^{113}Cd(p,nγ) 1990Vi09,1976Di03,1974Ki02

Type	Author	History Citation	Literature Cutoff Date
Full Evaluation	Jean Blachot	NDS 111, 1471 (2010)	1-May-2009

$J^\pi(^{113}Cd)=1/2^+$.

1976Di03: E=6-11 MeV. Measured (semi) Eγ, Iγ, γγ coin, γ(θ), E(ce), I(ce), excit. γ(θ) measured at 9 angles (30°−145°) at E=7.5 MeV.

1974Ki02: E=2.7-5.2 MeV. Measured neutron time of flight, Eγ, Iγ (semi), nγ coin.

1990Vi09: E=6.8 MeV. Measured Eγ, Iγ (semi), γγ.

The level scheme is as proposed by 1990Vi09, it is in agreement with the one given by 1976Di03 and 1974Ki02 upto the 1999-keV level. All levels above that have been proposed by 1990Vi09.

^{113}In Levels

E(level)	J^π‡	$T_{1/2}$†	E(level)	J^π‡
0.0	$9/2^+$		1865.36 *22*	$5/2^-,7/2^-$
391.73 *6*	$1/2^-$		1914.08 *10*	$3/2^+,5/2^+$
646.76 *6*	$3/2^-$		1920.77 *10*	$3/2^+,5/2^+,7/2^+$
1024.23@ *6*	$5/2^+$		1937.88 *11*	$3/2^-,5/2^-$
1029.60@ *8*	$1/2^+,(3/2^+)$	0.33 ns *3*	1947.57 *11*	
1063.89@ *8*	$3/2^+,(1/2^+)$	0.58 ns *3*	1999.13 *12*	1/2,3/2
1106.46 *9*	$3/2^-,5/2^-$		2032.71 *22*	
1131.45 *6*	$5/2^+$		2039.72 *14*	
1173.06 *9*	$(7/2^+,9/2^+),11/2^+$		2051.45 *12*	
1191.11@ *9*	$7/2^+$		2064.00 *22*	
1344.91 *10*	$(9/2^+,11/2^+),13/2^+$		2070.10 *14*	
1351.01 *20*			2095.38 *8*	
1380.77 *8*	$1/2^-,3/2^-$		2118.32 *19*	
1453.0 *3*			2144.51 *13*	
1471.87 *9*	$3/2^-,5/2^-,7/2^-$		2170.32 *14*	
1496.34 *11*			2180.8 *5*	
1504.0 *5*			2183.23 *11*	
1508.97 *17*	$(3/2,5/2),7/2^+$		2253.39 *11*	
1535.93 *10*	$3/2^-,5/2^-$		2281.04 *18*	
1552.0 *4*			2295.27 *14*	
1567.04 *9*	$(5/2),7/2^+,9/2^+$		2331.24 *21*	
1569.55 *9*	$1/2^-,3/2^-$		2339.49 *17*	
1618.89 *10*			2371.64 *12*	
1630.56 *9*	$5/2^+,7/2^+,9/2^+$		2378.18 *15*	
1675.47 *8*			2383.83 *16*	
1684.12 *9*			2476.0 *2*	
1688.61 *22*	$9/2^+$		2515.6 *4*	
1707.35 *9*	$(3/2,5/2)^+$		2557.00 *18*	
1760.26 *14*			2560.46# *22*	
1768.03 *9*	$3/2^+,5/2^+,7/2^+$		2665.0 *4*	
1802.30 *8*			2727.98 *23*	
1822.51 *11*	1/2,3/2,5/2		2783.84 *11*	
1835.68 *19*			2904.8 *3*	

† From pulsed-beam γ(t) with semi, 1971Ki14.

‡ Based on γ(θ), γ-decay properties, excit and systematics.

A 1451.1γ is given in Table 4 of 1990Vi09 but not in Table 2, does not fit in the level scheme.

@ Band(A): suggested members of rotational band with Nilsson Orbit 1/2+(431).

^{113}Cd(p,nγ) 1990Vi09,1976Di03,1974Ki02 (continued)

γ(^{113}In)

E_γ †	I_γ †	E_i(level)	J_i^π	E_f	J_f^π	Mult. #	δ	Comments
107.2 *2*	0.5 *1*	1131.45	5/2$^+$	1024.23	5/2$^+$			
160.3 *4*	0.4 *1*	1835.68		1675.47				
167.1 *3*	0.6 *1*	1191.11	7/2$^+$	1024.23	5/2$^+$	M1(+E2)	<0.89	Mult.: α(K)exp=0.081 *35* yields D(+Q). From decay scheme D=M1.
255.0 *1*	100 *3*	646.76	3/2$^-$	391.73	1/2$^-$	M1(+E2)	<1.17	Mult.: from α(K)exp=0.035 *4*.
266.8 *2*	0.8 *1*	1802.30		1535.93	3/2$^-$,5/2$^-$			
291.8 *1*	1.4 *1*	1999.13	1/2,3/2	1707.35	(3/2,5/2)$^+$			
316.7 *1*	4.4 *2*	1380.77	1/2$^-$,3/2$^-$	1063.89	3/2$^+$,(1/2$^+$)			
326.7 *1*	2.3 *1*	1835.68		1508.97	(3/2,5/2),7/2$^+$			
330.2 *2*	0.2 *1*	1802.30		1471.87	3/2$^-$,5/2$^-$,7/2$^-$			
345.0 *3*	0.6 *1*	1535.93	3/2$^-$,5/2$^-$	1191.11	7/2$^+$			
347.0 *3*	0.3 *2*	1914.08	3/2$^+$,5/2$^+$	1567.04	(5/2),7/2$^+$,9/2$^+$			
351.4 *1*	5.7 *3*	1380.77	1/2$^-$,3/2$^-$	1029.60	1/2$^+$,(3/2$^+$)	E1		Mult.: from α(K)exp=0.0058 *14*.
377.6 *1*	7.9 *5*	1024.23	5/2$^+$	646.76	3/2$^-$			
382.9 *1*	2.5 *1*	1029.60	1/2$^+$,(3/2$^+$)	646.76	3/2$^-$			
388.1 *3*	0.3 *1*	2095.38		1707.35	(3/2,5/2)$^+$			
391.8 *1*		391.73	1/2$^-$	0.0	9/2$^+$			
394.0 *5*	0.4 *1*	1567.04	(5/2),7/2$^+$,9/2$^+$	1173.06	(7/2$^+$,9/2$^+$),11/2$^+$			
411.5 *1*	1.4 *1*	2095.38		1684.12				
416.9 *1*	0.4 *1*	1063.89	3/2$^+$,(1/2$^+$)	646.76	3/2$^-$			
429.5 *2*	0.6 *1*	1535.93	3/2$^-$,5/2$^-$	1106.46	3/2$^-$,5/2$^-$			
457.7 *2*	1.0 *2*	1630.56	5/2$^+$,7/2$^+$,9/2$^+$	1173.06	(7/2$^+$,9/2$^+$),11/2$^+$			
459.8 *2*	2.3 *2*	1106.46	3/2$^-$,5/2$^-$	646.76	3/2$^-$	M1,E2		Mult.: from α(K)exp=0.0074 *20*.
472.1 *1*	4.0 *2*	1496.34		1024.23	5/2$^+$			
472.1 *1*	4.0 *2*	1535.93	3/2$^-$,5/2$^-$	1063.89	3/2$^+$,(1/2$^+$)	E1		Mult.: from α(K)exp=0.0024 *6*.
484.9 *1*	5.5 *3*	1131.45	5/2$^+$	646.76	3/2$^-$	E1		Mult.: from α(K)exp=0.0027 *7*.
497.5 *2*	2.7 *2*	1688.61	9/2$^+$	1191.11	7/2$^+$	M1,E2		Mult.: from α(K)exp=0.0062 *10*.
528.1 *3*	0.5 *1*	2095.38		1567.04	(5/2),7/2$^+$,9/2$^+$			
544.0 *1*	2.2 *1*	1675.47		1131.45	5/2$^+$			
548.7 *2*	0.6 *1*	2118.32		1569.55	1/2$^-$,3/2$^-$			
576.0 *1*	2.6 *2*	1707.35	(3/2,5/2)$^+$	1131.45	5/2$^+$	M1,E2		Mult.: from α(K)exp=0.0043 *11*.
587.2 *1*	1.7 *1*	1760.26		1173.06	(7/2$^+$,9/2$^+$),11/2$^+$			
598.1 *2*	7.4 *4*	2070.10		1471.87	3/2$^-$,5/2$^-$,7/2$^-$			
606.4 *3*	4.8 *3*	1630.56	5/2$^+$,7/2$^+$,9/2$^+$	1024.23	5/2$^+$			
609.5 *3*	6.3 *4*	2118.32		1508.97	(3/2,5/2),7/2$^+$			
613.3 *2*	0.4 *1*	2183.23		1569.55	1/2$^-$,3/2$^-$			
638.0 *1*	37 *2*	1029.60	1/2$^+$,(3/2$^+$)	391.73	1/2$^-$	E1		B(E1)(W.u.)=3.2×10^{-6} *4* Mult.: from α(K)exp=0.00130 *25*.
646.5 *2*	0.6 *1*	2560.46		1914.08	3/2$^+$,5/2$^+$			
651.1 *3*	0.6 *1*	1675.47		1024.23	5/2$^+$			
672.4 *2*	20 *1*	1063.89	3/2$^+$,(1/2$^+$)	391.73	1/2$^-$	E1		B(E1)(W.u.)=1.61×10^{-6} *14* Mult.: from α(K)exp=0.00095 *18*.
677.5 *5*	1.4 *1*	1707.35	(3/2,5/2)$^+$	1029.60	1/2$^+$,(3/2$^+$)			

$^{113}_{49}In_{64}$-2

^{113}Cd(p,nγ) 1990Vi09,1976Di03,1974Ki02 (continued)

γ(^{113}In) (continued)

E_γ †	I_γ †	E_i(level)	J_i^π	E_f	J_f^π	Mult.#	Comments
683.2 *2*	3.2 *2*	1707.35	$(3/2,5/2)^+$	1024.23	$5/2^+$	M1,E2	Mult.: from α(K)exp=0.0039 *10*.
689.5 *2*	1.4 *1*	2070.10		1380.77	$1/2^-,3/2^-$		
696.0 *2*	1.6 *1*	1802.30		1106.46	$3/2^-,5/2^-$		
711.0 *3*	0.3 *1*	2183.23		1471.87	$3/2^-,5/2^-,7/2^-$		
714.9 *2*	21 *1*	1106.46	$3/2^-,5/2^-$	391.73	$1/2^-$	M1,E2	Mult.: from α(K)exp=0.0022 *3*.
734.1 *2*	0.7 *1*	1380.77	$1/2^-,3/2^-$	646.76	$3/2^-$		
738.4 *1*	1.1 *1*	1768.03	$3/2^+,5/2^+,7/2^+$	1029.60	$1/2^+,(3/2^+)$		
743.8 *1*	5.6 *3*	1768.03	$3/2^+,5/2^+,7/2^+$	1024.23	$5/2^+$		
758.9 *2*	2.6 *1*	1865.36	$5/2^-,7/2^-$	1106.46	$3/2^-,5/2^-$	M1,E2	Mult.: from α(K)exp=0.0018 *4*.
759.3 *2*	2.5 *3*	2378.18		1618.89			
782.9 *2*	0.9 *1*	1914.08	$3/2^+,5/2^+$	1131.45	$5/2^+$		
789.3 *2*	1.0 *1*	1920.77	$3/2^+,5/2^+,7/2^+$	1131.45	$5/2^+$		
792.9 *1*	4.5 *2*	1822.51	1/2,3/2,5/2	1029.60	$1/2^+,(3/2^+)$		
808.0 *3*	0.5 *1*	1999.13	1/2,3/2	1191.11	$7/2^+$		
813.9 *2*	1.0 *2*	2727.98		1914.08	$3/2^+,5/2^+$		
825.0 *1*	11 *5*	1471.87	$3/2^-,5/2^-,7/2^-$	646.76	$3/2^-$	M1,E2	Mult.: from α(K)exp=0.0022 *4*.
831.3 *8*	0.2 *1*	1937.88	$3/2^-,5/2^-$	1106.46	$3/2^-,5/2^-$		
835.9 *4*	1.0 *1*	2180.8		1344.91	$(9/2^+,11/2^+),13/2^+$		
841.2 *5*	0.9 *1*	1947.57		1106.46	$3/2^-,5/2^-$		
848.6 *1*	2.1 *1*	2039.72		1191.11	$7/2^+$		
856.6 *2*	1.6 *1*	1920.77	$3/2^+,5/2^+,7/2^+$	1063.89	$3/2^+,(1/2^+)$		
889.8 *1*	10.5 *5*	1914.08	$3/2^+,5/2^+$	1024.23	$5/2^+$		
896.6 *1*	4.6 *2*	1920.77	$3/2^+,5/2^+,7/2^+$	1024.23	$5/2^+$		
922.7 *1*	8.3 *5*	1569.55	$1/2^-,3/2^-$	646.76	$3/2^-$	M1,E2	Mult.: from α(K)exp=0.0018 *3*.
945.0 *1*	1.2 *1*	2051.45		1106.46	$3/2^-,5/2^-$		
963.7 *2*	1.5 *2*	2095.38		1131.45	$5/2^+$		
972.1 *1*	1.1 *1*	1618.89		646.76	$3/2^-$		
979.2 *1*	1.3 *1*	2170.32		1191.11	$7/2^+$		
989.0 *1*	2.1 *1*	1380.77	$1/2^-,3/2^-$	391.73	$1/2^-$		
1000.1 *2*	2.5 *3*	2064.00		1063.89	$3/2^+,(1/2^+)$		
1003.1 *2*	3.9 *4*	2032.71		1029.60	$1/2^+,(3/2^+)$		
1024.3 *1*	73 *3*	1024.23	$5/2^+$	0.0	$9/2^+$	E2	
1034.4 *4*	1.0 *1*	2665.0		1630.56	$5/2^+,7/2^+,9/2^+$		
1037.6 *1*	6.8 *4*	1684.12		646.76	$3/2^-$		
1040.5 *5*	0.5 *1*	2070.10		1029.60	$1/2^+,(3/2^+)$		
1052.1 *2*	1.7 *1*	2183.23		1131.45	$5/2^+$		
1060.4		1707.35	$(3/2,5/2)^+$	646.76	$3/2^-$		
[x]1064.4 *3*	0.2 *1*						
1076.5 *3*	0.8 *1*	2183.23		1106.46	$3/2^-,5/2^-$		
1080.1 *2*	5.0 *4*	1471.87	$3/2^-,5/2^-,7/2^-$	391.73	$1/2^-$		
1114.9 *1*	8.0 *5*	2144.51		1029.60	$1/2^+,(3/2^+)$		
1131.5 *1*	31 *2*	1131.45	$5/2^+$	0.0	$9/2^+$	E2	
1136.5 *5*	0.4 *1*	2904.8		1768.03	$3/2^+,5/2^+,7/2^+$		

$^{113}_{49}In_{64}$-3

^{113}Cd(p,nγ) 1990Vi09,1976Di03,1974Ki02 (continued)

γ(^{113}In) (continued)

E_γ[†]	I_γ[†]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[#]	Comments
1144.5 *4*	0.7 *1*	1535.93	3/2$^-$,5/2$^-$	391.73	1/2$^-$		
1147.1 *4*	0.4 *1*	2253.39		1106.46	3/2$^-$,5/2$^-$		
1149.8 *3*	0.2 *1*	2281.04		1131.45	5/2$^+$		
1155.5 *4*	0.3 *1*	1802.30		646.76	3/2$^-$		
1159.5 *2*	0.9 *1*	2183.23		1024.23	5/2$^+$		
1164.3 *3*	0.6 *1*	2295.27		1131.45	5/2$^+$		
1173.1 *1*	11.3 *6*	1173.06	(7/2$^+$,9/2$^+$),11/2$^+$	0.0	9/2$^+$	M1,E2	Mult.: from α(K)exp=0.00090 *15*.
1177.8 *1*	2.6 *3*	1569.55	1/2$^-$,3/2$^-$	391.73	1/2$^-$		
1191.1 *1*	27 *1*	1191.11	7/2$^+$	0.0	9/2$^+$	M1,E2	Mult.: from α(K)exp=0.00085 *14*.
1233.1 *2*	2.2 *1*	2339.49		1106.46	3/2$^-$,5/2$^-$		
1256.7 *2*	1.2 *1*	2281.04		1024.23	5/2$^+$		
1271.9 *2*	1.4 *1*	2378.18		1106.46	3/2$^-$,5/2$^-$		
1274.4 *4*	0.6 *1*	2904.8		1630.56	5/2$^+$,7/2$^+$,9/2$^+$		
1291.1 *1*	6.5 *4*	1937.88	3/2$^-$,5/2$^-$	646.76	3/2$^-$		
1300.8 *1*	2.7 *2*	1947.57		646.76	3/2$^-$		
1307.0 *2*	1.2 *1*	2331.24		1024.23	5/2$^+$		
1315.3 *2*	0.8 *1*	1707.35	(3/2,5/2)$^+$	391.73	1/2$^-$		
1344.9 *1*	2.9 *2*	1344.91	(9/2$^+$,11/2$^+$),13/2$^+$	0.0	9/2$^+$	E2	
1347.4 *1*	1.4 *1*	2371.64		1024.23	5/2$^+$		
1351.0[‡] *2*	2.8 *2*	1351.01		0.0	9/2$^+$		
1352.0 *4*	0.4 *1*	1999.13	1/2,3/2	646.76	3/2$^-$		
1359.6 *2*	0.6 *1*	2383.83		1024.23	5/2$^+$		
1409.1 *3*	0.6 *1*	2515.6		1106.46	3/2$^-$,5/2$^-$		
1423.2 *3*	0.6 *1*	2070.10		646.76	3/2$^-$		
1430.8 *2*	0.3 *1*	1822.51	1/2,3/2,5/2	391.73	1/2$^-$		
1451.0 *2*	1.2 *1*	2476.0		1024.23	5/2$^+$		
1453.0[‡] *3*	1.1 *1*	1453.0		0.0	9/2$^+$		
[x]1454.1 *5*	0.7 *1*						
1496.4 *3*	0.4 *1*	1496.34		0.0	9/2$^+$		
1504.0[‡] *5*	0.4 *1*	1504.0		0.0	9/2$^+$		
1509.0 *2*	13.0 *6*	1508.97	(3/2,5/2),7/2$^+$	0.0	9/2$^+$		
1532.8 *3*	0.9 *1*	2557.00		1024.23	5/2$^+$		
1536.0 *3*	1.5 *1*	2183.23		646.76	3/2$^-$		
1546.3 *3*	0.8 *1*	1937.88	3/2$^-$,5/2$^-$	391.73	1/2$^-$		
1552.0[‡] *4*	0.4 *1*	1552.0		0.0	9/2$^+$		
1555.9 *3*	0.4 *1*	1947.57		391.73	1/2$^-$		
1567.0 *1*	6.7 *4*	1567.04	(5/2),7/2$^+$,9/2$^+$	0.0	9/2$^+$		
1606.6 *1*	2.1 *1*	2253.39		646.76	3/2$^-$		
1619.0 *2*	5.0 *5*	1618.89		0.0	9/2$^+$		
1630.5 *1*	6.3 *4*	1630.56	5/2$^+$,7/2$^+$,9/2$^+$	0.0	9/2$^+$		
1648.6 *2*	1.0 *1*	2295.27		646.76	3/2$^-$		
1675.5 *1*	7.3 *4*	1675.47		0.0	9/2$^+$		

$^{113}_{49}In_{64}$-4

^{113}Cd(p,nγ) 1990Vi09,1976Di03,1974Ki02 (continued)

γ(^{113}In) (continued)

E_γ †	I_γ †	E_i(level)	J_i^π	E_f	J_f^π	E_γ †	I_γ †	E_i(level)	J_i^π	E_f	J_f^π	E_γ †	I_γ †	E_i(level)	J_i^π	E_f	J_f^π
1692.6 *3*	0.8 *1*	2339.49		646.76	$3/2^-$	1861.7 *2*	2.3 *2*	2253.39		391.73	$1/2^-$	2095.2 *1*	3.6 *2*	2095.38		0.0	$9/2^+$
1731.0 *3*	0.8 *1*	2378.18		646.76	$3/2^-$	1903.2 *2*	0.9 *1*	2295.27		391.73	$1/2^-$	2137.0 *2*	0.7 *1*	2783.84		646.76	$3/2^-$
1737.0 *3*	0.2 *1*	2383.83		646.76	$3/2^-$	1910.2 *2*	0.5 *1*	2557.00		646.76	$3/2^-$	[x]2475.3 *3*	0.2 *1*				
1759.6 *1*	3.2 *2*	2783.84		1024.23	$5/2^+$	1947.6 *5*	0.4 *1*	2339.49		391.73	$1/2^-$	2476.3		2476.0		0.0	$9/2^+$
1773.4 *4*	0.5 *1*	2904.8		1131.45	$5/2^+$	1992.1 *3*	1.4 *1*	2383.83		391.73	$1/2^-$						
1802.2 *1*	5.2 *3*	1802.30		0.0	$9/2^+$	2051.4 *2*	0.4 *1*	2051.45		0.0	$9/2^+$						

† From 1990Vi09, Iγ at 90° to beam.
‡ Not observed by 1976Di03.
# α(K)exp calculated by evaluators normalizing 1024γ, 1132γ and 1345γ to E2 theory. These E2 assignments are based on adopted J^π values for the levels involved.
x γ ray not placed in level scheme.

$^{113}_{49}In_{64}$-5

^{113}Cd(p,nγ) 1990Vi09,1976Di03,1974Ki02

Level Scheme

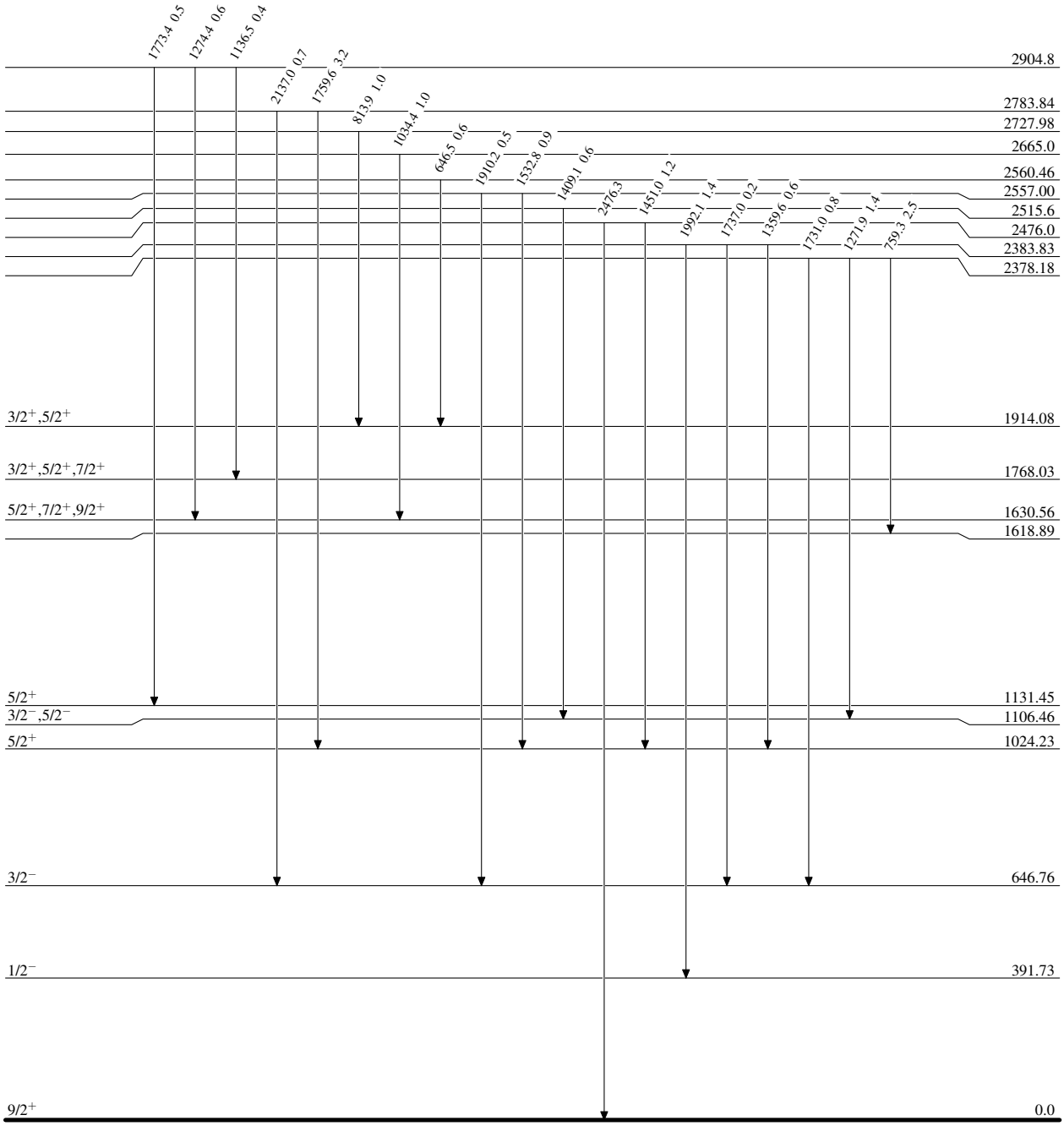
Intensities: Relative I_γ

Legend

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

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

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



$^{113}_{49}In_{64}$

^{113}Cd(p,nγ) 1990Vi09,1976Di03,1974Ki02

Level Scheme (continued)

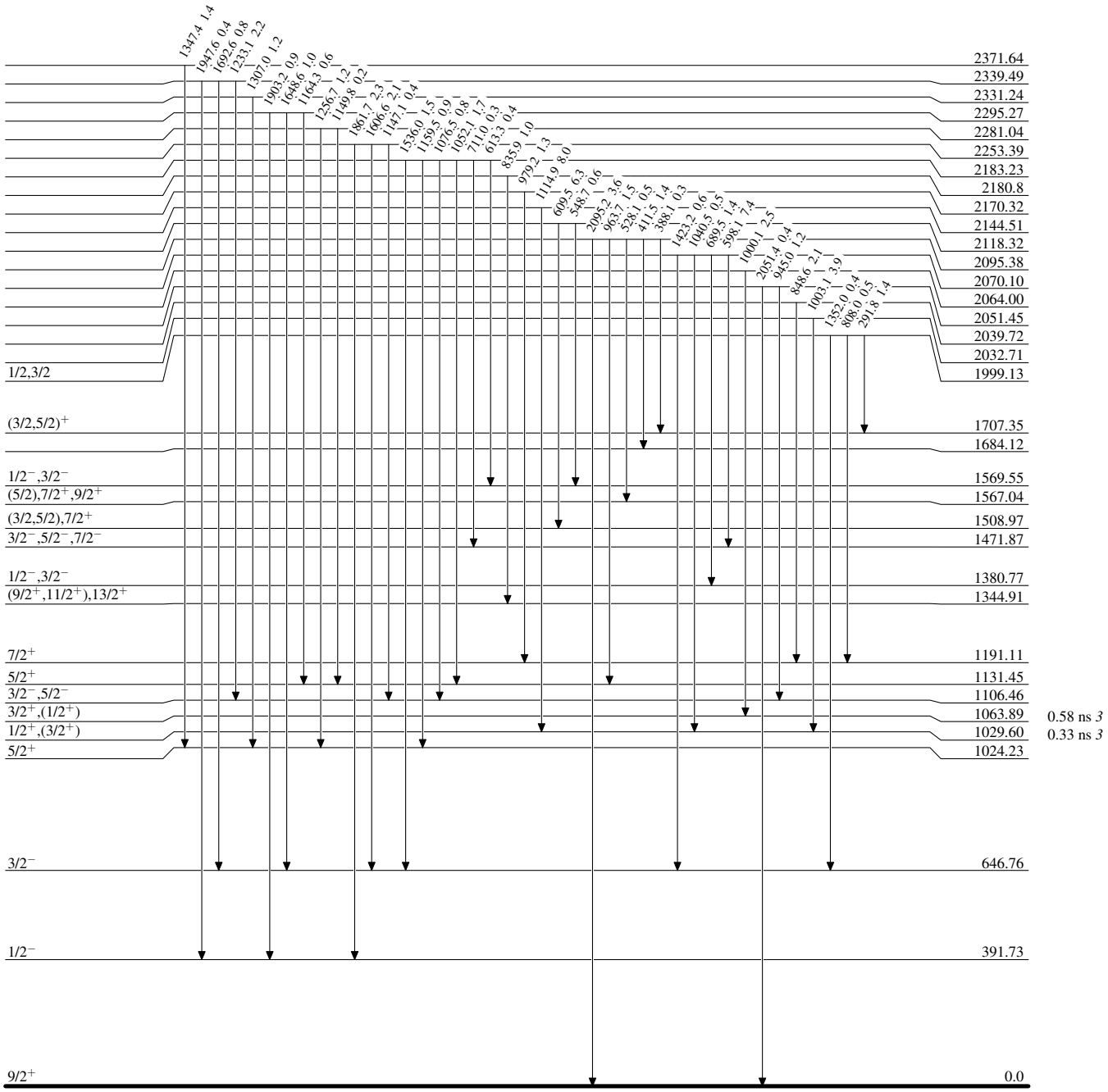
Intensities: Relative I_γ

Legend

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

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

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



$^{113}_{49}In_{64}$

^{113}Cd(p,nγ) 1990Vi09,1976Di03,1974Ki02

Level Scheme (continued)

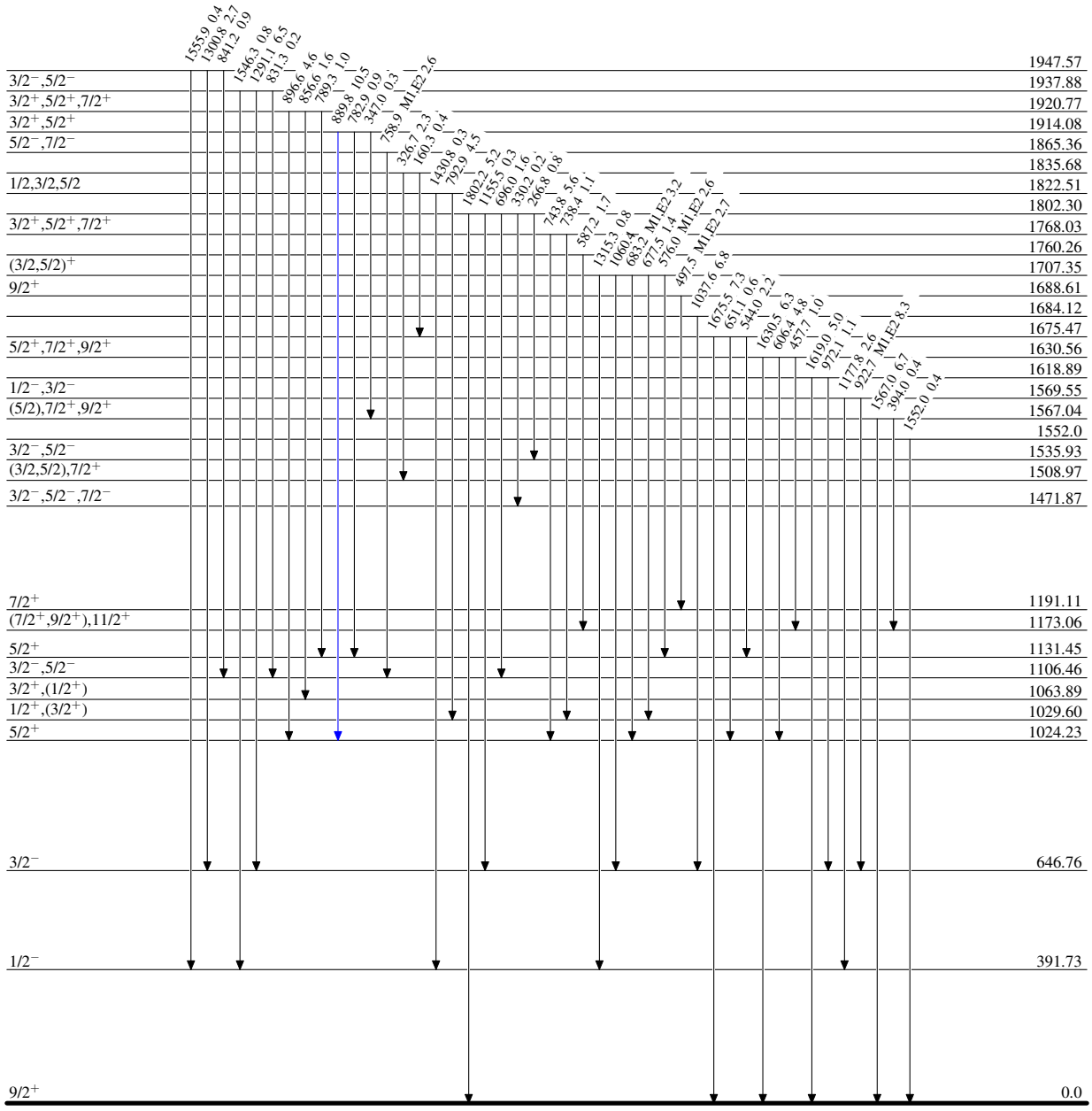
Intensities: Relative I_γ

Legend

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

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

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



$^{113}_{49}In_{64}$

^{113}Cd(p,nγ) 1990Vi09,1976Di03,1974Ki02

Level Scheme (continued)

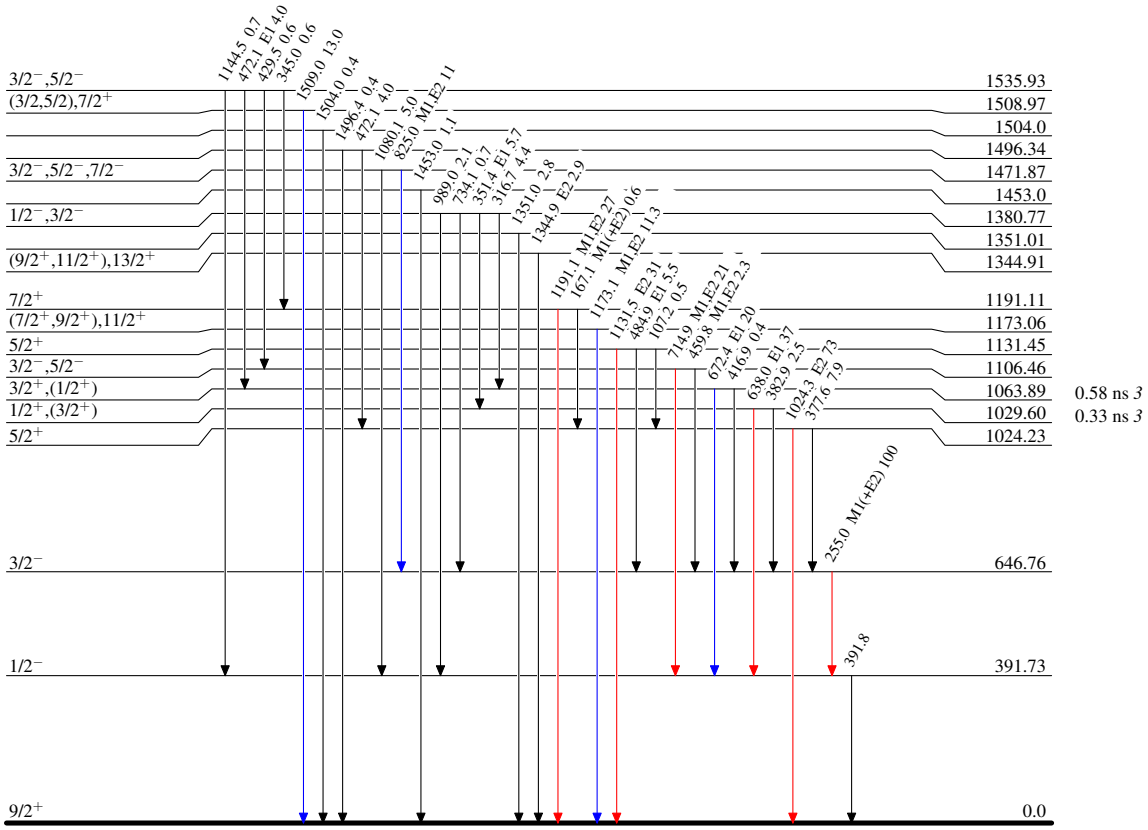
Intensities: Relative I_γ

Legend

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

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

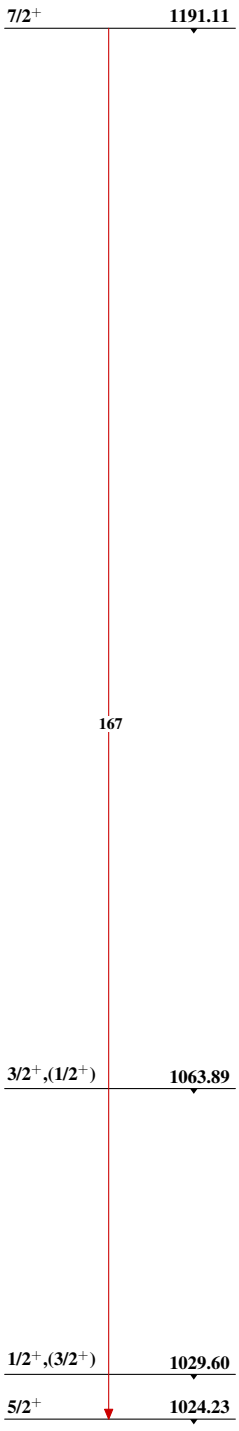
$I_\gamma > 10\% \times I_\gamma^{max}$



$^{113}_{49}In_{64}$

^{113}Cd(p,nγ) 1990Vi09,1976Di03,1974Ki02

Band(A): Suggested members of rotational band with Nilsson Orbit 1/2+(431)



$^{113}_{49}In_{64}$