Conference Sponsored by the European Physical Society

Third Conference on the Elementary Processes in Atomic Systems

31 Aug. - 2 Sept. 2005
University of Miskolc, Hungary

Book of Abstracts

ELECTRON COLLISIONS BY METAL ATOM VAPOURS

B. P. Marinković,[1*] D. M. Filipović,[1,2] V. Pejčev,[1,3] D. Šević,[1] S. Milisavljević,[1] B. Predojević[1,4] and M. Parđovska[1]

[1] Institute of Physics, P. O. Box 68, 11080 Belgrade, Serbia, Serbia and Montenegro
[2] Faculty of Physics, University of Belgrade, P. O. Box 368, 11001 Belgrade, Serbia, Serbia and Montenegro
[3] Faculty of Natural Science, University of Kragujevac, Serbia and Montenegro
[4] Faculty of Natural Sciences, University of Banja Luka, Republic of Srpska, Bosnia and Herzegovina

A systematic study of low and medium energy electron interactions with metal atom vapours has been performed exploiting crossed beam technique. A monochromatic electron beam of energies from 10 to 100 eV has been elastically and inelastically scattered by effusive beam of metal vapours of II A (Mg and Ca) [1] and II B (Zn, Cd, Hg) [2] group atoms as well as other metal atoms such as Yb [3] and Pb. Differential cross sections (DCS) were put on absolute scale by normalization trough optical oscillator strengths of the resonant transitions. After obtaining the transmission of the electron spectrometer, relative intensities between resonant transition and other features in energy loss spectra were determined for each impact energy. DCS were obtained in the angular range from 0° for the excitations and 10° for elastic scattering to 150° with the angular resolution of typically 1.5°. DCSs were extrapolated to 0° and 180° and numerically integrated to yield integral, momentum transfer and viscosity cross sections. Results are compared with available calculated values and other experimental data. Experimental DCS data serve as a stringent test for different theoretical approaches that intend to reproduce angular distribution curve in the whole domain of scattering angles and a wide range of energies.

References

[1] S Milisavljević, D Šević, R K Chauhan, V Pejčev, D M Filipović, R Srivastava and B P Marinković, *J. Phys. B: At. Mol. Opt. Phys.* **38** (2005) 2371; S Milisavljevic, D Sevic, V Pejcev, D M Filipovic and B P Marinkovic, *J. Phys. B: At. Mol. Opt. Phys.* **37** (2004) 3571.
[2] D. V. Fursa, I. Bray, and R. Panajotović, D. Šević, V. Pejčev, D. M. Filipović and B. P. Marinković, *Phys. Rev. A* **72** (2005) accepted.
[3] B Predojević, D Šević, V Pejčev, B P Marinković and D M Filipović, *J. Phys. B: At. Mol. Opt. Phys.* **38** (2005) 1329.

* e-mail: bratislav.marinkovic@phy.bg.ac.yu