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The prediction of non-compound nucleus fission contribution as a function of the mass number of projectile to induced fission of $^{208}_{82}Pb$ nucleus

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Abstract

The recent investigations show that the size and mass number of the target nucleus in the heavy-ion fission reactions are very important for the angular distribution of fission fragments. In this work, we consider the behavior of fission fragment angular anisotropies within the standard saddle-point statistical model for the $^{16}_{8}O$, $^{18}_{8}O$, $^{19}_{9}F$, $^{24}_{12}Mg$, $^{28}_{14}Si$, $^{32}_{16}S + ^{208}_{82}Pb$ fission reaction systems. As a result, a relation is found between the average contribution of non-compound nucleus fission and the mass number of projectile for these systems. It is also obtained that the onset of this contribution is significant for the projectile with the mass number greater than 20, as well as this quantity is an increasing function of the mass number of projectile. Finally, the comparison condition between α, and α_{BG} is modified for these reaction systems.

Keywords: heavy-ion induced fission, standard saddle-point statistical model, non-compound nucleus fission

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