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Total kinetic energy of fission fragments in heavy actinide fission

P Mehdipour Kaldiani

Department of Physics, Naragh Branch, Islamic Azad University, Naragh, Iran

E-mail: Payammehdipour@gmail.com

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Abstract

The total kinetic energy (TKE) of fission fragments for some heavy actinides fission is investigated and calculated using the scission point model. First, the deformation parameters of fission fragments are obtained by fitting the calculated results to the available experimental data. Then, the deformation parameters of fission fragments and the behavior of TKE distribution are investigated for heavy actinides fission. This indicates that the Usang model can better explain the TKE distribution for actinides heavier than californium than the Unik model. Also, the TKE value can be approximated by the sum of the Coulomb and nuclear energies of the fission fragments for light actinides, but this approximation is not correct for very heavy actinides such as fermium. Because the values of pre-scission kinetic energy are very different from the nuclear potential energy in the heavy actinides region. Finally, the distributions of TKE for spontaneous fission of ^{242}Am , ^{244}Am , ^{244}Cm , ^{246}Cm , ^{248}Cm , ^{250}Cf , and ^{254}Cf are evaluated using the scission point model.

Keywords: total kinetic energy, neutron and spontaneous fission, fragments energy distribution, scission point model, heavy actinides

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