

Calculations of Total and Differential Cross-Section of Scattering of Electron from Target Like Metastable Atom-A Theoretical Survey

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ABSTRACT:

Scattering cross sections may be defined in nuclear, atomic and particle physics for collisions of one type of particle with targets; either stationary or moving. The probability for any given reaction to occur is in proportion to its cross section. Thus to find the cross section for a given reaction is a proxy for stating the probability that a given scattering process will occur. The total ($\sigma_{\text{tot.}}$) and differential ($d\sigma$) cross sections are among the most important measurable quantities and it can reveal a great amount of information about the internal structure of target particle. Differential cross section ($d\sigma$) in inelastic scattering contain resonance peaks that indicate the creation of metastable state and contain information about their energy and lifetime. The given study provides the calculations of total and differential cross-section of scattering of electron(intermediate energy) from target like metastable atom e.g. He and the study of electron density distribution of it.

Keywords: Total cross section ($\sigma_{\text{tot.}}$), differential cross section ($d\sigma$), metastable atom, electron density distribution