Abstract Submitted
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Relativistic many-body calculations of electric-dipole lifetimes, transition rates, and oscillator strengths for $2l^{-1}3l'$ states in Ne-like ions[1] U.I. SAFRONOVA, T.E. COWAN, University of Nevada, Reno, M.S. SAFRONOVA, University of Delaware — Transition rates, oscillator strengths, and line strengths are calculated for electric-dipole (E1) transitions between odd- parity $2s^22p^53s$, $2s^22p^53d$, and $2s2p^63p$ states and even- parity $2s^22p^53p$, $2s2p^63s$, and $2s2p^63d$ states in Ne-like ions With the nuclear charges ranging from $Z = 14$ to 100. Relativistic many-body perturbation theory (RMBPT), 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 RMBPT is used to obtain intermediate coupling coefficients and second-order RMBPT is used to calculate transition matrix elements. Contributions from negative-energy states are included in the second-order E1 matrix elements to ensure the gauge independence of transition amplitudes. Transition energies used in the calculation of oscillator strengths and transition rates are from second-order RMBPT. Lifetimes of the 16 even-parity and 18 odd-parity levels are given for $Z = 14$–100. These atomic data are important in modeling of L-shell radiation spectra of heavy ions generated in electron beam ion trap experiments and in L-shell diagnostics of plasmas.

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