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Dielectronic recombination of Zn-like W^{44+} from Cu-like W^{45+1}
U.I. SAFRONOVA, A.S. SAFRONOVA, University of Nevada, Reno — Energy levels, radiative transition probabilities, and autoionization rates for [Ar]$3d^{10}4l'nl$ (n=4-12, $l \leq n-1$), [Ar]$3d^{10}5l'nl$ (n=5-8, $l \leq n-1$), and [Ar]$3d^{9}4l'4l''nl$ (n=4-5, $l \leq n-1$) states in Zn-like tungsten (W^{44+}) are calculated using the Hartree-Fock-Relativistic method (COWAN code), the Multiconfiguration relativistic Hebrew University Lawrence Atomic Code (HULLAC code), and the relativistic many-body perturbation theory method (RMBPT code). Autoionizing levels above the thresholds [Ar]$3d^{10}4s$ are considered. It is shown that the contribution of the highly excited states is very important for the calculation of total DR rates. Contributions to DR rate from the excited [Ar]$4l'nl$ states with $n \geq 13$ and [Ar]$4l'nl$ states with $n \geq 8$, and additionally from core-excited [Ar]$3d^{9}4l'4l''nl$ states with $n \geq 5$ are estimated by extrapolation of all atomic parameters. The total DR rate coefficient is derived as a function of electron temperature. Synthetic dielectronic satellite spectra from Zn-like W are simulated in a broad spectral range from 4 to to 140Å. These calculations provide highly accurate values for a number of W^{44+} properties useful for a variety of applications, including fusion and HEDP applications.

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U. I. Safronova
University of Nevada, Reno

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