

Total and partial cross sections for electron scattering on atoms and molecules

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Total and partial cross sections for electron scattering on atoms and molecules will be presented in a possibly wide (0.001 – 1000 eV) energy range. Total scattering and elastic cross sections are based mainly on experimental data, corrected whenever some systematical errors related to a specific technique used are suspected. Ionization total and partial cross sections are based on experiments; ionization total are further checked against Born-Bethe binary-encounter model [1]. Data for electronic excitation are poor: experiments may suffer from incorrect attribution of states and from normalization errors: the case of H₂O and N₂O will be discussed. For CH₄ the theory (R-matrix) will be shown. Vibrational excitation have little direct experiments but one can deduce cross sections from Born approximation and (in resonances) from differences between total and elastic. Rotational will be based on R-matrix calculations. Comprehensive sets of data will be shown [2].

[1] G.P. Karwasz, P. Możejko, Mi-Young Song, “Electron-impact ionization of fluoromethanes – review of experiments and binary-encounter models”, *Int. J. Mass Spectrom.*, 365/366 (2014) 232-237.

[2] M-Y. Song, J. Yoon, H. Cho, G. Karwasz, V. Kokoouline, Y. Nakamura, J. R. Hamilton, and J. Tennyson, “Cross Sections for Electron Collisions with NF₃”, *Journal of Physical and Chemical Reference Data* 46 (2017) 043104.