

Isthmus connecting mainland and island of stability of super-heavy nuclei

M. Kowal

National Centre for Nuclear Research, Pasteura 7, 02-093 Warsaw, Poland

The excitation functions for producing isotopes of super-heavy nuclei with charge numbers 108-116 are computed and compared to experimental data for ^{48}Ca and Ra /actinide-based complete fusion reactions. The estimated production cross sections suggest that the Ds nucleus marks the boundary between the island of stability of super-heavy nuclei and the mainland, which contains a relatively large number of neutrons [1]. Comparing the calculated production cross-section of the Cn isotope in the Ca+U hot fusion reaction with the experimental data from the Zn+Pb cold fusion reaction, it is evident that the fusion probability correlates strongly with asymmetry in the entrance reaction channel. This correlation suggests the possibility of bridging the gap between isotopes of super-heavy nuclei synthesized in opposite (cold and hot) reaction scenarios [2].

[1] J. Hong, G. G. Adamian, N.V. Antonenko, M. Kowal, P. Jachimowicz, *Physical Review C* **106** (1), 014614 (2022).

[2] J. Hong, G.G. Adamian, N.V. Antonenko, M. Kowal, P. Jachimowicz, *The European Physical Journal A* **58** (9), 180 (2022).