

Effects of Isospin on Pre-scission Particle Multiplicity of Heavy Systems and Its Excitation Energy Dependence

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Abstract: Isospin effects on particle emission of fissioning isobaric sources ^{202}Fr , ^{202}Po , ^{202}Tl and isotopic sources $^{189,202,212}\text{Po}$, and its dependence on the excitation energy are studied via Smoluchowski equations. It is shown that with increasing the isospin of fissioning systems, charged-particle emission is not sensitive to the strength of nuclear dissipation. In addition, we have found that increasing the excitation energy not only increases the influence of nuclear dissipation on particle emission but also greatly enhances the sensitivity of the emission of pre-scission neutrons or charged particles to the isospin of the system. Therefore, in order to extract dissipation strength more accurately by taking light particle multiplicities it is important to choose both a highly excited compound nucleus and a proper kind of particles for systems with different isospins.

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Key words: isospin effect, pre-scission particle multiplicity, excitation energy, fission diffusion model

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