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The viscosity cross section for electron scattering from the heavy noble gases ALLAN STAUFFER, York University, ROBERT MCEACHRAN, Australian National University — The viscosity cross section is defined in terms of the elastic differential cross section $\sigma(\theta)$ as

$$\sigma_v = \int_0^\pi (1 - \cos^2\theta)\, \sin\theta\, \sigma(\theta)\, \mathrm{d}\theta$$

and appears in the Boltzmann equation for the electron distribution function in velocity space. If this distribution function is expanded in Legendre polynomials, the viscosity cross section arises from the third term. Normally, only the first two terms in this expansion are retained in the solution of the Boltzmann equation. We have recently published results for the elastic and momentum transfer cross section for electron scattering from the heavy noble gases (argon, krypton and xenon) using our complex, relativistic optical potential method which includes the effect of excitation and ionization channels on the elastic cross sections. We also provided simple analytic fits to these cross sections to aid in plasma modelling calculations. We will present similar results for the viscosity cross sections for these gases including fits using similar analytic functions. By including the third term in the expansion of the Boltzmann equation which depends on this cross section, an evaluation of the accuracy of the two-term solution can be made.

Allan Stauffer
York University

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