Relativistic atomic data for Cu-like tungsten

U.I. SAFRONOVA, A.S. SAFRONOVA, University of Nevada, Reno, P. BEIERSDORFER, Lawrence Livermore National Lab. — Energy levels, radiative transition probabilities, and autoionization rates for [Ne]3s²3p⁶3d⁴4l'nl, [Ne]3s²3p⁵3d¹⁰4l'n'l(n=4-6), and [Ne]3s²3p⁶3d⁵5l'n'l(n=5-7) states in Cu-like tungsten (W⁴⁵⁺) are calculated using the relativistic many-body perturbation theory method (RMBPT code), the multiconfiguration relativistic Hebrew University Lawrence Livermore Atomic Code (HULLAC code), and the Hartree-Fock-relativistic method (COWAN code). Branching ratios relative to the first threshold and intensity factors are calculated for satellite lines, and dielectronic recombination (DR) rate coefficients are determined for the singly excited, as well as doubly excited non-autoionizing states in Cu-like W⁴⁵⁺ ion. Contributions from the autoionizing doubly excited states (with n up to 500), which are particularly important for calculating total DR rates, are estimated. Synthetic dielectronic satellite spectra from Cu-like W are simulated in a broad spectral range from 3 to 70 Å. These calculations provide highly accurate values for a number of W⁴⁵⁺ properties useful for a variety of applications including for fusion applications.

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