HIGH SPIN STATES IN NEUTRON DEFICIENT ^{102}Cd

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Up to now, a very little information has been available on Cadmium isotopes with A < 103, and only the half-life on the ground state of ^{102}Cd was known. Recently, the new isotope ^{102}In ($T_{1/2}$ = 24 ± 4 s) which feeds the first levels of ^{102}Cd by β-decay has been identified using an on-line mass isotopic separator. This work has been carried out by the Lyon-Grenoble collaboration[1]. This study has allowed us to extract the high spin level structure of ^{102}Cd, from the in-beam experiments, observed in the ^{92}Mo(^{12}C,2n) reaction.

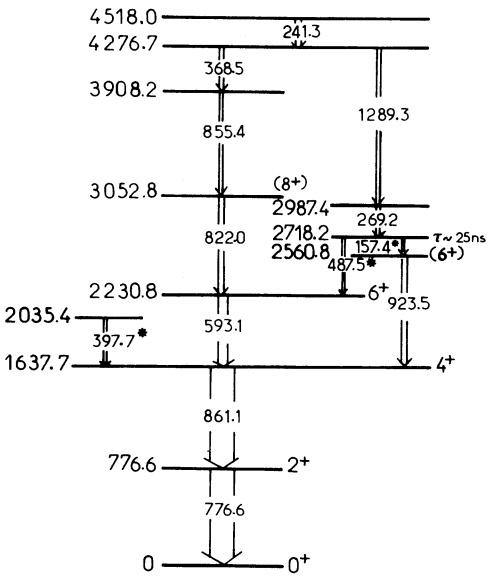

Fig. 1 : Level scheme of ^{102}Cd deduced from ^{92}Mo(^{12}C,2n)^{102}reaction, * indicates composite lines.

The ^{102}Cd nucleus has been investigated at 50 MeV bombarding energy with the ^{12}C beam of the Grenoble variable energy cyclotron. The level scheme shown in fig. 1 has been established by using data from γ ray single and γ-γ-t coincidence experiments. Angular distribution measurements were performed at several angles including 0° and 90° relative to the incident beam.

An isomeric state was found at 2.718 MeV energy. Its half-life was measured by γ-RF coincidence and estimated to be approximately 25 ns. The uncertainty in this value is due to the weak feeding of this isomeric level (∿ 10%). Moreover the 157.4 and 487.5 keV transitions are strongly mixed with lines belonging to other reaction products.

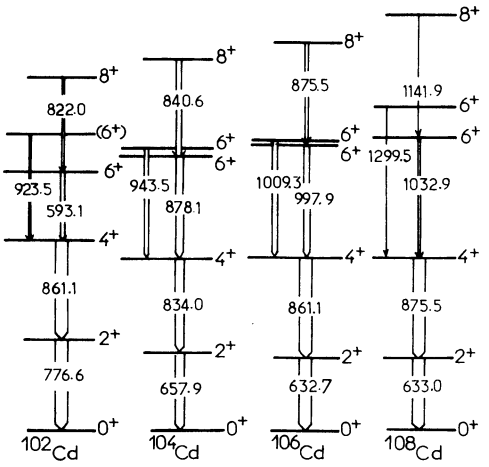

Fig. 2 : Systematics of light even Cadmium nuclei

The 923 keV line with an A_2 = + 0.19 ± 0.09 seems to be a pure E_2 transition. Thus the spin of the 2560.8 keV level is probably 6^+. It should also be noted that in ^{104,106,108}Cd (fig. 2) a second 6^+ state is excited from the nuclear reaction. The energy spacing between 6^+ levels is minimum at A = 106. The second 6^+ state can be interpreted as a two quasi-particle excitation $(\nu g\ 7/2)^2_{6^+}$.

REFERENCE

1. R. Béraud, J. Treherne, A. Charvet, R. Duffait, J. Genevey, A. Gizon, J. Gizon, M. Meyer, Zeit. für Phys., A 299 (1981) 279.