ISOMER SPECTROSCOPY OF $^{90}_{41}Nb_{49}$*

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The odd - odd nuclei, in general, exhibit a complex level structure and the study of high spin states in such nuclei renders valuable information concerning the underlying proton-neutron(p-n) residual interaction. The odd - odd nucleus ^{90}Nb(N = 49, Z = 41) is an ideal candidate with one proton particle and one neutron hole lying outside the Z=40 subshell and the N = 50 shell closure, respectively. Excited states in ^{90}Nb were populated in two seperate experiments using the reaction ^{63}Cu(^{31}P,3pn) at incident beam energy of $\sim$ 125 MeV. The recoil-isomer tagging technique was employed to identify the feeding for the known 11^- isomeric level($T_{1/2} \sim 0.44$ μs)[1]. This was achieved by using the INGA**(Indian National Gamma Array, comprising of 8 Compton-suppressed Clover detectors) facility coupled to the recoil separator HIRA(Heavy Ion Reaction Analyzer) at NSC, New Delhi. A representative prompt-delayed coincidence spectrum is shown in Fig. 1. The level scheme above the isomeric level was established using the γ-γ coincidence data from another experiment performed using INGA** at TIFR, Mumbai. With the observation of 17 new transitions, the level structure of ^{90}Nb has now been established upto a spin of J$\sim$19$\hbar$ and an excitation energy of $E_x \sim 8$ MeV. Spin and parity for the observed levels have been assigned using angular correlation and polarization measurements. The partial level scheme of ^{90}Nb deduced from the present work is shown in Fig. 2. The irregular spacing of the observed levels and the presence of high energy gamma rays with $E_\gamma \sim 2$ MeV are indicative of the persistence of single - particle nature of the observed levels upto the highest observed excitaion energy and spin.

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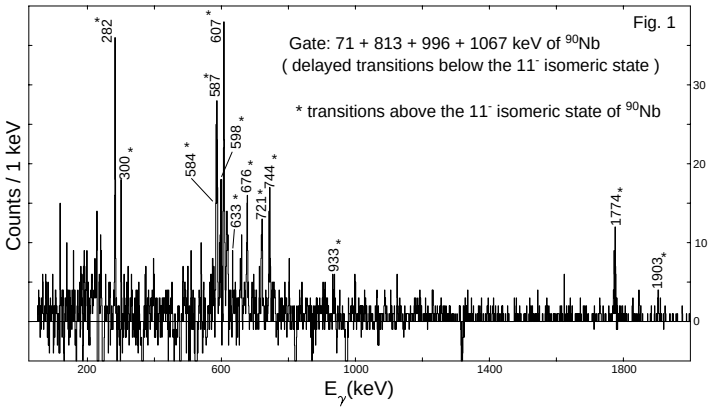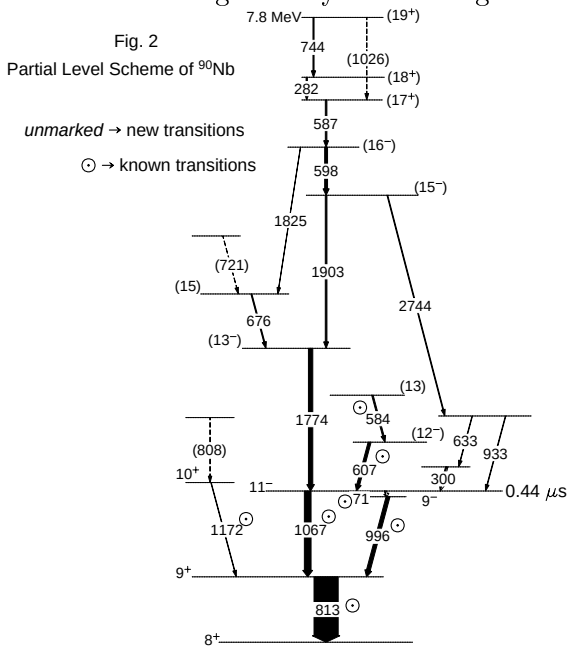
[1] C.A. Fields *et al.*, Nucl. Phys. **A363**, 311 (1981).