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Ionization energies of W I-LXXIV and critical compilation of spectra and energy levels of Ga I-XXX ALEXANDER KRAMIDA, JOSEPH READER, National Institute of Standards and Technology — Both tungsten and gallium are important materials for fusion energy research. In this work, a semi-empirical method is used to determine ionization energies (IE) of multiply charged W ions [A.E. Kramida, J. Reader, *Ionization Energies of Tungsten Ions: W^{2+} through W^{71+}*, At. Data Nucl. Data Tables, 2006, in press]. The method is based on Hartree-Fock calculations of electron binding energies with empirical scale factors. Relative uncertainties vary from 1.7 % for W IIIto 0.015 % for W LXXII. Combined with previously known experimental or theoretical IE values for W I-II and LXXIII-LXXIV, these new semiempirical results allow us to build a complete table of IEs of tungsten in all stages of ionization. For gallium, all available experimental data on wavelengths and energy levels are critically compiled and evaluated [T. Shirai, J. Reader, A.E. Kramida, J. Sugar, *Spectral Data for Gallium: Ga I through Ga XXXI*, J. Phys. Chem. Ref. Data, 2006, in press]. Such data exist for spectra Ga I-VII, XIII-XXVI, and XXX. For Li-like Ga XXIX through H-like Ga XXXI, theoretical data on energy levels and line wavelengths are compiled. For Ga I-III, XV-XX, XXIII-XXVI, and XXX, radiative transition probabilities are included where available. The ground state configuration and term and a value of IE are included for each ion. This work was supported in part by the Office of Fusion Energy Sciences of the U. S. Department of Energy.

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