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STUDY OF NUCLEON TRANSFER PROCESSES IN THE REACTIONS 48Ca + 197Au, 40Ca + 197Au

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The study of nucleon transfer reactions is an important field of heavy-ion physics, because such reactions provide the possibility of producing new exotic nuclei. Theoretical studies of the mechanisms of nucleon transfer are of great importance for planning and conducting experiments aimed at the production of neutron-rich nuclei located at the boundary of neutron stability [1]. In this work, we study elastic scattering in terms of the classical model [2] and nucleon transfer processes in the reactions 48Ca + 197Au, 40Ca + 197Au at energies above the Coulomb barrier based on numerical solution of the time-dependent Schrödinger equation for nucleons [3]. The nucleon transfer probabilities depend on the structure of single-particle states of the colliding nuclei; nucleons are mainly transferred from/to upper shells. Fig. 1. Differential cross sections of the channels of stripping and pick-up of protons of the 48Ca + 197Au reaction at a beam energy of 400 MeV For few-nucleon transfer, maxima for K, Ar and Sc are seen in the vicinity of the grazing collision angle. The angular distributions for multinucleon transfer (for S, P and V, Cr) are practically isotropic [4] (Fig. 1).
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Summary

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