

Total Cross Sections for Electron Scattering on Polyatomic Molecules ( $\text{CH}_4$ ,  $\text{CO}_2$ ,  $\text{NO}_2$ , and  $\text{N}_2\text{O}$ ) at 10~3000 eV

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**Abstract:** A new modified formulation of the Additivity Rule (AR) was proposed to calculate the total electron scattering cross sections for  $\text{CH}_4$ ,  $\text{CO}_2$ ,  $\text{NO}_2$ , and  $\text{N}_2\text{O}$ , considering the overlapping between atoms in molecules and the not fully transparency of the molecules. The present calculation covers the range of impact energy from 10 to 3000 eV. The results are compared with experimental data and other theories where available. The atoms are presented by spherical complex optical potential, which is composed of static, exchange, polarization, and absorption terms.

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Key words: total cross section, additivity rule, optical potential model

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