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Book of Abstracts

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Electron Impact Excitation of the Bismuth Resonance Line

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Electron scattering by bismuth atom has been of recent interest regarding the excitation of autoionising states [1] and the presence of Bi lines in so called CP (chemically peculiar) stars [2].

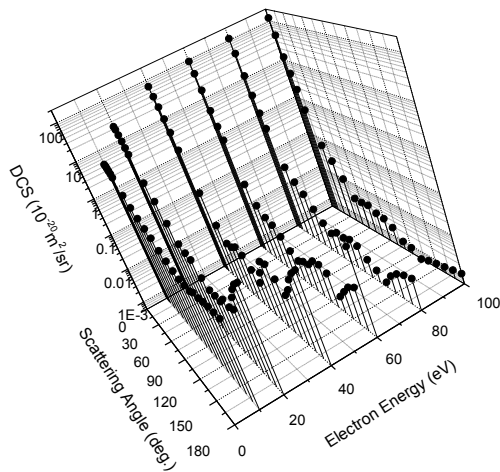


Figure 1. Differential cross sections of electron impact excitation of the $6p^2 7s \ ^4P_{1/2}$ state of bismuth in units of $10^{-20} \text{ m}^2/\text{sr}$ at incident electron energies of 10, 20, 40, 60, 80 and 100 eV and scattering angles from 2° to 150° . Data points out of this range are extrapolated values.

We have performed the measurements of differential cross sections (DCS) for the excitation of the $6p^2 7s \ ^4P_{1/2}$ state of bismuth using the electron spectrometer ESMA [1]. Effusive beam of bismuth atom was perpendicularly crossed by monochromatic electron beam and the yield of scattered electrons was determined. Before each measurement the energy loss spectrum was obtained in order to check for the presence of dimmers (Bi_2). After applying the effective length correction factor, relative DCS were put on the absolute scale by normalization to the optical oscillator strength of 0.146 of the resonance bismuth transition. By extrapolating DCS in the angular range toward zero and 180° angles, the integral, momentum transfer and viscosity cross sections have been determined.

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[1] B. P. Marinković, D. M. Filipović, V. Pejčev, D. Šević *J. Mass. Spectrom.* **271** (2008) 76-79.

[2] B. Predojević, V. Pejčev, D. Šević, B. P. Marinković *J. Phys.: Conf. Ser.* **565** (2014) 012016.