$sp(^3P)d\ ^4D_{1/2}$	21.291	5.86[11]	1.99[-2]	5.59[-3]	20.288	7.45[11]	2.30[-2]	6.14[-3]
$p^2(^1D)s\ ^2D_{5/2}$	$sp(^1P)d\ ^2P_{3/2}$	21.273	2.84[12]	1.29[-1]	5.39[-2]	20.256	3.18[12]	1.31[-1]	5.22[-2]
$p^2(^1D)s\ ^2D_{3/2}$	$sp(^3P)d\ ^2D_{5/2}$	21.196	4.07[11]	4.13[-2]	1.15[-2]	20.196	4.76[11]	4.38[-2]	1.16[-2]
$p^2(^1D)s\ ^2D_{5/2}$	$sp(^1P)d\ ^2D_{5/2}$	21.190	2.48[12]	1.67[-1]	7.01[-2]	20.180	2.79[12]	1.71[-1]	6.81[-2]
$p^2(^3P)s\ ^4P_{3/2}$	$sp(^3P)d\ ^4D_{5/2}$	21.093	1.39[11]	1.39[-2]	3.87[-3]	20.094	1.64[11]	1.49[-2]	3.93[-3]
$p^2(^3P)s\ ^4P_{3/2}$	$sp(^3P)d\ ^4P_{3/2}$	20.914	1.33[12]	8.71[-2]	2.40[-2]	19.924	1.47[12]	8.72[-2]	2.28[-2]
$p^2[^3P)s\ ^4P_{5/2}$	$sp(^3P)d\ ^4D_{3/2}$	20.600	2.39[11]	1.02[-2]	4.13[-3]	19.655	2.58[11]	9.98[-3]	3.87[-3]
$s^2(^1S)d\ ^2D_{5/2}$	$sp(^1P)d\ ^2D_{3/2}$	20.500	1.06[12]	4.45[-2]	1.80[-2]	19.540	1.19[12]	4.55[-2]	1.75[-2]
$p^2(^1S)s\ ^2S_{1/2}$	$sp(^3P)d\ ^2D_{3/2}$	20.461	1.41[12]	1.77[-1]	2.38[-2]	19.517	1.60[12]	1.82[-1]	2.34[-2]
$p^2(^3P)s\ ^4P_{5/2}$	$sp(^3P)d\ ^2D_{5/2}$	20.450	2.29[12]	1.43[-1]	5.80[-2]	19.512	2.58[12]	1.47[-1]	5.67[-2]
$p^2(^3P)s\ ^4P_{5/2}$	$sp(^3P)d\ ^4D_{7/2}$	20.360	1.78[12]	1.48[-1]	5.93[-2]	19.434	1.98[12]	1.50[-1]	5.75[-2]
$p^2(^3P)s\ ^4P_{3/2}$	$sp(^3P)d\ ^4P_{1/2}$	20.317	5.56[11]	1.72[-2]	4.61[-3]	19.371	6.96[11]	1.96[-2]	5.00[-3]
$p^2(^3P)s\ ^4P_{1/2}$	$p^2(^3P)p\ ^2P_{1/2}$	20.125	2.55[12]	1.55[-1]	2.05[-2]	19.214	2.83[12]	1.57[-1]	1.98[-2]
$p^2(^1D)s\ ^2D_{3/2}$	$sp(^3P)d\ ^2D_{3/2}$	20.119	2.21[12]	1.34[-1]	3.55[-2]	19.198	2.49[12]	1.38[-1]	3.49[-2]
$p^2(^3P)s\ ^4P_{3/2}$	$sp(^3P)d\ ^4D_{3/2}$	19.986	2.28[12]	1.37[-1]	3.59[-2]	19.085	2.58[12]	1.41[-1]	3.54[-2]
$p^2(^3P)s\ ^4P_{3/2}$	$sp(^3P)d\ ^4D_{1/2}$	19.928	1.32[12]	3.94[-2]	1.03[-2]	19.030	1.39[12]	3.78[-2]	9.47[-3]
$p^2(^3P)s\ ^4P_{1/2}$	$sp(^3P)d\ ^4F_{3/2}$	19.898	3.80[12]	4.51[-1]	5.92[-2]	18.996	4.29[12]	4.64[-1]	5.81[-2]
$p^2(^3P)s\ ^2P_{3/2}$	$sp(^3P)d\ ^2P_{3/2}$	19.853	1.01[11]	5.92[-3]	1.55[-3]	18.831	1.02[11]	5.37[-3]	1.34[-3]
$p^2(^1S)s\ ^2S_{1/2}$	$sp(^3P)d\ ^2P_{1/2}$	19.851	2.55[12]	1.51[-1]	1.97[-2]	18.955	2.87[12]	1.55[-1]	1.93[-2]
$p^2(^3P)s\ ^4P_{3/2}$	$sp(^3P)d\ ^2D_{5/2}$	19.845	6.93[11]	6.17[-2]	1.61[-2]	18.949	7.61[11]	6.17[-2]	1.53[-2]

31

Lower level	Upper level	λ	A	f	S	λ	A	f	S
				Z=77				Z=78	
$p^2(^1S)s\ ^2S_{1/2}$	$p^2(^3P)p\ ^2P_{3/2}$	38.968	2.37[11]	1.08[-1]	2.77[-2]	37.816	2.53[11]	1.08[-1]	2.71[-2]
$p^2(^1D)s\ ^2D_{3/2}$	$sp(^3P)d\ ^4P_{5/2}$	38.246	1.82[11]	5.99[-2]	3.02[-2]	37.109	1.94[11]	5.99[-2]	2.94[-2]
$p^2(^3P)s\ ^2P_{1/2}$	$sp(^1P)d\ ^2P_{1/2}$	37.725	4.25[11]	9.07[-2]	2.25[-2]	36.646	4.47[11]	9.01[-2]	2.17[-2]
$s^2(^1S)d\ ^2D_{5/2}$	$sp(^1P)d\ ^2F_{5/2}$	37.654	2.56[11]	5.44[-2]	4.05[-2]	36.556	2.72[11]	5.47[-2]	3.94[-2]
$s^2(^1S)p\ ^2P_{3/2}$	$p^2(^1D)s\ ^2D_{5/2}$	36.990	3.42[11]	1.05[-1]	5.15[-2]	35.921	3.65[11]	1.06[-1]	5.02[-2]
$p^2(^3P)s\ ^4P_{5/2}$	$sp(^3P)d\ ^4F_{7/2}$	36.987	2.26[11]	6.19[-2]	4.52[-2]	35.913	2.43[11]	6.25[-2]	4.44[-2]
$s^2(^1S)d\ ^2D_{5/2}$	$sp(^3P)d\ ^2F_{7/2}$	36.669	3.62[11]	9.73[-2]	7.04[-2]	35.623	3.85[11]	9.80[-2]	6.88[-2]
$p^2(^3P)s\ ^4P_{3/2}$	$sp(^3P)d\ ^4F_{5/2}$	36.554	3.15[11]	9.48[-2]	4.56[-2]	35.501	3.33[11]	9.49[-2]	4.44[-2]
$p^2(^3P)s\ ^2P_{1/2}$	$sp(^1P)d\ ^2P_{3/2}$	36.441	2.90[11]	1.15[-1]	2.77[-2]	35.405	3.06[11]	1.15[-1]	2.68[-2]
$s^2(^1S)d\ ^2D_{5/2}$	$sp(^1P)d\ ^2F_{7/2}$	34.561	2.61[11]	6.24[-2]	4.27[-2]	33.589	2.71[11]	6.11[-2]	4.05[-2]
$p^2(^1D)s\ ^2D_{5/2}$	$sp(^1P)d\ ^2F_{5/2}$	20.934	5.40[11]	3.54[-2]	1.47[-2]	19.881	5.98[11]	3.54[-2]	1.39[-2]
$s^2(^1S)p\ ^2P_{3/2}$	$s^2(^1S)d\ ^2D_{5/2}$	20.727	9.55[11]	9.22[-2]	2.52[-2]	19.691	1.06[12]	9.27[-2]	2.41[-2]
$p^2(^1D)s\ ^2D_{5/2}$	$sp(^3P)d\ ^2F_{7/2}$	20.625	1.57[11]	1.34[-2]	5.44[-3]	19.601	1.69[11]	1.30[-2]	5.03[-3]
$p^2(^1S)s\ ^2S_{1/2}$	$sp(^3P)d\ ^4P_{3/2}$	20.616	1.59[12]	2.02[-1]	2.75[-2]	19.589	1.77[12]	2.03[-1]	2.62[-2]
$p^2(^1D)s\ ^2D_{5/2}$	$sp(^3P)d\ ^2P_{3/2}$	20.494	3.36[11]	1.41[-2]	5.71[-3]	19.478	3.74[11]	1.42[-2]	5.46[-3]
$p^2(^1D)s\ ^2D_{3/2}$	$sp(^3P)d\ ^4D_{5/2}$	20.435	9.39[11]	8.84[-2]	2.38[-2]	19.424	1.03[12]	8.74[-2]	2.23[-2]
$p^2(^1D)s\ ^2D_{3/2}$	$sp(^3P)d\ ^4P_{3/2}$	20.251	4.17[11]	2.56[-2]	6.84[-3]	19.250	4.62[11]	2.56[-2]	6.50[-3]
$p^2(^3P)s\ ^2P_{3/2}$	$sp(^3P)d\ ^2D_{3/2}$	20.065	1.40[12]	8.49[-2]	2.24[-2]	19.080	1.56[12]	8.49[-2]	2.13[-2]
$p^2(^1S)s\ ^2S_{1/2}$	$sp(^3P)d\ ^4P_{1/2}$	20.013	3.52[11]	2.12[-2]	2.79[-3]	19.035	3.74[11]	2.03[-2]	2.55[-3]
$p^2(^1D)s\ ^2D_{5/2}$	$sp(^1P)d\ ^2F_{7/2}$	19.941	3.06[12]	2.43[-1]	9.56[-2]	18.969	3.45[12]	2.49[-1]	9.31[-2]
$p^2(^3P)s\ ^4P_{1/2}$	$p^2(^3P)p\ ^2D_{3/2}$	19.920	1.59[11]	1.89[-2]	2.48[-3]	18.961	1.53[11]	1.65[-2]	2.06[-3]
$s^2(^1S)p\ ^2P_{1/2}$	$p^2(^1D)s\ ^2D_{3/2}$	19.779	8.56[11]	1.00[-1]	1.31[-2]	18.820	9.34[11]	9.93[-2]	1.23[-2]
$p^2(^3P)s\ ^4P_{5/2}$	$sp(^3P)d\ ^4D_{5/2}$	19.729	3.80[11]	2.23[-2]	8.66[-3]	18.780	4.02[11]	2.13[-2]	7.89[-3]
$p^2(^1D)s\ ^2D_{3/2}$	$sp(^3P)d\ ^4P_{1/2}$	19.669	1.94[12]	5.60[-2]	1.46[-2]	18.714	2.03[12]	5.31[-2]	1.31[-2]
$p^2(^3P)s\ ^2P_{3/2}$	$sp(^3P)d\ ^2F_{5/2}$	19.657	5.84[12]	5.10[-1]	1.32[-1]	18.710	6.60[12]	5.20[-1]	1.28[-1]
$p^2(^3P)s\ ^4P_{5/2}$	$sp(^3P)d\ ^4P_{3/2}$	19.557	4.61[11]	1.76[-2]	6.82[-3]	18.618	5.26[11]	1.82[-2]	6.71[-3]
$p^2(^3P)s\ ^4P_{1/2}$	$p^2(^3P)p\ ^4S_{3/2}$	19.510	5.27[11]	6.02[-2]	7.73[-3]	18.591	5.90[11]	6.11[-2]	7.48[-3]
$p^2(^3P)s\ ^2P_{3/2}$	$sp(^3P)d\ ^2P_{1/2}$	19.466	4.57[12]	1.30[-1]	3.33[-2]	18.530	5.14[12]	1.33[-1]	3.23[-2]
$s^2(^1S)p\ ^2P_{3/2}$	$p^2(^3P)s\ ^2P_{1/2}$	19.443	2.79[12]	7.92[-2]	2.03[-2]	18.509	3.13[12]	8.02[-2]	1.96[-2]
$s^2(^1S)p\ ^2P_{1/2}$	$p^2(^1S)s\ ^2S_{1/2}$	19.442	3.86[12]	2.19[-1]	2.80[-2]	18.507	4.32[12]	2.22[-1]	2.71[-2]
$p^2(^1D)s\ ^2D_{3/2}$	$sp(^3P)d\ ^4D_{1/2}$	19.334	9.51[11]	2.67[-2]	6.79[-3]	18.425	1.22[12]	3.11[-2]	7.54[-3]
$p^2(^1D)s\ ^2D_{5/2}$	$sp(^1P)d\ ^2P_{3/2}$	19.290	3.56[12]	1.33[-1]	5.05[-2]	18.371	3.99[12]	1.35[-1]	4.89[-2]
$p^2(^1D)s\ ^2D_{3/2}$	$sp(^3P)d\ ^2D_{5/2}$	19.238	5.58[11]	4.65[-2]	1.18[-2]	18.330	6.50[11]	4.91[-2]	1.19[-2]
$p^2(^1D)s\ ^2D_{5/2}$	$sp(^1P)d\ ^2D_{5/2}$	19.222	3.14[12]	1.74[-1]	6.62[-2]	18.310	3.52[12]	1.78[-1]	6.43[-2]
$p^2(^3P)s\ ^4P_{3/2}$	$sp(^3P)d\ ^4D_{5/2}$	19.143	1.92[11]	1.59[-2]	4.00[-3]	18.239	2.26[11]	1.70[-2]	4.07[-3]
$p^2(^3P)s\ ^4P_{3/2}$	$sp(^3P)d\ ^4P_{3/2}$	18.982	1.60[12]	8.67[-2]	2.17[-2]	18.086	1.76[12]	8.62[-2]	2.05[-2]
$p^2[^3P)s\ ^4P_{5/2}$	$sp(^3P)d\ ^4D_{3/2}$	18.754	2.79[11]	9.78[-3]	3.63[-3]	17.894	2.99[11]	9.58[-3]	3.39[-3]
$p^2(^1S)s\ ^2S_{1/2}$	$sp(^3P)d\ ^2D_{3/2}$	18.618	1.80[12]	1.88[-1]	2.29[-2]	17.761	2.04[12]	1.93[-1]	2.25[-2]
$p^2(^3P)s\ ^4P_{5/2}$	$sp(^3P)d\ ^2D_{5/2}$	18.611	2.89[12]	1.50[-1]	5.53[-2]	17.756	3.26[12]	1.54[-1]	5.40[-2]
$p^2(^3P)s\ ^4P_{5/2}$	$sp(^3P)d\ ^4D_{7/2}$	18.546	2.21[12]	1.52[-1]	5.57[-2]	17.701	2.46[12]	1.55[-1]	5.40[-2]
$p^2(^3P)s\ ^4P_{3/2}$	$sp(^3P)d\ ^4P_{1/2}$	18.470	8.73[11]	2.24[-2]	5.44[-3]	17.612	1.10[12]	2.57[-2]	5.95[-3]
$p^2(^3P)s\ ^4P_{1/2}$	$p^2(^3P)p\ ^2P_{1/2}$	18.344	3.15[12]	1.60[-1]	1.92[-2]	17.514	3.51[12]	1.62[-1]	1.86[-2]
$p^2(^1D)s\ ^2D_{3/2}$	$sp(^3P)d\ ^2D_{3/2}$	18.319	2.83[12]	1.42[-1]	3.43[-2]	17.482	3.19[12]	1.46[-1]	3.37[-2]
$s^2(^1S)d\ ^2D_{3/2}$	$sp(^1P)d\ ^2D_{3/2}$	18.305	5.02[11]	2.52[-2]	6.08[-3]	17.453	5.21[12]	2.37[-1]	5.46[-2]
$p^2(^3P)s\ ^4P_{3/2}$	$sp(^3P)d\ ^4D_{3/2}$	18.224	2.92[12]	1.46[-1]	3.50[-2]	17.402	3.32[12]	1.51[-1]	3.46[-2]
$p^2(^3P)s\ ^4P_{3/2}$	$sp(^3P)d\ ^4D_{1/2}$	18.174	1.44[12]	3.59[-2]	8.58[-3]	17.355	1.48[12]	3.35[-2]	7.64[-3]
$p^2(^3P)s\ ^4P_{1/2}$	$sp(^3P)d\ ^4D_{3/2}$	18.136	4.84[12]	4.78[-1]	5.71[-2]	17.314	5.48[12]	4.92[-1]	5.61[-2]
$p^2(^1S)s\ ^2S_{1/2}$	$sp(^3P)d\ ^2P_{1/2}$	18.100	3.24[12]	1.59[-1]	1.90[-2]	17.284	3.64[12]	1.63[-1]	1.86[-2]
$p^2(^3P)s\ ^4P_{3/2}$	$sp(^3P)d\ ^2D_{5/2}$	18.089	8.35[11]	6.17[-2]	1.46[-2]	17.271	9.13[11]	6.12[-2]	1.40[-2]
$s^2(^1S)p\ ^2P_{1/2}$	$p^2(^3P)s\ ^2P_{3/2}$	18.080	5.31[12]	5.21[-1]	6.21[-2]	17.264	5.96[12]	5.34[-1]	6.07[-2]
$p^2(^1D)s\ ^2D_{3/2}$	$sp(^3P)d\ ^2F_{5/2}$	17.978	7.85[11]	5.71[-2]	1.35[-2]	17.171	8.50[11]	5.61[-2]	1.27[-2]

32

Lower level	Upper level	λ	A	f	S	λ	A	f	S
				Z=79				Z=80	
$p^2(^1S)s\ ^2S_{1/2}$	$p^2(^3P)p\ ^2P_{3/2}$	36.705	2.71[11]	1.09[-1]	2.64[-2]	35.625	2.88[11]	1.09[-1]	2.57[-2]
$p^2(^1D)s\ ^2D_{3/2}$	$sp(^3P)d\ ^4P_{5/2}$	35.994	2.07[11]	6.04[-2]	2.86[-2]	34.918	2.20[11]	6.04[-2]	2.78[-2]
$p^2(^3P)s\ ^2P_{1/2}$	$sp(^1P)d\ ^2P_{1/2}$	35.597	4.70[11]	8.94[-2]	2.10[-2]	34.576	4.96[11]	8.89[-2]	2.02[-2]
$s^2(^1S)d\ ^2D_{5/2}$	$sp(^1P)d\ ^2F_{5/2}$	35.491	2.88[11]	5.46[-2]	3.83[-2]	34.457	3.07[11]	5.46[-2]	3.72[-2]
$s^2(^1S)p\ ^2P_{3/2}$	$p^2(^1D)s\ ^2D_{5/2}$	34.883	3.88[11]	1.06[-1]	4.90[-2]	33.876	4.14[11]	1.07[-1]	4.78[-2]
$p^2(^3P)s\ ^4P_{5/2}$	$sp(^3P)d\ ^4F_{7/2}$	34.871	2.59[11]	6.35[-2]	4.37[-2]	33.860	2.79[11]	6.42[-2]	4.29[-2]
$s^2(^1S)d\ ^2D_{5/2}$	$sp(^3P)d\ ^2F_{7/2}$	34.606	4.11[11]	9.86[-2]	6.73[-2]	33.618	4.39[11]	9.93[-2]	6.59[-2]
$p^2(^3P)s\ ^4P_{3/2}$	$sp(^3P)d\ ^4F_{5/2}$	34.488	3.55[11]	9.53[-2]	4.32[-2]	33.499	3.79[11]	9.53[-2]	4.21[-2]
$p^2(^3P)s\ ^2P_{1/2}$	$sp(^1P)d\ ^2P_{3/2}$	34.398	3.24[11]	1.15[-1]	2.60[-2]	33.419	3.42[11]	1.15[-1]	2.52[-2]
$s^2(^1S)d\ ^2D_{5/2}$	$sp(^1P)d\ ^2F_{7/2}$	32.644	2.80[11]	5.98[-2]	3.85[-2]	31.727	2.90[11]	5.85[-2]	3.66[-2]
$p^2(^1D)s\ ^2D_{5/2}$	$sp(^1P)d\ ^2F_{5/2}$	18.884	6.64[11]	3.54[-2]	1.33[-2]	17.941	7.35[11]	3.57[-2]	1.26[-2]
$s^2(^1S)p\ ^2P_{3/2}$	$s^2(^1S)d\ ^2D_{5/2}$	18.711	1.19[12]	9.37[-2]	2.30[-2]	17.782	1.33[12]	9.42[-2]	2.21[-2]
$p^2(^1D)s\ ^2D_{5/2}$	$sp(^3P)d\ ^2F_{7/2}$	18.631	1.82[11]	1.27[-2]	4.66[-3]	17.711	1.97[11]	1.24[-2]	4.32[-3]
$p^2(^1S)s\ ^2S_{1/2}$	$sp(^3P)d\ ^4P_{3/2}$	18.617	1.97[12]	2.03[-1]	2.50[-2]	17.695	2.18[12]	2.04[-1]	2.38[-2]
$p^2(^1D)s\ ^2D_{5/2}$	$sp(^3P)d\ ^2P_{3/2}$	18.514	4.18[11]	1.43[-2]	5.24[-3]	17.602	4.66[11]	1.45[-2]	5.02[-3]
$p^2(^1D)s\ ^2D_{3/2}$	$sp(^3P)d\ ^4D_{5/2}$	18.467	1.13[12]	8.64[-2]	2.10[-2]	17.560	1.22[12]	8.49[-2]	1.97[-2]
$p^2(^1D)s\ ^2D_{3/2}$	$sp(^3P)d\ ^4D_{3/2}$	18.302	5.10[11]	2.56[-2]	6.18[-3]	17.403	5.63[11]	2.56[-2]	5.88[-3]
$p^2(^3P)s\ ^2P_{3/2}$	$sp(^3P)d\ ^2D_{3/2}$	18.146	1.72[12]	8.49[-2]	2.03[-2]	17.261	1.91[12]	8.54[-2]	1.94[-2]
$p^2(^1S)s\ ^2S_{1/2}$	$sp(^3P)d\ ^4P_{1/2}$	18.106	3.92[11]	1.93[-2]	2.30[-3]	17.226	4.04[11]	1.80[-2]	2.04[-3]
$p^2(^3P)s\ ^4P_{1/2}$	$p^2(^3P)p\ ^2D_{3/2}$	18.053	1.47[11]	1.44[-2]	1.71[-3]	17.190	1.40[11]	1.24[-2]	1.40[-3]
$p^2(^1D)s\ ^2D_{5/2}$	$sp(^1P)d\ ^2F_{7/2}$	18.047	3.89[12]	2.54[-1]	9.06[-2]	17.171	4.41[12]	2.60[-1]	8.81[-2]
$s^2(^1S)p\ ^2P_{1/2}$	$p^2(^1D)s\ ^2D_{3/2}$	17.911	1.02[12]	9.79[-2]	1.15[-2]	17.048	1.11[12]	9.62[-2]	1.08[-2]
$p^2(^3P)s\ ^4P_{5/2}$	$sp(^3P)d\ ^4D_{5/2}$	17.880	4.22[11]	2.03[-2]	7.16[-3]	17.024	4.42[11]	1.93[-2]	6.47[-3]
$p^2(^3P)s\ ^2P_{3/2}$	$sp(^3P)d\ ^2F_{5/2}$	17.811	7.44[12]	5.30[-1]	1.24[-1]	16.957	8.38[12]	5.40[-1]	1.21[-1]
$p^2(^1D)s\ ^2D_{3/2}$	$sp(^3P)d\ ^4P_{1/2}$	17.808	2.08[12]	4.94[-2]	1.16[-2]	16.948	2.08[12]	4.48[-2]	1.00[-2]
$p^2(^3P)s\ ^4P_{5/2}$	$sp(^3P)d\ ^4P_{3/2}$	17.725	5.99[11]	1.88[-2]	6.60[-3]	16.877	6.87[11]	1.95[-2]	6.51[-3]
$p^2(^3P)s\ ^4P_{1/2}$	$p^2(^3P)p\ ^4S_{3/2}$	17.706	6.54[11]	6.18[-2]	7.20[-3]	16.869	7.28[11]	6.20[-2]	6.88[-3]
$p^2(^3P)s\ ^2P_{3/2}$	$sp(^3P)d\ ^2P_{1/2}$	17.642	5.76[12]	1.35[-1]	3.13[-2]	16.798	6.48[12]	1.38[-1]	3.03[-2]
$s^2(^1S)p\ ^2P_{3/2}$	$p^2(^3P)s\ ^2P_{1/2}$	17.622	3.51[12]	8.17[-2]	1.89[-2]	16.780	3.93[12]	8.32[-2]	1.83[-2]
$s^2(^1S)p\ ^2P_{1/2}$	$p^2(^1S)s\ ^2S_{1/2}$	17.620	4.85[12]	2.26[-1]	2.62[-2]	16.776	5.42[12]	2.29[-1]	2.53[-2]
$p^2(^1D)s\ ^2D_{3/2}$	$sp(^3P)d\ ^4D_{1/2}$	17.561	1.57[12]	3.63[-2]	8.39[-3]	16.738	2.01[12]	4.23[-2]	9.32[-3]
$p^2(^1D)s\ ^2D_{5/2}$	$sp(^1P)d\ ^2P_{3/2}$	17.497	4.47[12]	1.37[-1]	4.73[-2]	16.667	5.00[12]	1.40[-1]	4.58[-2]
$p^2(^1D)s\ ^2D_{3/2}$	$sp(^3P)d\ ^2D_{5/2}$	17.466	7.58[11]	5.22[-2]	1.20[-2]	16.644	8.83[11]	5.52[-2]	1.21[-2]
$p^2(^1D)s\ ^2D_{5/2}$	$sp(^1P)d\ ^2D_{5/2}$	17.442	3.98[12]	1.81[-1]	6.25[-2]	16.617	4.46[12]	1.85[-1]	6.08[-2]
$p^2(^3P)s\ ^4P_{3/2}$	$sp(^3P)d\ ^4D_{5/2}$	17.379	2.67[11]	1.82[-2]	4.15[-3]	16.562	3.14[11]	1.94[-2]	4.22[-3]
$p^2(^3P)s\ ^4P_{3/2}$	$sp(^3P)d\ ^4P_{3/2}$	17.233	1.92[12]	8.52[-2]	1.94[-2]	16.422	2.08[12]	8.42[-2]	1.82[-2]
$p^2[^3P)s\ ^4P_{5/2}$	$sp(^3P)d\ ^4D_{3/2}$	17.074	3.21[11]	9.35[-3]	3.15[-3]	16.293	3.42[11]	9.08[-3]	2.92[-3]
$p^2(^1S)s\ ^2S_{1/2}$	$sp(^3P)d\ ^2D_{3/2}$	16.945	2.30[12]	1.98[-1]	2.21[-2]	16.167	2.60[12]	2.03[-1]	2.17[-2]
$p^2(^3P)s\ ^4P_{5/2}$	$sp(^3P)d\ ^2D_{5/2}$	16.940	3.65[12]	1.57[-1]	5.27[-2]	16.162	4.12[12]	1.61[-1]	5.15[-2]
$p^2(^3P)s\ ^4P_{5/2}$	$sp(^3P)d\ ^4D_{7/2}$	16.895	2.76[12]	1.57[-1]	5.23[-2]	16.126	3.06[12]	1.60[-1]	5.08[-2]
$p^2(^3P)s\ ^4P_{3/2}$	$sp(^3P)d\ ^4P_{1/2}$	16.795	1.40[12]	2.95[-2]	6.52[-3]	16.017	1.75[12]	3.39[-2]	7.13[-3]
$p^2(^3P)s\ ^4P_{1/2}$	$p^2(^3P)p\ ^2P_{1/2}$	16.722	3.91[12]	1.64[-1]	1.80[-2]	15.966	4.34[12]	1.67[-1]	1.75[-2]
$p^2(^1D)s\ ^2D_{3/2}$	$sp(^3P)d\ ^2D_{3/2}$	16.683	3.62[12]	1.50[-1]	3.32[-2]	15.922	4.09[12]	1.55[-1]	3.26[-2]
$s^2(^1S)d\ ^2D_{3/2}$	$sp(^1P)d\ ^2D_{3/2}$	16.665	5.80[12]	2.41[-1]	5.31[-2]	15.912	6.45[12]	2.45[-1]	5.15[-2]
$p^2(^3P)s\ ^4P_{3/2}$	$sp(^3P)d\ ^4D_{3/2}$	16.618	3.77[12]	1.56[-1]	3.42[-2]	15.869	4.30[12]	1.62[-1]	3.39[-2]
$p^2(^3P)s\ ^4P_{3/2}$	$sp(^3P)d\ ^4D_{1/2}$	16.574	1.48[12]	3.06[-2]	6.66[-3]	15.829	1.44[12]	2.72[-2]	5.66[-3]
$p^2(^3P)s\ ^4P_{1/2}$	$sp(^3P)d\ ^4D_{3/2}$	16.532	6.18[12]	5.06[-1]	5.51[-2]	15.784	6.97[12]	5.21[-1]	5.41[-2]
$p^2(^1S)s\ ^2S_{1/2}$	$sp(^3P)d\ ^2P_{1/2}$	16.505	4.10[12]	1.67[-1]	1.82[-2]	15.761	4.62[12]	1.72[-1]	1.79[-2]
$p^2(^3P)s\ ^4P_{3/2}$	$sp(^3P)d\ ^2D_{5/2}$	16.490	1.01[12]	6.12[-2]	1.33[-2]	15.745	1.09[12]	6.12[-2]	1.27[-2]
$s^2(^1S)p\ ^2P_{1/2}$	$p^2(^3P)s\ ^2P_{3/2}$	16.485	6.69[12]	5.47[-1]	5.94[-2]	15.741	7.53[12]	5.60[-1]	5.81[-2]
$p^2(^1D)s\ ^2D_{3/2}$	$sp(^3P)d\ ^2F_{5/2}$	16.400	9.22[11]	5.56[-2]	1.20[-2]	15.664	1.00[12]	5.51[-2]	1.14[-2]

Lower level	Upper level	λ	A	f	S	λ	A	f	S
				Z=81				Z=82	
$p^2(^1S)s\ ^2S_{1/2}$	$p^2(^3P)p\ ^2P_{3/2}$	34.576	3.07[11]	1.10[-1]	2.50[-2]	33.559	3.27[11]	1.10[-1]	2.44[-2]
$p^2(^1D)s\ ^2D_{3/2}$	$sp(^3P)d\ ^4P_{5/2}$	33.875	2.34[11]	6.04[-2]	2.70[-2]	32.862	2.49[11]	6.04[-2]	2.62[-2]
$p^2(^3P)s\ ^2P_{1/2}$	$sp(^1P)d\ ^2P_{1/2}$	33.585	5.22[11]	8.83[-2]	1.95[-2]	32.620	5.51[11]	8.78[-2]	1.89[-2]
$s^2(^1S)d\ ^2D_{5/2}$	$sp(^1P)d\ ^2F_{5/2}$	33.454	3.26[11]	5.46[-2]	3.62[-2]	32.480	3.46[11]	5.49[-2]	3.52[-2]
$s^2(^1S)p\ ^2P_{3/2}$	$p^2(^1D)s\ ^2D_{5/2}$	32.898	4.40[11]	1.07[-1]	4.66[-2]	31.949	4.69[11]	1.07[-1]	4.54[-2]
$p^2(^3P)s\ ^4P_{5/2}$	$sp(^3P)d\ ^4F_{7/2}$	32.879	3.01[11]	6.48[-2]	4.22[-2]	31.927	3.23[11]	6.58[-2]	4.15[-2]
$s^2(^1S)d\ ^2D_{5/2}$	$sp(^3P)d\ ^2F_{7/2}$	32.658	4.68[11]	1.00[-1]	6.44[-2]	31.725	4.99[11]	1.00[-1]	6.30[-2]
$p^2(^3P)s\ ^4P_{3/2}$	$sp(^3P)d\ ^4F_{5/2}$	32.538	4.01[11]	9.58[-2]	4.10[-2]	31.605	4.28[11]	9.58[-2]	4.00[-2]
$p^2(^3P)s\ ^2P_{1/2}$	$sp(^1P)d\ ^2P_{3/2}$	32.468	3.62[11]	1.14[-1]	2.45[-2]	31.544	3.83[11]	1.14[-1]	2.37[-2]
$s^2(^1S)d\ ^2D_{5/2}$	$sp(^1P)d\ ^2F_{7/2}$	30.835	3.02[11]	5.72[-2]	3.48[-2]	29.969	3.12[11]	5.62[-2]	3.32[-2]
$p^2(^1D)s\ ^2D_{5/2}$	$sp(^1P)d\ ^2F_{5/2}$	17.047	8.17[11]	3.57[-2]	1.20[-2]	16.201	9.08[11]	3.57[-2]	1.15[-2]
$s^2(^1S)p\ ^2P_{3/2}$	$s^2(^1S)d\ ^2D_{5/2}$	16.902	1.48[12]	9.52[-2]	2.11[-2]	16.068	1.65[12]	9.57[-2]	2.03[-2]
$p^2(^1D)s\ ^2D_{5/2}$	$sp(^3P)d\ ^2F_{7/2}$	16.838	2.13[11]	1.21[-2]	4.02[-3]	16.011	2.31[11]	1.18[-2]	3.74[-3]
$p^2(^1S)s\ ^2S_{1/2}$	$sp(^3P)d\ ^4P_{3/2}$	16.822	2.42[12]	2.05[-1]	2.27[-2]	15.995	2.68[12]	2.05[-1]	2.17[-2]
$p^2(^1D)s\ ^2D_{5/2}$	$sp(^3P)d\ ^2P_{3/2}$	16.736	5.22[11]	1.46[-2]	4.82[-3]	15.915	5.80[11]	1.47[-2]	4.62[-3]
$p^2(^1D)s\ ^2D_{3/2}$	$sp(^3P)d\ ^4D_{5/2}$	16.699	1.33[12]	8.39[-2]	1.84[-2]	15.883	1.45[12]	8.24[-2]	1.73[-2]
$p^2(^1D)s\ ^2D_{3/2}$	$sp(^3P)d\ ^4P_{3/2}$	16.550	6.26[11]	2.56[-2]	5.59[-3]	15.741	6.90[11]	2.56[-2]	5.31[-3]
$p^2(^3P)s\ ^2P_{3/2}$	$sp(^3P)d\ ^2D_{3/2}$	16.421	2.11[12]	8.49[-2]	1.84[-2]	15.625	2.32[12]	8.49[-2]	1.75[-2]
$p^2(^1S)s\ ^2S_{1/2}$	$sp(^3P)d\ ^4P_{1/2}$	16.391	4.11[11]	1.65[-2]	1.79[-3]	15.599	4.09[11]	1.49[-2]	1.54[-3]
$p^2(^1D)s\ ^2D_{5/2}$	$sp(^1P)d\ ^2F_{7/2}$	16.340	4.99[12]	2.66[-1]	8.58[-2]	15.551	5.62[12]	2.72[-1]	8.35[-2]
$s^2(^1S)p\ ^2P_{1/2}$	$p^2(^1D)s\ ^2D_{3/2}$	16.229	1.19[12]	9.44[-2]	1.01[-2]	15.451	1.29[12]	9.24[-2]	9.40[-3]
$p^2(^3P)s\ ^4P_{5/2}$	$sp(^3P)d\ ^4D_{5/2}$	16.211	4.62[11]	1.82[-2]	5.82[-3]	15.439	4.79[11]	1.71[-2]	5.20[-3]
$p^2(^3P)s\ ^2P_{3/2}$	$sp(^3P)d\ ^2F_{5/2}$	16.146	9.46[12]	5.55[-1]	1.18[-1]	15.375	1.06[13]	5.65[-1]	1.15[-1]
$p^2(^1D)s\ ^2D_{3/2}$	$sp(^3P)d\ ^4P_{1/2}$	16.132	2.02[12]	3.95[-2]	8.39[-3]	15.357	1.91[12]	3.38[-2]	6.82[-3]
$p^2(^3P)s\ ^4P_{1/2}$	$p^2(^3P)p\ ^4S_{3/2}$	16.071	7.96[11]	6.18[-2]	6.55[-3]	15.313	8.75[11]	6.13[-2]	6.19[-3]
$p^2(^3P)s\ ^4P_{5/2}$	$sp(^3P)d\ ^4P_{3/2}$	16.070	7.85[11]	2.02[-2]	6.43[-3]	15.304	8.97[11]	2.10[-2]	6.35[-3]
$p^2(^3P)s\ ^2P_{3/2}$	$sp(^3P)d\ ^2P_{1/2}$	15.996	7.27[12]	1.40[-1]	2.94[-2]	15.234	8.17[12]	1.42[-1]	2.85[-2]
$p^2(^1D)s\ ^2D_{3/2}$	$sp(^3P)d\ ^4D_{3/2}$	15.995	1.76[11]	6.77[-3]	1.42[-3]	15.246	2.12[11]	7.37[-3]	1.48[-3]
$s^2(^1S)p\ ^2P_{1/2}$	$p^2(^1S)s\ ^2S_{1/2}$	15.975	6.07[12]	2.33[-1]	2.45[-2]	15.214	6.80[12]	2.37[-1]	2.37[-2]
$s^2(^1S)p\ ^2P_{3/2}$	$p^2(^3P)s\ ^2P_{1/2}$	15.979	4.41[12]	8.42[-2]	1.77[-2]	15.218	4.93[12]	8.57[-2]	1.72[-2]
$p^2(^1D)s\ ^2D_{3/2}$	$sp(^3P)d\ ^4D_{1/2}$	15.954	2.57[12]	4.91[-2]	1.03[-2]	15.208	3.25[12]	5.62[-2]	1.13[-2]
$p^2(^1D)s\ ^2D_{5/2}$	$sp(^1P)d\ ^2P_{3/2}$	15.877	5.63[12]	1.42[-1]	4.44[-2]	15.126	6.32[12]	1.44[-1]	4.30[-2]
$p^2(^1D)s\ ^2D_{3/2}$	$sp(^3P)d\ ^2D_{5/2}$	15.861	1.02[12]	5.82[-2]	1.21[-2]	15.117	1.19[12]	6.12[-2]	1.22[-2]
$p^2(^1D)s\ ^2D_{5/2}$	$sp(^1P)d\ ^2D_{5/2}$	15.831	5.02[12]	1.89[-1]	5.91[-2]	15.084	5.63[12]	1.93[-1]	5.74[-2]
$p^2(^3P)s\ ^4P_{3/2}$	$sp(^3P)d\ ^4D_{5/2}$	15.784	3.70[11]	2.08[-2]	4.30[-3]	15.044	4.35[11]	2.22[-2]	4.38[-3]
$p^2(^3P)s\ ^4P_{3/2}$	$sp(^3P)d\ ^4P_{3/2}$	15.650	2.25[12]	8.28[-2]	1.70[-2]	14.916	2.42[12]	8.08[-2]	1.58[-2]
$p^2[^3P)s\ ^4P_{5/2}$	$sp(^3P)d\ ^4D_{3/2}$	15.547	3.64[11]	8.78[-3]	2.70[-3]	14.836	3.85[11]	8.48[-3]	2.48[-3]
$p^2(^1S)s\ ^2S_{1/2}$	$sp(^3P)d\ ^2D_{3/2}$	15.426	2.94[12]	2.09[-1]	2.13[-2]	14.720	3.31[12]	2.15[-1]	2.09[-2]
$p^2(^3P)s\ ^4P_{5/2}$	$sp(^3P)d\ ^2D_{5/2}$	15.421	4.61[12]	1.65[-1]	5.02[-2]	14.714	5.20[12]	1.68[-1]	4.90[-2]
$p^2(^3P)s\ ^4P_{5/2}$	$sp(^3P)d\ ^4D_{7/2}$	15.393	3.42[12]	1.62[-1]	4.93[-2]	14.693	3.82[12]	1.65[-1]	4.78[-2]
$p^2(^3P)s\ ^4P_{3/2}$	$sp(^3P)d\ ^4P_{1/2}$	15.276	2.20[12]	3.86[-2]	7.77[-3]	14.571	2.75[12]	4.37[-2]	8.38[-3]
$p^2(^3P)s\ ^4P_{1/2}$	$p^2(^3P)p\ ^2P_{1/2}$	15.244	4.84[12]	1.69[-1]	1.69[-2]	14.555	5.39[12]	1.72[-1]	1.64[-2]
$p^2(^1D)s\ ^2D_{3/2}$	$sp(^3P)d\ ^2D_{3/2}$	15.196	4.62[12]	1.60[-1]	3.20[-2]	14.504	5.22[12]	1.65[-1]	3.15[-2]
$s^2(^1S)d\ ^2D_{3/2}$	$sp(^1P)d\ ^2D_{3/2}$	15.194	7.19[12]	2.50[-1]	5.00[-2]	14.508	8.04[12]	2.54[-1]	4.85[-2]
$p^2(^3P)s\ ^4P_{3/2}$	$sp(^3P)d\ ^4D_{3/2}$	15.154	4.90[12]	1.69[-1]	3.37[-2]	14.471	5.60[12]	1.75[-1]	3.35[-2]
$p^2(^3P)s\ ^4P_{3/2}$	$sp(^3P)d\ ^4D_{1/2}$	15.117	1.36[12]	2.33[-2]	4.64[-3]	14.437	1.23[12]	1.93[-2]	3.67[-3]
$p^2(^3P)s\ ^4P_{1/2}$	$sp(^3P)d\ ^4D_{3/2}$	15.071	7.85[12]	5.36[-1]	5.31[-2]	14.390	8.84[12]	5.51[-1]	5.22[-2]
$p^2(^1S)s\ ^2S_{1/2}$	$sp(^3P)d\ ^2P_{1/2}$	15.050	5.20[12]	1.77[-1]	1.75[-2]	14.372	5.86[12]	1.81[-1]	1.72[-2]
$s^2(^1S)p\ ^2P_{1/2}$	$p^2(^3P)s\ ^2P_{3/2}$	15.032	8.47[12]	5.74[-1]	5.69[-2]	14.354	9.50[12]	5.89[-1]	5.57[-2]
$p^2(^3P)s\ ^4P_{3/2}$	$sp(^3P)d\ ^2D_{5/2}$	15.034	1.19[12]	6.07[-2]	1.20[-2]	14.355	1.30[12]	6.07[-2]	1.14[-2]
$p^2(^1D)s\ ^2D_{3/2}$	$sp(^3P)d\ ^2F_{5/2}$	14.960	1.08[12]	5.42[-2]	1.07[-2]	14.288	1.17[12]	5.37[-2]	1.01[-2]

Lower level	Upper level	λ	A	f	S	λ	A	f	S
				Z=83				Z=84	
$p^2(^1S)s\ ^2S_{1/2}$	$p^2(^3P)p\ ^2P_{3/2}$	32.571	3.49[11]	1.11[-1]	2.38[-2]	31.613	3.71[11]	1.11[-1]	2.32[-2]
$p^2(^1D)s\ ^2D_{3/2}$	$sp(^3P)d\ ^4P_{5/2}$	31.880	2.64[11]	6.03[-2]	2.54[-2]	30.926	2.80[11]	6.03[-2]	2.46[-2]
$p^2(^3P)s\ ^2P_{1/2}$	$sp(^1P)d\ ^2P_{1/2}$	31.683	5.80[11]	8.74[-2]	1.82[-2]	30.772	6.12[11]	8.69[-2]	1.76[-2]
$s^2(^1S)p\ ^2P_{3/2}$	$p^2(^1D)s\ ^2D_{5/2}$	31.027	4.99[11]	1.08[-1]	4.43[-2]	30.133	5.31[11]	1.09[-1]	4.31[-2]
$p^2(^3P)s\ ^4P_{5/2}$	$sp(^3P)d\ ^4F_{7/2}$	31.003	3.47[11]	6.65[-2]	4.08[-2]	30.106	3.71[11]	6.75[-2]	4.01[-2]
$p^2(^3P)s\ ^4P_{3/2}$	$sp(^3P)d\ ^4F_{5/2}$	30.698	4.53[11]	9.63[-2]	3.89[-2]	29.818	4.82[11]	9.68[-2]	3.80[-2]
$p^2(^3P)s\ ^2P_{1/2}$	$sp(^1P)d\ ^2P_{3/2}$	30.645	4.06[11]	1.14[-1]	2.31[-2]	29.773	4.30[11]	1.14[-1]	2.24[-2]
$p^2(^3P)s\ ^2P_{3/2}$	$sp(^3P)d\ ^2D_{5/2}$	15.523	1.71[11]	9.28[-3]	1.90[-3]	14.751	2.04[11]	1.00[-2]	1.94[-3]
$p^2(^1D)s\ ^2D_{5/2}$	$sp(^1P)d\ ^2F_{5/2}$	15.400	1.01[12]	3.60[-2]	1.09[-2]	14.641	1.12[12]	3.60[-2]	1.05[-2]
$p^2(^1D)s\ ^2D_{5/2}$	$sp(^3P)d\ ^2F_{7/2}$	15.227	2.49[11]	1.16[-2]	3.49[-3]	14.483	2.71[11]	1.14[-2]	3.25[-3]
$p^2(^1S)s\ ^2S_{1/2}$	$sp(^3P)d\ ^4P_{3/2}$	15.211	2.97[12]	2.06[-1]	2.06[-2]	14.468	3.28[12]	2.07[-1]	1.96[-2]
$p^2(^1D)s\ ^2D_{5/2}$	$sp(^3P)d\ ^2P_{3/2}$	15.137	6.48[11]	1.49[-2]	4.44[-3]	14.399	7.22[11]	1.50[-2]	4.27[-3]
$p^2(^1D)s\ ^2D_{3/2}$	$sp(^3P)d\ ^4D_{5/2}$	15.110	1.58[12]	8.09[-2]	1.61[-2]	14.376	1.71[12]	7.94[-2]	1.51[-2]
$p^2(^1D)s\ ^2D_{3/2}$	$sp(^3P)d\ ^4P_{3/2}$	14.974	7.63[11]	2.57[-2]	5.05[-3]	14.246	8.36[11]	2.56[-2]	4.79[-3]
$p^2(^3P)s\ ^2P_{3/2}$	$sp(^3P)d\ ^2D_{3/2}$	14.871	2.56[12]	8.49[-2]	1.66[-2]	14.154	2.81[12]	8.44[-2]	1.57[-2]
$p^2(^1S)s\ ^2S_{1/2}$	$sp(^3P)d\ ^4P_{1/2}$	14.848	4.01[11]	1.32[-2]	1.30[-3]	14.135	3.87[11]	1.16[-2]	1.08[-3]
$p^2(^1D)s\ ^2D_{5/2}$	$sp(^1P)d\ ^2F_{7/2}$	14.803	6.33[12]	2.77[-1]	8.12[-2]	14.091	7.15[12]	2.83[-1]	7.90[-2]
$p^2(^1S)s\ ^2S_{1/2}$	$sp(^3P)d\ ^4D_{1/2}$	14.720	2.55[11]	8.30[-3]	8.05[-4]	14.029	3.20[11]	9.44[-3]	8.72[-4]
$s^2(^1S)p\ ^2P_{1/2}$	$p^2(^1D)s\ ^2D_{3/2}$	14.713	1.39[12]	9.04[-2]	8.75[-3]	14.012	1.50[12]	8.80[-2]	8.12[-3]
$p^2(^3P)s\ ^4P_{5/2}$	$sp(^3P)d\ ^4D_{5/2}$	14.705	4.92[11]	1.59[-2]	4.63[-3]	14.008	5.02[11]	1.48[-2]	4.09[-3]
$p^2(^3P)s\ ^2P_{3/2}$	$sp(^3P)d\ ^2F_{5/2}$	14.643	1.20[13]	5.80[-1]	1.12[-1]	13.947	1.36[13]	5.90[-1]	1.09[-1]
$p^2(^1D)s\ ^2D_{3/2}$	$sp(^3P)d\ ^4P_{1/2}$	14.621	1.73[12]	2.79[-2]	5.37[-3]	13.923	1.53[12]	2.23[-2]	4.08[-3]
$p^2(^3P)s\ ^4P_{1/2}$	$p^2(^3P)p\ ^4S_{3/2}$	14.591	9.48[11]	6.05[-2]	5.82[-3]	13.904	1.02[12]	5.93[-2]	5.44[-3]
$p^2(^3P)s\ ^4P_{5/2}$	$sp(^3P)d\ ^4P_{3/2}$	14.577	1.03[12]	2.18[-2]	6.29[-3]	13.885	1.18[12]	2.27[-2]	6.23[-3]
$p^2(^1D)s\ ^2D_{3/2}$	$sp(^3P)d\ ^4D_{3/2}$	14.532	2.56[11]	8.12[-3]	1.55[-3]	13.853	3.09[11]	8.91[-3]	1.63[-3]
$p^2(^3P)s\ ^2P_{3/2}$	$sp(^3P)d\ ^2P_{1/2}$	14.511	9.17[12]	1.45[-1]	2.77[-2]	13.823	1.03[13]	1.48[-1]	2.69[-2]
$s^2(^1S)p\ ^2P_{1/2}$	$p^2(^1S)s\ ^2S_{1/2}$	14.491	7.63[12]	2.41[-1]	2.29[-2]	13.804	8.55[12]	2.45[-1]	2.22[-2]
$s^2(^1S)p\ ^2P_{3/2}$	$p^2(^3P)s\ ^2P_{1/2}$	14.495	5.54[12]	8.72[-2]	1.66[-2]	13.808	6.20[12]	8.87[-2]	1.61[-2]
$p^2(^1D)s\ ^2D_{3/2}$	$sp(^3P)d\ ^4D_{1/2}$	14.498	4.04[12]	6.36[-2]	1.22[-2]	13.821	4.94[12]	7.10[-2]	1.29[-2]
$p^2(^1D)s\ ^2D_{5/2}$	$sp(^1P)d\ ^2P_{3/2}$	14.411	7.05[12]	1.47[-1]	4.17[-2]	13.732	7.92[12]	1.49[-1]	4.04[-2]
$p^2(^1D)s\ ^2D_{3/2}$	$sp(^3P)d\ ^2D_{5/2}$	14.408	1.39[12]	6.46[-2]	1.23[-2]	13.733	1.61[12]	6.81[-2]	1.23[-2]
$p^2(^1D)s\ ^2D_{5/2}$	$sp(^1P)d\ ^2D_{5/2}$	14.374	6.34[12]	1.96[-1]	5.58[-2]	13.698	7.12[12]	2.00[-1]	5.43[-2]
$p^2(^3P)s\ ^4P_{3/2}$	$sp(^3P)d\ ^4D_{5/2}$	14.341	5.11[11]	2.37[-2]	4.46[-3]	13.671	5.99[11]	2.52[-2]	4.55[-3]
$p^2(^3P)s\ ^4P_{3/2}$	$sp(^3P)d\ ^4P_{3/2}$	14.218	2.58[12]	7.83[-2]	1.46[-2]	13.554	2.74[12]	7.54[-2]	1.34[-2]
$p^2[^3P)s\ ^4P_{5/2}$	$sp(^3P)d\ ^4D_{3/2}$	14.158	4.04[11]	8.11[-3]	2.26[-3]	13.511	4.21[11]	7.68[-3]	2.05[-3]
$p^2(^1S)s\ ^2S_{1/2}$	$sp(^3P)d\ ^2D_{3/2}$	14.047	3.75[12]	2.21[-1]	2.05[-2]	13.405	4.24[12]	2.28[-1]	2.02[-2]
$p^2(^3P)s\ ^4P_{5/2}$	$sp(^3P)d\ ^2D_{5/2}$	14.040	5.82[12]	1.72[-1]	4.78[-2]	13.397	6.54[12]	1.76[-1]	4.66[-2]
$p^2(^3P)s\ ^4P_{5/2}$	$sp(^3P)d\ ^4D_{7/2}$	14.026	4.27[12]	1.68[-1]	4.64[-2]	13.389	4.76[12]	1.71[-1]	4.51[-2]
$p^2(^3P)s\ ^4P_{3/2}$	$sp(^3P)d\ ^4P_{1/2}$	13.900	3.36[12]	4.88[-2]	8.92[-3]	13.261	4.06[12]	5.37[-2]	9.36[-3]
$p^2(^3P)s\ ^4P_{1/2}$	$p^2(^3P)p\ ^2P_{1/2}$	13.898	6.01[12]	1.75[-1]	1.59[-2]	13.271	6.70[12]	1.78[-1]	1.55[-2]
$s^2(^1S)d\ ^2D_{3/2}$	$sp(^1P)d\ ^2D_{3/2}$	13.853	8.98[12]	2.58[-1]	4.71[-2]	13.228	1.00[13]	2.63[-1]	4.58[-2]
$p^2(^1D)s\ ^2D_{3/2}$	$sp(^3P)d\ ^2D_{3/2}$	13.844	5.91[12]	1.70[-1]	3.09[-2]	13.215	6.65[12]	1.74[-1]	3.04[-2]
$p^2(^3P)s\ ^4P_{3/2}$	$sp(^3P)d\ ^4D_{3/2}$	13.819	6.39[12]	1.83[-1]	3.33[-2]	13.197	7.33[12]	1.91[-1]	3.33[-2]
$p^2(^3P)s\ ^4P_{3/2}$	$sp(^3P)d\ ^4D_{1/2}$	13.788	1.07[12]	1.53[-2]	2.78[-3]	13.168	8.94[11]	1.16[-2]	2.02[-3]
$p^2(^3P)s\ ^4P_{1/2}$	$sp(^3P)d\ ^4F_{3/2}$	13.740	1.01[13]	5.67[-1]	5.13[-2]	13.120	1.14[13]	5.84[-1]	5.04[-2]
$p^2(^1S)s\ ^2S_{1/2}$	$sp(^3P)d\ ^2P_{1/2}$	13.725	6.60[12]	1.86[-1]	1.69[-2]	13.107	7.43[12]	1.91[-1]	1.65[-2]
$s^2(^1S)p\ ^2P_{1/2}$	$p^2(^3P)s\ ^2P_{3/2}$	13.707	1.07[13]	6.04[-1]	5.45[-2]	13.090	1.21[13]	6.20[-1]	5.34[-2]
$p^2(^3P)s\ ^4P_{3/2}$	$sp(^3P)d\ ^2D_{5/2}$	13.707	1.42[12]	6.02[-2]	1.09[-2]	13.089	1.55[12]	5.97[-2]	1.03[-2]
$p^2(^1D)s\ ^2D_{3/2}$	$sp(^3P)d\ ^2F_{5/2}$	13.647	1.26[12]	5.27[-2]	9.49[-3]	13.034	1.36[12]	5.22[-2]	8.92[-3]
$p^2(^3P)s\ ^4P_{5/2}$	$sp(^3P)d\ ^2F_{5/2}$	13.316	1.02[12]	2.72[-2]	7.15[-3]	12.730	1.20[12]	2.92[-2]	7.33[-3]
$p^2(^3P)s\ ^4P_{3/2}$	$sp(^3P)d\ ^2D_{3/2}$	13.196	1.66[11]	4.32[-3]	7.51[-4]	12.617	1.95[11]	4.64[-3]	7.71[-4]

Lower level	Upper level	λ	A	f	S	λ	A	f	S
				$Z=85$				$Z=86$	
$p^2(^1S)s\ ^2S_{1/2}$	$p^2(^3P)p\ ^2P_{3/2}$	30.683	3.96[11]	1.11[-1]	2.26[-2]	29.781	4.21[11]	1.12[-1]	2.20[-2]
$p^2(^1D)s\ ^2D_{3/2}$	$sp(^3P)d\ ^4P_{5/2}$	30.002	2.99[11]	6.03[-2]	2.39[-2]	29.106	3.17[11]	6.03[-2]	2.31[-2]
$p^2(^3P)s\ ^2P_{1/2}$	$sp(^1P)d\ ^2P_{1/2}$	29.886	6.46[11]	8.66[-2]	1.70[-2]	29.026	6.82[11]	8.62[-2]	1.65[-2]
$s^2(^1S)p\ ^2P_{3/2}$	$p^2(^1D)s\ ^2D_{5/2}$	29.264	5.67[11]	1.09[-1]	4.21[-2]	28.420	6.03[11]	1.10[-1]	4.10[-2]
$p^2(^3P)s\ ^4P_{5/2}$	$sp(^3P)d\ ^4F_{7/2}$	29.236	3.99[11]	6.82[-2]	3.94[-2]	28.391	4.30[11]	6.92[-2]	3.88[-2]
$p^2(^3P)s\ ^4P_{3/2}$	$sp(^3P)d\ ^4F_{5/2}$	28.963	5.15[11]	9.73[-2]	3.70[-2]	28.132	5.48[11]	9.73[-2]	3.61[-2]
$p^2(^3P)s\ ^2P_{1/2}$	$sp(^1P)d\ ^2P_{3/2}$	28.924	4.55[11]	1.14[-1]	2.18[-2]	28.100	4.84[11]	1.14[-1]	2.12[-2]
$p^2(^3P)s\ ^2P_{3/2}$	$sp(^3P)d\ ^2D_{5/2}$	14.021	2.43[11]	1.08[-2]	1.98[-3]	13.330	2.89[11]	1.16[-2]	2.03[-3]
$p^2(^1D)s\ ^2D_{5/2}$	$sp(^1P)d\ ^2F_{5/2}$	13.922	1.25[12]	3.64[-2]	1.00[-2]	13.241	1.39[12]	3.67[-2]	9.57[-3]
$p^2(^1D)s\ ^2D_{5/2}$	$sp(^3P)d\ ^2F_{7/2}$	13.778	2.96[11]	1.12[-2]	3.04[-3]	13.110	3.20[11]	1.10[-2]	2.84[-3]
$p^2(^1S)s\ ^2S_{1/2}$	$sp(^3P)d\ ^4P_{3/2}$	13.764	3.62[12]	2.06[-1]	1.87[-2]	13.096	4.00[12]	2.06[-1]	1.77[-2]
$p^2(^1D)s\ ^2D_{5/2}$	$sp(^3P)d\ ^2P_{3/2}$	13.700	8.10[11]	1.52[-2]	4.10[-3]	13.037	9.02[11]	1.54[-2]	3.95[-3]
$p^2(^1D)s\ ^2D_{3/2}$	$sp(^3P)d\ ^4D_{5/2}$	13.680	1.85[12]	7.80[-2]	1.41[-2]	13.021	2.00[12]	7.65[-2]	1.31[-2]
$p^2(^1D)s\ ^2D_{3/2}$	$sp(^3P)d\ ^4P_{3/2}$	13.557	9.19[11]	2.55[-2]	4.53[-3]	12.903	1.01[12]	2.53[-2]	4.29[-3]
$p^2(^3P)s\ ^2P_{3/2}$	$sp(^3P)d\ ^2D_{3/2}$	13.475	3.09[12]	8.39[-2]	1.49[-2]	12.831	3.38[12]	8.34[-2]	1.41[-2]
$p^2(^1S)s\ ^2S_{1/2}$	$sp(^3P)d\ ^4P_{1/2}$	13.460	3.71[11]	1.01[-2]	8.93[-4]	12.819	3.55[11]	8.75[-3]	7.39[-4]
$p^2(^1D)s\ ^2D_{5/2}$	$sp(^1P)d\ ^2F_{7/2}$	13.416	8.06[12]	2.90[-1]	7.69[-2]	12.776	9.08[12]	2.96[-1]	7.48[-2]
$p^2(^1S)s\ ^2S_{1/2}$	$sp(^3P)d\ ^4D_{1/2}$	13.371	3.88[11]	1.04[-2]	9.15[-4]	12.744	4.56[11]	1.11[-2]	9.34[-4]
$s^2(^1S)p\ ^2P_{1/2}$	$p^2(^1D)s\ ^2D_{3/2}$	13.346	1.61[12]	8.56[-2]	7.52[-3]	12.713	1.71[12]	8.31[-2]	6.96[-3]
$p^2(^3P)s\ ^4P_{5/2}$	$sp(^3P)d\ ^4D_{5/2}$	13.346	5.12[11]	1.36[-2]	3.60[-3]	12.716	5.19[11]	1.25[-2]	3.15[-3]
$p^2(^3P)s\ ^2P_{3/2}$	$sp(^3P)d\ ^2F_{5/2}$	13.286	1.52[13]	6.05[-1]	1.06[-1]	12.658	1.72[13]	6.20[-1]	1.03[-1]
$p^2(^1D)s\ ^2D_{3/2}$	$sp(^3P)d\ ^4P_{1/2}$	13.261	1.32[12]	1.74[-2]	3.03[-3]	12.634	1.11[12]	1.33[-2]	2.21[-3]
$p^2(^3P)s\ ^4P_{1/2}$	$p^2(^3P)p\ ^4S_{3/2}$	13.250	1.10[12]	5.79[-2]	5.05[-3]	12.628	1.18[12]	5.63[-2]	4.67[-3]
$p^2(^3P)s\ ^4P_{5/2}$	$sp(^3P)d\ ^4P_{3/2}$	13.228	1.36[12]	2.36[-2]	6.18[-3]	12.603	1.55[12]	2.46[-2]	6.13[-3]
$p^2(^1D)s\ ^2D_{3/2}$	$sp(^3P)d\ ^4D_{3/2}$	13.206	3.75[11]	9.81[-3]	1.71[-3]	12.591	4.56[11]	1.09[-2]	1.80[-3]
$p^2(^1D)s\ ^2D_{3/2}$	$sp(^3P)d\ ^4D_{1/2}$	13.175	5.93[12]	7.75[-2]	1.34[-2]	12.560	7.01[12]	8.29[-2]	1.37[-2]
$p^2(^3P)s\ ^2P_{3/2}$	$sp(^3P)d\ ^2P_{1/2}$	13.169	1.16[13]	1.50[-1]	2.61[-2]	12.548	1.30[13]	1.53[-1]	2.53[-2]
$s^2(^1S)p\ ^2P_{1/2}$	$p^2(^1S)s\ ^2S_{1/2}$	13.151	9.57[12]	2.49[-1]	2.15[-2]	12.531	1.07[13]	2.53[-1]	2.08[-2]
$s^2(^1S)p\ ^2P_{3/2}$	$p^2(^3P)s\ ^2P_{1/2}$	13.155	6.95[12]	9.02[-2]	1.56[-2]	12.535	7.79[12]	9.17[-2]	1.52[-2]
$p^2(^1D)s\ ^2D_{3/2}$	$sp(^3P)d\ ^2D_{5/2}$	13.092	1.87[12]	7.16[-2]	1.24[-2]	12.481	2.15[12]	7.55[-2]	1.24[-2]
$p^2(^1D)s\ ^2D_{5/2}$	$sp(^1P)d\ ^2P_{3/2}$	13.086	8.85[12]	1.52[-1]	3.92[-2]	12.473	9.92[12]	1.55[-1]	3.80[-2]
$p^2(^1D)s\ ^2D_{5/2}$	$sp(^1P)d\ ^2D_{5/2}$	13.056	8.00[12]	2.04[-1]	5.28[-2]	12.445	8.97[12]	2.09[-1]	5.13[-2]
$p^2(^3P)s\ ^4P_{3/2}$	$sp(^3P)d\ ^4D_{5/2}$	13.034	7.04[11]	2.69[-2]	4.62[-3]	12.428	8.26[11]	2.87[-2]	4.70[-3]
$p^2(^3P)s\ ^4P_{3/2}$	$sp(^3P)d\ ^4P_{3/2}$	12.922	2.88[12]	7.19[-2]	1.22[-2]	12.321	3.00[12]	6.79[-2]	1.11[-2]
$p^2[^3P)s\ ^4P_{5/2}$	$sp(^3P)d\ ^4D_{3/2}$	12.894	4.35[11]	7.21[-3]	1.84[-3]	12.306	4.45[11]	6.75[-3]	1.64[-3]
$p^2(^1S)s\ ^2S_{1/2}$	$sp(^3P)d\ ^2D_{3/2}$	12.794	4.79[12]	2.35[-1]	1.98[-2]	12.211	5.41[12]	2.42[-1]	1.95[-2]
$p^2(^3P)s\ ^4P_{5/2}$	$sp(^3P)d\ ^2D_{5/2}$	12.785	7.33[12]	1.79[-1]	4.53[-2]	12.201	8.19[12]	1.83[-1]	4.41[-2]
$p^2(^3P)s\ ^4P_{5/2}$	$sp(^3P)d\ ^4D_{7/2}$	12.782	5.31[12]	1.74[-1]	4.38[-2]	12.203	5.94[12]	1.77[-1]	4.26[-2]
$p^2(^3P)s\ ^4P_{1/2}$	$p^2(^3P)p\ ^2P_{1/2}$	12.672	7.48[12]	1.81[-1]	1.50[-2]	12.101	8.33[12]	1.83[-1]	1.46[-2]
$p^2(^3P)s\ ^4P_{3/2}$	$sp(^3P)d\ ^4P_{1/2}$	12.653	4.82[12]	5.77[-2]	9.64[-3]	12.075	5.63[12]	6.17[-2]	9.79[-3]
$s^2(^1S)d\ ^2D_{3/2}$	$sp(^1P)d\ ^2D_{3/2}$	12.632	1.12[13]	2.67[-1]	4.45[-2]	12.063	1.25[13]	2.72[-1]	4.32[-2]
$p^2(^1D)s\ ^2D_{3/2}$	$sp(^3P)d\ ^2D_{3/2}$	12.615	7.54[12]	1.79[-1]	2.99[-2]	12.042	8.52[12]	1.85[-1]	2.93[-2]
$p^2(^3P)s\ ^4P_{3/2}$	$sp(^3P)d\ ^4D_{3/2}$	12.603	8.41[12]	2.00[-1]	3.32[-2]	12.036	9.65[12]	2.09[-1]	3.32[-2]
$p^2(^3P)s\ ^4P_{3/2}$	$sp(^3P)d\ ^4D_{1/2}$	12.575	7.18[11]	8.50[-3]	1.41[-3]	12.008	5.57[11]	6.01[-3]	9.53[-4]
$p^2(^3P)s\ ^4P_{1/2}$	$sp(^3P)d\ ^4F_{3/2}$	12.529	1.27[13]	6.00[-1]	4.95[-2]	11.964	1.44[13]	6.16[-1]	4.86[-2]
$p^2(^1S)s\ ^2S_{1/2}$	$sp(^3P)d\ ^2P_{1/2}$	12.517	8.37[12]	1.97[-1]	1.62[-2]	11.955	9.42[12]	2.02[-1]	1.59[-2]
$s^2(^1S)p\ ^2P_{1/2}$	$p^2(^3P)s\ ^2P_{3/2}$	12.501	1.36[13]	6.35[-1]	5.23[-2]	11.939	1.53[13]	6.52[-1]	5.12[-2]
$p^2(^3P)s\ ^4P_{3/2}$	$sp(^3P)d\ ^2D_{5/2}$	12.499	1.68[12]	5.92[-2]	9.74[-3]	11.936	1.83[12]	5.87[-2]	9.22[-3]
$p^2(^1D)s\ ^2D_{3/2}$	$sp(^3P)d\ ^2F_{5/2}$	12.448	1.47[12]	5.12[-2]	8.39[-3]	11.890	1.58[12]	5.02[-2]	7.89[-3]
$p^2(^3P)s\ ^4P_{5/2}$	$sp(^3P)d\ ^2F_{5/2}$	12.171	1.41[12]	3.12[-2]	7.51[-3]	11.635	1.65[12]	3.35[-2]	7.69[-3]
$p^2(^3P)s\ ^4P_{3/2}$	$sp(^3P)d\ ^2D_{3/2}$	12.063	2.28[11]	4.98[-3]	7.91[-4]	11.534	2.68[11]	5.33[-3]	8.11[-4]

Lower level	Upper level	λ	A	f	S	λ	A	f	S
				Z=87				Z=88	
$p^2(^1S)s\ ^2S_{1/2}$	$p^2(^3P)p\ ^2P_{3/2}$	28.905	4.49[11]	1.12[-1]	2.14[-2]	28.055	4.78[11]	1.13[-1]	2.09[-2]
$p^2(^1D)s\ ^2D_{3/2}$	$sp(^3P)d\ ^4P_{5/2}$	28.235	3.35[11]	6.03[-2]	2.24[-2]	27.392	3.57[11]	6.03[-2]	2.17[-2]
$p^2(^3P)s\ ^2P_{1/2}$	$sp(^1P)d\ ^2P_{1/2}$	28.189	7.21[11]	8.59[-2]	1.60[-2]	27.377	7.62[11]	8.57[-2]	1.54[-2]
$s^2(^1S)p\ ^2P_{3/2}$	$p^2(^1D)s\ ^2D_{5/2}$	27.602	6.42[11]	1.10[-1]	4.00[-2]	26.806	6.84[11]	1.11[-1]	3.90[-2]
$p^2(^3P)s\ ^4P_{5/2}$	$sp(^3P)d\ ^4F_{7/2}$	27.571	4.62[11]	7.01[-2]	3.81[-2]	26.775	4.96[11]	7.07[-2]	3.75[-2]
$p^2(^3P)s\ ^4P_{3/2}$	$sp(^3P)d\ ^4F_{5/2}$	27.326	5.83[11]	9.78[-2]	3.52[-2]	26.542	6.18[11]	9.82[-2]	3.44[-2]
$p^2(^3P)s\ ^2P_{1/2}$	$sp(^1P)d\ ^2P_{3/2}$	27.299	5.12[11]	1.15[-1]	2.06[-2]	26.522	5.46[11]	1.15[-1]	2.01[-2]
$p^2(^3P)s\ ^2P_{3/2}$	$sp(^3P)d\ ^2D_{5/2}$	12.674	3.45[11]	1.25[-2]	2.08[-3]	12.054	4.13[11]	1.35[-2]	2.14[-3]
$p^2(^1D)s\ ^2D_{5/2}$	$sp(^1P)d\ ^2F_{5/2}$	12.595	1.55[12]	3.70[-2]	9.17[-3]	11.982	1.73[12]	3.70[-2]	8.80[-3]
$p^2(^1D)s\ ^2D_{5/2}$	$sp(^3P)d\ ^2F_{7/2}$	12.475	3.47[11]	1.08[-2]	2.66[-3]	11.873	3.76[11]	1.06[-2]	2.49[-3]
$p^2(^1S)s\ ^2S_{1/2}$	$sp(^3P)d\ ^4P_{3/2}$	12.462	4.39[12]	2.05[-1]	1.68[-2]	11.861	4.81[12]	2.04[-1]	1.59[-2]
$p^2(^1D)s\ ^2D_{5/2}$	$sp(^3P)d\ ^2P_{3/2}$	12.407	1.00[12]	1.55[-2]	3.80[-3]	11.809	1.12[12]	1.57[-2]	3.66[-3]
$p^2(^1D)s\ ^2D_{3/2}$	$sp(^3P)d\ ^4D_{5/2}$	12.394	2.16[12]	7.45[-2]	1.22[-2]	11.799	2.32[12]	7.30[-2]	1.13[-2]
$p^2(^1D)s\ ^2D_{3/2}$	$sp(^3P)d\ ^4P_{3/2}$	12.281	1.11[12]	2.50[-2]	4.04[-3]	11.691	1.20[12]	2.46[-2]	3.79[-3]
$p^2(^3P)s\ ^2P_{3/2}$	$sp(^3P)d\ ^2D_{3/2}$	12.218	3.71[12]	8.30[-2]	1.33[-2]	11.637	4.05[12]	8.20[-2]	1.26[-2]
$p^2(^1S)s\ ^2S_{1/2}$	$sp(^3P)d\ ^4P_{1/2}$	12.212	3.37[11]	7.55[-3]	6.07[-4]	11.636	3.24[11]	6.56[-3]	5.03[-4]
$p^2(^1S)s\ ^2S_{1/2}$	$sp(^3P)d\ ^4D_{3/2}$	12.178	1.80[11]	7.98[-3]	6.40[-4]	11.610	2.51[11]	1.02[-2]	7.77[-4]
$p^2(^1D)s\ ^2D_{5/2}$	$sp(^1P)d\ ^2F_{7/2}$	12.167	1.02[13]	3.03[-1]	7.28[-2]	11.588	1.15[13]	3.09[-1]	7.08[-2]
$p^2(^1S)s\ ^2S_{1/2}$	$sp(^3P)d\ ^4D_{1/2}$	12.146	5.26[11]	1.16[-2]	9.32[-4]	11.576	5.93[11]	1.19[-2]	9.09[-4]
$s^2(^1S)p\ ^2P_{1/2}$	$p^2(^1D)s\ ^2D_{3/2}$	12.112	1.83[12]	8.04[-2]	6.41[-3]	11.540	1.94[12]	7.76[-2]	5.89[-3]
$p^2(^3P)s\ ^4P_{5/2}$	$sp(^3P)d\ ^4D_{5/2}$	12.117	5.19[11]	1.14[-2]	2.73[-3]	11.548	5.15[11]	1.03[-2]	2.35[-3]
$p^2(^3P)s\ ^2P_{3/2}$	$sp(^3P)d\ ^2F_{5/2}$	12.060	1.93[13]	6.30[-1]	1.00[-1]	11.492	2.18[13]	6.45[-1]	9.78[-2]
$p^2(^3P)s\ ^4P_{1/2}$	$p^2(^3P)p\ ^4S_{3/2}$	12.036	1.25[12]	5.42[-2]	4.29[-3]	11.473	1.32[12]	5.19[-2]	3.92[-3]
$p^2(^1D)s\ ^2D_{3/2}$	$sp(^3P)d\ ^4P_{1/2}$	12.038	9.02[11]	9.80[-3]	1.55[-3]	11.472	7.23[11]	7.11[-3]	1.08[-3]
$p^2(^3P)s\ ^4P_{5/2}$	$sp(^3P)d\ ^4P_{3/2}$	12.009	1.79[12]	2.57[-2]	6.10[-3]	11.444	2.05[12]	2.68[-2]	6.07[-3]
$p^2(^1D)s\ ^2D_{3/2}$	$sp(^3P)d\ ^4D_{3/2}$	12.005	5.57[11]	1.20[-2]	1.90[-3]	11.447	6.80[11]	1.34[-2]	2.01[-3]
$p^2(^1D)s\ ^2D_{3/2}$	$sp(^3P)d\ ^4D_{1/2}$	11.974	8.17[12]	8.78[-2]	1.39[-2]	11.414	9.44[12]	9.23[-2]	1.39[-2]
$p^2(^3P)s\ ^2P_{3/2}$	$sp(^3P)d\ ^2P_{1/2}$	11.957	1.45[13]	1.57[-1]	2.46[-2]	11.395	1.64[13]	1.60[-1]	2.39[-2]
$s^2(^1S)p\ ^2P_{1/2}$	$p^2(^1S)s\ ^2S_{1/2}$	11.940	1.20[13]	2.57[-1]	2.02[-2]	11.379	1.34[13]	2.62[-1]	1.96[-2]
$s^2(^1S)p\ ^2P_{3/2}$	$p^2(^3P)s\ ^2P_{1/2}$	11.945	8.72[12]	9.37[-2]	1.47[-2]	11.384	9.74[12]	9.52[-2]	1.43[-2]
$p^2(^1D)s\ ^2D_{3/2}$	$sp(^3P)d\ ^2D_{5/2}$	11.899	2.49[12]	7.95[-2]	1.24[-2]	11.346	2.88[12]	8.35[-2]	1.24[-2]
$p^2(^1D)s\ ^2D_{5/2}$	$sp(^1P)d\ ^2P_{3/2}$	11.888	1.11[13]	1.58[-1]	3.69[-2]	11.332	1.25[13]	1.60[-1]	3.58[-2]
$p^2(^1D)s\ ^2D_{5/2}$	$sp(^1P)d\ ^2D_{5/2}$	11.863	1.01[13]	2.13[-1]	4.99[-2]	11.309	1.13[13]	2.17[-1]	4.85[-2]
$p^2(^3P)s\ ^4P_{3/2}$	$sp(^3P)d\ ^4D_{5/2}$	11.851	9.66[11]	3.06[-2]	4.77[-3]	11.302	1.13[12]	3.26[-2]	4.84[-3]
$p^2(^3P)s\ ^4P_{3/2}$	$sp(^3P)d\ ^4P_{3/2}$	11.748	3.08[12]	6.35[-2]	9.83[-3]	11.203	3.11[12]	5.85[-2]	8.62[-3]
$p^2[^3P)s\ ^4P_{5/2}$	$sp(^3P)d\ ^4D_{3/2}$	11.745	4.48[11]	6.18[-3]	1.43[-3]	11.210	4.44[11]	5.58[-3]	1.24[-3]
$p^2(^1S)s\ ^2S_{1/2}$	$sp(^3P)d\ ^2D_{3/2}$	11.655	6.10[12]	2.49[-1]	1.91[-2]	11.125	6.94[12]	2.57[-1]	1.88[-2]
$p^2(^3P)s\ ^4P_{5/2}$	$sp(^3P)d\ ^4D_{7/2}$	11.650	6.63[12]	1.80[-1]	4.14[-2]	11.122	7.40[12]	1.84[-1]	4.02[-2]
$p^2(^3P)s\ ^4P_{5/2}$	$sp(^3P)d\ ^2D_{5/2}$	11.644	9.17[12]	1.87[-1]	4.29[-2]	11.113	1.03[13]	1.90[-1]	4.17[-2]
$p^2(^3P)s\ ^4P_{1/2}$	$p^2(^3P)p\ ^2P_{1/2}$	11.555	9.29[12]	1.86[-1]	1.42[-2]	11.035	1.04[13]	1.89[-1]	1.38[-2]
$s^2(^1S)d\ ^2D_{3/2}$	$sp(^1P)d\ ^2D_{3/2}$	11.520	1.39[13]	2.77[-1]	4.20[-2]	11.002	1.56[13]	2.81[-1]	4.08[-2]
$p^2(^3P)s\ ^4P_{3/2}$	$sp(^3P)d\ ^4P_{1/2}$	11.525	6.51[12]	6.47[-2]	9.84[-3]	11.001	7.44[12]	6.77[-2]	9.79[-3]
$p^2(^3P)s\ ^4P_{3/2}$	$sp(^3P)d\ ^4D_{3/2}$	11.495	1.11[13]	2.20[-1]	3.32[-2]	10.978	1.28[13]	2.30[-1]	3.33[-2]
$p^2(^1D)s\ ^2D_{3/2}$	$sp(^3P)d\ ^2D_{3/2}$	11.496	9.60[12]	1.91[-1]	2.88[-2]	10.975	1.08[13]	1.96[-1]	2.83[-2]
$p^2(^3P)s\ ^4P_{3/2}$	$sp(^3P)d\ ^4D_{1/2}$	11.466	4.07[11]	4.02[-3]	6.07[-4]	10.948	2.84[11]	2.56[-3]	3.69[-4]
$p^2(^3P)s\ ^4P_{1/2}$	$sp(^3P)d\ ^4F_{3/2}$	11.425	1.62[13]	6.34[-1]	4.77[-2]	10.911	1.83[13]	6.52[-1]	4.69[-2]
$p^2(^1S)s\ ^2S_{1/2}$	$sp(^3P)d\ ^2P_{1/2}$	11.417	1.07[13]	2.07[-1]	1.56[-2]	10.904	1.19[13]	2.13[-1]	1.53[-2]
$s^2(^1S)p\ ^2P_{1/2}$	$p^2(^3P)s\ ^2P_{3/2}$	11.402	1.71[13]	6.69[-1]	5.02[-2]	10.889	1.93[13]	6.85[-1]	4.92[-2]
$p^2(^3P)s\ ^4P_{3/2}$	$sp(^3P)d\ ^2D_{5/2}$	11.398	1.99[12]	5.82[-2]	8.71[-3]	10.885	2.15[12]	5.72[-2]	8.22[-3]
$p^2(^1D)s\ ^2D_{3/2}$	$sp(^3P)d\ ^2F_{5/2}$	11.356	1.71[12]	4.95[-2]	7.40[-3]	10.846	1.83[12]	4.87[-2]	6.94[-3]
$p^2(^3P)s\ ^4P_{5/2}$	$sp(^3P)d\ ^2F_{5/2}$	11.123	1.93[12]	3.58[-2]	7.88[-3]	10.633	2.26[12]	3.85[-2]	8.06[-3]

Lower level	Upper level	λ	A	f	S	λ	A	f	S
				Z=89				Z=90	
$p^2(^1S)s\ ^2S_{1/2}$	$p^2(^3P)p\ ^2P_{3/2}$	27.230	5.09[11]	1.13[-1]	2.03[-2]	26.430	5.43[11]	1.14[-1]	1.98[-2]
$p^2(^3P)s\ ^2P_{1/2}$	$sp(^1P)d\ ^2P_{1/2}$	26.587	8.06[11]	8.54[-2]	1.50[-2]	25.820	8.52[11]	8.53[-2]	1.45[-2]
$p^2(^1D)s\ ^2D_{3/2}$	$sp(^3P)d\ ^4P_{5/2}$	26.573	3.79[11]	5.98[-2]	2.10[-2]	25.780	4.01[11]	5.97[-2]	2.03[-2]
$s^2(^1S)p\ ^2P_{3/2}$	$p^2(^1D)s\ ^2D_{5/2}$	26.034	7.29[11]	1.11[-1]	3.80[-2]	25.285	7.74[11]	1.12[-1]	3.71[-2]
$p^2(^3P)s\ ^4P_{5/2}$	$sp(^3P)d\ ^4F_{7/2}$	26.002	5.30[11]	7.17[-2]	3.69[-2]	25.252	5.71[11]	7.27[-2]	3.63[-2]
$p^2(^3P)s\ ^4P_{3/2}$	$sp(^3P)d\ ^4F_{5/2}$	25.782	6.61[11]	9.87[-2]	3.35[-2]	25.043	7.03[11]	9.92[-2]	3.27[-2]
$p^2(^3P)s\ ^2P_{1/2}$	$sp(^1P)d\ ^2P_{3/2}$	25.766	5.80[11]	1.15[-1]	1.95[-2]	25.032	6.14[11]	1.15[-1]	1.90[-2]
$p^2(^3P)s\ ^2P_{3/2}$	$sp(^3P)d\ ^2D_{5/2}$	11.465	4.91[11]	1.46[-2]	2.20[-3]	10.908	5.89[11]	1.58[-2]	2.26[-3]
$p^2(^1D)s\ ^2D_{5/2}$	$sp(^1P)d\ ^2F_{5/2}$	11.401	1.92[12]	3.74[-2]	8.45[-3]	10.850	2.14[12]	3.77[-2]	8.11[-3]
$p^2(^1D)s\ ^2D_{5/2}$	$sp(^3P)d\ ^2F_{7/2}$	11.301	4.08[11]	1.04[-2]	2.33[-3]	10.759	4.44[11]	1.03[-2]	2.18[-3]
$p^2(^1S)s\ ^2S_{1/2}$	$sp(^3P)d\ ^4P_{3/2}$	11.290	5.25[12]	2.01[-1]	1.50[-2]	10.749	5.74[12]	1.99[-1]	1.41[-2]
$p^2(^1D)s\ ^2D_{5/2}$	$sp(^3P)d\ ^2P_{3/2}$	11.242	1.26[12]	1.59[-2]	3.52[-3]	10.703	1.41[12]	1.61[-2]	3.40[-3]
$p^2(^1D)s\ ^2D_{3/2}$	$sp(^3P)d\ ^4D_{5/2}$	11.235	2.50[12]	7.10[-2]	1.05[-2]	10.699	2.68[12]	6.90[-2]	9.73[-3]
$p^2(^1D)s\ ^2D_{3/2}$	$sp(^3P)d\ ^4P_{3/2}$	11.131	1.29[12]	2.42[-2]	3.54[-3]	10.600	1.40[12]	2.36[-2]	3.29[-3]
$p^2(^3P)s\ ^2P_{3/2}$	$sp(^3P)d\ ^2D_{3/2}$	11.084	4.41[12]	8.15[-2]	1.19[-2]	10.560	4.82[12]	8.05[-2]	1.12[-2]
$p^2(^1S)s\ ^2S_{1/2}$	$sp(^3P)d\ ^4P_{1/2}$	11.088	3.11[11]	5.74[-3]	4.19[-4]	10.569	3.04[11]	5.09[-3]	3.54[-4]
$p^2(^1S)s\ ^2S_{1/2}$	$sp(^3P)d\ ^4D_{3/2}$	11.068	3.51[11]	1.29[-2]	9.38[-4]	10.553	4.79[11]	1.61[-2]	1.11[-3]
$p^2(^1D)s\ ^2D_{5/2}$	$sp(^1P)d\ ^2F_{7/2}$	11.038	1.30[13]	3.16[-1]	6.89[-2]	10.516	1.46[13]	3.23[-1]	6.71[-2]
$p^2(^1S)s\ ^2S_{1/2}$	$sp(^3P)d\ ^4D_{1/2}$	11.033	6.57[11]	1.20[-2]	8.72[-4]	10.517	7.17[11]	1.19[-2]	8.24[-4]
$p^2(^3P)s\ ^4P_{5/2}$	$sp(^3P)d\ ^4D_{5/2}$	11.006	5.05[11]	9.22[-3]	2.00[-3]	10.491	4.96[11]	8.19[-3]	1.70[-3]
$s^2(^1S)p\ ^2P_{1/2}$	$p^2(^1D)s\ ^2D_{3/2}$	10.997	2.06[12]	7.45[-2]	5.40[-3]	10.481	2.18[12]	7.15[-2]	4.94[-3]
$p^2(^3P)s\ ^2P_{3/2}$	$sp(^3P)d\ ^2F_{5/2}$	10.952	2.45[13]	6.60[-1]	9.53[-2]	10.438	2.76[13]	6.75[-1]	9.28[-2]
$p^2(^3P)s\ ^4P_{1/2}$	$p^2(^3P)p\ ^4S_{3/2}$	10.936	1.37[12]	4.94[-2]	3.56[-3]	10.426	1.43[12]	4.68[-2]	3.21[-3]
$p^2(^1D)s\ ^2D_{3/2}$	$sp(^3P)d\ ^4P_{1/2}$	10.935	5.64[11]	5.08[-3]	7.29[-4]	10.424	4.36[11]	3.55[-3]	4.88[-4]
$p^2(^1D)s\ ^2D_{3/2}$	$sp(^3P)d\ ^4D_{3/2}$	10.915	8.33[11]	1.49[-2]	2.14[-3]	10.409	1.02[12]	1.66[-2]	2.27[-3]
$p^2(^3P)s\ ^4P_{5/2}$	$sp(^3P)d\ ^4P_{3/2}$	10.907	2.36[12]	2.80[-2]	6.04[-3]	10.396	2.71[12]	2.93[-2]	6.01[-3]
$p^2(^1D)s\ ^2D_{3/2}$	$sp(^3P)d\ ^4D_{1/2}$	10.881	1.08[13]	9.57[-2]	1.38[-2]	10.374	1.23[13]	9.92[-2]	1.35[-2]
$p^2(^3P)s\ ^2P_{3/2}$	$sp(^3P)d\ ^2P_{1/2}$	10.861	1.83[13]	1.63[-1]	2.32[-2]	10.353	2.06[13]	1.66[-1]	2.26[-2]
$s^2(^1S)p\ ^2P_{3/2}$	$p^2(^3P)s\ ^2P_{1/2}$	10.850	1.09[13]	9.67[-2]	1.38[-2]	10.343	1.23[13]	9.86[-2]	1.34[-2]
$s^2(^1S)p\ ^2P_{1/2}$	$p^2(^1S)s\ ^2S_{1/2}$	10.846	1.51[13]	2.66[-1]	1.90[-2]	10.339	1.68[13]	2.71[-1]	1.84[-2]
$p^2(^1D)s\ ^2D_{3/2}$	$sp(^3P)d\ ^2D_{5/2}$	10.818	3.31[12]	8.74[-2]	1.24[-2]	10.316	3.83[12]	9.14[-2]	1.24[-2]
$p^2(^1D)s\ ^2D_{5/2}$	$sp(^1P)d\ ^2P_{3/2}$	10.803	1.39[13]	1.63[-1]	3.47[-2]	10.300	1.57[13]	1.66[-1]	3.37[-2]
$p^2(^1D)s\ ^2D_{5/2}$	$sp(^1P)d\ ^2D_{5/2}$	10.782	1.27[13]	2.21[-1]	4.72[-2]	10.281	1.42[13]	2.26[-1]	4.59[-2]
$p^2(^3P)s\ ^4P_{3/2}$	$sp(^3P)d\ ^4D_{5/2}$	10.779	1.33[12]	3.46[-2]	4.91[-3]	10.282	1.55[12]	3.68[-2]	4.97[-3]
$p^2[^3P)s\ ^4P_{5/2}$	$sp(^3P)d\ ^4D_{3/2}$	10.699	4.31[11]	4.91[-3]	1.04[-3]	10.213	4.09[11]	4.26[-3]	8.61[-4]
$p^2(^3P)s\ ^4P_{3/2}$	$sp(^3P)d\ ^4P_{3/2}$	10.684	3.08[12]	5.26[-2]	7.42[-3]	10.190	3.00[12]	4.68[-2]	6.27[-3]
$p^2(^1S)s\ ^2S_{1/2}$	$sp(^3P)d\ ^2D_{3/2}$	10.619	7.83[12]	2.65[-1]	1.85[-2]	10.137	8.88[12]	2.73[-1]	1.83[-2]
$p^2(^3P)s\ ^4P_{5/2}$	$sp(^3P)d\ ^4D_{7/2}$	10.619	8.27[12]	1.87[-1]	3.91[-2]	10.139	9.23[12]	1.90[-1]	3.80[-2]
$p^2(^3P)s\ ^4P_{5/2}$	$sp(^3P)d\ ^2D_{5/2}$	10.606	1.14[13]	1.93[-1]	4.05[-2]	10.123	1.28[13]	1.97[-1]	3.94[-2]
$p^2(^3P)s\ ^4P_{1/2}$	$p^2(^3P)p\ ^2P_{1/2}$	10.538	1.16[13]	1.92[-1]	1.34[-2]	10.064	1.29[13]	1.96[-1]	1.30[-2]
$s^2(^1S)d\ ^2D_{3/2}$	$sp(^1P)d\ ^2D_{3/2}$	10.507	1.74[13]	2.87[-1]	3.97[-2]	10.034	1.94[13]	2.92[-1]	3.86[-2]
$p^2(^3P)s\ ^4P_{3/2}$	$sp(^3P)d\ ^4P_{1/2}$	10.503	8.46[12]	7.02[-2]	9.68[-3]	10.028	9.55[12]	7.22[-2]	9.52[-3]
$p^2(^3P)s\ ^4P_{3/2}$	$sp(^3P)d\ ^4D_{3/2}$	10.485	1.47[13]	2.42[-1]	3.34[-2]	10.014	1.69[13]	2.54[-1]	3.35[-2]
$p^2(^1D)s\ ^2D_{3/2}$	$sp(^3P)d\ ^2D_{3/2}$	10.478	1.22[13]	2.02[-1]	2.78[-2]	10.004	1.38[13]	2.07[-1]	2.73[-2]
$p^2(^3P)s\ ^4P_{1/2}$	$sp(^3P)d\ ^4F_{3/2}$	10.420	2.06[13]	6.71[-1]	4.60[-2]	9.952	2.32[13]	6.89[-1]	4.52[-2]
$p^2(^1S)s\ ^2S_{1/2}$	$sp(^3P)d\ ^2P_{1/2}$	10.414	1.34[13]	2.19[-1]	1.50[-2]	9.947	1.51[13]	2.25[-1]	1.47[-2]
$s^2(^1S)p\ ^2P_{1/2}$	$p^2(^3P)s\ ^2P_{3/2}$	10.400	2.17[13]	7.03[-1]	4.82[-2]	9.933	2.44[13]	7.22[-1]	4.72[-2]
$p^2(^3P)s\ ^4P_{3/2}$	$sp(^3P)d\ ^2D_{5/2}$	10.395	2.32[12]	5.67[-2]	7.75[-3]	9.928	2.51[12]	5.57[-2]	7.29[-3]
$p^2(^1D)s\ ^2D_{3/2}$	$sp(^3P)d\ ^2F_{5/2}$	10.360	1.97[12]	4.77[-2]	6.51[-3]	9.895	2.13[12]	4.69[-2]	6.11[-3]
$p^2(^3P)s\ ^4P_{5/2}$	$sp(^3P)d\ ^2F_{5/2}$	10.165	2.65[12]	4.11[-2]	8.25[-3]	9.717	3.10[12]	4.38[-2]	8.43[-3]
$p^2(^3P)s\ ^4P_{3/2}$	$sp(^3P)d\ ^2D_{3/2}$	10.081	4.32[11]	6.57[-3]	8.73[-4]	9.639	5.04[11]	7.02[-3]	8.93[-4]

Lower level	Upper level	λ	A	f	S	λ	A	f	S
				$Z=91$				$Z=92$	
$p^2(^1S)s\ ^2S_{1/2}$	$p^2(^3P)p\ ^2P_{3/2}$	25.654	5.77[11]	1.14[-1]	1.93[-2]	24.900	6.15[11]	1.15[-1]	1.88[-2]
$p^2(^3P)s\ ^2P_{1/2}$	$sp(^1P)d\ ^2P_{1/2}$	25.075	9.02[11]	8.51[-2]	1.41[-2]	24.351	9.55[11]	8.50[-2]	1.36[-2]
$p^2(^1D)s\ ^2D_{3/2}$	$sp(^3P)d\ ^4P_{5/2}$	25.010	4.23[11]	5.97[-2]	1.96[-2]	24.265	4.49[11]	5.92[-2]	1.90[-2]
$s^2(^1S)p\ ^2P_{3/2}$	$p^2(^1D)s\ ^2D_{5/2}$	24.558	8.26[11]	1.12[-1]	3.62[-2]	23.851	8.78[11]	1.13[-1]	3.53[-2]
$p^2(^3P)s\ ^4P_{5/2}$	$sp(^3P)d\ ^4F_{7/2}$	24.524	6.13[11]	7.37[-2]	3.57[-2]	23.818	6.56[11]	7.47[-2]	3.51[-2]
$p^2(^3P)s\ ^4P_{3/2}$	$sp(^3P)d\ ^4F_{5/2}$	24.326	7.48[11]	1.00[-1]	3.20[-2]	23.629	8.00[11]	1.00[-1]	3.12[-2]
$p^2(^3P)s\ ^2P_{1/2}$	$sp(^1P)d\ ^2P_{3/2}$	24.319	6.52[11]	1.16[-1]	1.85[-2]	23.626	6.91[11]	1.16[-1]	1.81[-2]
$p^2(^3P)s\ ^2P_{3/2}$	$sp(^3P)d\ ^4P_{3/2}$	10.665	2.25[11]	3.84[-3]	5.39[-4]	10.136	2.64[11]	4.07[-3]	5.43[-4]
$p^2(^3P)s\ ^2P_{3/2}$	$sp(^3P)d\ ^2D_{5/2}$	10.379	7.04[11]	1.71[-2]	2.34[-3]	9.878	8.40[11]	1.85[-2]	2.40[-3]
$p^2(^1D)s\ ^2D_{5/2}$	$sp(^1P)d\ ^2F_{5/2}$	10.327	2.39[12]	3.84[-2]	7.80[-3]	9.831	2.67[12]	3.87[-2]	7.50[-3]
$p^2(^1D)s\ ^2D_{5/2}$	$sp(^3P)d\ ^2F_{7/2}$	10.243	4.81[11]	1.01[-2]	2.05[-3]	9.755	5.23[11]	9.92[-3]	1.92[-3]
$p^2(^1S)s\ ^2S_{1/2}$	$sp(^3P)d\ ^4P_{3/2}$	10.235	6.19[12]	1.95[-1]	1.32[-2]	9.747	6.73[12]	1.92[-1]	1.23[-2]
$p^2(^1D)s\ ^2D_{5/2}$	$sp(^3P)d\ ^2P_{3/2}$	10.191	1.57[12]	1.63[-2]	3.27[-3]	9.706	1.75[12]	1.65[-2]	3.16[-3]
$p^2(^1D)s\ ^2D_{3/2}$	$sp(^3P)d\ ^4D_{5/2}$	10.189	2.86[12]	6.71[-2]	8.99[-3]	9.706	3.07[12]	6.51[-2]	8.32[-3]
$p^2(^1D)s\ ^2D_{3/2}$	$sp(^3P)d\ ^4P_{3/2}$	10.095	1.49[12]	2.28[-2]	3.03[-3]	9.616	1.59[12]	2.20[-2]	2.78[-3]
$p^2(^1S)s\ ^2S_{1/2}$	$sp(^3P)d\ ^4P_{1/2}$	10.075	2.97[11]	4.52[-3]	3.00[-4]	9.605	2.96[11]	4.10[-3]	2.59[-4]
$p^2(^3P)s\ ^2P_{3/2}$	$sp(^3P)d\ ^2D_{3/2}$	10.061	5.25[12]	7.95[-2]	1.05[-2]	9.587	5.69[12]	7.90[-2]	9.94[-3]
$p^2(^1S)s\ ^2S_{1/2}$	$sp(^3P)d\ ^4D_{3/2}$	10.062	6.55[11]	1.99[-2]	1.32[-3]	9.595	8.77[11]	2.42[-2]	1.53[-3]
$p^2(^1D)s\ ^2D_{5/2}$	$sp(^1P)d\ ^2F_{7/2}$	10.020	1.65[13]	3.30[-1]	6.53[-2]	9.548	1.85[13]	3.37[-1]	6.35[-2]
$p^2(^1S)s\ ^2S_{1/2}$	$sp(^3P)d\ ^4D_{1/2}$	10.024	7.71[11]	1.16[-2]	7.67[-4]	9.556	8.22[11]	1.12[-2]	7.09[-4]
$p^2(^3P)s\ ^4P_{5/2}$	$sp(^3P)d\ ^4D_{5/2}$	10.001	4.76[11]	7.17[-3]	1.42[-3]	9.535	4.60[11]	6.27[-3]	1.18[-3]
$s^2(^1S)p\ ^2P_{1/2}$	$p^2(^1D)s\ ^2D_{3/2}$	9.989	2.29[12]	6.83[-2]	4.49[-3]	9.523	2.40[12]	6.53[-2]	4.09[-3]
$p^2(^3P)s\ ^2P_{3/2}$	$sp(^3P)d\ ^2F_{5/2}$	9.949	3.10[13]	6.90[-1]	9.04[-2]	9.485	3.49[13]	7.05[-1]	8.81[-2]
$p^2(^3P)s\ ^4P_{1/2}$	$p^2(^3P)p\ ^4S_{3/2}$	9.940	1.48[12]	4.39[-2]	2.87[-3]	9.478	1.53[12]	4.12[-2]	2.57[-3]
$p^2(^1D)s\ ^2D_{3/2}$	$sp(^3P)d\ ^4P_{1/2}$	9.939	3.20[11]	2.37[-3]	3.10[-4]	9.477	2.33[11]	1.57[-3]	1.96[-4]
$p^2(^1D)s\ ^2D_{3/2}$	$sp(^3P)d\ ^4D_{3/2}$	9.927	1.26[12]	1.86[-2]	2.43[-3]	9.467	1.53[12]	2.07[-2]	2.57[-3]
$p^2(^3P)s\ ^4P_{5/2}$	$sp(^3P)d\ ^4P_{3/2}$	9.910	3.12[12]	3.06[-2]	5.98[-3]	9.448	3.56[12]	3.18[-2]	5.93[-3]
$p^2(^1D)s\ ^2D_{3/2}$	$sp(^3P)d\ ^4D_{1/2}$	9.889	1.40[13]	1.02[-1]	1.33[-2]	9.429	1.57[13]	1.04[-1]	1.30[-2]
$p^2(^3P)s\ ^2P_{3/2}$	$sp(^3P)d\ ^2P_{1/2}$	9.870	2.31[13]	1.69[-1]	2.19[-2]	9.410	2.59[13]	1.72[-1]	2.13[-2]
$s^2(^1S)p\ ^2P_{3/2}$	$p^2(^3P)s\ ^2P_{1/2}$	9.860	1.37[13]	1.00[-1]	1.30[-2]	9.401	1.54[13]	1.02[-1]	1.26[-2]
$s^2(^1S)p\ ^2P_{1/2}$	$p^2(^1S)s\ ^2S_{1/2}$	9.856	1.89[13]	2.76[-1]	1.79[-2]	9.397	2.11[13]	2.81[-1]	1.73[-2]
$p^2(^1D)s\ ^2D_{3/2}$	$sp(^3P)d\ ^2D_{5/2}$	9.838	4.38[12]	9.59[-2]	1.24[-2]	9.383	5.03[12]	1.00[-1]	1.23[-2]
$p^2(^1D)s\ ^2D_{5/2}$	$sp(^1P)d\ ^2P_{3/2}$	9.821	1.75[13]	1.69[-1]	3.27[-2]	9.366	1.96[13]	1.71[-1]	3.17[-2]
$p^2(^1D)s\ ^2D_{5/2}$	$sp(^1P)d\ ^2D_{5/2}$	9.804	1.60[13]	2.30[-1]	4.46[-2]	9.350	1.79[13]	2.35[-1]	4.34[-2]
$p^2(^3P)s\ ^4P_{3/2}$	$sp(^3P)d\ ^4D_{5/2}$	9.808	1.80[12]	3.90[-2]	5.04[-3]	9.357	2.10[12]	4.13[-2]	5.08[-3]
$p^2[^3P)s\ ^4P_{5/2}$	$sp(^3P)d\ ^4D_{3/2}$	9.748	3.74[11]	3.56[-3]	6.84[-4]	9.305	3.34[11]	2.89[-3]	5.32[-4]
$p^2(^3P)s\ ^4P_{3/2}$	$sp(^3P)d\ ^4P_{3/2}$	9.720	2.83[12]	4.01[-2]	5.12[-3]	9.273	2.61[12]	3.38[-2]	4.12[-3]
$p^2(^3P)s\ ^4P_{5/2}$	$sp(^3P)d\ ^4D_{7/2}$	9.680	1.03[13]	1.94[-1]	3.70[-2]	9.243	1.15[13]	1.98[-1]	3.60[-2]
$p^2(^1S)s\ ^2S_{1/2}$	$sp(^3P)d\ ^2D_{3/2}$	9.677	1.01[13]	2.82[-1]	1.80[-2]	9.239	1.14[13]	2.91[-1]	1.77[-2]
$p^2(^3P)s\ ^4P_{5/2}$	$sp(^3P)d\ ^2D_{5/2}$	9.663	1.43[13]	2.00[-1]	3.82[-2]	9.224	1.59[13]	2.03[-1]	3.70[-2]
$p^2(^3P)s\ ^4P_{1/2}$	$p^2(^3P)p\ ^2P_{1/2}$	9.611	1.44[13]	2.00[-1]	1.27[-2]	9.179	1.61[13]	2.03[-1]	1.23[-2]
$s^2(^1S)d\ ^2D_{3/2}$	$sp(^1P)d\ ^2D_{3/2}$	9.583	2.16[13]	2.97[-1]	3.76[-2]	9.153	2.41[13]	3.03[-1]	3.66[-2]
$p^2(^3P)s\ ^4P_{3/2}$	$sp(^3P)d\ ^4P_{1/2}$	9.575	1.08[13]	7.38[-2]	9.32[-3]	9.144	1.21[13]	7.58[-2]	9.11[-3]
$p^2(^3P)s\ ^4P_{3/2}$	$sp(^3P)d\ ^4D_{3/2}$	9.564	1.95[13]	2.67[-1]	3.36[-2]	9.135	2.23[13]	2.79[-1]	3.35[-2]
$p^2(^1D)s\ ^2D_{3/2}$	$sp(^3P)d\ ^2D_{3/2}$	9.552	1.56[13]	2.13[-1]	2.68[-2]	9.120	1.75[13]	2.19[-1]	2.63[-2]
$p^2(^1S)s\ ^2S_{1/2}$	$sp(^3P)d\ ^2P_{1/2}$	9.500	1.71[13]	2.31[-1]	1.44[-2]	9.074	1.91[13]	2.37[-1]	1.42[-2]
$p^2(^3P)s\ ^4P_{1/2}$	$sp(^3P)d\ ^4P_{3/2}$	9.505	2.62[13]	7.09[-1]	4.43[-2]	9.078	2.94[13]	7.28[-1]	4.35[-2]
$s^2(^1S)p\ ^2P_{1/2}$	$p^2(^3P)s\ ^2P_{3/2}$	9.487	2.75[13]	7.41[-1]	4.63[-2]	9.062	3.08[13]	7.60[-1]	4.53[-2]
$p^2(^3P)s\ ^4P_{3/2}$	$sp(^3P)d\ ^2D_{5/2}$	9.482	2.71[12]	5.47[-2]	6.85[-3]	9.056	2.92[12]	5.42[-2]	6.44[-3]
$p^2(^1D)s\ ^2D_{3/2}$	$sp(^3P)d\ ^2F_{5/2}$	9.451	2.29[12]	4.59[-2]	5.71[-3]	9.028	2.46[12]	4.52[-2]	5.37[-3]
$p^2(^3P)s\ ^4P_{5/2}$	$sp(^3P)d\ ^2F_{5/2}$	9.289	3.62[12]	4.71[-2]	8.62[-3]	8.880	4.24[12]	5.01[-2]	8.79[-3]

Lower level	Upper level	λ	A	f	S	λ	A	f	S
				Z=93				Z=94	
$p^2(^1S)s\ ^2S_{1/2}$	$p^2(^3P)p\ ^2P_{3/2}$	24.169	6.59[11]	1.15[-1]	1.83[-2]	23.460	7.03[11]	1.16[-1]	1.79[-2]
$p^2(^3P)s\ ^2P_{1/2}$	$sp(^1P)d\ ^2P_{1/2}$	23.649	1.01[12]	8.49[-2]	1.32[-2]	22.966	1.07[12]	8.49[-2]	1.28[-2]
$p^2(^1D)s\ ^2D_{3/2}$	$sp(^3P)d\ ^4P_{5/2}$	23.541	4.73[11]	5.92[-2]	1.83[-2]	22.842	5.02[11]	5.87[-2]	1.77[-2]
$s^2(^1S)p\ ^2P_{3/2}$	$p^2(^1D)s\ ^2D_{5/2}$	23.166	9.36[11]	1.13[-1]	3.45[-2]	22.500	9.94[11]	1.14[-1]	3.37[-2]
$p^2(^3P)s\ ^4P_{5/2}$	$sp(^3P)d\ ^4F_{7/2}$	23.132	7.05[11]	7.53[-2]	3.45[-2]	22.467	7.58[11]	7.63[-2]	3.39[-2]
$p^2(^3P)s\ ^2P_{1/2}$	$sp(^1P)d\ ^2P_{3/2}$	22.953	7.35[11]	1.17[-1]	1.76[-2]	22.300	7.83[11]	1.17[-1]	1.72[-2]
$p^2(^3P)s\ ^4P_{3/2}$	$sp(^3P)d\ ^4F_{5/2}$	22.953	8.51[11]	1.01[-1]	3.05[-2]	22.297	9.06[11]	1.01[-1]	2.98[-2]
$p^2(^3P)s\ ^2P_{3/2}$	$sp(^3P)d\ ^4P_{3/2}$	9.635	3.10[11]	4.32[-3]	5.48[-4]	9.162	3.61[11]	4.55[-3]	5.48[-4]
$p^2(^3P)s\ ^2P_{3/2}$	$sp(^3P)d\ ^2D_{5/2}$	9.402	1.01[12]	2.00[-2]	2.48[-3]	8.952	1.20[12]	2.17[-2]	2.56[-3]
$p^2(^1D)s\ ^2D_{5/2}$	$sp(^1P)d\ ^2F_{5/2}$	9.359	2.97[12]	3.90[-2]	7.22[-3]	8.913	3.32[12]	3.94[-2]	6.96[-3]
$p^2(^1D)s\ ^2D_{5/2}$	$sp(^3P)d\ ^2F_{7/2}$	9.290	5.67[11]	9.79[-3]	1.80[-3]	8.849	6.15[11]	9.65[-3]	1.69[-3]
$p^2(^1S)s\ ^2S_{1/2}$	$sp(^3P)d\ ^4P_{3/2}$	9.283	7.23[12]	1.86[-1]	1.14[-2]	8.844	7.72[12]	1.81[-1]	1.06[-2]
$p^2(^1D)s\ ^2D_{5/2}$	$sp(^3P)d\ ^2P_{3/2}$	9.245	1.95[12]	1.67[-2]	3.05[-3]	8.807	2.18[12]	1.69[-2]	2.94[-3]
$p^2(^1D)s\ ^2D_{3/2}$	$sp(^3P)d\ ^4D_{5/2}$	9.246	3.27[12]	6.31[-2]	7.67[-3]	8.810	3.50[12]	6.11[-2]	7.10[-3]
$p^2(^1D)s\ ^2D_{3/2}$	$sp(^3P)d\ ^4P_{3/2}$	9.160	1.67[12]	2.09[-2]	2.52[-3]	8.728	1.74[12]	1.99[-2]	2.28[-3]
$p^2(^1S)s\ ^2S_{1/2}$	$sp(^3P)d\ ^4D_{3/2}$	9.150	1.18[12]	2.94[-2]	1.77[-3]	8.726	1.52[12]	3.48[-2]	2.00[-3]
$p^2(^1S)s\ ^2S_{1/2}$	$sp(^3P)d\ ^4P_{1/2}$	9.158	2.95[11]	3.71[-3]	2.24[-4]	8.733	3.00[11]	3.43[-3]	1.97[-4]
$p^2(^3P)s\ ^2P_{3/2}$	$sp(^3P)d\ ^2D_{3/2}$	9.137	6.18[12]	7.75[-2]	9.35[-3]	8.709	6.72[12]	7.65[-2]	8.80[-3]
$p^2(^1S)s\ ^2S_{1/2}$	$sp(^3P)d\ ^4D_{1/2}$	9.109	8.65[11]	1.07[-2]	6.46[-4]	8.685	9.06[11]	1.02[-2]	5.86[-4]
$p^2(^1D)s\ ^2D_{5/2}$	$sp(^1P)d\ ^2F_{7/2}$	9.099	2.08[13]	3.44[-1]	6.18[-2]	8.673	2.33[13]	3.50[-1]	6.02[-2]
$s^2(^1S)p\ ^2P_{1/2}$	$p^2(^1D)s\ ^2D_{3/2}$	9.078	2.50[12]	6.18[-2]	3.70[-3]	8.656	2.62[12]	5.88[-2]	3.35[-3]
$p^2(^3P)s\ ^2P_{3/2}$	$sp(^3P)d\ ^2F_{5/2}$	9.043	3.91[13]	7.20[-1]	8.58[-2]	8.622	4.40[13]	7.35[-1]	8.35[-2]
$p^2(^3P)s\ ^4P_{1/2}$	$p^2(^3P)p\ ^4S_{3/2}$	9.038	1.55[12]	3.81[-2]	2.26[-3]	8.619	1.58[12]	3.53[-2]	2.00[-3]
$p^2(^1D)s\ ^2D_{3/2}$	$sp(^3P)d\ ^4D_{3/2}$	9.030	1.89[12]	2.31[-2]	2.74[-3]	8.613	2.29[12]	2.55[-2]	2.89[-3]
$p^2(^3P)s\ ^4P_{5/2}$	$sp(^3P)d\ ^4P_{3/2}$	9.008	4.08[12]	3.31[-2]	5.89[-3]	8.590	4.64[12]	3.45[-2]	5.82[-3]
$p^2(^1D)s\ ^2D_{3/2}$	$sp(^3P)d\ ^4D_{1/2}$	8.990	1.77[13]	1.07[-1]	1.27[-2]	8.573	1.98[13]	1.10[-1]	1.23[-2]
$p^2(^3P)s\ ^2P_{3/2}$	$sp(^3P)d\ ^2P_{1/2}$	8.972	2.90[13]	1.76[-1]	2.07[-2]	8.556	3.25[13]	1.79[-1]	2.01[-2]
$s^2(^1S)p\ ^2P_{1/2}$	$p^2(^1S)s\ ^2S_{1/2}$	8.960	2.37[13]	2.86[-1]	1.68[-2]	8.545	2.65[13]	2.91[-1]	1.63[-2]
$s^2(^1S)p\ ^2P_{3/2}$	$p^2(^3P)s\ ^2P_{1/2}$	8.963	1.73[13]	1.04[-1]	1.23[-2]	8.548	1.93[13]	1.06[-1]	1.19[-2]
$p^2(^1D)s\ ^2D_{3/2}$	$sp(^3P)d\ ^2D_{5/2}$	8.949	5.78[12]	1.04[-1]	1.23[-2]	8.537	6.64[12]	1.09[-1]	1.22[-2]
$p^2(^1D)s\ ^2D_{5/2}$	$sp(^1P)d\ ^2P_{3/2}$	8.931	2.19[13]	1.74[-1]	3.08[-2]	8.519	2.46[13]	1.77[-1]	2.99[-2]
$p^2(^3P)s\ ^4P_{3/2}$	$sp(^3P)d\ ^4D_{5/2}$	8.926	2.43[12]	4.37[-2]	5.13[-3]	8.517	2.82[12]	4.61[-2]	5.16[-3]
$p^2(^1D)s\ ^2D_{5/2}$	$sp(^1P)d\ ^2D_{5/2}$	8.917	2.01[13]	2.40[-1]	4.22[-2]	8.506	2.25[13]	2.44[-1]	4.10[-2]
$p^2[^3P)s\ ^4P_{5/2}$	$sp(^3P)d\ ^4D_{3/2}$	8.882	2.80[11]	2.20[-3]	3.87[-4]	8.479	2.26[11]	1.62[-3]	2.73[-4]
$p^2(^3P)s\ ^4P_{3/2}$	$sp(^3P)d\ ^4P_{3/2}$	8.846	2.29[12]	2.69[-2]	3.13[-3]	8.440	1.96[12]	2.10[-2]	2.33[-3]
$p^2(^1S)s\ ^2S_{1/2}$	$sp(^3P)d\ ^2D_{3/2}$	8.820	1.29[13]	3.00[-1]	1.75[-2]	8.421	1.46[13]	3.10[-1]	1.72[-2]
$p^2(^3P)s\ ^4P_{5/2}$	$sp(^3P)d\ ^4D_{7/2}$	8.825	1.29[13]	2.01[-1]	3.50[-2]	8.427	1.44[13]	2.04[-1]	3.41[-2]
$p^2(^3P)s\ ^4P_{5/2}$	$sp(^3P)d\ ^2D_{5/2}$	8.804	1.77[13]	2.06[-1]	3.58[-2]	8.405	1.97[13]	2.09[-1]	3.46[-2]
$p^2(^3P)s\ ^4P_{1/2}$	$p^2(^3P)p\ ^2P_{1/2}$	8.766	1.80[13]	2.07[-1]	1.20[-2]	8.372	2.01[13]	2.11[-1]	1.16[-2]
$s^2(^1S)d\ ^2D_{3/2}$	$sp(^1P)d\ ^2D_{3/2}$	8.741	2.70[13]	3.09[-1]	3.56[-2]	8.349	3.02[13]	3.15[-1]	3.46[-2]
$p^2(^3P)s\ ^4P_{3/2}$	$sp(^3P)d\ ^4P_{1/2}$	8.732	1.35[13]	7.73[-2]	8.88[-3]	8.339	1.51[13]	7.88[-2]	8.65[-3]
$p^2(^3P)s\ ^4P_{3/2}$	$sp(^3P)d\ ^4D_{3/2}$	8.724	2.56[13]	2.92[-1]	3.35[-2]	8.333	2.92[13]	3.04[-1]	3.34[-2]
$p^2(^1D)s\ ^2D_{3/2}$	$sp(^3P)d\ ^2D_{3/2}$	8.708	1.98[13]	2.25[-1]	2.58[-2]	8.315	2.22[13]	2.31[-1]	2.52[-2]
$p^2(^3P)s\ ^4P_{1/2}$	$sp(^3P)d\ ^4F_{3/2}$	8.670	3.32[13]	7.48[-1]	4.27[-2]	8.281	3.73[13]	7.68[-1]	4.19[-2]
$p^2(^1S)s\ ^2S_{1/2}$	$sp(^3P)d\ ^2P_{1/2}$	8.667	2.16[13]	2.43[-1]	1.39[-2]	8.278	2.43[13]	2.50[-1]	1.36[-2]
$s^2(^1S)p\ ^2P_{1/2}$	$p^2(^3P)s\ ^2P_{3/2}$	8.655	3.46[13]	7.79[-1]	4.44[-2]	8.267	3.90[13]	7.99[-1]	4.35[-2]
$p^2(^3P)s\ ^4P_{3/2}$	$sp(^3P)d\ ^2D_{5/2}$	8.649	3.14[12]	5.27[-2]	6.03[-3]	8.261	3.38[12]	5.22[-2]	5.66[-3]
$p^2(^1D)s\ ^2D_{3/2}$	$sp(^3P)d\ ^2F_{5/2}$	8.623	2.64[12]	4.42[-2]	5.02[-3]	8.237	2.85[12]	4.36[-2]	4.72[-3]
$p^2(^3P)s\ ^4P_{5/2}$	$sp(^3P)d\ ^2F_{5/2}$	8.488	4.96[12]	5.34[-2]	8.98[-3]	8.114	5.79[12]	5.70[-2]	9.13[-3]
$p^2(^3P)s\ ^4P_{3/2}$	$sp(^3P)d\ ^2D_{3/2}$	8.424	8.10[11]	8.62[-3]	9.58[-4]	8.054	9.49[11]	9.21[-3]	9.78[-4]

Lower level	Upper level	λ	A	f	S	λ	A	f	S
				Z=95				Z=96	
$p^2(^1S)s\ ^2S_{1/2}$	$p^2(^3P)p\ ^2P_{3/2}$	22.773	7.46[11]	1.16[-1]	1.74[-2]	22.105	7.94[11]	1.17[-1]	1.70[-2]
$p^2(^3P)s\ ^2P_{1/2}$	$sp(^1P)d\ ^2P_{1/2}$	22.304	1.14[12]	8.48[-2]	1.25[-2]	21.660	1.21[12]	8.47[-2]	1.21[-2]
$p^2(^1D)s\ ^2D_{3/2}$	$sp(^3P)d\ ^4P_{5/2}$	22.162	5.30[11]	5.87[-2]	1.71[-2]	21.504	5.62[11]	5.81[-2]	1.65[-2]
$s^2(^1S)p\ ^2P_{3/2}$	$p^2(^1D)s\ ^2D_{5/2}$	21.854	1.06[12]	1.14[-1]	3.29[-2]	21.227	1.13[12]	1.15[-1]	3.21[-2]
$p^2(^3P)s\ ^4P_{5/2}$	$sp(^3P)d\ ^4F_{7/2}$	21.821	8.13[11]	7.73[-2]	3.34[-2]	21.195	8.74[11]	7.83[-2]	3.28[-2]
$p^2(^3P)s\ ^2P_{1/2}$	$sp(^1P)d\ ^2P_{3/2}$	21.666	8.31[11]	1.17[-1]	1.67[-2]	21.050	8.84[11]	1.18[-1]	1.63[-2]
$p^2(^3P)s\ ^4P_{3/2}$	$sp(^3P)d\ ^4F_{5/2}$	21.659	9.67[11]	1.02[-1]	2.91[-2]	21.041	1.03[12]	1.02[-1]	2.84[-2]
$p^2(^3P)s\ ^2P_{3/2}$	$sp(^3P)d\ ^4D_{5/2}$	8.798	2.59[11]	4.52[-3]	5.23[-4]	8.369	2.99[11]	4.72[-3]	5.19[-4]
$p^2(^3P)s\ ^2P_{3/2}$	$sp(^3P)d\ ^4P_{3/2}$	8.712	4.20[11]	4.79[-3]	5.49[-4]	8.288	4.85[11]	5.01[-3]	5.45[-4]
$p^2(^3P)s\ ^2P_{3/2}$	$sp(^3P)d\ ^2D_{5/2}$	8.523	1.44[12]	2.36[-2]	2.64[-3]	8.116	1.72[12]	2.55[-2]	2.73[-3]
$p^2(^1D)s\ ^2D_{5/2}$	$sp(^1P)d\ ^2F_{5/2}$	8.488	3.71[12]	4.00[-2]	6.71[-3]	8.084	4.13[12]	4.04[-2]	6.47[-3]
$p^2(^1S)s\ ^2S_{1/2}$	$sp(^3P)d\ ^4P_{3/2}$	8.425	8.22[12]	1.75[-1]	9.69[-3]	8.027	8.72[12]	1.68[-1]	8.91[-3]
$p^2(^1D)s\ ^2D_{5/2}$	$sp(^3P)d\ ^2F_{7/2}$	8.429	6.67[11]	9.50[-3]	1.58[-3]	8.031	7.23[11]	9.33[-3]	1.48[-3]
$p^2(^1D)s\ ^2D_{5/2}$	$sp(^3P)d\ ^2P_{3/2}$	8.390	2.43[12]	1.72[-2]	2.84[-3]	7.994	2.72[12]	1.74[-2]	2.74[-3]
$p^2(^1D)s\ ^2D_{3/2}$	$sp(^3P)d\ ^4D_{5/2}$	8.394	3.73[12]	5.91[-2]	6.53[-3]	8.000	3.95[12]	5.71[-2]	6.02[-3]
$p^2(^1S)s\ ^2S_{1/2}$	$sp(^3P)d\ ^4D_{3/2}$	8.322	1.98[12]	4.11[-2]	2.25[-3]	7.936	2.50[12]	4.72[-2]	2.47[-3]
$p^2(^1S)s\ ^2S_{1/2}$	$sp(^3P)d\ ^4P_{1/2}$	8.328	3.04[11]	3.17[-3]	1.74[-4]	7.942	3.14[11]	2.97[-3]	1.55[-4]
$p^2(^1D)s\ ^2D_{3/2}$	$sp(^3P)d\ ^4P_{3/2}$	8.316	1.80[12]	1.87[-2]	2.04[-3]	7.925	1.85[12]	1.75[-2]	1.82[-3]
$p^2(^3P)s\ ^2P_{3/2}$	$sp(^3P)d\ ^2D_{3/2}$	8.301	7.31[12]	7.55[-2]	8.26[-3]	7.914	7.95[12]	7.45[-2]	7.77[-3]
$p^2(^1S)s\ ^2S_{1/2}$	$sp(^3P)d\ ^4D_{1/2}$	8.280	9.37[11]	9.63[-3]	5.25[-4]	7.895	9.64[11]	9.02[-3]	4.69[-4]
$p^2(^1D)s\ ^2D_{5/2}$	$sp(^1P)d\ ^2F_{7/2}$	8.267	2.63[13]	3.57[-1]	5.86[-2]	7.881	2.96[13]	3.67[-1]	5.70[-2]
$p^2(^3P)s\ ^4P_{5/2}$	$sp(^3P)d\ ^4D_{5/2}$	8.267	3.75[11]	3.81[-3]	6.25[-4]	7.885	3.42[11]	3.19[-3]	4.96[-4]
$s^2(^1S)p\ ^2P_{1/2}$	$p^2(^1D)s\ ^2D_{3/2}$	8.253	2.71[12]	5.55[-2]	3.01[-3]	7.870	2.82[12]	5.24[-2]	2.72[-3]
$p^2(^3P)s\ ^2P_{3/2}$	$sp(^3P)d\ ^2F_{5/2}$	8.221	4.92[13]	7.49[-1]	8.13[-2]	7.840	5.55[13]	7.69[-1]	7.92[-2]
$p^2(^3P)s\ ^4P_{1/2}$	$p^2(^3P)p\ ^4S_{3/2}$	8.220	1.58[12]	3.21[-2]	1.74[-3]	7.840	1.59[12]	2.92[-2]	1.51[-3]
$p^2(^1D)s\ ^2D_{3/2}$	$sp(^3P)d\ ^4D_{3/2}$	8.215	2.79[12]	2.82[-2]	3.05[-3]	7.836	3.37[12]	3.10[-2]	3.19[-3]
$p^2(^3P)s\ ^4P_{5/2}$	$sp(^3P)d\ ^4P_{3/2}$	8.191	5.31[12]	3.55[-2]	5.74[-3]	7.812	6.00[12]	3.65[-2]	5.64[-3]
$p^2(^1D)s\ ^2D_{3/2}$	$sp(^3P)d\ ^4D_{1/2}$	8.175	2.22[13]	1.12[-1]	1.20[-2]	7.796	2.49[13]	1.14[-1]	1.17[-2]
$p^2(^3P)s\ ^2P_{3/2}$	$sp(^3P)d\ ^2P_{1/2}$	8.160	3.65[13]	1.83[-1]	1.96[-2]	7.782	4.09[13]	1.87[-1]	1.90[-2]
$s^2(^1S)p\ ^2P_{3/2}$	$p^2(^3P)s\ ^2P_{1/2}$	8.151	2.17[13]	1.07[-1]	1.16[-2]	7.775	2.42[13]	1.10[-1]	1.12[-2]
$s^2(^1S)p\ ^2P_{1/2}$	$p^2(^1S)s\ ^2S_{1/2}$	8.148	2.96[13]	2.95[-1]	1.59[-2]	7.772	3.32[13]	3.00[-1]	1.54[-2]
$p^2(^1D)s\ ^2D_{3/2}$	$sp(^3P)d\ ^2D_{5/2}$	8.143	7.58[12]	1.13[-1]	1.21[-2]	7.768	8.65[12]	1.17[-1]	1.20[-2]
$p^2(^1D)s\ ^2D_{5/2}$	$sp(^1P)d\ ^2P_{3/2}$	8.125	2.75[13]	1.81[-1]	2.91[-2]	7.751	3.07[13]	1.84[-1]	2.82[-2]
$p^2(^3P)s\ ^4P_{3/2}$	$sp(^3P)d\ ^4D_{5/2}$	8.127	3.27[12]	4.87[-2]	5.20[-3]	7.755	3.78[12]	5.13[-2]	5.22[-3]
$p^2(^1D)s\ ^2D_{5/2}$	$sp(^1P)d\ ^2D_{5/2}$	8.113	2.52[13]	2.49[-1]	3.99[-2]	7.740	2.83[13]	2.54[-1]	3.88[-2]
$p^2(^3P)s\ ^4P_{3/2}$	$sp(^3P)d\ ^4P_{3/2}$	8.053	1.54[12]	1.50[-2]	1.59[-3]	7.685	1.15[12]	1.02[-2]	1.03[-3]
$p^2(^3P)s\ ^4P_{5/2}$	$sp(^3P)d\ ^4D_{7/2}$	8.046	1.62[13]	2.08[-1]	3.32[-2]	7.683	1.81[13]	2.13[-1]	3.23[-2]
$p^2(^1S)s\ ^2S_{1/2}$	$sp(^3P)d\ ^2D_{3/2}$	8.039	1.66[13]	3.20[-1]	1.70[-2]	7.676	1.87[13]	3.31[-1]	1.67[-2]
$p^2(^3P)s\ ^4P_{5/2}$	$sp(^3P)d\ ^2D_{5/2}$	8.023	2.19[13]	2.11[-1]	3.35[-2]	7.660	2.42[13]	2.14[-1]	3.24[-2]
$p^2(^3P)s\ ^4P_{1/2}$	$p^2(^3P)p\ ^2P_{1/2}$	7.995	2.24[13]	2.15[-1]	1.13[-2]	7.636	2.51[13]	2.19[-1]	1.10[-2]
$s^2(^1S)d\ ^2D_{3/2}$	$sp(^1P)d\ ^2D_{3/2}$	7.974	3.36[13]	3.21[-1]	3.37[-2]	7.616	3.76[13]	3.27[-1]	3.28[-2]
$p^2(^3P)s\ ^4P_{3/2}$	$sp(^3P)d\ ^4P_{1/2}$	7.964	1.68[13]	8.03[-2]	8.42[-3]	7.606	1.88[13]	8.18[-2]	8.19[-3]
$p^2(^3P)s\ ^4P_{3/2}$	$sp(^3P)d\ ^4D_{3/2}$	7.959	3.33[13]	3.17[-1]	3.32[-2]	7.601	3.79[13]	3.28[-1]	3.28[-2]
$p^2(^1D)s\ ^2D_{3/2}$	$sp(^3P)d\ ^2D_{3/2}$	7.940	2.50[13]	2.37[-1]	2.47[-2]	7.582	2.81[13]	2.43[-1]	2.42[-2]
$p^2(^1S)s\ ^2S_{1/2}$	$sp(^3P)d\ ^2P_{1/2}$	7.907	2.73[13]	2.56[-1]	1.33[-2]	7.552	3.07[13]	2.63[-1]	1.31[-2]
$p^2(^3P)s\ ^4P_{1/2}$	$sp(^3P)d\ ^4F_{3/2}$	7.909	4.20[13]	7.88[-1]	4.10[-2]	7.554	4.72[13]	8.08[-1]	4.02[-2]
$s^2(^1S)p\ ^2P_{1/2}$	$p^2(^3P)s\ ^2P_{3/2}$	7.896	4.38[13]	8.20[-1]	4.26[-2]	7.542	4.92[13]	8.40[-1]	4.17[-2]
$p^2(^3P)s\ ^4P_{3/2}$	$sp(^3P)d\ ^2D_{5/2}$	7.891	3.64[12]	5.07[-2]	5.29[-3]	7.537	3.91[12]	4.97[-2]	4.95[-3]
$p^2(^1D)s\ ^2D_{3/2}$	$sp(^3P)d\ ^2F_{5/2}$	7.867	3.07[12]	4.27[-2]	4.42[-3]	7.515	3.30[12]	4.21[-2]	4.16[-3]
$p^2(^3P)s\ ^4P_{5/2}$	$sp(^3P)d\ ^2F_{5/2}$	7.756	6.73[12]	6.07[-2]	9.31[-3]	7.413	7.82[12]	6.47[-2]	9.46[-3]
$p^2(^3P)s\ ^4P_{3/2}$	$sp(^3P)d\ ^2D_{3/2}$	7.700	1.11[12]	9.86[-3]	1.00[-3]	7.362	1.29[12]	1.06[-2]	1.02[-3]

Lower level	Upper level	λ	A	f	S	λ	A	f	S
				Z=97				Z=98	
$p^2(^1S)s\ ^2S_{1/2}$	$p^2(^3P)p\ ^2P_{3/2}$	21.458	8.48[11]	1.17[-1]	1.66[-2]	20.831	9.06[11]	1.18[-1]	1.62[-2]
$p^2(^3P)s\ ^2P_{1/2}$	$sp(^1P)d\ ^2P_{1/2}$	21.036	1.27[12]	8.48[-2]	1.17[-2]	20.429	1.35[12]	8.49[-2]	1.14[-2]
$p^2(^1D)s\ ^2D_{3/2}$	$sp(^3P)d\ ^4P_{5/2}$	20.866	5.93[11]	5.81[-2]	1.60[-2]	20.249	6.28[11]	5.76[-2]	1.54[-2]
$s^2(^1S)p\ ^2P_{3/2}$	$p^2(^1D)s\ ^2D_{5/2}$	20.619	1.21[12]	1.16[-1]	3.13[-2]	20.028	1.28[12]	1.16[-1]	3.06[-2]
$p^2(^3P)s\ ^4P_{5/2}$	$sp(^3P)d\ ^4F_{7/2}$	20.587	9.36[11]	7.93[-2]	3.23[-2]	19.997	1.01[12]	8.02[-2]	3.18[-2]
$p^2(^3P)s\ ^2P_{1/2}$	$sp(^1P)d\ ^2P_{3/2}$	20.452	9.42[11]	1.19[-1]	1.59[-2]	19.871	1.01[12]	1.19[-1]	1.56[-2]
$p^2(^3P)s\ ^4P_{3/2}$	$sp(^3P)d\ ^4F_{5/2}$	20.441	1.10[12]	1.03[-1]	2.78[-2]	19.858	1.17[12]	1.04[-1]	2.72[-2]
$p^2(^3P)s\ ^2P_{3/2}$	$sp(^3P)d\ ^4D_{5/2}$	7.962	3.43[11]	4.92[-3]	5.15[-4]	7.576	3.95[11]	5.12[-3]	5.09[-4]
$p^2(^3P)s\ ^2P_{3/2}$	$sp(^3P)d\ ^4P_{3/2}$	7.885	5.56[11]	5.21[-3]	5.39[-4]	7.504	6.35[11]	5.36[-3]	5.30[-4]
$p^2(^3P)s\ ^2P_{3/2}$	$sp(^3P)d\ ^2D_{5/2}$	7.730	2.05[12]	2.77[-2]	2.82[-3]	7.363	2.45[12]	2.99[-2]	2.90[-3]
$p^2(^1D)s\ ^2D_{5/2}$	$sp(^1P)d\ ^2F_{5/2}$	7.701	4.59[12]	4.10[-2]	6.24[-3]	7.337	5.15[12]	4.17[-2]	6.02[-3]
$p^2(^1D)s\ ^2D_{5/2}$	$sp(^3P)d\ ^2F_{7/2}$	7.652	7.85[11]	9.20[-3]	1.39[-3]	7.292	8.50[11]	9.03[-3]	1.30[-3]
$p^2(^1S)s\ ^2S_{1/2}$	$sp(^3P)d\ ^4P_{3/2}$	7.649	9.22[12]	1.61[-1]	8.13[-3]	7.290	9.71[12]	1.55[-1]	7.44[-3]
$p^2(^1D)s\ ^2D_{3/2}$	$sp(^3P)d\ ^4D_{5/2}$	7.624	4.22[12]	5.52[-2]	5.54[-3]	7.267	4.48[12]	5.37[-2]	5.11[-3]
$p^2(^1D)s\ ^2D_{5/2}$	$sp(^3P)d\ ^2P_{3/2}$	7.618	3.04[12]	1.76[-2]	2.65[-3]	7.260	3.39[12]	1.79[-2]	2.56[-3]
$p^2(^1S)s\ ^2S_{1/2}$	$sp(^3P)d\ ^4D_{3/2}$	7.569	3.13[12]	5.39[-2]	2.69[-3]	7.219	3.84[12]	6.00[-2]	2.85[-3]
$p^2(^1D)s\ ^2D_{3/2}$	$sp(^3P)d\ ^4P_{3/2}$	7.553	1.89[12]	1.62[-2]	1.60[-3]	7.200	1.93[12]	1.50[-2]	1.42[-3]
$p^2(^3P)s\ ^2P_{3/2}$	$sp(^3P)d\ ^2D_{3/2}$	7.545	8.59[12]	7.36[-2]	7.30[-3]	7.194	9.33[12]	7.26[-2]	6.87[-3]
$p^2(^1S)s\ ^2S_{1/2}$	$sp(^3P)d\ ^4D_{1/2}$	7.528	9.82[11]	8.35[-3]	4.14[-4]	7.179	1.00[12]	7.73[-3]	3.65[-4]
$p^2(^1D)s\ ^2D_{5/2}$	$sp(^1P)d\ ^2F_{7/2}$	7.513	3.32[13]	3.74[-1]	5.55[-2]	7.164	3.71[13]	3.80[-1]	5.40[-2]
$s^2(^1S)p\ ^2P_{1/2}$	$p^2(^1D)s\ ^2D_{3/2}$	7.505	2.91[12]	4.92[-2]	2.43[-3]	7.158	3.02[12]	4.63[-2]	2.18[-3]
$p^2(^3P)s\ ^2P_{3/2}$	$sp(^3P)d\ ^2F_{5/2}$	7.477	6.23[13]	7.84[-1]	7.71[-2]	7.131	6.98[13]	7.99[-1]	7.50[-2]
$p^2(^3P)s\ ^4P_{1/2}$	$p^2(^3P)p\ ^4S_{3/2}$	7.478	1.57[12]	2.63[-2]	1.30[-3]	7.133	1.55[12]	2.37[-2]	1.11[-3]
$p^2(^1D)s\ ^2D_{3/2}$	$sp(^3P)d\ ^4D_{3/2}$	7.475	4.05[12]	3.40[-2]	3.34[-3]	7.131	4.81[12]	3.68[-2]	3.45[-3]
$p^2(^3P)s\ ^4P_{5/2}$	$sp(^3P)d\ ^4P_{3/2}$	7.451	6.79[12]	3.75[-2]	5.53[-3]	7.108	7.63[12]	3.85[-2]	5.40[-3]
$p^2(^1D)s\ ^2D_{3/2}$	$sp(^3P)d\ ^4D_{1/2}$	7.435	2.79[13]	1.16[-1]	1.13[-2]	7.092	3.12[13]	1.17[-1]	1.10[-2]
$p^2(^3P)s\ ^2P_{3/2}$	$sp(^3P)d\ ^2P_{1/2}$	7.423	4.58[13]	1.90[-1]	1.85[-2]	7.081	5.13[13]	1.94[-1]	1.80[-2]
$s^2(^1S)p\ ^2P_{1/2}$	$p^2(^1S)s\ ^2S_{1/2}$	7.413	3.72[13]	3.06[-1]	1.49[-2]	7.071	4.16[13]	3.11[-1]	1.45[-2]
$s^2(^1S)p\ ^2P_{3/2}$	$p^2(^3P)s\ ^2P_{1/2}$	7.415	2.71[13]	1.12[-1]	1.09[-2]	7.074	3.04[13]	1.14[-1]	1.06[-2]
$p^2(^1D)s\ ^2D_{3/2}$	$sp(^3P)d\ ^2D_{5/2}$	7.411	9.90[12]	1.22[-1]	1.19[-2]	7.070	1.13[13]	1.27[-1]	1.18[-2]
$p^2(^3P)s\ ^4P_{3/2}$	$sp(^3P)d\ ^4D_{5/2}$	7.400	4.37[12]	5.37[-2]	5.24[-3]	7.062	5.03[12]	5.62[-2]	5.24[-3]
$p^2(^1D)s\ ^2D_{5/2}$	$sp(^1P)d\ ^2P_{3/2}$	7.394	3.43[13]	1.87[-1]	2.74[-2]	7.054	3.84[13]	1.91[-1]	2.66[-2]
$p^2(^1D)s\ ^2D_{5/2}$	$sp(^1P)d\ ^2D_{5/2}$	7.384	3.17[13]	2.59[-1]	3.78[-2]	7.045	3.54[13]	2.64[-1]	3.67[-2]
$p^2(^3P)s\ ^4P_{5/2}$	$sp(^3P)d\ ^4D_{7/2}$	7.336	2.02[13]	2.17[-1]	3.15[-2]	7.005	2.26[13]	2.21[-1]	3.07[-2]
$p^2(^3P)s\ ^4P_{3/2}$	$sp(^3P)d\ ^4P_{3/2}$	7.333	7.52[11]	6.07[-3]	5.86[-4]	6.999	4.38[11]	3.21[-3]	2.96[-4]
$p^2(^1S)s\ ^2S_{1/2}$	$sp(^3P)d\ ^2D_{3/2}$	7.328	2.12[13]	3.41[-1]	1.65[-2]	6.997	2.40[13]	3.52[-1]	1.62[-2]
$p^2(^3P)s\ ^4P_{5/2}$	$sp(^3P)d\ ^2D_{5/2}$	7.312	2.69[13]	2.16[-1]	3.12[-2]	6.981	2.99[13]	2.19[-1]	3.01[-2]
$p^2(^3P)s\ ^4P_{1/2}$	$p^2(^3P)p\ ^2P_{1/2}$	7.293	2.81[13]	2.23[-1]	1.07[-2]	6.965	3.13[13]	2.28[-1]	1.05[-2]
$s^2(^1S)d\ ^2D_{3/2}$	$sp(^1P)d\ ^2D_{3/2}$	7.274	4.21[13]	3.34[-1]	3.20[-2]	6.947	4.70[13]	3.41[-1]	3.11[-2]
$p^2(^3P)s\ ^4P_{3/2}$	$sp(^3P)d\ ^4P_{1/2}$	7.264	2.10[13]	8.33[-2]	7.96[-3]	6.938	2.35[13]	8.47[-2]	7.74[-3]
$p^2(^3P)s\ ^4P_{3/2}$	$sp(^3P)d\ ^4D_{3/2}$	7.260	4.29[13]	3.39[-1]	3.24[-2]	6.933	4.84[13]	3.48[-1]	3.18[-2]
$p^2(^1D)s\ ^2D_{3/2}$	$sp(^3P)d\ ^2D_{3/2}$	7.240	3.17[13]	2.49[-1]	2.37[-2]	6.914	3.55[13]	2.55[-1]	2.32[-2]
$p^2(^1S)s\ ^2S_{1/2}$	$sp(^3P)d\ ^2P_{1/2}$	7.213	3.45[13]	2.70[-1]	1.28[-2]	6.890	3.88[13]	2.76[-1]	1.25[-2]
$p^2(^3P)s\ ^4P_{1/2}$	$sp(^3P)d\ ^4F_{3/2}$	7.215	5.33[13]	8.29[-1]	3.94[-2]	6.892	5.97[13]	8.50[-1]	3.86[-2]
$s^2(^1S)p\ ^2P_{1/2}$	$p^2(^3P)s\ ^2P_{3/2}$	7.204	5.51[13]	8.60[-1]	4.08[-2]	6.881	6.20[13]	8.81[-1]	3.99[-2]
$p^2(^3P)s\ ^4P_{3/2}$	$sp(^3P)d\ ^2D_{5/2}$	7.199	4.16[12]	4.87[-2]	4.62[-3]	6.876	4.50[12]	4.78[-2]	4.33[-3]
$p^2(^1D)s\ ^2D_{3/2}$	$sp(^3P)d\ ^2F_{5/2}$	7.178	3.56[12]	4.14[-2]	3.91[-3]	6.856	3.85[12]	4.09[-2]	3.69[-3]
$p^2(^3P)s\ ^4P_{5/2}$	$sp(^3P)d\ ^2F_{5/2}$	7.086	9.10[12]	6.87[-2]	9.62[-3]	6.772	1.05[13]	7.27[-2]	9.74[-3]
$p^2(^3P)s\ ^4P_{3/2}$	$sp(^3P)d\ ^2D_{3/2}$	7.038	1.51[12]	1.13[-2]	1.04[-3]	6.728	1.77[12]	1.20[-2]	1.06[-3]
$p^2(^3P)s\ ^4P_{3/2}$	$sp(^3P)d\ ^2F_{5/2}$	6.979	5.35[11]	5.87[-3]	5.40[-4]	6.674	6.23[11]	6.27[-3]	5.50[-4]
$p^2(^3P)s\ ^2P_{3/2}$	$sp(^1P)d\ ^2P_{1/2}$	6.442	5.66[11]	1.76[-3]	1.50[-4]	6.144	6.06[11]	1.71[-3]	1.39[-4]

Lower level	Upper level	λ	A	f	S	λ	A	f	S
				Z=99				Z=100	
$p^2(^1S)s\ ^2S_{1/2}$	$p^2(^3P)p\ ^2P_{3/2}$	20.222	9.68[11]	1.19[-1]	1.58[-2]	19.632	1.03[12]	1.19[-1]	1.54[-2]
$p^2(^3P)s\ ^2P_{1/2}$	$sp(^1P)d\ ^2P_{1/2}$	19.841	1.44[12]	8.49[-2]	1.11[-2]	19.270	1.53[12]	8.51[-2]	1.08[-2]
$p^2(^1D)s\ ^2D_{3/2}$	$sp(^3P)d\ ^4P_{5/2}$	19.652	6.61[11]	5.76[-2]	1.49[-2]	19.074	6.99[11]	5.76[-2]	1.44[-2]
$s^2(^1S)p\ ^2P_{3/2}$	$p^2(^1D)s\ ^2D_{5/2}$	19.456	1.37[12]	1.17[-1]	2.99[-2]	18.900	1.46[12]	1.17[-1]	2.92[-2]
$p^2(^3P)s\ ^4P_{5/2}$	$sp(^3P)d\ ^4F_{7/2}$	19.425	1.08[12]	8.15[-2]	3.12[-2]	18.870	1.16[12]	8.25[-2]	3.07[-2]
$p^2(^3P)s\ ^2P_{1/2}$	$sp(^1P)d\ ^2P_{3/2}$	19.308	1.07[12]	1.20[-1]	1.52[-2]	18.760	1.14[12]	1.20[-1]	1.48[-2]
$p^2(^3P)s\ ^4P_{3/2}$	$sp(^3P)d\ ^4F_{5/2}$	19.293	1.25[12]	1.04[-1]	2.66[-2]	18.744	1.33[12]	1.05[-1]	2.60[-2]
$p^2(^3P)s\ ^2P_{3/2}$	$sp(^3P)d\ ^4D_{5/2}$	7.211	4.51[11]	5.26[-3]	5.02[-4]	6.864	5.17[11]	5.46[-3]	4.94[-4]
$p^2(^3P)s\ ^2P_{3/2}$	$sp(^3P)d\ ^4P_{3/2}$	7.143	7.19[11]	5.51[-3]	5.18[-4]	6.800	8.12[11]	5.66[-3]	5.05[-4]
$p^2(^3P)s\ ^2P_{3/2}$	$sp(^3P)d\ ^2D_{5/2}$	7.014	2.92[12]	3.23[-2]	2.98[-3]	6.683	3.46[12]	3.48[-2]	3.06[-3]
$p^2(^1D)s\ ^2D_{5/2}$	$sp(^1P)d\ ^2F_{5/2}$	6.990	5.74[12]	4.20[-2]	5.82[-3]	6.661	6.43[12]	4.27[-2]	5.62[-3]
$p^2(^1S)s\ ^2S_{1/2}$	$sp(^3P)d\ ^4P_{3/2}$	6.949	1.03[13]	1.49[-1]	6.81[-3]	6.624	1.09[13]	1.43[-1]	6.24[-3]
$p^2(^1D)s\ ^2D_{5/2}$	$sp(^3P)d\ ^2F_{7/2}$	6.949	9.19[11]	8.90[-3]	1.22[-3]	6.623	9.97[11]	8.73[-3]	1.14[-3]
$p^2(^1D)s\ ^2D_{5/2}$	$sp(^3P)d\ ^2P_{3/2}$	6.920	3.78[12]	1.81[-2]	2.47[-3]	6.596	4.22[12]	1.84[-2]	2.39[-3]
$p^2(^1D)s\ ^2D_{3/2}$	$sp(^3P)d\ ^4D_{5/2}$	6.927	4.81[12]	5.17[-2]	4.72[-3]	6.604	5.10[12]	5.02[-2]	4.37[-3]
$p^2(^1S)s\ ^2S_{1/2}$	$sp(^3P)d\ ^4D_{3/2}$	6.886	4.64[12]	6.59[-2]	2.99[-3]	6.567	5.52[12]	7.13[-2]	3.08[-3]
$p^2(^3P)s\ ^2P_{3/2}$	$sp(^3P)d\ ^2D_{3/2}$	6.860	1.02[13]	7.16[-2]	6.47[-3]	6.541	1.11[13]	7.06[-2]	6.10[-3]
$p^2(^1D)s\ ^2D_{3/2}$	$sp(^3P)d\ ^4P_{3/2}$	6.864	1.97[12]	1.39[-2]	1.25[-3]	6.545	2.01[12]	1.29[-2]	1.11[-3]
$p^2(^1S)s\ ^2S_{1/2}$	$sp(^3P)d\ ^4D_{1/2}$	6.847	1.01[12]	7.10[-3]	3.20[-4]	6.530	1.01[12]	6.50[-3]	2.80[-4]
$p^2(^1D)s\ ^2D_{5/2}$	$sp(^1P)d\ ^2F_{7/2}$	6.832	4.18[13]	3.90[-1]	5.25[-2]	6.515	4.69[13]	3.97[-1]	5.11[-2]
$s^2(^1S)p\ ^2P_{1/2}$	$p^2(^1D)s\ ^2D_{3/2}$	6.828	3.12[12]	4.35[-2]	1.96[-3]	6.513	3.22[12]	4.11[-2]	1.76[-3]
$p^2(^3P)s\ ^2P_{3/2}$	$sp(^3P)d\ ^2F_{5/2}$	6.802	7.83[13]	8.14[-1]	7.30[-2]	6.489	8.78[13]	8.29[-1]	7.10[-2]
$p^2(^3P)s\ ^4P_{1/2}$	$p^2(^3P)p\ ^4S_{3/2}$	6.805	1.52[12]	2.12[-2]	9.48[-4]	6.492	1.49[12]	1.88[-2]	8.05[-4]
$p^2(^1D)s\ ^2D_{3/2}$	$sp(^3P)d\ ^4D_{3/2}$	6.803	5.68[12]	3.95[-2]	3.54[-3]	6.490	6.71[12]	4.23[-2]	3.61[-3]
$p^2(^3P)s\ ^4P_{5/2}$	$sp(^3P)d\ ^4P_{3/2}$	6.780	8.52[12]	3.91[-2]	5.26[-3]	6.469	9.56[12]	4.01[-2]	5.11[-3]
$p^2(^1D)s\ ^2D_{3/2}$	$sp(^3P)d\ ^4D_{1/2}$	6.765	3.48[13]	1.19[-1]	1.07[-2]	6.453	3.89[13]	1.21[-1]	1.03[-2]
$p^2(^3P)s\ ^2P_{3/2}$	$sp(^3P)d\ ^2P_{1/2}$	6.755	5.75[13]	1.98[-1]	1.75[-2]	6.444	6.44[13]	2.01[-1]	1.70[-2]
$s^2(^1S)p\ ^2P_{1/2}$	$p^2(^1S)s\ ^2S_{1/2}$	6.746	4.64[13]	3.17[-1]	1.41[-2]	6.436	5.19[13]	3.23[-1]	1.37[-2]
$s^2(^1S)p\ ^2P_{3/2}$	$p^2(^3P)s\ ^2P_{1/2}$	6.748	3.40[13]	1.16[-1]	1.03[-2]	6.438	3.80[13]	1.18[-1]	1.00[-2]
$p^2(^1D)s\ ^2D_{3/2}$	$sp(^3P)d\ ^2D_{5/2}$	6.746	1.28[13]	1.31[-1]	1.17[-2]	6.436	1.45[13]	1.36[-1]	1.15[-2]
$p^2(^1D)s\ ^2D_{5/2}$	$sp(^1P)d\ ^2P_{3/2}$	6.730	4.29[13]	1.94[-1]	2.59[-2]	6.422	4.80[13]	1.98[-1]	2.51[-2]
$p^2(^3P)s\ ^4P_{3/2}$	$sp(^3P)d\ ^4D_{5/2}$	6.739	5.75[12]	5.87[-2]	5.23[-3]	6.432	6.61[12]	6.17[-2]	5.21[-3]
$p^2(^1D)s\ ^2D_{5/2}$	$sp(^1P)d\ ^2D_{5/2}$	6.722	3.97[13]	2.69[-1]	3.57[-2]	6.414	4.46[13]	2.74[-1]	3.47[-2]
$p^2(^1S)s\ ^2S_{1/2}$	$sp(^3P)d\ ^2D_{3/2}$	6.680	2.71[13]	3.64[-1]	1.60[-2]	6.378	3.07[13]	3.75[-1]	1.57[-2]
$p^2(^3P)s\ ^4P_{5/2}$	$sp(^3P)d\ ^4D_{7/2}$	6.688	2.53[13]	2.26[-1]	2.99[-2]	6.386	2.83[13]	2.30[-1]	2.91[-2]
$p^2(^3P)s\ ^4P_{5/2}$	$sp(^3P)d\ ^2D_{5/2}$	6.665	3.32[13]	2.21[-1]	2.91[-2]	6.363	3.68[13]	2.23[-1]	2.80[-2]
$p^2(^3P)s\ ^4P_{1/2}$	$p^2(^3P)p\ ^2P_{1/2}$	6.652	3.50[13]	2.32[-1]	1.02[-2]	6.352	3.92[13]	2.37[-1]	9.92[-3]
$s^2(^1S)d\ ^2D_{3/2}$	$sp(^1P)d\ ^2D_{3/2}$	6.635	5.26[13]	3.47[-1]	3.03[-2]	6.337	5.85[13]	3.54[-1]	2.95[-2]
$p^2(^3P)s\ ^4P_{3/2}$	$sp(^3P)d\ ^4P_{1/2}$	6.626	2.62[13]	8.62[-2]	7.52[-3]	6.328	2.92[13]	8.77[-2]	7.31[-3]
$p^2(^3P)s\ ^4P_{3/2}$	$sp(^3P)d\ ^4D_{3/2}$	6.622	5.41[13]	3.57[-1]	3.12[-2]	6.324	6.10[13]	3.65[-1]	3.04[-2]
$p^2(^1D)s\ ^2D_{3/2}$	$sp(^3P)d\ ^2D_{3/2}$	6.602	3.99[13]	2.62[-1]	2.27[-2]	6.305	4.47[13]	2.68[-1]	2.22[-2]
$p^2(^1S)s\ ^2S_{1/2}$	$sp(^3P)d\ ^2P_{1/2}$	6.581	4.36[13]	2.83[-1]	1.23[-2]	6.286	4.89[13]	2.90[-1]	1.20[-2]
$p^2(^3P)s\ ^4P_{1/2}$	$sp(^3P)d\ ^4F_{3/2}$	6.582	6.70[13]	8.71[-1]	3.78[-2]	6.287	7.54[13]	8.93[-1]	3.69[-2]
$s^2(^1S)p\ ^2P_{1/2}$	$p^2(^3P)s\ ^2P_{3/2}$	6.573	6.94[13]	9.02[-1]	3.91[-2]	6.278	7.82[13]	9.24[-1]	3.82[-2]
$p^2(^3P)s\ ^4P_{3/2}$	$sp(^3P)d\ ^2D_{5/2}$	6.568	4.82[12]	4.69[-2]	4.05[-3]	6.273	5.19[12]	4.59[-2]	3.79[-3]
$p^2(^1D)s\ ^2D_{3/2}$	$sp(^3P)d\ ^2F_{5/2}$	6.549	4.19[12]	4.05[-2]	3.50[-3]	6.256	4.58[12]	4.03[-2]	3.32[-3]
$p^2(^3P)s\ ^4P_{5/2}$	$sp(^3P)d\ ^2F_{5/2}$	6.473	1.22[13]	7.69[-2]	9.85[-3]	6.186	1.42[13]	8.13[-2]	9.94[-3]
$p^2(^3P)s\ ^4P_{3/2}$	$sp(^3P)d\ ^2D_{3/2}$	6.432	2.06[12]	1.27[-2]	1.08[-3]	6.148	2.38[12]	1.35[-2]	1.09[-3]
$p^2(^3P)s\ ^4P_{3/2}$	$sp(^3P)d\ ^2F_{5/2}$	6.381	7.26[11]	6.67[-3]	5.58[-4]	6.101	8.37[11]	7.01[-3]	5.65[-4]
$p^2(^3P)s\ ^2P_{3/2}$	$sp(^1P)d\ ^2P_{1/2}$	5.860	6.47[11]	1.67[-3]	1.29[-4]	5.590	6.91[11]	1.62[-3]	1.19[-4]

Table II: Lifetimes (10^{-9} sec) for excited levels in Al-like ions, Z=15-100. Numbers in brackets represent powers of 10.

Z	$3p^2(^3P)3s$			$3p^2(^1D)3s$		$3p^2(^1S)3s$	$3p^2(^3P)3s$		$3s^2(^1S)3d$	
	$^4P_{1/2}$	$^4P_{3/2}$	$^4P_{5/2}$	$^2D_{3/2}$	$^2D_{5/2}$	$^2S_{1/2}$	$^2P_{1/2}$	$^2P_{3/2}$	$^2D_{3/2}$	$^2D_{5/2}$
15	6.57[4]	3.06[5]	4.39[5]	1.01[2]	1.09[2]	5.51[-1]	1.81[-1]	1.80[-1]	1.69[-1]	1.72[-1]
16	1.13[4]	8.51[4]	4.61[4]	9.98[0]	1.03[1]	3.29[-1]	1.26[-1]	1.25[-1]	1.07[-1]	1.09[-1]
17	5.60[3]	3.53[4]	1.50[4]	4.42[0]	4.63[0]	2.62[-1]	9.61[-2]	9.55[-2]	7.84[-2]	8.00[-2]
18	2.40[3]	1.54[4]	6.71[3]	3.06[0]	3.26[0]	2.06[-1]	7.78[-2]	7.66[-2]	6.38[-2]	6.54[-2]
19	1.11[3]	6.99[3]	2.85[3]	2.07[0]	2.22[0]	1.66[-1]	6.45[-2]	6.35[-2]	5.29[-2]	5.43[-2]
20	1.98[2]	3.60[3]	1.45[3]	1.68[0]	1.83[0]	9.41[-2]	5.53[-2]	5.39[-2]	4.51[-2]	4.72[-2]
21	3.82[2]	1.88[3]	6.76[2]	1.14[0]	1.27[0]	1.31[-1]	4.75[-2]	4.59[-2]	3.96[-2]	4.15[-2]
22	2.12[2]	1.09[3]	3.75[2]	9.21[-1]	1.05[0]	1.08[-1]	4.22[-2]	4.02[-2]	3.52[-2]	3.72[-2]
23	1.26[2]	6.63[2]	2.16[2]	7.64[-1]	8.85[-1]	9.06[-2]	3.79[-2]	3.55[-2]	3.16[-2]	3.37[-2]
24	7.86[1]	4.19[2]	1.29[2]	6.34[-1]	7.58[-1]	7.70[-2]	3.46[-2]	3.15[-2]	2.86[-2]	3.09[-2]
25	5.07[1]	2.75[2]	8.00[1]	5.37[-1]	6.62[-1]	6.51[-2]	3.17[-2]	2.84[-2]	2.61[-2]	2.83[-2]
26	3.34[1]	1.85[2]	5.08[1]	4.58[-1]	5.81[-1]	5.50[-2]	2.98[-2]	2.55[-2]	2.39[-2]	2.63[-2]
27	2.27[1]	1.29[2]	3.30[1]	3.94[-1]	5.24[-1]	4.71[-2]	2.79[-2]	2.31[-2]	2.19[-2]	2.44[-2]
28	1.57[1]	9.09[1]	2.20[1]	3.40[-1]	4.72[-1]	4.03[-2]	2.65[-2]	2.10[-2]	2.02[-2]	2.28[-2]
29	1.11[1]	6.62[1]	1.51[1]	2.93[-1]	4.29[-1]	3.48[-2]	2.52[-2]	1.92[-2]	1.86[-2]	2.13[-2]
30	7.98[0]	4.91[1]	1.05[1]	2.54[-1]	3.95[-1]	3.02[-2]	2.40[-2]	1.75[-2]	1.72[-2]	2.00[-2]
31	5.81[0]	3.72[1]	7.46[0]	2.20[-1]	3.66[-1]	2.67[-2]	2.29[-2]	1.61[-2]	1.59[-2]	1.89[-2]
32	4.30[0]	2.84[1]	5.41[0]	1.90[-1]	3.41[-1]	2.36[-2]	2.17[-2]	1.48[-2]	1.48[-2]	1.78[-2]
33	3.22[0]	2.22[1]	4.02[0]	1.65[-1]	3.21[-1]	2.10[-2]	2.07[-2]	1.36[-2]	1.36[-2]	1.69[-2]
34	2.45[0]	1.75[1]	3.04[0]	1.44[-1]	3.04[-1]	1.89[-2]	1.96[-2]	1.25[-2]	1.27[-2]	1.59[-2]
35	1.88[0]	1.41[1]	2.34[0]	1.25[-1]	2.90[-1]	1.70[-2]	1.85[-2]	1.15[-2]	1.17[-2]	1.50[-2]
36	1.47[0]	1.14[1]	1.86[0]	1.09[-1]	2.79[-1]	1.54[-2]	1.75[-2]	1.06[-2]	1.09[-2]	1.42[-2]
37	1.16[0]	9.33[0]	1.49[0]	9.51[-2]	2.72[-1]	1.40[-2]	1.65[-2]	9.78[-3]	1.00[-2]	1.34[-2]
38	9.26[-1]	7.74[0]	1.21[0]	8.24[-2]	2.67[-1]	1.28[-2]	1.55[-2]	9.00[-3]	9.29[-3]	1.27[-2]
39	7.51[-1]	6.42[0]	1.01[0]	7.20[-2]	2.64[-1]	1.16[-2]	1.45[-2]	8.29[-3]	8.53[-3]	1.21[-2]
40	6.09[-1]	5.40[0]	8.47[-1]	6.26[-2]	2.64[-1]	1.06[-2]	1.36[-2]	7.67[-3]	7.86[-3]	1.14[-2]
41	5.02[-1]	4.60[0]	7.30[-1]	5.50[-2]	2.66[-1]	9.72[-3]	1.27[-2]	7.07[-3]	7.25[-3]	1.08[-2]
42	4.17[-1]	3.93[0]	6.33[-1]	4.79[-2]	2.75[-1]	8.94[-3]	1.18[-2]	6.53[-3]	6.61[-3]	1.02[-2]
43	3.52[-1]	3.38[0]	5.56[-1]	4.22[-2]	2.88[-1]	8.17[-3]	1.10[-2]	6.01[-3]	6.10[-3]	9.62[-3]
44	2.98[-1]	2.92[0]	4.93[-1]	3.72[-2]	3.14[-1]	7.46[-3]	1.02[-2]	5.57[-3]	5.57[-3]	9.09[-3]
45	2.56[-1]	2.54[0]	4.41[-1]	3.28[-2]	3.57[-1]	6.82[-3]	9.44[-3]	5.10[-3]	5.07[-3]	8.55[-3]
46	2.21[-1]	2.21[0]	3.98[-1]	2.89[-2]	4.35[-1]	6.24[-3]	8.63[-3]	4.71[-3]	4.63[-3]	8.13[-3]
47	1.93[-1]	1.94[0]	3.61[-1]	2.56[-2]	5.92[-1]	5.71[-3]	7.95[-3]	4.31[-3]	4.22[-3]	7.63[-3]
48	1.69[-1]	1.71[0]	3.30[-1]	2.27[-2]	9.80[-1]	5.21[-3]	7.37[-3]	3.95[-3]	3.84[-3]	7.14[-3]
49	1.50[-1]	1.51[0]	3.04[-1]	2.01[-2]	2.60[0]	4.77[-3]	6.73[-3]	3.61[-3]	3.51[-3]	6.71[-3]
50	1.34[-1]	1.34[0]	2.80[-1]	1.79[-2]	8.06[1]	4.34[-3]	6.19[-3]	3.30[-3]	3.19[-3]	6.33[-3]
51	1.20[-1]	1.18[0]	2.60[-1]	1.59[-2]	3.44[0]	3.97[-3]	5.63[-3]	3.01[-3]	2.90[-3]	5.95[-3]
52	1.08[-1]	1.05[0]	2.42[-1]	1.43[-2]	5.56[-1]	3.61[-3]	5.14[-3]	2.74[-3]	2.64[-3]	5.65[-3]
53	9.80[-2]	9.32[-1]	2.25[-1]	1.27[-2]	1.91[-1]	3.28[-3]	4.66[-3]	2.49[-3]	2.39[-3]	5.41[-3]
54	8.93[-2]	8.30[-1]	2.11[-1]	1.14[-2]	8.93[-2]	2.98[-3]	4.24[-3]	2.26[-3]	2.16[-3]	5.21[-3]
55	8.20[-2]	7.39[-1]	1.96[-1]	1.02[-2]	5.05[-2]	2.71[-3]	3.87[-3]	2.05[-3]	1.96[-3]	5.08[-3]
56	7.58[-2]	6.57[-1]	1.86[-1]	9.13[-3]	3.26[-2]	2.45[-3]	3.49[-3]	1.86[-3]	1.76[-3]	4.98[-3]
57	6.99[-2]	5.87[-1]	1.75[-1]	8.11[-3]	2.32[-2]	2.22[-3]	3.16[-3]	1.68[-3]	1.60[-3]	4.88[-3]
58	6.49[-2]	5.21[-1]	1.64[-1]	7.29[-3]	1.77[-2]	2.01[-3]	2.85[-3]	1.53[-3]	1.44[-3]	4.78[-3]
59	6.02[-2]	4.62[-1]	1.55[-1]	6.59[-3]	1.43[-2]	1.81[-3]	2.58[-3]	1.37[-3]	1.30[-3]	4.65[-3]
60	5.59[-2]	4.13[-1]	1.47[-1]	5.97[-3]	1.20[-2]	1.64[-3]	2.32[-3]	1.22[-3]	1.17[-3]	4.41[-3]
61	5.26[-2]	3.68[-1]	1.39[-1]	5.33[-3]	1.04[-2]	1.48[-3]	2.09[-3]	1.12[-3]	1.05[-3]	4.27[-3]
62	4.95[-2]	3.28[-1]	1.32[-1]	4.78[-3]	9.09[-3]	1.33[-3]	1.89[-3]	1.00[-3]	9.43[-4]	4.05[-3]
63	4.65[-2]	2.92[-1]	1.25[-1]	4.33[-3]	8.20[-3]	1.20[-3]	1.69[-3]	9.01[-4]	8.40[-4]	3.80[-3]
64	4.41[-2]	2.59[-1]	1.19[-1]	3.89[-3]	7.41[-3]	1.08[-3]	1.52[-3]	8.06[-4]	7.57[-4]	3.56[-3]

Z	$3p^2(^3P)3s$			$3p^2(^1D)3s$		$3p^2(^1S)3s$	$3p^2(^3P)3s$		$3s^2(^1S)3d$	
	$^4P_{1/2}$	$^4P_{3/2}$	$^4P_{5/2}$	$^2D_{3/2}$	$^2D_{5/2}$	$^2S_{1/2}$	$^2P_{1/2}$	$^2P_{3/2}$	$^2D_{3/2}$	$^2D_{5/2}$
65	4.15[-2]	2.30[-1]	1.13[-1]	3.51[-3]	6.76[-3]	9.60[-4]	1.36[-3]	7.30[-4]	6.75[-4]	3.30[-3]
66	3.94[-2]	2.04[-1]	1.08[-1]	3.17[-3]	6.25[-3]	8.67[-4]	1.22[-3]	6.54[-4]	6.09[-4]	3.05[-3]
67	3.73[-2]	1.81[-1]	1.02[-1]	2.87[-3]	5.75[-3]	7.79[-4]	1.10[-3]	5.81[-4]	5.43[-4]	2.80[-3]
68	3.55[-2]	1.61[-1]	9.80[-2]	2.60[-3]	5.32[-3]	7.02[-4]	9.84[-4]	5.21[-4]	4.85[-4]	2.57[-3]
69	3.38[-2]	1.43[-1]	9.35[-2]	2.36[-3]	4.95[-3]	6.27[-4]	8.80[-4]	4.67[-4]	4.34[-4]	2.35[-3]
70	3.22[-2]	1.27[-1]	8.85[-2]	2.14[-3]	4.61[-3]	5.63[-4]	7.90[-4]	4.18[-4]	3.89[-4]	2.14[-3]
71	3.06[-2]	1.12[-1]	8.47[-2]	1.94[-3]	4.29[-3]	5.00[-4]	7.01[-4]	3.75[-4]	3.47[-4]	1.95[-3]
72	2.93[-2]	9.93[-2]	8.13[-2]	1.77[-3]	4.02[-3]	4.51[-4]	6.30[-4]	3.33[-4]	3.10[-4]	1.76[-3]
73	2.80[-2]	8.80[-2]	7.75[-2]	1.61[-3]	3.76[-3]	4.03[-4]	5.59[-4]	2.98[-4]	2.80[-4]	1.60[-3]
74	2.68[-2]	7.84[-2]	7.46[-2]	1.47[-3]	3.52[-3]	3.60[-4]	5.03[-4]	2.65[-4]	2.95[-4]	1.44[-3]
75	2.57[-2]	6.93[-2]	7.14[-2]	1.34[-3]	3.31[-3]	3.21[-4]	4.49[-4]	2.37[-4]	4.77[-3]	1.29[-3]
76	2.46[-2]	6.09[-2]	6.80[-2]	1.23[-3]	3.11[-3]	2.87[-4]	4.00[-4]	2.11[-4]	6.22[-3]	1.16[-3]
77	2.36[-2]	5.44[-2]	6.54[-2]	1.13[-3]	2.92[-3]	2.57[-4]	3.57[-4]	1.88[-4]	6.37[-3]	1.05[-3]
78	2.27[-2]	4.79[-2]	6.29[-2]	1.04[-3]	2.74[-3]	2.30[-4]	3.19[-4]	1.68[-4]	6.28[-3]	9.43[-4]
79	2.18[-2]	4.27[-2]	6.02[-2]	9.52[-4]	2.58[-3]	2.05[-4]	2.84[-4]	1.49[-4]	6.18[-3]	8.40[-4]
80	2.10[-2]	3.79[-2]	5.78[-2]	8.76[-4]	2.42[-3]	1.83[-4]	2.54[-4]	1.33[-4]	6.05[-3]	7.51[-4]
81	2.02[-2]	3.37[-2]	5.56[-2]	8.18[-4]	2.27[-3]	1.64[-4]	2.26[-4]	1.18[-4]	5.89[-3]	6.75[-4]
82	1.95[-2]	2.98[-2]	5.35[-2]	7.55[-4]	2.13[-3]	1.46[-4]	2.02[-4]	1.05[-4]	5.73[-3]	6.06[-4]
83	1.88[-2]	2.65[-2]	5.13[-2]	7.02[-4]	2.00[-3]	1.30[-4]	1.80[-4]	9.35[-5]	5.60[-3]	5.46[-4]
84	1.81[-2]	2.36[-2]	4.93[-2]	6.51[-4]	1.88[-3]	1.16[-4]	1.61[-4]	8.26[-5]	5.45[-3]	1.85[-3]
85	1.75[-2]	2.10[-2]	4.76[-2]	6.07[-4]	1.76[-3]	1.04[-4]	1.44[-4]	7.35[-5]	5.31[-3]	1.77[-3]
86	1.69[-2]	1.86[-2]	4.59[-2]	5.72[-4]	1.66[-3]	9.31[-5]	1.28[-4]	6.54[-5]	5.17[-3]	1.67[-3]
87	1.63[-2]	1.67[-2]	4.42[-2]	5.35[-4]	1.56[-3]	8.30[-5]	1.15[-4]	5.85[-5]	5.06[-3]	1.58[-3]
88	1.58[-2]	1.48[-2]	4.26[-2]	5.05[-4]	1.46[-3]	7.44[-5]	1.03[-4]	5.18[-5]	4.89[-3]	1.49[-3]
89	1.53[-2]	1.33[-2]	4.12[-2]	4.76[-4]	1.37[-3]	6.60[-5]	9.16[-5]	4.61[-5]	4.79[-3]	1.41[-3]
90	1.48[-2]	1.19[-2]	3.97[-2]	4.50[-4]	1.29[-3]	5.93[-5]	8.12[-5]	4.10[-5]	4.67[-3]	1.33[-3]
91	1.43[-2]	1.06[-2]	3.83[-2]	4.28[-4]	1.21[-3]	5.28[-5]	7.29[-5]	3.64[-5]	4.56[-3]	1.26[-3]
92	1.39[-2]	9.42[-3]	3.70[-2]	4.09[-4]	1.14[-3]	4.73[-5]	6.49[-5]	3.25[-5]	4.46[-3]	1.18[-3]
93	1.35[-2]	8.53[-3]	3.58[-2]	3.92[-4]	1.07[-3]	4.21[-5]	5.77[-5]	2.89[-5]	4.33[-3]	1.12[-3]
94	1.31[-2]	7.62[-3]	3.47[-2]	3.75[-4]	1.01[-3]	3.77[-5]	5.18[-5]	2.56[-5]	4.24[-3]	1.05[-3]
95	1.28[-2]	6.84[-3]	3.38[-2]	3.62[-4]	9.43[-4]	3.37[-5]	4.60[-5]	2.28[-5]	4.14[-3]	9.90[-4]
96	1.24[-2]	6.12[-3]	3.28[-2]	3.48[-4]	8.85[-4]	3.01[-5]	4.13[-5]	2.03[-5]	4.03[-3]	9.35[-4]
97	1.21[-2]	5.52[-3]	3.16[-2]	3.38[-4]	8.26[-4]	2.68[-5]	3.69[-5]	1.81[-5]	3.96[-3]	8.77[-4]
98	1.18[-2]	4.94[-3]	3.10[-2]	3.25[-4]	7.81[-4]	2.40[-5]	3.29[-5]	1.61[-5]	3.89[-3]	8.26[-4]
99	1.15[-2]	4.46[-3]	3.01[-2]	3.15[-4]	7.30[-4]	2.15[-5]	2.94[-5]	1.44[-5]	3.79[-3]	7.81[-4]
100	1.12[-2]	3.99[-3]	2.95[-2]	3.05[-4]	6.85[-4]	1.92[-5]	2.63[-5]	1.28[-5]	3.72[-3]	7.35[-4]

Z	$3s3p(^3P)3d$						$3s3p(^3P)3d$			$3s3p(^3P)3d$
	$^4F_{3/2}$	$^4F_{5/2}$	$^4F_{7/2}$	$^4P_{1/2}$	$^4P_{3/2}$	$^4P_{5/2}$	$^4D_{1/2}$	$^4D_{3/2}$	$^4D_{5/2}$	$^4D_{7/2}$
15	4.60[3]	3.45[3]	3.82[3]	2.61[-1]	2.61[-1]	2.64[-1]	1.51[-1]	1.51[-1]	1.51[-1]	1.51[-1]
16	1.35[3]	1.06[3]	1.20[3]	1.72[-1]	1.72[-1]	1.73[-1]	9.99[-2]	1.00[-1]	1.01[-1]	1.00[-1]
17	5.31[2]	4.41[2]	5.12[2]	1.29[-1]	1.29[-1]	1.30[-1]	7.51[-2]	7.59[-2]	7.60[-2]	7.57[-2]
18	2.39[2]	2.02[2]	2.36[2]	1.02[-1]	1.02[-1]	1.04[-1]	6.11[-2]	6.13[-2]	6.19[-2]	6.13[-2]
19	1.16[2]	1.01[2]	1.19[2]	8.35[-2]	8.26[-2]	8.56[-2]	5.17[-2]	5.29[-2]	5.26[-2]	5.18[-2]
20	6.13[1]	5.47[1]	6.43[1]	6.78[-2]	6.81[-2]	7.21[-2]	4.67[-2]	4.70[-2]	4.63[-2]	4.50[-2]
21	3.24[1]	3.13[1]	3.67[1]	5.28[-2]	5.66[-2]	6.21[-2]	4.51[-2]	4.34[-2]	4.16[-2]	3.98[-2]
22	1.77[1]	1.88[1]	2.20[1]	4.18[-2]	4.76[-2]	5.45[-2]	4.51[-2]	4.05[-2]	3.80[-2]	3.59[-2]
23	1.03[1]	1.18[1]	1.37[1]	3.53[-2]	4.10[-2]	4.81[-2]	4.42[-2]	3.83[-2]	3.50[-2]	3.26[-2]
24	6.61[0]	7.67[0]	8.86[0]	3.11[-2]	3.63[-2]	4.34[-2]	4.19[-2]	3.61[-2]	3.24[-2]	2.99[-2]
25	4.58[0]	5.15[0]	5.85[0]	2.81[-2]	3.26[-2]	3.94[-2]	3.92[-2]	3.40[-2]	3.02[-2]	2.76[-2]
26	3.32[0]	3.55[0]	4.00[0]	2.56[-2]	2.96[-2]	3.60[-2]	3.65[-2]	3.19[-2]	2.80[-2]	2.58[-2]

Z	$3s3p(^3P)3d$			$3s3p(^3P)3d$				$3s3p(^3P)3d$		
	$^4F_{3/2}$	$^4F_{5/2}$	$^4F_{7/2}$	$^4P_{1/2}$	$^4P_{3/2}$	$^4P_{5/2}$	$^4D_{1/2}$	$^4D_{3/2}$	$^4D_{5/2}$	$^4D_{7/2}$
27	2.46[0]	2.50[0]	2.78[0]	2.35[-2]	2.71[-2]	3.34[-2]	3.41[-2]	2.97[-2]	2.61[-2]	2.40[-2]
28	1.84[0]	1.81[0]	1.98[0]	2.17[-2]	2.50[-2]	3.10[-2]	3.17[-2]	2.78[-2]	2.43[-2]	2.25[-2]
29	1.39[0]	1.33[0]	1.43[0]	2.01[-2]	2.31[-2]	2.89[-2]	2.94[-2]	2.59[-2]	2.26[-2]	2.12[-2]
30	1.07[0]	9.98[-1]	1.06[0]	1.87[-2]	2.15[-2]	2.72[-2]	2.74[-2]	2.42[-2]	2.10[-2]	2.00[-2]
31	8.22[-1]	7.60[-1]	7.95[-1]	1.74[-2]	2.01[-2]	2.57[-2]	2.55[-2]	2.26[-2]	1.95[-2]	1.89[-2]
32	6.34[-1]	5.87[-1]	6.07[-1]	1.62[-2]	1.88[-2]	2.41[-2]	2.37[-2]	2.11[-2]	1.82[-2]	1.79[-2]
33	4.87[-1]	4.59[-1]	4.72[-1]	1.51[-2]	1.76[-2]	2.27[-2]	2.21[-2]	1.96[-2]	1.69[-2]	1.70[-2]
34	3.68[-1]	3.63[-1]	3.72[-1]	1.41[-2]	1.71[-2]	2.15[-2]	2.06[-2]	1.83[-2]	1.56[-2]	1.61[-2]
35	2.66[-1]	2.87[-1]	2.96[-1]	1.31[-2]	1.91[-2]	2.03[-2]	1.92[-2]	1.70[-2]	1.45[-2]	1.53[-2]
36	1.78[-1]	2.29[-1]	2.39[-1]	1.22[-2]	2.07[-2]	1.93[-2]	1.78[-2]	1.58[-2]	1.35[-2]	1.46[-2]
37	1.05[-1]	1.84[-1]	1.95[-1]	1.13[-2]	1.99[-2]	1.82[-2]	1.66[-2]	1.48[-2]	1.27[-2]	1.39[-2]
38	5.20[-2]	1.46[-1]	1.61[-1]	1.05[-2]	1.83[-2]	1.73[-2]	1.54[-2]	1.40[-2]	1.27[-2]	1.32[-2]
39	2.59[-2]	1.17[-1]	1.35[-1]	1.16[-2]	1.63[-2]	1.63[-2]	1.44[-2]	1.34[-2]	1.46[-2]	1.25[-2]
40	1.69[-2]	9.29[-2]	1.14[-1]	1.46[-2]	1.39[-2]	1.55[-2]	1.33[-2]	1.33[-2]	1.60[-2]	1.19[-2]
41	1.36[-2]	7.45[-2]	9.72[-2]	1.40[-2]	1.14[-2]	1.46[-2]	1.24[-2]	1.32[-2]	1.61[-2]	1.13[-2]
42	1.20[-2]	6.13[-2]	8.40[-2]	1.30[-2]	9.16[-3]	1.38[-2]	1.15[-2]	1.03[-2]	1.55[-2]	1.07[-2]
43	1.09[-2]	5.22[-2]	7.23[-2]	1.19[-2]	7.49[-3]	1.32[-2]	1.06[-2]	9.22[-3]	1.46[-2]	1.01[-2]
44	9.99[-3]	4.58[-2]	6.30[-2]	1.08[-2]	6.34[-3]	1.26[-2]	9.89[-3]	8.85[-3]	1.37[-2]	9.56[-3]
45	9.27[-3]	4.08[-2]	5.57[-2]	9.83[-3]	5.52[-3]	1.22[-2]	9.16[-3]	8.44[-3]	1.27[-2]	8.98[-3]
46	8.63[-3]	3.60[-2]	4.91[-2]	8.91[-3]	4.93[-3]	1.19[-2]	8.42[-3]	7.88[-3]	1.16[-2]	8.41[-3]
47	8.29[-3]	3.09[-2]	4.38[-2]	8.08[-3]	4.46[-3]	1.19[-2]	7.73[-3]	7.24[-3]	1.06[-2]	7.92[-3]
48	6.24[-3]	2.63[-2]	3.91[-2]	7.29[-3]	4.07[-3]	1.20[-2]	7.14[-3]	6.61[-3]	9.58[-3]	7.38[-3]
49	5.31[-3]	2.23[-2]	3.51[-2]	6.60[-3]	3.70[-3]	1.23[-2]	6.58[-3]	6.02[-3]	8.67[-3]	6.86[-3]
50	4.79[-3]	1.93[-2]	3.17[-2]	5.97[-3]	3.39[-3]	1.26[-2]	6.02[-3]	5.49[-3]	7.90[-3]	6.33[-3]
51	4.30[-3]	1.70[-2]	2.86[-2]	5.36[-3]	3.09[-3]	1.28[-2]	5.52[-3]	4.98[-3]	7.13[-3]	5.88[-3]
52	3.87[-3]	1.52[-2]	2.60[-2]	4.81[-3]	2.83[-3]	1.29[-2]	5.06[-3]	4.52[-3]	6.51[-3]	5.40[-3]
53	3.48[-3]	1.37[-2]	2.37[-2]	4.34[-3]	2.59[-3]	1.27[-2]	4.67[-3]	4.13[-3]	5.96[-3]	4.99[-3]
54	3.11[-3]	1.26[-2]	2.17[-2]	3.92[-3]	2.37[-3]	1.25[-2]	4.25[-3]	3.74[-3]	5.44[-3]	4.58[-3]
55	2.78[-3]	1.16[-2]	1.99[-2]	3.50[-3]	2.17[-3]	1.20[-2]	3.89[-3]	3.38[-3]	4.98[-3]	4.19[-3]
56	2.49[-3]	1.08[-2]	1.83[-2]	3.15[-3]	1.98[-3]	1.15[-2]	3.55[-3]	3.07[-3]	4.58[-3]	3.82[-3]
57	2.23[-3]	1.01[-2]	1.69[-2]	2.82[-3]	1.81[-3]	1.09[-2]	3.24[-3]	2.78[-3]	4.17[-3]	3.50[-3]
58	1.98[-3]	9.34[-3]	1.55[-2]	2.53[-3]	1.66[-3]	1.03[-2]	2.95[-3]	2.51[-3]	3.82[-3]	3.16[-3]
59	1.77[-3]	8.80[-3]	1.43[-2]	2.26[-3]	1.51[-3]	9.78[-3]	2.69[-3]	2.26[-3]	3.48[-3]	2.89[-3]
60	1.57[-3]	8.26[-3]	1.31[-2]	2.04[-3]	1.36[-3]	9.16[-3]	2.43[-3]	2.04[-3]	3.21[-3]	2.59[-3]
61	1.40[-3]	7.78[-3]	1.23[-2]	1.81[-3]	1.24[-3]	8.71[-3]	2.21[-3]	1.84[-3]	2.90[-3]	2.37[-3]
62	1.25[-3]	7.30[-3]	1.14[-2]	1.62[-3]	1.13[-3]	8.20[-3]	2.01[-3]	1.67[-3]	2.64[-3]	2.14[-3]
63	1.10[-3]	6.87[-3]	1.06[-2]	1.45[-3]	1.02[-3]	7.73[-3]	1.82[-3]	1.49[-3]	2.40[-3]	1.93[-3]
64	9.71[-4]	6.49[-3]	9.80[-3]	1.30[-3]	9.24[-4]	7.28[-3]	1.65[-3]	1.34[-3]	2.19[-3]	1.75[-3]
65	8.62[-4]	6.11[-3]	9.15[-3]	1.16[-3]	8.35[-4]	6.88[-3]	1.49[-3]	1.20[-3]	1.98[-3]	1.58[-3]
66	7.75[-4]	5.81[-3]	8.48[-3]	1.04[-3]	7.52[-4]	6.48[-3]	1.35[-3]	1.08[-3]	1.80[-3]	1.43[-3]
67	6.84[-4]	5.48[-3]	7.88[-3]	9.28[-4]	6.82[-4]	6.10[-3]	1.22[-3]	9.62[-4]	1.64[-3]	1.28[-3]
68	6.05[-4]	5.15[-3]	7.42[-3]	8.29[-4]	6.14[-4]	5.75[-3]	1.10[-3]	8.63[-4]	1.49[-3]	1.16[-3]
69	5.37[-4]	4.86[-3]	6.87[-3]	7.40[-4]	5.53[-4]	5.41[-3]	9.88[-4]	7.68[-4]	1.36[-3]	1.04[-3]
70	4.78[-4]	4.58[-3]	6.44[-3]	6.64[-4]	4.98[-4]	5.09[-3]	8.90[-4]	6.85[-4]	1.23[-3]	9.40[-4]
71	4.23[-4]	4.33[-3]	5.97[-3]	5.91[-4]	4.49[-4]	4.81[-3]	8.00[-4]	6.10[-4]	1.12[-3]	8.43[-4]
72	3.74[-4]	4.07[-3]	5.58[-3]	5.33[-4]	4.04[-4]	4.53[-3]	7.19[-4]	5.45[-4]	1.02[-3]	7.59[-4]
73	3.33[-4]	3.84[-3]	5.23[-3]	4.76[-4]	3.63[-4]	4.25[-3]	6.41[-4]	4.86[-4]	9.26[-4]	6.81[-4]
74	2.94[-4]	3.61[-3]	4.88[-3]	4.26[-4]	3.29[-4]	4.00[-3]	5.75[-4]	4.30[-4]	8.45[-4]	6.13[-4]
75	2.61[-4]	3.42[-3]	4.54[-3]	3.84[-4]	2.95[-4]	3.78[-3]	5.14[-4]	3.82[-4]	7.73[-4]	5.52[-4]
76	2.32[-4]	3.21[-3]	4.26[-3]	3.46[-4]	2.66[-4]	3.55[-3]	4.57[-4]	3.39[-4]	7.03[-4]	4.96[-4]
77	2.05[-4]	3.03[-3]	3.97[-3]	3.12[-4]	2.41[-4]	3.34[-3]	4.07[-4]	3.00[-4]	6.43[-4]	4.45[-4]

Z	$3s3p(^3P)3d$			$3s3p(^3P)3d$			$3s3p(^3P)3d$			
	$^4F_{3/2}$	$^4F_{5/2}$	$^4F_{7/2}$	$^4P_{1/2}$	$^4P_{3/2}$	$^4P_{5/2}$	$^4D_{1/2}$	$^4D_{3/2}$	$^4D_{5/2}$	$^4D_{7/2}$
78	1.81[-4]	2.86[-3]	3.70[-3]	2.82[-4]	2.17[-4]	3.14[-3]	3.59[-4]	2.65[-4]	5.87[-4]	4.00[-4]
79	1.61[-4]	2.69[-3]	3.49[-3]	2.55[-4]	1.96[-4]	2.95[-3]	3.16[-4]	2.34[-4]	5.35[-4]	3.57[-4]
80	1.43[-4]	2.52[-3]	3.25[-3]	2.34[-4]	1.78[-4]	2.78[-3]	2.78[-4]	2.06[-4]	4.92[-4]	3.22[-4]
81	1.27[-4]	2.38[-3]	3.02[-3]	2.14[-4]	1.61[-4]	2.62[-3]	2.43[-4]	1.81[-4]	4.50[-4]	2.88[-4]
82	1.13[-4]	2.23[-3]	2.82[-3]	1.95[-4]	1.47[-4]	2.46[-3]	2.12[-4]	1.59[-4]	4.11[-4]	2.58[-4]
83	9.86[-5]	2.11[-3]	2.64[-3]	1.81[-4]	1.34[-4]	2.31[-3]	1.85[-4]	1.40[-4]	3.76[-4]	2.31[-4]
84	8.74[-5]	1.98[-3]	2.47[-3]	1.66[-4]	1.23[-4]	2.18[-3]	1.61[-4]	1.22[-4]	3.50[-4]	2.07[-4]
85	7.85[-5]	1.85[-3]	2.31[-3]	1.52[-4]	1.13[-4]	2.04[-3]	1.41[-4]	1.07[-4]	3.20[-4]	1.86[-4]
86	6.92[-5]	1.74[-3]	2.15[-3]	1.40[-4]	1.04[-4]	1.92[-3]	1.24[-4]	9.29[-5]	2.93[-4]	1.66[-4]
87	6.15[-5]	1.64[-3]	2.01[-3]	1.28[-4]	9.54[-5]	1.80[-3]	1.09[-4]	8.08[-5]	2.69[-4]	1.49[-4]
88	5.45[-5]	1.55[-3]	1.87[-3]	1.17[-4]	8.84[-5]	1.69[-3]	9.62[-5]	7.01[-5]	2.47[-4]	1.34[-4]
89	4.84[-5]	1.45[-3]	1.76[-3]	1.06[-4]	8.23[-5]	1.58[-3]	8.53[-5]	6.10[-5]	2.25[-4]	1.20[-4]
90	4.30[-5]	1.36[-3]	1.64[-3]	9.65[-5]	7.67[-5]	1.49[-3]	7.57[-5]	5.29[-5]	2.06[-4]	1.07[-4]
91	3.81[-5]	1.28[-3]	1.53[-3]	8.70[-5]	7.22[-5]	1.40[-3]	6.71[-5]	4.57[-5]	1.89[-4]	9.62[-5]
92	3.39[-5]	1.19[-3]	1.43[-3]	7.86[-5]	6.78[-5]	1.31[-3]	6.01[-5]	3.98[-5]	1.72[-4]	8.62[-5]
93	3.01[-5]	1.12[-3]	1.34[-3]	7.12[-5]	6.42[-5]	1.23[-3]	5.36[-5]	3.44[-5]	1.58[-4]	7.69[-5]
94	2.68[-5]	1.05[-3]	1.25[-3]	6.41[-5]	6.09[-5]	1.15[-3]	4.81[-5]	3.00[-5]	1.44[-4]	6.89[-5]
95	2.38[-5]	9.88[-4]	1.16[-3]	5.79[-5]	5.78[-5]	1.08[-3]	4.30[-5]	2.61[-5]	1.31[-4]	6.13[-5]
96	2.11[-5]	9.27[-4]	1.09[-3]	5.19[-5]	5.49[-5]	1.01[-3]	3.84[-5]	2.28[-5]	1.19[-4]	5.48[-5]
97	1.87[-5]	8.68[-4]	1.02[-3]	4.66[-5]	5.20[-5]	9.50[-4]	3.43[-5]	1.99[-5]	1.08[-4]	4.92[-5]
98	1.67[-5]	8.16[-4]	9.45[-4]	4.17[-5]	4.91[-5]	8.89[-4]	3.08[-5]	1.75[-5]	9.82[-5]	4.40[-5]
99	1.49[-5]	7.63[-4]	8.85[-4]	3.74[-5]	4.61[-5]	8.35[-4]	2.76[-5]	1.55[-5]	8.88[-5]	3.93[-5]
100	1.32[-5]	7.17[-4]	8.26[-4]	3.35[-5]	4.29[-5]	7.83[-4]	2.47[-5]	1.37[-5]	8.04[-5]	3.51[-5]

Z	$3s3p(^3P)3d$		$3s3p(^3P)3d$		$3s3p(^3P)3d$		$3p^2(^3P)3p$		$3p^2(^3P)3p$	
	$^2D_{3/2}$	$^2D_{5/2}$	$^2F_{5/2}$	$^2F_{7/2}$	$^2P_{1/2}$	$^2P_{3/2}$	$^2D_{3/2}$	$^2D_{5/2}$	$^2P_{1/2}$	$^2P_{3/2}$
15	1.78[-1]	1.78[-1]	4.88[-1]	4.88[-1]	1.63[-1]	1.59[-1]	1.23[1]	1.20[1]	6.44[-1]	6.42[-1]
16	1.20[-1]	1.20[-1]	3.08[-1]	3.07[-1]	9.99[-2]	9.83[-2]	4.36[0]	4.30[0]	3.62[-1]	3.64[-1]
17	9.17[-2]	9.19[-2]	2.20[-1]	2.18[-1]	7.08[-2]	6.97[-2]	2.21[0]	2.18[0]	2.63[-1]	2.65[-1]
18	7.47[-2]	7.54[-2]	1.75[-1]	1.72[-1]	5.61[-2]	5.49[-2]	1.43[0]	1.41[0]	2.03[-1]	2.05[-1]
19	6.31[-2]	6.33[-2]	1.43[-1]	1.40[-1]	4.62[-2]	4.52[-2]	1.01[0]	1.00[0]	1.62[-1]	1.64[-1]
20	5.40[-2]	5.45[-2]	1.22[-1]	1.19[-1]	3.73[-2]	3.61[-2]	7.58[-1]	7.50[-1]	1.04[-1]	1.01[-1]
21	4.71[-2]	4.74[-2]	1.04[-1]	1.01[-1]	3.54[-2]	3.41[-2]	6.06[-1]	6.00[-1]	1.23[-1]	1.23[-1]
22	4.19[-2]	4.21[-2]	9.15[-2]	8.78[-2]	3.15[-2]	3.00[-2]	4.91[-1]	4.94[-1]	1.03[-1]	1.03[-1]
23	3.75[-2]	3.79[-2]	8.14[-2]	7.75[-2]	2.84[-2]	2.69[-2]	4.08[-1]	4.15[-1]	8.97[-2]	8.93[-2]
24	3.39[-2]	3.44[-2]	7.35[-2]	6.97[-2]	2.59[-2]	2.42[-2]	3.40[-1]	3.54[-1]	7.90[-2]	7.94[-2]
25	3.08[-2]	3.14[-2]	6.66[-2]	6.24[-2]	2.38[-2]	2.19[-2]	2.83[-1]	3.09[-1]	6.98[-2]	7.08[-2]
26	2.82[-2]	2.89[-2]	6.08[-2]	5.64[-2]	2.22[-2]	2.00[-2]	2.34[-1]	2.71[-1]	6.22[-2]	6.29[-2]
27	2.59[-2]	2.68[-2]	5.55[-2]	5.13[-2]	2.07[-2]	1.82[-2]	1.91[-1]	2.42[-1]	5.61[-2]	5.65[-2]
28	2.39[-2]	2.50[-2]	5.07[-2]	4.67[-2]	1.94[-2]	1.67[-2]	1.54[-1]	2.17[-1]	5.05[-2]	5.08[-2]
29	2.20[-2]	2.35[-2]	4.66[-2]	4.25[-2]	1.82[-2]	1.53[-2]	1.24[-1]	1.96[-1]	4.57[-2]	4.58[-2]
30	2.04[-2]	2.22[-2]	4.23[-2]	3.90[-2]	1.71[-2]	1.41[-2]	1.01[-1]	1.79[-1]	4.15[-2]	4.15[-2]
31	1.89[-2]	2.12[-2]	3.83[-2]	3.58[-2]	1.62[-2]	1.29[-2]	8.30[-2]	1.64[-1]	3.76[-2]	3.76[-2]
32	1.75[-2]	2.06[-2]	3.43[-2]	3.29[-2]	1.54[-2]	1.18[-2]	6.95[-2]	1.52[-1]	3.43[-2]	3.44[-2]
33	1.63[-2]	2.02[-2]	2.99[-2]	3.03[-2]	1.47[-2]	1.09[-2]	5.93[-2]	1.41[-1]	3.13[-2]	3.11[-2]
34	1.52[-2]	2.04[-2]	2.57[-2]	2.78[-2]	1.40[-2]	1.00[-2]	5.15[-2]	1.33[-1]	2.86[-2]	2.68[-2]
35	1.41[-2]	2.09[-2]	2.20[-2]	2.55[-2]	1.33[-2]	9.23[-3]	4.54[-2]	1.26[-1]	2.61[-2]	1.95[-2]
36	1.30[-2]	2.14[-2]	1.92[-2]	2.36[-2]	1.26[-2]	8.55[-3]	4.06[-2]	1.22[-1]	2.40[-2]	1.58[-2]
37	1.22[-2]	2.11[-2]	1.70[-2]	2.16[-2]	1.20[-2]	7.88[-3]	3.65[-2]	1.20[-1]	2.20[-2]	1.42[-2]
38	1.13[-2]	1.86[-2]	1.55[-2]	1.99[-2]	1.13[-2]	7.23[-3]	3.32[-2]	1.21[-1]	2.01[-2]	1.31[-2]
39	1.05[-2]	1.38[-2]	1.43[-2]	1.83[-2]	1.05[-2]	6.70[-3]	3.04[-2]	1.27[-1]	1.42[-2]	1.21[-2]
40	9.73[-3]	1.13[-2]	1.33[-2]	1.68[-2]	9.69[-3]	6.15[-3]	2.79[-2]	1.42[-1]	9.83[-3]	1.12[-2]

Z	$3s3p(^3P)3d$		$3s3p(^3P)3d$		$3s3p(^3P)3d$		$3p^2(^3P)3p$		$3p^2(^3P)3p$	
	$^2D_{3/2}$	$^2D_{5/2}$	$^2F_{5/2}$	$^2F_{7/2}$	$^2P_{1/2}$	$^2P_{3/2}$	$^2D_{3/2}$	$^2D_{5/2}$	$^2P_{1/2}$	$^2P_{3/2}$
41	8.85[-3]	9.93[-3]	1.25[-2]	1.55[-2]	8.82[-3]	5.70[-3]	2.57[-2]	1.73[-1]	8.80[-3]	1.04[-2]
42	1.17[-2]	9.04[-3]	1.18[-2]	1.42[-2]	7.93[-3]	5.25[-3]	2.38[-2]	2.28[-1]	8.15[-3]	9.60[-3]
43	1.37[-2]	8.26[-3]	1.11[-2]	1.31[-2]	7.07[-3]	4.80[-3]	2.20[-2]	3.11[-1]	7.52[-3]	8.82[-3]
44	1.46[-2]	7.58[-3]	1.05[-2]	1.21[-2]	6.24[-3]	4.41[-3]	2.05[-2]	3.86[-1]	6.92[-3]	8.10[-3]
45	1.50[-2]	6.95[-3]	9.86[-3]	1.11[-2]	5.50[-3]	4.04[-3]	1.91[-2]	3.94[-1]	6.41[-3]	7.43[-3]
46	1.51[-2]	6.35[-3]	9.32[-3]	1.03[-2]	4.84[-3]	3.69[-3]	1.78[-2]	3.51[-1]	5.90[-3]	6.74[-3]
47	1.48[-2]	5.83[-3]	8.81[-3]	9.49[-3]	4.26[-3]	3.40[-3]	1.65[-2]	2.96[-1]	5.43[-3]	6.00[-3]
48	1.36[-2]	5.30[-3]	8.29[-3]	8.81[-3]	3.75[-3]	3.13[-3]	1.55[-2]	2.46[-1]	5.01[-3]	6.62[-3]
49	1.21[-2]	4.86[-3]	7.81[-3]	8.15[-3]	3.32[-3]	2.92[-3]	1.44[-2]	2.09[-1]	4.62[-3]	6.58[-3]
50	1.01[-2]	4.43[-3]	7.37[-3]	7.60[-3]	2.95[-3]	2.76[-3]	1.35[-2]	1.81[-1]	4.25[-3]	6.25[-3]
51	8.03[-3]	4.02[-3]	6.93[-3]	7.09[-3]	2.61[-3]	2.63[-3]	1.26[-2]	1.58[-1]	3.91[-3]	5.83[-3]
52	6.35[-3]	3.66[-3]	6.54[-3]	6.61[-3]	2.31[-3]	2.55[-3]	1.18[-2]	1.40[-1]	3.57[-3]	5.47[-3]
53	5.08[-3]	3.32[-3]	6.16[-3]	6.20[-3]	2.06[-3]	2.46[-3]	1.10[-2]	1.25[-1]	3.29[-3]	5.09[-3]
54	4.10[-3]	3.00[-3]	5.80[-3]	5.78[-3]	1.83[-3]	2.39[-3]	1.03[-2]	1.13[-1]	3.01[-3]	4.75[-3]
55	3.36[-3]	2.72[-3]	5.44[-3]	5.44[-3]	1.63[-3]	2.33[-3]	9.61[-3]	1.04[-1]	2.75[-3]	4.43[-3]
56	2.80[-3]	2.45[-3]	5.14[-3]	5.12[-3]	1.45[-3]	2.27[-3]	9.03[-3]	9.54[-2]	2.52[-3]	4.12[-3]
57	2.34[-3]	2.22[-3]	4.81[-3]	4.79[-3]	1.29[-3]	2.21[-3]	8.46[-3]	8.82[-2]	2.30[-3]	3.85[-3]
58	1.98[-3]	1.99[-3]	4.52[-3]	4.56[-3]	1.15[-3]	2.14[-3]	7.95[-3]	8.19[-2]	2.10[-3]	3.59[-3]
59	1.69[-3]	1.79[-3]	4.22[-3]	4.30[-3]	1.03[-3]	2.09[-3]	7.47[-3]	7.64[-2]	1.91[-3]	3.36[-3]
60	1.45[-3]	1.59[-3]	3.90[-3]	4.08[-3]	9.18[-4]	2.03[-3]	7.14[-3]	7.18[-2]	1.74[-3]	3.13[-3]
61	1.25[-3]	1.45[-3]	3.50[-3]	3.84[-3]	8.16[-4]	1.96[-3]	6.63[-3]	6.72[-2]	1.58[-3]	2.95[-3]
62	1.09[-3]	1.30[-3]	2.85[-3]	3.65[-3]	7.28[-4]	1.90[-3]	6.26[-3]	6.33[-2]	1.44[-3]	2.78[-3]
63	9.45[-4]	1.16[-3]	1.71[-3]	3.46[-3]	6.49[-4]	1.84[-3]	5.89[-3]	5.98[-2]	1.31[-3]	2.61[-3]
64	8.27[-4]	1.04[-3]	8.94[-4]	3.28[-3]	5.76[-4]	1.78[-3]	5.64[-3]	5.67[-2]	1.18[-3]	2.46[-3]
65	7.21[-4]	9.29[-4]	6.46[-4]	3.10[-3]	5.17[-4]	1.72[-3]	5.39[-3]	5.39[-2]	1.07[-3]	2.33[-3]
66	6.33[-4]	8.27[-4]	5.41[-4]	2.93[-3]	4.58[-4]	1.65[-3]	5.16[-3]	5.12[-2]	9.78[-4]	2.20[-3]
67	5.56[-4]	7.37[-4]	4.70[-4]	2.79[-3]	4.08[-4]	1.59[-3]	4.96[-3]	4.87[-2]	8.81[-4]	2.09[-3]
68	4.90[-4]	6.58[-4]	4.14[-4]	2.63[-3]	3.64[-4]	1.52[-3]	4.80[-3]	4.65[-2]	7.96[-4]	1.97[-3]
69	4.31[-4]	5.84[-4]	3.68[-4]	2.50[-3]	3.24[-4]	1.45[-3]	4.68[-3]	4.45[-2]	7.15[-4]	1.87[-3]
70	3.83[-4]	5.23[-4]	3.25[-4]	2.35[-3]	2.88[-4]	1.39[-3]	4.58[-3]	4.26[-2]	6.54[-4]	1.77[-3]
71	3.37[-4]	4.65[-4]	2.89[-4]	2.23[-3]	2.57[-4]	1.32[-3]	4.52[-3]	4.09[-2]	5.88[-4]	1.68[-3]
72	2.98[-4]	4.13[-4]	2.56[-4]	2.11[-3]	2.29[-4]	1.26[-3]	4.50[-3]	3.92[-2]	5.29[-4]	1.59[-3]
73	2.64[-4]	3.68[-4]	2.27[-4]	1.99[-3]	2.04[-4]	1.19[-3]	4.48[-3]	3.77[-2]	4.78[-4]	1.51[-3]
74	2.34[-4]	3.27[-4]	2.02[-4]	1.88[-3]	1.81[-4]	1.15[-3]	4.51[-3]	3.62[-2]	4.30[-4]	1.43[-3]
75	2.07[-4]	2.91[-4]	1.80[-4]	1.77[-3]	1.61[-4]	1.16[-3]	4.60[-3]	3.49[-2]	3.87[-4]	1.36[-3]
76	1.85[-4]	2.58[-4]	1.60[-4]	1.66[-3]	1.44[-4]	1.10[-3]	4.70[-3]	3.36[-2]	3.49[-4]	1.29[-3]
77	1.64[-4]	2.30[-4]	1.42[-4]	1.57[-3]	1.28[-4]	1.04[-3]	4.84[-3]	3.24[-2]	3.14[-4]	1.22[-3]
78	1.45[-4]	2.04[-4]	1.26[-4]	1.48[-3]	1.14[-4]	9.76[-4]	5.03[-3]	3.13[-2]	2.82[-4]	1.16[-3]
79	1.29[-4]	1.82[-4]	1.12[-4]	1.39[-3]	1.01[-4]	9.14[-4]	5.25[-3]	3.02[-2]	2.53[-4]	1.10[-3]
80	1.15[-4]	1.61[-4]	9.96[-5]	1.30[-3]	8.98[-5]	8.57[-4]	5.50[-3]	2.92[-2]	2.28[-4]	1.04[-3]
81	1.02[-4]	1.44[-4]	8.83[-5]	1.22[-3]	8.00[-5]	7.99[-4]	5.82[-3]	2.82[-2]	2.05[-4]	9.89[-4]
82	9.08[-5]	1.28[-4]	7.88[-5]	1.15[-3]	7.11[-5]	7.48[-4]	6.16[-3]	2.72[-2]	1.84[-4]	9.37[-4]
83	8.06[-5]	1.14[-4]	6.98[-5]	1.08[-3]	6.32[-5]	6.96[-4]	6.59[-3]	2.64[-2]	1.65[-4]	8.89[-4]
84	7.19[-5]	1.01[-4]	6.16[-5]	2.32[-3]	5.63[-5]	7.00[-4]	7.07[-3]	2.56[-2]	1.48[-4]	8.42[-4]
85	6.38[-5]	8.99[-5]	5.51[-5]	2.20[-3]	4.99[-5]	6.47[-4]	7.58[-3]	2.49[-2]	1.33[-4]	7.98[-4]
86	5.68[-5]	8.02[-5]	4.87[-5]	2.06[-3]	4.45[-5]	5.99[-4]	8.17[-3]	2.40[-2]	1.19[-4]	7.55[-4]
87	5.06[-5]	7.14[-5]	4.34[-5]	1.93[-3]	3.96[-5]	5.54[-4]	8.89[-3]	2.34[-2]	1.07[-4]	7.14[-4]
88	4.51[-5]	6.35[-5]	3.84[-5]	1.80[-3]	3.52[-5]	5.10[-4]	9.63[-3]	2.27[-2]	9.57[-5]	6.76[-4]
89	4.02[-5]	5.70[-5]	3.42[-5]	1.68[-3]	3.15[-5]	4.67[-4]	1.06[-2]	2.20[-2]	8.58[-5]	6.39[-4]
90	3.57[-5]	5.07[-5]	3.03[-5]	1.57[-3]	2.79[-5]	4.29[-4]	1.16[-2]	2.15[-2]	7.72[-5]	6.05[-4]
91	3.17[-5]	4.52[-5]	2.69[-5]	1.46[-3]	2.48[-5]	3.94[-4]	1.28[-2]	2.08[-2]	6.92[-5]	5.74[-4]

Z	$3s3p(^3P)3d$		$3s3p(^3P)3d$		$3s3p(^3P)3d$		$3p^2(^3P)3p$		$3p^2(^3P)3p$	
	$^2D_{3/2}$	$^2D_{5/2}$	$^2F_{5/2}$	$^2F_{7/2}$	$^2P_{1/2}$	$^2P_{3/2}$	$^2D_{3/2}$	$^2D_{5/2}$	$^2P_{1/2}$	$^2P_{3/2}$
92	2.83[-5]	4.05[-5]	2.39[-5]	1.36[-3]	2.22[-5]	3.62[-4]	1.41[-2]	2.03[-2]	6.19[-5]	5.43[-4]
93	2.52[-5]	3.62[-5]	2.13[-5]	1.27[-3]	1.97[-5]	3.32[-4]	1.56[-2]	1.98[-2]	5.54[-5]	5.12[-4]
94	2.25[-5]	3.23[-5]	1.89[-5]	1.18[-3]	1.76[-5]	3.03[-4]	1.73[-2]	1.93[-2]	4.96[-5]	4.84[-4]
95	2.00[-5]	2.89[-5]	1.68[-5]	1.10[-3]	1.56[-5]	2.77[-4]	1.93[-2]	1.88[-2]	4.45[-5]	4.59[-4]
96	1.78[-5]	2.60[-5]	1.49[-5]	1.02[-3]	1.39[-5]	2.53[-4]	2.14[-2]	1.84[-2]	3.97[-5]	4.33[-4]
97	1.59[-5]	2.32[-5]	1.32[-5]	9.53[-4]	1.24[-5]	2.30[-4]	2.39[-2]	1.79[-2]	3.55[-5]	4.09[-4]
98	1.42[-5]	2.08[-5]	1.18[-5]	8.87[-4]	1.11[-5]	2.10[-4]	2.61[-2]	1.75[-2]	3.19[-5]	3.87[-4]
99	1.26[-5]	1.86[-5]	1.05[-5]	8.25[-4]	9.87[-6]	1.91[-4]	2.85[-2]	1.72[-2]	2.85[-5]	3.65[-4]
100	1.12[-5]	1.67[-5]	9.31[-6]	7.66[-4]	8.81[-6]	1.74[-4]	3.04[-2]	1.68[-2]	2.55[-5]	3.45[-4]

Z	$3s3p(^1P)3d$		$3s3p(^1P)3d$		$3s3p(^1P)3d$		$3p^2(^3P)3p$
	$^2D_{3/2}$	$^2D_{5/2}$	$^2F_{5/2}$	$^2F_{7/2}$	$^2P_{1/2}$	$^2P_{3/2}$	$^4S_{3/2}$
15	9.68[-2]	9.73[-2]	1.61[-1]	1.61[-1]	1.99[-1]	2.02[-1]	1.89[-1]
16	5.93[-2]	5.95[-2]	9.70[-2]	9.68[-2]	1.32[-1]	1.36[-1]	1.34[-1]
17	4.34[-2]	4.36[-2]	6.97[-2]	6.98[-2]	9.99[-2]	1.05[-1]	1.04[-1]
18	3.50[-2]	3.53[-2]	5.44[-2]	5.45[-2]	7.37[-2]	7.99[-2]	8.41[-2]
19	2.90[-2]	2.92[-2]	4.52[-2]	4.52[-2]	5.97[-2]	6.69[-2]	7.00[-2]
20	2.49[-2]	2.50[-2]	3.77[-2]	3.78[-2]	4.85[-2]	5.57[-2]	5.93[-2]
21	2.24[-2]	2.19[-2]	3.37[-2]	3.41[-2]	4.16[-2]	5.17[-2]	5.13[-2]
22	2.11[-2]	1.94[-2]	3.00[-2]	3.03[-2]	3.57[-2]	5.56[-2]	4.49[-2]
23	2.03[-2]	1.75[-2]	2.70[-2]	2.74[-2]	3.07[-2]	5.74[-2]	3.99[-2]
24	1.92[-2]	1.59[-2]	2.44[-2]	2.49[-2]	2.70[-2]	5.48[-2]	3.57[-2]
25	1.79[-2]	1.46[-2]	2.22[-2]	2.28[-2]	2.37[-2]	4.97[-2]	3.23[-2]
26	1.65[-2]	1.34[-2]	2.03[-2]	2.10[-2]	2.11[-2]	4.42[-2]	2.96[-2]
27	1.52[-2]	1.24[-2]	1.87[-2]	1.95[-2]	1.89[-2]	3.95[-2]	2.72[-2]
28	1.40[-2]	1.15[-2]	1.72[-2]	1.81[-2]	1.71[-2]	3.51[-2]	2.53[-2]
29	1.29[-2]	1.07[-2]	1.59[-2]	1.69[-2]	1.55[-2]	3.17[-2]	2.38[-2]
30	1.19[-2]	9.95[-3]	1.47[-2]	1.58[-2]	1.43[-2]	2.88[-2]	2.23[-2]
31	1.09[-2]	9.32[-3]	1.35[-2]	1.48[-2]	1.32[-2]	2.62[-2]	2.12[-2]
32	1.00[-2]	8.73[-3]	1.25[-2]	1.39[-2]	1.23[-2]	2.42[-2]	2.01[-2]
33	9.23[-3]	8.21[-3]	1.15[-2]	1.31[-2]	1.15[-2]	2.23[-2]	1.92[-2]
34	8.48[-3]	7.69[-3]	1.07[-2]	1.23[-2]	1.09[-2]	2.11[-2]	1.82[-2]
35	7.75[-3]	7.26[-3]	9.86[-3]	1.16[-2]	1.04[-2]	2.07[-2]	1.74[-2]
36	7.13[-3]	6.84[-3]	9.13[-3]	1.10[-2]	1.01[-2]	1.96[-2]	1.68[-2]
37	6.53[-3]	6.44[-3]	8.42[-3]	1.04[-2]	9.94[-3]	1.82[-2]	1.67[-2]
38	5.95[-3]	6.06[-3]	7.75[-3]	9.81[-3]	1.00[-2]	1.67[-2]	1.81[-2]
39	5.45[-3]	5.74[-3]	7.13[-3]	9.26[-3]	1.08[-2]	1.52[-2]	2.41[-2]
40	4.98[-3]	5.40[-3]	6.56[-3]	8.76[-3]	1.20[-2]	1.37[-2]	3.78[-2]
41	4.60[-3]	5.08[-3]	6.04[-3]	8.25[-3]	1.32[-2]	1.24[-2]	5.30[-2]
42	4.23[-3]	4.78[-3]	5.53[-3]	7.82[-3]	1.44[-2]	1.11[-2]	6.36[-2]
43	3.90[-3]	4.49[-3]	5.07[-3]	7.36[-3]	1.52[-2]	9.88[-3]	6.84[-2]
44	3.59[-3]	4.22[-3]	4.67[-3]	6.94[-3]	1.54[-2]	8.83[-3]	6.85[-2]
45	3.31[-3]	3.97[-3]	4.26[-3]	6.54[-3]	1.49[-2]	7.85[-3]	6.61[-2]
46	3.06[-3]	3.72[-3]	3.90[-3]	6.13[-3]	1.44[-2]	7.06[-3]	6.23[-2]
47	2.81[-3]	3.47[-3]	3.56[-3]	5.75[-3]	1.36[-2]	6.35[-3]	5.78[-2]
48	2.59[-3]	3.24[-3]	3.25[-3]	5.42[-3]	1.28[-2]	5.75[-3]	5.30[-2]
49	2.37[-3]	3.04[-3]	2.94[-3]	5.04[-3]	1.21[-2]	5.19[-3]	4.83[-2]
50	2.17[-3]	2.84[-3]	2.68[-3]	4.72[-3]	1.14[-2]	4.69[-3]	4.39[-2]
51	1.99[-3]	2.65[-3]	2.43[-3]	4.35[-3]	1.08[-2]	4.26[-3]	3.96[-2]
52	1.82[-3]	2.46[-3]	2.21[-3]	4.05[-3]	1.02[-2]	3.84[-3]	3.57[-2]
53	1.65[-3]	2.28[-3]	2.00[-3]	3.72[-3]	9.68[-3]	3.48[-3]	3.22[-2]

Z	$3s3p(^1P)3d$		$3s3p(^1P)3d$		$3s3p(^1P)3d$		$3p^2(^3P)3p$
	$^2D_{3/2}$	$^2D_{5/2}$	$^2F_{5/2}$	$^2F_{7/2}$	$^2P_{1/2}$	$^2P_{3/2}$	$^4S_{3/2}$
54	1.51[-3]	2.12[-3]	1.80[-3]	3.44[-3]	9.19[-3]	3.15[-3]	2.88[-2]
55	1.37[-3]	1.97[-3]	1.63[-3]	3.18[-3]	8.70[-3]	2.85[-3]	2.57[-2]
56	1.24[-3]	1.82[-3]	1.47[-3]	2.89[-3]	8.24[-3]	2.58[-3]	2.30[-2]
57	1.12[-3]	1.67[-3]	1.32[-3]	2.62[-3]	7.82[-3]	2.33[-3]	2.03[-2]
58	1.01[-3]	1.54[-3]	1.19[-3]	2.40[-3]	7.42[-3]	2.10[-3]	1.80[-2]
59	9.16[-4]	1.42[-3]	1.07[-3]	2.19[-3]	7.03[-3]	1.90[-3]	1.60[-2]
60	8.13[-4]	1.30[-3]	9.67[-4]	1.99[-3]	6.58[-3]	1.71[-3]	1.40[-2]
61	7.45[-4]	1.20[-3]	8.73[-4]	1.78[-3]	6.32[-3]	1.54[-3]	1.24[-2]
62	6.70[-4]	1.10[-3]	8.12[-4]	1.61[-3]	6.00[-3]	1.39[-3]	1.09[-2]
63	5.98[-4]	1.00[-3]	8.48[-4]	1.45[-3]	5.69[-3]	1.25[-3]	9.57[-3]
64	5.39[-4]	9.15[-4]	1.20[-3]	1.30[-3]	5.39[-3]	1.12[-3]	8.35[-3]
65	4.83[-4]	8.36[-4]	1.61[-3]	1.16[-3]	5.11[-3]	1.01[-3]	7.31[-3]
66	4.35[-4]	7.61[-4]	1.80[-3]	1.04[-3]	4.85[-3]	9.05[-4]	6.39[-3]
67	3.87[-4]	6.93[-4]	1.83[-3]	9.34[-4]	4.61[-3]	8.08[-4]	5.57[-3]
68	3.47[-4]	6.29[-4]	1.78[-3]	8.37[-4]	4.37[-3]	7.24[-4]	4.88[-3]
69	3.10[-4]	5.70[-4]	1.71[-3]	7.46[-4]	4.15[-3]	6.52[-4]	4.24[-3]
70	2.77[-4]	5.18[-4]	1.62[-3]	6.68[-4]	3.93[-3]	5.82[-4]	3.71[-3]
71	2.48[-4]	4.68[-4]	1.52[-3]	5.94[-4]	3.73[-3]	5.23[-4]	3.26[-3]
72	2.21[-4]	4.25[-4]	1.42[-3]	5.31[-4]	3.55[-3]	4.70[-4]	2.86[-3]
73	1.98[-4]	3.84[-4]	1.32[-3]	4.74[-4]	3.37[-3]	4.20[-4]	2.52[-3]
74	1.94[-4]	3.56[-4]	1.23[-3]	4.20[-4]	3.24[-3]	3.77[-4]	2.23[-3]
75	4.43[-4]	3.76[-4]	1.14[-3]	3.76[-4]	3.35[-3]	3.41[-4]	1.98[-3]
76	3.62[-4]	3.36[-4]	1.06[-3]	3.33[-4]	3.18[-3]	3.05[-4]	1.77[-3]
77	3.35[-4]	3.00[-4]	9.77[-4]	2.97[-4]	3.03[-3]	2.73[-4]	1.58[-3]
78	1.91[-4]	2.69[-4]	9.01[-4]	2.65[-4]	2.88[-3]	2.44[-4]	1.43[-3]
79	1.72[-4]	2.39[-4]	8.30[-4]	2.37[-4]	2.72[-3]	2.18[-4]	1.30[-3]
80	1.55[-4]	2.14[-4]	7.64[-4]	2.10[-4]	2.60[-3]	1.95[-4]	1.17[-3]
81	1.39[-4]	1.90[-4]	7.01[-4]	1.87[-4]	2.47[-3]	1.74[-4]	1.08[-3]
82	1.24[-4]	1.70[-4]	6.44[-4]	1.66[-4]	2.35[-3]	1.55[-4]	9.88[-4]
83	1.11[-4]	1.52[-4]	5.90[-4]	1.48[-4]	2.23[-3]	1.39[-4]	9.16[-4]
84	9.99[-5]	1.36[-4]	6.84[-4]	1.38[-4]	2.13[-3]	1.24[-4]	8.55[-4]
85	8.92[-5]	1.21[-4]	6.22[-4]	1.22[-4]	2.03[-3]	1.11[-4]	7.97[-4]
86	7.99[-5]	1.08[-4]	5.66[-4]	1.09[-4]	1.93[-3]	9.94[-5]	7.46[-4]
87	7.19[-5]	9.64[-5]	5.13[-4]	9.68[-5]	1.84[-3]	8.89[-5]	7.06[-4]
88	6.40[-5]	8.62[-5]	4.64[-4]	8.59[-5]	1.75[-3]	7.90[-5]	6.70[-4]
89	5.74[-5]	7.68[-5]	4.22[-4]	7.60[-5]	1.67[-3]	7.10[-5]	6.46[-4]
90	5.15[-5]	6.88[-5]	3.82[-4]	6.77[-5]	1.60[-3]	6.29[-5]	6.20[-4]
91	4.63[-5]	6.11[-5]	3.45[-4]	5.99[-5]	1.52[-3]	5.65[-5]	6.00[-4]
92	4.15[-5]	5.47[-5]	3.12[-4]	5.35[-5]	1.45[-3]	5.05[-5]	5.80[-4]
93	3.70[-5]	4.88[-5]	2.83[-4]	4.76[-5]	1.38[-3]	4.52[-5]	5.72[-4]
94	3.31[-5]	4.36[-5]	2.55[-4]	4.25[-5]	1.32[-3]	4.02[-5]	5.61[-4]
95	2.97[-5]	3.90[-5]	2.30[-4]	3.77[-5]	1.26[-3]	3.60[-5]	5.60[-4]
96	2.66[-5]	3.47[-5]	2.08[-4]	3.35[-5]	1.20[-3]	3.23[-5]	5.55[-4]
97	2.37[-5]	3.10[-5]	1.89[-4]	2.98[-5]	1.15[-3]	2.89[-5]	5.60[-4]
98	2.13[-5]	2.78[-5]	1.69[-4]	2.67[-5]	1.10[-3]	2.58[-5]	5.65[-4]
99	1.90[-5]	2.48[-5]	1.53[-4]	2.37[-5]	1.05[-3]	2.31[-5]	5.73[-4]
100	1.71[-5]	2.21[-5]	1.38[-4]	2.11[-5]	1.00[-3]	2.07[-5]	5.82[-4]