Fission Barriers of Compound Superheavy Nuclei

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The dependence of fission barriers on the excitation energy of the compound nucleus impacts the survival probability of superheavy nuclei synthesized in heavy-ion fusion reactions. In this work [1,2], we investigate the isentropic fission barriers by means of the self-consistent nuclear density functional theory. The relationship between isothermal and isentropic descriptions is demonstrated. Calculations have been carried out for $^{264}$Fm, $^{272}$Ds, $^{278}$Cp, $^{292}$114, and $^{312}$124. For nuclei around $^{278}$Cp produced in “cold fusion” reactions, we predict a more rapid decrease of fission barriers with excitation energy as compared to the nuclei around $^{292}$114 synthesized in “hot fusion” experiments. This is explained in terms of the difference between the ground-state and saddle-point temperatures.


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