^{119}Cd β^- decay (2.20 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=146.54 *11*; J^π=(11/2$^-$); $T_{1/2}$=2.20 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*	1436.42 *9*	7/2$^+$,9/2$^+$
310.81 *21*	1/2$^-$	18.0 min *3*	2021.32 *8*	(9/2$^-$,11/2$^-$)
603.68 *21*	3/2$^-$	<1.0 ns	2104.27# *15*	(9/2,11/2,13/2$^+$)
653.84 *20*	(3/2)$^+$	130 ns *15*	2126.89 *8*	(11/2$^-$)
720.48# *10*	(7/2$^+$)		2359.46 *22*	(9/2,11/2)
787.84 *21*	1/2$^+$,3/2$^+$	2.00 ns *15*	2389.13 *11*	(9/2$^-$,11/2$^-$)
941.35 *9*	5/2$^+$		2422.45 *17*	(9/2$^-$,11/2$^-$)
1025.00 *7*	(11/2$^+$)		2487.14 *12*	(9/2$^-$,11/2$^-$,13/2$^-$)
1142.92 *10*	(11/2$^+$)		2520.3# *5*	(9/2,11/2,13/2$^+$)
1203.69 *7*	(13/2$^+$)		2526.5# *5*	(9/2,11/2,13/2)
1353.00 *10*	(9/2$^+$)		2564.62 *17*	(9/2$^-$,11/2$^-$)
1388.34# *16*	7/2$^-$		2672.17 *23*	(9/2$^-$,11/2$^-$)

† Level energies have been deduced by evaluators from least-squares fit to γ-ray energies. by the evaluators to E(γ's).

‡ From Adopted Levels.

From 1976Sc30.

β^- radiations

E(decay)	E(level)	Iβ^-†	Log *ft*	Comments
(1.20×10^3 *4*)	2672.17	2.1 *6*	5.63 *17*	av Eβ=464 *35*
(1.31×10^3 *4*)	2564.62	2.2 *6*	5.75 *16*	av Eβ=510 *35*
(1.35×10^3 *4*)	2526.5	0.76 *18*	6.25 *15*	av Eβ=527 *35*
(1.36×10^3 *4*)	2520.3	0.95 *22*	6.16 *14*	av Eβ=529 *35*
(1.39×10^3 *4*)	2487.14	7.2 *15*	5.32 *14*	av Eβ=544 *36* E(decay): 1480 *210* (1982Al29).
(1.45×10^3 *4*)	2422.45	7.4 *16*	5.38 *13*	av Eβ=572 *36* E(decay): 1610 *430* (1982Al29).
(1.49×10^3 *4*)	2389.13	10.9 *22*	5.25 *13*	av Eβ=587 *36* E(decay): 1590 *140* (1982Al29). Value is a weighted average of 1500 *230* and 1640 *180*.
(1.52×10^3 *4*)	2359.46	2.4 *7*	5.94 *16*	av Eβ=600 *36*
(1.75×10^3 *4*)	2126.89	19 *4*	5.28 *12*	av Eβ=704 *36* E(decay): 1730 *150* (1982Al29). Value is a weighted average of 1730 *200* and 1740 *240*.
(1.77×10^3 *4*)	2104.27	4.3 *9*	5.95 *12*	av Eβ=714 *37*
(1.86×10^3 *4*)	2021.32	22 *5*	5.31 *13*	av Eβ=751 *37* E(decay): 1820 *190* (1982Al29). Authors reported the 2121γ as gating γ for this β^-component, but that may be a misprint of 2021 keV.

Continued on next page (footnotes at end of table)

^{119}Cd β^- decay (2.20 min) 1974Mc09,1976Sc30 (continued)

β^- radiations (continued)

E(decay)	E(level)	Iβ^-[†]	Log *ft*	Comments
(2.44×10^3 *4*)	1436.42	0.9 *6*	7.2 *3*	av Eβ=1019 *37*
(2.49×10^3 *4*)	1388.34	0.9 *5*	7.21 *25*	av Eβ=1042 *38*
(2.52×10^3 *4*)	1353.00	0.9 *4*	7.23 *21*	av Eβ=1058 *38*
(2.67×10^3 *4*)	1203.69	≤1.6	≥7.1	av Eβ=1127 *38*
(2.73×10^3 *4*)	1142.92	1.2 *7*	7.2 *3*	av Eβ=1156 *38*
(2.85×10^3 *4*)	1025.00	≤3.3	≥6.9	av Eβ=1211 *38*
(3.16×10^3 *4*)	720.48	≤1.4	≥7.4	av Eβ=1353 *38*
(3.88×10^3 *4*)	0	≤30	≥6.5	av Eβ=1693 *38* Iβ^-: Direct β^- feeding of≤30% has been estimated from a β^- spectrum together with the ^{119}Cd/119mcd population ratio from ^{119}Ag β^- decay (unpublished research from Y. Kawase et al., quoted in 1974Mc09).

[†] Absolute intensity per 100 decays.

^{119}Cd β^- decay (2.20 min) 1974Mc09,1976Sc30 (continued)

$\gamma(^{119}In)$

Iγ normalization: From Σ Ti(to g.s.)+Σ Ti(to 311 level)=85% 15.
See ^{119}Cd(2.69-min) decay for transitions tentatively assigned to that decay but which might belong to ^{119}Cd(2.20-min) decay. Evaluators reassigned the 130γ in 1974Mc09 to the decay scheme from ^{119}Cd(2.69-min).

E_γ[‡]	I_γ[‡c]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[#]	δ	α[†]	$I_{(\gamma+ce)}$[c]	Comments
50.2[b] *1*	0.0082 *5*	653.84	$(3/2)^+$	603.68	$3/2^-$	[E1]		1.203	0.018 *1*	ce(K)/(γ+ce)=0.469 *5*; ce(L)/(γ+ce)=0.0631 *11*; ce(M)/(γ+ce)=0.01214 *21*; ce(N+)/(γ+ce)=0.00227 *4* ce(N)/(γ+ce)=0.00214 *4*; ce(O)/(γ+ce)=0.0001237 *22* $I_{(\gamma+ce)}$,Iγ: from Ti(to 654 level)=0.42 *9*, γ-branching, and α.
98.0 *2*	3.1 *2*	2487.14	$(9/2^-,11/2^-,13/2^-)$	2389.13	$(9/2^-,11/2^-)$					
105.6 *1*	13.2 *13*	2126.89	$(11/2^-)$	2021.32	$(9/2^-,11/2^-)$	[M1,E2]		0.9 *5*		α(K)=0.7 *3*; α(L)=0.15 *11*; α(M)=0.031 *22*; α(N+..)=0.006 *4* α(N)=0.005 *4*; α(O)=0.00023 *11*
134.0[b] *1*	0.039[b] *8*	787.84	$1/2^+,3/2^+$	653.84	$(3/2)^+$	E2(+M1)	>1.1	0.47 *8*		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*
153.5[b] *3*	0.05[b] *1*	941.35	$5/2^+$	787.84	$1/2^+,3/2^+$	[M1,E2]		0.25 *10*		α(K)=0.20 *7*; α(L)=0.036 *19*; α(M)=0.007 *4*; α(N+..)=0.0013 *7* α(N)=0.0012 *7*; α(O)=6.7×10^{-5} *23*
178.6 *1*	3.7 *5*	1203.69	$(13/2^+)$	1025.00	$(11/2^+)$					
284.9 *2*	3.1 *4*	2389.13	$(9/2^-,11/2^-)$	2104.27	$(9/2,11/2,13/2^+)$					
287.6[b] *3*	0.31[b] *8*	941.35	$5/2^+$	653.84	$(3/2)^+$					
292.9[b] *1*	0.45[b] *6*	603.68	$3/2^-$	310.81	$1/2^-$	M1,E2		0.032 *5*	0.46 *6*	ce(K)/(γ+ce)=0.027 *4*; ce(L)/(γ+ce)=0.0037 *9*; ce(M)/(γ+ce)=0.00072 *17*; ce(N+)/(γ+ce)=0.00014 *3* ce(N)/(γ+ce)=0.00013 *3*; ce(O)/(γ+ce)=8.6×10^{-6} *10*
304.6[&e] *4*	0.7 *3*	1025.00	$(11/2^+)$	720.48	$(7/2^+)$					
[x]318.0[&] *3*	1.7 *3*									
337.6[b] *3*	0.39[b] *5*	941.35	$5/2^+$	603.68	$3/2^-$					
343.0[b] *1*	0.40[b] *9*	653.84	$(3/2)^+$	310.81	$1/2^-$	E1			0.40 *9*	ce(K)/(γ+ce)=0.00497 *7*; ce(L)/(γ+ce)=0.000595 *9*; ce(M)/(γ+ce)=0.0001148 *16*; ce(N+)/(γ+ce)=2.24×10^{-5} *4*

$^{119}_{49}In_{70}$-3

^{119}Cd β^- decay (2.20 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
						ce(N)/(γ+ce)=2.09×10^{-5} *3*; ce(O)/(γ+ce)=1.493×10^{-6} *21* $I_{(\gamma+ce)}$,I_γ: see 50.2γ.
x355.1 *3*	1.3 *5*					
360.3 *2*	4.1 *6*	2487.14	(9/2$^-$,11/2$^-$,13/2$^-$)	2126.89	(11/2$^-$)	
363.6[&] *4*	2.6 *3*	1388.34	7/2$^-$	1025.00	(11/2$^+$)	
411.5[d] *1*	3.0[d] *2*	1353.00	(9/2$^+$)	941.35	5/2$^+$	
411.5[d] *1*	4.6[d] *7*	1436.42	7/2$^+$,9/2$^+$	1025.00	(11/2$^+$)	
422.4 *1*	38.2 *22*	1142.92	(11/2$^+$)	720.48	(7/2$^+$)	
437.7[@] *6*	1.2 *6*	2564.62	(9/2$^-$,11/2$^-$)	2126.89	(11/2$^-$)	
585.0 *1*	19.7 *14*	2021.32	(9/2$^-$,11/2$^-$)	1436.42	7/2$^+$,9/2$^+$	
633.0[d] *2*	2.9[d] *9*	1353.00	(9/2$^+$)	720.48	(7/2$^+$)	I_γ: divided from 5.7 *17* of weighted av of 7.7 *8* (1976Sc30) and 1.2 *2* (1974Mc09). Value from 1974Mc09 was given for a composite peak.
633.0[d] *2*	2.8[d] *16*	2021.32	(9/2$^-$,11/2$^-$)	1388.34	7/2$^-$	
667.9[d] *3*	1.0[d] *5*	1388.34	7/2$^-$	720.48	(7/2$^+$)	I_γ: divided from 1.9 *8* of weighted av of 1.5 *5* (1976Sc30) and 3.3 *9* (1974Mc09).
667.9[d] *3*	0.9[d] *5*	2021.32	(9/2$^-$,11/2$^-$)	1353.00	(9/2$^+$)	
x688.3 *5*	3.0 *4*					
x709.0[@a] *5*	4.9 *16*					
720.7 *2*	72 *4*	720.48	(7/2$^+$)	0	9/2$^+$	
817.6 *1*	5.4 *4*	2021.32	(9/2$^-$,11/2$^-$)	1203.69	(13/2$^+$)	
878.3 *3*	1.4 *3*	2021.32	(9/2$^-$,11/2$^-$)	1142.92	(11/2$^+$)	
x902.7 *3*	4.5 *10*					I_γ: from 1974Mc09.
923.2 *1*	27.7 *17*	2126.89	(11/2$^-$)	1203.69	(13/2$^+$)	
941.2[b] *1*	2.24[b] *19*	941.35	5/2$^+$	0	9/2$^+$	E_γ: possible doublet (1976Sc30).
983.9 *2*	3.9 *7*	2126.89	(11/2$^-$)	1142.92	(11/2$^+$)	
996.3 *2*	6.6 *16*	2021.32	(9/2$^-$,11/2$^-$)	1025.00	(11/2$^+$)	I_γ: 10.2 *18* (1976Sc30), 5.9 *8* (1974Mc09).
x999.7[@] *2*	3.0 *6*					
1025.0 *1*	100 *5*	1025.00	(11/2$^+$)	0	9/2$^+$	I_γ: uncertainty from 1974Mc09.
1035.1[@] *10*	3.8 *7*	2389.13	(9/2$^-$,11/2$^-$)	1353.00	(9/2$^+$)	
1101.9 *1*	39 *2*	2126.89	(11/2$^-$)	1025.00	(11/2$^+$)	
1142.7[&] *4*	3.7 *5*	1142.92	(11/2$^+$)	0	9/2$^+$	
1185.5 *2*	11.7 *8*	2389.13	(9/2$^-$,11/2$^-$)	1203.69	(13/2$^+$)	
1203.7 *1*	54 *3*	1203.69	(13/2$^+$)	0	9/2$^+$	
1217.1[@] *12*	0.5 *4*	2359.46	(9/2,11/2)	1142.92	(11/2$^+$)	
x1222.9[@a] *5*	2.0 *7*					
1236.2[@] *10*	1.0 *4*	2672.17	(9/2$^-$,11/2$^-$)	1436.42	7/2$^+$,9/2$^+$	
1279.5[@] *5*	1.0 *4*	2422.45	(9/2$^-$,11/2$^-$)	1142.92	(11/2$^+$)	
1334.2 *3*	8.5 *24*	2359.46	(9/2,11/2)	1025.00	(11/2$^+$)	I_γ: 7.5 *8* (1976Sc30), 14.3 *18* (1974Mc09).
1344.2 *1*	27.1 *17*	2487.14	(9/2$^-$,11/2$^-$,13/2$^-$)	1142.92	(11/2$^+$)	

^{119}Cd β^- decay (2.20 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
1352.9@ 2	3.3 7	1353.00	(9/2$^+$)	0	9/2$^+$	
1360.8 2	6.0 9	2564.62	(9/2$^-$,11/2$^-$)	1203.69	(13/2$^+$)	
1364.1 2	21 3	2389.13	(9/2$^-$,11/2$^-$)	1025.00	(11/2$^+$)	I_γ: 19.4 17 (1976Sc30), 25.9 28 (1974Mc09).
1388.1& 4	3.5 5	1388.34	7/2$^-$	0	9/2$^+$	
1397.1@ 10	5 3	2422.45	(9/2$^-$,11/2$^-$)	1025.00	(11/2$^+$)	
1436.5 2	20.5 18	1436.42	7/2$^+$,9/2$^+$	0	9/2$^+$	
1468.0@ 4	4.2 10	2672.17	(9/2$^-$,11/2$^-$)	1203.69	(13/2$^+$)	
1528.3@ 8	2.1 10	2672.17	(9/2$^-$,11/2$^-$)	1142.92	(11/2$^+$)	
1539.9 3	3.3 9	2564.62	(9/2$^-$,11/2$^-$)	1025.00	(11/2$^+$)	
x1624.5@ 4	1.6 4					
x1633.6@ 4	1.4 4					
1639.2@ 3	2.2 5	2359.46	(9/2,11/2)	720.48	(7/2$^+$)	
1668.5 2	12.3 10	2389.13	(9/2$^-$,11/2$^-$)	720.48	(7/2$^+$)	
1701.9 2	11.3 8	2422.45	(9/2$^-$,11/2$^-$)	720.48	(7/2$^+$)	
x1773.2@a 4	5.2 11					
1806.0& 4	3.6 5	2526.5	(9/2,11/2,13/2)	720.48	(7/2$^+$)	
x1845.7@ 4	2.2 5					
2021.3 2	91 6	2021.32	(9/2$^-$,11/2$^-$)	0	9/2$^+$	
2104.3 2	23.6 14	2104.27	(9/2,11/2,13/2$^+$)	0	9/2$^+$	
2389.3 3	2.9 4	2389.13	(9/2$^-$,11/2$^-$)	0	9/2$^+$	
x2394.2@a 10	5 3					
2422.6 3	18.1 15	2422.45	(9/2$^-$,11/2$^-$)	0	9/2$^+$	
2520.3 5	4.5 6	2520.3	(9/2,11/2,13/2$^+$)	0	9/2$^+$	
x2527.4@a 12	4 3					
2672.5 3	2.8 3	2672.17	(9/2$^-$,11/2$^-$)	0	9/2$^+$	

† Additional information 2.
‡ Eγ and Iγ values are weighted averages of values given in 1974Mc09 and 1976Sc30, unless otherwise noted. Intensities of multiply-placed transitions are divided based on γ-ray intensity balance.
# From ^{119}Cd(2.69-min) β^- decay.
@ From 1974Mc09.
& From 1976Sc30.
a Isomeric assignment uncertain.
b Eγ from ^{119}Cd(2.69-min) decay. Iγ from intensity balance and branching ratios in ^{119}Cd(2.69-min) decay.
c For absolute intensity per 100 decays, multiply by 0.21 4.
d Multiply placed with intensity suitably divided.

γ(^{119}In) (continued)

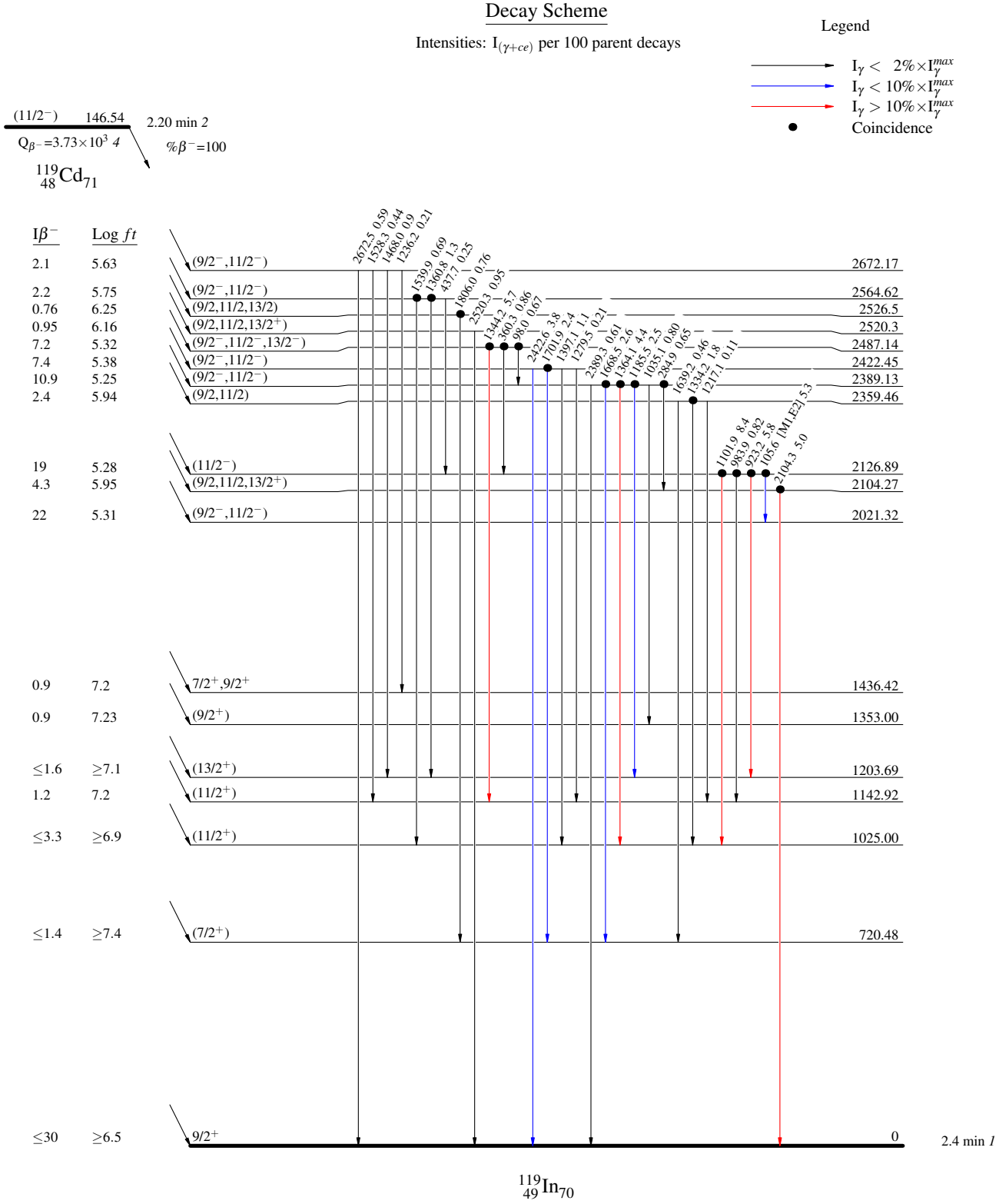
[e] Placement of transition in the level scheme is uncertain.
[x] γ ray not placed in level scheme.

$^{119}_{49}In_{70}$-6

^{119}Cd β^- decay (2.20 min) 1974Mc09,1976Sc30

Decay Scheme

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



^{119}Cd β^- decay (2.20 min) 1974Mc09,1976Sc30

Decay Scheme (continued)

Intensities: $I_{(\gamma+ce)}$ per 100 parent decays
@ Multiply placed: intensity suitably divided

Legend
- $I_\gamma < 2\% \times I_\gamma^{max}$
- $I_\gamma < 10\% \times I_\gamma^{max}$
- $I_\gamma > 10\% \times I_\gamma^{max}$
- γ Decay (Uncertain)
- Coincidence