

¹⁰⁶Cd(d,n γ) 1975Di12

Type	Author	History Citation	Literature Cutoff Date
Full Evaluation	Jean Blachot	NDS 109, 1383 (2008)	1-Mar-2008

E(d)=5-11 MeV.

Preliminary studies: ¹⁰⁸Cd(p,2n γ) E=20 MeV (1976VaYY) and ¹⁰⁴Pd(⁶Li,3n γ) (1976EiZY). Latter reference assigned other E γ =439,152,203,395 in cascade built on 13/2⁺, 1415-keV state. A similar γ spectrum was assigned to ¹⁰⁷Sn by 1969Ya05 via ¹⁰⁶Cd(α ,3n γ) E=50 MeV.

¹⁰⁷In Levels

E(level)	J π^{\dagger}	T _{1/2}	Comments
0.0	9/2 ⁺	32.4 min 3	
678.3	1/2 ⁻	50.4 s 6	
1001.3	(11/2) ⁺		
1106.8	(3/2) ⁻		
1129.2	(5/2) ⁺		
1165.9 \ddagger	(1/2) ⁺		
1396.0 \ddagger	(5/2) ⁺		
1414.8	(13/2) ⁺		
1423.2	(9/2) ⁺		
1490.8 \ddagger	(3/2) ⁺		
1518.7	(3/2,5/2) ⁻		
1540.6	(5/2) ⁺		
1805.5			
1864.2	(3/2,5/2,7/2) ⁻		See ¹⁰⁷ Sn decay for deexciting 736 γ .
1910.2	(7/2) ⁻		See ¹⁰⁷ Sn decay for deexciting 1911 γ .
1937.2			
1941.2			

\dagger Based on excitation functions, transition multiplicities, and $\gamma(\theta)$ spectra recorded at 9 angles ($\theta=30^{\circ}-145^{\circ}$).

\ddagger Band(A): 1/2(431) band. Rotational parameters $\alpha=44.6$ keV, $a=+1.4$ are derived from J=1/2,3/2,5/2 E(level) spacing. 1975Di12 propose K=1/2⁺ bands in ¹⁰⁷In-¹¹⁹In and compare with theory.

$\gamma(^{107}\text{In})$

$\alpha(K)\text{exp}=\text{ce}(K)/I_{\gamma}$ normalized to $\alpha(K)(428\gamma)=0.0093$ (M1 theory); I(ce(K)) measured at ED=8 MeV, $\theta=55^{\circ}$, semi.

E γ	I γ^{\dagger}	E _i (level)	J π_i^{\dagger}	E _f	J π_f^{\dagger}	Mult. \ddagger	Comments
324.7 7	4 [#] 2	1490.8	(3/2) ⁺	1165.9	(1/2) ⁺		
361.6 3	51 5	1490.8	(3/2) ⁺	1129.2	(5/2) ⁺	M1(+E2)	$\alpha(K)\text{exp}=0.0176$ 25, $A_2=-0.15$ 4.
413.5 5	10 [#] 3	1414.8	(13/2) ⁺	1001.3	(11/2) ⁺	M1,E2	$\alpha(K)\text{exp}=0.012$ 6.
422.1 3	19 3	1423.2	(9/2) ⁺	1001.3	(11/2) ⁺	M1(+E2)	$\alpha(K)\text{exp}=0.011$ 3, $A_2=-0.20$ 9.
428.5 3	100	1106.8	(3/2) ⁻	678.3	1/2 ⁻	M1	$A_2=-0.12$ 4. δ : undetermined; for analogous 3/2 ⁻ to 1/2 ⁻ transition, $\delta(261\gamma,^{115}\text{In})=-0.09$ 6 (1973Ba29).
450.4 7	\approx 3	1941.2		1490.8	(3/2) ⁺		
487.6 4	56 6	1165.9	(1/2) ⁺	678.3	1/2 ⁻	E1	$\alpha(K)\text{exp}=0.0017$ 5, $A_2=-0.015$ 45.
676 1	\approx 2 [#]	1805.5		1129.2	(5/2) ⁺		
678.3 3		678.3	1/2 ⁻	0.0	9/2 ⁺	M4	Mult.: see 50.4-s ¹⁰⁷ In decay.
757.4 5	12 2	1864.2	(3/2,5/2,7/2) ⁻	1106.8	(3/2) ⁻	(M1,E2)	$\alpha(K)\text{exp}\approx 0.002$.

Continued on next page (footnotes at end of table)

$^{106}\text{Cd}(\text{d},\text{n}\gamma)$ 1975Di12 (continued) $\gamma(^{107}\text{In})$ (continued)

E_γ	I_γ †	$E_i(\text{level})$	J_i^π	E_f	J_f^π	Mult. ‡	Comments
803.4 6	35 3	1910.2	(7/2) ⁻	1106.8	(3/2) ⁻	E2	$\alpha(\text{K})\text{exp}=0.0015$ 6, $A_2=0.44$ 18.
808 1	12# 4	1937.2		1129.2	(5/2) ⁺		
840.4 4	42# 8	1518.7	(3/2,5/2) ⁻	678.3	1/2 ⁻	E2,M1	$\alpha(\text{K})\text{exp}=0.0017$ 6.
1001.3 3	100 10	1001.3	(11/2) ⁺	0.0	9/2 ⁺	E2(+M1)	$\alpha(\text{K})\text{exp}=0.00085$ 26, $A_2=0.13$ 3. δ : undetermined; for analogous 11/2 ⁺ to 9/2 ⁺ transitions, $\delta(^{1153}\gamma, ^{111}\text{In})=+0.4$ 1 (1978He10), $\delta(^{1133}\gamma, ^{115}\text{In})=+0.51$ 4 (1977Kr13).
1129.2 4	200 10	1129.2	(5/2) ⁺	0.0	9/2 ⁺	E2	$\alpha(\text{K})\text{exp}=0.00073$ 13, $A_2=0.04$ 1.
1396.0 5	52 5	1396.0	(5/2) ⁺	0.0	9/2 ⁺	(E2)	$\alpha(\text{K})\text{exp}\approx 0.0005$.
1414.8 5	27 3	1414.8	(13/2) ⁺	0.0	9/2 ⁺	(E2)	Mult.: from 1415 $\gamma(\theta)$ 1976EiZY.
1423.1 5	37 3	1423.2	(9/2) ⁺	0.0	9/2 ⁺		
1540.6 5	62 5	1540.6	(5/2) ⁺	0.0	9/2 ⁺	(E2)	$A_2=0.42$ 12.
1805.7 8	20 5	1805.5		0.0	9/2 ⁺		

† At ED=8 MeV, $\theta=55^\circ$, semi γ singles. Other I_γ for weak or composite peaks from $\gamma\gamma$ -coin or $\text{tof n}\gamma$ -coin.

‡ Based on $\alpha(\text{K})\text{exp}$ and/or A_2 coef; $\alpha(\text{K})\text{exp}$ indicates E1 or M1, E2 and dominant dipole or quadrupole character is from A_2 coef.

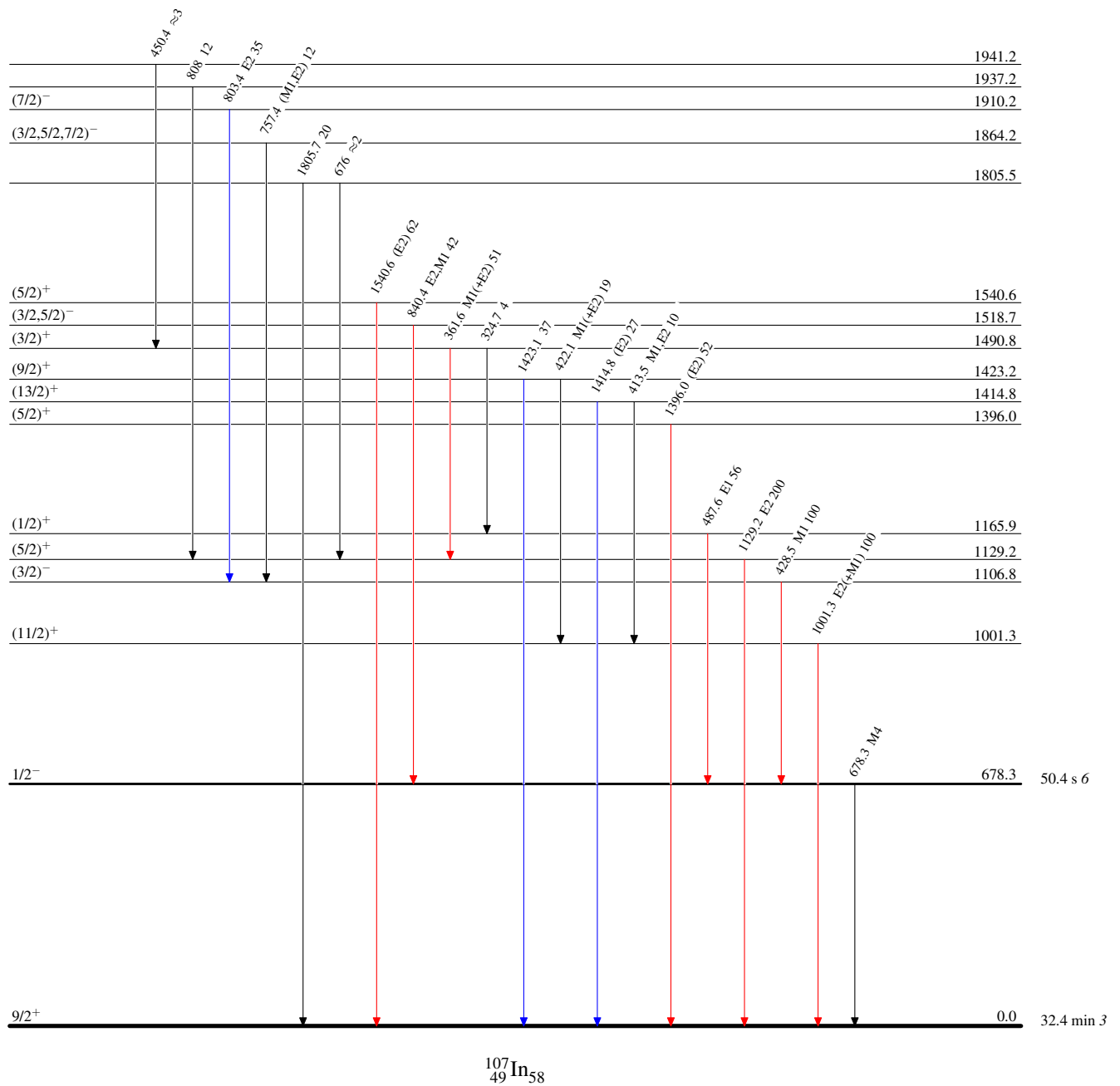
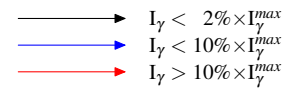
From $\gamma\gamma$ only.

$^{106}\text{Cd}(d,n\gamma)$ 1975Di12

Level Scheme

Intensities: Type not specified

Legend



$^{106}\text{Cd}(\text{d},\text{n}\gamma)$ 1975Di12

Band(A): 1/2(431) band

 $(3/2)^+$ 1490.8 $(5/2)^+$ 1396.0

325

 $(1/2)^+$ 1165.9 $^{107}_{49}\text{In}_{58}$