

SIGNATURE OF INCOMPLETE FUSION REACTION DYNAMICS IN $^{18,16}\text{O} + ^{51}\text{V}$ AT MODERATE EXCITATION ENERGIES.

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An attempt has been made to investigate the projectile structure effect for the reaction dynamics leading to incomplete fusion (ICF) of heavy ions at moderate energies, especially the influence of incomplete fusion on complete fusion (CF) of ^{16}O and ^{18}O induced reactions at various energies. Excitation functions of various reaction products populated via complete and/or incomplete fusion of these projectiles in different target materials have been measured at the considered energy range, using stacked foil activation technique followed by off line gamma ray spectroscopy. Experiments were performed using 15 UD pelletron accelerator facility, at Inter-University Accelerator Centre (IUAC), New Delhi (INDIA). General Purpose Scattering Chamber (GPSC) with a facility of in vacuum transfer facility of targets dedicated for reaction work was employed for the study. The measured excitation functions were compared with theoretical calculations using statistical model code ALICE91. The results suggest that the existence of ICF even at slightly above barrier energies where CF is supposed to be the sole contributor, and decisively demonstrate strong projectile structure and energy dependence of ICF. The incomplete fusion strength functions for the said systems are also analysed as a function of α - Q values. Attempt has also been made to have a better reconciliation of ICF reactions and their dependence on various entrance channel parameters. A strong projectile structure effect has been observed on incomplete fusion reactions. It is observed that two neutron (2n) excess projectile ^{18}O as compared to ^{16}O results in less incomplete fusion contribution due to its relatively large negative α - Q values.