

TOTAL REACTIONS CROSS SECTIONS MEASURING METHODS

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Properties of nuclear sizes, such as material and charge root-mean-square radii and density distributions of nuclear matter, provide us with basic information for understanding the structure of the nucleus [1, 2]. One of the experimental approaches to extracting these parameters, particularly for radioactive nuclei, is based on measuring the total reaction cross sections σ_R and their energy dependencies $\sigma_R(E)$ [3-5]. The σ_R measurement provides us with an objective and model-independent test for various theoretical models.

Currently, the development of methods for measuring σ_R is especially important due to the low intensities of beams of exotic nuclei located at the boundary of nucleon stability [5].

The paper provides an overview of methods for measuring total reaction cross sections, provides a systematic description of the methods, and outlines the main directions of their development. Particular attention is paid to the analysis of 4π methods for measuring the total cross sections of reactions with radioactive nuclei in the energy range 5–50 MeV/nucleon [6,7].

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Section

Applications of nuclear methods in science, technology, medicine and radioecology

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