

Abstract Submitted  
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**Electron impact multiple ionization cross sections of heavy ions**  
JIAOLONG ZENG, PENGFEI LIU, JIAYU DAI, JIANMIN YUAN, National University of Defense Technology — Cross sections of electron impact ionization are important in modeling both astrophysical and laboratory plasmas. For heavy ions, accurate determination of this microscopic physical quantity is difficult due to the complex atomic structure. At high incident electron energy, inner-shell excitation and ionization processes can occur, which will result in complicated decay including Auger and radiative decay processes. For deep inner-shell excitation and ionization, cascaded Auger processes are very likely. Under conditions of collisional ionization equilibrium, the balance of electron-ion recombination and electron impact single ionization determines the charge state distribution (CSD). Accurate CSD, which in turn determined by accurate cross sections, is very important in a wide regime of spectroscopic diagnostics to infer the physical conditions of plasmas such as the electron temperature, electron density, and elemental abundance. As an illustrative example, the cross sections from the ground configuration of  $\text{Sn}^{13+}$  in forming  $\text{Sn}^{13+}$ ,  $-\text{Sn}^{16+}$  are reported in detail. The contributions from the electron impact excitation, electron impact ionization and resonant excitation processes are included.

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