^{119}Cd β^- decay (2.69 min) 1974Mc09,1976Sc30

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	D. M. Symochko, E. Browne, J. K. Tuli	NDS 110,2945 (2009)	1-Dec-2008

Parent: ^{119}Cd: E=0.0; $J^\pi=1/2^+$; $T_{1/2}$=2.69 min *2*; Q(β^-)=3.73×10^3 *4*; %β^- decay=100.0

Additional information 1.

1974Mc09: ^{235}U(n,F) E=th, on-line mass separation; measured semi, scin γ, ce, semi-semi $\gamma\gamma$; scin-scin $\beta\gamma$(t), $\gamma\gamma$(t).

1976Sc30: Sn(p,spallation), on-line mass separation, chem; measured semi γ, ce, γ(t); semi-semi $\gamma\gamma$.

Others: 1982Al29 (semi-semi $\beta\gamma$, deduced Q(β^-)), 1968Sc24, 1961Gl06.

The decay scheme is that proposed by 1974Mc09, unless otherwise noted.

^{119}In Levels

E(level)†	J^π‡	$T_{1/2}$‡	E(level)†	J^π‡
0	$9/2^+$	2.4 min *1*	1920.75 *12*	$1/2^+,3/2^+$
311.07 *12*	$1/2^-$	18.0 min *3*	2063.98 *19*	$1/2^+,3/2,5/2^-$
603.94 *11*	$3/2^-$	<1.0 ns	2337.83 *11*	$1/2^+,3/2^+$
654.03 *11*	$(3/2)^+$	130 ns *15*	2367.72 *13*	$1/2^+,3/2^+$
788.03 *12*	$1/2^+,3/2^+$	2.00 ns *15*	2524.43 *13*	$1/2^+,3/2^+,5/2^+$
941.33 *9*	$5/2^+$		2554.16 *23*	1/2,3/2,5/2
1044.14? *23*	$5/2^-$		2564.6 *3*	$1/2^+,3/2^+,5/2^+$
1050.08 *9*	$(5/2^+)$		2667.57 *22*	$1/2^+,3/2^+$
1624.71 *19*	1/2,3/2,5/2		2798.4# *5*	$1/2^+,3/2^+,5/2^+$
1769.79? *16*	$1/2^+,3/2,5/2$		2859.29# *23*	$1/2^+,3/2^+$
1806.38 *16*	$1/2^+,3/2,5/2$			

† E(levels) are based on a least-squares fit by the evaluators to E(γ's).

‡ From Adopted Levels.

From 1976Sc30.

β^- radiations

E(decay)	E(level)	Iβ^-†‡	Log *ft*	Comments
(8.7×10^2 *4*)	2859.29	1.7 *6*	5.32 *21*	av Eβ=324 *33*
(9.3×10^2 *4*)	2798.4	1.1 *2*	5.61 *16*	av Eβ=349 *34*
(1.06×10^3 *4*)	2667.57	5 *3*	5.1 *3*	av Eβ=403 *34*
(1.17×10^3 *4*)	2564.6	0.95 *19*	6.01 *14*	av Eβ=447 *35*
(1.18×10^3 *4*)	2554.16	1.62 *22*	5.79 *13*	av Eβ=451 *35*
(1.21×10^3 *4*)	2524.43	2.0 *3*	5.74 *13*	av Eβ=464 *35*
(1.36×10^3 *4*)	2367.72	16.4 *22*	5.02 *12*	av Eβ=532 *35* E(decay): 1500 *240* (1982Al29).
(1.39×10^3 *4*)	2337.83	14.4 *22*	5.11 *12*	av Eβ=545 *36* E(decay): 1840 *110* (1982Al29). Value from weighted average of 1730 *170* and 19300 *150*.
(1.67×10^3 *4*)	2063.98	2.1 *3*	6.24 *11*	av Eβ=666 *36*
(1.81×10^3 *4*)	1920.75	20.5 *19*	5.39 *9*	av Eβ=731 *37* E(decay): 1840 *110* (1982Al29). Value from weighted average of 1730 *170* and 1930 *150*.
(1.92×10^3 *4*)	1806.38	2.5 *3*	6.41 *9*	av Eβ=782 *37*
(1.96×10^3 *4*)	1769.79?	1.51 *24*	6.66 *10*	av Eβ=799 *37*
(2.11×10^3 *4*)	1624.71	1.7 *4*	6.73 *13*	av Eβ=865 *37*
(2.68×10^3 *4*)	1050.08	2.1 *9*	7.06 *20*	av Eβ=1131 *38*
(2.69×10^3 *4*)	1044.14?	2.0 *3*	7.08 *9*	av Eβ=1133 *38*

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^{119}Cd β^- decay (2.69 min) 1974Mc09,1976Sc30 (continued)

β^- radiations (continued)

E(decay)	E(level)	Iβ^-[†][‡]	Log *ft*	Comments
(2.79×10^3 *4*)	941.33	2.1 *4*	7.13 *10*	av Eβ=1181 *38*
(2.94×10^3 *4*)	788.03	6.4 *11*	6.74 *9*	av Eβ=1253 *38*
(3.08×10^3 *4*)	654.03	≤3.0	≥7.1	av Eβ=1316 *38*
(3.13×10^3 *4*)	603.94	5 *4*	7.0 *4*	av Eβ=1339 *38*
(3.42×10^3 *4*)	311.07	≈10	≈6.8	av Eβ=1477 *38* Iβ^-: Estimated by evaluators.

[†] Evaluators estimated Iβ(to 311 level)≈10% from a systematic trend of β^-feedings to the first 1/2$^-$ state of indium from other (1/2$^+$ or 3/2$^+$) cadmium isotopes. 1974Mc09 estimated this feeding at≈40%.

[‡] Absolute intensity per 100 decays.

^{119}Cd β^- decay (2.69 min) 1974Mc09,1976Sc30 (continued)

$\gamma(^{119}In)$

Iγ normalization: from Σ Ti(to g.s.)+Σ Ti(to 311 level)=90 if Iβ(to 311 level)=10%. Other: Iγ normalization=0.25 *12* (1974Mc09).
E(d,F,H) Assignment to ^{119}Cd(2.69-min) or ^{119}Cd(2.20-min) is uncertain.

E_γ[‡]	I_γ[‡c]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[#]	δ	α[†]	Comments
50.2 *1*	0.98 *9*	654.03	$(3/2)^+$	603.94	$3/2^-$	[E1]		1.203	α(K)=1.032 *16*; α(L)=0.1390 *21*; α(M)=0.0267 *4*; α(N+..)=0.00500 *8* α(N)=0.00472 *8*; α(O)=0.000273 *4*
130.8[&] *4*	2.1 *2*	2798.4	$1/2^+,3/2^+,5/2^+$	2667.57	$1/2^+,3/2^+$	[M1,E2]		0.42 *18*	α(K)=0.34 *13*; α(L)=0.07 *4*; α(M)=0.013 *8*; α(N+..)=0.0024 *14* α(N)=0.0023 *14*; α(O)=0.00011 *5* E_γ: originally assigned by 1974Mc09 to Cd(2.20-min) decay.
134.0 *1*	18.0 *13*	788.03	$1/2^+,3/2^+$	654.03	$(3/2)^+$	E2(+M1)	>1.1	0.47 *8*	α(K)exp=0.44 *11* α(K)=0.38 *6*; α(L)=0.079 *16*; α(M)=0.016 *4*; α(N+..)=0.0029 *6* α(N)=0.0027 *6*; α(O)=0.000126 *19* δ: from α(K)exp.
143.2[@] *5*	0.32 *12*	2063.98	$1/2^+,3/2,5/2^-$	1920.75	$1/2^+,3/2^+$				
153.5[@] *3*	0.20 *8*	941.33	$5/2^+$	788.03	$1/2^+,3/2^+$				
184.1 *1*	0.57 *10*	788.03	$1/2^+,3/2^+$	603.94	$3/2^-$				
x245.9[&] *4*	0.5 *1*								
287.6 *3*	1.2 *3*	941.33	$5/2^+$	654.03	$(3/2)^+$				
292.9 *1*	100 *5*	603.94	$3/2^-$	311.07	$1/2^-$	M1,E2		0.032 *5*	α(K)exp=0.028 *8* α(K)=0.028 *4*; α(L)=0.0038 *9*; α(M)=0.00075 *18*; α(N+..)=0.00014 *3* α(N)=0.00013 *3*; α(O)=8.8×10^{-6} *10*
x331.7[&] *4*	0.5 *2*								
337.6 *3*	1.5 *2*	941.33	$5/2^+$	603.94	$3/2^-$				
343.0 *1*	46 *4*	654.03	$(3/2)^+$	311.07	$1/2^-$	E1		0.00574 *8*	α(K)exp<0.007 α=0.00574 *8*; α(K)=0.00500 *7*; α(L)=0.000599 *9*; α(M)=0.0001155 *17*; α(N+..)=2.25×10^{-5} *4* α(N)=2.10×10^{-5} *3*; α(O)=1.502×10^{-6} *21*
x348.3[&] *5*	0.7 *2*								
x355.1 *3*	1.0 *5*								
417.1 *1*	1.4 *2*	2337.83	$1/2^+,3/2^+$	1920.75	$1/2^+,3/2^+$				
441.1[@] *7*	1.1 *2*	1044.14?	$5/2^-$	603.94	$3/2^-$				
446.2 *4*	5.0 *4*	1050.08	$(5/2^+)$	603.94	$3/2^-$				
447.3[@] *5*	0.6 *2*	2367.72	$1/2^+,3/2^+$	1920.75	$1/2^+,3/2^+$				
x473.7[&] *4*	1.1 *2*								
476.7 *3*	2.3 *3*	788.03	$1/2^+,3/2^+$	311.07	$1/2^-$				I_γ: 3.1 *3* (1976Sc30), 0.8 *4* (1974Mc09).

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^{119}Cd β^- decay (2.69 min) 1974Mc09,1976Sc30 (continued)

$\gamma(^{119}In)$ (continued)

E_γ ‡	I_γ ‡c	E_i(level)	J_i^π	E_f	J_f^π	Comments
x494.3& 4	0.5 2					
597.9& 3	1.4 2	2367.72	1/2+,3/2+	1769.79?	1/2+,3/2,5/2	
x709.0 5	1.8 6					
733.0 2	4.3 6	1044.14?	5/2−	311.07	1/2−	
742.8@ 3	1.2 2	2367.72	1/2+,3/2+	1624.71	1/2,3/2,5/2	
x784.7& 3	2.8 4					
828.5 2	2.1 2	1769.79?	1/2+,3/2,5/2	941.33	5/2+	
836.6 2	3.6 5	1624.71	1/2,3/2,5/2	788.03	1/2+,3/2+	I_γ: from 1974Mc09. Other: 1.1 *1* (1976Sc30).
864.8@ 3	1.3 4	1806.38	1/2+,3/2,5/2	941.33	5/2+	
870.6 2	1.4 2	1920.75	1/2+,3/2+	1050.08	(5/2+)	
x902.7 3	2.5 9					
x928.8 6	2.1 1					
x933.9@ 5	0.20 8					
941.2 1	8.6 7	941.33	5/2+	0	9/2+	E_γ: possible doublet (1976Sc30).
970.6 4	2.2 6	1624.71	1/2,3/2,5/2	654.03	(3/2)+	
x981.6& 4	1.6 5					
1014.0@ 3	1.8 4	2063.98	1/2+,3/2,5/2−	1050.08	(5/2+)	
1018.4@ 2	3.3 3	1806.38	1/2+,3/2,5/2	788.03	1/2+,3/2+	
1050.2 1	17.8 14	1050.08	(5/2+)	0	9/2+	
1115.7 2	3.4 5	1769.79?	1/2+,3/2,5/2	654.03	(3/2)+	
1122.5@ 3	0.92 20	2063.98	1/2+,3/2,5/2−	941.33	5/2+	
1132.6 3	2.5 3	1920.75	1/2+,3/2+	788.03	1/2+,3/2+	
1152.4 2	2.3 3	1806.38	1/2+,3/2,5/2	654.03	(3/2)+	
x1222.9@ 5	0.9 3					
1267.3@ 8	0.28 20	1920.75	1/2+,3/2+	654.03	(3/2)+	
1287.8 1	7.3 13	2337.83	1/2+,3/2+	1050.08	(5/2+)	
1316.9 2	24 3	1920.75	1/2+,3/2+	603.94	3/2−	
1317.8 3	3.0 10	2367.72	1/2+,3/2+	1050.08	(5/2+)	E_γ: not resolved from intense 1318γ in authors′ singles spectrum. I_γ: 6.0 *12* (1974Mc09), 2.7 *4* (1976Sc30); Iγ(1317+1318) =34 *2* (1974Mc09), 24 *2* (1976Sc30).
x1332.2@ 4	2.9 4					I_γ: decomposed from a 1332+1334 peak. The other 1334γ component was assigned to ^{119}Cd(2.20-min) decay. Possibility of double escape peak of strong 2356γ in 2.69-min decay was pointed out by 1976Sc30.
1409.7@ 5	1.1 3	2063.98	1/2+,3/2,5/2−	654.03	(3/2)+	
1426.3@ 5	0.92 20	2367.72	1/2+,3/2+	941.33	5/2+	
1474.4a 1	3.6 5	2524.43	1/2+,3/2+,5/2+	1050.08	(5/2+)	
1549.4@ 5	2.5 6	2337.83	1/2+,3/2+	788.03	1/2+,3/2+	
1609.7 1	29.7 19	1920.75	1/2+,3/2+	311.07	1/2−	
1623.0 5	0.48 20	2564.6	1/2+,3/2+,5/2+	941.33	5/2+	

^{119}Cd β^- decay (2.69 min) 1974Mc09,1976Sc30 (continued)

$\gamma(^{119}In)$ (continued)

E_γ[‡]	I_γ[‡c]	E_i(level)	J_i^π	E_f	J_f^π	Comments
1683.9 *2*	2.0 *2*	2337.83	$1/2^+,3/2^+$	654.03	$(3/2)^+$	
1714.0 *2*	6.2 *8*	2367.72	$1/2^+,3/2^+$	654.03	$(3/2)^+$	
1733.8 *1*	22 *5*	2337.83	$1/2^+,3/2^+$	603.94	$3/2^-$	I_γ: 18.9 *11* (1976Sc30), 28.8 *16* (1974Mc09).
1753.3[@] *5*	1.68 *20*	2063.98	$1/2^+,3/2,5/2^-$	311.07	$1/2^-$	
1763.7 *1*	25 *5*	2367.72	$1/2^+,3/2^+$	603.94	$3/2^-$	I_γ: 21.0 *15* (1976Sc30), 30.8 *20* (1974Mc09).
[x]1773.2 *4*	1.8 *6*					
1869.4 *10*	1.1 *4*	2524.43	$1/2^+,3/2^+,5/2^+$	654.03	$(3/2)^+$	
1911.0 *10*	0.5 *3*	2564.6	$1/2^+,3/2^+,5/2^+$	654.03	$(3/2)^+$	
[x]1920.0 *3*	0.7 *2*					
1920.0 *3*	0.8 *3*	2524.43	$1/2^+,3/2^+,5/2^+$	603.94	$3/2^-$	
1950.2[b] *2*	4.4 *5*	2554.16	1/2,3/2,5/2	603.94	$3/2^-$	
[x]1956.6[@] *4*	1.8 *4*					
1960.7[b] *3*	1.6 *3*	2564.6	$1/2^+,3/2^+,5/2^+$	603.94	$3/2^-$	
2026.6 *3*	3.8 *5*	2337.83	$1/2^+,3/2^+$	311.07	$1/2^-$	
2056.5 *3*	6.0 *5*	2367.72	$1/2^+,3/2^+$	311.07	$1/2^-$	
2064.1[&] *5*	1.1 *2*	2667.57	$1/2^+,3/2^+$	603.94	$3/2^-$	
2356.4 *2*	16 *7*	2667.57	$1/2^+,3/2^+$	311.07	$1/2^-$	I_γ: 25.2 *18* (1976Sc30), 11.6 *13* (1974Mc09).
[x]2394.2[@] *10*	1.7 *10*					
[x]2466.7[&] *4*	1.4 *2*					
[x]2525.6[&] *6*	1.0 *3*					Possible doublet (1976Sc30).
2548.2 *2*	4.7 *16*	2859.29	$1/2^+,3/2^+$	311.07	$1/2^-$	I_γ: 6.6 *6* (1976Sc30), 3.3 *5* (1974Mc09).
[x]2594.0[&] *6*	1.2 *4*					
[x]2688.3 *4*	0.28 *12*					
[x]2701.6 *3*	0.7 *2*					
[x]2748.1[&] *7*	0.4 *1*					
[x]2781.1[&] *7*	0.2 *1*					

[†] Additional information 2.
[‡] Eγ and Iγ values are weighted averages of values of 1974Mc09 and 1976Sc30, unless otherwise noted.
[#] From α(K)exp. Values are from Ice(K)/Iγ, normalized to α(K) for transitions with known multipolarities in ^{85}Kr and ^{135}Xe (1974Mc09).
[@] From 1974Mc09 only.
[&] From 1976Sc30 only.
[a] Assigned in 1976Sc30 to ^{119}Cd(2.20-min) decay, but observed in coincidence with a γ ray that belongs to ^{119}Cd(2.69-min) decay (1974Mc09,1976Sc30).
[b] Assigned in 1976Sc30 to ^{119}Cd(2.20-min) decay based on γ(t) for 1950γ+1960γ.
[c] For absolute intensity per 100 decays, multiply by 0.369 *24*.
[x] γ ray not placed in level scheme.

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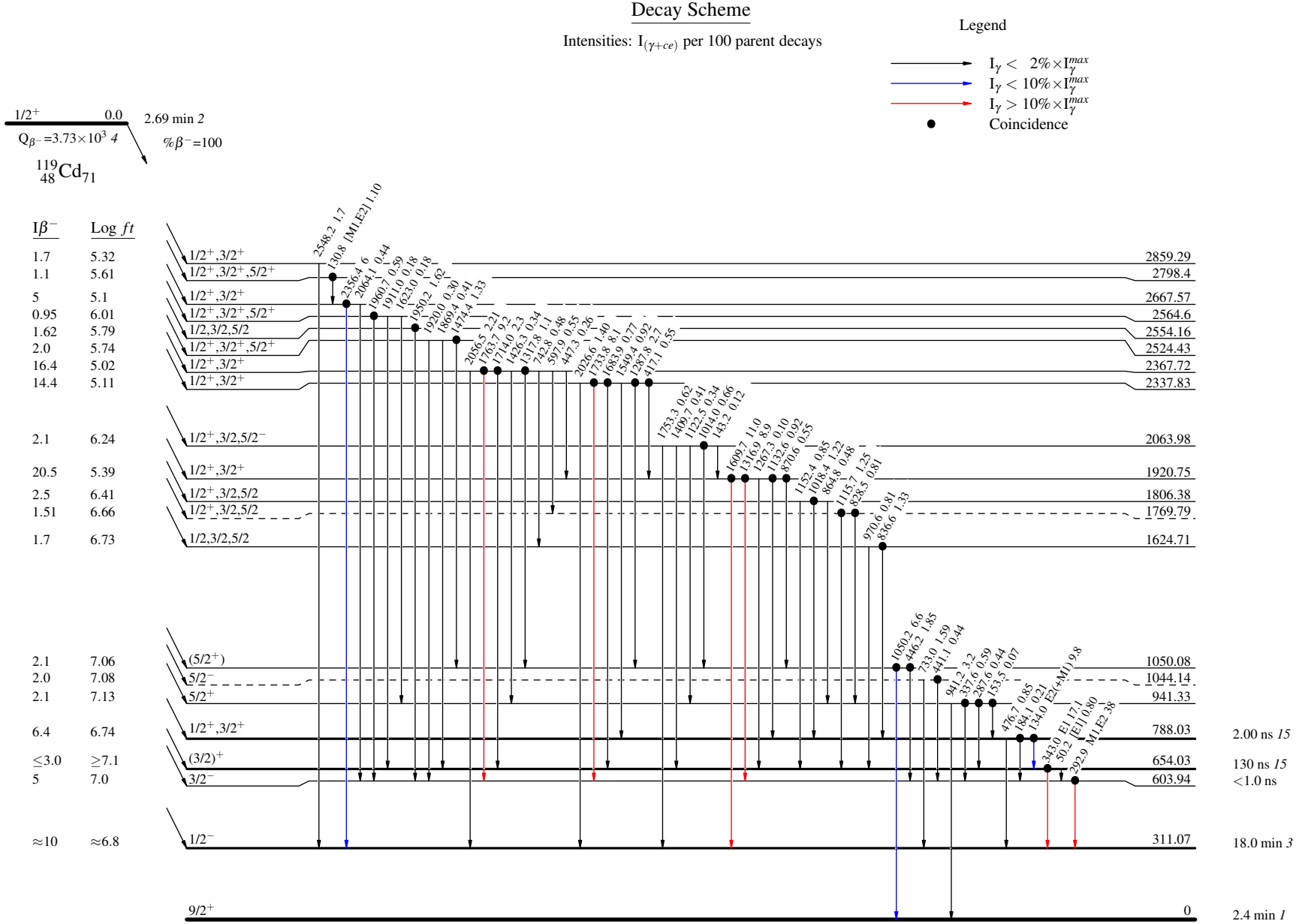
^{119}Cd β^- decay (2.69 min) 1974Mc09,1976Sc30

Decay Scheme

Intensities: $I_{(\gamma+ce)}$ per 100 parent decays



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