

NUCLEAR REACTION MECHANISMS OF $^{143}\text{Nd} (n_{\text{fast}}, \alpha)^{140}\text{Ce}$

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Nuclear reactions induced by fast neutrons starting from 0.5 MeV up to 25 MeV with emission of alpha particles were investigated. Cross sections, angular correlations and forward – backward asymmetry effects were evaluated with Talys [1] and own computer codes. Contribution to the cross section of nuclear reaction mechanisms like direct, compound and pre-equilibrium together with discrete and continuum states of residual nuclei were determined. Theoretical evaluations are compared with existing experimental data and parameters of nuclear potential in incident and emergent channels are obtained. Using cross section and angular correlation data from Talys, forward – backward effect are obtained for different incident neutron energies and target with finite dimensions. Simulated forward – backward asymmetry coefficient is sensible lower than the effect measured in the experiment [2]. The difference can be explained by the presence of other emergent channels including alpha particles and not by the presence of so-called non-statistical effects suggested in [2].

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2. Yu.M.Gledenov *et al.* // Phys. Rev. C. 2009. V.80. 044602.