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ELECTRON SCATTERING BY N_2O^*

L.Vušković, Cz.Szmytkowski**, V.Pejčev, B.Marinković
and D.Filipović

Institute of Physics, P.O.Box 57, 11001 Beograd,
Yugoslavia

Experiment have been carried out in crossed molecular-beam electron-beam arrangement at electron impact energies of 10,12,15,20,30,50 and 80 eV. We measured angular distribution of intensity of elastically scattered electrons as well as scattered electrons at the most prominent inelastic features⁽¹⁾ 1Π and $2^1\Sigma^+$ (8.5 and 9.6 eV energy loss, respectively). The data were taken between 0° and 150° scattering angles.

The intensity distributions corrected for effective path length were extrapolated to 0° and 180° in order to obtain integral and momentum transfer cross sections. Integral cross sections for elastic scattering were subsequently put on the absolute scale by using total cross sections measurement⁽²⁾ with subtraction of ionization cross section⁽³⁾. We assume that contribution of integral excitation cross section is negligible.

Finally, results are presented in absolute units for differential, integral and momentum transfer cross sections for elastic and inelastic scattering at 80 eV. For inelastic

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** Permanent address: Institute of Physics, Technical University of Gdańsk, Poland.

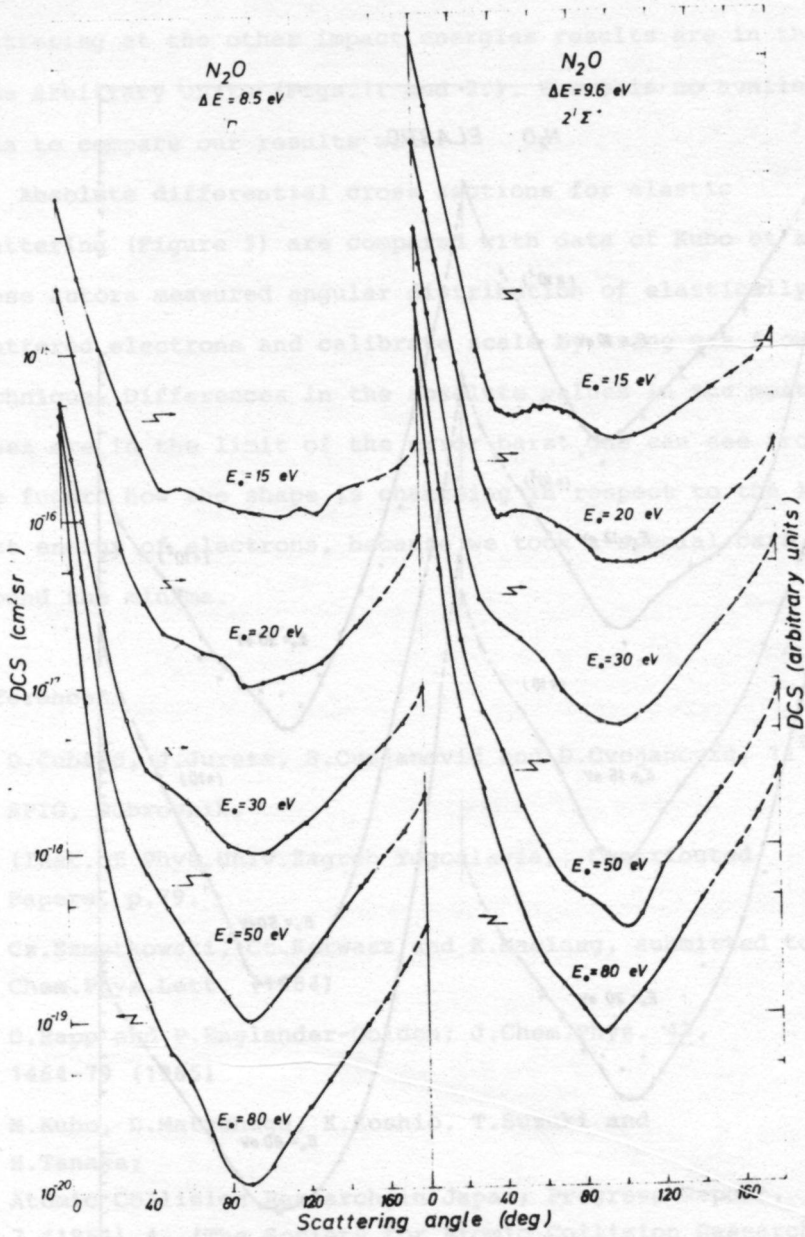


Fig.1

Fig.2

Fig.1 Differential cross sections for the π , 8.5 eV energy loss feature

Fig.2 Differential cross sections for the $2^1\Sigma^+$, 9.6 eV energy loss feature

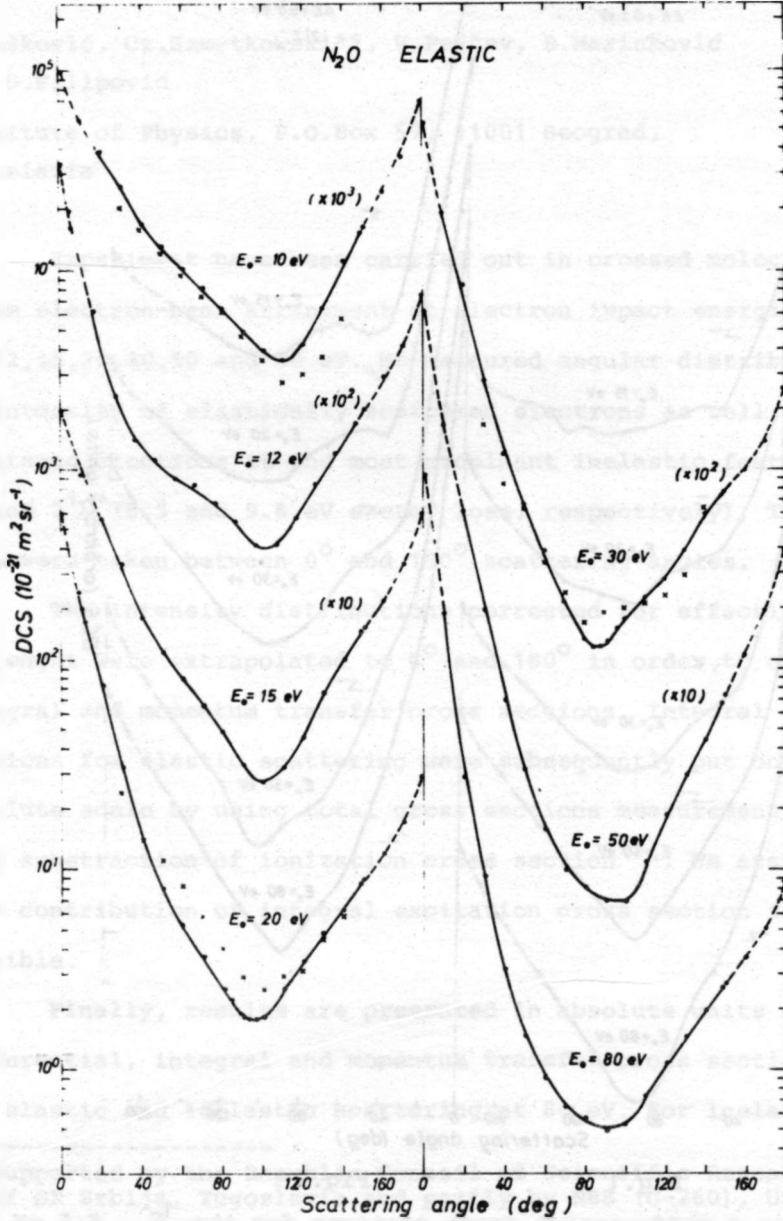


Fig.3 Elastic differential cross sections
 o—o present data, x Kubo et al. (Ref.4)

scattering at the other impact energies results are in the same arbitrary units (Figs.1. and 2.). There is no available data to compare our results with.

Absolute differential cross sections for elastic scattering (Figure 3) are compared with data of Kubo et al⁽⁴⁾. These authors measured angular distribution of elastically scattered electrons and calibrate scale by using gas flow technique. Differences in the absolute values in the most cases are in the limit of the error-bars. One can see from the figure how the shape is changing in respect to the impact energy of electrons, because we took a special care around the minima.

References:

- 1) D.Čubrić, J.Jureta, S.Cvejanović and D.Cvejanović, 11th SPIG, Dubrovnik, (Inst.of Phys.Univ.Zagreb Yugoslavia), Contributed Papers, p.79.
- 2) Cz.Szmytkowski, Ct.Karwasz and K.Maciaeg, submitted to Chem.Phys.Lett. (1984)
- 3) D.Rapp and P.Englander-Golden; J.Chem.Phys. 43, 1464-79 (1965)
- 4) M.Kubo, D.Matsunaga, K.Koshio, T.Suzuki and H.Tanaka; Atomic Collision Research in Japan; Progress Report, 7 (1981) 4. (The Society for Atomic Collision Research).