

Influence of the structure and energy of reactants on the fusion process and the related reaction products

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We study the mass-asymmetric and more mass-symmetric reactions in the entrance channel in order to analyze the dynamical effects on the reaction product yields like fragments and evaporation residue nuclei formations. We discuss about the sensitivity of theoretical results on the static and dynamical parameters of interacting nuclei and their evolution from the capture stage to the competition between quasifission and complete fusion processes, as well as the angular momentum dependence of the competition between fission and evaporation processes along the de-excitation cascade of the compound nucleus. We also discuss about the relevant uncertainties of extracted experimental results due to the not always realistic assumptions in the treatment and analysis of the registered events that can determine large uncertainties on the results, especially when the complete fusion process is strongly hindered or when the fast fission contribution is large. In addition, we also emphasize that the uncertainty of 1-2 MeV in estimation of the excitation energy produces differences of 1-2 orders of magnitude in determination of experimental excitation functions.