

Excitation of CO by Electron Impact

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The BE*f* scaling [1]—which converts plane-wave Born (PWB) cross sections for electron-impact excitations of atoms to accurate results at low incident electron energy T —also provides reliable vibrational excitation cross sections for the $A^1\Pi v' = 0-7 \leftarrow X^1\Sigma^+ v'' = 0$ transitions of CO in excellent agreement with experimental cross sections at $T = 50-200$ eV obtained by integrating energy-loss angular distributions measured at the Sophia Univ. and the Flinders Univ. The generalized oscillator strength calculated by Chantranupong et al. [2] was used to generate PWB cross sections. The scaled Born cross sections are also in excellent agreement at $T = 300-1500$ eV with the experimental results available in the literature [3,4].

Preliminary data on the application of the BE*f* scaling to H₂ and H₂O indicate that the scaling method is applicable to a wide range of molecules. The theoretical method is valid only for integrated cross sections of electric-dipole and spin allowed excitations.

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