

## STUDY OF THE ELASTIC SCATTERING PROCESS OF $^{14}\text{N}$ IONS WITH $^{16}\text{O}$ NUCLEI IN A WIDE INTERVAL ENERGY

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The mechanisms for the formation of cross sections for elastic scattering of heavy ions on light nuclei remain controversial and require more detailed studies. In the differential cross sections of earlier papers [1], weak oscillations are observed in the region of small and medium angles, while in the backscattering angles they manifest themselves quite sharply, and with increasing energy of the incident ion, the oscillations increase. A noticeable increase in cross sections in the region of large angles is also observed. Such a behavior of the angular distributions of elastic scattering of heavy ions is difficult to theoretical description within the framework of the standard optical model. It follows from this that, in addition to the purely potential interaction, other mechanisms that must be taken into account in theoretical analysis contribute to the formation of elastic scattering cross sections in these processes. In particular, it is necessary to take into account the cluster structure of the studied nuclei and the mechanisms of cluster transfer.

At the DC-60 accelerator of the Institute of Nuclear Physics (Nur-Sultan, Kazakhstan), differential cross sections of elastic scattering of  $^{14}\text{N}$  ions on  $^{16}\text{O}$  nuclei were measured at energies of 1.5 and 1.75 MeV/nucleon in the range of angles  $30^\circ$ – $165^\circ$  in the center of mass system [1].

The analysis of angular distributions at energies of 21–76.2 MeV was carried out in the framework of the optical model and the distorted wave Born approximation (DWBA) methods using the FRESKO program. It should also be noted that we introduced two additional potentials in a phenomenological way, exploring the sensitivity of scattering to the optical potential. In the framework of the DWBA, elastic scattering was analyzed taking into account the contribution of the cluster transfer mechanism, which showed that for  $^{16}\text{O}(^{14}\text{N}, ^{16}\text{O})^{14}\text{N}$  processes in the region of large angles, the influence of this mechanism on the formation of scattering cross sections is significant.

[1] Burtebaev N, Kerimkulov Zh.K., Amangeldi N., Alimov D.K., Yushkov A.V., Mukhamedzhanov E.S., Dzhanshetov D.M., Mauey B., Aimaganbetov A., Zhagypar K., Pattaev A. Studying the elastic scattering of  $^{14}\text{N}$  ions on  $^{16}\text{O}$  nuclei at energy near the Coulomb barrier // Izvestiya NAS RK. series of phys. - mat. -2016. №3(307) -P.170–176.

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