^{142}La β^- decay 1982Mi01,1983Wo09,1971La04

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	T. D. Johnson, D. Symochko(a), M. Fadil(b), and J. K. Tuli	NDS 112, 1949 (2011)	1-Jun-2010

Parent: ^{142}La: E=0.0; $J^\pi=2^-$; $T_{1/2}$=91.1 min *5*; Q(β^-)=4504 *5*; %β^- decay=100.0

Measured: γ, $\gamma\gamma$ (1982Mi01,1971La04), $\gamma\gamma(\theta)$ (1983Wo09,1982Mi01,1977CoZO,1975Ba15), $\beta\gamma$ (1964Pr03), shape of β^- spectra (1965Pr03).

1990La04: measured $\gamma\gamma(\theta)$.

1997Gr09: determined Iβ using total-absorption γ-ray spectrometer (TAGS).

Other measurements: 1989Ma38, 1981Ge04, 1971To02, 1969WiZX, 1968Al06, 1959Sc36, 1958Ry76.

Eβ^-=4490 *50* (13%), 3850 *40* (2.4%), 2980 *30* (1.7%), 2310 *50* (6.7%), 2110 *30* (26%), 1980 *40* (20%), 1790 *30* (11%), 1230 *60* (4.4%), 870 *30* (15%) from $\beta\gamma$, scin (1964Pr03).

The component 4490β^- has shape of first-forbidden unique β^- transition (1965Pr03).

Decay scheme is mainly as given by 1982Mi01.

1971La04 reported some additional weak γ's not observed by 1982Mi01: 119.4 *6* (<0.1), 142.2 *6* (<0.1), 169.5 *7* (<0.1), 353.6 *6* (<0.1), 408.4 *4* (0.1 *1*), 427.9 *5* (0.1 *1*), 597.6 *5* (0.1 *1*), 601.8 *5* (0.1 *1*), 619.5 *1* (0.3 *1*), 1270.1 *4* (0.2 *1*), 1332.3 *4* (0.2 *1*), 1341.2 *6* (0.1 *1*), 1535.5 *3* (0.5 *2*), 1651.4 *3* (0.4 *2*), 1752.4 *7* (0.2 *1*), 1788.4 *7* (0.1 *1*), 1806.3 *5* (0.3 *2*), 1817.1 *6* (0.2 *1*), 1954 *1* (0.1 *1*), 2290.5 *6* (0.7 *3*), 2532.3 *7* (0.2 *1*), 2779 *1* (0.1 *1*), 3022.3 *7* (0.2 *1*), 3236.7 *2* (0.6 *2*), 3420.4 *4* (0.1 *1*), 3746.3 *8* (0.1 *1*), 4045.2 *3* (0.1 *1*), 4192.3 *3*.

^{142}Ce Levels

E(level)	J^π[†]	$T_{1/2}$	Comments
0.0	0^+		
641.287 *9*	2^+	10 ps *5*	$T_{1/2}$: from $\beta\gamma$(t) (1989Mo06).
1219.38 *4*	4^+		
1536.14 *16*	2^+		
1652.65 *16*	3^-		
2004.32 *21*	2^+		
2014.7? *10*			
2030.6 *3*	0^+		
2043.5? *5*			
2181.62 *22*	3^+		
2187.20 *22*	1^-		
2364.56 *22*	2^+		J^π: from (n,n'γ). $J^\pi=1^+$ (1990La04).
2397.92 *21*	1^+		
2542.66 *17*	2^+		
2590.6 *3*			
2666.7 *3*	1^+		
2696.47 *20*	2^+		
2727.3 *3*	$2^{(-)}$		J^π: from (n,n'γ).
2741.9 *4*	$(2,3)^+$		
2767.4 *4*	(1 to 3)$^+$		J^π: 0^+ suggested in β^- decay.
2793.2 *4*			
2800.9 *4*	$1^{(+)}$		
2999.4 *8*	1^+		
3010.8? *4*	1		
3060.8 *6*	$^+$		
3101.6 *3*			
3122.0 *5*			
3154.3 *4*	2^+		
3164.7 *7*			
3180.8 *4*	1		
3304.4 *6*	2^+		
3313.3 *4*			

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^{142}La β^- decay 1982Mi01,1983Wo09,1971La04 (continued)

^{142}Ce Levels (continued)

E(level)	J$^\pi$[†]	Comments
3419.89 *25*	1$^-$,2$^-$	J$^\pi$: from $\gamma\gamma(\theta)$ (1990La04).
3423.33 *25*		
3459.56 *24*		
3470.1 *3*		
3612.1 *3*	2$^+$	J$^\pi$: from $\gamma\gamma(\theta)$ (1990La04).
3633.07 *24*		
3648.3 *5*		
3675.6 *6*	1$^+$	
3688.8 *5*		
3703.5 *3*		
3717.43 *25*	1$^+$	
3719.1 *4*		
3850.8 *6*		
3883.8 *5*		
3914.5 *6*		
3976.2 *4*		
4043.0 *4*	2$^+$	J$^\pi$: from $\gamma\gamma(\theta)$ (1990La04).
4045.2 *4*		

[†] Adopted values.

β^- radiations

1997Gr09 values obtained in TAGS experiment are given in comments. They also report a 0.55% branch each to 2014.7, 2030.6, and 2043.5 levels. They have also introduced a pseudo-level at 4200 with Iβ=0.092%.

E(decay)	E(level)	Iβ^-[†]	Log *ft*	Comments
(459 *5*)	4045.2	0.09 *5*	7.20 *25*	av Eβ=138.0 *18* Iβ^-: 0.083 (1997Gr09) TAGS.
(461 *5*)	4043.0	1.5 *1*	5.99 *4*	av Eβ=138.8 *18* Iβ^-: 0.0 (1997Gr09) TAGS.
(528 *5*)	3976.2	0.3 *1*	6.89 *15*	av Eβ=162.2 *18* Iβ^-: 0.28 (1997Gr09) TAGS.
(590 *5*)	3914.5	0.3 *1*	7.05 *15*	av Eβ=184.3 *19* Iβ^-: 0.46 (1997Gr09) TAGS.
(620 *5*)	3883.8	0.3 *1*	7.13 *15*	av Eβ=195.6 *19* Iβ^-: 0.22 (1997Gr09) TAGS.
(653 *5*)	3850.8	0.4 *1*	7.08 *11*	av Eβ=207.8 *19* Iβ^-: 0.30 (1997Gr09) TAGS.
(785 *5*)	3719.1	0.7 *1*	7.12 *7*	av Eβ=257.6 *20* Iβ^-: 0.48 (1997Gr09) TAGS.
(787 *5*)	3717.43	1.0 *1*	6.97 *5*	av Eβ=258.3 *20* Iβ^-: 0.69 (1997Gr09) TAGS.
(801 *5*)	3703.5	0.9 *1*	7.04 *5*	av Eβ=263.6 *20* Iβ^-: 0.62 (1997Gr09) TAGS.
(815 *5*)	3688.8	0.5 *1*	7.32 *9*	av Eβ=269.3 *20* Iβ^-: 0.35 (1997Gr09) TAGS.
(828 *5*)	3675.6	1.2 *1*	6.97 *4*	av Eβ=274.5 *20* Iβ^-: 0.83 (1997Gr09) TAGS.
(856 *5*)	3648.3	1.1 *1*	7.06 *4*	av Eβ=285.2 *20* Iβ^-: 1.01 (1997Gr09) TAGS.

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^{142}La β^- decay 1982Mi01,1983Wo09,1971La04 (continued)

β^- radiations (continued)

E(decay)	E(level)	Iβ^-[†]	Log *ft*	Comments
870 *30*	3633.07	1.7 *1*	6.89 *3*	av Eβ=291.2 *20* Iβ⁻: 1.57 (1997Gr09) TAGS.
870 *30*	3612.1	5.0 *2*	6.462 *20*	av Eβ=299.4 *20* Iβ⁻: 4.61 (1997Gr09) TAGS.
(1034 *5*)	3470.1	0.8 *1*	7.49 *6*	av Eβ=356.4 *21* Iβ⁻: 0.96 (1997Gr09) TAGS.
(1044 *5*)	3459.56	1.2 *1*	7.33 *4*	av Eβ=360.7 *21* Iβ⁻: 1.44 (1997Gr09) TAGS.
(1081 *5*)	3423.33	1.2 *1*	7.39 *4*	av Eβ=375.5 *21* Iβ⁻: 1.44 (1997Gr09) TAGS.
(1084 *5*)	3419.89	2.1 *1*	7.148 *23*	av Eβ=377.0 *21* Iβ⁻: 2.52 (1997Gr09) TAGS.
1230 *60*	3313.3	1.3 *1*	7.51 *4*	av Eβ=421.1 *21* Iβ⁻: 1.38 (1997Gr09) TAGS.
(1200 *5*)	3304.4	1.0 *1*	7.63 *5*	av Eβ=424.8 *21* Iβ⁻: 1.06 (1997Gr09) TAGS.
(1323 *5*)	3180.8	1.0 *1*	7.79 *5*	av Eβ=476.7 *22* Iβ⁻: 1.01 (1997Gr09) TAGS.
(1350 *5*)	3154.3	0.7 *1*	7.98 *7*	av Eβ=488.0 *22* Iβ⁻: 0.71 (1997Gr09) TAGS.
(1443 *5*)	3060.8	0.8 *1*	8.04 *6*	av Eβ=528.0 *22* Iβ⁻: 0.74 (1997Gr09) TAGS.
(1505 *5*)	2999.4	0.8 *1*	8.10 *6*	av Eβ=554.4 *22* Iβ⁻: 1.57 (1997Gr09) TAGS.
(1703 *5*)	2800.9	0.9 *1*	8.26 *5*	av Eβ=640.9 *22* Iβ⁻: 0.66 (1997Gr09) TAGS.
(1737 *5*)	2767.4	0.3 *1*	8.77 *15*	av Eβ=655.7 *22* Iβ⁻: 0.33 (1997Gr09) TAGS.
(1762 *5*)	2741.9	0.9 *1*	8.32 *5*	av Eβ=666.9 *23* Iβ⁻: 1.00 (1997Gr09) TAGS.
(1777 *5*)	2727.3	0.6 *1*	8.51 *8*	av Eβ=673.3 *23* Iβ⁻: 0.66 (1997Gr09) TAGS.
1790 *30*	2696.47	6.7 *2*	7.492 *14*	av Eβ=687.0 *23* Iβ⁻: 7.41 (1997Gr09) TAGS.
(1837 *5*)	2666.7	3.1 *2*	7.85 *3*	av Eβ=700.1 *23* Iβ⁻: 1.38 (1997Gr09) TAGS.
1980 *40*	2542.66	17.3 *4*	7.220 *12*	av Eβ=755.3 *23* Iβ⁻: 12.91 (1997Gr09) TAGS.
2110 *30*	2397.92	17.8 *4*	7.331 *11*	av Eβ=820.1 *23* Iβ⁻: 16.41 (1997Gr09) TAGS.
(2139 *5*)	2364.56	1.5 *1*	8.43 *3*	av Eβ=835.1 *23* Iβ⁻: 1.38 (1997Gr09) TAGS.
2310 *50*	2187.20	3.2 *2*	8.24 *3*	av Eβ=915.2 *23* Iβ⁻: 4.43 (1997Gr09) TAGS.
(2322 *5*)	2181.62	0.4 *1*	9.15 *11*	av Eβ=917.7 *23* Iβ⁻: 0.55 (1997Gr09) TAGS.
(2500 *5*)	2004.32	1.6 *1*	8.68 *3*	av Eβ=998.3 *23* Iβ⁻: 1.48 (1997Gr09) TAGS.
(2851 *5*)	1652.65	0.9 *2*	9.16 *10*	av Eβ=1159.4 *23* Iβ⁻: 0.46 (1997Gr09) TAGS.
2980 *30*	1536.14	≈0.1	≈10.2	av Eβ=1213.0 *23* Iβ⁻: ≈0.09 (1997Gr09) TAGS.
(3285 *5*)	1219.38	0.24 *10*	11.45[1u] *19*	av Eβ=1342.0 *23* Iβ⁻: 0.28 (1997Gr09) TAGS.
3850 *40*	641.287	1.4 *4*	9.53 *13*	av Eβ=1627.9 *24* Iβ⁻: 3.50 (1997Gr09) TAGS.

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^{142}La β^- decay 1982Mi01,1983Wo09,1971La04 (continued)

β^- radiations (continued)

E(decay)	E(level)	Iβ^-[†]	Log *ft*	Comments
4490 *50*	0.0	16.5 *10*	10.45[1u] *3*	av Eβ=1904.3 *24* Iβ^-: 21.0 *25* (1997Gr09) TAGS.

[†] Absolute intensity per 100 decays.

$\gamma(^{142}Ce)$

Iγ normalization: I(641γ)=47.4% *5* βγ (1981Ge04).

E_γ[‡]	I_γ[‡a]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[#]	α[†]	Comments
105.9 *3*	0.3	2696.47	2^+	2590.6				
173.5 *3*	0.2 *1*	3633.07		3459.56				
178.3 *3*	0.4 *1*	2542.66	2^+	2364.56	2^+			
297.9 *3*	0.1 *1*	3717.43	1^+	3419.89	$1^-,2^-$			
318.0 *3*	0.1 *1*	3419.89	$1^-,2^-$	3101.6				
332.1 *4*	0.1 *1*	2696.47	2^+	2364.56	2^+			
339.5 *4*	0.2 *1*	4043.0	2^+	3703.5				
341.7 *4*	0.1 *1*	4045.2		3703.5				
350.3[b] *3*	<0.1	2364.56	2^+	2014.7?				
355.3 *3*	<0.1	2542.66	2^+	2187.20	1^-			
361.1 *3*	0.2	3154.3	2^+	2793.2				
367.3 *2*	0.3	2397.92	1^+	2030.6	0^+			
393.6 *2*	0.4	2397.92	1^+	2004.32	2^+			
420.2 *2*	0.5	3010.8?	1	2590.6				
433.3 *2*	0.8	1652.65	3^-	1219.38	4^+	E1	0.00501 *7*	α=0.00501 *7*; α(K)=0.00431 *6*; α(L)=0.000555 *8*; α(M)=0.0001152 *17*; α(N+..)=2.98×10^{-5} *5* α(N)=2.55×10^{-5} *4*; α(O)=4.09×10^{-6} *6*; α(P)=2.99×10^{-7} *5* δ: 0.10 *6*.
439.0 *5*	0.1 *1*	3180.8	1	2741.9	$(2,3)^+$			
453.7 *5*	0.2	3180.8	1	2727.3	$2^{(-)}$			
514.7[b] *4*	0.3 *1*	2696.47	2^+	2181.62	3^+			
529.4 *6*	0.1 *1*	2181.62	3^+	1652.65	3^-			
531.6 *2*	0.3	3633.07		3101.6				
538.3 *5*	0.1	2542.66	2^+	2004.32	2^+			
546.0 *2*	<0.1	3313.3		2767.4	$(1\text{ to }3)^+$			
570.6 *5*	0.1 *1*	3883.8		3313.3				
578.09 *4*	2.8 *1*	1219.38	4^+	641.287	2^+	E2	0.00733 *11*	α=0.00733 *11*; α(K)=0.00616 *9*; α(L)=0.000925 *13*; α(M)=0.000195 *3*; α(N+..)=5.02×10^{-5} *7* α(N)=4.30×10^{-5} *6*; α(O)=6.79×10^{-6} *10*; α(P)=4.38×10^{-7} *7* E_γ: see 1983Wo09.
[x]639.5 *4*	0.2 *1*							
641.285 *9*	100.0	641.287	2^+	0.0	0^+	E2	0.00563 *8*	α=0.00563 *8*; α(K)=0.00475 *7*; α(L)=0.000695 *10*; α(M)=0.0001463 *21*; α(N+..)=3.77×10^{-5} *6* α(N)=3.22×10^{-5} *5*; α(O)=5.11×10^{-6} *8*; α(P)=3.40×10^{-7} *5* E_γ: from 1979Bo26 (cryst). I_γ: I(641γ)=47.4% *5* βγ (1981Ge04); other: 52.5% *25* (1971To02).
646.2 *7*	0.3 *2*	3313.3		2666.7	1^+			
677.0 *6*	0.1 *1*	3470.1		2793.2				

^{142}La β^- decay 1982Mi01,1983Wo09,1971La04 (continued)

$\gamma(^{142}Ce)$ (continued)

E_γ ‡	I_γ ‡a	E_i(level)	J_i^π	E_f	J_f^π	Mult.#	δ#&	α†	Comments
681.2 *6*	0.1 *1*	3423.33		2741.9	$(2,3)^+$				
692.4 *6*	0.2	2696.47	2^+	2004.32	2^+				
793.1 *4*	0.1 *1*	3459.56		2666.7	1^+				
861.6 *7*	3.5 *1*	2397.92	1^+	1536.14	2^+	M1+E2	+0.03 *5*	0.00413 *6*	α=0.00413 *6*; α(K)=0.00355 *5*; α(L)=0.000457 *7*; α(M)=9.51×10^{-5} *14*; α(N+..)=2.48×10^{-5} *4* α(N)=2.11×10^{-5} *3*; α(O)=3.44×10^{-6} *5*; α(P)=2.67×10^{-7} *4* δ: +0.31 *+8−7* (1982Mi01). Others: +0.31 *+8−7* (1977CoZO), see 1975Ba15.
878.2 *4*	0.4	3419.89	$1^-,2^-$	2542.66	2^+				
894.9 *4*	17.6 *3*	1536.14	2^+	641.287	2^+	M1+E2	−0.63 *10*	0.00343 *10*	α=0.00343 *10*; α(K)=0.00295 *8*; α(L)=0.000384 *10*; α(M)=8.00×10^{-5} *20*; α(N+..)=2.08×10^{-5} *6* α(N)=1.77×10^{-5} *5*; α(O)=2.88×10^{-6} *8*; α(P)=2.20×10^{-7} *7* δ: −0.10 *3* (1983Wo09). Others: −0.11 *+2−3* (1982Mi01), see 1977CoZO, 1975Ba15.
915.6 *5*	0.1 *1*	3612.1	2^+	2696.47	2^+				
946.9 *4*	0.2	3688.8		2741.9	$(2,3)^+$				
962.2 *4*	0.8 *1*	2181.62	3^+	1219.38	4^+	M1+E2	−0.56 *5*	0.00295 *6*	α=0.00295 *6*; α(K)=0.00253 *5*; α(L)=0.000328 *6*; α(M)=6.83×10^{-5} *12*; α(N+..)=1.78×10^{-5} *3* α(N)=1.51×10^{-5} *3*; α(O)=2.46×10^{-6} *5*; α(P)=1.89×10^{-7} *4*
989.8 *5*	0.2	3717.43	1^+	2727.3	$2^{(-)}$				
1006.7 *2*	0.5	2542.66	2^+	1536.14	2^+				
1011.4 *3*	8.3 *2*	1652.65	3^-	641.287	2^+	E1		0.000827 *12*	α=0.000827 *12*; α(K)=0.000715 *10*; α(L)=8.90×10^{-5} *13*; α(M)=1.84×10^{-5} *3*; α(N+..)=4.80×10^{-6} *7* α(N)=4.09×10^{-6} *6*; α(O)=6.63×10^{-7} *10*; α(P)=5.08×10^{-8} *8* δ: −0.01 *3* (1990La04); −0.14 *3* (1982Mi01), −0.04 *4* (1977CoZO), −0.06 *6* (1975Ba15).
1020.8 *4*	<0.1	3717.43	1^+	2696.47	2^+				
[x]1039.4 *3*	0.2								
1043.7 *5*	5.7 *1*	2696.47	2^+	1652.65	3^-	D(+Q)	+0.02 *3*		δ: +0.18 *4* (1982Mi01). Others: −0.07 *3* (1977CoZO), −0.03 *4* (1975Ba15).
1058.4 *4*	0.2	3423.33		2364.56	2^+				
1061.5 *4*		3459.56		2397.92	1^+				
1069.4 *5*	0.2 *1*	3612.1	2^+	2542.66	2^+				
1072.2 *8*	0.2 *1*	3470.1		2397.92	1^+				
1089.9 *7*	0.3	3633.07		2542.66	2^+				
1091.2 *8*	0.2	3122.0		2030.6	0^+				
1104.8 *8*	0.1	3470.1		2364.56	2^+				
1112.9 *5*	0.1 *1*	3703.5		2590.6					
1117.7 *5*	<0.1	3122.0		2004.32	2^+				
1121.2 *6*	0.1	3914.5		2793.2					
1130.6 *5*	1.0 *1*	2666.7	1^+	1536.14	2^+	M1(+E2)	−6 *+2−7*	0.00158 *3*	α=0.00158 *3*; α(K)=0.00135 *3*; α(L)=0.000178 *4*; α(M)=3.71×10^{-5} *7*; α(N+..)=1.071×10^{-5} *19* α(N)=8.21×10^{-6} *15*; α(O)=1.325×10^{-6} *25*; α(P)=9.81×10^{-8} *20*;

$^{142}_{58}Ce_{84}$-6

^{142}La β^- decay 1982Mi01,1983Wo09,1971La04 (continued)

$\gamma(^{142}Ce)$ (continued)

E_γ[‡]	I_γ[‡a]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[#]	δ[#&]	α[†]	Comments
									α(IPF)=1.073×10^{-6} *23* δ: >3.0 or <−2.5 from 1982Mi01.
[x]1144.2 *4*	<0.1								
1160.2 *5*	3.6 *1*	2696.47	2$^+$	1536.14	2$^+$	D+Q	+0.20 *5*		δ: +0.22 *13* (1982Mi01). Others: +0.49 *30* (1975Ba15); see also 1977CoZO.
1176.4 *4*	0.3	3719.1		2542.66	2$^+$				
1191.1 *4*	0.8	2727.3	2$^{(-)}$	1536.14	2$^+$	D+Q	−0.43 *10*		
1205.7 *5*	0.1	2741.9	(2,3)$^+$	1536.14	2$^+$				
1214.0 *5*	0.1 *1*	3612.1	2$^+$	2397.92	1$^+$				
1231.3 *5*	0.1 *1*	2767.4	(1 to 3)$^+$	1536.14	2$^+$				
1233.1 *6*	4.0 *1*	3419.89	1$^-$,2$^-$	2187.20	1$^-$	D+Q			δ: +0.45 *5* or 2.24 *25* for J=1 and +0.4 *8* or 11 *+27−5* for J=2 (1990La04).
1242.0 *4*	0.5	3423.33		2181.62	3$^+$				
1264.7 *4*	0.2	2800.9	1$^{(+)}$	1536.14	2$^+$				
1280.1 *4*	<0.1	3976.2		2696.47	2$^+$				
1283.2 *5*	<0.1	3470.1		2187.20	1$^-$				
1288.5 *4*	<0.1	3470.1		2181.62	3$^+$				
1323.2 *5*	0.7 *1*	2542.66	2$^+$	1219.38	4$^+$	E2		0.001157 *17*	α=0.001157 *17*; α(K)=0.000972 *14*; α(L)=0.0001261 *18*; α(M)=2.62×10^{-5} *4*; α(N+..)=3.28×10^{-5} α(N)=5.81×10^{-6} *9*; α(O)=9.40×10^{-7} *14*; α(P)=7.07×10^{-8} *10*; α(IPF)=2.60×10^{-5} *4* Mult.: from $\gamma\gamma(\theta)$ (1983Wo09,1990La04).
1348.7 *5*	<0.1	4045.2		2696.47	2$^+$				
1352.6 *5*	0.2	3717.43	1$^+$	2364.56	2$^+$				
1363.0 *5*	4.5 *1*	2004.32	2$^+$	641.287	2$^+$	M1+E2	+0.16 *4*	0.001457 *21*	α=0.001457 *21*; α(K)=0.001225 *18*; α(L)=0.0001555 *23*; α(M)=3.23×10^{-5} *5*; α(N+..)=4.42×10^{-5} α(N)=7.17×10^{-6} *11*; α(O)=1.169×10^{-6} *17*; α(P)=9.15×10^{-8} *14*; α(IPF)=3.57×10^{-5} *6* δ: +0.41 *7* (1982Mi01). δ: from 1982Mi01; others: +0.35 *6* (1977CoZO), +0.09 *6* (1975Ba15).
1372.9[b] *7*	0.1 *1*	2014.7?		641.287	2$^+$				
1389.3 *8*	0.9 *1*	2030.6	0$^+$	641.287	2$^+$	E2		0.001070 *15*	α=0.001070 *15*; α(K)=0.000883 *13*; α(L)=0.0001140 *16*; α(M)=2.37×10^{-5} *4*; α(N+..)=4.88×10^{-5} α(N)=5.26×10^{-6} *8*; α(O)=8.51×10^{-7} *12*; α(P)=6.42×10^{-8} *9*; α(IPF)=4.26×10^{-5} *7*
1393.0 *8*	0.3	3423.33		2030.6	0$^+$				
1402.2 *5*	0.3	2043.5?		641.287	2$^+$				
1445.5 *5*	0.3	3633.07		2187.20	1$^-$				
1455.1 *5*	0.2	3459.56		2004.32	2$^+$				
1461.2 *5*	2.0 *1*	3648.3		2187.20	1$^-$				
1494.1 *7*	0.3	3675.6	1$^+$	2181.62	3$^+$				

$^{142}_{58}Ce_{84}$-7

^{142}La β^- decay 1982Mi01,1983Wo09,1971La04 (continued)

$\gamma(^{142}Ce)$ (continued)

E_γ[‡]	I_γ[‡a]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[#]	δ[#&]	α[†]	Comments
1500.3 *6*	0.2	4043.0	2^+	2542.66	2^+				
1516.3 *6*	0.9 *1*	3703.5		2187.20	1^-				
1524.6 *7*	1.0 *1*	3060.8	$^+$	1536.14	2^+				
1540.2 *7*	1.0 *2*	2181.62	3^+	641.287	2^+				
1545.8 *5*	6.3 *3*	2187.20	1^-	641.287	2^+	D+(Q)	−0.05 *5*		δ: +0.04 *4* (1982Mi01). Others: +0.06 *3* (1977CoZO), +0.01 *4* (1975Ba15).
1618.2 *7*	0.6	3154.3	2^+	1536.14	2^+				
1628.5 *7*	<0.1	3164.7		1536.14	2^+				
1644.3 *7*	0.5	3180.8	1	1536.14	2^+				
1688.6 *8*	0.5	3719.1		2030.6	0^+				
1722.7 *8*	3.2 *1*	2364.56	2^+	641.287	2^+	M1+E2	−0.38 *4*	0.001000 *15*	α=0.001000 *15*; α(K)=0.000715 *11*; α(L)=9.02×10^{-5} *14*; α(M)=1.87×10^{-5} *3*; α(N+..)=0.000176 *3* α(N)=4.16×10^{-6} *7*; α(O)=6.78×10^{-7} *10*; α(P)=5.31×10^{-8} *8*; α(IPF)=0.0001714 *25* δ: −0.28 *+3−4* (1982Mi01). Others: −0.36 *7* (1977CoZO), −0.35 *5* (1975Ba15).
1756.4 *8*	5.7 *1*	2397.92	1^+	641.287	2^+	E2+M1	−1.57 *10*	0.000884 *14*	α=0.000884 *14*; α(K)=0.000605 *10*; α(L)=7.65×10^{-5} *12*; α(M)=1.588×10^{-5} *25*; α(N+..)=0.000187 α(N)=3.52×10^{-6} *6*; α(O)=5.73×10^{-7} *9*; α(P)=4.43×10^{-8} *7*; α(IPF)=0.000182 *3* δ: −0.93 *+28−22* (1982Mi01). Others: −0.79 *3* (1977CoZO), −1.2 *+3−4* (1983Wo09), −1.06 *13* (1975Ba15).
1768.2 *7*	0.5 *1*	3304.4	2^+	1536.14	2^+				
1770.8 *7*	0.4 *1*	3423.33		1652.65	3^-				
1793.8 *7*	<0.1	3976.2		2181.62	3^+				
1846.2 *8*	0.1 *1*	3850.8		2004.32	2^+				
1887.3 *8*	0.3 *2*	3423.33		1536.14	2^+				
1901.3 *7*	15.1 *3*	2542.66	2^+	641.287	2^+	M1+E2	+0.65 *5*	0.000905 *14*	α=0.000905 *14*; α(K)=0.000561 *9*; α(L)=7.06×10^{-5} *11*; α(M)=1.465×10^{-5} *23*; α(N+..)=0.000259 α(N)=3.25×10^{-6} *5*; α(O)=5.30×10^{-7} *8*; α(P)=4.15×10^{-8} *7*; α(IPF)=0.000255 *4* δ: +0.55 *+40−54* (1983Wo09). Other: +0.71 *7* (1977CoZO); data of 1982Mi01 and 1975Ba15 are not consistent with J=2, data of 1983Wo09 agree better with J=1 or 3.
1923.3 *7*	0.4 *1*	3459.56		1536.14	2^+				
1933.6 *7*	0.3	3470.1		1536.14	2^+				
1949.4 *9*	0.8 *1*	2590.6		641.287	2^+				
1961.5 *9*	0.3	3976.2		2014.7?					
2004.2 *9*	1.9 *1*	2004.32	2^+	0.0	0^+				
2014.1[b] *10*	0.2	2014.7?		0.0	0^+				
2025.5 *10*	2.1 *1*	2666.7	1^+	641.287	2^+	M1+(E2)	+1.3 *3*	0.000850 *19*	α=0.000850 *19*; α(K)=0.000465 *13*; α(L)=5.84×10^{-5} *16*; α(M)=1.21×10^{-5} *4*; α(N+..)=0.000314 *5* α(N)=2.69×10^{-6} *8*; α(O)=4.37×10^{-7} *12*; α(P)=3.41×10^{-8} *10*;

$^{142}_{58}Ce_{84}$-8

^{142}La β^- decay 1982Mi01,1983Wo09,1971La04 (continued)

$\gamma(^{142}Ce)$ (continued)

E_γ[‡]	I_γ[‡a]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[#]	δ[#&]	α[†]	Comments
									α(IPF)=0.000311 *5* δ: +1.02 to +2.54 (1982Mi01), +0.60 *5* (1975Ba15), see also 1977CoZO.
2038.7 *8*	2.0 *1*	4043.0	2^+	2004.32	2^+	D+Q	−0.99 *20*		
2050.9 *8*	1.0 *2*	3703.5		1652.65	3^-				
2055.2 *8*	4.6 *2*	2696.47	2^+	641.287	2^+	D+(Q)	−0.63 *10*		δ: −0.02 *6* (1982Mi01). Other: −0.55 *27* (1975Ba15).
2076.1 *9*	1.7 *2*	3612.1	2^+	1536.14	2^+	D+Q	−0.7 *3*		
2086.0 *9*	0.8	2727.3	$2^{(-)}$	641.287	2^+	D+Q	−0.60 *10*		δ: −0.23 *13* (1982Mi01).
2096.6 *9*	0.1 *1*	3633.07		1536.14	2^+				
2100.4 *8*	2.2 *2*	2741.9	$(2,3)^+$	641.287	2^+	D+(Q)	−0.50 *5*		δ: −0.39 *6* (1982Mi01). Other: −0.40 *9* (1975Ba15).
2111.9 *8*	<0.1	3648.3		1536.14	2^+				
2126.2 *9*	0.7 *1*	2767.4	(1 to 3)$^+$	641.287	2^+	M1+E2		0.00086 *6*	α=0.00086 *6*; α(K)=0.00043 *4*; α(L)=5.4×10^{-5} *5*; α(M)=1.12×10^{-5} *9*; α(N+..)=0.000367 *12* α(N)=2.49×10^{-6} *21*; α(O)=4.1×10^{-7} *4*; α(P)=3.2×10^{-8} *3*; α(IPF)=0.000364 *12* Mult.: from Adopted Levels. E2 suggested from $\gamma\gamma(\theta)$ (1982Mi01,1990La04).
2139.3 *8*	1.1 *2*	3675.6	1^+	1536.14	2^+	D+Q	−0.56 *10*		δ: +0.89<δ<+1.9 from $\gamma\gamma(\theta)$ (1982Mi01).
2152.0 *8*	0.3 *1*	2793.2		641.287	2^+				
2160.0 *9*	<0.1	2800.9	$1^{(+)}$	641.287	2^+				
2180.9 *9*	1.1 *2*	3717.43	1^+	1536.14	2^+	D+Q	−1.2 *+3−5*		δ: +0.65<δ<+2.7 from $\gamma\gamma(\theta)$ (1982Mi01).
2187.2 *10*	7.8 *2*	2187.20	1^-	0.0	0^+				
2347.4 *9*	0.1 *1*	3883.8		1536.14	2^+				
2357.8 *10*	1.2 *1*	2999.4	1^+	641.287	2^+	E2+M1[@]		0.00089 *5*	α=0.00089 *5*; α(K)=0.000352 *23*; α(L)=4.4×10^{-5} *3*; α(M)=9.1×10^{-6} *6*; α(N+..)=0.000482 *17* α(N)=2.02×10^{-6} *14*; α(O)=3.30×10^{-7} *23*; α(P)=2.59×10^{-8} *19*; α(IPF)=0.000480 *17* δ: +0.87<δ<+3.30 from $\gamma\gamma(\theta)$ (1982Mi01).
2364.4 *9*	0.9 *1*	2364.56	2^+	0.0	0^+				
2378.6 *9*	0.3	3914.5		1536.14	2^+				
2397.8 *9*	28.0 *6*	2397.92	1^+	0.0	0^+				
2419.5 *9*	0.4	3060.8	$^+$	641.287	2^+				
2460.3 *10*	1.0 *1*	3101.6		641.287	2^+				
2513.1 *9*	0.2	3154.3	2^+	641.287	2^+				
2523.3[b] *9*	<0.1	3164.7		641.287	2^+				
2539.2 *11*	0.8 *1*	3180.8	1	641.287	2^+				
2542.7 *10*	21.1 *5*	2542.66	2^+	0.0	0^+				
2590.6 *10*	0.3	2590.6		0.0	0^+				
[x]2598.7 *9*	0.3								
[x]2612.4 *9*	0.7								
[x]2645.7 *10*	0.2								
2663.1 *10*	1.5 *2*	3304.4	2^+	641.287	2^+	Q+(D)	>+1.1		δ: from $\gamma\gamma(\theta)$ (1982Mi01).

$^{142}_{58}Ce_{84}$-9

^{142}La β^- decay 1982Mi01,1983Wo09,1971La04 (continued)

$\gamma(^{142}Ce)$ (continued)

E_γ ‡	I_γ ‡[a]	E_i(level)	J_i^π	E_f	J_f^π	E_γ ‡	I_γ ‡[a]	E_i(level)	J_i^π	E_f	J_f^π
2666.8 *9*	3.8 *2*	2666.7	1^+	0.0	0^+	3101.5 *12*	0.3	3101.6		0.0	0^+
2672.6 *10*	0.4	3313.3		641.287	2^+	3121.9 *13*	0.4	3122.0		0.0	0^+
[x]2732.5 *10*	0.3 *1*					3154.3 *14*	0.4	3154.3	2^+	0.0	0^+
2782.2 *10*	0.7	3423.33		641.287	2^+	3164.7 *13*	0.2	3164.7		0.0	0^+
2800.8 *10*	1.6 *1*	2800.9	$1^{(+)}$	0.0	0^+	3180.4 *13*	0.6	3180.8	1	0.0	0^+
2818.5 *11*	1.6 *1*	3459.56		641.287	2^+	3210.2 *12*	0.2	3850.8		641.287	2^+
2828.8 *11*	0.6	3470.1		641.287	2^+	3242.4 *12*	0.4	3883.8		641.287	2^+
[x]2888.0 *10*	0.2 *1*					3273.2 *14*	0.3	3914.5		641.287	2^+
2971.0 *12*	6.6 *3*	3612.1	2^+	641.287	2^+	3313.8 *12*	2.0 *1*	3313.3		0.0	0^+
2991.6 *11*	0.2	3633.07		641.287	2^+	3334.2 *12*	0.2	3976.2		641.287	2^+
2999.9 *12*	0.5	2999.4	1^+	0.0	0^+	3401.9 *12*	0.7	4043.0	2^+	641.287	2^+
[x]3002.6 *12*	0.5					3459.3 *13*	0.5	3459.56		0.0	0^+
3006.8 *12*	0.2	3648.3		641.287	2^+	3470.0 *13*	0.2	3470.1		0.0	0^+
3010.8 *13*	0.3	3010.8?	1	0.0	0^+	3612.1 *14*	1.9 *1*	3612.1	2^+	0.0	0^+
[x]3012.4 *13*	0.9					3632.7 *13*	2.1 *1*	3633.07		0.0	0^+
3034.3 *14*	1.1 *1*	3675.6	1^+	641.287	2^+	3719.1 *13*	0.6	3719.1		0.0	0^+
3047.4 *14*	0.9	3688.8		641.287	2^+	3850.4 *13*	0.5	3850.8		0.0	0^+
3060.7 *14*	0.2	3060.8	$^+$	0.0	0^+	3975.6[b] *2*	<0.1	3976.2		0.0	0^+
3062.4 *13*	0.2	3703.5		641.287	2^+	4045.2		4045.2		0.0	0^+
3075.9 *12*	0.4	3717.43	1^+	641.287	2^+						

† Additional information 1.
‡ From 1982Mi01, except where noted otherwise.
# From 1990La04, unless indicated otherwise.
@ From $\gamma\gamma(\theta)$ in 1983Wo09 assuming that usually M2 cannot compete with E1.
& Because of strong sensitivity of δ to $\gamma\gamma(\theta)$ parameters A_2, A_4 and usually large ΔA_2 and ΔA_4, the extracted values of δ are often not very reliable.
[a] For absolute intensity per 100 decays, multiply by 0.474 *5*.
[b] Placement of transition in the level scheme is uncertain.
[x] γ ray not placed in level scheme.

$^{142}_{58}Ce_{84}$-10

^{142}La β^- decay 1982Mi01,1983Wo09,1971La04

Decay Scheme

Intensities: Relative I_γ

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

2^- 0.0 91.1 min 5

Q_{β^-}=4504 5 $\%\beta^-$=100

$^{142}_{57}La_{85}$

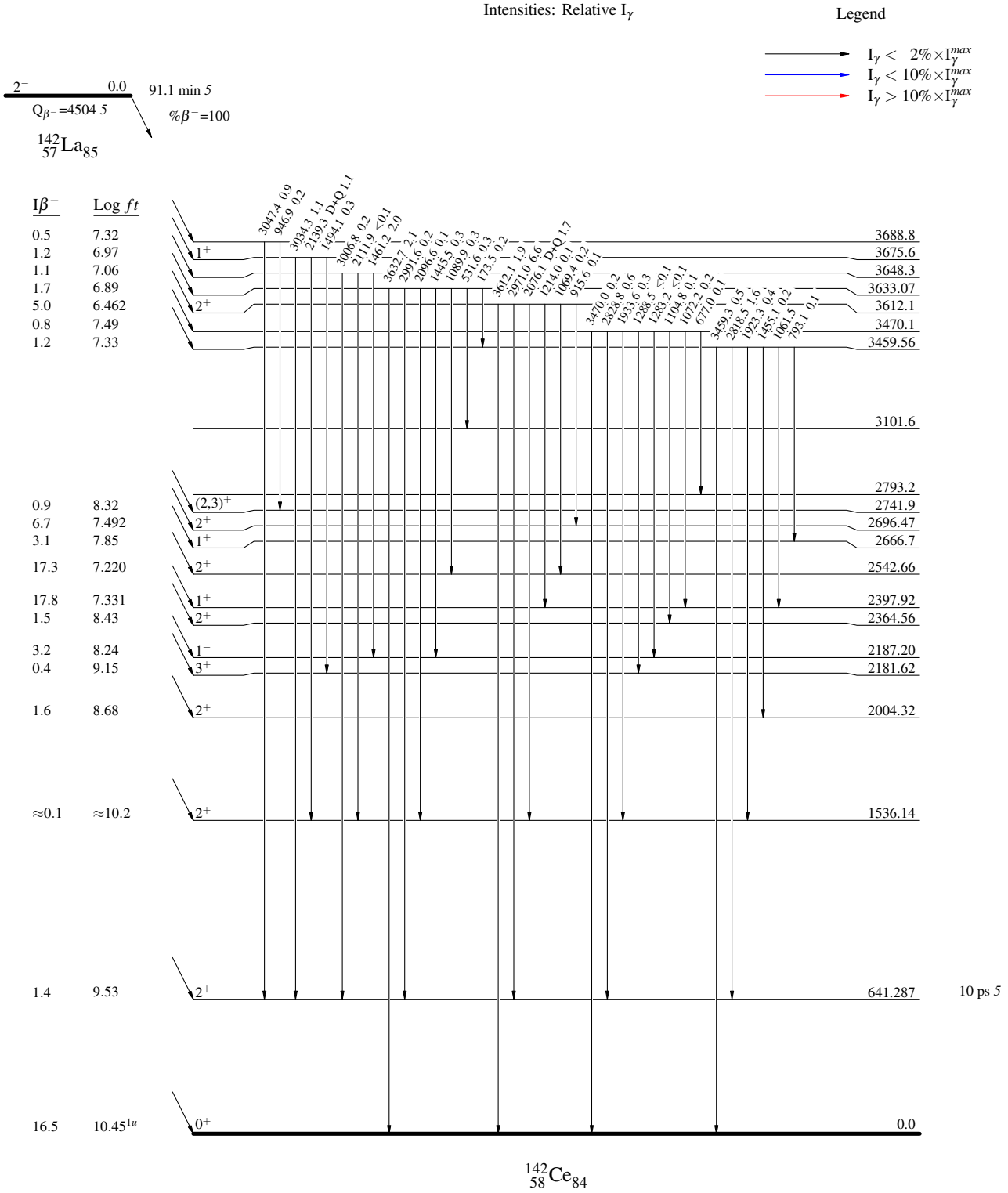
$I\beta^-$	Log ft		
0.09	7.20	2^+	4045.2
1.5	5.99		4043.0
0.3	6.89		3976.2
0.3	7.05		3914.5
0.3	7.13		3883.8
0.4	7.08		3850.8
0.7	7.12		3719.1
1.0	6.97	1^+	3717.43
0.9	7.04		3703.5
2.1	7.148	$1^-,2^-$	3419.89
1.3	7.51		3313.3
			2793.2
0.6	8.51	$2^{(-)}$	2727.3
6.7	7.492	2^+	2696.47
			2590.6
17.3	7.220	2^+	2542.66
1.5	8.43	2^+	2364.56
3.2	8.24	1^-	2187.20
0.4	9.15	3^+	2181.62
		0^+	2030.6
			2014.7
1.6	8.68	2^+	2004.32
0.9	9.16	3^-	1652.65
≈0.1	≈10.2	2^+	1536.14
1.4	9.53	2^+	641.287 10 ps 5
16.5	10.45[1u]	0^+	0.0

$^{142}_{58}Ce_{84}$

^{142}La β^- decay 1982Mi01,1983Wo09,1971La04

Decay Scheme (continued)

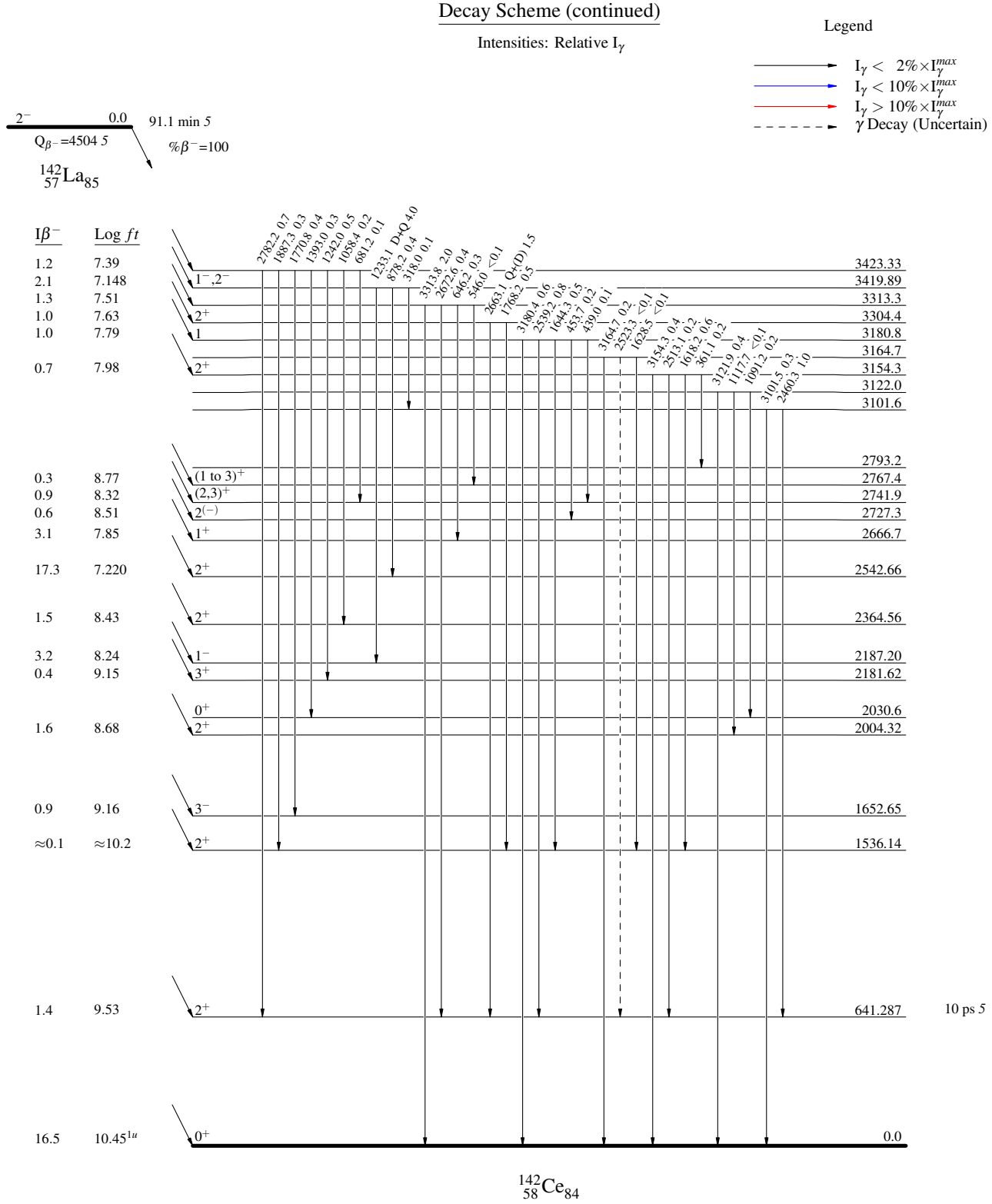
Intensities: Relative I_γ



^{142}La β^- decay 1982Mi01,1983Wo09,1971La04

Decay Scheme (continued)

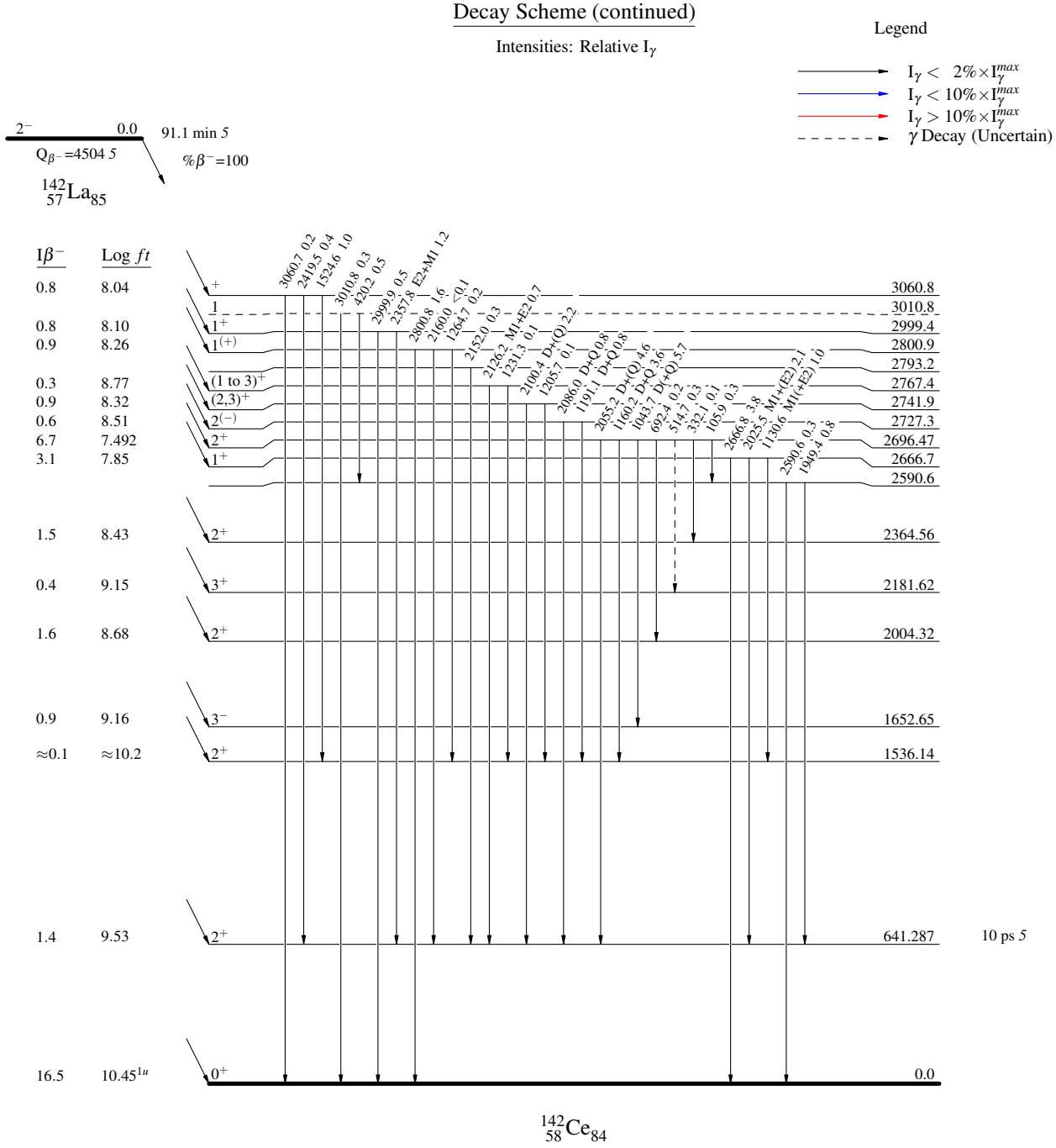
Intensities: Relative I_γ



^{142}La β^- decay 1982Mi01,1983Wo09,1971La04

Decay Scheme (continued)

Intensities: Relative I_γ



^{142}La β^- decay 1982Mi01,1983Wo09,1971La04

Decay Scheme (continued)

Intensities: Relative I_γ