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Nuclear Structure study of 183Ir

Investigation of the structure of atomic nuclei in the vicinity of Z=82 shell closure become important due to co-existance of single particle and collective excitations. Three high-j obitals viz. d5/2 , h11/2 and h9/2 lie near proton Fermi surface along with low-j s1/2 and d3/2 orbitals, resulting in number of K-isomers in this mass region.

The iridium isotopes (Z = 77) are located in the transitional region between the rare-earth isotopic chains of well-deformed nuclei and lead (Z = 82) chain of near-spherical isotopes. The structure of these nuclei are mainly influenced by the low-Ω intruder 1/2[541]h9/2 proton orbital. Interestingly, a signature partner of πh9/2 band was reported in 181Ir. In heavier 185Ir, a band built on 11/2- state was also reported. But such kind of band structure on 11/2- state is hitherto unreported in 183Ir. Hence it is interesting to search for the band structure above 11/2- state in the structure of Iridium isotopes.

High spin states of 183Ir were populated via 169Tm(18O,4n) fusion evaporation reaction at beam energy 94MeV, delivered by 15UD Pelletron acceletrator of Inter- University Accelerator Centre [IUAC], New Delhi. Indian National Gamma Array [INGA] is used for detecting the emitted gammas in the reaction. A self-supporting 169Tm foil of 6.5mg/cm2 thickness was used as the target. Typical beam current was 4 nA. Offline analysis is being done using CANDLE, INGASORT and RADWARE computer codes. Results will be reported in the conference.

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