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In-Beam Gamma Spectroscopy. . MAYANK, Amity Institute of Nuclear Science and Tech, Amity University, S. MURALITHAR, Inter University Accelerator Center, S. SIHOTRA, S. KUMAR, D. MEHTA, Department of Physics, Panjab University, R. P. SINGH, Inter University Accelerator Center, URVASHI RATHORE, CET, Mody University — In-beam Gamma ray spectroscopic techniques have been studied using Indian National Gamma Array, IUAC which has a relative photo-peak efficiency of 5%. Data of a previous experiment where high angular momentum states of various nuclides were populated in the fusion-evaporation reaction 75As (28Si, 2p2n) at Elab = 120MeV. When gammas from populated nuclides are emanated during de-excitation, they are emitted with a certain angular distribution depending upon their multipolarity. Angular distribution of dipole and quadrupole transitions in ^{96}Ru has been obtained from this data. The efficiency corrected angular distribution plot has been compared with the theoretical angular distribution function. The distribution co-efficients A2 and A_4 for dipole and quadrupole were extracted from fitting the distribution with the equation: W (θ) $= 1+A_2{*}P_2$ (cos θ) $+A_4{*}P_4$ (cos θ). The Directional-correlation of Oriented Nuclei method was used to assign various other transitions as quadrupole or dipole. A DCO matrix between detectors at 148^0 versus 90^0 was created using CANDLE. Intensities of transitions that have similar multipolarity as the gated transition would be equal in both the projected spectrums. In case of different multipolarity intensities would vary by a factor of 2. R_{DCO} plots for ^{96}Ru transitions have been obtained. To determine the nature of transitions whether magnetic or electric, a plot between polarization asymmetry (Δ) and DCO-ratio for transitions in ^{96}Ru has been obtained.

. Mayank
Amity Institute of Nuclear Science and Tech, Amity University

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