

Electron Impact Ionization of Ionic Targets*)

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The electron impact ionization cross sections (EIICS) are of fundamental importance not only in basic researches but also for wide applications such as fusion plasmas in tokomaks, modeling of radiation effects in material and medical sciences, semi conductor etching and also in astro-physics. Unfortunately neither experimental measurements nor sophisticated calculations can fulfill such a huge demand of the EIICS for many targets at different energies.

The simple analytical models, however, can overcome this short coming rather

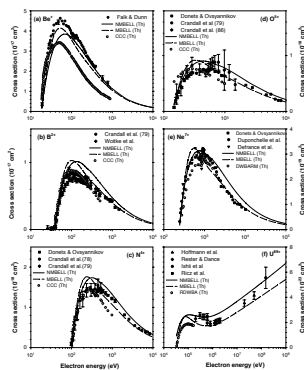


Fig. 1: Total EIICS for the Li-like ions: (a) Be⁺, (b) O²⁺, (c) B⁺, (d) Ne⁺, (e) N⁺ and (f) U¹¹⁺ with ionization in the 1s and 2s shells.

Fig. 1: Total EIICS for Li-like ions. Solid and broken lines are NMBELL and MBELL.

easily. We report such a simple-to-use model that provides sufficiently accurate EIICS over wide domains in both energies and targets. We modified the empirical model of Bell [1] with species dependent parameters and included both ionic and relativistic ingredients enables it easy extension to high projectile velocity regime [2]. In addition, we include the quantum mechanical form of orbital radius of the ionized shell and a non-linear feature that requires a fewer parameters.

Detail results will be presented at the conference.

[1] K. L. Bell, H. B. Gilbody, J. G. Kingston, A. E. Smith, J. Phys. Chem Ref Data **12**, 891 (1983).

[2] A. K. F. Haque, M. A. Uddin, A. K. Basak, K. R. Karim, B. C. Saha and F. B. Malik, Phys. Scr 74, 377 (2006); Phys. Rev A **73**, 052703 (2006); Phys. Lett A **354**, 449 (2006).

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