Near-barrier Nucleon Transfer in Reactions ^{3,6}He + ^{45}Sc, ^{197}Au, ^{64}Zn

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The theoretical approach based on the numeric solution of the time-dependent Schrödinger equation (TDSE) [1, 2] for the external neutrons of ^{6}He, ^{45}Sc, and ^{197}Au nuclei as well as the protons of ^{3}He nucleus is applied to the calculation of the experimental cross sections for formation of isotopes ^{46}Sc in reaction ^{6}He + ^{45}Sc [3], ^{196,198}Au in reaction ^{6}He + ^{197}Au [4, 5], ^{65}Zn in reaction ^{6}He + ^{64}Zn [6], and ^{45}Ti in reaction ^{3}He + ^{45}Sc [7]. The contribution of fusion and subsequent evaporation to the experimental data is negligible in the case of ^{6}He + ^{197}Au reaction, whereas in the case of ^{6}He + ^{45}Sc reaction, it is quite large. The fusion-evaporation was taken into account using the NRV evaporation code [8]. Results of calculation demonstrate overall satisfactory agreement with the experimental data. The used realization of the TDSE method may also be applied to the calculation of reactions with cluster nuclei.

References

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