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The experimental study of MNT process in the reaction 136Xe+238U at energy above the Coulomb barrier

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During recent years it becomes more evident that multinucleon transfer (MNT) reactions can be considered as the promising way to synthesize and investigate heavy and superheavy elements which cannot be produced in other reaction mechanisms. The 238U ions are apparently optimal for bombarding particles in the synthesis of superheavy elements in MNT reactions. For deeper understanding of the MNT mechanisms and the best planning the future experiments on the production of new heavy isotopes in the reactions with 238U beam the theoretical calculation has to be checked with experimental data for the reactions like 136Xe+238U and 209Bi+238U.

Primary and secondary mass and energy distributions of projectilelike fragments formed in the reaction 136Xe+238U at 136Xe beam energy of 1.11 GeV have been experimentally investigated with the CORSET setup independently and in coincidence with survived heavy targetlike fragments. Since the heavy fragments formed in the reactions is highly excited, the masses, energies and the angles of the both fragments as products of sequential fission of excited heavy MNT fragments have been measured. Our study was organized using two independent experimental techniques, namely, double-arm Time-of-Flight measurements (ToF-ToF method) to investigate two body coincidences and three arms combining Time-of-Flight and energy measurements (ToF-E method) to investigate three body coincidences. The obtained experimental results will be presented and discussed.

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