

## **FORMATION AND DECAY OF THE COMPOSITE SYSTEM Z = 120 IN REACTIONS WITH HEAVY IONS AT ENERGIES NEAR THE COULOMB BARRIER**

Novikov K.V.<sup>1</sup>, Kozulin E.M.<sup>1</sup>, Knyazheva G.N.<sup>1</sup>, Itkis I.M.<sup>1</sup>, Itkis M.G.<sup>1</sup>,  
Diatlov I.N.<sup>1</sup>, Cheralu M.<sup>1</sup>, Kozulina N.I.<sup>1</sup>, Kumar D.<sup>1</sup>, Pan A.N.<sup>1,2</sup>,  
Pchelintsev I.V.<sup>1</sup>, Saveleva E.O.<sup>1</sup>, Sahoo R.N.<sup>2</sup>, Singh P.P.<sup>2</sup>, Thakur S.<sup>2</sup>,  
Vorobiev I.V.<sup>1</sup>

<sup>1</sup> *Flerov Laboratory of Nuclear Reactions, Joint Institute for Nuclear Research, 141980  
Dubna, Russia;* <sup>2</sup> *Department of Physics, Indian Institute of Technology Ropar, Rupnagar,  
Punjab - 140001, India*

E-mail: kiryuha-ya@mail.ru

One of the actual problems of modern nuclear physics is the study of the interaction mechanism of nuclei and the study of competing processes in their interaction. Study of competition between compound nucleus fission and quasifission in heavy-ion-induced reactions and its dependence on the reaction entrance channel are important for picking up the right target-projectile combination for the synthesis of superheavy elements.

The reactions  $^{64}\text{Ni} + ^{238}\text{U}$ ,  $^{58}\text{Fe} + ^{244}\text{Pu}$ ,  $^{52}\text{Cr} + ^{248}\text{Cm}$ ,  $^{54}\text{Cr} + ^{248}\text{Cm}$  with energies near the Coulomb barrier were chosen to investigate the competition of compound nucleus fission and quasifission. All reactions lead to the formation of composite systems with  $Z=120$ . Mass-energy distributions of binary fragments formed in the reactions have been measured using the double-arm time-of-flight spectrometer CORSET.

The process of compound nucleus fission and the process of quasifission were separated based on the analysis of the energy distributions of the reaction fragments. The evaluation of the cross section for fissionlike events was carried out as a result of the research. The analysis of the dependence of the reaction entrance channel on the probability of quasifission and compound nucleus fission was also carried out.

This work was supported by the Indian Department of Science and Technology (DST) and the Russian Science Foundation (RSF) (Project No.19-42-02014).