

ELASTIC SCATTERING AND NEUTRON TRANSFER IN THE COLLISION ${}^7\text{Li}$ (58 MeV) + ${}^{10}\text{B}$

The study of nucleon and cluster transfer reactions makes it possible to obtain information on the structure of the investigated nuclei (clusters, neutron halo, etc.) and its manifestation in nuclear reactions [1]. This work continues our systematic studies of nucleon and cluster transfer mechanisms in reactions with various projectiles and targets (for example, $d + {}^9\text{Be}$ [2], ${}^3\text{He} + {}^9\text{Be}$ [3]). Here, we will analyze the results of the experiment on measuring angular distributions for elastic scattering and neutron transfer channels in the collision ${}^7\text{Li}$ (58 MeV) + ${}^{10}\text{B}$. The experiment was carried out at the U-400 cyclotron of the Flerov Laboratory of Nuclear Reactions, Joint Institute for Nuclear Research, Dubna, Russia. The obtained experimental angular distributions for the elastic scattering channel and neutron transfer channel ${}^{10}\text{B}({}^7\text{Li}, {}^6\text{Li}_{g.s.}){}^{11}\text{B}_{g.s.}$ are shown in Fig. 1(a) and (b), respectively. A theoretical analysis of the experimental data will be done within the optical model and the DWBA approach. From the analysis of the experimental data on elastic scattering of ${}^7\text{Li} + {}^{10}\text{B}$, the parameters of the optical potential will be determined, which will be used in the description of neutron transfer channels, including ${}^{10}\text{B}({}^7\text{Li}, {}^6\text{Li}_{g.s.}){}^{11}\text{B}_{g.s.}$.

Fig. 1. Experimental angular distributions for the elastic scattering channel (a) and neutron transfer channel ${}^{10}\text{B}({}^7\text{Li}, {}^6\text{Li}_{g.s.}){}^{11}\text{B}_{g.s.}$ (b) in the collision ${}^7\text{Li}$ (58 MeV) + ${}^{10}\text{B}$.

1. Yu.E. Penionzhkevich, R. Kalpakchieva, *Light Exotic Nuclei Near the Boundary of Neutron Stability* (World Scientific Publishing Co. Pte. Ltd., Singapore, 2022).
2. S.M. Lukyanov et al. // *J. Phys: Conf. Ser.* 2016. V. 724. P. 012031.
3. B.A. Urazbekov et al. // *Chin. Phys. C.* 2024. V. 48. P. 014001.

Section

Experimental and theoretical studies of nuclear reactions

Primary authors: SHAKHOV, Alexei (FLNR JINR); NAUMENKO, Mikhail (Joint Institute for Nuclear Research); STUKALOV, Sergei (FLNR JINR); MASLOV, Vladimir (JINR); PENIONZHKEVICH, Yuri (Head of department, professor); SOBOLEV, Yuri (FLNR JINR)

Presenter: NAUMENKO, Mikhail (Joint Institute for Nuclear Research)

Session Classification: Experimental and theoretical studies of nuclear reactions