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# Investigation of binary processes in reactions 36Ar+144, 154Sm and 68Zn+112Sn leading to the formation of neutron-deficient 180, 190Hg composite systems.

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Asymmetric fission process observed in decay of neutron-deficient nuclei lying in sub-lead (Pb) region provoked intensive investigations of fission process of these nuclei [1, 2]. Mass-energy and angular distributions of fission fragments of neutron-deficient 180, 190Hg composite systems formed in the reactions 36Ar + 144, 154Sm, 68Zn + 112Sn were measured using two-arm time-of-flight spectrometer CORSET [3] at energies near and above the Coulomb barrier. Analysis of the experimental data showed that in fission of these nuclei at the excitation energies up to 75 MeV both symmetric and asymmetric fission modes are clearly observed.
It was found that mass distributions of fragments formed in the reaction 68Zn + 112Sn have wide two humped shape with maximum yield at 70/110 amu for light and heavy fragments, respectively, and differ significantly from the distribution obtained in the reaction 36Ar + 144Sm leading to the formation of the same composite system of 180Hg. Difference of entrance channel properties in these two reactions leads to appearance of quasifission process in the reaction with 68Zn ions.
At highest incident energies fast fission process was observed [4] for composite systems of 180,190Hg. This occurs due to vanishing of fission barrier of formed composite system at large angular momenta. Fast fission process also widens the mass and energy distributions of fission fragments.
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