CLUSTER TRANSFER IN THE SCATTERING OF 2H, 3He and 6LI FROM BE TARGET

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Angular distributions for the9Be(d,d)9Be*, 9Be(d,p)10Be, 9Be(d,t)8Be, and 9Be(d,4He)7Li channels were measured. Experimental angular distributions were described within the optical model, the coupled channel approach, and the distorted wave Born approximation. The spectroscopic factors for the systems 9Be =4He+ 5He and 7Li = d + 5He are close to unity, which confirms the contribution of the considered cluster configurations to the structure of ground states. The analysis shows that the contribution of the compound nucleus mechanism is negligible. In the (d, 4He) channel, the deuteron transfer provides only a small contribution, whereas a relatively large contribution of the dilute system of 5He transfer was found.

The results of recent experiment on studying nucleon and cluster transfer processes in the reactions of the 3He(30 MeV) and 6Li(68 MeV) ions with the 9Be target nuclei are reported.

The angular distributions for the reaction channels 9Be(6Li,4He)11Bg.s. and 9Be(6Li,10B)5Heg.s. have been measured. To describe the possible contributions of sequential transfer of nucleon and alpha clusters, as direct transfer of the dilute 5He cluster, the Coupled Reaction Channel method (FRESCO) is used. The spectroscopic amplitudes are obtained for the configurations of (9Be+d) and (6Li+5He) in the 11B nucleus and (6Li+4He) in the 10B nucleus. The results indicate a strong

correlation between a neutron and an 4He, leading to the formation of the dilute 5He-cluster in the transfer processes. The experimental differential cross sections for cluster transfer in the reaction channel 9Be(6Li,4He)11Bg.s. compared with the results of calculations. In the case of 5He

transfer, the following mechanisms were taken into account: simultaneous transfer (5He) and

sequential transfer (n+4He and 4He+n). The probability of the

sequential transfer (4He-n or n-4He) is much lower than that for the process of the simultaneous transfer of 5He over the entire range of angles.

Section

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