Relativistic configuration-interaction calculations for the $4s - 4p$ transition energies of zinclike heavy ions\(^1\) M. H. CHEN, K. T. CHENG, Lawrence Livermore National Laboratory, Livermore, CA 94550 — The $4s^2\,^1S_0 - 4s4p\,^{1,3}P_1$ transition energies for zinclike ions with $Z = 70, 76, 83, 90$ and $92$ are calculated using the relativistic configuration-interaction (RCI) method. These calculations are based on the no-pair Hamiltonian which includes both Coulomb and frequency-dependent retarded Breit interactions and use one-electron B-spline orbitals as basis functions. Our RCI configuration expansions include not only single and double excitations but also dominant triple and quadruple excitations for highly accurate correlation results, and Davidson’s method is used to solve these large eigenvalue problems for the first few eigenstates. Quantum electrodynamic and mass polarization corrections are also calculated. Our transition energy results are in very good agreement with recent high precision EBIT measurements by Träbert \textit{et al.} \cite{PhysRevA.70.032506}.

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