

Improved techniques of measuring accurate electron - molecule cross sections near threshold and over the entire angular range

Michael Allan

Department of Chemistry, University of Fribourg, Fribourg, Switzerland

Michael.Allan@unifr.ch

Domain : Low Energy Electron Molecule Interactions

Elastic and vibrational excitation cross sections were measured in N₂ at energies at and below the ²Π_g resonance region, and over a large angular range using the Magnetic Angle Changer (MAC) with particular attention to the determination of the instrumental response both as a function of energy and as a function of scattering angle [1]. In the intermediate angular range, about 40° – 130°, the new results agree well with many published cross sections, but larger discrepancies are found at angles below and above this range. The new results agree very well with the calculations of Morrison and coworkers [2,3] and of Telega and Gianturco [4,5]. The method was also applied to near threshold electronic excitation of neon [6] and (at a fixed scattering angle) of argon and xenon [7], where a very good agreement with the Breit-Pauli *B*-spline *R*-matrix calculation was obtained [6,7]. Fixed angle measurements were then performed for formic acid [8] and its dimer. The most remarkable finding here was a very strong ‘unspecific’ vibrational excitation in the dimer.

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