

THEORETICAL STUDY OF THE REACTIONS LEADING TO PRODUCTION OF NEW SUPERHEAVY NUCLEI

The major goals of modern superheavy element physics are the production of superheavy elements with $Z=119$, 120 and the synthesis of neutron-enriched isotopes, thereby advancing to the center of the "island of stability" (the neutron shell with $N=184$).

In this talk, a multidimensional dynamical model of nucleus-nucleus collisions based on the Langevin equations [1,2] has been used for analysis of reactions of ^{48}Ca ions with actinide target nuclei. The cross sections of capture and fusion as well as the cross sections of evaporation residues for two combinations of colliding nuclei $^{48}\text{Ca}+^{244}\text{Pu}$ and $^{48}\text{Ca}+^{248}\text{Cm}$ have been studied. The possibilities of obtaining new neutron-enriched isotopes of superheavy elements in pxn channels have been analyzed.

The analysis of the competition of quasi-fission and fusion-fission processes in the reactions leading to the formation of 119 and 120 elements has been done in the framework of the dynamical model.

1. A.V. Karpov and V.V. Saiko, Phys. Rev. C 96, 024618 (2017).
2. V.V. Saiko and A.V. Karpov, Phys. Rev. C 99, 014613 (2019).

The speaker is a student or young scientist

Yes

Section

1. Experimental and theoretical studies of nuclear reactions

Primary authors: KURKOVA, Nataliia (Joint Institute for Nuclear Research, Dubna, Russia; Dubna State University, Dubna, Russia); Dr KARPOV, Alexander (Joint Institute for Nuclear Research, Dubna, Russia; Dubna State University, Dubna, Russia)

Presenter: KURKOVA, Nataliia (Joint Institute for Nuclear Research, Dubna, Russia; Dubna State University, Dubna, Russia)

Session Classification: Experimental and theoretical studies of nuclear reactions