

^{130}Cd IT decay (220 ns) 2007Ju05

| Type | History | | Literature Cutoff Date |
|-----------------|--------------|----------|------------------------|
| | Author | Citation | |
| Full Evaluation | Balraj Singh | ENSDF | 31-May-2008 |

Parent: ^{130}Cd : E=2130 2; $J^\pi=(8^+)$; $T_{1/2}=220$ ns 30; %IT decay=100.0

2007Ju05: two reactions were used at GSI facility. 1. 6-proton knockout from ^{136}Xe beam at 750 MeV/nucleon hitting a Be target. 2. Fission of ^{238}U beam at 650 MeV/nucleon hitting a Be target. GSI fragment separator FRS used to identify ^{130}Cd fragments. Measured E_γ , I_γ , $\gamma\gamma$ coin, $\gamma\gamma(t)$ using array of 15 Ge cluster detectors from EUROBALL array. Comparison with shell-model calculations.

 ^{130}Cd Levels

| E(level) [†] | J^π [‡] | $T_{1/2}$ | Comments |
|-----------------------|----------------------|-----------|---|
| 0 [#] | 0 ⁺ | | Configuration contains $\pi p_{1/2}^{-2}$ and $\pi g_{9/2}^{-2}$. |
| 1325 [#] 1 | (2 ⁺) | | E(level): earlier level proposed by 2000Ka48 (also 2004KaZR) at 957 is not confirmed by 2007Ju05. |
| 1864 [#] 2 | (4 ⁺) | | |
| 1992 [#] 2 | (6 ⁺) | | E(level): the ordering of the 128-138 cascade is not determined. |
| 2130 [#] 2 | (8 ⁺) | 220 ns 30 | $T_{1/2}$: $\gamma\gamma(t)$ (2007Ju05). |

[†] From E_γ 's, assuming 1 keV uncertainty for each E_γ .

[‡] As proposed by 2007Ju05 based on $\pi g_{9/2}^{-2}$ configuration and E2 assignment for two gamma rays at the top. The assignments are the same in 'Adopted Levels'.

[#] Band(A): Yrast structure. Configuration= pure $\pi g_{9/2}^{-2}$ for 2⁺ to 8⁺ states from systematics of similar states in ^{76}Ni and ^{98}Cd .

 $\gamma(^{130}\text{Cd})$

I_γ normalization: $TI(1325\gamma+539\gamma+128\gamma+138\gamma)=400$.

Total conversion coefficients are from intensity balance, assuming 1 keV uncertainty for E_γ .

| E_γ | I_γ [‡] | $E_i(\text{level})$ | J_i^π | E_f | J_f^π | Mult. | α [#] | Comments |
|------------------|-------------------------|---------------------|-------------------|-------|-------------------|-------|-----------------------|--|
| 128 | 2.1 3 | 1992? | (6 ⁺) | 1864 | (4 ⁺) | E2 | 0.621 20 | $\alpha(\text{exp})=0.63$ 26 $\alpha(\text{K})=0.489$ 15; $\alpha(\text{L})=0.107$ 4; $\alpha(\text{M})=0.0211$ 8; $\alpha(\text{N+..})=0.00364$ 13 $\alpha(\text{N})=0.00355$ 13; $\alpha(\text{O})=9.4\times 10^{-5}$ 3 |
| 138 [†] | 2.2 3 | 2130 | (8 ⁺) | 1992? | (6 ⁺) | E2 | 0.475 14 | $\alpha(\text{exp})=0.56$ 25 $\alpha(\text{K})=0.379$ 11; $\alpha(\text{L})=0.079$ 3; $\alpha(\text{M})=0.0155$ 6; $\alpha(\text{N+..})=0.00268$ 9 $\alpha(\text{N})=0.00261$ 9; $\alpha(\text{O})=7.40\times 10^{-5}$ 21 |
| 539 | 3.2 4 | 1864 | (4 ⁺) | 1325 | (2 ⁺) | | | |
| 1325 | 3.6 6 | 1325 | (2 ⁺) | 0 | 0 ⁺ | | | |

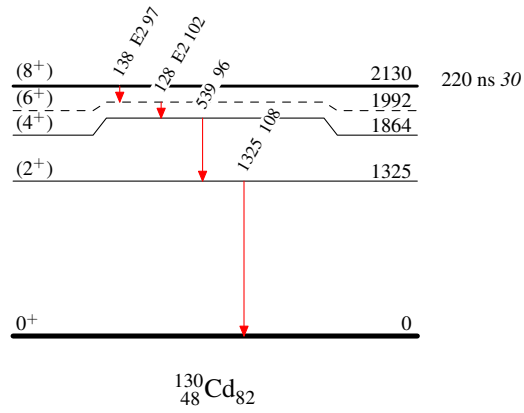
[†] The order of the γ -rays in this cascade is unknown, it could be 128-138 or 138-128.

[‡] For absolute intensity per 100 decays, multiply by 30 2.

[#] Total theoretical internal conversion coefficients, calculated using the BrIcc code (2008Ki07) with Frozen orbital approximation based on γ -ray energies, assigned multiplicities, and mixing ratios, unless otherwise specified.

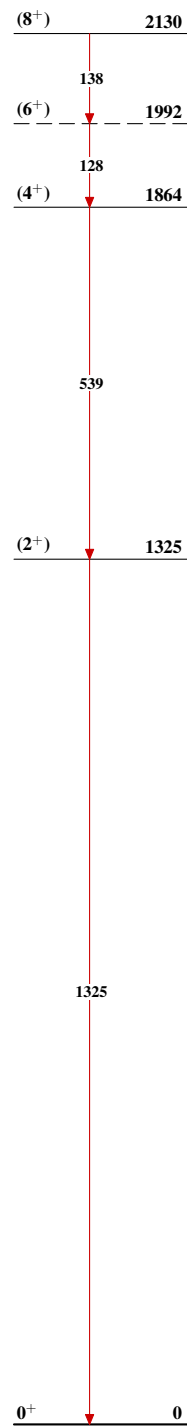
^{130}Cd IT decay (220 ns) 2007Ju05**Decay Scheme**Intensities: $I_{(\gamma+ce)}$ per 100 parent decays
%IT=100.0**Legend**

- $I_{\gamma} < 2\% \times I_{\gamma}^{max}$
- $I_{\gamma} < 10\% \times I_{\gamma}^{max}$
- $I_{\gamma} > 10\% \times I_{\gamma}^{max}$



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Band(A): Yrast structure

 $^{130}_{48}\text{Cd}_{82}$