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Correlation and relativistic effects for the $4d - nl$ multipole transitions in Pd-like ions R. BISTA, R. BRUCH, U.I. SAFRONOVA, University of Nevada, Reno, H. MERABET, Dhofar University — Wavelengths, transition rates, and line strengths are calculated for the 85 possible multipole (E1, M1, E2, M2, E3, M3) transitions between the excited $4p^6 4d^9 4f$, $4p^6 4d^9 5l$, $4p^5 4d^{10} 4f$, and $4p^5 3d^{10} 5l$ states and the ground $4p^6 4d^{10}$ state in Pd-like ions with the nuclear charges ranging from $Z = 47$ to 100. Relativistic many-body perturbation theory (RMBPT), including the Breit interaction, is used to evaluate energies and transition rates for multipole transitions in hole-particle systems. This method is based on the relativistic many-body perturbation theory, agrees with MCDF calculations in lowest-order, includes all second-order correlation corrections, and includes corrections from negative energy states. The calculations start from a [Zn]$4p^6 4d^{10}$ Dirac-Fock potential. First-order perturbation theory is used to obtain intermediate-coupling coefficients, and second-order RMBPT is used to determine the matrix elements. The contributions from negative-energy states are included into the second-order E1, M1, E2, M2, E3, and M3 matrix elements. The resulting transition energies and transition rates are compared with experimental values and with results from other recent calculations. The Z dependence of the energy splitting for all triplet terms of the $4p^6 4d^9 4f$ and $4p^6 4d^9 5l$ configurations are shown for $Z = 47$–100.

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