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DIFFERENTIAL CROSS SECTIONS FOR ELASTIC AND INELASTIC SCATTERING OF INTERMEDIATE ENERGY ELECTRONS BY KRYPTON ATOMS

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Electron spectrometer, briefly described earlier[1], has been used for electron-krypton atom DCS (differential cross section) measurements. Energy resolution was approximately 40 meV and acceptance angle of the analyzer approximately 10^{-3} sr.

Elastic scattering of electrons has been measured at 20, 30, 40, 50 and 80 eV impact energies and up to 150^{o} scattering angle. Data were normalized with respect to elastic DCS-s obtained by Srivastava et al.[2]. Satisfactory agreement in shape exsists between these two measurements at all impact energies. The DCS-s for 20 eV impact energy are shown in Fig. 1. Tipical energy-loss spectrum is shown in Fig.2. Corespondence of feature numbers used in this work with krypton spectral line designations is explained in Table 1. Relative DCS-s for all numbered features have been measured for 20, 30 and 50 eV impact energies.

Our aim is to obtaine, in a separate series of experiments, elastic-to-inelastic intensity ratios for the referent $5s[3/2]_1$ state for the energies mentioned above. On the basis of those ratios referent inelastic DCS-s will be put on the absolute

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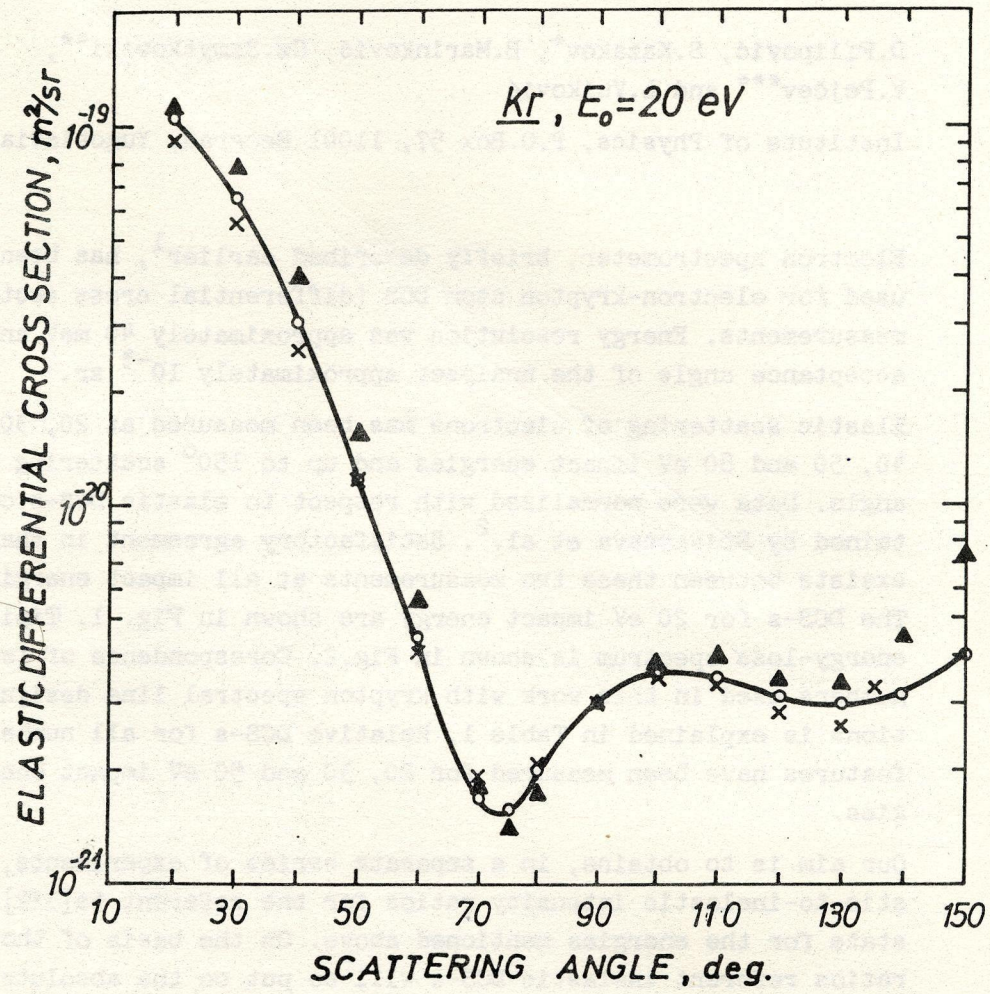

Fig. 1 Elastic differential cross sections

X Srivastava et al.

▲ Williams and Crowe[3]

—o—Present results

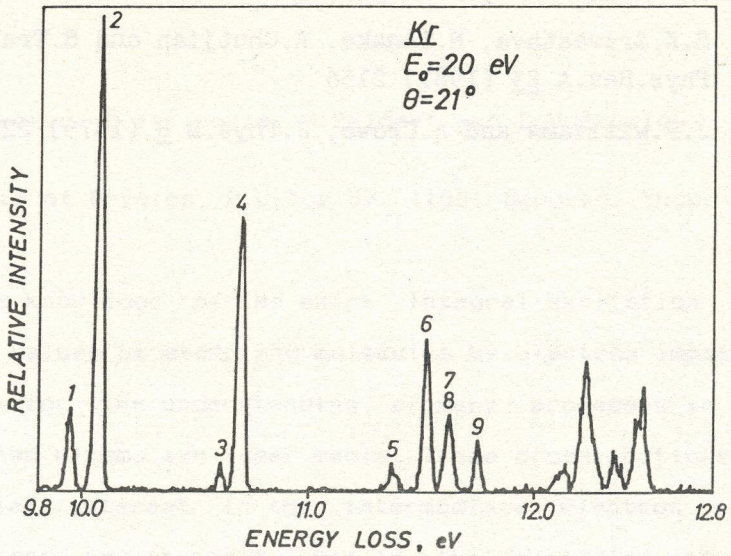

Fig.2

Table 1. Designation of the states of krypton and their energies

FEATURE No.	DESIGNATION	ENERGY, eV	FEATURE No.	DESIGNATION	ENERGY, eV
Ground	$4p^6\ ^1S$	0.0	6	$5p\,[5/2]_3$	11.443
1	$5s\,[3/2]_2$	9.915		$5p\,[5/2]_2$	11.445
2	$5s\,[3/2]_1$	10.033	7	$5p\,[3/2]_1$	11.526
3	$5s'\,[1/2]_0$	10.563	8	$5p\,[3/2]_2$	11.546
4	$5s'\,[1/2]_1$	10.644	9	$5p\,[1/2]_0$	11.666
5	$5p\,[1/2]_1$	11.304			

scale. Inelastic DCS-s for the other features will be obtained by energy-loss spectra analysis.

1. B.Marinković, Cz.Szmytkowski, V.Pejčev, D.Filipović and L.Vušković, (accepted in J.Phys.B)
2. S.K.Srivastava, H.Tanaka, A.Chutjian and S.Trajmar, Phys.Rev.A 23 (1981) 2156
3. J.F.Williams and A.Crowe, J.Phys.B 8 (1975) 2233