^{149}La β^- decay (1.091 s) 2002Sy01

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	Balraj Singh and Jun Chen	NDS 185, 2 (2022)	23-Aug-2022

Parent: ^{149}La: E=0.0; J$^\pi$=(3/2); $T_{1/2}$=1.091 s *34*; Q(β^-)=6.45×10^3 *20*; %β^- decay=100.0
^{149}La-J$^\pi$,$T_{1/2}$: From ^{149}La Adopted Levels.
^{149}La-Q(β^-): From 2021Wa16.
2002Sy01 (also 2007SyZZ thesis, 2002SyZY): measured Eγ, Iγ, γγ-coin using two Compton-suppressed NORDBALL Ge spectrometers, and a high-purity x-ray detector (LEPS) for low-energy photons at Studsvik.
2003Sy01 (same group as 2002Sy01): measured βγγ(t), half-life of the 133.5 level, and intrinsic electric dipole moments.
Others:
1987MaZY: $T_{1/2}$, eight γ rays reported.
$T_{1/2}$ and production of ^{149}La: 1993Ru01, 1986ReZU (also 1986Wa17), 1979En02.
Q(β^-) measurement by TAGS method: 2008HaZO.
All data are from 2002Sy01 unless otherwise stated.
Total decay energy deposit of 6.40 MeV *70* calculated by RADLIST code is in agreement with the expected value of 6.45 MeV *20* (2021Wa16). However the decay scheme is considered as incomplete in view of a large gap of about 4 MeV between Q(β^-) value and the highest known populated level at 1868.8 keV.

^{149}Ce Levels

E(level)[†]	J$^\pi$[‡]	$T_{1/2}$[‡#]	Comments
0.0[@]	(3/2$^-$)	5.12 s *25*	
55.10[@] *7*	(5/2$^-$)		
133.48[&] *7*	(3/2$^+$)	0.60 ns *10*	
142.60[&] *7*	(5/2$^+$)		
147.70[@] *10*	(7/2$^-$)		
187.24 *18*	(3/2$^-$,5/2,7/2$^-$)		J$^\pi$: 2002Sy01 give (3/2,5/2).
190.94[&] *13*	(7/2$^+$)		
245.41[a] *7*	(3/2$^-$)	≤0.12 ns	
289.00 *12*	(7/2$^-$)		
305.53[a] *11*	(5/2$^-$)		
391.26[a] *18*	(7/2$^-$)		
433.25 *17*			
444.10 *12*			
459.76 *17*			
557.40 *20*			
575.2 *4*			
605.10 *22*			
615.4 *3*			
630.6 *3*			
638.9 *3*			
654.8 *3*			
661.7 *7*			
694.6 *4*			
760.3 *5*			
826.1 *5*			
1791.2 *5*			
1842.1 *7*			
1868.8 *10*			
4343+x			S(n)(^{149}Ce)=4343 *15* (2021Wa16). x<[Q(β^-)−S(n)] i.e. x<2107 *200*. This represents a range of unobserved levels that subsequently decay to ^{148}Ba via one-neutron emission.

Continued on next page (footnotes at end of table)

^{149}La β^- decay (1.091 s) 2002Sy01 (continued)

^{149}Ce Levels (continued)

† From least-squares fit to Eγ data.
‡ From the Adopted Levels.
# From $\beta\gamma\gamma$(t) (2003Sy01).
@ Band(A): K^π=3/2$^-$ band.
& Band(B): Decoupled band.
a Band(C): K^π=3/2$^-$ band.

β^- radiations

E(decay)	E(level)	Iβ^-[†#]	Log *ft*[‡]	Comments
(1.1×10^3[&] *11*)	4343+x	1.41 *34*		Iβ^-: %β^-n=1.41 *34* (from ^{149}La Adopted Levels).
(4.58×10^3 *20*)	1868.8	0.3	6.8	av Eβ=1963 *94*
(4.61×10^3 *20*)	1842.1	0.3	6.8	av Eβ=1975 *94* Iβ^-: 0.7 (2002Sy01); revised to 0.3 in 2007SyZZ.
(4.66×10^3 *20*)	1791.2	0.8	6.4	av Eβ=1999 *94* Iβ^-: 0.8 (2002Sy01); revised to 0.9 in 2007SyZZ.
(5.62×10^3 *20*)	826.1	0.3	7.2	av Eβ=2450 *94* Iβ^-: 0.7 (2002Sy01); revised to 0.3 in 2007SyZZ.
(5.69×10^3 *20*)	760.3	0.5	7.0	av Eβ=2481 *94*
(5.76×10^3 *20*)	694.6	0.2	7.4	av Eβ=2511 *94*
(5.79×10^3 *20*)	661.7	0.1	7.7	av Eβ=2527 *94*
(5.80×10^3 *20*)	654.8	1.2	6.7	av Eβ=2530 *94*
(5.81×10^3 *20*)	638.9	0.4	7.1	av Eβ=2538 *94*
(5.82×10^3 *20*)	630.6	0.7	6.9	av Eβ=2541 *94*
(5.83×10^3 *20*)	615.4	0.4	7.1	av Eβ=2548 *94*
(5.84×10^3 *20*)	605.10	1.2	6.7	av Eβ=2553 *94* Iβ^-: 1.0 (2002Sy01); revised to 1.3 in 2007SyZZ.
(5.87×10^3 *20*)	575.2	0.7	6.9	av Eβ=2567 *94*
(5.89×10^3 *20*)	557.40	1.1	6.7	av Eβ=2576 *94* Iβ^-: 1.2 (2002Sy01).
(5.99×10^3 *20*)	459.76	1.8	6.5	av Eβ=2621 *94* Iβ^-: 2.0 (2002Sy01).
(6.01×10^3 *20*)	444.10	1.5	6.6	av Eβ=2629 *94* Iβ^-: 1.6 (2002Sy01).
(6.02×10^3 *20*)	433.25	1.1	6.8	av Eβ=2634 *94* Iβ^-: 1.2 (2002Sy01).
(6.06×10^3 *20*)	391.26	0.6	7.0	av Eβ=2653 *94* Iβ^-: 0.5 (2002Sy01).
(6.14×10^3 *20*)	305.53	7.0	6.0	av Eβ=2693 *94* Iβ^-: 7.9 (2002Sy01).
(6.16×10^3 *20*)	289.00	1.7	6.6	av Eβ=2701 *94* Iβ^-: 1.9 (2002Sy01).
(6.20×10^3 *20*)	245.41	9.3	5.9	av Eβ=2721 *94* Iβ^-: 11.5 (2002Sy01).
(6.26×10^3 *20*)	190.94	2.3	6.5	av Eβ=2747 *94* Iβ^-: 2.0 (2002Sy01).
(6.26×10^3 *20*)	187.24	4.2	6.3	av Eβ=2749 *94* Iβ^-: 4.5 (2002Sy01); revised to 4.6 in 2007SyZZ.
(6.30×10^3[@] *20*)	147.70	<1.8	>6.6	av Eβ=2767 *94* Iβ^-: 1.6 (2002Sy01).
(6.31×10^3 *20*)	142.60	7.5	6.0	av Eβ=2769 *94* Iβ^-: 7.9 (2002Sy01).
(6.32×10^3 *20*)	133.48	7.2	6.0	av Eβ=2774 *94*

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^{149}La β^- decay (1.091 s) 2002Sy01 (continued)

β^- radiations (continued)

E(decay)	E(level)	$I\beta^-$ †#	Log ft ‡	Comments
				$I\beta^-$: 5.6 (2002Sy01); but revised to 6.1 in 2007SyZZ.
(6.39×10^3 *20*)	55.10	16	5.7	av $E\beta$=2810 *94* $I\beta^-$: ≈12 (2002Sy01).
(6.45×10^3 *20*)	0.0	≈30	≈5.5	av $E\beta$=2836 *94* $I\beta^-$: estimated by 2002Sy01 from Alaga rule, assuming spin of 3/2 or 5/2 for the parent level, although as 2002Sy01 mention that this rule is not strictly valid for K-mixed states. For comparison, log ft=5.7 for ^{147}La to ^{147}Ce g.s. Other: $I\beta^-$<12 if first forbidden decay (log ft>5.9), as for ^{141}La decay to ^{141}Ce g.s.

† Deduced by the evaluators from intensity balance, using theoretical conversion coefficients for assumed multipolarity assignments. Values given by 2002Sy01 and some of the revised values (2002SyZY) are given under comments, when different. Since there is a gap of about 4 MeV between Q value and the last known populated level at 1868.8, there remains the likelihood of missing transitions and levels above 1868.8. Thus all the $I\beta$ values, especially weak feedings (<5% or so), should be treated as upper limits; and associated Log ft values as lower limits.
‡ Lower limits for listed $I\beta$ values.
# Absolute intensity per 100 decays.
@ Existence of this branch is questionable.
& Estimated for a range of levels.

$\gamma(^{149}Ce)$

Iγ normalization: Feeding to g.s. assumed as ≈30%; and $\%\beta^-$n=1.41 *34* from ^{149}La Adopted Levels. Due to incomplete decay scheme and possible unobserved transitions, this normalization is considered as approximate.

E_γ	I_γ [†a]	E_i(level)	J_i^π	E_f	J_f^π	Mult. [&]	δ [&]	α [b]	$I_{(\gamma+ce)}$ [a]	Comments
(9.1)		142.60	(5/2$^+$)	133.48	(3/2$^+$)				20.2 *34*	E_γ: from level-energy difference; transition required from $\gamma\gamma$ coin data. $I_{(\gamma+ce)}$: from 2002Sy01, deduced from intensity balance of γ-transitions observed in the singles and coincidence spectra.
48.4 *2*	0.7 *2*	190.94	(7/2$^+$)	142.60	(5/2$^+$)	[M1+E2]		20 *11*		α(K)=7.2 *10*; α(L)=10 *9*; α(M)=2.3 *21* α(N)=0.5 *4*; α(O)=0.07 *6*; α(P)=5.0×10^{-4} *14*
55.1 *1*	27.6[#] *25*	55.10	(5/2$^-$)	0.0	(3/2$^-$)	M1(+E2)	≤0.42	7.5 *9*		α(K)exp=5.3 *6* α(K)=5.61 *9*; α(L)=1.5 *7*; α(M)=0.33 *16* α(N)=0.071 *35*; α(O)=0.011 *5*; α(P)=0.000426 *13*
78.4 *1*	9.3[@] *14*	133.48	(3/2$^+$)	55.10	(5/2$^-$)	E1		0.474 *7*		α(exp)≤1.45 α(K)=0.401 *6*; α(L)=0.0576 *8*; α(M)=0.01200 *17* α(N)=0.00261 *4*; α(O)=0.000402 *6*; α(P)=2.337×10^{-5} *34* Intrinsic dipole moment D_0=0.034 *7* e fm (2003Sy01).
87.5 *1*	11.3[@] *20*	142.60	(5/2$^+$)	55.10	(5/2$^-$)	E1		0.351 *5*		α(exp)≤1.35 α(K)=0.298 *4*; α(L)=0.0421 *6*; α(M)=0.00878 *13* α(N)=0.001913 *27*; α(O)=0.000296 *4*; α(P)=1.761×10^{-5} *25*
92.6 *1*	10.0[@] *13*	147.70	(7/2$^-$)	55.10	(5/2$^-$)	E2(+M1)		2.1 *6*		α(exp)≥1.71 α(K)=1.39 *13*; α(L)=0.5 *4*; α(M)=0.12 *9* α(N)=0.026 *18*; α(O)=0.0038 *25*; α(P)=8.8×10^{-5} *9* α: for E2.
102.8 *1*	4.7 *13*	245.41	(3/2$^-$)	142.60	(5/2$^+$)	[E1]		0.2253 *32*		α(K)=0.1917 *27*; α(L)=0.0267 *4*; α(M)=0.00555 *8* α(N)=0.001212 *17*; α(O)=0.0001886 *27*; α(P)=1.160×10^{-5} *16* Intrinsic dipole moment D_0≥0.045 e fm (2003Sy01).
112.0 *2*	15.3[#] *14*	245.41	(3/2$^-$)	133.48	(3/2$^+$)	[E1]		0.1779 *26*		α(K)=0.1515 *22*; α(L)=0.02091 *31*; α(M)=0.00435 *6* α(N)=0.000951 *14*; α(O)=0.0001485 *22*; α(P)=9.27×10^{-6} *14* Intrinsic dipole moment D_0≥0.058 e fm (2003Sy01).
114.6 *3*	3.3[#] *3*	305.53	(5/2$^-$)	190.94	(7/2$^+$)	[E1]		0.1670 *26*		α(K)=0.1423 *22*; α(L)=0.01959 *31*; α(M)=0.00408 *6* α(N)=0.000892 *14*; α(O)=0.0001393 *22*; α(P)=8.73×10^{-6} *14*

$\gamma(^{149}Ce)$ (continued)

E_γ	I_γ[†a]	E_i(level)	J^π_i	E_f	J^π_f	Mult.[&]	α[b]	Comments
								α(O)=0.0001393 22; α(P)=8.73×10^{-6} 14
132.2 4	9.0[#] 13	187.24	(3/2$^-$,5/2,7/2$^-$)	55.10	(5/2$^-$)	[D,E2]	0.44 33	
133.5 1	100.0[#] 34	133.48	(3/2$^+$)	0.0	(3/2$^-$)	[E1]	0.1096 16	α(K)=0.0936 13; α(L)=0.01273 18; α(M)=0.00265 4 α(N)=0.000580 8; α(O)=9.11×10^{-5} 13; α(P)=5.86×10^{-6} 8 Intrinsic dipole moment D_0=0.041 5 e fm (2003Sy01).
135.8 2	7.5 9	190.94	(7/2$^+$)	55.10	(5/2$^-$)	[E1]	0.1046 15	α(N)=0.000553 8; α(O)=8.68×10^{-5} 13; α(P)=5.60×10^{-6} 8 α(K)=0.0893 13; α(L)=0.01213 18; α(M)=0.00252 4
141.3 6	7.5[#] 9	289.00	(7/2$^-$)	147.70	(7/2$^-$)	[M1+E2]	0.53 8	α(K)=0.401 22; α(L)=0.10 5; α(M)=0.021 11 α(N)=0.0046 23; α(O)=6.9×10^{-4} 30; α(P)=2.67×10^{-5} 27
142.6 1	50.2[#] 20	142.60	(5/2$^+$)	0.0	(3/2$^-$)	[E1]	0.0914 13	α(K)=0.0781 11; α(L)=0.01057 15; α(M)=0.002200 31 α(N)=0.000482 7; α(O)=7.58×10^{-5} 11; α(P)=4.93×10^{-6} 7
147.7 2	4.1[#] 9	147.70	(7/2$^-$)	0.0	(3/2$^-$)	[E2]	0.520 8	α(K)=0.366 5; α(L)=0.1203 18; α(M)=0.0265 4 α(N)=0.00571 9; α(O)=0.000826 12; α(P)=2.109×10^{-5} 31
154.2[‡] 2	3.6 22	459.76		305.53	(5/2$^-$)	[D,E2]	0.26 19	
157.8 2	6.8 11	305.53	(5/2$^-$)	147.70	(7/2$^-$)	[M1+E2]	0.37 4	α(K)=0.288 10; α(L)=0.065 27; α(M)=0.014 6 α(N)=0.0030 13; α(O)=4.6×10^{-4} 17; α(P)=1.95×10^{-5} 21
162.9 3	5.3[#] 13	305.53	(5/2$^-$)	142.60	(5/2$^+$)	[E1]	0.0634 9	α(N)=0.000333 5; α(O)=5.25×10^{-5} 8; α(P)=3.48×10^{-6} 5 α(K)=0.0543 8; α(L)=0.00729 11; α(M)=0.001516 23
172.1 3	7.6[@] 17	305.53	(5/2$^-$)	133.48	(3/2$^+$)	[E1]	0.0546 8	α(K)=0.0467 7; α(L)=0.00625 9; α(M)=0.001301 19 α(N)=0.000286 4; α(O)=4.52×10^{-5} 7; α(P)=3.01×10^{-6} 4
187.2 2	20.9[#] 12	187.24	(3/2$^-$,5/2,7/2$^-$)	0.0	(3/2$^-$)	[D,E2]	0.13 9	
190.3 2	12.1[#] 10	245.41	(3/2$^-$)	55.10	(5/2$^-$)	[M1+E2]	0.206 11	α(K)=0.1652 29; α(L)=0.033 10; α(M)=0.0070 23 α(N)=0.0015 5; α(O)=2.3×10^{-4} 6; α(P)=1.14×10^{-5} 15
198.7 1	7.7 22	444.10		245.41	(3/2$^-$)	[D,E2]	0.11 7	
200.3[‡] 2	1.3 3	391.26	(7/2$^-$)	190.94	(7/2$^+$)	[E1]	0.0362 5	α(K)=0.0310 4; α(L)=0.00411 6; α(M)=0.000856 12 α(N)=0.0001882 27; α(O)=2.98×10^{-5} 4; α(P)=2.029×10^{-6} 29
214.5[‡] 5	1.3 4	459.76		245.41	(3/2$^-$)	[D,E2]	0.09 6	
233.9 1	2.5 4	289.00	(7/2$^-$)	55.10	(5/2$^-$)	[M1+E2]	0.1103 21	α(K)=0.090 5; α(L)=0.0159 31; α(M)=0.0034 7 α(N)=0.00074 15; α(O)=0.000115 19; α(P)=6.4×10^{-6} 10
243.0[‡] 9	0.7 2	433.25		190.94	(7/2$^+$)	[D,E2]	0.06 4	
245.4 1	42 8	245.41	(3/2$^-$)	0.0	(3/2$^-$)	[M1+E2]	0.0956 29	α(K)=0.078 6; α(L)=0.0135 23; α(M)=0.0029 5 α(N)=0.00063 11; α(O)=9.8×10^{-5} 13; α(P)=5.6×10^{-6} 9
246.1[‡] 8	1.8 9	433.25		187.24	(3/2$^-$,5/2,7/2$^-$)	[D,E2]	0.06 4	
248.5 4	1.1 3	391.26	(7/2$^-$)	142.60	(5/2$^+$)	[E1]	0.02033 30	α(K)=0.01744 26; α(L)=0.002294 34; α(M)=0.000477 7 α(N)=0.0001051 15; α(O)=1.674×10^{-5} 25; α(P)=1.165×10^{-6} 17
250.4 8	5.1 8	305.53	(5/2$^-$)	55.10	(5/2$^-$)	[M1+E2]	0.090 4	α(K)=0.074 6; α(L)=0.0127 20; α(M)=0.0027 5 α(N)=0.00059 10; α(O)=9.2×10^{-5} 12; α(P)=5.2×10^{-6} 9

γ(^{149}Ce) (continued)

E_γ	I_γ [†a]	E_i(level)	J_i^π	E_f	J_f^π	Mult. [&]	α [b]	Comments
290.5 *3*	0.6 *2*	433.25		142.60	(5/2$^+$)	[D,E2]	0.038 *24*	
299.8 *2*	4.7 *6*	433.25		133.48	(3/2$^+$)	[D,E2]	0.035 *23*	
305.5 *2*	23.1[#] *20*	305.53	(5/2$^-$)	0.0	(3/2$^-$)	[M1+E2]	0.050 *5*	α(K)=0.042 *5*; α(L)=0.0067 *4*; α(M)=0.00142 *11* α(N)=0.000311 *21*; α(O)=4.88×10^{-5} *19*; α(P)=3.0×10^{-6} *6*
310.6[‡] *7*	2.3 *4*	444.10		133.48	(3/2$^+$)	[D,E2]	0.032 *21*	
317.2[‡] *3*	2.2 *6*	459.76		142.60	(5/2$^+$)	[D,E2]	0.030 *20*	
336.3[‡] *3*	1.6 *4*	391.26	(7/2$^-$)	55.10	(5/2$^-$)	[M1+E2]	0.038 *4*	α(K)=0.032 *4*; α(L)=0.00496 *12*; α(M)=0.00105 *4* α(N)=0.000231 *7*; α(O)=3.64×10^{-5} *5*; α(P)=2.3×10^{-6} *5*
393.5 *3*	3.0[#] *7*	638.9		245.41	(3/2$^-$)			
404.6[‡] *5*	5.2 *8*	459.76		55.10	(5/2$^-$)			
409.5 *5*	2.7 *8*	654.8		245.41	(3/2$^-$)			
409.7 *5*	6.8 *12*	557.40		147.70	(7/2$^-$)			
462.5[‡] *3*	1.4 *4*	605.10		142.60	(5/2$^+$)			
481.9[‡] *3*	1.8 *3*	615.4		133.48	(3/2$^+$)			
497.1[‡] *3*	5.2 *7*	630.6		133.48	(3/2$^+$)			
502.3[‡] *2*	1.5 *5*	557.40		55.10	(5/2$^-$)			
507.1 *3*	5.9 *12*	654.8		147.70	(7/2$^-$)			
519.1[‡] *7*	0.8 *3*	661.7		142.60	(5/2$^+$)			
520.1 *4*	4.8 *9*	575.2		55.10	(5/2$^-$)			
560.3[‡] *10*	1.0 *3*	615.4		55.10	(5/2$^-$)			
605.1 *3*	7.7[#] *28*	605.10		0.0	(3/2$^-$)			
626.8[‡] *5*	3.7 *6*	760.3		133.48	(3/2$^+$)			
638.4[‡] *8*	1.0 *5*	826.1		187.24	(3/2$^-$,5/2,7/2$^-$)			
639.5[‡] *4*	1.3 *4*	694.6		55.10	(5/2$^-$)			
692.8[‡] *6*	1.4 *3*	826.1		133.48	(3/2$^+$)			
1648.5[‡] *10*	1.2 *5*	1791.2		142.60	(5/2$^+$)			
1657.7[‡] *5*	4.7 *9*	1791.2		133.48	(3/2$^+$)			
1681.6[‡] *9*	2.4 *10*	1868.8		187.24	(3/2$^-$,5/2,7/2$^-$)			
1700.0[‡] *13*	0.8 *4*	1842.1		142.60	(5/2$^+$)			
1708.5[‡] *7*	1.4 *4*	1842.1		133.48	(3/2$^+$)			

[†] From $\gamma\gamma$ coin spectra unless otherwise stated.
[‡] From $\gamma\gamma$ coin.
[#] From singles γ spectra.
[@] From average of singles γ and $\gamma\gamma$ coin spectra.

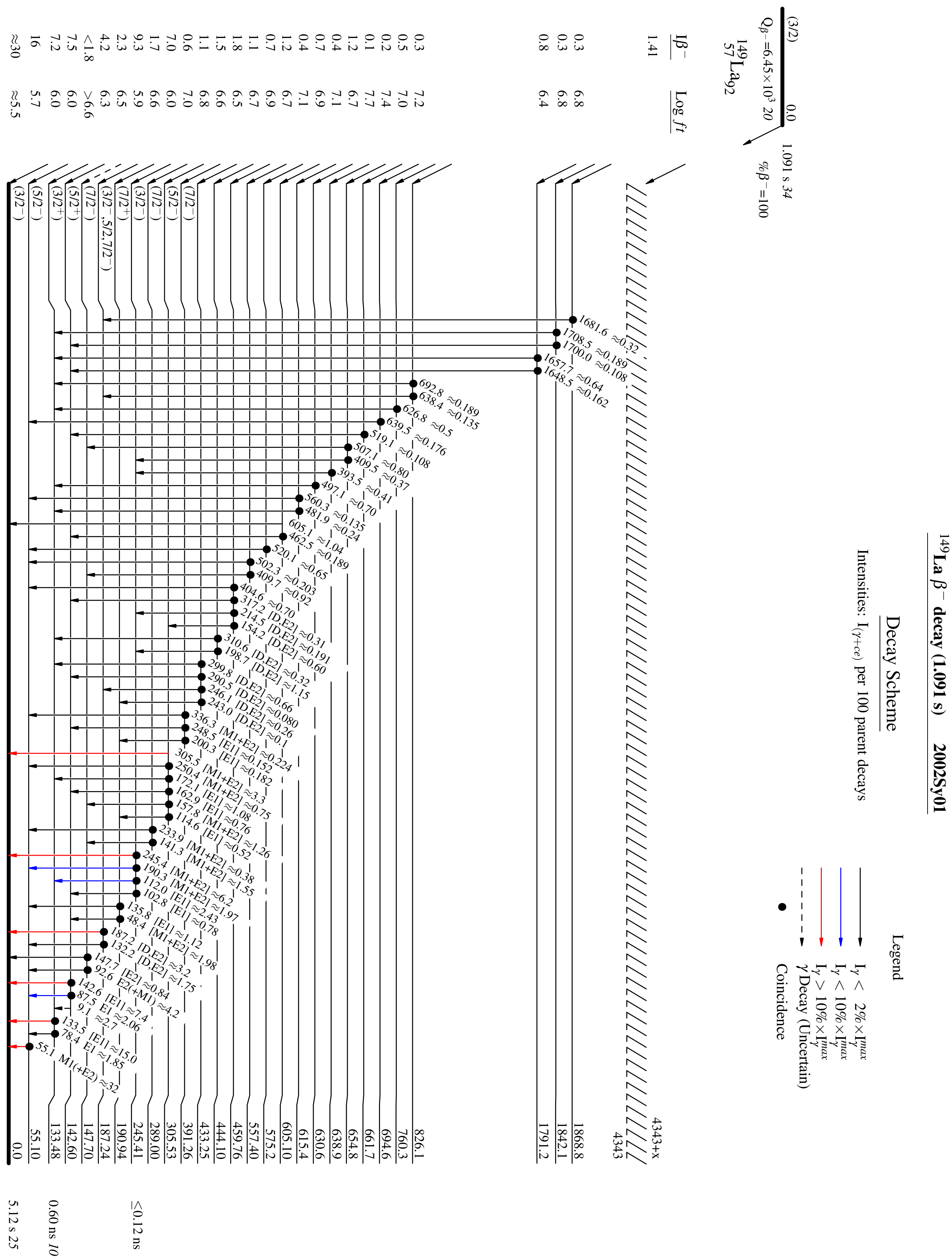
γ(^{149}Ce) (continued)

[&] Estimated from I(x ray)/Iγ (2002Sy01). Most assignments are assumed from proposed ΔJ^π; mult=[D,E2] indicates dipole or E2 since no long-lived levels have been reported by 2002Sy01.

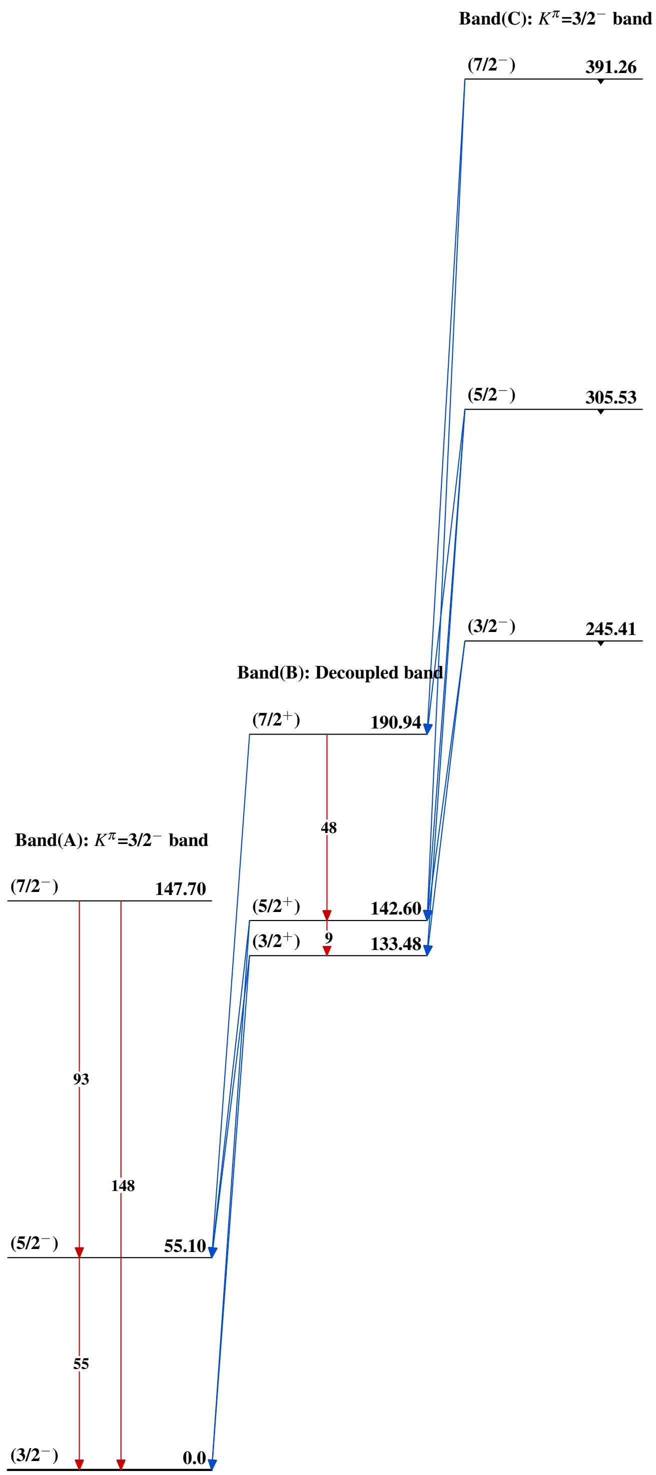
[a] For absolute intensity per 100 decays, multiply by ≈0.135.

[b] 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.

$^{149}_{58}Ce_{91}$-7


149La β− decay (1.091 s) 2002Sy01
Decay Scheme
Intensities: I(γ+ce) per 100 parent decays
Legend
Iγ < 2%×Iγmax
Iγ < 10%×Iγmax
Iγ > 10%×Iγmax
γ Decay (Uncertain)
Coincidence
(3/2) 0.0 1.091 s 34
%β− =100
Qβ− =6.45×10³ 20
149 57La92
Iβ− Log ft
1.41
0.3 6.8
0.3 6.8
0.8 6.4
0.3 7.2
0.5 7.0
0.2 7.4
0.1 7.7
1.2 6.7
0.4 7.1
0.7 6.9
0.4 7.1
1.2 6.7
0.7 6.9
1.1 6.7
1.8 6.5
1.5 6.6
1.1 6.8
0.6 7.0
7.0 6.0
1.7 6.6
9.3 5.9
2.3 6.5
4.2 6.3
<1.8 >6.6
7.5 6.0
7.2 6.0
16 5.7
≈30 ≈5.5
4343+x
4343
1868.8
1842.1
1791.2
826.1
760.3
694.6
661.7
654.8
638.9
630.6
615.4
605.10
575.2
557.40
459.76
444.10
433.25
391.26 (7/2−)
305.53 (5/2−)
289.00 (7/2−)
245.41 (3/2−)
190.94 (7/2+)
187.24 (3/2−,5/2,7/2−) ≤0.12 ns
147.70 (7/2−)
142.60 (5/2+)
133.48 (3/2+) 0.60 ns 10
55.10 (5/2−)
0.0 (3/2−) 5.12 s 25
1681.6 ≈0.32
1708.5 ≈0.189
1700.0 ≈0.108
1657.7 ≈0.64
1648.5 ≈0.162
692.8 ≈0.189
638.4 ≈0.135
626.8 ≈0.5
639.5 ≈0.176
519.1 ≈0.108
507.1 ≈0.80
409.5 ≈0.37
393.5 ≈0.41
497.1 ≈0.70
560.3 ≈0.135
481.9 ≈0.24
605.1 ≈1.04
462.5 ≈0.189
520.1 ≈0.65
502.3 ≈0.203
409.7 ≈0.92
404.6 ≈0.70
317.2 [D,E2] ≈0.31
214.5 [D,E2] ≈0.191
154.2 [D,E2] ≈0.60
310.6 [D,E2] ≈0.32
198.7 [D,E2] ≈1.15
299.8 [D,E2] ≈0.66
290.5 [D,E2] ≈0.080
246.1 [D,E2] ≈0.26
243.0 [D,E2] ≈0.1
336.3 [M1+E2] ≈0.224
248.5 [E1] ≈0.152
200.3 [E1] ≈0.182
305.5 [M1+E2] ≈3.3
250.4 [M1+E2] ≈0.75
172.1 [E1] ≈1.08
162.9 [E1] ≈0.76
157.8 [M1+E2] ≈1.26
114.6 [E1] ≈0.52
233.9 [M1+E2] ≈0.38
141.3 [M1+E2] ≈1.55
245.4 [M1+E2] ≈6.2
190.3 [M1+E2] ≈1.97
112.0 [E1] ≈2.43
102.8 [E1] ≈0.78
135.8 [E1] ≈1.12
48.4 [M1+E2] ≈1.98
187.2 [D,E2] ≈3.2
132.2 [D,E2] ≈1.75
147.7 [E2] ≈0.84
92.6 E2(+M1) ≈4.2
142.6 [E1] ≈7.4
87.5 E1 ≈2.06
9.1 ≈2.7
133.5 [E1] ≈15.0
78.4 E1 ≈1.85
55.1 M1(+E2) ≈32
149 58Ce91

^{149}La β^- decay (1.091 s) 2002Sy01



$^{149}_{58}Ce_{91}$