Adopted Levels, Gammas

Type	Author	History Citation	Literature Cutoff Date
Full Evaluation	S. Ohya	NDS 111,1619 (2010)	20-Jan-2009

Q(β^-)=4.76×10^3 *3*; S(n)=5188 *5*; S(p)=12711 *5*; Q(α)=−7074 *8* 2012Wa38
Note: Current evaluation has used the following Q record 4780 805176 8512702 85-7035 92 2009AuZZ.

^{121}Cd Levels

Cross Reference (XREF) Flags

A ^{121}Ag β^- decay
B ^{252}Cf SF decay

E(level)†	J$^\pi$	T$_{1/2}$	XREF	Comments
0.0	(3/2$^+$)	13.5 s *3*	A	%β^-=100 J$^\pi$: systematics of J$^\pi$ in odd Cd isotopes suggests 1/2$^+$ or 3/2$^+$, but 3/2$^+$ is more likely because log *ft*=5.7 to the 1315-keV, (5/2$^+$) state in ^{121}In. T$_{1/2}$: weighted average of 12.8 s *4* (1965We09), 12.7 s *5* (1974Sc05), 13.8 s *2* (1974Gr29), 12.5 s *15* (1982Fo04).
7.52 *11*	(1/2$^+$)		A	Decay mode is not known; however, one can assume a conservative estimate of log *ft*≥5 for any β branch to a level in ^{121}In. For a branch of 1% to the 313 level for example, one gets T$_{1/2}$(parent)>0.1s, leading to B(M1)(W.u.)<4×10^{-9} or B(E2)(W.u.)<7×10^{-5}. These are both unreasonably small. Any larger β branching would give even smaller Weisskopf estimates, as would 1% branches to higher lying levels. Any possible β branching must thus be <<1%. J$^\pi$: systematics of J$^\pi$ in odd Cd isotopes.
214.86‡ *15*	(11/2$^-$)	8.3 s *8*	AB	%β^-=100 Additional information 1. J$^\pi$: no γ to (1/2$^+$), (3/2$^+$); the upper limit of Iγ to (3/2$^+$) is estimated to be 1%, systematics of J$^\pi$ in odd-Cd isotopes suggests 11/2$^-$ based on 1h$_{11/2}$, J=11/2 is consistent with log *ft*≤6.5 to 1182, 13/2$^+$ state in ^{121}In. T$_{1/2}$: from 1982Fo04.
314.50 *6*	(5/2$^+$,7/2$^+$)	19 ns *2*	A	J$^\pi$: (E2) γ to (3/2$^+$); log *ft*=5.5 from (7/2$^+$). T$_{1/2}$: from $\beta\gamma$(t) in ^{121}Ag β^- decay.
329.92 *17*	(9/2$^-$,11/2$^-$)	<2 ns	A	J$^\pi$: M1 γ to (11/2$^-$), D γ from (7/2$^-$,9/2). T$_{1/2}$: from $\beta\gamma$(t) in ^{121}Ag β^- decay.
353.48 *6*	(5/2$^+$,7/2$^+$)		A	J$^\pi$: M1,E2 γ to (3/2$^+$); log *ft*=6.2 from (7/2$^+$).
369.35 *7*	(5/2$^+$)		A	J$^\pi$: γ to (1/2$^+$); log *ft*=6.1 from (7/2$^+$).
500.59 *7*	(5/2$^+$,7/2$^+$)		A	J$^\pi$: log *ft*=5.8 from (7/2$^+$); γ to (3/2$^+$).
508.39 *17*	(7/2$^-$,9/2)	<2 ns	A	J$^\pi$: γ's to (11/2$^-$) and (9/2$^-$,11/2$^-$,13/2$^-$); log *ft*=6.1 from (7/2$^+$). T$_{1/2}$: from $\beta\gamma$(t) in ^{121}Ag β^- decay.
602.55 *10*			A	
725.43 *8*			A	
744.75 *9*			A	
825.5‡ *4*	(15/2$^-$)		B	J$^\pi$: γ to (11/2$^-$) and systematics of high-spin levels in odd-Cd isotopes.
880.09 *18*	(7/2$^-$,9/2)		A	J$^\pi$: γ's to (11/2$^-$) and (9/2$^-$,11/2$^-$,13/2$^-$); log *ft*=6.2 from (7/2$^+$).
936.47 *10*			A	
989.48 *13*			A	
1071.13 *9*	(5/2$^+$)		A	J$^\pi$: log *ft*=6.0 from (7/2$^+$); γ to (1/2$^+$).
1095.86 *21*			A	
1118.08 *12*			A	
1170.70 *7*	(5/2$^+$,7/2$^+$)		A	J$^\pi$: log *ft*=5.4 from (7/2$^+$); γ to (3/2$^+$).
1191.60 *22*			A	

Continued on next page (footnotes at end of table)

Adopted Levels, Gammas (continued)

^{121}Cd Levels (continued)

E(level)†	J^π	XREF	Comments
1208.04 *14*		A	
1233.85 *17*		A	
1241.1 *3*		A	
1243.58 *21*		A	
1249.29 *20*		A	
1341.10 *25*	(7/2$^-$,9/2)	A	J^π: γ's to (11/2$^-$) and (9/2$^-$,11/2$^-$,13/2$^-$); log *ft*=6.6 from (7/2$^+$).
1371.01 *20*		A	
1400.7 *3*		A	
1510.45 *6*	(5/2$^+$,7/2$^+$)	A	J^π: log *ft*=4.9 from (7/2$^+$); γ to (3/2$^+$).
1516.34 *12*		A	
1617.59 *22*		A	
1627.7‡ *5*	(19/2$^-$)	B	J^π: γ to (15/2$^-$) and systematics of high-spin levels in odd-Cd isotopes.
1685.55 *8*	(5/2$^+$,7/2$^+$)	A	J^π: log *ft*=5.6 from (7/2$^+$); γ to (3/2$^+$).
1812.02 *12*	(5/2$^+$,7/2$^+$)	A	J^π: log *ft*=5.7 from (7/2$^+$); γ to (3/2$^+$).
1823.6 *6*		A	
1841.3 *5*		A	
1908.26 *21*		A	
1925.5 *3*		A	
1988.78 *22*		A	
2035.1 *6*	(21/2$^-$)	B	J^π: γ to (19/2$^-$) and systematics of high-spin levels in odd-Cd isotopes.
2100.8 *4*		A	
2134.02 *21*		A	
2162.7 *3*		A	
2165.66 *14*	(5/2$^+$,7/2$^+$)	A	J^π: log *ft*=5.9 from (7/2$^+$); γ to (3/2$^+$).
2327.9 *3*		A	
2405.2 *3*		A	
2416.3 *8*		A	
2443.8 *5*		A	
2517.1‡ *6*	(23/2$^-$)	B	J^π: γ to (21/2$^-$) and systematics of high-spin levels in odd-Cd isotopes.
2518.32 *15*	(5/2$^+$,7/2$^+$)	A	J^π: log *ft*=5.4 from (7/2$^+$); γ to (3/2$^+$).
2676.2 *3*		A	
2717.5 *5*		A	
2780.0 *9*	(25/2$^-$)	B	J^π: γ to (23/2$^-$) and systematics of high-spin levels in odd-Cd isotopes.
2797.95 *19*	(5/2$^+$,7/2$^+$,9/2$^+$)	A	J^π: log *ft*=5.5 from (7/2$^+$).
2825.25 *22*	(5/2$^+$,7/2$^+$)	A	J^π: log *ft*=5.6 from (7/2$^+$); γ to (3/2$^+$).
2872.67 *23*	(5/2$^+$,7/2$^+$,9/2$^+$)	A	J^π: log *ft*=5.7 from (7/2$^+$).
2881.3 *3*	(5/2$^+$,7/2$^+$)	A	J^π: log *ft*=5.4 from (7/2$^+$); γ to (3/2$^+$).
2946.8 *5*		A	
3015.2 *5*		A	
3048.2 *5*		A	
3390.2‡ *9*	(27/2$^-$)	B	J^π: γ to (25/2$^-$) and systematics of high-spin levels in odd-Cd isotopes.

† Least-squares fit to γ-ray energies.
‡ Band(A): $\nu h_{11/2}$ band, α=−1/2.

γ(^{121}Cd)

E_i(level)	J^{π}_i	E_γ†	I_γ‡	E_f	J^{π}_f	Mult.#	α@	Comments
7.52	(1/2$^+$)	7.52 *11*	100	0.0	(3/2$^+$)	[M1,E2]		α: 127 *6* for M1, 9.90E4 *8* for E2. E_γ: deduced from the β^- decay scheme.
314.50	(5/2$^+$,7/2$^+$)	314.55 *10*	100	0.0	(3/2$^+$)	(E2)	0.0278	α(K)=0.0236 *4*; α(L)=0.00341 *5*; α(M)=0.000661 *10*; α(N+..)=0.0001200 *17* α(N)=0.0001149 *17*; α(O)=5.16×10^{-6} *8* B(E2)(W.u.)=0.26 *3*
329.92	(9/2$^-$,11/2$^-$)	115.02 *10*	100	214.86	(11/2$^-$)	M1	0.313	α(K)=0.271 *4*; α(L)=0.0339 *5*; α(M)=0.00651 *10*; α(N+..)=0.001226 *18* α(N)=0.001160 *17*; α(O)=6.62×10^{-5} *10* B(M1)(W.u.)>0.0055
353.48	(5/2$^+$,7/2$^+$)	353.43 *10*	100	0.0	(3/2$^+$)	M1,E2	0.0174 *18*	α(K)=0.0150 *14*; α(L)=0.0020 *4*; α(M)=0.00038 *7*; α(N+..)=7.0×10^{-5} *11* α(N)=6.7×10^{-5} *11*; α(O)=3.45×10^{-6} *16*
369.35	(5/2$^+$)	361.88 *10*	70 *3*	7.52	(1/2$^+$)			
		369.33& *10*	100& *3*	0.0	(3/2$^+$)			
500.59	(5/2$^+$,7/2$^+$)	147.10 *10*	2.4 *3*	353.48	(5/2$^+$,7/2$^+$)			
		500.61 *10*	100 *7*	0.0	(3/2$^+$)			
508.39	(7/2$^-$,9/2)	178.47 *10*	100 *8*	329.92	(9/2$^-$,11/2$^-$)	D		
		293.47 *10*	70 *4*	214.86	(11/2$^-$)			
602.55		602.57 *10*	100	0.0	(3/2$^+$)			
725.43		371.82& *10*	100&	353.48	(5/2$^+$,7/2$^+$)			
		725.50 *20*	61 *6*	0.0	(3/2$^+$)			
744.75		415.00 *20*	16 *2*	329.92	(9/2$^-$,11/2$^-$)			
		430.32 *10*	100 *4*	314.50	(5/2$^+$,7/2$^+$)			
		744.16 *20*	6.3 *16*	0.0	(3/2$^+$)			
825.5	(15/2$^-$)	610.6 *3*	100	214.86	(11/2$^-$)			E_γ: from ^{252}Cf SF decay.
880.09	(7/2$^-$,9/2)	371.82& *10*	8.6&	508.39	(7/2$^-$,9/2)			
		550.10 *10*	100 *7*	329.92	(9/2$^-$,11/2$^-$)			
		665.8 *3*	36 *5*	214.86	(11/2$^-$)			
936.47		435.85 *10*	100 *7*	500.59	(5/2$^+$,7/2$^+$)			
		582.88 *20*	48 *7*	353.48	(5/2$^+$,7/2$^+$)			
989.48		620.31 *20*	100 *14*	369.35	(5/2$^+$)			
		635.90 *15*	91 *14*	353.48	(5/2$^+$,7/2$^+$)			
1071.13	(5/2$^+$)	701.4 *3*	30 *4*	369.35	(5/2$^+$)			
		717.64 *10*	100 *6*	353.48	(5/2$^+$,7/2$^+$)			
		1063.50 *15*	63 *6*	7.52	(1/2$^+$)			
1095.86		726.51 *20*	100	369.35	(5/2$^+$)			
1118.08		803.58 *10*	100	314.50	(5/2$^+$,7/2$^+$)			
1170.70	(5/2$^+$,7/2$^+$)	443.9 *4*	5 *1*	725.43				
		801.35 *10*	40 *2*	369.35	(5/2$^+$)			

$^{121}_{48}$Cd$_{73}$-3

$\gamma(^{121}Cd)$ (continued)

E_i(level)	J^π_i	E_γ[†]	I_γ[‡]	E_f	J^π_f	Comments
1170.70	(5/2+,7/2+)	817.24 *10*	100 *5*	353.48	(5/2+,7/2+)	
		856.06 *15*	40 *3*	314.50	(5/2+,7/2+)	
		1170.94 *15*	57 *5*	0.0	(3/2+)	
1191.60		691.0 *2*	100	500.59	(5/2+,7/2+)	
1208.04		605.51 *10*	100 *21*	602.55		
		837.6 *7*	36 *9*	369.35	(5/2+)	
1233.85		864.50 *15*	100	369.35	(5/2+)	
1241.1		732.70 *20*	100	508.39	(7/2−,9/2)	
1243.58		890.10 *20*	100	353.48	(5/2+,7/2+)	
1249.29		369.33[&] *10*	83[&]	880.09	(7/2−,9/2)	
		740.40 *20*	100	508.39	(7/2−,9/2)	
1341.10	(7/2−,9/2)	1011.10 *20*	100 *15*	329.92	(9/2−,11/2−)	
		1126.7 *5*	30 *8*	214.86	(11/2−)	
1371.01		862.45 *15*	100	508.39	(7/2−,9/2)	
1400.7		900.1 *3*	100	500.59	(5/2+,7/2+)	
1510.45	(5/2+,7/2+)	439.08 *15*	11.0 *14*	1071.13	(5/2+)	
		765.5 *5*	1.9 *9*	744.75		
		784.93 *15*	28 *3*	725.43		
		1002.10 *20*	9.5 *5*	508.39	(7/2−,9/2)	
		1157.07 *10*	53 *2*	353.48	(5/2+,7/2+)	
		1195.93 *10*	100 *5*	314.50	(5/2+,7/2+)	
		1510.47 *10*	88 *8*	0.0	(3/2+)	
1516.34		345.64 *10*	100	1170.70	(5/2+,7/2+)	
1617.59		892.15 *20*	100	725.43		
1627.7	(19/2−)	802.2 *3*	100	825.5	(15/2−)	E_γ: from ^{252}Cf SF decay.
1685.55	(5/2+,7/2+)	748.8 *3*	16 *6*	936.47		
		1332.14 *10*	100 *8*	353.48	(5/2+,7/2+)	
		1371.07 *10*	84 *6*	314.50	(5/2+,7/2+)	
		1684.5 *4*	10 *2*	0.0	(3/2+)	
1812.02	(5/2+,7/2+)	440.85 *15*	84 *9*	1371.01		
		1086.1 *4*	13 *3*	725.43		
		1443.1 *3*	66 *6*	369.35	(5/2+)	
		1812.13[&] *15*	100[&] *13*	0.0	(3/2+)	
1823.6		943.5 *5*	100	880.09	(7/2−,9/2)	
1841.3		1096.5 *5*	100	744.75		
1908.26		1538.90 *20*	100	369.35	(5/2+)	
1925.5		1424.9 *3*	100	500.59	(5/2+,7/2+)	
1988.78		1263.4 *3*	100 *18*	725.43		
		1988.7 *3*	57 *7*	0.0	(3/2+)	
2035.1	(21/2−)	407.4 *3*	100	1627.7	(19/2−)	E_γ: from ^{252}Cf SF decay.
2100.8		1770.9 *3*	100	329.92	(9/2−,11/2−)	

$^{121}_{48}Cd_{73}$-4

$\gamma(^{121}Cd)$ (continued)

E_i(level)	J^{π}_i	E_{γ}†	I_{γ}‡	E_f	J^{π}_f	Comments
2134.02		1819.50 *20*	100	314.50	$(5/2^+,7/2^+)$	
2162.7		1809.2 *3*	100	353.48	$(5/2^+,7/2^+)$	
2165.66	$(5/2^+,7/2^+)$	1812.13& *15*	100& *20*	353.48	$(5/2^+,7/2^+)$	
		2165.8 *3*	65 *10*	0.0	$(3/2^+)$	
2327.9		1827.3 *3*	100	500.59	$(5/2^+,7/2^+)$	
2405.2		2090.7 *3*	100	314.50	$(5/2^+,7/2^+)$	
2416.3		1208.3 *7*	100	1208.04		
2443.8		2129.3 *5*	100	314.50	$(5/2^+,7/2^+)$	
2517.1	$(23/2^-)$	482.0[a] *7*		2035.1	$(21/2^-)$	E_{γ},I_{γ}: from ^{252}Cf SF decay.
		889.4 *3*	100	1627.7	$(19/2^-)$	E_{γ},I_{γ}: from ^{252}Cf SF decay.
2518.32	$(5/2^+,7/2^+)$	2017.9 *3*	28 *4*	500.59	$(5/2^+,7/2^+)$	
		2203.70 *20*	100 *6*	314.50	$(5/2^+,7/2^+)$	
		2518.3 *3*	46 *4*	0.0	$(3/2^+)$	
2676.2		2322.6 *3*	100 *20*	353.48	$(5/2^+,7/2^+)$	
		2676.4 *6*	26 *8*	0.0	$(3/2^+)$	
2717.5		2216.9 *5*	100	500.59	$(5/2^+,7/2^+)$	
2780.0	$(25/2^-)$	262.9 *7*	100	2517.1	$(23/2^-)$	E_{γ}: from ^{252}Cf SF decay.
2797.95	$(5/2^+,7/2^+,9/2^+)$	1861.30 *20*	100 *10*	936.47		
		2483.8 *3*	47 *6*	314.50	$(5/2^+,7/2^+)$	
2825.25	$(5/2^+,7/2^+)$	1889.2 *4*	38 *9*	936.47		
		2080.3 *3*	100 *10*	744.75		
		2825.1 *4*	29 *9*	0.0	$(3/2^+)$	
2872.67	$(5/2^+,7/2^+,9/2^+)$	1936.19 *20*	100	936.47		
2881.3	$(5/2^+,7/2^+)$	2156.5 *5*	10 *3*	725.43		
		2881.0 *3*	100 *6*	0.0	$(3/2^+)$	
2946.8		2577.4 *5*	100	369.35	$(5/2^+)$	
3015.2		2645.8 *5*	100	369.35	$(5/2^+)$	
3048.2		2733.7 *5*	100	314.50	$(5/2^+,7/2^+)$	
3390.2	$(27/2^-)$	610.2[a] *7*		2780.0	$(25/2^-)$	E_{γ}: from ^{252}Cf SF decay.
		873.1 *7*	100	2517.1	$(23/2^-)$	E_{γ},I_{γ}: from ^{252}Cf SF decay.

† From ^{121}Ag β^- decay, except as noted.

‡ From ^{121}Ag β^- decay, except as noted. The intensity of multiply placed γ's is distributed by $\gamma\gamma$ coin. experiments.

From α in β^- decay.

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

& Multiply placed with intensity suitably divided.

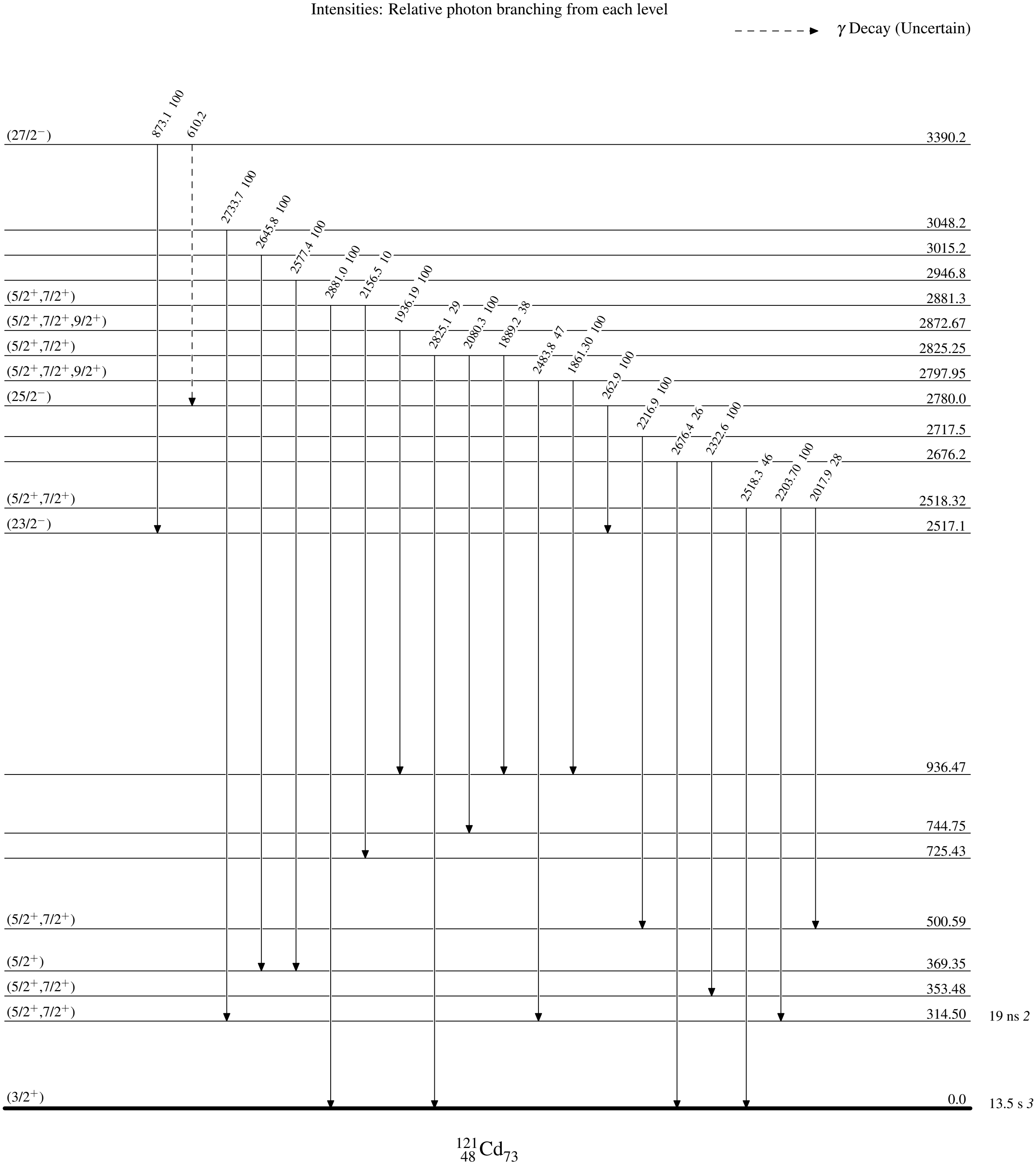
[a] Placement of transition in the level scheme is uncertain.

$^{121}_{48}Cd_{73}$-5

Adopted Levels, Gammas

Level Scheme

Intensities: Relative photon branching from each level



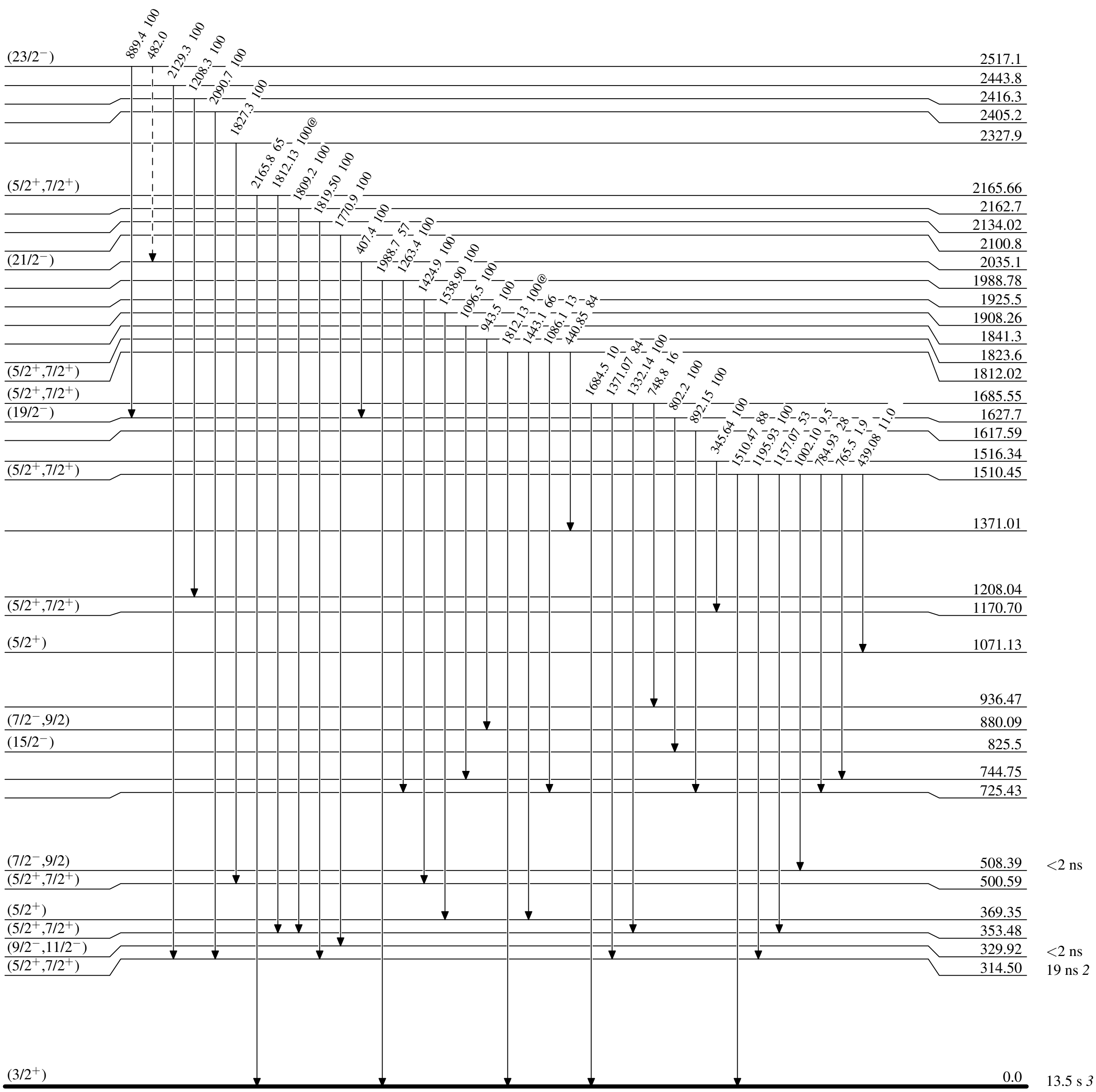
Adopted Levels, Gammas

Legend

Level Scheme (continued)

Intensities: Relative photon branching from each level
@ Multiply placed: intensity suitably divided

γ Decay (Uncertain)

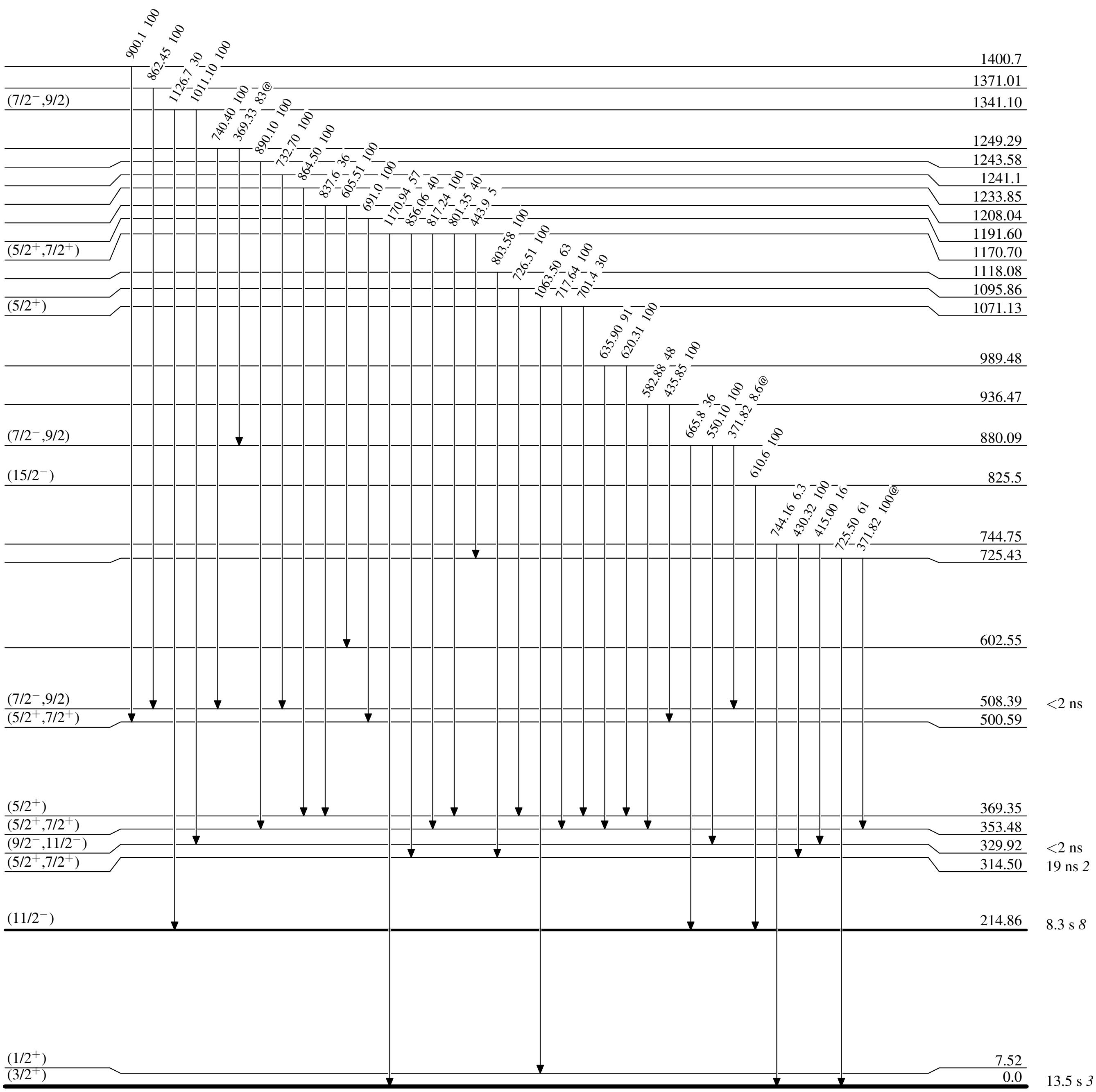


$^{121}_{48}Cd_{73}$

Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Relative photon branching from each level
@ Multiply placed: intensity suitably divided

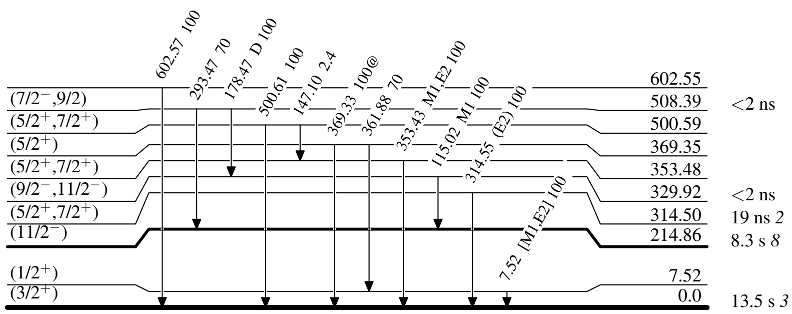


$^{121}_{48}Cd_{73}$

Adopted Levels, Gammas

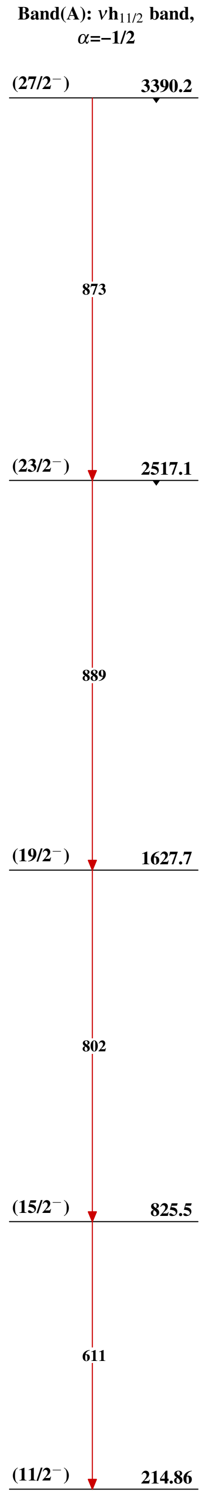
Level Scheme (continued)

Intensities: Relative photon branching from each level
@ Multiply placed: intensity suitably divided



$^{121}_{48}Cd_{73}$

Adopted Levels, Gammas



$^{121}_{48}Cd_{73}$