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Probing for the systematic behavior of incomplete fusion fraction and complete fusion suppression induced by 12,13C on 165Ho target

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Abstract

Fusion reactions induced by Heavy Ions play a role of paramount importance in nuclear physics, as they help the nuclear physicists to study the properties of superheavy nuclei near and away from the stability line. In the reactions involving heavy ion projectiles such as 12C, 13C, 16O, 18O etc., and heavier mass targets at projectile energies below 8 MeV/nucleon, the two most dominant reaction modes are complete fusion (CF) and incomplete fusion (ICF) [1-3]. Study of these fusion reactions has remained the subject of enormous interest for both theoretical and experimental nuclear physicists over the past two decades. Various efforts have been made to comprehend the CF and ICF reaction dynamics since its first observation. However, due to lack of proper theoretical model below 8 MeV/nucleon, which may reproduce the experimentally measured ICF data satisfactorily, the study of CF and ICF is still an interesting area of research work [1-6]. In order to develop a proper theoretical model, the ICF dependence on entrance channel parameters such as projectile energy, mass asymmetry of interacting nuclei, Coulomb effect (ZPZT), projectile Qα-value, target deformation and input angular momentum values needs to be systematically investigated. Keeping the above mentioned aspects into consideration and to have better understanding of CF and ICF, the excitation function of the evaporation residues populated in 12,13C with 165Ho target have been studied. The interesting results have been obtained, which will be discussed during the presentation.

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Field of your work

Experiental nuclear physics

Primary author: Dr TALI , Suhail A. (Department of Physics, Aligarh Muslim University, Aligarh –202002, India)

Co-authors: Dr KUMAR, Harish (Department of Physics, Aligarh Muslim University, Aligarh –202002, India); Prof. AFZAL ANSARI, M. (Department of Physics, Aligarh Muslim University, Aligarh –202002, India); Dr SINGH, D. (Centre for Applied Physics, Central University of Jharkhand, Ranchi –835205, India); Dr ALI, Rahbar (Department of Physics, G. F. (P. G.) College, Shahjahanpur –242001, India); Mr GIRI, Pankaj K. (Centre for Applied Physics, Central University of Jharkhand, Ranchi –835205, India); Dr LINDA, Sneha B. (Centre for Applied Physics, Central University of Jharkhand, Ranchi –835205, India); Dr KUMAR, R. (Inter-University Accelerator Centre, Aruna Asaf Ali Marg, New Delhi –110067, India); Mr MAHATO, Amritraj (Centre for Applied Physics, Central University of Jharkhand, Ranchi –835205, India); Dr MURALITHAR, S. (Inter-University Accelerator Centre, Aruna Asaf Ali Marg, New Delhi –110067, India); Dr SINGH, R.P. (Inter-University Accelerator Centre, Aruna Asaf Ali Marg, New Delhi –110067, India)

Presenter: Dr TALI , Suhail A. (Department of Physics, Aligarh Muslim University, Aligarh –202002, India)

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