^{147}Ba β^- decay 1981ShZH,1981ScZM,2007SyZZ

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	N. Nica and B. Singh	NDS 181, 1 (2022)	9-Mar-2022

Parent: ^{147}Ba: E=0.0; J^π=(5/2$^-$); $T_{1/2}$=0.894 s *7*; Q(β^-)=6414 *22*; %β^- decay=100.0

^{147}Ba-data from ^{147}Ba Adopted Levels.

^{147}Ba-Q(β^-): From 2021Wa16.

1981ShZH: n-induced ^{235}U fission products analyzed with Tristan ISOL isotope separator at BNL with thermoionization source and moving tape collector. Measured $T_{1/2}$ at SOLIS facility with γ-x HPGe detector and 2π plastic scintillator; measured $\gamma\gamma$ with two Ge(Li) detectors.

1981ScZM: fission products analyzed with ISOL systems Lohengrin and Ostis (ILL Grenoble), and Josef (K.F.A Julich). Measured γ, $\gamma\gamma$, $\gamma\gamma$t, $\beta\gamma$t. Measured conversion electrons and mixing ratios (K/L ratio) with Ge(Li).

2007SyZZ: n-induced ^{235}U fission products analyzed with mass separator OSIRIS (Neutron Research Laboratory Studsvik). Measured $\beta\gamma\gamma$t and extended level scheme (with no γ intensities).

1974ClZX: ^{147}La detected in isomeric decay of fission fragments from spontaneous fission of ^{252}Cf.

Others: 2003SyZZ ($T_{1/2}$, deduced Q_0), 1989Ro20 (^{147}La β^-, J^π of ^{147}La g.s., see also 1981ScZM), 1987RoZW (absolute photon intensity of ^{147}La 167γ), 1986Wa17, 1982Ga24 (^{147}La %β^-n).

Level scheme is from 1981ShZH, which differs notably from that of 1981ScZM by including the 16 keV level (and some replacements of γ's).

^{147}La Levels

E(level)†	J^π‡	$T_{1/2}$#	Comments
0.0	(5/2$^+$)	4.06 s *4*	%β^-=100; %β^-n=0.041 *4* $T_{1/2}$,%β^-,%β^-n: Adopted Values.
15.6	(3/2$^+$)		
74.5	(7/2$^+$)	3 ns	
120.9	(5/2$^+$)	1.4 ns	
167.5	(7/2$^-$)	2.4 ns *11*	$T_{1/2}$: mean value of 3.5 ns (1981ScZM, no unc) and 1.3 ns *1* (2007SyZZ) with unc taken to cover both values (both, probably by γ(t)).
211.7	(7/2$^+$)		
229.3	(11/2$^-$)	10.2 ns *9*	$T_{1/2}$: from 2007SyZZ by γ(t).
232.9	(9/2$^+$)		
252.3			
265.0	(5/2$^-$)	0.3 ns	
278.7			
307.9			
317.7			
342.5			
362.5			
379.2			
380.1			
419.6			
440.1			
473.7			
476.9	(−)		
493.5			
510.6			
523.4			
542.1			
603.0			
620.1			
703.3			
734.4			
766.6			
777.8			

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^{147}Ba β^- decay 1981ShZH,1981ScZM,2007SyZZ (continued)

^{147}La Levels (continued)

E(level)†	E(level)†	E(level)†	E(level)†
810.3	1014.6	1384.3	1671.9
825.5	1016.7	1415.6	1701.1
836.7	1022.3	1501.5	1715.2
844.9	1120.2	1532.8	1741.5
856.5	1158.8	1552.6	1757.8
866.2	1190.0	1568.6	1766.4
910.8	1190.5	1588.7	1776.9
920.0	1243.6	1618.0	1949.1
953.9	1275.6	1619.4	
964.4	1299.8	1648.5	
996.9	1301.5	1660.9	

† From least-squares fit to Eγ′s. As no uncertainties are available for the Eγ input, the E(level) values are calculated with the assumption that the uncertainties are the same (of 1 keV) for all the Eγ′s.
‡ From Adopted Levels.
# From 1981ScZM except as noted.

β^- radiations

Q(β^-)≈6.4 MeV and the highest level at ≈1.8 MeV indicate that the level scheme is incomplete. However based on the existing data, Σ Iβ≈100, which indicates that the level scheme is rather complete. This contradiction suggests that these data should be used rather cautiously; new studies are needed for ^{147}Ba β^- decay.

E(decay)	E(level)	Iβ⁻‡	Log *ft*†	Comments
(4656 *22*)	1757.8	2.6	5.8	av Eβ=2001 *11*
(4766 *22*)	1648.5	0.54	6.5	av Eβ=2053 *11*
(4825 *22*)	1588.7	2.00	6.0	av Eβ=2081 *11*
(4861 *22*)	1552.6	0.87	6.4	av Eβ=2098 *11*
(4881 *22*)	1532.8	7.7	5.4	av Eβ=2107 *11*
(5224 *22*)	1190.0	1.37	6.3	av Eβ=2267 *11*
(5503 *22*)	910.8	0.94	6.6	av Eβ=2398 *11*
(5558 *22*)	856.5	1.61	6.3	av Eβ=2424 *11*
(5604 *22*)	810.3	0.64	6.8	av Eβ=2445 *11*
(5636 *22*)	777.8	0.29	7.1	av Eβ=2460 *11*
(5680 *22*)	734.4	0.38	7.0	av Eβ=2481 *11*
(5711 *22*)	703.3	1.65	6.4	av Eβ=2495 *11*
(5794 *22*)	620.1	0.76	6.8	av Eβ=2534 *11*
(5811 *22*)	603.0	0.57	6.9	av Eβ=2542 *11*
(5872 *22*)	542.1	2.30	6.3	av Eβ=2571 *11*
(5903 *22*)	510.6	1.26	6.6	av Eβ=2586 *11*
(5937 *22*)	476.9	4.6	6.0	av Eβ=2601 *11*
(5940 *22*)	473.7	3.3	6.2	av Eβ=2603 *11*
(5974 *22*)	440.1	0.46	7.0	av Eβ=2619 *11*
(5994 *22*)	419.6	0.47	7.0	av Eβ=2628 *11*
(6034 *22*)	380.1	3.1	6.2	av Eβ=2647 *11*
(6035 *22*)	379.2	0.68	6.9	av Eβ=2647 *11*
(6052 *22*)	362.5	1.52	6.5	av Eβ=2655 *11*
(6072 *22*)	342.5	1.70	6.5	av Eβ=2664 *11*
(6096 *22*)	317.7	1.8	6.5	av Eβ=2676 *11*
(6106 *22*)	307.9	1.53	6.5	av Eβ=2680 *11*
(6135 *22*)	278.7	1.7	6.5	av Eβ=2694 *11*

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^{147}Ba β^- decay 1981ShZH,1981ScZM,2007SyZZ (continued)

β^- radiations (continued)

E(decay)	E(level)	Iβ^-[‡]	Log ft[†]	Comments
(6149 *22*)	265.0	5.4	6.0	av Eβ=2701 *11*
(6162 *22*)	252.3	0.35	7.2	av Eβ=2706 *11*
(6181 *22*)	232.9	1.30	6.6	av Eβ=2716 *11*
(6202 *22*)	211.7	8.0	5.9	av Eβ=2725 *11*
(6247 *22*)	167.5	8.7	5.8	av Eβ=2746 *11*
(6293 *22*)	120.9	8.7	5.9	av Eβ=2768 *11*
(6340 *22*)	74.5	8	5.9	av Eβ=2790 *11*
(6398 *22*)	15.6			
(6414 *22*)	0.0	13	5.7	av Eβ=2825 *11* Iβ^-: γ feeding of 15.7 level was included in the feeding of g.s.

[†] Since many γ multipolarities are not known, conversion coefficients averaged over E1, M1 and E2 values were used to calculate log ft's. Although these values are approximate and tentative especially for β-feedings deduced from more intense low energy γ's (Eγ<200 keV), they might be beneficial for future studies, reason for which they are listed here.
[‡] Absolute intensity per 100 decays.

$\gamma(^{147}La)$

Iγ normalization: absolute photon intensities were calculated from the absolute intensity %Iγ(167.4γ in ^{147}La)=15.9 *16*, based on %Iγ(315γ in ^{147}Pr β^- decay)=18.2 *18* (the value listed here for %Iγ(167.4γ) was recalculated by evaluator from %Iγ(167.4γ)=11 from 1987RoZW and %Iγ(315γ)=12.60 used by 1987RoZW – see ^{147}Pr β^- in ^{147}Nd datasets for discussion on %Iγ(315γ in ^{147}Pr β^- decay)).

E$_\gamma$[#]	I$_\gamma$[#@e]	E$_i$(level)	J$_i^\pi$	E$_f$	J$_f^\pi$	Mult.[&]	α[‡]	Comments
(15.7[d])		15.6	(3/2$^+$)	0.0	(5/2$^+$)	[M1]	36.6	α(L)=29.0 *4*; α(M)=6.04 *9* α(N)=1.325 *19*; α(O)=0.215 *3*; α(P)=0.01644 *23* E$_\gamma$: 15.4 (2007SyZZ).
46.6[f d]	10[f]	120.9	(5/2$^+$)	74.5	(7/2$^+$)	[M1+E2]	22 *13*	%Iγ=0.16 α(K)=7.7 *8*; α(L)=11 *11*; α(M)=2.5 *23* α(N)=0.53 *48*; α(O)=0.074 *66*; α(P)=0.00054 *13* E$_\gamma$: 46.5 (2007SyZZ).
46.6[f d]	59[f]	167.5	(7/2$^-$)	120.9	(5/2$^+$)	(E1)	1.86	%Iγ=0.94 α(K)=1.556 *22*; α(L)=0.243 *4*; α(M)=0.0504 *7* α(N)=0.01077 *15*; α(O)=0.001623 *23*; α(P)=8.57×10^{-5} *12* E$_\gamma$: 46.5 (2007SyZZ). Mult.: from Adopted Gammas.
61.3	7	379.2		317.7		E1	0.897	%Iγ=0.11 α(K)=0.757 *11*; α(L)=0.1114 *16*; α(M)=0.0230 *4* α(N)=0.00495 *7*; α(O)=0.000758 *11*; α(P)=4.32×10^{-5} *6*
61.8[c]		229.3	(11/2$^-$)	167.5	(7/2$^-$)	E2	11.50	α(K)=4.41 *7*; α(L)=5.55 *8*; α(M)=1.238 *18* α(N)=0.261 *4*; α(O)=0.0364 *5*; α(P)=0.000228 *4*
74.3[d]	220	74.5	(7/2$^+$)	0.0	(5/2$^+$)	M1(+E2)	4.2 *17*	%Iγ=3.5 α(K)=2.5 *4*; α(L)=1.3 *11*; α(M)=0.29 *23* α(N)=0.062 *49*; α(O)=0.0088 *67*; α(P)=0.000157 *12* E$_\gamma$: 74.3 (2007SyZZ).

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^{147}Ba β^- decay 1981ShZH,1981ScZM,2007SyZZ (continued)

$\gamma(^{147}La)$ (continued)

E_γ[#]	I_γ[#@e]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[&]	δ[†a]	α[‡]	Comments
90.9[d]	20	211.7	(7/2$^+$)	120.9	(5/2$^+$)	[M1+E2]		2.11[b] *69*	%Iγ=0.32 α(K)=1.41 *20*; α(L)=0.55 *39*; α(M)=0.120 *86* α(N)=0.026 *18*; α(O)=0.0037 *25*; α(P)=9.0×10^{-5} *5* E_γ: 90.9 (2007SyZZ).
93.0[d]	71	167.5	(7/2$^-$)	74.5	(7/2$^+$)	E1		0.287	%Iγ=1.1 α(K)=0.245 *4*; α(L)=0.0339 *5*; α(M)=0.00701 *10* α(N)=0.001516 *22*; α(O)=0.000237 *4*; α(P)=1.480×10^{-5} *21* E_γ: 93.1 (2007SyZZ).
97.4[f d]	75[f]	265.0	(5/2$^-$)	167.5	(7/2$^-$)	M1		1.166	%Iγ=1.2 α(K)=0.995 *14*; α(L)=0.1350 *19*; α(M)=0.0281 *4* α(N)=0.00617 *9*; α(O)=0.001002 *14*; α(P)=7.76×10^{-5} *11* E_γ: 97.5 (2007SyZZ).
97.4[f d]	10[f]	476.9	(−)	379.2				1.2[b] *9*	%Iγ=0.16 E_γ: 97.7 (2007SyZZ).
100.6[d]	7	379.2		278.7				1.1[b] *9*	%Iγ=0.11 E_γ: 100.6 (2007SyZZ).
105.2[d]	440	120.9	(5/2$^+$)	15.6	(3/2$^+$)	M1+E2	0.65	1.151	%Iγ=7.0 α(K)=0.872 *13*; α(L)=0.220 *3*; α(M)=0.0475 *7* α(N)=0.01021 *15*; α(O)=0.001526 *22*; α(P)=6.07×10^{-5} *9* E_γ: 105.5 (2007SyZZ).
115.1[d]	33	380.1		265.0	(5/2$^-$)			0.7[b] *5*	%Iγ=0.53 E_γ: 115.1 (2007SyZZ).
120.8[d]	34	120.9	(5/2$^+$)	0.0	(5/2$^+$)	[M1+E2]		0.83[b] *20*	%Iγ=0.54 α(K)=0.61 *8*; α(L)=0.168 *96*; α(M)=0.037 *22* α(N)=0.0078 *45*; α(O)=0.00116 *62*; α(P)=4.01×10^{-5} *21* E_γ: 120.8 (2007SyZZ).
127.8	12	380.1		252.3				0.5[b] *4*	%Iγ=0.19
130.6[d]	33	510.6		380.1		M1+E2		0.64 *14*	%Iγ=0.53 α(K)=0.48 *5*; α(L)=0.124 *65*; α(M)=0.027 *15* α(N)=0.0057 *31*; α(O)=8.5×10^{-4} *42*; α(P)=3.21×10^{-5} *18* E_γ: 130.4 (2007SyZZ).
134.5[d]	4	476.9	(−)	342.5				0.4[b] *3*	%Iγ=0.064 E_γ: 134.6 (2007SyZZ).
140.6	5	307.9		167.5	(7/2$^-$)			0.34[b] *25*	%Iγ=0.080
140.6[d]	5	419.6		278.7				0.34[b] *25*	%Iγ=0.080 E_γ: 140.4 (2007SyZZ).
144.0[d]	52	265.0	(5/2$^-$)	120.9	(5/2$^+$)	[E1]		0.0858[b]	%Iγ=0.83 α(K)=0.0734 *11*; α(L)=0.00982 *14*; α(M)=0.00203 *3* α(N)=0.000441 *7*; α(O)=6.98×10^{-5} *10*;

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^{147}Ba β^- decay 1981ShZH,1981ScZM,2007SyZZ (continued)

$\gamma(^{147}La)$ (continued)

E_γ[#]	I_γ[#@e]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[&]	α[‡]	Comments
								α(P)=4.70×10^{-6} *7* E_γ: 143.8 (2007SyZZ).
147.6[c]		510.6		362.5				
149.9	97	317.7		167.5	(7/2$^-$)		0.30[b] *21*	%Iγ=1.5
149.9[c]		379.2		229.3	(11/2$^-$)			
150.2[c]		362.5		211.7	(7/2$^+$)			
157.7[d]	63	278.7		120.9	(5/2$^+$)		0.24[b] *17*	%Iγ=1.0 E_γ: 157.6 (2007SyZZ).
158.6[d]	55	232.9	(9/2$^+$)	74.5	(7/2$^+$)	M1+E2	0.34 *5*	%Iγ=0.88 α(K)=0.270 *18*; α(L)=0.059 *25*; α(M)=0.0126 *56* α(N)=0.0027 *12*; α(O)=4.1×10^{-4} *16*; α(P)=1.84×10^{-5} *13* E_γ: 158.7 (2007SyZZ).
167.4[d]	1000	167.5	(7/2$^-$)	0.0	(5/2$^+$)	E1	0.0567	%Iγ=15.9 α(K)=0.0486 *7*; α(L)=0.00644 *9*; α(M)=0.001330 *19* α(N)=0.000289 *4*; α(O)=4.60×10^{-5} *7*; α(P)=3.16×10^{-6} *5* E_γ: 167.4 (2007SyZZ).
168.4[d]	10	380.1		211.7	(7/2$^+$)		0.19[b] *13*	%Iγ=0.16 E_γ: 168.5 (2007SyZZ).
175.0[d]	57	342.5		167.5	(7/2$^-$)		0.17[b] *12*	%Iγ=0.91 E_γ: 175.0 (2007SyZZ).
190.5[d]	58	265.0	(5/2$^-$)	74.5	(7/2$^+$)	[E1]	0.0398[b]	%Iγ=0.92 α(K)=0.0342 *5*; α(L)=0.00450 *7*; α(M)=0.000929 *13* α(N)=0.000202 *3*; α(O)=3.23×10^{-5} *5*; α(P)=2.25×10^{-6} *4* E_γ: 190.6 (2007SyZZ).
196.1[d]	435	211.7	(7/2$^+$)	15.6	(3/2$^+$)	E2	0.190	%Iγ=6.9 α(K)=0.1454 *21*; α(L)=0.0353 *5*; α(M)=0.00762 *11* α(N)=0.001634 *23*; α(O)=0.000243 *4*; α(P)=9.02×10^{-6} *13* E_γ: 196.2 (2007SyZZ).
198.2[d]	12	476.9	(−)	278.7			0.11[b] *7*	%Iγ=0.19 E_γ: 198.5 (2007SyZZ).
203.3[d]	5	510.6		307.9			0.10[b] *7*	%Iγ=0.080 E_γ: 202.5 (2007SyZZ).
208.9[d]	12	473.7		265.0	(5/2$^-$)		0.09[b] *6*	%Iγ=0.19 E_γ: 208.9 (2007SyZZ).
211.7[f d]	70[f]	211.7	(7/2$^+$)	0.0	(5/2$^+$)	M1+E2	0.140 *7*	%Iγ=1.1 α(K)=0.1142 *17*; α(L)=0.0207 *55*; α(M)=0.0044 *13* α(N)=9.5×10^{-4} *26*; α(O)=0.00015 *4*; α(P)=8.0×10^{-6} *9* E_γ: 211.7 (2007SyZZ).
211.7[c]		379.2		167.5	(7/2$^-$)			
211.7[f d]	70[f]	476.9	(−)	265.0	(5/2$^-$)	M1+E2	0.140 *7*	%Iγ=1.1 α(K)=0.1142 *17*; α(L)=0.0207 *55*; α(M)=0.0044 *13*

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^{147}Ba β^- decay 1981ShZH,1981ScZM,2007SyZZ (continued)

$\gamma(^{147}La)$ (continued)

E_γ[#]	I_γ[#@e]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[&]	α[‡]	Comments
								α(N)=9.5×10^{-4} *26*; α(O)=0.00015 *4*; α(P)=8.0×10^{-6} *9* E_γ: 211.8 (2007SyZZ).
226.2[d]	30	703.3		476.9	(−)		0.08[b] *5*	%Iγ=0.48 E_γ: 226.4 (2007SyZZ).
232.9[d]	53	232.9	(9/2$^+$)	0.0	(5/2$^+$)	(E2)	0.1068[b]	%Iγ=0.84 α(K)=0.0839 *12*; α(L)=0.0181 *3*; α(M)=0.00388 *6* α(N)=0.000835 *12*; α(O)=0.0001258 *18*; α(P)=5.37×10^{-6} *8* E_γ: 232.9 (2007SyZZ).
236.6	38	252.3		15.6	(3/2$^+$)		0.06[b] *4*	%Iγ=0.60
240.9[c]		620.1		379.2				
241.7[d]	13	362.5		120.9	(5/2$^+$)		0.06[b] *4*	%Iγ=0.21 E_γ: 241.4 (2007SyZZ).
243.9[d]	8	476.9	(−)	232.9	(9/2$^+$)		0.06[b] *4*	%Iγ=0.13 E_γ: 243.9 (2007SyZZ).
249.3[d]	328	265.0	(5/2$^-$)	15.6	(3/2$^+$)	E1	0.0193	%Iγ=5.2 α(K)=0.01661 *24*; α(L)=0.00216 *3*; α(M)=0.000447 *7* α(N)=9.75×10^{-5} *14*; α(O)=1.562×10^{-5} *22*; α(P)=1.124×10^{-6} *16* E_γ: 249.4 (2007SyZZ).
251.4[d]	12	419.6		167.5	(7/2$^-$)		0.05[b] *4*	%Iγ=0.19 E_γ: 251.4 (2007SyZZ).
259.5[d]	10	380.1		120.9	(5/2$^+$)		0.05[b] *3*	%Iγ=0.16 E_γ: 259.0 (2007SyZZ).
260.3[c]		493.5		232.9	(9/2$^+$)			
261.8[d]	42	473.7		211.7	(7/2$^+$)		0.05[b] *3*	%Iγ=0.67 E_γ: 262.0 (2007SyZZ).
262.8[d]	60	278.7		15.6	(3/2$^+$)		0.046[b] *25*	%Iγ=0.95 E_γ: 262.8 (2007SyZZ).
264.8[d]	64	265.0	(5/2$^-$)	0.0	(5/2$^+$)	[E1]	0.01649[b]	%Iγ=1.0 α(K)=0.01417 *20*; α(L)=0.00184 *3*; α(M)=0.000380 *6* α(N)=8.30×10^{-5} *12*; α(O)=1.331×10^{-5} *19*; α(P)=9.63×10^{-7} *14* E_γ: 264.9 (2007SyZZ).
268.2[d]	29	342.5		74.5	(7/2$^+$)		0.044[b] *28*	%Iγ=0.46 E_γ: 268.1 (2007SyZZ).
277.0[d]	15	542.1		265.0	(5/2$^-$)		0.038[b] *24*	%Iγ=0.24 E_γ: 276.9 (2007SyZZ).
278.3[d]	25	278.7		0.0	(5/2$^+$)		0.040[b] *29*	%Iγ=0.40 E_γ: 278.5 (2007SyZZ).
292.3[d]	48	307.9		15.6	(3/2$^+$)		0.032[b] *20*	%Iγ=0.76 E_γ: 292.4 (2007SyZZ).
294.1[c]		523.4		229.3	(11/2$^-$)			
298.5[f d]	5[f]	419.6		120.9	(5/2$^+$)		0.033[b] *21*	%Iγ=0.080 E_γ: 298.0 (2007SyZZ).
298.5[f d]	19[f]	510.6		211.7	(7/2$^+$)		0.033 *21*	%Iγ=0.30 E_γ: 298.7 (2007SyZZ).

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^{147}Ba β^- decay 1981ShZH,1981ScZM,2007SyZZ (continued)

$\gamma(^{147}La)$ (continued)

E_γ[#]	I_γ[#@e]	E_i(level)	J_i^π	E_f	J_f^π	α[‡]	Comments
304.8[d]	36	379.2		74.5	(7/2$^+$)	0.03[b] *2*	%Iγ=0.57 E_γ: 304.8 (2007SyZZ).
307.9[d]	81	307.9		0.0	(5/2$^+$)		%Iγ=1.3 E_γ: 307.7 (2007SyZZ).
309.5[f d]	95[f]	476.9	(−)	167.5	(7/2$^-$)	0.03[b] *2*	%Iγ=1.5 E_γ: 309.5 (2007SyZZ).
309.5[f d]	10[f]	542.1		232.9	(9/2$^+$)	0.031[b] *20*	%Iγ=0.16 E_γ: 308.6 (2007SyZZ).
319.3[d]	8	440.1		120.9	(5/2$^+$)	0.028[b] *17*	%Iγ=0.13 E_γ: 319.0 (2007SyZZ).
323.2[d]	27	703.3		380.1		0.028[b] *17*	%Iγ=0.43 E_γ: 323.2 (2007SyZZ).
337.9	4	603.0		265.0	(5/2$^-$)	0.024[b] *14*	%Iγ=0.064
340.8[d]	20	703.3		362.5		0.023[b] *14*	%Iγ=0.32 E_γ: 340.5 (2007SyZZ).
342.5	15	342.5		0.0	(5/2$^+$)	0.023[b] *14*	%Iγ=0.24
344.6[d]	5	419.6		74.5	(7/2$^+$)	0.02[b] *1*	%Iγ=0.080 E_γ: 344.6 (2007SyZZ).
352.5[d]	5	473.7		120.9	(5/2$^+$)	0.021[b] *13*	%Iγ=0.080 E_γ: 355.2 (1981ShZH); value of 2007SyZZ was adopted becasue it is in better agreement with ΔE(levels).
355.9[c]		523.4		167.5	(7/2$^-$)		
356.1[d]	148	476.9	(−)	120.9	(5/2$^+$)	0.021[b] *13*	%Iγ=2.4 E_γ: 356.1 (2007SyZZ).
362.6[d]	100	362.5		0.0	(5/2$^+$)	0.020[b] *13*	%Iγ=1.6 E_γ: 362.6 (2007SyZZ).
364.5[d]	144	380.1		15.6	(3/2$^+$)		%Iγ=2.3 E_γ: 364.7 (2007SyZZ).
365.3[c]		440.1		74.5	(7/2$^+$)		
370.2[d]	26	603.0		232.9	(9/2$^+$)	0.019[b] *13*	%Iγ=0.41 E_γ: 370.2 (2007SyZZ).
372.7[c]		493.5		120.9	(5/2$^+$)		
374.4[d]	38	542.1		167.5	(7/2$^-$)	0.018[b] *12*	%Iγ=0.60 E_γ: 374.3 (2007SyZZ).
379.9[d]	36	380.1		0.0	(5/2$^+$)		%Iγ=0.57 E_γ: 380.2 (2007SyZZ).
387.4[d]	5	620.1		232.9	(9/2$^+$)	0.017[b] *12*	%Iγ=0.080 E_γ: 396.9 (2007SyZZ).
395.4[d]	17	703.3		307.9		0.016[b] *11*	%Iγ=0.27 E_γ: 395.4 (2007SyZZ).
399.4[d]	44	473.7		74.5	(7/2$^+$)		%Iγ=0.70 E_γ: 399.3 (2007SyZZ).
401.9	5	476.9	(−)	74.5	(7/2$^+$)		%Iγ=0.080
419.3[c]		493.5		74.5	(7/2$^+$)		
421.2[d]	8	542.1		120.9	(5/2$^+$)		%Iγ=0.13 E_γ: 420.8 (2007SyZZ).
424.5[d]	21	440.1		15.6	(3/2$^+$)		%Iγ=0.33 E_γ: 424.5 (2007SyZZ).
438.2	8	703.3		265.0	(5/2$^-$)		%Iγ=0.13
452.4[d]	16	620.1		167.5	(7/2$^-$)		%Iγ=0.25 E_γ: 452.5 (2007SyZZ).

Continued on next page (footnotes at end of table)

^{147}Ba β^- decay 1981ShZH,1981ScZM,2007SyZZ (continued)

$\gamma(^{147}La)$ (continued)

E_γ[#]	I_γ[#@e]	E_i(level)	J_i^π	E_f	J_f^π	Comments
455.5[d]	9	734.4		278.7		%Iγ=0.14 E_γ: 455.5 (2007SyZZ).
458.1	20	473.7		15.6	$(3/2^+)$	%Iγ=0.32
467.6[d]	22	542.1		74.5	$(7/2^+)$	%Iγ=0.35 E_γ: 467.5 (2007SyZZ).
473.7[d]	117	473.7		0.0	$(5/2^+)$	%Iγ=1.9 E_γ: 473.7 (2007SyZZ).
477.0[d]	40	476.9	$(^-)$	0.0	$(5/2^+)$	%Iγ=0.64 E_γ: 476.9 (2007SyZZ).
482.3[c]		603.0		120.9	$(5/2^+)$	
491.5[d]	11	703.3		211.7	$(7/2^+)$	%Iγ=0.18 E_γ: 491.5 (2007SyZZ).
502.3	13	810.3		307.9		%Iγ=0.21
528.7[c]		603.0		74.5	$(7/2^+)$	
534.3[c]		953.9		419.6		
536.0[d]	24	703.3		167.5	$(7/2^-)$	%Iγ=0.38 E_γ: 535.9 (2007SyZZ).
541.9[d]	50	542.1		0.0	$(5/2^+)$	%Iγ=0.80 E_γ: 541.9 (2007SyZZ).
545.7	27	620.1		74.5	$(7/2^+)$	%Iγ=0.43
548.4[d]	5	856.5		307.9		%Iγ=0.080 E_γ: 548.4 (2007SyZZ).
566.1[d]	10	777.8		211.7	$(7/2^+)$	%Iγ=0.16 E_γ: 565.6 (2007SyZZ).
567.2[c]		734.4		167.5	$(7/2^-)$	
577.8[d]	15	856.5		278.7		%Iγ=0.24 E_γ: 577.8 (2007SyZZ).
591.7[d]	41	856.5		265.0	$(5/2^-)$	%Iγ=0.65 E_γ: 591.4 (2007SyZZ).
598.6[d]	36	810.3		211.7	$(7/2^+)$	%Iγ=0.57 E_γ: 598.5 (2007SyZZ).
602.5	5	603.0		0.0	$(5/2^+)$	%Iγ=0.080
613.4[d]	15	734.4		120.9	$(5/2^+)$	%Iγ=0.24 E_γ: 613.4 (2007SyZZ).
621.4[c]		1532.8		910.8		
642.8[c]		810.3		167.5	$(7/2^-)$	
644.6[c]		856.5		211.7	$(7/2^+)$	
645.5	14	910.8		265.0	$(5/2^-)$	%Iγ=0.22
645.7[c]		766.6		120.9	$(5/2^+)$	
656.8[d]	8	777.8		120.9	$(5/2^+)$	%Iγ=0.13 E_γ: 656.8 (2007SyZZ).
658.0[c]		825.5		167.5	$(7/2^-)$	
659.9[c]		734.4		74.5	$(7/2^+)$	
669.2[c]		836.7		167.5	$(7/2^-)$	
677.4[c]		844.9		167.5	$(7/2^-)$	
678.4	14	1588.7		910.8		%Iγ=0.22
689.0[d]	40	856.5		167.5	$(7/2^-)$	%Iγ=0.64 E_γ: 689.0 (2007SyZZ).
689.5[c]		810.3		120.9	$(5/2^+)$	
692.1[c]		766.6		74.5	$(7/2^+)$	
698.7[c]		866.2		167.5	$(7/2^-)$	

Continued on next page (footnotes at end of table)

^{147}Ba β^- decay 1981ShZH,1981ScZM,2007SyZZ (continued)

$\gamma(^{147}La)$ (continued)

E_γ[#]	I_γ[#@e]	E_i(level)	J_i^π	E_f	J_f^π	Comments
735.7[c]		856.5		120.9	$(5/2^+)$	
737.3[c]		1158.8		419.6		
743.5[d]	59	910.8		167.5	$(7/2^-)$	%Iγ=0.94 E_γ: 743.4 (2007SyZZ).
752.5[c]		920.0		167.5	$(7/2^-)$	
757.3[c]		1022.3		265.0	$(5/2^-)$	
785.3[c]		1014.6		229.3	$(11/2^-)$	
796.9[c]		964.4		167.5	$(7/2^-)$	
798.6[c]		1275.6		476.9	$(^-)$	
810.3[c]		1190.5		380.1		
810.6[c]		1022.3		211.7	$(7/2^+)$	
811.3[c]		1190.5		379.2		
829.4[c]		996.9		167.5	$(7/2^-)$	
838.2	9	1648.5		810.3		%Iγ=0.14
849.2[c]		1016.7		167.5	$(7/2^-)$	
855.3[c]		1120.2		265.0	$(5/2^-)$	
864.1[c]		1243.6		379.2		
885.1[d]	37	1588.7		703.3		%Iγ=0.59 E_γ: 885.2 (2007SyZZ).
908.4[c]		1120.2		211.7	$(7/2^+)$	
914.7[c]		1618.0		703.3		
925.1[d]	46	1190.0		265.0	$(5/2^-)$	%Iγ=0.73 E_γ: 924.9 (2007SyZZ).
949.0[c]		1158.8		211.7	$(7/2^+)$	
978.1[d]	16	1190.0		211.7	$(7/2^+)$	%Iγ=0.25 E_γ: 977.7 (2007SyZZ).
1022.7[d]	24	1190.0		167.5	$(7/2^-)$	%Iγ=0.38 E_γ: 1022.5 (2007SyZZ).
1036.7[c]		1301.5		265.0	$(5/2^-)$	
1055.8[d]	99	1532.8		476.9	$(^-)$	%Iγ=1.6
1059.1[d]	38	1532.8		473.7		%Iγ=0.60
1076.3[c]		1243.6		167.5	$(7/2^-)$	
1089.6[c]		1301.5		211.7	$(7/2^+)$	
1091.8[c]		1568.6		476.9	$(^-)$	
1108.3[c]		1275.6		167.5	$(7/2^-)$	
1132.3[c]		1299.8		167.5	$(7/2^-)$	
1150.7[c]		1415.6		265.0	$(5/2^-)$	
1154.0[c]		1532.8		379.2		
1173.3[c]		1552.6		379.2		
1216.8[c]		1384.3		167.5	$(7/2^-)$	
1239.2[c]		1619.4		380.1		
1248.1[c]		1415.6		167.5	$(7/2^-)$	
1268.0[d]	34	1532.8		265.0	$(5/2^-)$	%Iγ=0.54 E_γ: 1268.0 (2007SyZZ).
1319.4[c]		1552.6		232.9	$(9/2^+)$	
1323.4	12	1588.7		265.0	$(5/2^-)$	%Iγ=0.19
1334.0[c]		1501.5		167.5	$(7/2^-)$	
1341.1[c]		1415.6		74.5	$(7/2^+)$	
1354.6[c]		1619.4		265.0	$(5/2^-)$	
1365.4[d]	73	1532.8		167.5	$(7/2^-)$	%Iγ=1.2 E_γ: 1365.2 (2007SyZZ).

Continued on next page (footnotes at end of table)

^{147}Ba β^- decay 1981ShZH,1981ScZM,2007SyZZ (continued)

$\gamma(^{147}La)$ (continued)

E_γ [#]	I_γ [#@e]	E_i(level)	J_i^π	E_f	J_f^π	Comments
1383.8	16	1648.5		265.0	$(5/2^-)$	%Iγ=0.25
1385.8[d]	21	1552.6		167.5	$(7/2^-)$	%Iγ=0.33 E_γ: 1384.8 (2007SyZZ).
1401.0[c]		1568.6		167.5	$(7/2^-)$	
1406.9[c]		1671.9		265.0	$(5/2^-)$	
1431.2[d]	34	1552.6		120.9	$(5/2^+)$	%Iγ=0.54 E_γ: 1431.4 (2007SyZZ).
1436.5[d]	9	1648.5		211.7	$(7/2^+)$	%Iγ=0.14 E_γ: 1436.0 (2007SyZZ).
1449.2[c]		1660.9		211.7	$(7/2^+)$	
1467.7[d]	37	1588.7		120.9	$(5/2^+)$	%Iγ=0.59 E_γ: 1467.7 (2007SyZZ).
1476.3[c]		1741.5		265.0	$(5/2^-)$	
1501.4[c]		1766.4		265.0	$(5/2^-)$	
1503.5[c]		1715.2		211.7	$(7/2^+)$	
1517.3[d]	240	1532.8		15.6	$(3/2^+)$	%Iγ=3.8 E_γ: 1517.3 (2007SyZZ).
1530.1[c]		1741.5		211.7	$(7/2^+)$	
1533.6[c]		1701.1		167.5	$(7/2^-)$	
1588.7	26	1588.7		0.0	$(5/2^+)$	%Iγ=0.41
1589.3[c]		1757.8		167.5	$(7/2^-)$	
1609.4[c]		1776.9		167.5	$(7/2^-)$	
1636.5[d]	30	1757.8		120.9	$(5/2^+)$	%Iγ=0.48 E_γ: 1636.1 (2007SyZZ).
1683.1[d]	13	1757.8		74.5	$(7/2^+)$	%Iγ=0.21 E_γ: 1683.1 (2007SyZZ).
1759.3	123	1757.8		0.0	$(5/2^+)$	%Iγ=2.0
1781.6[c]		1949.1		167.5	$(7/2^-)$	

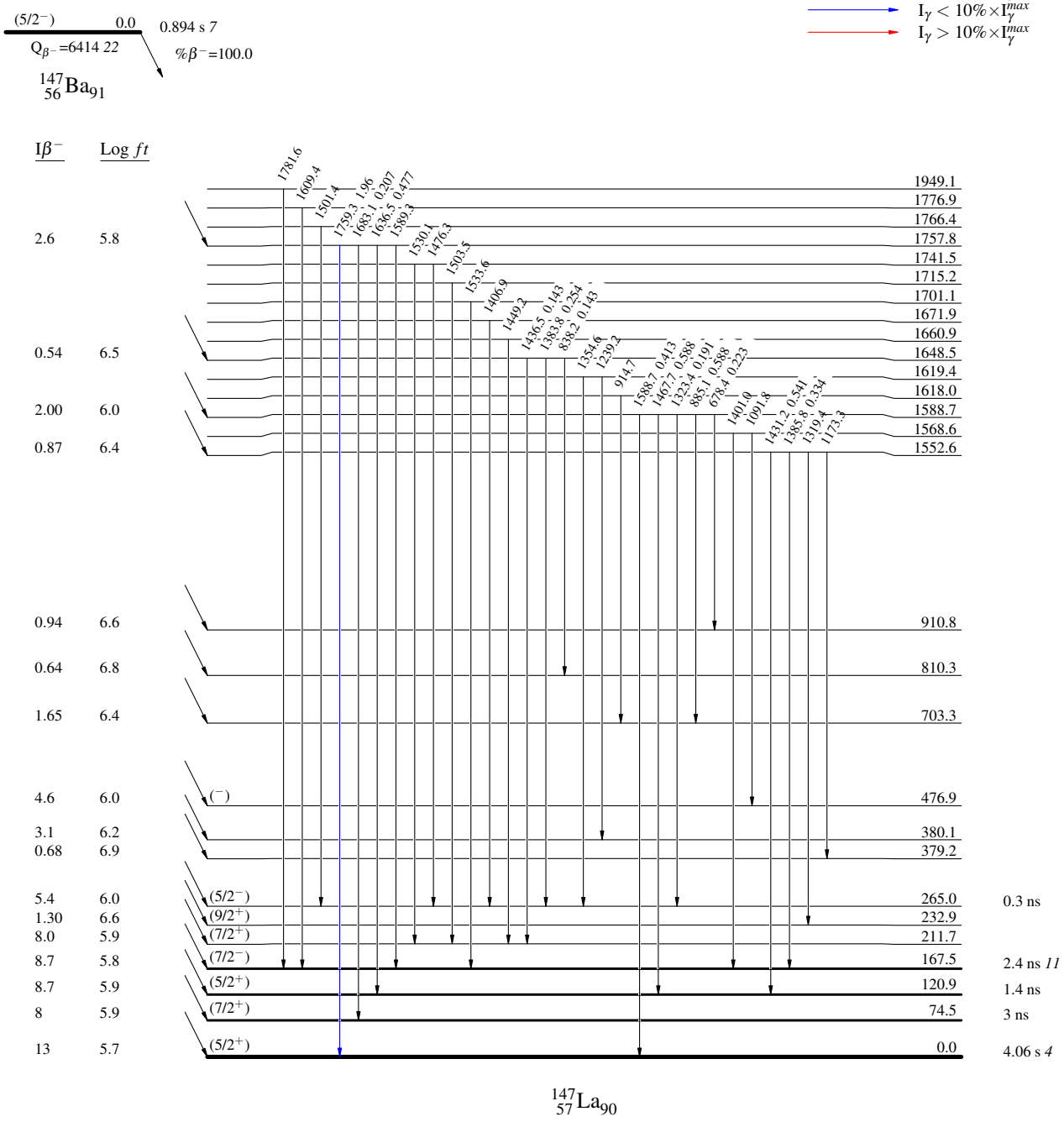
† Additional information 1.
‡ Additional information 2.
# From 1981ShZH (reported with no unc) except as noted.
@ Values are relative to 1000 for the 167.4-keV transition.
& From Adopted Levels, Gammas dataset with most values deduced in this dataset by 1981ScZM based on α(K)exp (values not given).
[a] From 1981ScZM based on measured K/L ratios (values not given).
[b] Since the multipolarity is not known for this γ, the α is calculated as average of smallest and largest values for the E1, M2 and E2 multipolarities for this transition with an uncertainty taken large enough to overlap these values.
[c] From 2007SyZZ (reported with no unc). 2007SyZZ give no γ ray intensities.
[d] Observed by both 1981ShZH and 2007SyZZ.
[e] For absolute intensity per 100 decays, multiply by 0.0159.
[f] Multiply placed with intensity suitably divided.

^{147}Ba β^- decay 1981ShZH,1981ScZM,2007SyZZ

Decay Scheme

Intensities: I_γ per 100 parent decays

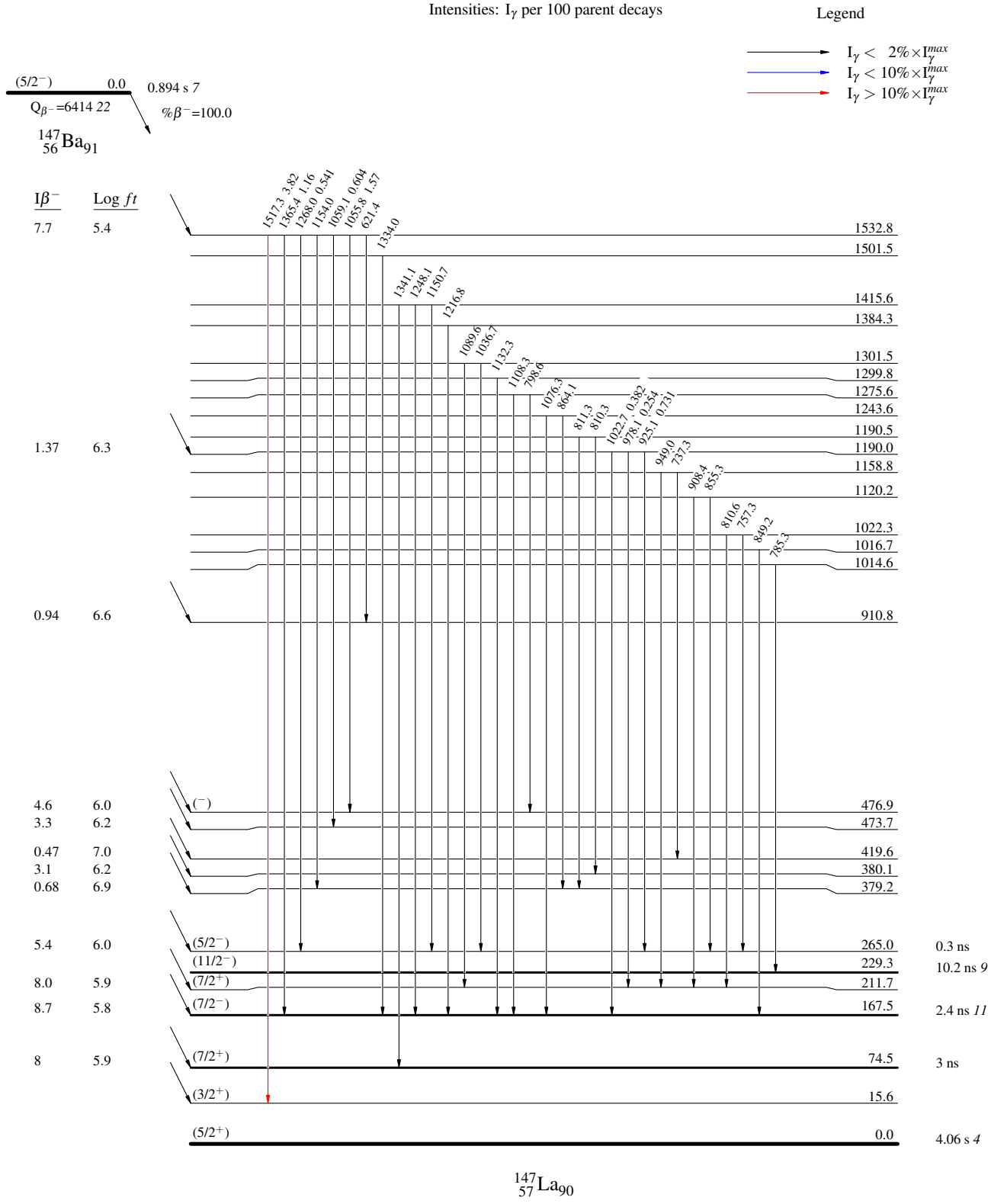
Legend
$I_\gamma < 2\% \times I_\gamma^{max}$
$I_\gamma < 10\% \times I_\gamma^{max}$
$I_\gamma > 10\% \times I_\gamma^{max}$



^{147}Ba β^- decay 1981ShZH,1981ScZM,2007SyZZ

Decay Scheme (continued)

Intensities: I_γ per 100 parent decays



^{147}Ba β^- decay 1981ShZH,1981ScZM,2007SyZZ

Decay Scheme (continued)

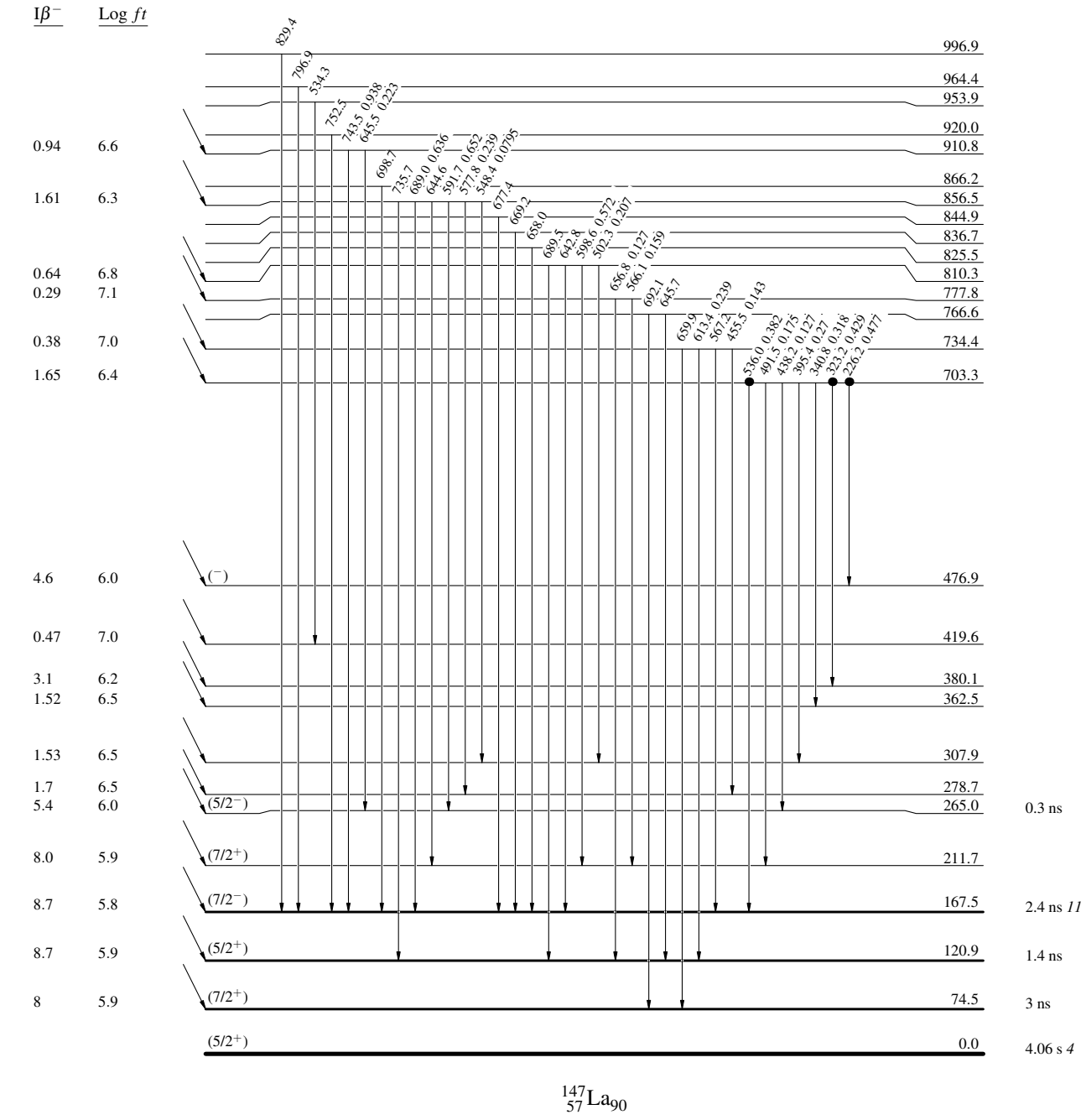
Intensities: I_γ per 100 parent decays

Legend
- $I_\gamma < 2\% \times I_\gamma^{max}$
- $I_\gamma < 10\% \times I_\gamma^{max}$
- $I_\gamma > 10\% \times I_\gamma^{max}$
- Coincidence

$(5/2^-)$ 0.0 0.894 s *7*

Q_{β^-}=6414 *22* $\%\beta^-$=100.0

$^{147}_{56}Ba_{91}$



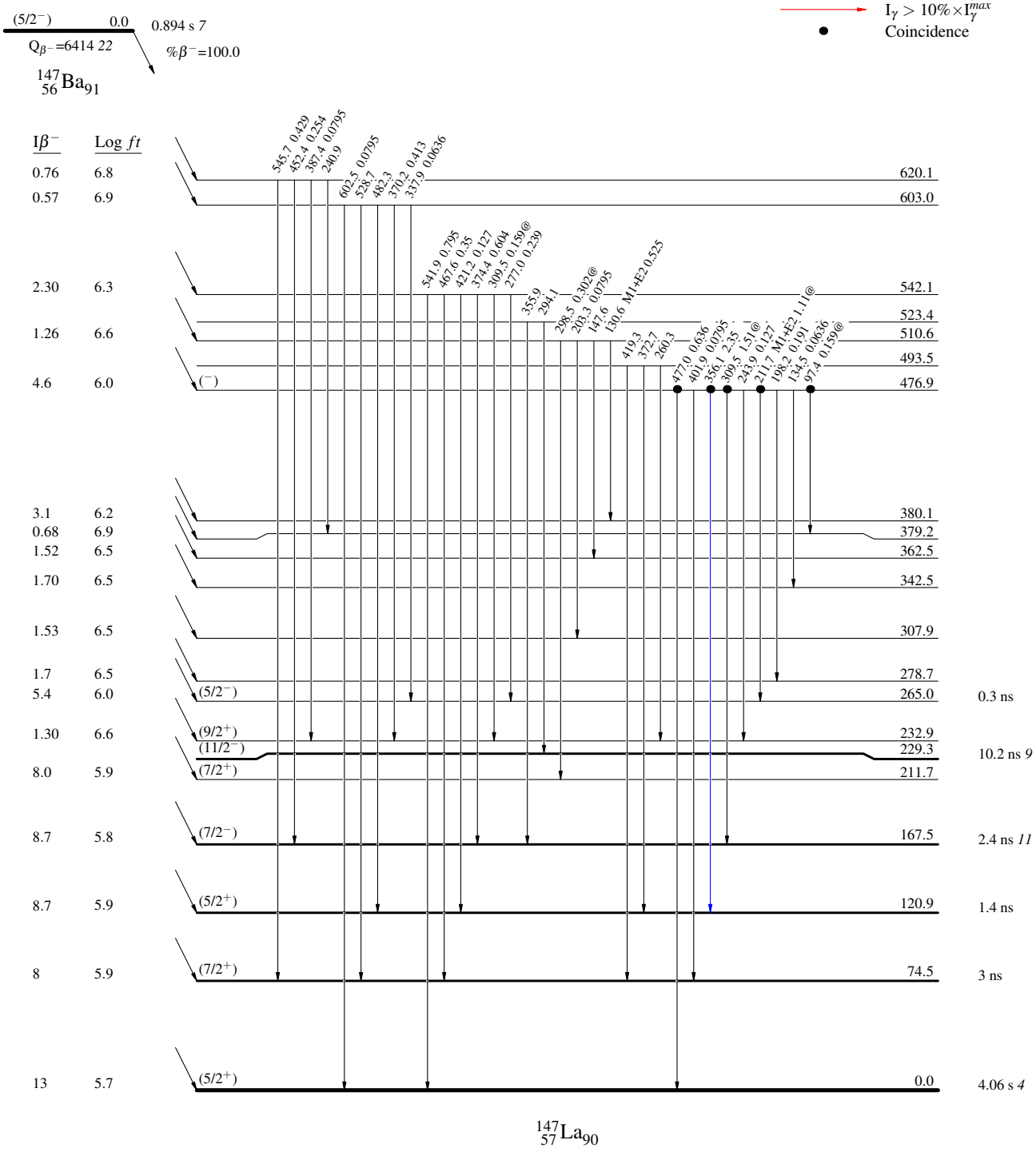
$^{147}_{57}La_{90}$

^{147}Ba β^- decay 1981ShZH,1981ScZM,2007SyZZ

Decay Scheme (continued)

Intensities: I_γ per 100 parent decays
@ Multiply placed: intensity suitably divided

Legend
$I_\gamma < 2\% \times I_\gamma^{max}$
$I_\gamma < 10\% \times I_\gamma^{max}$
$I_\gamma > 10\% \times I_\gamma^{max}$
Coincidence

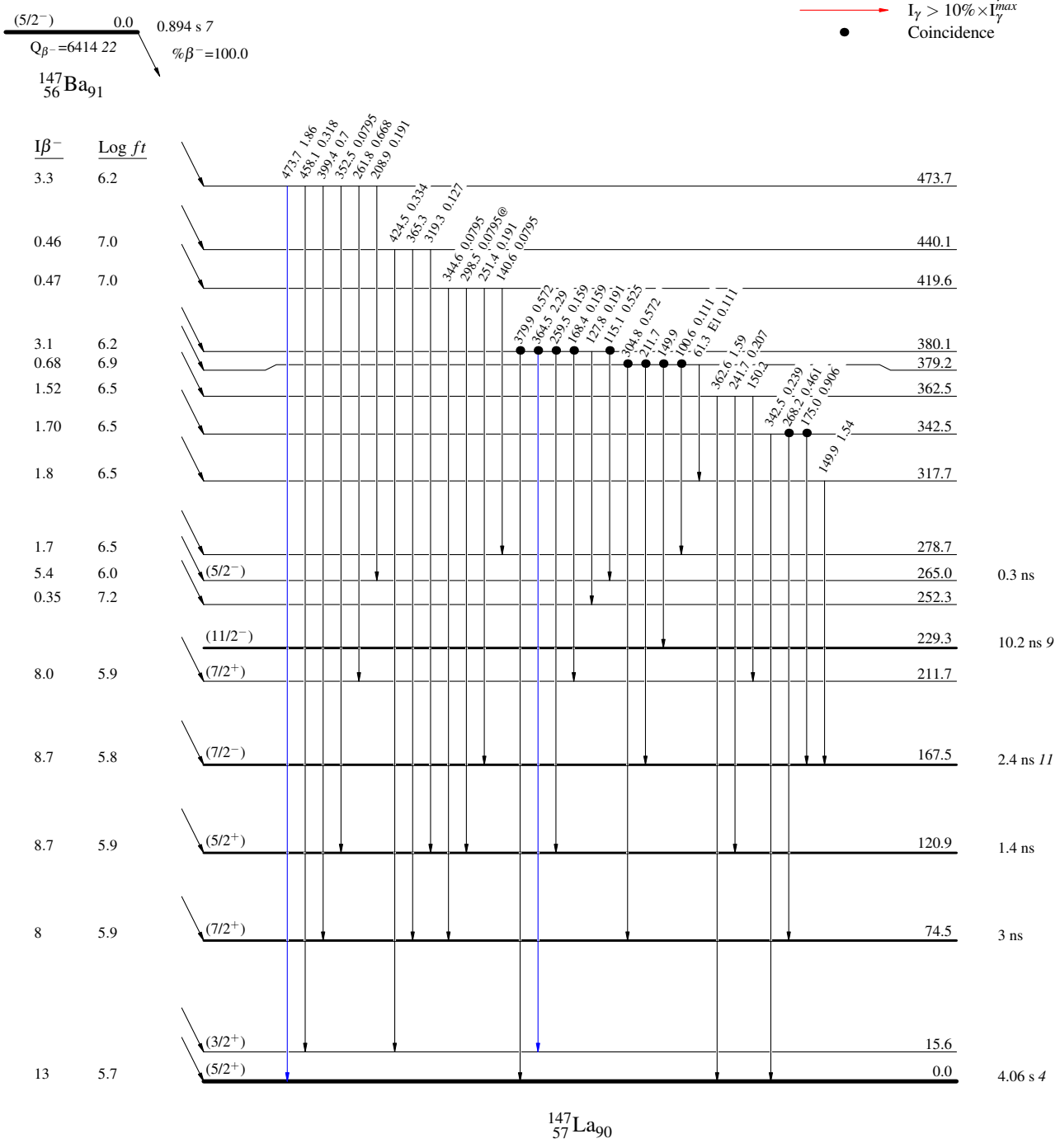


^{147}Ba β^- decay 1981ShZH,1981ScZM,2007SyZZ

Decay Scheme (continued)

Intensities: I_γ per 100 parent decays
@ Multiply placed: intensity suitably divided

Legend
$I_\gamma < 2\% \times I_\gamma^{max}$
$I_\gamma < 10\% \times I_\gamma^{max}$
$I_\gamma > 10\% \times I_\gamma^{max}$
Coincidence



^{147}Ba β^- decay 1981ShZH,1981ScZM,2007SyZZ

Decay Scheme (continued)

Intensities: I_γ per 100 parent decays
@ Multiply placed: intensity suitably divided