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XVI SUMMER SCHOOL and INTERNATIONAL SYMPOSIUM on the PHYSICS OF IONIZED GASES

September 25 -28, 1993. Belgrade, Yugoslavia

CONTRIBUTED PAPERS

& ABSTRACTS OF INVITED LECTURES AND PROGRESS REPORTS

edited by
M. Milosavljević

Institute of Nuclear Sciences "Vinča"
Belgrade, Yugoslavia

Institute "Braća Karić"
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II

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MINIMA IN DIFFERENTIAL CROSS SECTIONS FOR ELECTRON SCATTERING BY IIb GROUP ATOMS

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Electron-atom collision processes are the subject of our investigations for more than a decade. We measured differential cross sections (DCS) for elastic and inelastic scattering (including resonances) of electrons by atoms of rare gases and alkali metals . The latest work has been done with atoms of the elements of the IIb group (Cadmium[1] and Mercury[2]) with two outer shell electrons . We concetrated our attention on fenomena of the fine structure, significant for the IIb group atoms, and on the improuvement of the apparatus.

In comparing DCS for the elastic scattering and also for the excitation of the n^1S_o states of Cd and Hg, one can find the resemblance in the shape (Fig.1). The positions of the first minima of inelastic DCS (7^1S_o of Hg and 6^1S_o of Cd) are the same. It will be interesting to compare these with the DCS for the excitation of 5^1S_o state of Zn (also in IIb group) which will be the next target in our experiment.

To obtain more information from electron-atom scattering, we intend to do the polarization analysis of atomic line radiation. The most convinient for this are the DCS minima of sufficient intensity (previously mentioned as the first minima), because at their positions the polarization changes drastically. We are interested in resonances (Fig.2) due to the same reason. Results of the first simple test will be shawn.

With respect to design of our experiment, breafly described earlier[1], the automatization of the data aquisition and the computer control of the oven power supply are the

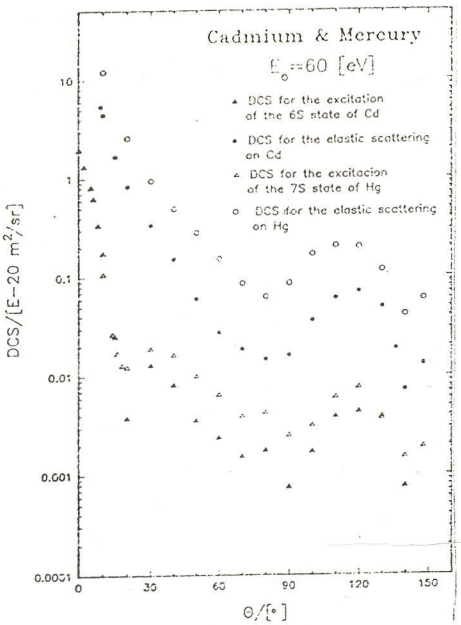

Fig.1. Elastic and inelastic DCS for Cd and Hg

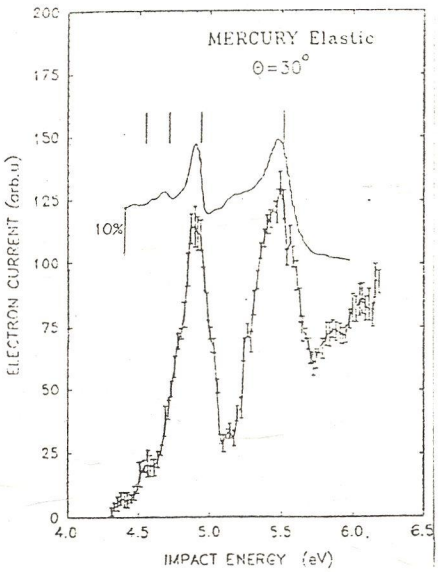

Fig.2. Resonances in Hg --, Albert[3]; I, Panajotović

main improvements. We also included the automatic change of the position of the electron analyzing system by mounting one stepping-motor, in order to determine the scattering angle faster and more precisely.

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