LXXII International conference "Nucleus-2022: Fundamental problems and applications"

Contribution ID: 168

Type: Oral talk (15 min + 5 min questions)

## Fission modes in 238Np populated by 6Li+232Th

Tuesday, 12 July 2022 11:00 (20 minutes)

The mass-total kinetic energy(M-TKED) of fission fragments of the reaction 6Li+232Th were measured at two laboratory energies Elab = 28.5 and 40 MeV [1] using the CORSET set up at the Flerov Laboratory of Nuclear Reaction. The transfer induced fission and/or the breakup of 6Li mainly into  $\alpha$  and d clusters contributes to the incomplete fusion in this reaction. The binary events within the gate of  $180\pm3.5$  degree in the fission fragment folding angle distribution have only been considered discarding the incomplete fusion events, for multi-modal analysis.

Two dimensional M-TKEDs of the binary fragments of 6Li+232Th, have been described by the multi-modal random neck rupture (MM-RNR) model [3]. Three modes were necessary to fit the data properly. Channel probabilities and the characteristics of different fission modes are obtained and discussed. The average kinetic energy <TKE> release in fission obtained from Viola systematic [4] matches well with that of the Standard 2 mode, but not with that of broad liquid drop like Superlong mode. This is associated with the decrease of the total kinetic energy associated with asymmetric fission with increasing excitation [5, 6] due to fading out of shell effects at high excitation energies. The slope of asymmetric to symmetric fission yields (when plotted against the excitation energy) of 6Li+232Th is found to be similar to that of previously reported 18O+208Pb.

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- 4. V. E. Viola Jr., Nucl. Data Sheets A1, 391 (1966); V. E. Viola, K. Kwiatkowski, and M. Walker, Phys. Rev. C 31, 1550 (1985).
- 5. A. Pica et al., Phys. Rev. C 102, 064612 (2020).
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## The speaker is a student or young scientist

No

## Section

1. Experimental and theoretical studies of nuclear reactions

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Session Classification: Experimental and theoretical studies of nuclear reactions