

K-shell Ionization of Neutral Targets by Electron Impact

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Reliable K-shell ionization cross sections play a decisive role for quantitative analyses using (i) electron probe microanalysis, (ii) Auger electron spectroscopy and (iii) electron energy loss spectra. In recent years there are considerable attentions both theoretically and experimentally on this problem. Attempts are still continuing to search for a model that can generate reliable cross sections for a wide range of energies and for various targets. We modify the binary encounter approximation (BEA) [1,2] for ionization by incorporating the ionic and relativistic corrections [3,4] and have tested by evaluating the electron impact K-shell ionization cross sections, which are shown in Fig. 1

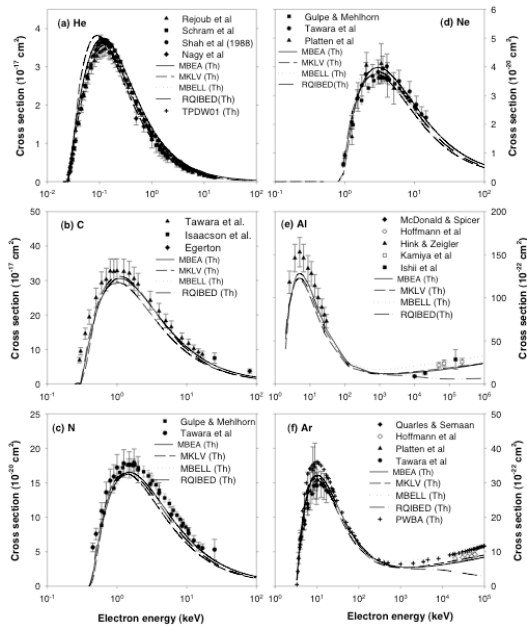


Fig. 1. ERCS for the K-shell ionization for (a) He, (b) C, (c) N, (d) Ne, (e) Al and (f) Ar. The sources of experimental data are given in the text.

[1] M. Gryzinski, Phys. Rev. A **138**, 336 (1965); [2] L. Vriens, Proc. Phys. Soc. (London) **89**, 13, (1966). [3] M. A. Uddin, A. K. F. Haque, M. M. Billah, A. K. Basak, K. R. Karim and B. C. Saha, Phys. Rev. A **71**, 032715 (2005); [4] M. A. Uddin, A. K. Basak, and B. C. Saha, Int. J. Quan. Chem **100**, 184 (2004).]

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