

Abstract Submitted
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Ionization of silicon, germanium, tin, and lead by electron impact PHILIP STONE, YONG-KI KIM, NIST, Gaithersburg, MD — We continue our investigation of electron impact ionization of neutral atoms that are important in modeling of low temperature plasmas and gases. Cross sections for ionization have been calculated for ionization from ground levels and low-lying metastable levels of Si, Ge, Sn and Pb. We use the binary-encounter-Bethe approximation (BEB) for direct ionization and scaled plane-wave-Born approximation for dipole- and spin-allowed transitions to autoionizing levels.^{1,2} Multiconfiguration Dirac-Fock wavefunctions have been used for the atomic structure. The calculated values are in agreement with the few experimental results available for comparison. It is clear that autoionization is important in these elements and must be included accurately. These results complement earlier calculations of H, He, Li, B, C, N, O, Al, Ga, and In. The results for these atoms, along with ionization cross sections for many molecules are being made available on a NIST web site.³

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¹ Kim Y-K and Desclaux JP, Phys. Rev. A 2002; **66**; 012708.

² Kim Y-K and Stone PM, Phys. Rev. A 2001; **64**; 052707.

³ <http://physics.nist.gov/ionxsec><http://physics.nist.gov/ionxsec> (2005).

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