

Bethe surface, elastic and inelastic differential cross sections for CF₃CHClBr obtained by electron scattering with 1 keV incident electrons

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Sinopse. Electron impact spectra for halothane (CF₃CHClBr) have been obtained at scattering angles of 2°, 2.5°, 3.5°, 4°, 5°, 6°, 8° and 10° using 1 keV incident electrons. The measured intensities were converted to an absolute scale at each scattering angle. Absolute electron-impact differential cross sections for elastic scattering is shown over the range 2 degrees to 25 degrees.

Halothane (CF₃CHClBr), is a substituted ethane molecule, containing chlorine and bromine and three fluorine atoms. The fluoroethanes compounds containing chlorine have U.V. absorption spectra very similar to the fluoro-chloro-methanes. On the other hand, the presence of chlorine, bromine or iodine atoms in a molecule cause changes in the spectra due to the fact that the ionization potentials depart from a lone pair orbital.

Electron impact spectra for CF₃CHClBr have been obtained at scattering angles of 2°, 2.5°, 3.5°, 4°, 5°, 6°, 8° and 10° using 1 keV incident electrons, to the valence excitation spectrum determined up to 100 eV energy range. These relative intensities of the generalized oscillator strength was measured using an intermediate energy, variable-angle, low-resolution electron energy loss (EEL) spectrometer.[1]

The measured intensities were converted to generalized oscillator strengths and placed on an absolute scale at each scattering angle by the use of the sum rule. The methodology in the determination of the optical oscillator strengths distribution from the electron energy loss spectrum (EEL) has been previously described by references [2,3]. Briefly, to convert the 2° EEL spectrum (4-100 eV) into relative differential generalized oscillator strength, each data point was extrapolated to the momentum transfer is negligible, according to the universal formula introduced by Msezane and Sakmar [p.e., see ref. 4].

In addition, the differential cross sections of electrons elastically scattered was measured. The absolute electron-impact differential cross sections was determined using additional data

from another source [5] and is shown in Figure 1.

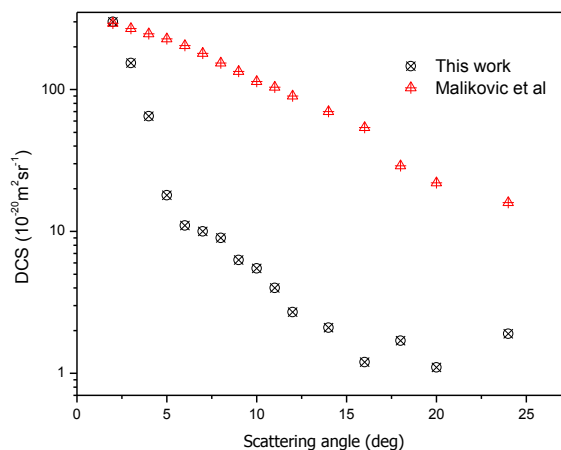


Figure 1. Absolute electron-impact differential cross sections for the elastic scattering of halothane molecule.

The authors would like to acknowledge the CNPq, FAPERJ and IFRJ-Prociência for financial support.

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