

STUDY OF ELASTIC SCATTERING OF PROTONS FROM ^{14}N NUCLEI AT ENERGIES NEAR THE COULOMB BARRIER.

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The purpose of this study is experimental and theoretical study of the elastic scattering of protons from ^{14}N nuclei at energies close to the Coulomb barrier.

Experiments were carried out on a linear accelerator UKP-2-1 at INP (Almaty). The accelerated protons energies were 700-1100 keV. Measurements of the differential scattering cross sections were made in the angular range of 20° - 170° in laboratory system. The particles were detected by silicon detectors with sensitive layer 200 microns thick. The employed targets were thin films made of titanium nitride with thickness of $60\text{-}70 \mu\text{g}/\text{cm}^2$. Thicknesses of targets were defined with a accuracy within 5%. In general, the absolute error of the data does not exceed 10%. As an example, the cross sections for elastic scattering of protons from ^{14}N nuclei at energies 990 and 1100 keV are shown on figure 1.

The experimental data were analyzed within the framework of standard phenomenological optical model and semi-microscopic folding model.

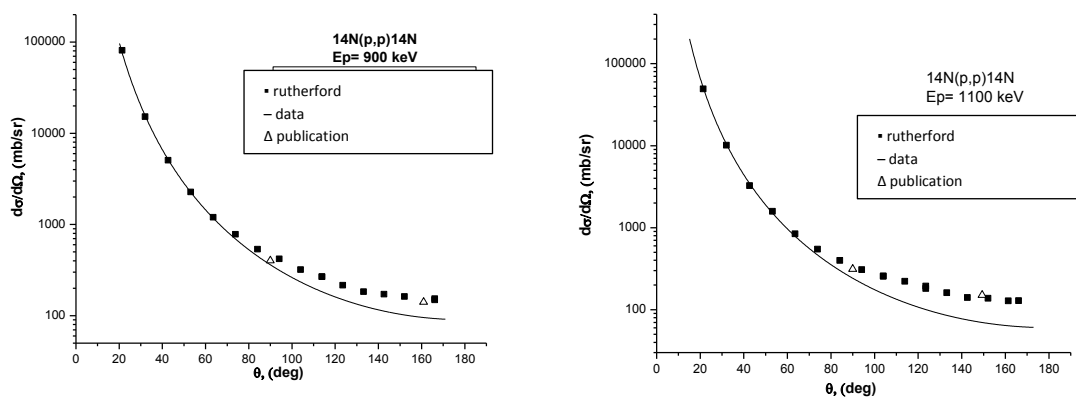


Figure 1. Differential cross sections for elastic scattering of protons by nitrogen nuclei ($E_p = 990$ keV and 1100 keV)