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Description of low energy fragmentation reactions in the transport-statistical approach

Fragmentation reactions at energies from 35 to 140 MeV per nucleon are a powerful tool to obtain new isotopes far from stability line. To plan the future experiments model calculations should be performed. Usually models developed to describe relativistic heavy-ion collisions are used for this purpose, like the EPAX and the Abration-Ablation models. They perfectly predict the cross-sections of the isotopes on the stability-line, but it is known that these models underestimate the cross-sections of neutron-reach isotopes and also they can't explain the hyperbolic shape of target ratio of the nuclear reactions with the same projectile but two different targets. In this talk we explain the target ratio of reactions on two targets 181Ta and 9Be for projectiles 18O at energy 35 MeV per nucleon and 86Kr (64 MeV per nucleon) in the multi-step transport statistical approach. The first step of our calculations is solving the Boltzmann-Nordheim–Vlasov (BNV) equation with the test-particle method and the second - is using SMM code to find de-excited fragments to be able to compare to experimental data. We show that hyperbolic shape of target ratio can be explained by the impact-parameter dependence of final isotope distributions. The influence of mass and energy of the projectile on the parameters of this hyperbola is discussed.

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