^{133}Ce ε decay (5.1 h) 1978He16

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	Yu. Khazov and A. Rodionov, F. G. Kondev	NDS 112,855 (2011)	31-Oct-2010

Parent: ^{133}Ce: E=37.2 *7*; $J^\pi=9/2^-$; $T_{1/2}$=5.1 h *3*; Q(ε)=3071 *32*; %ε+%$β^+$ decay≤100

1978He16: ^{133}Ce ε (5.1 h) [from Ba(α,xn)]; measured Eγ, Iγ, γγ, ce; deduced levels, α(exp), log *ft*. Ge(Li) detectors, Compton suppressed system, magnetic spectrometer, chemical procedure and mass-separator.

1984Gr30: ^{133}Ce ε (5.1 h) [from Gd(p,X), E=660 MeV]; measured ce; deduced α(exp), δ. Magnetic spectrograph.

Other measurements: 1967Ab10, 1968Ge01, 1968Ab02, 1973Mo08, 1984Is06.

^{133}La Levels

E(level)†	Jπ‡	$T_{1/2}$#	Comments
0.0	$5/2^+$	3.912 h *8*	$T_{1/2}$: from Adopted Levels.
87.940 *11*	$5/2^+$	1.30 ns *10*	
97.259 *10*	$3/2^+$	<0.4 ns	$T_{1/2}$: from 1973Mo08, delayed coincidence. Other: 0.4 ns *6* (1984Is06), ≤ 0.1 ns (1972Be77).
130.804 *10*	$7/2^+$	1.12 ns *18*	$T_{1/2}$: supersedes the value of 1.19 ns 20 in 1970BaYT. Other: 0.8 ns *3* (1967Ab10).
477.213 *21*	$9/2^+$		
495.02 *3*	$7/2^+$		
535.588 *21*	$11/2^-$	64 ns *5*	g=1.37 *8* (1979BuZW) g: from γγ(θ,H,t); =2.2 (1969GeZZ). $T_{1/2}$: from γ(t) of 1975Bu10.
541.20 *3*	$7/2^+$		
563.348 *25*	$9/2^+$		
591.25 *6*	$7/2,9/2^+$		
654.60 *4*	$11/2^+$		
765.38 *6*	$(5/2^+)$		
784.531 *22*	$7/2^-$		
838.24 *4*	$9/2^+$		
867.15 *7*	$(7/2^+)$		
950.35 *5*	$(9/2)^+$		
979.91 *9*	$15/2^-$		
1045.925 *23*	$9/2^-$		
1092.38 *5*	$7/2^+,9/2^+$		
1153.35 *5*	$13/2^-$		
1188.56 *5*	$13/2^+$		
1194.63? *8*	$7/2,9/2^+$		
1218.90 *14*	$7/2^+$		
1311.09 *9*	$7/2^+,9/2,11/2$		
1318.57? *10*	$7/2,9/2^+$		
1365.01 *4*	$11/2^-$		
1396.40 *4*	$5/2^-$		
1468.86 *4*	$9/2^-$		
1561.16 *10*	$(11/2^-)$		
1690.64 *4*	$(9/2)^-$		
1715.40 *5*	$7/2^-,9/2^-$		
1734.15 *14*	$(11/2^-)$		
1735.44 *4*	$(9/2)^-$		
1748.29 *6*	7/2,9/2		
1753.62 *5*	$7/2^-,9/2,11/2^+$		
1778.23? *9*	$7/2,9/2,11/2^+$		
1784.19 *6*	$(9/2^+,11/2^+)$		
1784.76? *11*	$7/2^-,9/2,11/2^-$		
1806.62 *7*	$(9/2^-,11/2^-)$		
1850.90 *5*	$(9/2^-)$		

Continued on next page (footnotes at end of table)

^{133}Ce ε decay (5.1 h) 1978He16 (continued)

^{133}La Levels (continued)

E(level)†	Jπ‡	E(level)†	Jπ‡	E(level)†	Jπ‡
1857.39 *3*	$7/2^-$	2036.04 *3*	$7/2^-$,$9/2^-$	2250.00 *9*	$7/2^+$,$9/2^+$
1912.81 *5*	$9/2^-$	2062.16 *4*	$9/2^-$	2298.5? *3*	7/2,$9/2^+$
1958.67 *16*	$9/2^-$,11/2	2122.59 *18*	$11/2^-$	2359.87 *8*	$(7/2,9/2,11/2)^-$
1967.76 *5*	$7/2^-$,$9/2^-$	2132.08 *7*	7/2,$9/2^+$	2367.35 *17*	$(7/2,9/2)^+$
1983.38 *10*	$7/2^-$,9/2,$11/2^+$	2137.18 *7*	$9/2^-$	2501.31 *11*	$9/2^-$,$11/2^+$
2018.26 *6*	$7/2^-$	2155.17 *6*	$(9/2^-)$	2572.76? *24*	$(7/2^+)$
2029.84 *9*	7/2,$9/2^+$	2175.64 *9*	$(11/2^-)$	2734.8? *4*	$7/2^-$,$9/2^+$
2035.22 *7*	$(7/2^-,9/2^-,11/2^-)$	2199.95 *6*	$(9/2^-)$	2851.11 *22*	$(9/2^-,11/2^+)$

† From a least-squares fit to Eγ's.
‡ From 'Adopted Levels and gammas'.
# From γγ(t) of 1973Mo08 and 1984Is06, except as noted.

ε,$β^+$ radiations

E(decay)	E(level)	Iβ+ ‡	Iε‡	Log *ft*	I(ε+β+)†‡	Comments
(257 *32*)	2851.11		0.344 *25*	6.13 *14*	0.344 *25*	εK=0.813 *7*; εL=0.145 *5*; εM+=0.0421 *17*
(373 *32*)	2734.8?		0.065 *24*	7.22 *19*	0.065 *24*	εK=0.827 *3*; εL=0.1341 *20*; εM+=0.0385 *7*
(535 *32*)	2572.76?		0.20 *3*	7.07 *9*	0.20 *3*	εK=0.8359 *12*; εL=0.1277 *9*; εM+=0.0364 *3*
(607 *32*)	2501.31		0.51 *5*	6.78 *7*	0.51 *5*	εK=0.8381 *9*; εL=0.1260 *7*; εM+=0.03586 *22*
(741 *32*)	2367.35		0.30 *4*	7.19 *8*	0.30 *4*	εK=0.8410 *6*; εL=0.1239 *5*; εM+=0.03514 *14*
(748 *32*)	2359.87		0.81 *6*	6.77 *6*	0.81 *6*	εK=0.8411 *6*; εL=0.1238 *4*; εM+=0.03510 *14*
(810 *32*)	2298.5?		0.078 *5*	7.86 *6*	0.078 *5*	εK=0.8421 *5*; εL=0.1230 *4*; εM+=0.03486 *12*
(858 *32*)	2250.00		2.20 *9*	6.46 *5*	2.20 *9*	εK=0.8428 *4*; εL=0.1225 *3*; εM+=0.03470 *10*
(908 *32*)	2199.95		2.73 *8*	6.42 *5*	2.73 *8*	εK=0.8434 *4*; εL=0.1221 *3*; εM+=0.03455 *9*
(933 *32*)	2175.64		1.24 *7*	6.79 *5*	1.24 *7*	εK=0.8436 *4*; εL=0.1219 *3*; εM+=0.03448 *9*
(953 *32*)	2155.17		0.96 *8*	6.92 *6*	0.96 *8*	εK=0.8438 *4*; εL=0.12173 *24*; εM+=0.03443 *8*
(971 *32*)	2137.18		1.52 *13*	6.73 *6*	1.52 *13*	εK=0.8440 *3*; εL=0.12159 *23*; εM+=0.03438 *8*
(976 *32*)	2132.08		0.81 *3*	7.01 *5*	0.81 *3*	εK=0.8441 *3*; εL=0.12155 *23*; εM+=0.03437 *8*
(986 *32*)	2122.59		0.32 *4*	7.42 *7*	0.32 *4*	εK=0.8442 *3*; εL=0.12148 *23*; εM+=0.03435 *8*
(1046 *32*)	2062.16		5.42 *13*	6.25 *4*	5.42 *13*	εK=0.8447 *3*; εL=0.12107 *20*; εM+=0.03421 *7*
(1072 *32*)	2036.04		14.69 *25*	5.84 *4*	14.69 *25*	εK=0.8449 *3*; εL=0.12091 *19*; εM+=0.03416 *7*
(1073 *32*)	2035.22		1.13 *7*	6.95 *5*	1.13 *7*	εK=0.8449 *3*; εL=0.12091 *19*; εM+=0.03416 *7*
(1078 *32*)	2029.84		1.52 *7*	6.83 *5*	1.52 *7*	εK=0.8450 *3*; εL=0.12088 *19*; εM+=0.03415 *7*
(1090 *32*)	2018.26		4.54 *25*	6.36 *5*	4.54 *25*	εK=0.8451 *3*; εL=0.12081 *18*; εM+=0.03412 *6*
(1125 *32*)	1983.38		0.91 *5*	7.09 *5*	0.91 *5*	εK=0.8453 *3*; εL=0.12061 *17*; εM+=0.03406 *6*
(1140 *32*)	1967.76		2.74 *8*	6.62 *4*	2.74 *8*	εK=0.8454 *3*; εL=0.12053 *17*; εM+=0.03403 *6*
(1150 *32*)	1958.67		0.28 *5*	7.62 *9*	0.28 *5*	εK=0.8455 *2*; εL=0.12048 *17*; εM+=0.03401 *6*
(1195 *32*)	1912.81		3.29 *9*	6.58 *4*	3.29 *9*	εK=0.8458 *2*; εL=0.12024 *16*; εM+=0.03394 *5*
(1251 *32*)	1857.39		2.43 *13*	6.76 *4*	2.43 *13*	εK=0.8460 *1*; εL=0.11997 *15*; εM+=0.03385 *5*
(1257 *32*)	1850.90		3.53 *10*	6.60 *4*	3.53 *10*	εK=0.84599 *9*; εL=0.11994 *15*; εM+=0.03384 *5*
(1302 *32*)	1806.62		0.39 *5*	7.59 *7*	0.39 *5*	εK=0.8460; εL=0.11972 *15*; εM+=0.03377 *5*
(1323 *32*)	1784.76?		0.44 *6*	7.55 *7*	0.44 *6*	εK=0.8460 *2*; εL=0.11961 *16*; εM+=0.03373 *5*
(1324 *32*)	1784.19		1.01 *8*	7.19 *5*	1.01 *8*	εK=0.8460 *2*; εL=0.11961 *16*; εM+=0.03373 *5*
(1330 *32*)	1778.23?		0.37 *5*	7.63 *7*	0.37 *5*	εK=0.8459 *2*; εL=0.11958 *16*; εM+=0.03372 *5*
(1355 *32*)	1753.62	0.00031 *15*	0.30 *6*	7.74 *10*	0.30 *6*	av Eβ=160 *14*; εK=0.8458 *3*; εL=0.11945 *17*; εM+=0.03368 *6*
(1360 *32*)	1748.29	0.0008 *4*	0.72 *9*	7.36 *7*	0.72 *9*	av Eβ=162 *14*; εK=0.8458 *3*; εL=0.11942 *17*; εM+=0.03367 *6*
(1373 *32*)	1735.44	0.012 *5*	9.36 *21*	6.25 *4*	9.37 *21*	av Eβ=168 *14*; εK=0.8457 *3*; εL=0.11935 *17*; εM+=0.03365 *6*
(1374 *32*)	1734.15	0.0007 *3*	0.52 *4*	7.51 *5*	0.52 *4*	av Eβ=168 *14*; εK=0.8457 *4*; εL=0.11935 *17*; εM+=0.03365 *6*
(1393 *32*)	1715.40	0.0053 *20*	3.20 *12*	6.73 *4*	3.21 *12*	av Eβ=177 *14*; εK=0.8455 *4*; εL=0.11924 *18*;

Continued on next page (footnotes at end of table)

^{133}Ce ε decay (5.1 h) 1978He16 (continued)

ε,β+ radiations (continued)

E(decay)	E(level)	Iβ+ ‡	Iε‡	Log *ft*	I(ε+β+)†‡	Comments
						εM+=0.03361 *6*
(1418 *32*)	1690.64	0.008 *3*	3.89 *13*	6.66 *4*	3.90 *13*	av Eβ=188 *14*; εK=0.8452 *5*; εL=0.11910 *19*; εM+=0.03357 *6*
(1547 *32*)	1561.16	0.0033 *9*	0.50 *8*	7.64 *8*	0.50 *8*	av Eβ=245 *14*; εK=0.8419 *13*; εL=0.1182 *3*; εM+=0.03329 *8*
(1639 *32*)	1468.86	0.015 *3*	1.19 *8*	7.31 *5*	1.24 *8*	av Eβ=285 *14*; εK=0.8375 *19*; εL=0.1173 *4*; εM+=0.03302 *11*
(1743 *32*)	1365.01	0.0086 *25*	0.39 *10*	7.85 *12*	0.40 *10*	av Eβ=330 *14*; εK=0.830 *3*; εL=0.1159 *5*; εM+=0.03263 *14*
(1790 *32*)	1318.57?	0.013 *2*	0.46 *5*	7.80 *6*	0.47 *5*	av Eβ=351 *14*; εK=0.825 *4*; εL=0.1152 *6*; εM+=0.03242 *15*
(1797 *32*)	1311.09	0.0092 *17*	0.32 *4*	7.96 *6*	0.33 *4*	av Eβ=354 *14*; εK=0.825 *4*; εL=0.1151 *6*; εM+=0.03238 *16*
(1889 *32*)	1218.90	0.030 *5*	0.69 *7*	7.67 *6*	0.72 *7*	av Eβ=394 *14*; εK=0.814 *5*; εL=0.1133 *7*; εM+=0.03188 *19*
(1914 *32*)	1194.63?	0.016 *3*	0.33 *4*	8.00 *6*	0.35 *4*	av Eβ=405 *14*; εK=0.810 *5*; εL=0.1128 *7*; εM+=0.03174 *20*
(1920 *32*)	1188.56	0.013 *5*	0.27 *10*	8.10 *16*	0.28 *10*	av Eβ=408 *14*; εK=0.810 *5*; εL=0.1127 *7*; εM+=0.03170 *20*
(2016 *32*)	1092.38	0.046 *7*	0.67 *8*	7.74 *7*	0.72 *9*	av Eβ=450 *14*; εK=0.794 *6*; εL=0.1103 *9*; εM+=0.03103 *23*
(2062 *32*)	1045.925	0.65 *8*	8.0 *6*	6.68 *5*	8.7 *6*	av Eβ=470 *14*; εK=0.786 *6*; εL=0.1091 *9*; εM+=0.03067 *25*
(2158 *32*)	950.35	0.20 *3*	1.87 *19*	7.36 *6*	2.07 *21*	av Eβ=512 *14*; εK=0.766 *7*; εL=0.1062 *10*; εM+=0.0299 *3*
(2241 *32*)	867.15	0.061 *10*	0.44 *6*	8.02 *7*	0.50 *7*	av Eβ=549 *14*; εK=0.746 *8*; εL=0.1033 *11*; εM+=0.0290 *3*
(2270 *32*)	838.24	0.017 *9*	0.11 *6*	8.62 *24*	0.13 *7*	av Eβ=562 *14*; εK=0.739 *8*; εL=0.1023 *12*; εM+=0.0288 *4*
(2324 *32*)	784.531	0.16 *6*	0.9 *3*	7.72 *16*	1.1 *4*	av Eβ=586 *14*; εK=0.725 *9*; εL=0.1003 *12*; εM+=0.0282 *4*
(2454 *32*)	654.60	0.04 *3*	0.19 *13*	8.5 *3*	0.23 *16*	av Eβ=644 *14*; εK=0.688 *9*; εL=0.0950 *13*; εM+=0.0267 *4*
(2517 *32*)	591.25	0.030 *9*	0.11 *3*	8.72 *13*	0.14 *4*	av Eβ=672 *14*; εK=0.669 *10*; εL=0.0923 *14*; εM+=0.0259 *4*
(2545 *32*)	563.348	0.41 *4*	1.42 *13*	7.62 *5*	1.83 *17*	av Eβ=684 *14*; εK=0.660 *10*; εL=0.0911 *14*; εM+=0.0256 *4*
(2573 *32*)	535.588	0.3 *3*	0.9 *8*	7.8 *4*	1.2 *11*	av Eβ=697 *14*; εK=0.651 *10*; εL=0.0898 *14*; εM+=0.0252 *4*
(2613 *32*)	495.02	0.33 *3*	1.00 *7*	7.80 *5*	1.33 *9*	av Eβ=715 *14*; εK=0.638 *10*; εL=0.0880 *14*; εM+=0.0247 *4*
(2977 *32*)	130.804	1.1 *3*	1.6 *5*	7.69 *14*	2.7 *8*	av Eβ=879 *14*; εK=0.519 *10*; εL=0.0714 *14*; εM+=0.0200 *4*
(3020 *32*)	87.940	0.49 *8*	2.2 *3*	9.11[1u] *8*	2.7 *4*	av Eβ=911 *14*; εK=0.693 *7*; εL=0.0975 *10*; εM+=0.0275 *3*

† From intensity balance considerations.
‡ For absolute intensity per 100 decays, multiply by ≤1.0.

^{133}Ce ε decay (5.1 h) 1978He16 (continued)

γ(^{133}La)

Iγ normalization: Σ(I(γ+ce) to g.s.)=100 and by assuming that there is no direct feeding to ^{133}La g.s. (J^π=5/2$^+$). Please note that calculated using GTOL net feeding to the 97.259 keV (J^π=3/2$^+$) level amounts to 0.8% *5*.

E_γ ‡	I_γ ‡ d	E_i(level)	J_i^π	E_f	J_f^π	Mult. #	δ @	α †	$I_{(\gamma+ce)}$ d	Comments
(33.54)		130.804	7/2$^+$	97.259	3/2$^+$				≤41	E_γ: not measured. Existence is required by 346γ-97γ coin. $I_{(\gamma+ce)}$: from intensity balance.
42.7 bc *1*	2.0 *3*	130.804	7/2$^+$	87.940	5/2$^+$	M1+E2	0.160 *+18−21*	13.6 *3*	29 *4*	ce(L1)=2.5 *3*; ce(L2)=0.80 *7*; ce(L3)≤0.4; α(L1)exp=1.25 *24*; α(L2)exp=0.40 *3*; α(L3)exp≤0.2 ce(K)/(γ+ce)=0.734 *14*; ce(L)/(γ+ce)=0.156 *12*; ce(M)/(γ+ce)=0.033 *3*; ce(N+)/(γ+ce)=0.0084 *8* α(L1)=1.340 *21*; α(L2)=0.45 *3*; α(L3)=0.47 *5* ce(N)/(γ+ce)=0.0072 *7*; ce(O)/(γ+ce)=0.00110 *9*; ce(P)/(γ+ce)=5.78×10^{-5} *16* α(N+..)=0.121 *5*; α(N)=0.104 *4*; α(O)=0.0160 *6*; α(P)=0.000842 *14* $I_{(\gamma+ce)}$: from α_{tot} and I_γ. δ: from 1984Gr30. α(L)exp: calculated by evaluators.
50.09 a *10*		591.25	7/2,9/2$^+$	541.20	7/2$^+$					ce(K)<0.5
58.39 *3*	491 *10*	535.588	11/2$^-$	477.213	9/2$^+$	E1		1.023		ce(K)=420 *40*; ce(L1)=40 *3*; ce(L2)=9.1 *7*; ce(L3)=13.3 *11* α(K)exp=0.86 *8*; α(L1)exp=0.081 *7*; α(L2)exp=0.0185 *15*; α(L3)exp=0.027 *2* α(K)=0.862 *13*; α(L)=0.1280 *18*; α(M)=0.0265 *4*; α(N+..)=0.00660 *10* α(N)=0.00568 *8*; α(O)=0.000868 *13*; α(P)=4.88×10^{-5} *7* α(L1)=0.0809 *11*; α(L2)=0.01948 *27*; α(L3)=0.02763 *39*
63.93 a *11*	0.14 *4*	541.20	7/2$^+$	477.213	9/2$^+$	[M1,E2]		7 *4*		ce(K)=0.50 *15* α(K)=3.7 *4*; α(L)=2.6 *22*; α(M)=0.6 *5*; α(N+..)=0.14 *12* α(N)=0.12 *10*; α(O)=0.017 *14*; α(P)=0.00024 *3*
72.39 a *10*	0.56 *17*	1468.86	9/2$^-$	1396.40	5/2$^-$	[E2]		6.39		Iγ: from ce(K) and α(K) if M1, E2. ce(K)=1.5 *4* α(K)=3.02 *5*; α(L)=2.64 *4*; α(M)=0.588 *9*; α(N+..)=0.1419 *22*

$^{133}_{57}La_{76}$-4

^{133}Ce ε decay (5.1 h) 1978He16 (continued)

γ(^{133}La) (continued)

E_γ[‡]	I_γ[‡d]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[#]	δ[@]	α[†]	Comments
									α(N)=0.1244 *20*; α(O)=0.0174 *3*; α(P)=0.0001553 *23*
									α(N)=0.07 *6*; α(O)=0.010 *8*; α(P)=0.000169 *14*
									ce(N)/(γ+ce)=0.012 *11*; ce(O)/(γ+ce)=0.0018 *15*; ce(P)/(γ+ce)=3.0×10^{-5} *11*
72.67[a] *10*		1850.90	(9/2$^-$)	1778.23?	7/2,9/2,11/2$^+$				I_γ: from ce(K) and α(K)=2.7 *3* if M1, E2.
86.11[a] *12*	0.06 *2*	563.348	9/2$^+$	477.213	9/2$^+$	[M1,E2]		2.5 *9*	ce(K)=0.20 *7*
									ce(K)=0.12 *4*
									α(K)=1.65 *24*; α(L)=0.7 *5*; α(M)=0.15 *12*; α(N+..)=0.04 *3*
									α(N)=0.032 *24*; α(O)=0.005 *4*; α(P)=0.000105 *6*
									I_γ: from ce(K) and α(K) if M1, E2.
87.939 *11*	131 *3*	87.940	5/2$^+$	0.0	5/2$^+$	M1+E2	0.051 *+12−16*	1.566	ce(K)=190 *30*; ce(L1)=28 *3*; ce(L2)=2.6 *3*; ce(L3)=0.70 *8*
									α(K)=1.335 *19*; α(L)=0.183 *3*; α(M)=0.0382 *6*; α(N+..)=0.00985 *16*
									α(N)=0.00838 *14*; α(O)=0.001359 *21*; α(P)=0.0001040 *15*
									α(L1)=0.1656 *23*; α(L2)=0.0138 *6*; α(L3)=0.0040 *7*
									δ: from 1984Gr30.
97.261 *10*	44.8 *10*	97.259	3/2$^+$	0.0	5/2$^+$	M1+E2	0.157 *17*	1.195 *18*	ce(K)=49 *5*; ce(L1)=6.3 *6*; ce(L2)=0.80 *8*; ce(L3)<0.3
									α(K)exp=1.1 *1*; α(L1)exp=0.14 *2*; α(L2)exp=0.018 *2*; α(L3)exp<0.006
									α(K)=1.007 *15*; α(L)=0.149 *4*; α(M)=0.0311 *8*; α(N+..)=0.00799 *20*
									α(N)=0.00682 *17*; α(O)=0.001092 *25*; α(P)=7.78×10^{-5} *11*
									α(L1)=0.1240 *17*; α(L2)=0.0155 *14*; α(L3)=0.0091 *16*
									δ: from 1984Gr30.
102.6[a] *1*		1850.90	(9/2$^-$)	1748.29	7/2,9/2				ce(K)=0.08 *3*
112.03[a] *11*	0.20 *8*	950.35	(9/2)$^+$	838.24	9/2$^+$	[M1+E2]		1.1 *3*	ce(K)=0.15 *6*
									α(K)=0.76 *10*; α(L)=0.23 *14*; α(M)=0.05 *3*; α(N+..)=0.012 *8*
									α(N)=0.011 *7*; α(O)=0.0016 *9*; α(P)=4.98×10^{-5} *25*
									I_γ: from ce(K) and α(K) if M1+E2.
									Mult.: from level scheme.
114.02[a] *11*		591.25	7/2,9/2$^+$	477.213	9/2$^+$				ce(K)≈0.05
118.96[a] *13*	0.65 *24*	654.60	11/2$^+$	535.588	11/2$^-$	[E1]		0.1455	ce(K)=0.08 *3*

$^{133}_{57}La_{76}$-5

$\gamma(^{133}La)$ (continued)

E_γ[‡]	I_γ[‡][d]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[#]	δ[@]	α[†]	$I_{(\gamma+ce)}$[d]	Comments
										α(K)=0.1243 *18*; α(L)=0.01685 *25*; α(M)=0.00348 *5*; α(N+..)=0.000881 *13* α(N)=0.000755 *11*; α(O)=0.0001188 *17*; α(P)=7.77×10^{-6} *12* I$_\gamma$: from ce(K) and α(K) if E1. Mult.: from level scheme.
130.803 *10*	457 *10*	130.804	7/2$^+$	0.0	5/2$^+$	M1+E2	0.239 *+30−21*	0.520	695 *15*	ce(K)=205 *24*; ce(L1)=23.3 *25*; ce(L2)=3.9 *3*; ce(L3)=2.1 *2* α(K)exp=0.46 *6*; α(L1)exp=0.050 *7*; α(L2)exp=0.0085 *7*; α(L3)exp=0.0046 *5* α(L1)=0.0534 *7*; α(L2)=0.0073 *8*; α(L3)=0.0046 *8* ce(N)/(γ+ce)=0.00197 *7*; ce(O)/(γ+ce)=0.000315 *9*; ce(P)/(γ+ce)=2.20×10^{-5} *4* α(N)=0.00299 *9*; α(O)=0.000478 *12*; α(P)=3.35×10^{-5} *5*
135.5[a] *2*		1850.90	(9/2$^-$)	1715.40	7/2$^-$,9/2$^-$					ce(K)≤0.1
150.3[a] *2*		1468.86	9/2$^-$	1318.57?	7/2,9/2$^+$					ce(K)=0.20 *6*
159.56[a] *18*	0.35 *14*	654.60	11/2$^+$	495.02	7/2$^+$	[E2]		0.385		ce(K)=0.10 *4* α(K)=0.282 *4*; α(L)=0.0813 *12*; α(M)=0.0177 *3*; α(N+..)=0.00435 *7* α(N)=0.00378 *6*; α(O)=0.000554 *9*; α(P)=1.677×10^{-5} *25* I$_\gamma$: from ce(K) and α(K) if E2. Mult.: from level scheme.
165.72[a] *18*	8.0 *20*	950.35	(9/2)$^+$	784.531	7/2$^-$	[E1]		0.0583		ce(K)=0.4 *1* α(K)=0.0499 *8*; α(L)=0.00663 *10*; α(M)=0.001368 *20*; α(N+..)=0.000348 *5* α(N)=0.000298 *5*; α(O)=4.73×10^{-5} *7*; α(P)=3.25×10^{-6} *5* I$_\gamma$: from ce(K) and α(K) if E1. Mult.: from level scheme.
173[c]	<2.4	1153.35	13/2$^-$	979.91	15/2$^-$	(M1,E2)		0.26 *3*		ce(K)=0.12 *4*; α(K)exp>0.05 α(K)=0.208 *10*; α(L)=0.042 *16*; α(M)=0.009 *4*; α(N+..)=0.0023 *9* α(N)=0.0020 *8*; α(O)=0.00030 *10*; α(P)=1.43×10^{-5} *12*
174.0 *2*	1.6 *8*	1735.44	(9/2)$^-$	1561.16	(11/2$^-$)	M1+E2	0.67 *7*	0.246 *5*		ce(K)=0.26 *4*; ce(L2)=0.023 *3*; ce(L3)=0.021 *8*; α(K)exp=0.16 *8*;

^{133}Ce ε decay (5.1 h) 1978He16 (continued)

γ(^{133}La) (continued)

E_γ[‡]	I_γ[‡ d]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[#]	α[†]	Comments
								α(L2)exp=0.014 *7* α(L3)exp=0.013 *7* α(K)=0.201 *3*; α(L)=0.0358 *15*; α(M)=0.0076 *4*; α(N+..)=0.00192 *8* α(L2)=0.0068 *8*; α(L3)=0.0056 *6* α(N)=0.00165 *7*; α(O)=0.000256 *10*; α(P)=1.450×10^{-5} *24* δ: calculated by evaluators from K:L2:L3 ratios (1984Gr30) with BrIccMixing program.
177.3 *2*	1.3 *5*	654.60	11/2$^+$	477.213	9/2$^+$	M1,E2	0.24 *3*	ce(K)=0.25 *4*; α(K)exp=0.19 *8* α(K)=0.193 *9*; α(L)=0.039 *14*; α(M)=0.008 *4*; α(N+..)=0.0021 *8* α(N)=0.0018 *7*; α(O)=0.00027 *9*; α(P)=1.33×10^{-5} *12*
178.65 *3*	31 *1*	2036.04	7/2$^-$,9/2$^-$	1857.39	7/2$^-$	M1,E2	0.237 *25*	ce(K)=6 *1*; ce(L1)=0.8 *1*; α(K)exp=0.19 *3*; α(L1)exp=0.026 *4* α(K)=0.189 *8*; α(L)=0.038 *14*; α(M)=0.008 *3*; α(N+..)=0.0020 *8* α(N)=0.0017 *7*; α(O)=0.00027 *9*; α(P)=1.30×10^{-5} *12* α(L1)=0.02119 *15*
[x]204.16 *12*	1.3 *4*					M1,E2	0.157 *10*	ce(K)=0.18 *4*; α(K)exp=0.14 *5* α(K)=0.1271 *20*; α(L)=0.023 *7*; α(M)=0.0050 *15*; α(N+..)=0.0013 *4* α(N)=0.0011 *4*; α(O)=0.00017 *5*; α(P)=8.9×10^{-6} *10*
211.65 *6*	7.0 *5*	1365.01	11/2$^-$	1153.35	13/2$^-$	M1,E2	0.140 *7*	ce(K)=0.8 *2*; α(K)exp=0.11 *3* α(K)=0.1143 *17*; α(L)=0.021 *6*; α(M)=0.0044 *13*; α(N+..)=0.0011 *3* α(N)=0.0010 *3*; α(O)=0.00015 *4*; α(P)=8.0×10^{-6} *9*
221.2[a] *1*	≈2	784.531	7/2$^-$	563.348	9/2$^+$	[E1]	0.0266	ce(K)≈0.05 α(K)=0.0228 *4*; α(L)=0.00299 *5*; α(M)=0.000617 *9*; α(N+..)=0.0001576 *23* α(N)=0.0001345 *19*; α(O)=2.15×10^{-5} *3*; α(P)=1.528×10^{-6} *22* Mult.,I_γ: from placement in the level scheme mult.=E1. Iγ is calculated according to α(K) and ce(K) by evaluators.
[x]221.97 *9*	2.2 *4*					M1,E2	0.122 *5*	ce(K)=0.20 *7*; α(K)exp=0.09 *3* α(K)=0.0993 *21*; α(L)=0.018 *5*; α(M)=0.0037 *10*; α(N+..)=0.00094 *22* α(N)=0.00081 *20*; α(O)=0.00013 *3*; α(P)=7.0×10^{-6} *9*
224.16 *7*	3.6 *4*	765.38	(5/2$^+$)	541.20	7/2$^+$	M1,E2	0.118 *4*	ce(K)=0.3 *1*; α(K)exp=0.09 *3* α(K)=0.0965 *22*; α(L)=0.017 *4*; α(M)=0.0036 *9*; α(N+..)=0.00091 *21* α(N)=0.00078 *19*; α(O)=0.000121 *25*; α(P)=6.8×10^{-6} *8*
228.59 *6*	9.7 *5*	2035.22	(7/2$^-$,9/2$^-$,11/2$^-$)	1806.62	(9/2$^-$,11/2$^-$)	M1,E2	0.111 *3*	ce(K)=0.9 *2*; α(K)exp=0.093 *21*; ce(L1)=0.15 *3* α(K)=0.0911 *25*; α(L)=0.016 *4*; α(M)=0.0034 *8*; α(N+..)=0.00085 *19* α(N)=0.00073 *17*; α(O)=0.000114 *22*; α(P)=6.5×10^{-6} *8*

$^{133}_{57}La_{76}$-7

^{133}Ce ε decay (5.1 h) 1978He16 (continued)

γ(^{133}La) (continued)

E_γ[‡]	I_γ[‡][d]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[#]	α[†]	Comments
[x]235.9[a] 2								ce(K)=0.20 4
248.95 2	34.0 8	784.531	7/2⁻	535.588	11/2⁻	E2	0.0857	ce(K)=2.3 5; L1/L2=1.9 5; α(K)exp=0.068 15 α(K)=0.0679 10; α(L)=0.01405 20; α(M)=0.00301 5; α(N+..)=0.000751 11 α(N)=0.000649 9; α(O)=9.81×10⁻⁵ 14; α(P)=4.40×10⁻⁶ 7
[x]256.6[b] 2	1.3 5					(M1,E2)	0.0788 16	ce(K)≤0.1; α(K)exp≤0.07 α(K)=0.065 4; α(L)=0.0108 18; α(M)=0.0023 4; α(N+..)=0.00058 10 α(N)=0.00050 9; α(O)=7.8×10⁻⁵ 11; α(P)=4.7×10⁻⁶ 7
261.396 14	44.4 10	1045.925	9/2⁻	784.531	7/2⁻	M1(+E2)	0.0746 18	ce(K)=2.9 4; ce(L1)=0.4 1; α(K)exp=0.065 9; α(L1)exp=0.009 2 α(K)=0.062 4; α(L)=0.0102 16; α(M)=0.0022 4; α(N+..)=0.00054 9 α(N)=0.00047 8; α(O)=7.3×10⁻⁵ 9; α(P)=4.4×10⁻⁶ 7 α(L1)=0.0071 9
264.70[&] 10	1.8 4	2018.26	7/2⁻	1753.62	7/2⁻,9/2,11/2⁺	(M1,E2)	0.0719 20	ce(K)≈0.1; α(K)exp≈0.06 α(K)=0.059 4; α(L)=0.0098 15; α(M)=0.0021 4; α(N+..)=0.00052 8 α(N)=0.00045 7; α(O)=7.0×10⁻⁵ 9; α(P)=4.3×10⁻⁶ 6 E_γ: in 1978He16, this transition de-excites the 1311 level as uncertain, corresponding level energy difference is equal to 265.23 14.
274.84 7	3.4 5	838.24	9/2⁺	563.348	9/2⁺	M1,E2	0.0643 24	ce(K)=0.18 4; α(K)exp=0.053 13 α(K)=0.053 4; α(L)=0.0086 11; α(M)=0.0018 3; α(N+..)=0.00046 6 α(N)=0.00040 6; α(O)=6.2×10⁻⁵ 7; α(P)=3.8×10⁻⁶ 6
278.0 5	≈6	2062.16	9/2⁻	1784.19	(9/2⁺,11/2⁺)	(E1)	0.01452	ce(K)=0.09 2; α(K)exp≈0.015 α(K)=0.01248 19; α(L)=0.001619 24; α(M)=0.000334 5; α(N+..)=8.56×10⁻⁵ 13 α(N)=7.30×10⁻⁵ 11; α(O)=1.171×10⁻⁵ 18; α(P)=8.52×10⁻⁷ 13
282.42 5	7.4 5	2036.04	7/2⁻,9/2⁻	1753.62	7/2⁻,9/2,11/2⁺			
287.73[&] 8	4.4 6	2036.04	7/2⁻,9/2⁻	1748.29	7/2,9/2			E_γ: in table 1 (1978He16) this transition was placed tentatively from the 765 keV level, but with poor energy fit.
294.23 5	12.7 6	1690.64	(9/2)⁻	1396.40	5/2⁻	E2	0.0499	ce(K)=0.5 1; α(K)exp=0.04 1 α(K)=0.0403 6; α(L)=0.00761 11; α(M)=0.001623 23; α(N+..)=0.000407 6 α(N)=0.000350 5; α(O)=5.36×10⁻⁵ 8; α(P)=2.68×10⁻⁶ 4
296.0[a] 1	2.3 10	950.35	(9/2)⁺	654.60	11/2⁺	[M1,E2]	0.052 3	ce(K)=0.10 4 α(K)=0.043 4; α(L)=0.0068 7; α(M)=0.00144 16; α(N+..)=0.00037 4 α(N)=0.00031 3; α(O)=4.9×10⁻⁵ 4; α(P)=3.1×10⁻⁶ 5

^{133}Ce ε decay (5.1 h) 1978He16 (continued)

γ(^{133}La) (continued)

E_γ[‡]	I_γ[‡d]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[#]	α[†]	Comments
								I_γ: from ce(K) and α(K) if M1, E2. E_γ: poor fit; the level energy difference is equal to 295.74 *6* keV.
300.54 *10*	6.1 *10*	2036.04	7/2$^-$,9/2$^-$	1735.44	(9/2)$^-$	M1,E2	0.050 *3*	ce(K)=0.25 *4*; α(K)exp=0.041 *9* α(K)=0.041 *4*; α(L)=0.0065 *6*; α(M)=0.00137 *14*; α(N+..)=0.00035 *3* α(N)=0.00030 *3*; α(O)=4.7×10^{-5} *3*; α(P)=3.0×10^{-6} *5*
307.30 *6*	23.8 *9*	784.531	7/2$^-$	477.213	9/2$^+$	E1	0.01121	ce(K)=0.25 *4*; α(K)exp=0.0011 *2* α(K)=0.00964 *14*; α(L)=0.001245 *18*; α(M)=0.000257 *4*; α(N+..)=6.59×10^{-5} *10* α(N)=5.62×10^{-5} *8*; α(O)=9.03×10^{-6} *13*; α(P)=6.63×10^{-7} *10*
315.45 *8*	5.1 *6*	1468.86	9/2$^-$	1153.35	13/2$^-$	E2	0.0401	ce(K)=0.16 *5*; α(K)exp=0.030 *9* α(K)=0.0325 *5*; α(L)=0.00595 *9*; α(M)=0.001265 *18*; α(N+..)=0.000318 *5* α(N)=0.000273 *4*; α(O)=4.20×10^{-5} *6*; α(P)=2.19×10^{-6} *3* α(N)=0.000256 *18*; α(O)=4.05×10^{-5} *17*; α(P)=2.6×10^{-6} *5*
319.03 *7*	8.0 *7*	1365.01	11/2$^-$	1045.925	9/2$^-$	M1,E2	0.042 *4*	ce(K)=0.28 *4*; α(K)exp=0.035 *6* α(K)=0.035 *4*; α(L)=0.0054 *4*; α(M)=0.00114 *9*; α(N+..)=0.000289 *17* α(N)=0.000247 *16*; α(O)=3.91×10^{-5} *15*; α(P)=2.5×10^{-6} *5*
320.72 *10*	3.4 *7*	2036.04	7/2$^-$,9/2$^-$	1715.40	7/2$^-$,9/2$^-$			
339.03 *5*	24.9 *15*	1735.44	(9/2)$^-$	1396.40	5/2$^-$	[E2]	0.0320	α(K)=0.0262 *4*; α(L)=0.00463 *7*; α(M)=0.000982 *14*; α(N+..)=0.000247 *4* α(N)=0.000213 *3*; α(O)=3.28×10^{-5} *5*; α(P)=1.779×10^{-6} *25*
342.65 *9*	3.0 *5*	2199.95	(9/2$^-$)	1857.39	7/2$^-$	[M1]	0.0374	ce(K)≈0.03; α(K)exp≈0.01 α(K)=0.0321 *5*; α(L)=0.00422 *6*; α(M)=0.000874 *13*; α(N+..)=0.000226 *4* α(N)=0.000192 *3*; α(O)=3.13×10^{-5} *5*; α(P)=2.47×10^{-6} *4*
346.39 *5*	106 *2*	477.213	9/2$^+$	130.804	7/2$^+$	M1(+E2)	0.033 *4*	ce(K)=3.5 *5*; ce(L1)=0.5 *1*; α(K)exp=0.033 *5*; α(L1)exp=0.005 *1* α(K)=0.028 *4*; α(L)=0.00420 *12*; α(M)=0.00088 *4*; α(N+..)=0.000225 *6* α(N)=0.000192 *6*; α(O)=3.05×10^{-5} *5*; α(P)=2.0×10^{-6} *4* α(L1)=0.001949 *27*
350.03[c] *11*	1.9 *4*	1188.56	13/2$^+$	838.24	9/2$^+$			
351[c]	<2.3	1396.40	5/2$^-$	1045.925	9/2$^-$			
360.96 *10*	2.4 *6*	838.24	9/2$^+$	477.213	9/2$^+$	(M1,E2)	0.030 *4*	ce(K)≈0.07; α(K)exp≈0.029 α(K)=0.025 *4*; α(L)=0.00371 *6*; α(M)=0.000778 *19*; α(N+..)=0.000199 *3* α(N)=0.000170 *3*; α(O)=2.70×10^{-5} *6*; α(P)=1.8×10^{-6} *4*
364.19 *4*	32.0 *8*	495.02	7/2$^+$	130.804	7/2$^+$	M1,E2	0.029 *4*	ce(K)=0.8 *2*; ce(L1)=0.10 *3*; α(K)exp=0.025 *6*; α(L1)exp=0.003 *1* α(K)=0.024 *4*; α(L)=0.00361 *6*; α(M)=0.000757 *16*; α(N+..)=0.000193 *3* α(N)=0.000165 *3*; α(O)=2.63×10^{-5} *6*; α(P)=1.8×10^{-6} *4* α(L1)=0.0029 *5*
[x]369.9 *2*	4.8 *10*							ce(K)≤0.06; α(K)exp≤0.013

$^{133}_{57}La_{76}$-9

^{133}Ce ε decay (5.1 h) 1978He16 (continued)

γ(^{133}La) (continued)

E_γ ‡	I_γ ‡d	E_i(level)	J_i^π	E_f	J_f^π	Mult.#	α†	Comments
371.9 *3*	1.3 *4*	867.15	(7/2$^+$)	495.02	7/2$^+$	[M1,E2]	0.027 *3*	α(K)=0.023 *3*; α(L)=0.00339 *5*; α(M)=0.000711 *12*; α(N+..)=0.000182 *3* α(N)=0.0001553 *22*; α(O)=2.47×10^{-5} *7*; α(P)=1.7×10^{-6} *4*
x376.71 *9*	3.9 *5*					(M1,E2)	0.026 *3*	ce(K)=0.09 *4*; α(K)exp=0.025 *12* α(K)=0.022 *3*; α(L)=0.00327 *6*; α(M)=0.000684 *10*; α(N+..)=0.000175 *3* α(N)=0.0001494 *22*; α(O)=2.38×10^{-5} *8*; α(P)=1.6×10^{-6} *3*
380.7 *2*	1.9 *5*	1218.90	7/2$^+$	838.24	9/2$^+$			
384.6 *5*	<1.7	1365.01	11/2$^-$	979.91	15/2$^-$			
389.37 *9*	5.4 *5*	477.213	9/2$^+$	87.940	5/2$^+$	E2	0.0211	ce(K)=0.10 *3*; α(K)exp=0.019 *6* α(K)=0.01739 *25*; α(L)=0.00291 *4*; α(M)=0.000615 *9*; α(N+..)=0.0001553 *22* α(N)=0.0001333 *19*; α(O)=2.08×10^{-5} *3*; α(P)=1.203×10^{-6} *17* Mult.: M1,E2 from conversion data. M1 ruled out from placement in level scheme.
392.16& *8*	8.1 *5*	2359.87	(7/2,9/2,11/2)$^-$	1967.76	7/2$^-$,9/2$^-$	M1,E2	0.024 *3*	ce(K)=0.15 *3*; α(K)exp=0.019 *4* α(K)=0.020 *3*; α(L)=0.00290 *8*; α(M)=0.000608 *12*; α(N+..)=0.000155 *5* α(N)=0.000133 *4*; α(O)=2.12×10^{-5} *10*; α(P)=1.5×10^{-6} *3*
397.75 *6*	15.3 *6*	495.02	7/2$^+$	97.259	3/2$^+$	E2	0.0198	ce(K)=0.30 *5*; α(K)exp=0.019 *4* α(K)=0.01635 *23*; α(L)=0.00271 *4*; α(M)=0.000573 *8*; α(N+..)=0.0001449 *21* α(N)=0.0001243 *18*; α(O)=1.94×10^{-5} *3*; α(P)=1.134×10^{-6} *16* Mult.: M1,E2 from conversion data. M1 ruled out from placement in level scheme.
404.78 *4*	43.3 *9*	535.588	11/2$^-$	130.804	7/2$^+$	M2	0.0883	ce(K)=3.3 *7*; ce(L)=0.5 *1*; α(K)exp=0.076 *16*; α(L)exp=0.012 *3* α(K)=0.0742 *11*; α(L)=0.01117 *16*; α(M)=0.00235 *4*; α(N+..)=0.000608 *9* α(N)=0.000518 *8*; α(O)=8.38×10^{-5} *12*; α(P)=6.32×10^{-6} *9* α(L1)=0.00993 *14*
407.10 *10*	6.3 *5*	495.02	7/2$^+$	87.940	5/2$^+$	M1,E2	0.021 *3*	ce(K)=0.13 *3*; α(K)exp=0.021 *5* α(K)=0.018 *3*; α(L)=0.00260 *10*; α(M)=0.000545 *16*; α(N+..)=0.000139 *6* α(N)=0.000119 *5*; α(O)=1.90×10^{-5} *11*; α(P)=1.3×10^{-6} *3*
408.0 *5*	≈2.4	1561.16	(11/2$^-$)	1153.35	13/2$^-$	[M1]	0.0239	α(K)=0.0205 *3*; α(L)=0.00268 *4*; α(M)=0.000555 *8*; α(N+..)=0.0001436 *21* α(N)=0.0001221 *18*; α(O)=1.99×10^{-5} *3*; α(P)=1.574×10^{-6} *23* E_γ: ΔEγ is assigned by evaluators.
410.39 *10*	18.4 *6*	541.20	7/2$^+$	130.804	7/2$^+$	M1,E2	0.021 *3*	ce(K)=0.4 *1*; α(K)exp=0.022 *5* α(K)=0.018 *3*; α(L)=0.00254 *10*; α(M)=0.000532 *17*;

$^{133}_{57}La_{76}$-10

^{133}Ce ε decay (5.1 h) 1978He16 (continued)

γ(^{133}La) (continued)

E_γ[‡]	I_γ[‡d]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[#]	α[†]	Comments
								α(N+..)=0.000136 *6* α(N)=0.000116 *5*; α(O)=1.86×10^{-5} *11*; α(P)=1.3×10^{-6} *3*
415.4[&] *5*	2.5 *6*	1734.15	(11/2$^-$)	1318.57?	7/2,9/2$^+$			ce(K)≈0.1; α(K)exp≈0.04 E_γ: ΔE is assigned by evaluators.
419.16 *5*	12.0 *6*	1784.19	(9/2$^+$,11/2$^+$)	1365.01	11/2$^-$			
422.92 *5*	18.1 *6*	1468.86	9/2$^-$	1045.925	9/2$^-$	M1,E2	0.019 *3*	ce(K)=0.30 *6*; α(K)exp=0.017 *3* α(K)=0.016 *3*; α(L)=0.00233 *12*; α(M)=0.000488 *20*; α(N+..)=0.000125 *7* α(N)=0.000107 *5*; α(O)=1.71×10^{-5} *12*; α(P)=1.20×10^{-6} *24*
432.55 *4*	90 *2*	563.348	9/2$^+$	130.804	7/2$^+$	M1,E2	0.018 *3*	ce(K)=0.94 *15*; α(K)exp=0.011 *2* α(K)=0.0153 *25*; α(L)=0.00219 *12*; α(M)=0.000457 *22*; α(N+..)=0.000117 *7* α(N)=0.000100 *6*; α(O)=1.60×10^{-5} *12*; α(P)=1.13×10^{-6} *23*
437.69 *7*	4.2 *5*	1092.38	7/2$^+$,9/2$^+$	654.60	11/2$^+$	M1,E2	0.017 *3*	ce(K)=0.10 *3*; α(K)exp=0.023 *7* α(K)=0.0148 *24*; α(L)=0.00212 *13*; α(M)=0.000442 *23*; α(N+..)=0.000113 *7* α(N)=9.7×10^{-5} *6*; α(O)=1.55×10^{-5} *12*; α(P)=1.09×10^{-6} *23*
444.2[e] *1*	≈35[e]	541.20	7/2$^+$	97.259	3/2$^+$	(E2)	0.01436	ce(K)=0.58 *7*; α(K)exp=0.0097 *12* α(K)=0.01195 *17*; α(L)=0.00191 *3*; α(M)=0.000401 *6*; α(N+..)=0.0001018 *15* α(N)=8.73×10^{-5} *13*; α(O)=1.368×10^{-5} *20*; α(P)=8.38×10^{-7} *12* E_γ: poor fit; the level energy difference is equal to 443.94 *3* keV. α(K)exp: for undivided line; Iγ=59 *2*. Mult.: α(K)exp for two unresolved γ-rays (from 979 and 541 states) is consistent with mult=E2; multipolarity of E2 for each γ does not conflict with the level scheme.
444.2[e] *1*	≈24[e]	979.91	15/2$^-$	535.588	11/2$^-$	E2	0.01436	ce(K)=0.58 *7*; α(K)exp=0.0097 *12* α(K)=0.01195 *17*; α(L)=0.00191 *3*; α(M)=0.000401 *6*; α(N+..)=0.0001018 *15* α(N)=8.73×10^{-5} *13*; α(O)=1.368×10^{-5} *20*; α(P)=8.38×10^{-7} *12* α(K)exp: for undivided line; Iγ=59 *2*. Mult.: α(K)exp for two unresolved γ-rays (from 979 and 541 states) is consistent with mult=E2; multipolarity of E2 for each γ do not conflicted with the level scheme.
453.27 *5*	25.4 *9*	541.20	7/2$^+$	87.940	5/2$^+$	M1,E2	0.0159 *24*	ce(K)=0.30 *5*; α(K)exp=0.013 *3* α(K)=0.0135 *23*; α(L)=0.00192 *14*; α(M)=0.000400 *25*; α(N+..)=0.000103 *8* α(N)=8.8×10^{-5} *6*; α(O)=1.40×10^{-5} *12*; α(P)=1.00×10^{-6} *21*
455.28 *10*	2.8 *9*	950.35	(9/2)$^+$	495.02	7/2$^+$	(M1+E2)	0.0157 *24*	ce(K)≈0.05; α(K)exp≈0.018 α(K)=0.0133 *22*; α(L)=0.00189 *14*; α(M)=0.000395 *25*;

$^{133}_{57}La_{76}$-11

^{133}Ce ε decay (5.1 h) 1978He16 (continued)

γ(^{133}La) (continued)

E_γ[‡]	I_γ[‡d]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[#]	α[†]	Comments
								α(N+..)=0.000101 *8* α(N)=8.6×10^{-5} *6*; α(O)=1.39×10^{-5} *12*; α(P)=9.9×10^{-7} *21*
460.5[e] *5*	≈1.7[e]	591.25	7/2,9/2$^+$	130.804	7/2$^+$			E_γ,I_γ: ΔE is assigned by evaluators. I(γ+ce)=4.9 *6* is divided on the basis of coincidence data (1978He16).
460.5[e] *5*	≈3.2[e]	1857.39	7/2$^-$	1396.40	5/2$^-$			E_γ,I_γ: I(γ+ce)=4.9 *6* is divided on the basis of coincidence data (1978He16).
475.49 *6*	81 *2*	563.348	9/2$^+$	87.940	5/2$^+$	E2	0.01185	ce(K)=1.0 *3*; α(K)exp=0.012 *4* α(K)=0.00990 *14*; α(L)=0.001544 *22*; α(M)=0.000325 *5*; α(N+..)=8.25×10^{-5} *12* α(N)=7.07×10^{-5} *10*; α(O)=1.112×10^{-5} *16*; α(P)=6.99×10^{-7} *10*
477.22 *4*	1000	477.213	9/2$^+$	0.0	5/2$^+$	E2	0.01173	ce(K)=9.80; ce(L)=1.5 *3*; α(K)=0.00980; α(L)exp=0.0015 *3* α(K)=0.00980 *14*; α(L)=0.001527 *22*; α(M)=0.000321 *5*; α(N+..)=8.16×10^{-5} *12* α(N)=6.99×10^{-5} *10*; α(O)=1.100×10^{-5} *16*; α(P)=6.92×10^{-7} *10*
495.07 *7*	15.4 *6*	495.02	7/2$^+$	0.0	5/2$^+$	[M1]	0.01466	α(K)=0.01260 *18*; α(L)=0.001636 *23*; α(M)=0.000339 *5*; α(N+..)=8.76×10^{-5} *13* α(N)=7.45×10^{-5} *11*; α(O)=1.216×10^{-5} *17*; α(P)=9.64×10^{-7} *14*
498.72 *8*	5.1 *5*	1967.76	7/2$^-$,9/2$^-$	1468.86	9/2$^-$			
502.04 *9*	5.1 *12*	1690.64	(9/2)$^-$	1188.56	13/2$^+$	[M2]	0.0459	α(K)=0.0388 *6*; α(L)=0.00564 *8*; α(M)=0.001185 *17*; α(N+..)=0.000306 *5* α(N)=0.000261 *4*; α(O)=4.23×10^{-5} *6*; α(P)=3.23×10^{-6} *5*
504.73 *8*	13 *3*	1045.925	9/2$^-$	541.20	7/2$^+$	[E1]	0.00334 *5*	α(K)=0.00288 *4*; α(L)=0.000366 *6*; α(M)=7.54×10^{-5} *11*; α(N+..)=1.94×10^{-5} *3* α(N)=1.652×10^{-5} *24*; α(O)=2.67×10^{-6} *4*; α(P)=2.04×10^{-7} *3*
510.36 *7*	528 *12*	1045.925	9/2$^-$	535.588	11/2$^-$	M1(+E2)	0.0117 *20*	ce(K)=6.4 *10*; ce(L)=0.9 *2*; α(K)exp=0.012 *2*; α(L)exp=0.0017 *4* α(K)=0.0099 *18*; α(L)=0.00138 *14*; α(M)=0.00029 *3*; α(N+..)=7.4×10^{-5} *8* α(N)=6.3×10^{-5} *6*; α(O)=1.01×10^{-5} *12*; α(P)=7.4×10^{-7} *16*
523.76 *5*	80 *2*	654.60	11/2$^+$	130.804	7/2$^+$	E2	0.00909 *13*	ce(K)=0.6 *1*; α(K)exp=0.008 *1* (1984Gr30); α(K)exp=0.0062 *7* (1978He16) α(K)=0.00763 *11*; α(L)=0.001156 *17*; α(M)=0.000243 *4*; α(N+..)=6.17×10^{-5} *9* α(N)=5.28×10^{-5} *8*; α(O)=8.35×10^{-6} *12*; α(P)=5.43×10^{-7} *8*
534.3 *8*	4 *2*	1188.56	13/2$^+$	654.60	11/2$^+$	M1+E2	0.0104 *18*	α(K)=0.0088 *16*; α(L)=0.00122 *13*; α(M)=0.00025 *3*; α(N+..)=6.5×10^{-5} *7* α(N)=5.6×10^{-5} *6*; α(O)=9.0×10^{-6} *11*; α(P)=6.6×10^{-7} *14*
535	3 *1*	535.588	11/2$^-$	0.0	5/2$^+$	[E3]	0.0234	E_γ,I_γ: from adopted gammas; Iγ value normalized to that for 711γ. α(K)=0.0186 *3*; α(L)=0.00383 *6*; α(M)=0.000824 *12*; α(N+..)=0.000207 *3* α(N)=0.0001784 *25*; α(O)=2.73×10^{-5} *4*; α(P)=1.370×10^{-6} *20*

$^{133}_{57}La_{76}$-12

^{133}Ce ε decay (5.1 h) 1978He16 (continued)

γ(^{133}La) (continued)

E_γ[‡]	I_γ[‡d]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[#]	α[†]	Comments
541.09 *10*	75 *10*	541.20	7/2$^+$	0.0	5/2$^+$	M1	0.01175	ce(K)=0.8 *2*; α(K)exp=0.011 *3* α(K)=0.01010 *15*; α(L)=0.001308 *19*; α(M)=0.000271 *4*; α(N+..)=7.00×10^{-5} *10* α(N)=5.96×10^{-5} *9*; α(O)=9.72×10^{-6} *14*; α(P)=7.72×10^{-7} *11*
546.86 *8*	5.8 *5*	1735.44	(9/2)$^-$	1188.56	13/2$^+$	[M2]	0.0357	α(K)=0.0302 *5*; α(L)=0.00434 *6*; α(M)=0.000909 *13*; α(N+..)=0.000235 *4* α(N)=0.000200 *3*; α(O)=3.25×10^{-5} *5*; α(P)=2.49×10^{-6} *4*
551.2 *2*	1.8 *5*	1092.38	7/2$^+$,9/2$^+$	541.20	7/2$^+$	[M1]	0.01123	α(K)=0.00965 *14*; α(L)=0.001249 *18*; α(M)=0.000258 *4*; α(N+..)=6.69×10^{-5} *10* α(N)=5.69×10^{-5} *8*; α(O)=9.28×10^{-6} *13*; α(P)=7.38×10^{-7} *11*
553.16[&] *15*	1.7 *5*	1318.57?	7/2,9/2$^+$	765.38	(5/2$^+$)			
[x]560.09 *7*	15 *6*							
566.5 *5*	≈1.7	2035.22	(7/2$^-$,9/2$^-$,11/2$^-$)	1468.86	9/2$^-$			
[x]571.06 *10*	4.1 *10*					(M1,E2)	0.0088 *16*	ce(K)≈0.05; α(K)exp≈0.012 α(K)=0.0075 *14*; α(L)=0.00102 *13*; α(M)=0.000213 *25*; α(N+..)=5.5×10^{-5} *7* α(N)=4.7×10^{-5} *6*; α(O)=7.5×10^{-6} *10*; α(P)=5.6×10^{-7} *12*
580.4 *5*	<1	1365.01	11/2$^-$	784.531	7/2$^-$			
581.12 *10*	15.7 *15*	1561.16	(11/2$^-$)	979.91	15/2$^-$	[E2]	0.00690 *10*	α(K)=0.00582 *9*; α(L)=0.000857 *12*; α(M)=0.000179 *3*; α(N+..)=4.58×10^{-5} *7* α(N)=3.91×10^{-5} *6*; α(O)=6.22×10^{-6} *9*; α(P)=4.17×10^{-7} *6*
591.24 *10*	5.5 *7*	591.25	7/2,9/2$^+$	0.0	5/2$^+$			
597.36 *14*	9.6 *8*	1092.38	7/2$^+$,9/2$^+$	495.02	7/2$^+$	M1,E2	0.0078 *14*	ce(K)=0.07 *2*; α(K)exp=0.007 *2* α(K)=0.0067 *13*; α(L)=0.00091 *12*; α(M)=0.000189 *23*; α(N+..)=4.9×10^{-5} *7* α(N)=4.1×10^{-5} *6*; α(O)=6.7×10^{-6} *10*; α(P)=5.0×10^{-7} *11*
602.5 *3*	5.9 *7*	1967.76	7/2$^-$,9/2$^-$	1365.01	11/2$^-$			
611.83 *6*	66.2 *16*	1396.40	5/2$^-$	784.531	7/2$^-$	M1(+E2)	0.0074 *14*	ce(K)=0.45 *5*; α(K)exp=0.0068 *7* α(K)=0.0063 *12*; α(L)=0.00085 *12*; α(M)=0.000177 *23*; α(N+..)=4.6×10^{-5} *6* α(N)=3.9×10^{-5} *5*; α(O)=6.3×10^{-6} *9*; α(P)=4.7×10^{-7} *11*
615.39 *12*	6.9 *8*	1092.38	7/2$^+$,9/2$^+$	477.213	9/2$^+$	(M1,E2)	0.0073 *13*	ce(K)≈0.06; α(K)exp≈0.0087 α(K)=0.0062 *12*; α(L)=0.00084 *11*; α(M)=0.000175 *22*; α(N+..)=4.5×10^{-5} *6* α(N)=3.8×10^{-5} *5*; α(O)=6.2×10^{-6} *9*; α(P)=4.6×10^{-7} *10* E_γ: poor fit; the level energy difference is equal to 615.16 *5* keV.
617.7 *2*	42 *6*	1153.35	13/2$^-$	535.588	11/2$^-$	M1(+E2)	0.0072 *13*	ce(K)=0.30 *5*; α(K)exp=0.0071 *13* α(K)=0.0061 *12*; α(L)=0.00083 *11*; α(M)=0.000173 *22*;

$^{133}_{57}La_{76}$-13

^{133}Ce ε decay (5.1 h) 1978He16 (continued)

γ(^{133}La) (continued)

E_γ [‡]	I_γ [‡d]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[#]	α[†]	Comments
								α(N+..)=4.5×10^{-5} *6* α(N)=3.8×10^{-5} *5*; α(O)=6.1×10^{-6} *9*; α(P)=4.6×10^{-7} *10*
621.8 *5*	14 *6*	2018.26	7/2$^-$	1396.40	5/2$^-$			
634.5 *2*	2.8 *10*	765.38	(5/2$^+$)	130.804	7/2$^+$	[M1]	0.00795 *12*	α(K)=0.00684 *10*; α(L)=0.000881 *13*; α(M)=0.000182 *3*; α(N+..)=4.71×10^{-5} *7* α(N)=4.01×10^{-5} *6*; α(O)=6.55×10^{-6} *10*; α(P)=5.22×10^{-7} *8*
639.3 *2*	6.6 *10*	2036.04	7/2$^-$,9/2$^-$	1396.40	5/2$^-$			
644.74 *4*	50.2 *12*	1690.64	(9/2)$^-$	1045.925	9/2$^-$	M1(+E2)	0.0065 *12*	ce(K)=0.29 *4*; α(K)exp=0.0061 *9* α(K)=0.0055 *11*; α(L)=0.00075 *11*; α(M)=0.000155 *21*; α(N+..)=4.0×10^{-5} *6* α(N)=3.4×10^{-5} *5*; α(O)=5.5×10^{-6} *8*; α(P)=4.1×10^{-7} *9*
653.75 *12*	11.2 *10*	784.531	7/2$^-$	130.804	7/2$^+$	[E1]	0.00189 *3*	α(K)=0.001628 *23*; α(L)=0.000204 *3*; α(M)=4.21×10^{-5} *6*; α(N+..)=1.085×10^{-5} *16* α(N)=9.23×10^{-6} *13*; α(O)=1.499×10^{-6} *21*; α(P)=1.159×10^{-7} *17*
656.47 *11*	3.3 *6*	1311.09	7/2$^+$,9/2,11/2	654.60	11/2$^+$			
669.0[cf] *2*	3.9 *5*	1857.39	7/2$^-$	1188.56	13/2$^+$			E_γ: poor fit; level energy difference is equal to 668.78 *6*.
669.0[&] *2*	3.9 *5*	2359.87	(7/2,9/2,11/2)$^-$	1690.64	(9/2)$^-$			
678.3[e] *5*	≈7[e]	765.38	(5/2$^+$)	87.940	5/2$^+$	[M1,E2]	0.0057 *11*	α(K)=0.0049 *10*; α(L)=0.00065 *10*; α(M)=0.000136 *19*; α(N+..)=3.5×10^{-5} *5* α(N)=3.0×10^{-5} *5*; α(O)=4.8×10^{-6} *8*; α(P)=3.6×10^{-7} *8* E_γ,I_γ: transition with this energy de-excites the 1218.9 keV state also. I(γ+ce)=21 *4* is divided on the basis of coincidence data (1978He16).
678.3[e] *5*	≈14[e]	1218.90	7/2$^+$	541.20	7/2$^+$			E_γ,I_γ: transition with this energy de-excites the 765.38 keV state also. I(γ+ce)=21 *4* is divided on the basis of coincidence data (1978He16).
684.28 *8*	10.4 *8*	1468.86	9/2$^-$	784.531	7/2$^-$	[M1]	0.00662 *10*	α(K)=0.00570 *8*; α(L)=0.000732 *11*; α(M)=0.0001513 *22*; α(N+..)=3.92×10^{-5} *6* α(N)=3.33×10^{-5} *5*; α(O)=5.44×10^{-6} *8*; α(P)=4.34×10^{-7} *6*
689.48 *4*	105 *3*	1735.44	(9/2)$^-$	1045.925	9/2$^-$	M1(+E2)	0.0055 *11*	ce(K)=0.61 *5*; α(K)exp=0.0062 *6* α(K)=0.0047 *9*; α(L)=0.00063 *9*; α(M)=0.000130 *19*; α(N+..)=3.4×10^{-5} *5* α(N)=2.9×10^{-5} *4*; α(O)=4.6×10^{-6} *8*; α(P)=3.5×10^{-7} *8*
692.36[&] *12*	2.6 *8*	1784.76?	7/2$^-$,9/2,11/2$^-$	1092.38	7/2$^+$,9/2$^+$			
697.19 *6*	9.8 *5*	2062.16	9/2$^-$	1365.01	11/2$^-$			
699.58[c] *7*	6.2 *5*	1194.63?	7/2,9/2$^+$	495.02	7/2$^+$			
702.37 *11*	3.1 *5*	1748.29	7/2,9/2	1045.925	9/2$^-$			
707.41 *6*	10.1 *7*	838.24	9/2$^+$	130.804	7/2$^+$	[M1]	0.00611 *9*	α(K)=0.00526 *8*; α(L)=0.000675 *10*; α(M)=0.0001395 *20*;

^{133}Ce ε decay (5.1 h) 1978He16 (continued)

γ(^{133}La) (continued)

E_γ[‡]	I_γ[‡d]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[#]	α[†]	Comments
								α(N+..)=3.61×10^{-5} *5* α(N)=3.07×10^{-5} *5*; α(O)=5.02×10^{-6} *7*; α(P)=4.00×10^{-7} *6*
711.42 *7*	12.5 *7*	1188.56	13/2$^+$	477.213	9/2$^+$			
736.32 *11*	4.1 *6*	867.15	(7/2$^+$)	130.804	7/2$^+$	[M1,E2]	0.0047 *9*	α(K)=0.0040 *8*; α(L)=0.00053 *8*; α(M)=0.000111 *16*; α(N+..)=2.8×10^{-5} *5* α(N)=2.4×10^{-5} *4*; α(O)=3.9×10^{-6} *7*; α(P)=3.0×10^{-7} *7*
739.0[c] *3*	2.0 *10*	1784.76?	7/2$^-$,9/2,11/2$^-$	1045.925	9/2$^-$			
740.84 *12*	7.0 *8*	2137.18	9/2$^-$	1396.40	5/2$^-$			
[x]742.9 *2*	3.2 *8*							
747.76 *13*	5.1 *7*	1311.09	7/2$^+$,9/2,11/2	563.348	9/2$^+$			
754.25 *12*	10.8 *6*	1734.15	(11/2$^-$)	979.91	15/2$^-$			
759.04 *13*	4.2 *7*	2155.17	(9/2$^-$)	1396.40	5/2$^-$			E_γ: poor fit; the level energy difference is equal to 758.78 *6* keV.
765.19 *12*	6.7 *7*	765.38	(5/2$^+$)	0.0	5/2$^+$	[M1,E2]	0.0043 *8*	α(K)=0.0037 *7*; α(L)=0.00048 *8*; α(M)=0.000101 *15*; α(N+..)=2.6×10^{-5} *4* α(N)=2.2×10^{-5} *4*; α(O)=3.6×10^{-6} *6*; α(P)=2.7×10^{-7} *6*
769.9 *2*	2.9 *5*	867.15	(7/2$^+$)	97.259	3/2$^+$	[E2]	0.00344 *5*	α(K)=0.00293 *5*; α(L)=0.000406 *6*; α(M)=8.44×10^{-5} *12*; α(N+..)=2.16×10^{-5} *3* α(N)=1.85×10^{-5} *3*; α(O)=2.96×10^{-6} *5*; α(P)=2.13×10^{-7} *3*
779.16 *14*	5.0 *8*	867.15	(7/2$^+$)	87.940	5/2$^+$	[M1]	0.00485 *7*	α(K)=0.00417 *6*; α(L)=0.000534 *8*; α(M)=0.0001104 *16*; α(N+..)=2.86×10^{-5} *4* α(N)=2.43×10^{-5} *4*; α(O)=3.97×10^{-6} *6*; α(P)=3.17×10^{-7} *5*
784.55 *8*	246 *6*	784.531	7/2$^-$	0.0	5/2$^+$	E1	0.001290 *18*	ce(K)=0.38 *3*; α(K)exp=0.0016 *2* α(K)=0.001115 *16*; α(L)=0.0001390 *20*; α(M)=2.86×10^{-5} *4*; α(N+..)=7.38×10^{-6} α(N)=6.28×10^{-6} *9*; α(O)=1.021×10^{-6} *15*; α(P)=7.97×10^{-8} *12*
790.2[&] *2*	2.2 *6*	2155.17	(9/2$^-$)	1365.01	11/2$^-$			
[x]792.8 *2*	2.8 *7*							
798.59 *15*	3.4 *6*	2359.87	(7/2,9/2,11/2)$^-$	1561.16	(11/2$^-$)			
802.1 *3*	4.2 *7*	1365.01	11/2$^-$	563.348	9/2$^+$			
805.4 *2*	3.9 *6*	1958.67	9/2$^-$,11/2	1153.35	13/2$^-$			
811.2 *3*	7.6 *15*	1857.39	7/2$^-$	1045.925	9/2$^-$			
819.47 *15*	22.7 *12*	950.35	(9/2)$^+$	130.804	7/2$^+$	M1(+E2)	0.0036 *7*	ce(K)=0.094 *10*; α(K)exp=0.0044 *6* α(K)=0.0031 *6*; α(L)=0.00041 *7*; α(M)=8.5×10^{-5} *13*; α(N+..)=2.2×10^{-5} *4* α(N)=1.9×10^{-5} *3*; α(O)=3.0×10^{-6} *5*; α(P)=2.3×10^{-7} *5*
829.42 *15*	25.7 *9*	1365.01	11/2$^-$	535.588	11/2$^-$	M1(+E2)	0.0035 *7*	ce(K)=0.075 *9*; α(K)exp=0.0031 *4* α(K)=0.0030 *6*; α(L)=0.00040 *7*; α(M)=8.3×10^{-5} *13*; α(N+..)=2.1×10^{-5} *4* α(N)=1.8×10^{-5} *3*; α(O)=2.9×10^{-6} *5*; α(P)=2.3×10^{-7} *5*

$^{133}_{57}La_{76}$-15

γ(^{133}La) (continued)

E_γ[‡]	I_γ[‡d]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[#]	α[†]	Comments
834.77 *15*	10.9 *6*	2199.95	(9/2$^-$)	1365.01	11/2$^-$	M1,E2	0.0035 *7*	ce(K)=0.031 *7*; α(K)exp=0.0030 *7* α(K)=0.0030 *6*; α(L)=0.00039 *6*; α(M)=8.1×10^{-5} *13*; α(N+..)=2.1×10^{-5} *4* α(N)=1.8×10^{-5} *3*; α(O)=2.9×10^{-6} *5*; α(P)=2.2×10^{-7} *5*
838.1 *2*	3.7 *6*	838.24	9/2$^+$	0.0	5/2$^+$	[E2]	0.00283 *4*	α(K)=0.00241 *4*; α(L)=0.000329 *5*; α(M)=6.84×10^{-5} *10*; α(N+..)=1.755×10^{-5} *25* α(N)=1.496×10^{-5} *21*; α(O)=2.41×10^{-6} *4*; α(P)=1.759×10^{-7} *25*
841.37[c] *14*	12.7 *7*	1318.57?	7/2,9/2$^+$	477.213	9/2$^+$			
[x]844.19[b] *14*	7.1 *7*							
862.29 *13*	17.7 *6*	950.35	(9/2)$^+$	87.940	5/2$^+$	[E2]	0.00265 *4*	α(K)=0.00226 *4*; α(L)=0.000307 *5*; α(M)=6.38×10^{-5} *9*; α(N+..)=1.638×10^{-5} *23* α(N)=1.397×10^{-5} *20*; α(O)=2.25×10^{-6} *4*; α(P)=1.652×10^{-7} *24*
867.2[e] *5*	≈8.2[e]	867.15	(7/2$^+$)	0.0	5/2$^+$	[M1]	0.00376 *6*	α(K)=0.00324 *5*; α(L)=0.000413 *6*; α(M)=8.53×10^{-5} *12*; α(N+..)=2.21×10^{-5} *4* α(N)=1.88×10^{-5} *3*; α(O)=3.07×10^{-6} *5*; α(P)=2.46×10^{-7} *4* I$_\gamma$: I(γ+ce)=10.7 *7* is divided on the basis of coincidence data (1978He16).
867.2[e] *5*	2.5[e] *5*	1912.81	9/2$^-$	1045.925	9/2$^-$			I$_\gamma$: I(γ+ce)=10.7 *7* is divided on the basis of coincidence data (1978He16).
877.13[&] *14*	9.3 *8*	1715.40	7/2$^-$,9/2$^-$	838.24	9/2$^+$			
[x]879.5 *2*	4.9 *7*							
887.7 *2*	6.2 *12*	1365.01	11/2$^-$	477.213	9/2$^+$			
[x]901.79 *15*	5.0 *7*							
906.13 *11*	11.1 *7*	1690.64	(9/2)$^-$	784.531	7/2$^-$	M1,E2	0.0029 *6*	ce(K)=0.026 *5*; α(K)exp=0.0025 *6* α(K)=0.0025 *5*; α(L)=0.00032 *5*; α(M)=6.7×10^{-5} *11*; α(N+..)=1.7×10^{-5} *3* α(N)=1.47×10^{-5} *23*; α(O)=2.4×10^{-6} *4*; α(P)=1.8×10^{-7} *4*
914.8 *3*	3.4 *7*	1045.925	9/2$^-$	130.804	7/2$^+$	[E1]	0.000951 *14*	α(K)=0.000823 *12*; α(L)=0.0001020 *15*; α(M)=2.10×10^{-5} *3*; α(N+..)=5.42×10^{-6} α(N)=4.61×10^{-6} *7*; α(O)=7.51×10^{-7} *11*; α(P)=5.90×10^{-8} *9*
930.87 *12*	4.4 *11*	1715.40	7/2$^-$,9/2$^-$	784.531	7/2$^-$			
943.70 *9*	14.6 *10*	2036.04	7/2$^-$,9/2$^-$	1092.38	7/2$^+$,9/2$^+$			
950.99 *7*	32.5 *8*	1735.44	(9/2)$^-$	784.531	7/2$^-$	(E2)	0.00213 *3*	ce(K)=0.053 *7*; α(K)exp=0.0017 *3* α(K)=0.00182 *3*; α(L)=0.000244 *4*; α(M)=5.06×10^{-5} *7*; α(N+..)=1.300×10^{-5} *19* α(N)=1.108×10^{-5} *16*; α(O)=1.79×10^{-6} *3*; α(P)=1.334×10^{-7} *19*
961.8 *4*	4 *1*	1092.38	7/2$^+$,9/2$^+$	130.804	7/2$^+$	[M1]	0.00295 *5*	α(K)=0.00254 *4*; α(L)=0.000323 *5*; α(M)=6.68×10^{-5} *10*; α(N+..)=1.728×10^{-5} *25* α(N)=1.469×10^{-5} *21*; α(O)=2.40×10^{-6} *4*; α(P)=1.93×10^{-7} *3*

$^{133}_{57}La_{76}$-16

^{133}Ce ε decay (5.1 h) 1978He16 (continued)

γ(^{133}La) (continued)

E_γ [‡]	I_γ [‡d]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[#]	α[†]	Comments
963.6 *4*	4 *1*	1748.29	7/2,9/2	784.531	7/2⁻			
968.7	≈3	2122.59	11/2⁻	1153.35	13/2⁻			
972.34 *9*	24.9 *11*	2018.26	7/2⁻	1045.925	9/2⁻	M1,E2	0.0025 *5*	ce(K)=0.061 *7*; α(K)exp=0.0026 *4* α(K)=0.0021 *4*; α(L)=0.00027 *5*; α(M)=5.7×10^{-5} *9*; α(N+..)=1.46×10^{-5} *23* α(N)=1.24×10^{-5} *19*; α(O)=2.0×10^{-6} *4*; α(P)=1.6×10^{-7} *3*
983.9[e] *2*	19.2[e] *8*	2029.84	7/2,9/2⁺	1045.925	9/2⁻			I_γ: I(γ+ce)=20.7 *8* is divided on the basis of coincidence data (1978He16).
983.9[e] *2*	≈1.5[e]	2137.18	9/2⁻	1153.35	13/2⁻			I_γ: I(γ+ce)=20.7 *8* is divided on the basis of coincidence data (1978He16).
990.13 *5*	75 *2*	2036.04	7/2⁻,9/2⁻	1045.925	9/2⁻	M1(+E2)	0.0024 *4*	ce(K)=0.166 *16*; α(K)exp=0.0023 *3* α(K)=0.0020 *4*; α(L)=0.00026 *4*; α(M)=5.4×10^{-5} *9*; α(N+..)=1.40×10^{-5} *22* α(N)=1.19×10^{-5} *19*; α(O)=1.9×10^{-6} *3*; α(P)=1.5×10^{-7} *3*
[x]997.25 *11*	6.3 *6*							
1000.2[c] *3*	2.2 *6*	1784.76?	7/2⁻,9/2,11/2⁻	784.531	7/2⁻			
1004.49 *10*	9.0 *6*	1092.38	7/2⁺,9/2⁺	87.940	5/2⁺	[M1,E2]	0.0023 *4*	α(K)=0.0020 *4*; α(L)=0.00025 *4*; α(M)=5.2×10^{-5} *8*; α(N+..)=1.35×10^{-5} *21* α(N)=1.15×10^{-5} *18*; α(O)=1.9×10^{-6} *3*; α(P)=1.5×10^{-7} *3*
1016.22 *9*	12.3 *6*	2062.16	9/2⁻	1045.925	9/2⁻	M1(+E2)	0.0022 *4*	ce(K)=0.034 *5*; α(K)exp=0.0029 *5* α(K)=0.0019 *4*; α(L)=0.00025 *4*; α(M)=5.1×10^{-5} *8*; α(N+..)=1.32×10^{-5} *21* α(N)=1.12×10^{-5} *17*; α(O)=1.8×10^{-6} *3*; α(P)=1.4×10^{-7} *3*
1019.24[&] *14*	3.0 *6*	1857.39	7/2⁻	838.24	9/2⁺			
1022.24 *12*	9.9 *8*	2175.64	(11/2⁻)	1153.35	13/2⁻	[M1]	0.00256 *4*	α(K)=0.00221 *3*; α(L)=0.000280 *4*; α(M)=5.78×10^{-5} *8*; α(N+..)=1.497×10^{-5} *21* α(N)=1.273×10^{-5} *18*; α(O)=2.08×10^{-6} *3*; α(P)=1.671×10^{-7} *24*
1036.3 *3*	3.1 *15*	1690.64	(9/2)⁻	654.60	11/2⁺	[E1]	0.000751 *11*	α(K)=0.000650 *10*; α(L)=8.02×10^{-5} *12*; α(M)=1.650×10^{-5} *24*; α(N+..)=4.26×10^{-6} α(N)=3.62×10^{-6} *5*; α(O)=5.90×10^{-7} *9*; α(P)=4.67×10^{-8} *7*
1066.3 *3*	2.2 *8*	1850.90	(9/2⁻)	784.531	7/2⁻			
1073.20 *12*	7.3 *8*	1857.39	7/2⁻	784.531	7/2⁻			E_γ: poor fit; level energy difference is equal to 1072.86 *3*.
1076.6 *2*	3.8 *7*	2122.59	11/2⁻	1045.925	9/2⁻			
1081.1 *2*	6.6 *10*	1735.44	(9/2)⁻	654.60	11/2⁺	[E1]	0.000694 *10*	α(K)=0.000601 *9*; α(L)=7.41×10^{-5} *11*; α(M)=1.523×10^{-5} *22*; α(N+..)=3.93×10^{-6} *6* α(N)=3.34×10^{-6} *5*; α(O)=5.45×10^{-7} *8*; α(P)=4.32×10^{-8} *6*
1085.43 *13*	12.0 *12*	1850.90	(9/2⁻)	765.38	(5/2⁺)			
1091.7[e] *2*	≈12[e]	1857.39	7/2⁻	765.38	(5/2⁺)			I_γ: I(γ+ce)=31 *2* is divided on the basis of coincidence data (1978He16).

$^{133}_{57}La_{76}$-17

^{133}Ce ε decay (5.1 h) 1978He16 (continued)

γ(^{133}La) (continued)

E_γ[‡]	I_γ[‡d]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[#]	α[†]	Comments
1091.7[e] *2*	19[e] *3*	2137.18	9/2⁻	1045.925	9/2⁻			E_γ: poor fit; the level energy difference is equal to 1091.25 *7* keV. I_γ: I(γ+ce)=31 *2* is divided on the basis of coincidence data (1978He16); ΔIγ assigned by evaluators.
1107.1[c] *3*	2.8 *7*	1194.63?	7/2,9/2⁺	87.940	5/2⁺			
1109.44 *14*	4.9 *7*	2155.17	(9/2⁻)	1045.925	9/2⁻			
1121.5 *2*	2.5 *7*	1218.90	7/2⁺	97.259	3/2⁺			
1128.0 *2*	6.0 *10*	1912.81	9/2⁻	784.531	7/2⁻			
1129.7[e] *2*	≈1.2[e]	1784.19	(9/2⁺,11/2⁺)	654.60	11/2⁺			I_γ: I(γ+ce)=13.5 *10* is divided on the basis of coincidence data (1978He16).
1129.7[e] *2*	12.3[e] *10*	2175.64	(11/2⁻)	1045.925	9/2⁻	(M1,E2)	0.0018 *3*	α(K)exp=0.00118 *23* α(K)=0.00151 *25*; α(L)=0.00019 *3*; α(M)=4.0×10⁻⁵ *6*; α(N+..)=1.14×10⁻⁵ *15* α(N)=8.8×10⁻⁶ *13*; α(O)=1.43×10⁻⁶ *22*; α(P)=1.13×10⁻⁷ *20*; α(IPF)=1.057×10⁻⁶ *23* E_γ: from Table I (1978He16); in the ^{133}La level scheme (Fig.3) E=1219.7. I_γ: I(γ+ce)=13.5 *10* is divided on the basis of coincidence data (1978He16). α(K)exp: calculated by evaluators assuming mult.=(M1+E2) for 1128.0-keV γ placed between levels with J=(9/2)⁻ and J=7/2⁻, and data from 1978He16.
1135.9[c] *3*	1.7 *6*	2501.31	9/2⁻,11/2⁺	1365.01	11/2⁻			
1143.0[c] *4*	1.3 *6*	2122.59	11/2⁻	979.91	15/2⁻			
1152.05 *11*	11.3 *8*	1806.62	(9/2⁻,11/2⁻)	654.60	11/2⁺	(E1)	0.000629 *9*	α(K)=0.000535 *8*; α(L)=6.58×10⁻⁵ *10*; α(M)=1.353×10⁻⁵ *19*; α(N+..)=1.506×10⁻⁵ *2* α(N)=2.97×10⁻⁶ *5*; α(O)=4.85×10⁻⁷ *7*; α(P)=3.85×10⁻⁸ *6*; α(IPF)=1.156×10⁻⁵ *17* Mult.: from ce(K)=2.5 *5* and α(K)exp=0.00088 *18* (calculated by evaluators) values for the 1152.05γ+1154.68γ, it can be deduced that one of the two transitions should be of mult=E1 and the other of mult=E2,M1. If mult(1154γ)=(M1,E2) according to decay pattern then mult(1152γ)=(E1).
1154.68[f] *10*	16.9 *9*	2199.95	(9/2⁻)	1045.925	9/2⁻	[M1,E2]	0.0017 *3*	α(K)=0.00144 *23*; α(L)=0.00018 *3*; α(M)=3.8×10⁻⁵ *6*; α(N+..)=1.20×10⁻⁵ *14* α(N)=8.4×10⁻⁶ *13*; α(O)=1.36×10⁻⁶ *21*; α(P)=1.08×10⁻⁷ *19*; α(IPF)=2.20×10⁻⁶ *5* E_γ: poor fit; the level energy difference is equal to 1154.02 *6* keV. Mult.: see comment on 1152γ from 1806.6 keV level.

$^{133}_{57}La_{76}$-18

γ(^{133}La) (continued)

E_γ[‡]	I_γ[‡d]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[#]	α[†]	Comments
1168.76 *14*	4.5 *9*	2036.04	7/2⁻,9/2⁻	867.15	(7/2⁺)			
1172.05 *10*	15.1 *9*	1735.44	(9/2)⁻	563.348	9/2⁺	[E1]	0.000617 *9*	α(K)=0.000518 *8*; α(L)=6.38×10⁻⁵ *9*; α(M)=1.311×10⁻⁵ *19*; α(N+..)=2.13×10⁻⁵ *3* α(N)=2.88×10⁻⁶ *4*; α(O)=4.70×10⁻⁷ *7*; α(P)=3.73×10⁻⁸ *6*; α(IPF)=1.79×10⁻⁵ *3*
1174.1 *3*	3.8 *10*	1715.40	7/2⁻,9/2⁻	541.20	7/2⁺			
1180.1[c] *2*	3.0 *7*	1715.40	7/2⁻,9/2⁻	535.588	11/2⁻			
1183.33 *9*	28.0 *9*	1967.76	7/2⁻,9/2⁻	784.531	7/2⁻	M1,E2	0.00159 *25*	ce(K)=0.033 *5*; α(K)exp=0.0013 *3* α(K)=0.00137 *22*; α(L)=0.000175 *25*; α(M)=3.6×10⁻⁵ *6*; α(N+..)=1.37×10⁻⁵ *13* α(N)=7.9×10⁻⁶ *12*; α(O)=1.29×10⁻⁶ *19*; α(P)=1.02×10⁻⁷ *18*; α(IPF)=4.40×10⁻⁶ *9*
1187.1[c] *2*	3.6 *7*	1778.23?	7/2,9/2,11/2⁺	591.25	7/2,9/2⁺			
1190.33 *10*	11.8 *7*	1753.62	7/2⁻,9/2,11/2⁺	563.348	9/2⁺			
1196.28 *11*	16.1 *10*	1850.90	(9/2⁻)	654.60	11/2⁺			
1199.9 *2*	40 *3*	1735.44	(9/2)⁻	535.588	11/2⁻	[M1]	0.001779 *25*	α(K)=0.001530 *22*; α(L)=0.000193 *3*; α(M)=3.99×10⁻⁵ *6*; α(N+..)=1.636×10⁻⁵ *2* α(N)=8.77×10⁻⁶ *13*; α(O)=1.435×10⁻⁶ *20*; α(P)=1.155×10⁻⁷ *17*; α(IPF)=6.04×10⁻⁶ *9*
1207.04 *11*	15.6 *9*	1748.29	7/2,9/2	541.20	7/2⁺			
1212.9 *2*	20 *2*	1690.64	(9/2)⁻	477.213	9/2⁺	[E1]	0.000598 *9*	α(K)=0.000488 *7*; α(L)=5.99×10⁻⁵ *9*; α(M)=1.231×10⁻⁵ *18*; α(N+..)=3.85×10⁻⁵ *6* α(N)=2.70×10⁻⁶ *4*; α(O)=4.41×10⁻⁷ *7*; α(P)=3.51×10⁻⁸ *5*; α(IPF)=3.53×10⁻⁵ *5* E_γ: poor fit; the level energy difference is equal to 1213.43 *4* keV.
1217.7[c] *3*	2.8 *7*	1753.62	7/2⁻,9/2,11/2⁺	535.588	11/2⁻			
1221.2 *3*	6.2 *15*	1784.19	(9/2⁺,11/2⁺)	563.348	9/2⁺			
1225.4 *3*	1.8 *6*	2175.64	(11/2⁻)	950.35	(9/2)⁺			
1233.64 *11*	12.8 *8*	2018.26	7/2⁻	784.531	7/2⁻	M1(+E2)	0.00146 *22*	ce(K)=0.021 *4*; α(K)exp=0.0017 *4* α(K)=0.00125 *19*; α(L)=0.000159 *23*; α(M)=3.3×10⁻⁵ *5*; α(N+..)=1.89×10⁻⁵ *11* α(N)=7.2×10⁻⁶ *11*; α(O)=1.18×10⁻⁶ *17*; α(P)=9.3×10⁻⁸ *16*; α(IPF)=1.044×10⁻⁵ *19*
1238.0 *2*	3.6 *7*	1715.40	7/2⁻,9/2⁻	477.213	9/2⁺			
1245.1 *2*	5.4 *10*	2029.84	7/2,9/2⁺	784.531	7/2⁻			
1249.1[c] *3*	4.3 *6*	1784.76?	7/2⁻,9/2,11/2⁻	535.588	11/2⁻			
1251.68 *15*	8.5 *7*	2036.04	7/2⁻,9/2⁻	784.531	7/2⁻			
1258.2[e] *5*	≈12[e]	1735.44	(9/2)⁻	477.213	9/2⁺	[E1]	0.000585 *9*	α(K)=0.000457 *7*; α(L)=5.61×10⁻⁵ *8*; α(M)=1.152×10⁻⁵ *17*;

$^{133}_{57}La_{76}$-19

^{133}Ce ε decay (5.1 h) 1978He16 (continued)

γ(^{133}La) (continued)

E_γ[‡]	I_γ[‡d]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[#]	α[†]	Comments
								α(N+..)=6.09×10^{-5} *9* α(N)=2.53×10^{-6} *4*; α(O)=4.13×10^{-7} *6*; α(P)=3.29×10^{-8} *5*; α(IPF)=5.79×10^{-5} *9* I_γ: 22.2 *10* is divided on the basis of coincidence data (1978He16).
1258.2[e] *5*	≈10[e]	1912.81	9/2$^-$	654.60	11/2$^+$			I_γ: I(γ+ce)=22.2 *10* is divided on the basis of coincidence data (1978He16).
1265.57 *15*	9.2 *8*	1396.40	5/2$^-$	130.804	7/2$^+$			
1270.95 *14*	9.5 *8*	1806.62	(9/2$^-$,11/2$^-$)	535.588	11/2$^-$			
1277.47 *10*	16.0 *11*	2062.16	9/2$^-$	784.531	7/2$^-$	(M1,E2)	0.00136 *20*	ce(K)=0.012 *3*; α(K)exp=0.0008 *3* α(K)=0.00116 *17*; α(L)=0.000147 *21*; α(M)=3.0×10^{-5} *5*; α(N+..)=2.51×10^{-5} *10* α(N)=6.7×10^{-6} *10*; α(O)=1.09×10^{-6} *16*; α(P)=8.6×10^{-8} *14*; α(IPF)=1.73×10^{-5} *3*
1287.58 *7*	21.9 *8*	1850.90	(9/2$^-$)	563.348	9/2$^+$			
1294.07 *11*	7.6 *7*	1857.39	7/2$^-$	563.348	9/2$^+$			
1301.2 *3*	2.7 *7*	1778.23?	7/2,9/2,11/2$^+$	477.213	9/2$^+$			
[x]1305.0 *2*	3.8 *8*							
1309.7 *2*	5.0 *10*	1850.90	(9/2$^-$)	541.20	7/2$^+$			
1314.1 *2*	4.9 *10*	2359.87	(7/2,9/2,11/2)$^-$	1045.925	9/2$^-$			
1316.1 *2*	4.6 *15*	1857.39	7/2$^-$	541.20	7/2$^+$			
[x]1333.21 *15*	5.9 *11*							
1348.02 *12*	7.2 *7*	2501.31	9/2$^-$,11/2$^+$	1153.35	13/2$^-$			
1352.9[c] *5*	1.2 *7*	2137.18	9/2$^-$	784.531	7/2$^-$			
1362.41 *9*	15.4 *7*	1857.39	7/2$^-$	495.02	7/2$^+$			
[x]1365.8 *2*	2.9 *6*							
1369.9[c] *4*	1.2 *6*	2734.8?	7/2$^-$,9/2$^+$	1365.01	11/2$^-$			
1377.22 *7*	44 *1*	1912.81	9/2$^-$	535.588	11/2$^-$	M1,E2	0.00118 *16*	ce(K)=0.035 *5*; α(K)exp=0.00084 *13* α(K)=0.00099 *14*; α(L)=0.000125 *17*; α(M)=2.6×10^{-5} *4*; α(N+..)=4.61×10^{-5} *10* α(N)=5.7×10^{-6} *8*; α(O)=9.3×10^{-7} *13*; α(P)=7.3×10^{-8} *11*; α(IPF)=3.94×10^{-5} *6*
1380.19 *11*	6.4 *7*	1857.39	7/2$^-$	477.213	9/2$^+$			
1395.1 *3*	2.2 *7*	1958.67	9/2$^-$,11/2	563.348	9/2$^+$			
1404.51 *11*	5.4 *6*	1967.76	7/2$^-$,9/2$^-$	563.348	9/2$^+$			
1407.5[c] *5*	1.2 *6*	2062.16	9/2$^-$	654.60	11/2$^+$			
1419.9 *3*	3.0 *7*	1983.38	7/2$^-$,9/2,11/2$^+$	563.348	9/2$^+$			
1423.1 *4*	1.1 *5*	1958.67	9/2$^-$,11/2	535.588	11/2$^-$			
1432.22 *7*	30.6 *8*	1967.76	7/2$^-$,9/2$^-$	535.588	11/2$^-$	M1,E2	0.00111 *14*	ce(K)=0.024 *4*; α(K)exp=0.00083 *15* α(K)=0.00091 *12*; α(L)=0.000115 *15*; α(M)=2.4×10^{-5} *3*;

$^{133}_{57}La_{76}$-20

^{133}Ce ε decay (5.1 h) 1978He16 (continued)

γ(^{133}La) (continued)

E_γ [‡]	I_γ [‡d]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[#]	α[†]	Comments
								α(N+..)=6.18×10^{-5} *12* α(N)=5.2×10^{-6} *7*; α(O)=8.5×10^{-7} *11*; α(P)=6.8×10^{-8} *10*; α(IPF)=5.56×10^{-5} *8*
1435.6 *3*	1.3 *6*	1912.81	9/2$^-$	477.213	9/2$^+$			
1447.7[c] *4*	0.8 *4*	1983.38	7/2$^-$,9/2,11/2$^+$	535.588	11/2$^-$			
1455.3[e] *5*	≈1.1[e]	2018.26	7/2$^-$	563.348	9/2$^+$			I$_\gamma$: I(γ+ce)=2.3 *6* is divided on the basis of coincidence data (1978He16).
1455.3[e] *5*	≈1.2[e]	2501.31	9/2$^-$,11/2$^+$	1045.925	9/2$^-$			I$_\gamma$: I(γ+ce)=2.3 *6* is divided on the basis of coincidence data (1978He16).
1465.3[e f] *2*	≈2[e]	2029.84	7/2,9/2$^+$	563.348	9/2$^+$			E$_\gamma$: poor fit; the level energy difference is equal to 1466.49 *9*. I$_\gamma$: I(γ+ce)=18.9 *8* is divided on the basis of coincidence data (1978He16).
1465.3[e] *2*	16.9[e] *8*	2250.00	7/2$^+$,9/2$^+$	784.531	7/2$^-$			I$_\gamma$: I(γ+ce)=18.9 *8* is divided on the basis of coincidence data (1978He16).
1472.08 *11*	7.1 *8*	2035.22	(7/2$^-$,9/2$^-$,11/2$^-$)	563.348	9/2$^+$			
1494.85 *5*	82 *2*	2036.04	7/2$^-$,9/2$^-$	541.20	7/2$^+$	E1	0.000605 *9*	ce(K)=0.018 *4*; α(K)exp=0.00023 *6* α(K)=0.000339 *5*; α(L)=4.14×10^{-5} *6*; α(M)=8.51×10^{-6} *12*; α(N+..)=0.000216 *3* α(N)=1.87×10^{-6} *3*; α(O)=3.06×10^{-7} *5*; α(P)=2.44×10^{-8} *4*; α(IPF)=0.000214 *3*
1498.9 *3*	7.4 *5*	2062.16	9/2$^-$	563.348	9/2$^+$			
1500.41[e] *6*	121[e] *4*	2036.04	7/2$^-$,9/2$^-$	535.588	11/2$^-$	M1,E2	0.00103 *12*	ce(K)=0.078 *11*; α(K)exp=0.00068 *11* α(K)=0.00082 *11*; α(L)=0.000104 *13*; α(M)=2.1×10^{-5} *3*; α(N+..)=8.38×10^{-5} *15* α(N)=4.7×10^{-6} *6*; α(O)=7.7×10^{-7} *10*; α(P)=6.1×10^{-8} *9*; α(IPF)=7.82×10^{-5} *12* I$_\gamma$: I(γ+ce)=123 *3* is divided on the basis of coincidence data (1978He16).
1500.41[e] *6*	≈2[e]	2155.17	(9/2$^-$)	654.60	11/2$^+$			E$_\gamma$: poor fit; the level energy difference is equal to 1500.58 *5* keV. I$_\gamma$: I(γ+ce)=123 *3* is divided on the basis of coincidence data (1978He16).
1506.28 *12*	5.3 *7*	1983.38	7/2$^-$,9/2,11/2$^+$	477.213	9/2$^+$			
1521.03 *10*	14.5 *9*	2062.16	9/2$^-$	541.20	7/2$^+$			
1526.56 *6*	63 *2*	2062.16	9/2$^-$	535.588	11/2$^-$	E2(+M1)	0.00101 *12*	ce(K)=0.036 *8*; α(K)exp=0.00061 *14* α(K)=0.00079 *10*; α(L)=0.000100 *12*; α(M)=2.07×10^{-5} *25*; α(N+..)=9.30×10^{-5} *17* α(N)=4.5×10^{-6} *6*; α(O)=7.4×10^{-7} *9*; α(P)=5.9×10^{-8} *8*; α(IPF)=8.76×10^{-5} *13*
[x]1544.47 *15*	3.1 *6*							

$^{133}_{57}La_{76}$-21

^{133}Ce ε decay (5.1 h) 1978He16 (continued)

γ(^{133}La) (continued)

E_γ ‡	I_γ ‡ d	E_i(level)	J_i^π	E_f	J_f^π	Mult. #	α †	Comments
1557.82 *10*	9.2 *13*	2035.22	(7/2$^-$,9/2$^-$,11/2$^-$)	477.213	9/2$^+$			
x1567.9 *3*	1.9 *8*							
1573.65 *10*	8.1 *6*	2137.18	9/2$^-$	563.348	9/2$^+$			
1584.62 *6*	61 *2*	1715.40	7/2$^-$,9/2$^-$	130.804	7/2$^+$	E1	0.000636 *9*	ce(K)=0.015 *3*; α(K)exp=0.00026 *6* α(K)=0.000308 *5*; α(L)=3.75×10^{-5} *6*; α(M)=7.71×10^{-6} *11*; α(N+..)=0.000283 *4* α(N)=1.694×10^{-6} *24*; α(O)=2.77×10^{-7} *4*; α(P)=2.22×10^{-8} *4*; α(IPF)=0.000281 *4*
1595.43 *11*	6.9 *6*	2250.00	7/2$^+$,9/2$^+$	654.60	11/2$^+$			
1601.3 c *5*	≈1.8	2137.18	9/2$^-$	535.588	11/2$^-$			
1612.3 *2*	3.8 *6*	2175.64	(11/2$^-$)	563.348	9/2$^+$			
1620.0 *2*	4.6 *7*	2155.17	(9/2$^-$)	535.588	11/2$^-$			Eγ: poor fit; the level energy difference is equal to 1619.59 *5* keV.
1623.0 *2*	2.4 *6*	1753.62	7/2$^-$,9/2,11/2$^+$	130.804	7/2$^+$			
1636.7 *2*	11.5 *6*	2199.95	(9/2$^-$)	563.348	9/2$^+$	[E1]	0.000657 *10*	α(K)=0.000292 *4*; α(L)=3.55×10^{-5} *5*; α(M)=7.30×10^{-6} *11*; α(N+..)=0.000322 *5* α(N)=1.605×10^{-6} *23*; α(O)=2.62×10^{-7} *4*; α(P)=2.10×10^{-8} *3*; α(IPF)=0.000321 *5*
1640.2 *3*	3.7 *6*	2175.64	(11/2$^-$)	535.588	11/2$^-$			
1646.9 c *3*	3.1 *8*	1778.23?	7/2,9/2,11/2$^+$	130.804	7/2$^+$			
1653.4 *2*	12.3 *8*	1784.19	(9/2$^+$,11/2$^+$)	130.804	7/2$^+$			
1658.9 *3*	4.3 *5*	2199.95	(9/2$^-$)	541.20	7/2$^+$	[E1]	0.000666 *10*	α(K)=0.000285 *4*; α(L)=3.48×10^{-5} *5*; α(M)=7.14×10^{-6} *10*; α(N+..)=0.000339 *5* α(N)=1.569×10^{-6} *22*; α(O)=2.56×10^{-7} *4*; α(P)=2.06×10^{-8} *3*; α(IPF)=0.000337 *5*
1664.4 *2*	19.2 *8*	2199.95	(9/2$^-$)	535.588	11/2$^-$	[M1]	0.000999 *14*	ce(K)=0.005 *2*; α(K)exp=0.00028 *12* α(K)=0.000738 *11*; α(L)=9.24×10^{-5} *13*; α(M)=1.90×10^{-5} *3*; α(N+..)=0.0001493 α(N)=4.19×10^{-6} *6*; α(O)=6.86×10^{-7} *10*; α(P)=5.55×10^{-8} *8*; α(IPF)=0.0001444 *21* Mult.: from placement in level scheme; mult=E1 from α(K)exp conflicts with placement. As α(K)exp value for 834γ is more precise than α(K)exp for 1664γ, it is reasonable to assume there is an error in the latter or that the placement of the 1664γ is different.
1678.3 *3*	6.6 *12*	2155.17	(9/2$^-$)	477.213	9/2$^+$			
x1683.2 *3*	3.5 *5*							
x1686.0 *4*	1.8 *5*							
1698.0 *3*	7.5 *6*	2851.11	(9/2$^-$,11/2$^+$)	1153.35	13/2$^-$			
1705.5 c *3*	4.2 *7*	2572.76?	(7/2$^+$)	867.15	(7/2$^+$)			
1712.4 *3*	3.2 *6*	2367.35	(7/2,9/2)$^+$	654.60	11/2$^+$			

$^{133}_{57}La_{76}$-22

^{133}Ce ε decay (5.1 h) 1978He16 (continued)

γ(^{133}La) (continued)

E_γ [‡]	I_γ [‡ d]	E_i(level)	J_i^π	E_f	J_f^π	Mult. [#]	α [†]	Comments
1720.2 *2*	32.7 *8*	1850.90	(9/2$^-$)	130.804	7/2$^+$	(E1)	0.000693 *10*	α(K)=0.000269 *4*; α(L)=3.27×10^{-5} *5*; α(M)=6.72×10^{-6} *10*; α(N+..)=0.000385 *6* α(N)=1.477×10^{-6} *21*; α(O)=2.41×10^{-7} *4*; α(P)=1.94×10^{-8} *3*; α(IPF)=0.000383 *6* Mult.: deduced by evaluators from ce spectrum (fig. 2) of 1978He16 as Ice(K)(1720)≤Ice(K)(1664) and Ice(K)(1769).
1722.7 *3*	4.5 *7*	2199.95	(9/2$^-$)	477.213	9/2$^+$	[E1]	0.000695 *10*	α(K)=0.000268 *4*; α(L)=3.26×10^{-5} *5*; α(M)=6.70×10^{-6} *10*; α(N+..)=0.000387 *6* α(N)=1.473×10^{-6} *21*; α(O)=2.41×10^{-7} *4*; α(P)=1.93×10^{-8} *3*; α(IPF)=0.000385 *6*
1726.7 *3*	5.0 *6*	1857.39	7/2$^-$	130.804	7/2$^+$			
1769.36 *8*	31.1 *7*	1857.39	7/2$^-$	87.940	5/2$^+$	E1	0.000717 *10*	ce(K)=0.0060 *18*; α(K)exp=0.00020 *7* α(K)=0.000257 *4*; α(L)=3.12×10^{-5} *5*; α(M)=6.41×10^{-6} *9*; α(N+..)=0.000422 *6* α(N)=1.410×10^{-6} *20*; α(O)=2.30×10^{-7} *4*; α(P)=1.85×10^{-8} *3*; α(IPF)=0.000421 *6*
1782.03 *7*	17.6 *8*	1912.81	9/2$^-$	130.804	7/2$^+$	E1	0.000723 *11*	ce(K)=0.040 *16*; α(K)exp=0.00024 *10* α(K)=0.000254 *4*; α(L)=3.09×10^{-5} *5*; α(M)=6.34×10^{-6} *9*; α(N+..)=0.000432 *6* α(N)=1.393×10^{-6} *20*; α(O)=2.28×10^{-7} *4*; α(P)=1.83×10^{-8} *3*; α(IPF)=0.000430 *6*
1824.4[c] *4*	2.4 *8*	1912.81	9/2$^-$	87.940	5/2$^+$			
1837.3 *3*	3.1 *7*	1967.76	7/2$^-$,9/2$^-$	130.804	7/2$^+$			
1846.5 *4*	1.1 *5*	2501.31	9/2$^-$,11/2$^+$	654.60	11/2$^+$			
1852.3 *2*	14.0 *7*	1983.38	7/2$^-$,9/2,11/2$^+$	130.804	7/2$^+$			
1858.0[c f] *3*	2.0 *5*	1857.39	7/2$^-$	0.0	5/2$^+$			E$_\gamma$: poor fit; level energy difference is equal to 1857.39 *3*.
1872.4[c] *4*	0.8 *4*	2367.35	(7/2,9/2)$^+$	495.02	7/2$^+$			
[x]1876.3 *3*	2.6 *14*							
1887.3 *3*	25.9 *8*	2018.26	7/2$^-$	130.804	7/2$^+$			E$_\gamma$: 1887.3γ is given in table I and 1887.5 in fig.3 of 1978He16.
1890.3 *3*	1.8 *7*	2367.35	(7/2,9/2)$^+$	477.213	9/2$^+$			
1899.1 *2*	4.2 *6*	2029.84	7/2,9/2$^+$	130.804	7/2$^+$			
1905.1 *3*	1.7 *5*	2036.04	7/2$^-$,9/2$^-$	130.804	7/2$^+$			
1931.4 *2*	7.6 *11*	2062.16	9/2$^-$	130.804	7/2$^+$			
1941.83 *15*	7.3 *6*	2029.84	7/2,9/2$^+$	87.940	5/2$^+$			
1960.3 *5*	≈1.8	2501.31	9/2$^-$,11/2$^+$	541.20	7/2$^+$			
[x]1962.9 *3*	6.5 *10*							
2001.9 *3*	1.8 *4*	2132.08	7/2,9/2$^+$	130.804	7/2$^+$			E$_\gamma$: poor fit; the level energy difference is equal to 2001.28 *7* keV.
2018.23 *11*	34.8 *8*	2018.26	7/2$^-$	0.0	5/2$^+$			
2030.4 *3*	2.5 *4*	2029.84	7/2,9/2$^+$	0.0	5/2$^+$			E$_\gamma$: poor fit; the level energy difference is equal to 2029.84 *9*.
2044.09 *7*	17.8 *6*	2132.08	7/2,9/2$^+$	87.940	5/2$^+$			
[x]2051.45 *12*	1.1 *2*							

$^{133}_{57}La_{76}$-23

^{133}Ce ε decay (5.1 h) 1978He16 (continued)

γ(^{133}La) (continued)

E_γ ‡	I_γ ‡d	E_i(level)	J_i^π	E_f	J_f^π	Mult.#	α†	Comments
x2057.4 3	0.4 1							
x2063.8 3	0.94 10							
2069.2 3	0.66 10	2199.95	(9/2⁻)	130.804	7/2⁺	[E1]	0.000870 13	α(K)=0.000200 3; α(L)=2.43×10⁻⁵ 4; α(M)=4.98×10⁻⁶ 7; α(N+..)=0.000641 9 α(N)=1.095×10⁻⁶ 16; α(O)=1.79×10⁻⁷ 3; α(P)=1.443×10⁻⁸ 21; α(IPF)=0.000639 9
x2075.0 3	0.65 8							
x2090.5 3	0.99 10							
2095.8c 4	0.49 8	2572.76?	(7/2⁺)	477.213	9/2⁺			
2111.84 13	15.2 9	2199.95	(9/2⁻)	87.940	5/2⁺	[M2]	0.001262 18	α(K)=0.000919 13; α(L)=0.0001170 17; α(M)=2.42×10⁻⁵ 4; α(N+..)=0.000202 α(N)=5.32×10⁻⁶ 8; α(O)=8.71×10⁻⁷ 13; α(P)=7.02×10⁻⁸ 10; α(IPF)=0.000196 3
2119.2 2	32 2	2250.00	7/2⁺,9/2⁺	130.804	7/2⁺			
2132.1 3	1.0 1	2132.08	7/2,9/2⁺	0.0	5/2⁺			
x2147.2 3	2.2 2							
x2160.0 4	0.90 10							
2167.6c 4	0.94 10	2298.5?	7/2,9/2⁺	130.804	7/2⁺			
x2186.1 4	1.9 2							
2196.4 4	0.38 7	2851.11	(9/2⁻,11/2⁺)	654.60	11/2⁺			
2210.6c 4	1.05 8	2298.5?	7/2,9/2⁺	87.940	5/2⁺			
x2217.1 4	0.40 6							
2237.0 5	0.35 7	2367.35	(7/2,9/2)⁺	130.804	7/2⁺			
2249.9c 8	0.19 5	2250.00	7/2⁺,9/2⁺	0.0	5/2⁺			
2279.1 6	1.3 1	2367.35	(7/2,9/2)⁺	87.940	5/2⁺			
x2291.2 7	0.41 6							
2314.4 8	0.32 5	2851.11	(9/2⁻,11/2⁺)	535.588	11/2⁻			
x2320.1 9	0.72 7							
x2349.0 10	0.27 4							
2367.6 10	0.20 5	2367.35	(7/2,9/2)⁺	0.0	5/2⁺			
2373.6 6	0.48 6	2851.11	(9/2⁻,11/2⁺)	477.213	9/2⁺			
2441.8c 11	0.13 5	2572.76?	(7/2⁺)	130.804	7/2⁺			
2474.8c 11	0.31 7	2572.76?	(7/2⁺)	97.259	3/2⁺			
x2575.7 4	0.63 6							
2604.0c 9	0.30 4	2734.8?	7/2⁻,9/2⁺	130.804	7/2⁺			
2720.5 10	0.07 3	2851.11	(9/2⁻,11/2⁺)	130.804	7/2⁺			
2734.1 11	0.16 3	2734.8?	7/2⁻,9/2⁺	0.0	5/2⁺			
x2863.4 13	0.10 3							

$^{133}_{57}La_{76}$-24

^{133}Ce ε decay (5.1 h) 1978He16 (continued)

$\gamma(^{133}La)$ (continued)

† Additional information 1.
‡ From 1978He16, except as noted. When $\Delta E\gamma$ is not given and $E\gamma$ is quoted to nearest tenth of a keV, evaluators assumed ΔE=0.5 keV; ΔE=1 keV otherwise.
# From α(exp) taken from 1984Gr30 for $E\gamma$=42-617 keV, from 1987He16 for $E\gamma$=346-1781 keV. α(exp) normalized to α(K)(477.22, E2)=0.00980 (2002Ba85).
@ From α(K)exp, L subshell or K/L ratios.
& Inserted into the scheme by evaluators from unplaced γ's in 1995Ra12. For all transitions, the values of differences of level energies, where the transitions were placed, consist with transition energy values in the range of $\Delta E\gamma$ values.
[a] Observed in ce spectra only (1984Gr30).
[b] γ ray is shown as questionable in 1978He16.
[c] Placement of the transition is shown as questionable in 1978He16.
[d] For absolute intensity per 100 decays, multiply by ≤0.039.
[e] Multiply placed with intensity suitably divided.
[f] Placement of transition in the level scheme is uncertain.
[x] γ ray not placed in level scheme.

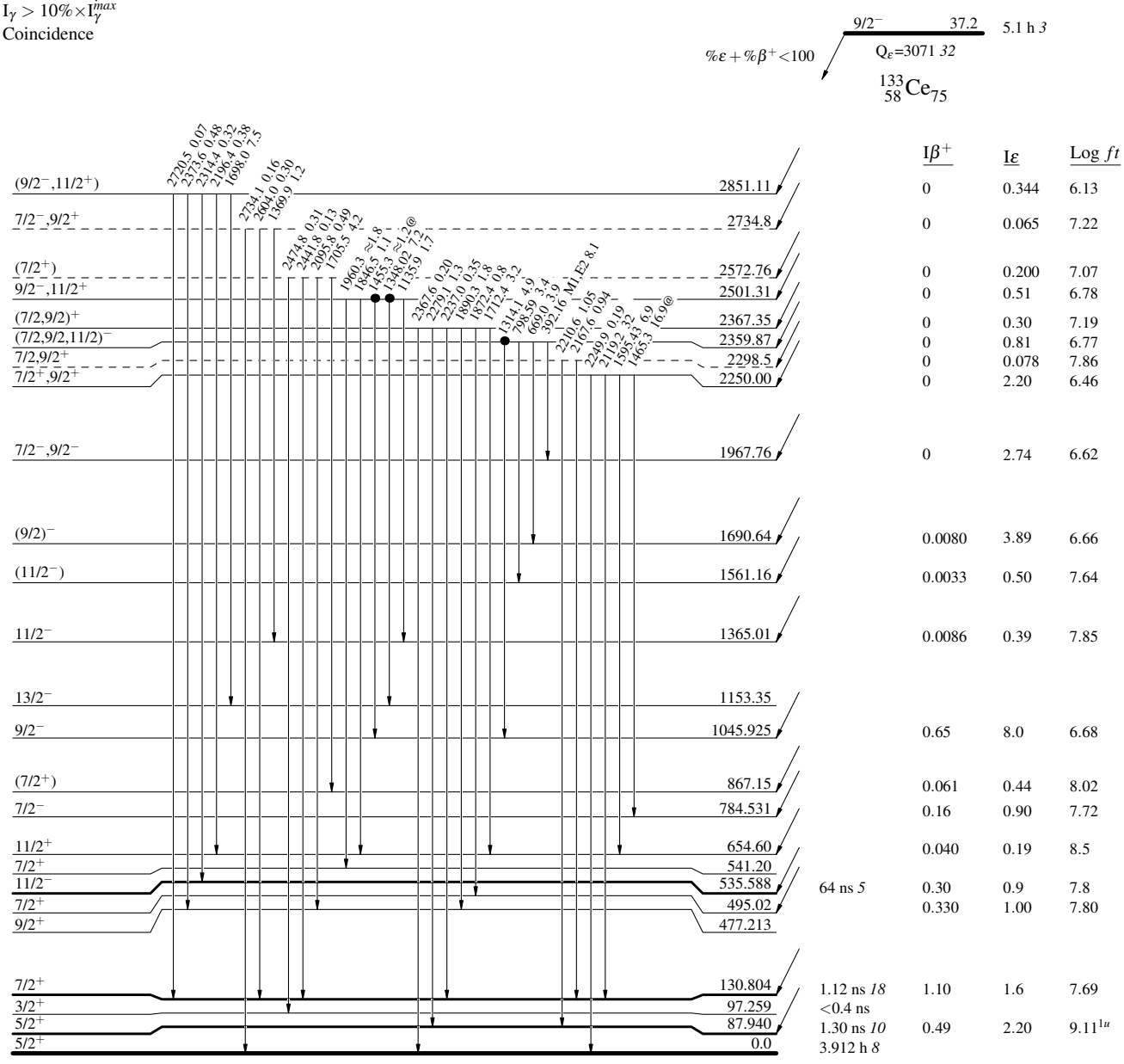
$^{133}_{57}La_{76}$-25

^{133}Ce ε decay (5.1 h) 1978He16

Decay Scheme

Intensities: Relative I_γ
@ 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

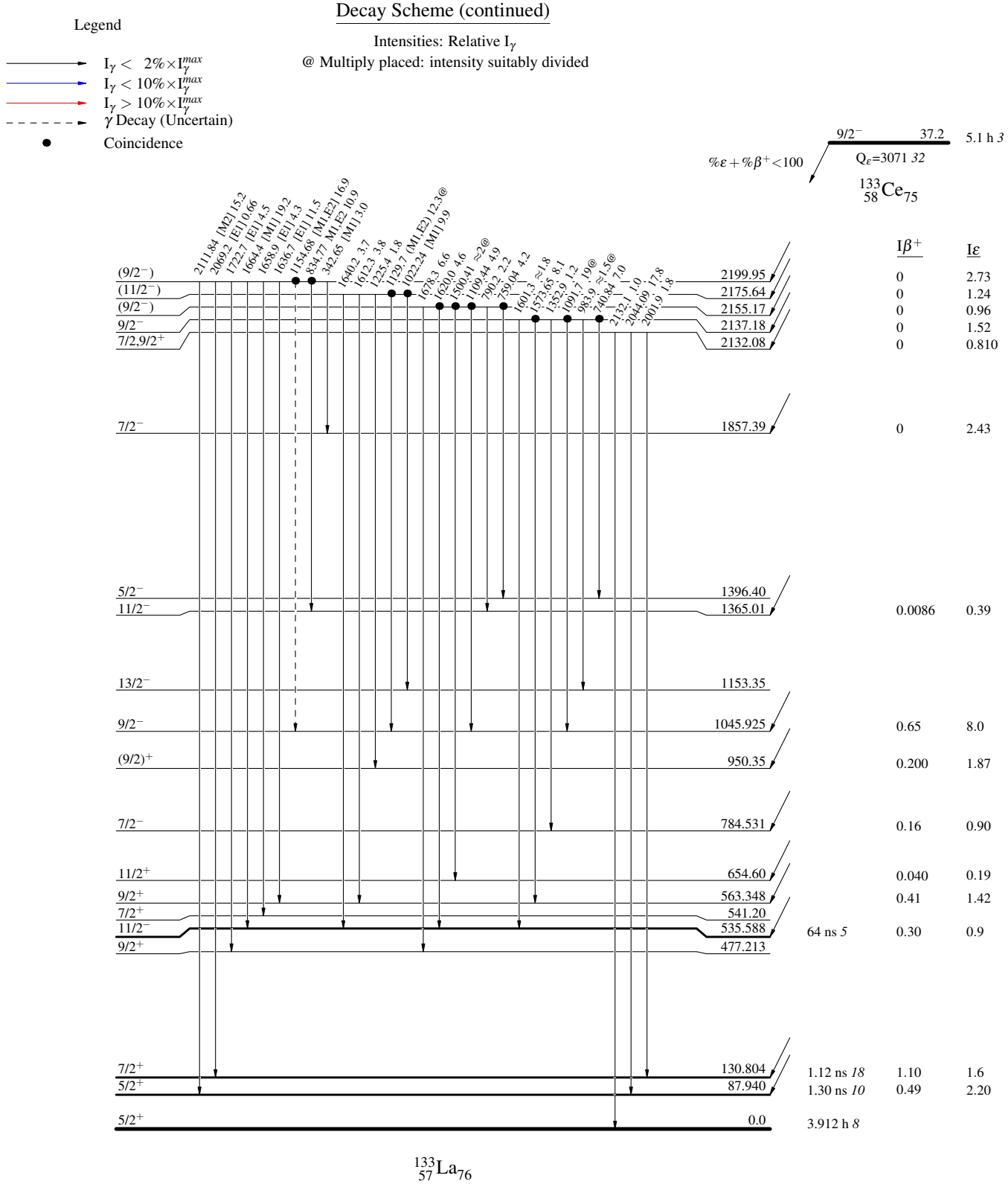


^{133}Ce ε decay (5.1 h) 1978He16

Decay Scheme (continued)

Intensities: Relative I_γ

@ Multiply placed: intensity suitably divided

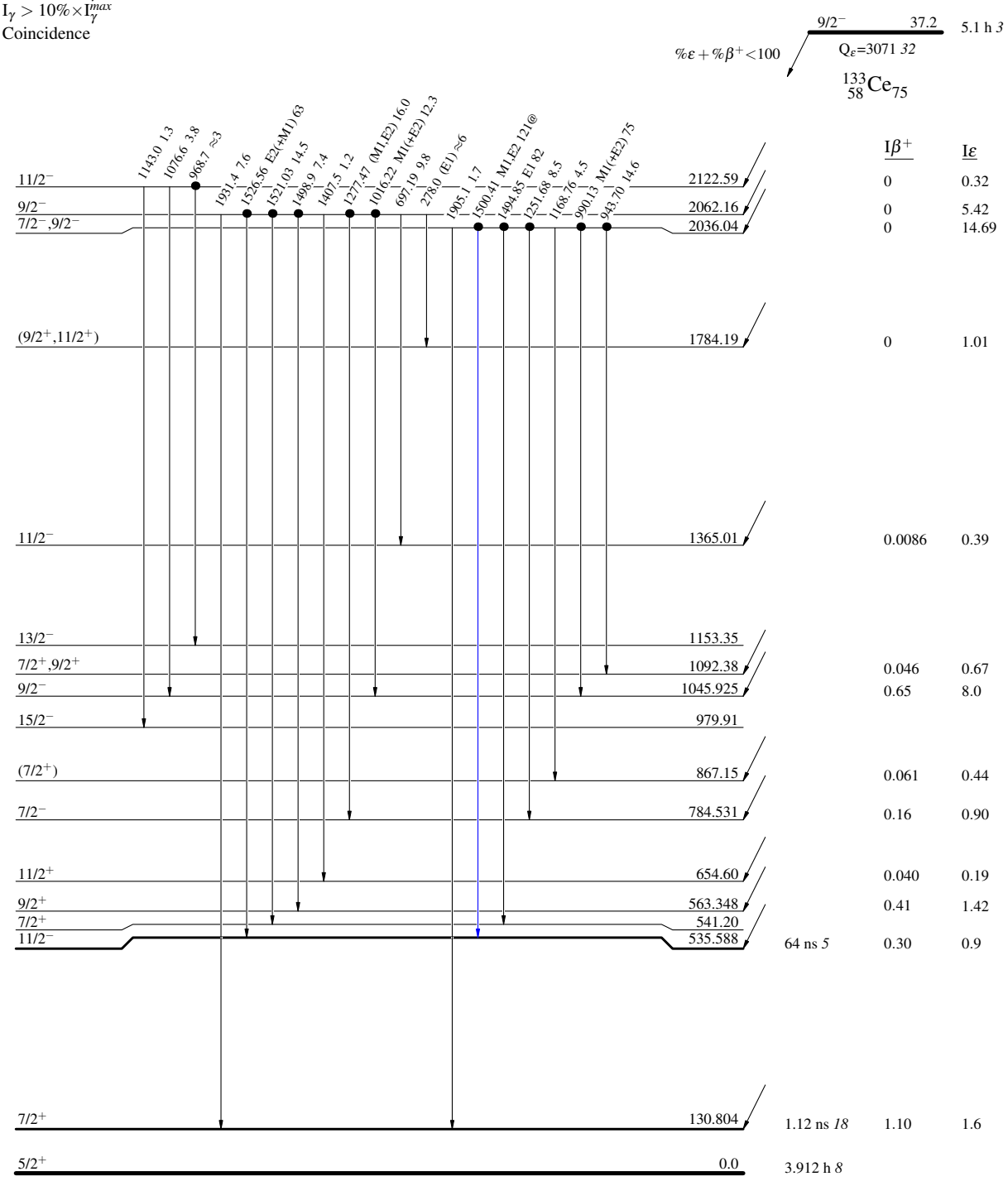


^{133}Ce ε decay (5.1 h) 1978He16

Decay Scheme (continued)

Intensities: Relative I_γ
@ 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



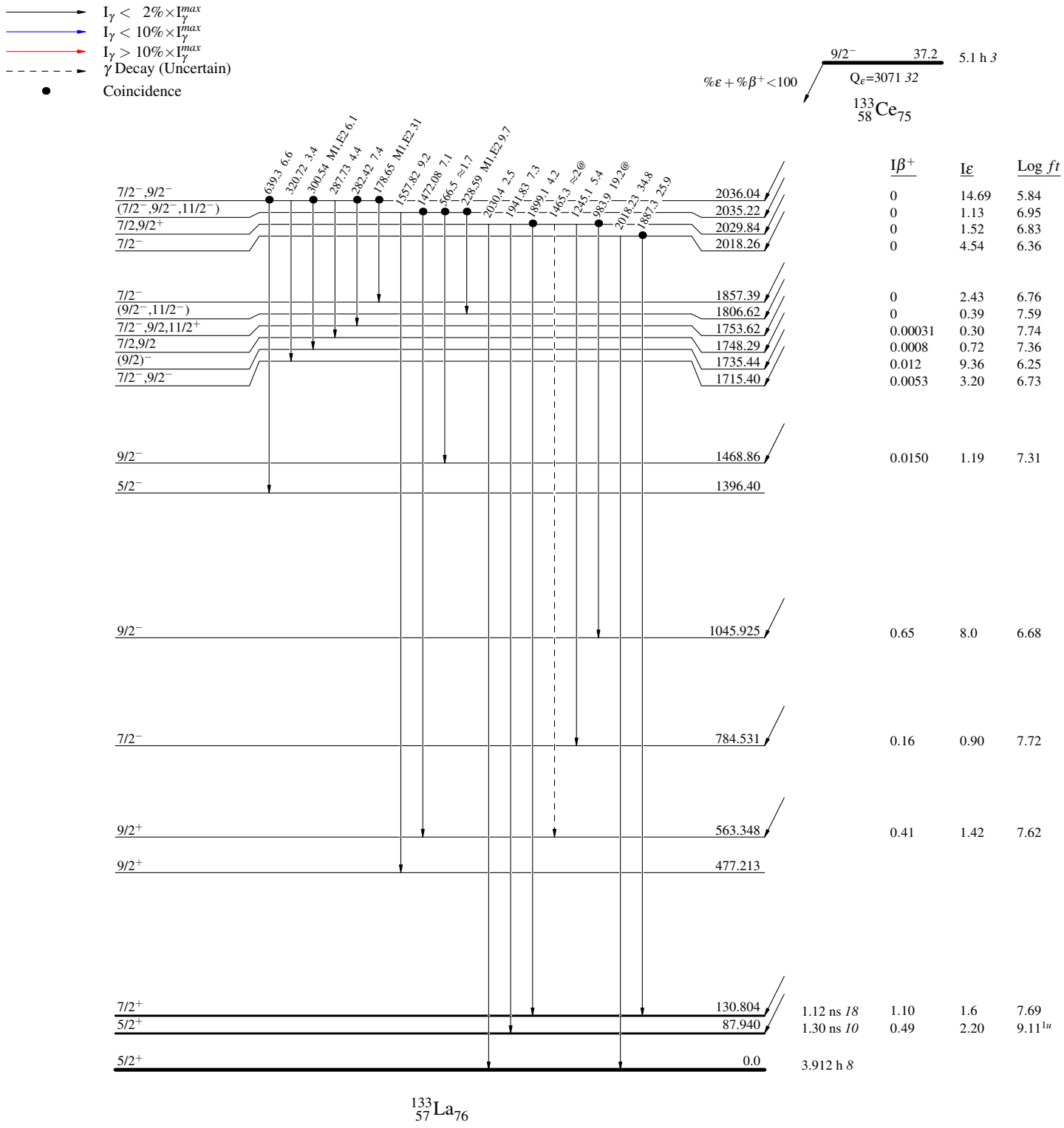
	Iβ+	Iε	Log *ft*
11/2− 2122.59	0	0.32	7.42
9/2− 2062.16	0	5.42	6.25
7/2−,9/2− 2036.04	0	14.69	5.84
(9/2+,11/2+) 1784.19	0	1.01	7.19
11/2− 1365.01	0.0086	0.39	7.85
13/2− 1153.35			
7/2+,9/2+ 1092.38	0.046	0.67	7.74
9/2− 1045.925	0.65	8.0	6.68
15/2− 979.91			
(7/2+) 867.15	0.061	0.44	8.02
7/2− 784.531	0.16	0.90	7.72
11/2+ 654.60	0.040	0.19	8.5
9/2+ 563.348	0.41	1.42	7.62
7/2+ 541.20			
11/2− 535.588 64 ns 5	0.30	0.9	7.8
7/2+ 130.804 1.12 ns 18	1.10	1.6	7.69
5/2+ 0.0 3.912 h 8			

$^{133}_{57}La_{76}$

^{133}Ce ε decay (5.1 h) 1978He16

Decay Scheme (continued)

Intensities: Relative I_γ
@ Multiply placed: intensity suitably divided

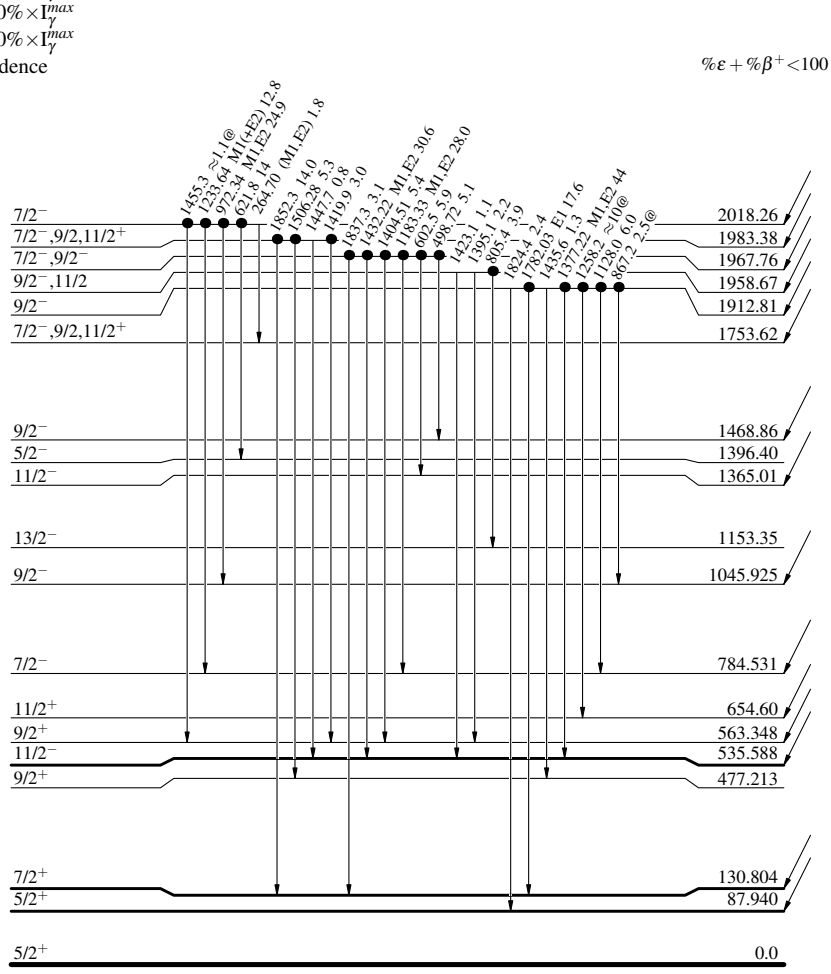


^{133}Ce ε decay (5.1 h) 1978He16

Decay Scheme (continued)

Intensities: Relative I_γ
@ 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



	Iβ+	Iε	Log *ft*
2018.26	0	4.54	6.36
1983.38	0	0.91	7.09
1967.76	0	2.74	6.62
1958.67	0	0.28	7.62
1912.81	0	3.29	6.58
1753.62	0.00031	0.30	7.74
1468.86	0.0150	1.19	7.31
1396.40			
1365.01	0.0086	0.39	7.85
1153.35			
1045.925	0.65	8.0	6.68
784.531	0.16	0.90	7.72
654.60	0.040	0.19	8.5
563.348	0.41	1.42	7.62
535.588 (64 ns 5)	0.30	0.9	7.8
477.213			
130.804 (1.12 ns 18)	1.10	1.6	7.69
87.940 (1.30 ns 10)	0.49	2.20	9.11[1u]
0.0 (3.912 h 8)			

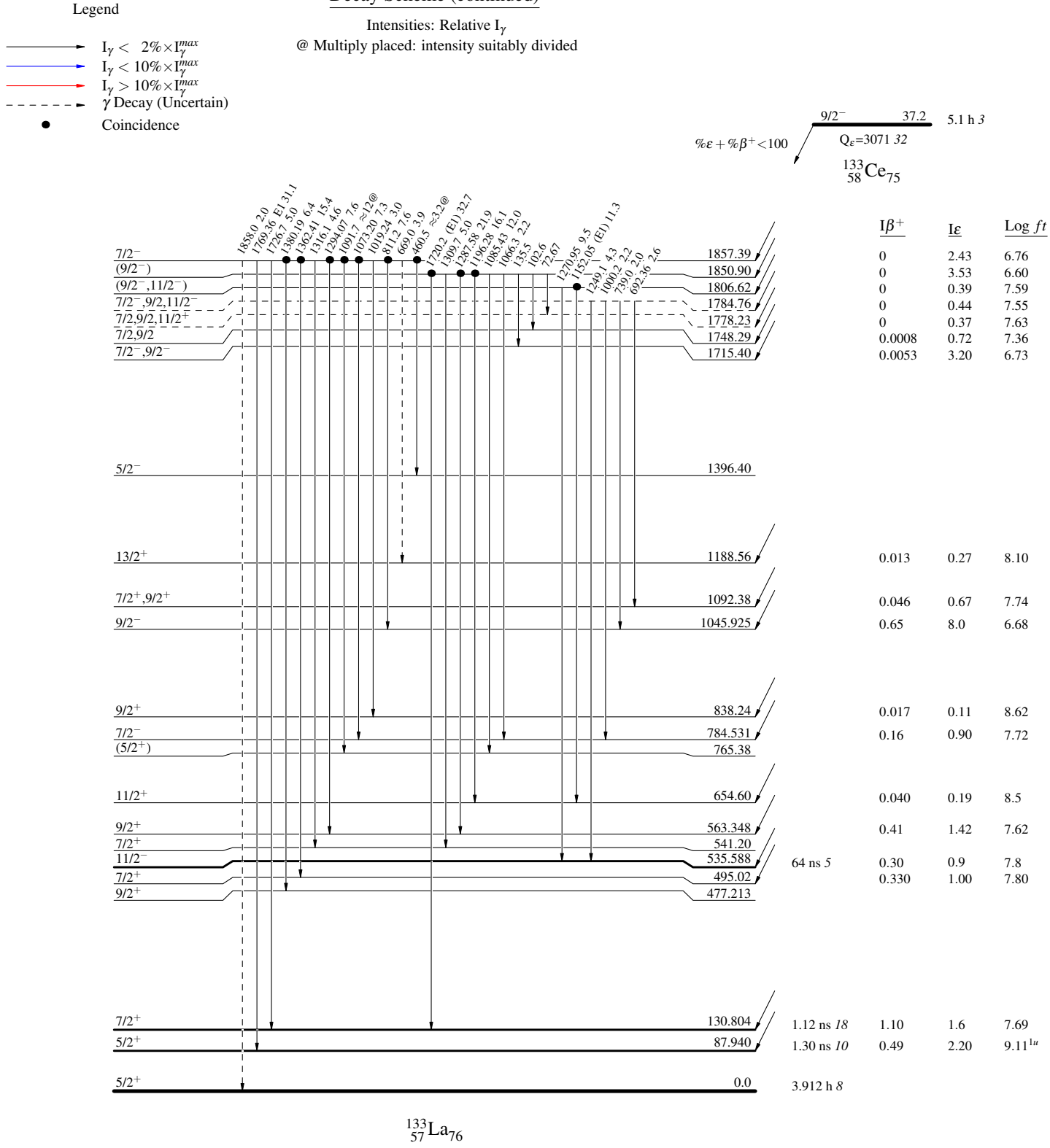
$^{133}_{57}La_{76}$

^{133}Ce ε decay (5.1 h) 1978He16

Decay Scheme (continued)

Intensities: Relative I_γ

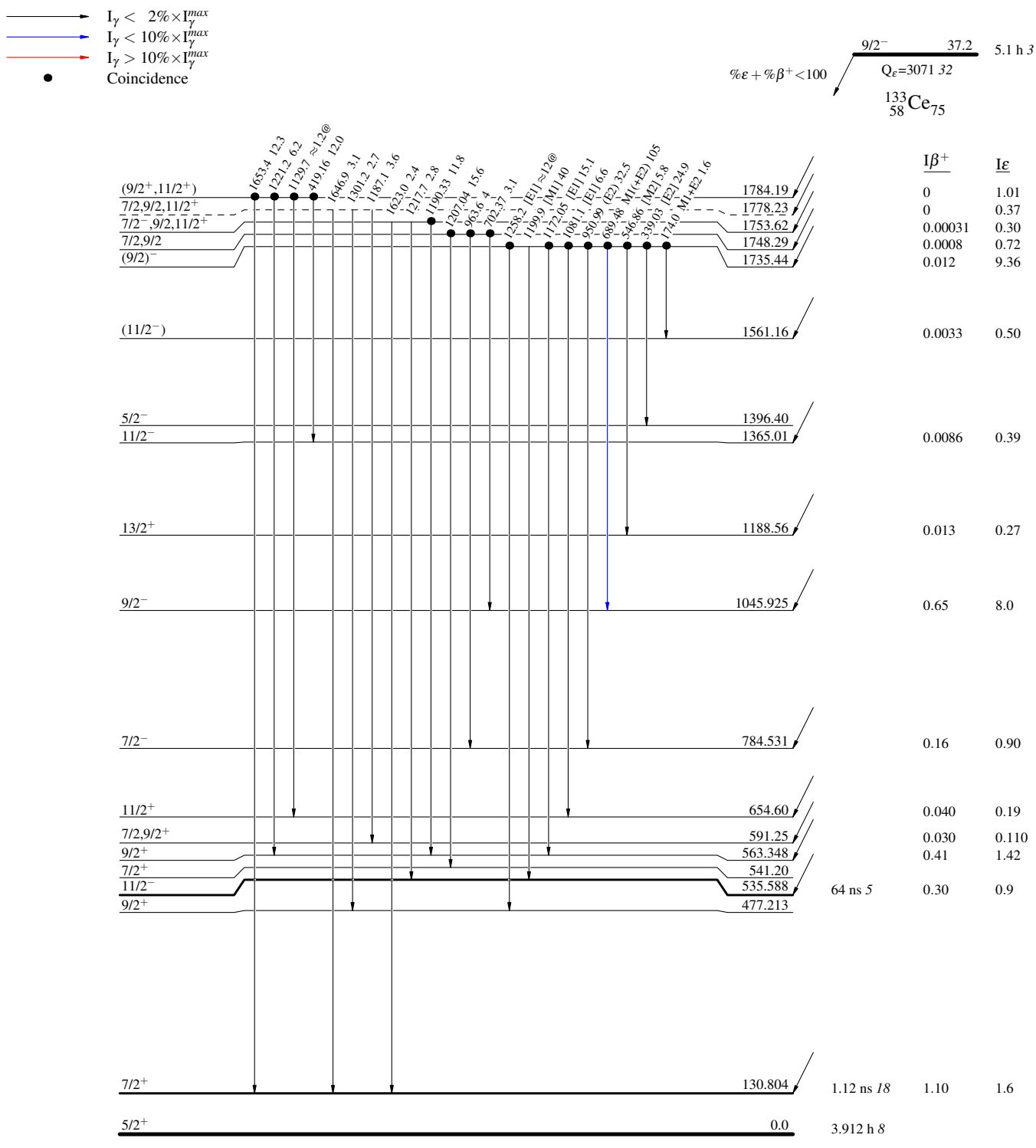
@ Multiply placed: intensity suitably divided



^{133}Ce ε decay (5.1 h) 1978He16

Decay Scheme (continued)

Intensities: Relative I_γ
@ Multiply placed: intensity suitably divided

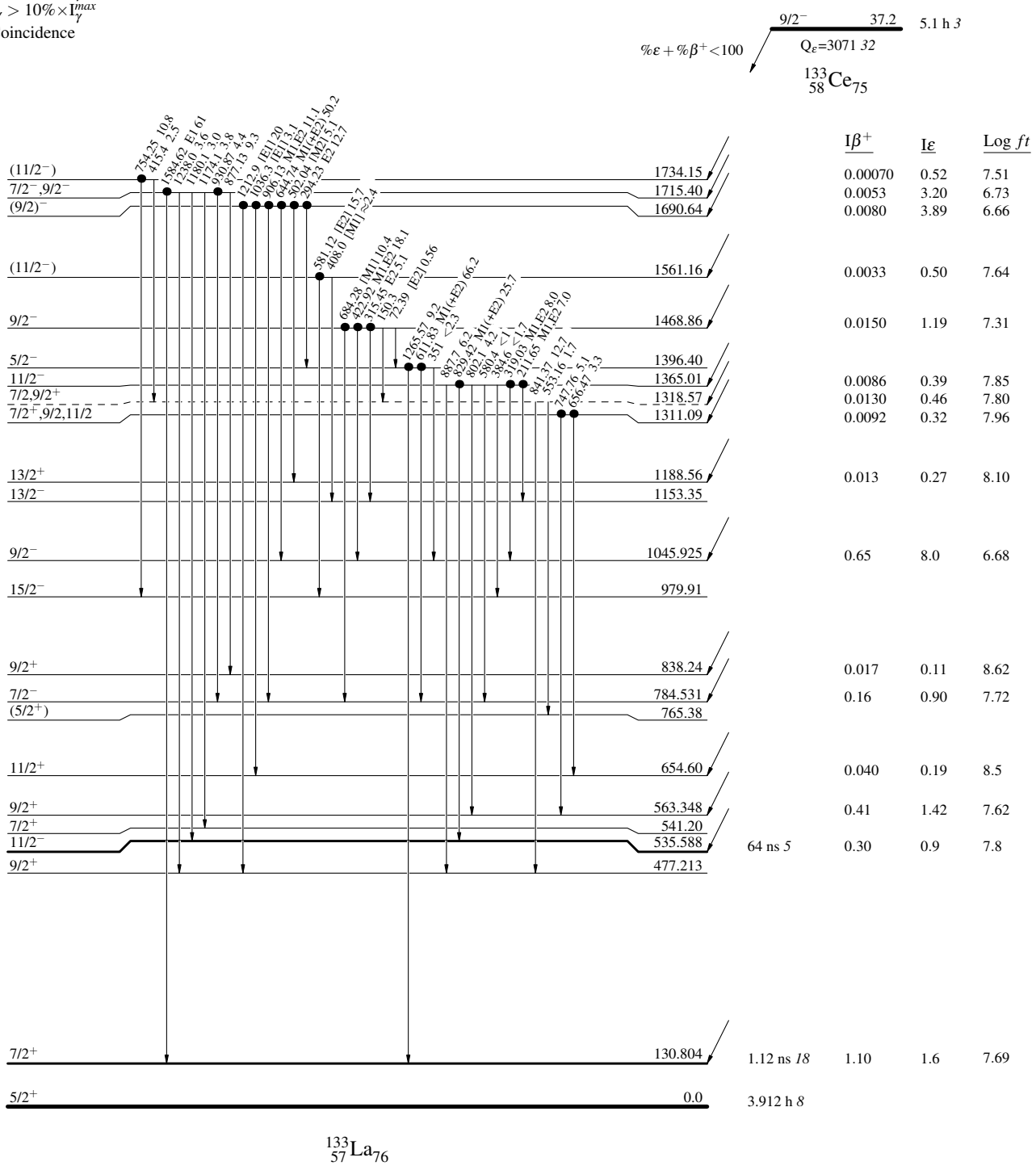


^{133}Ce ε decay (5.1 h) 1978He16

Decay Scheme (continued)

Intensities: Relative I_γ
@ 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

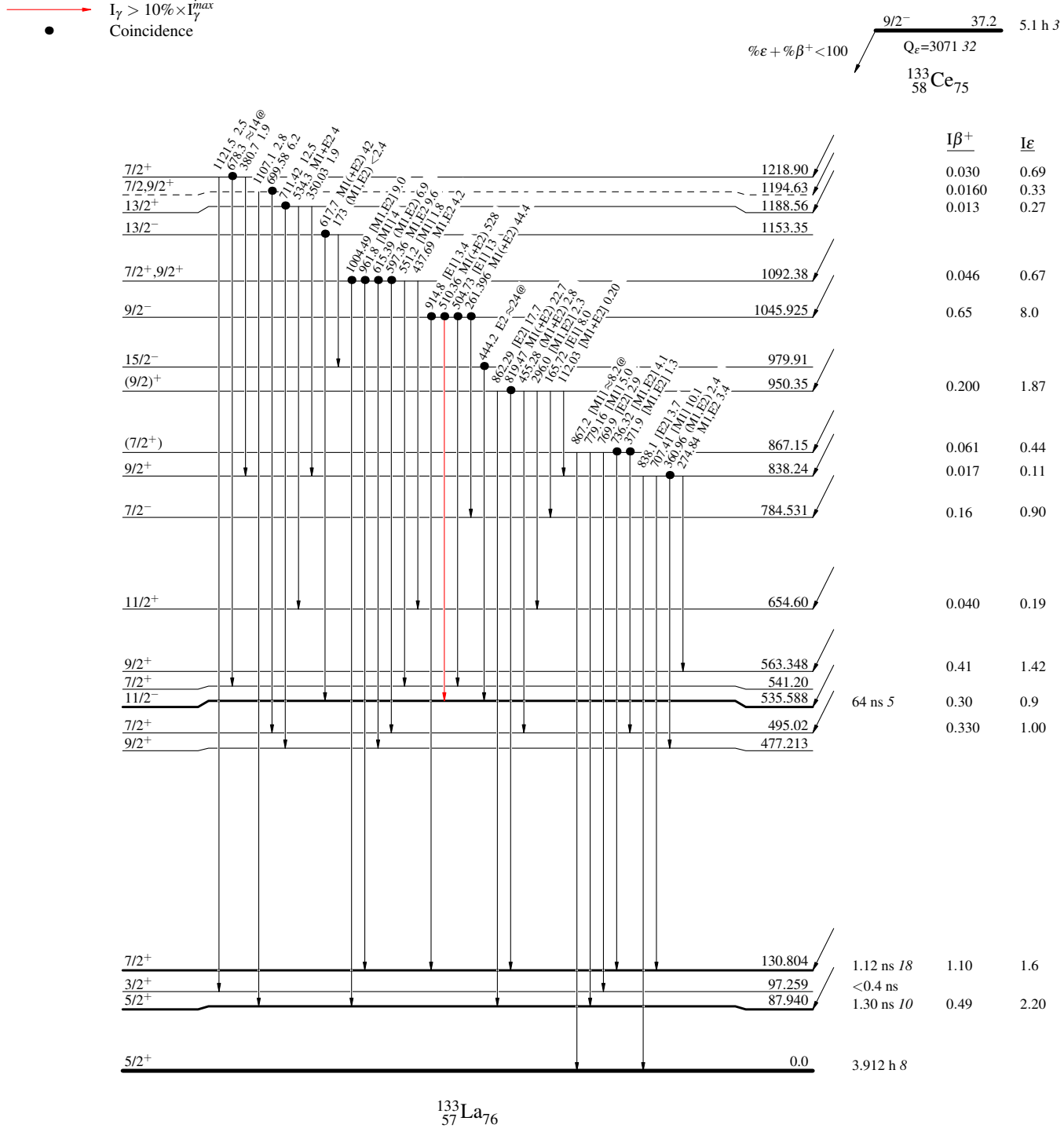


^{133}Ce ε decay (5.1 h) 1978He16

Decay Scheme (continued)

Intensities: Relative I_γ
@ 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

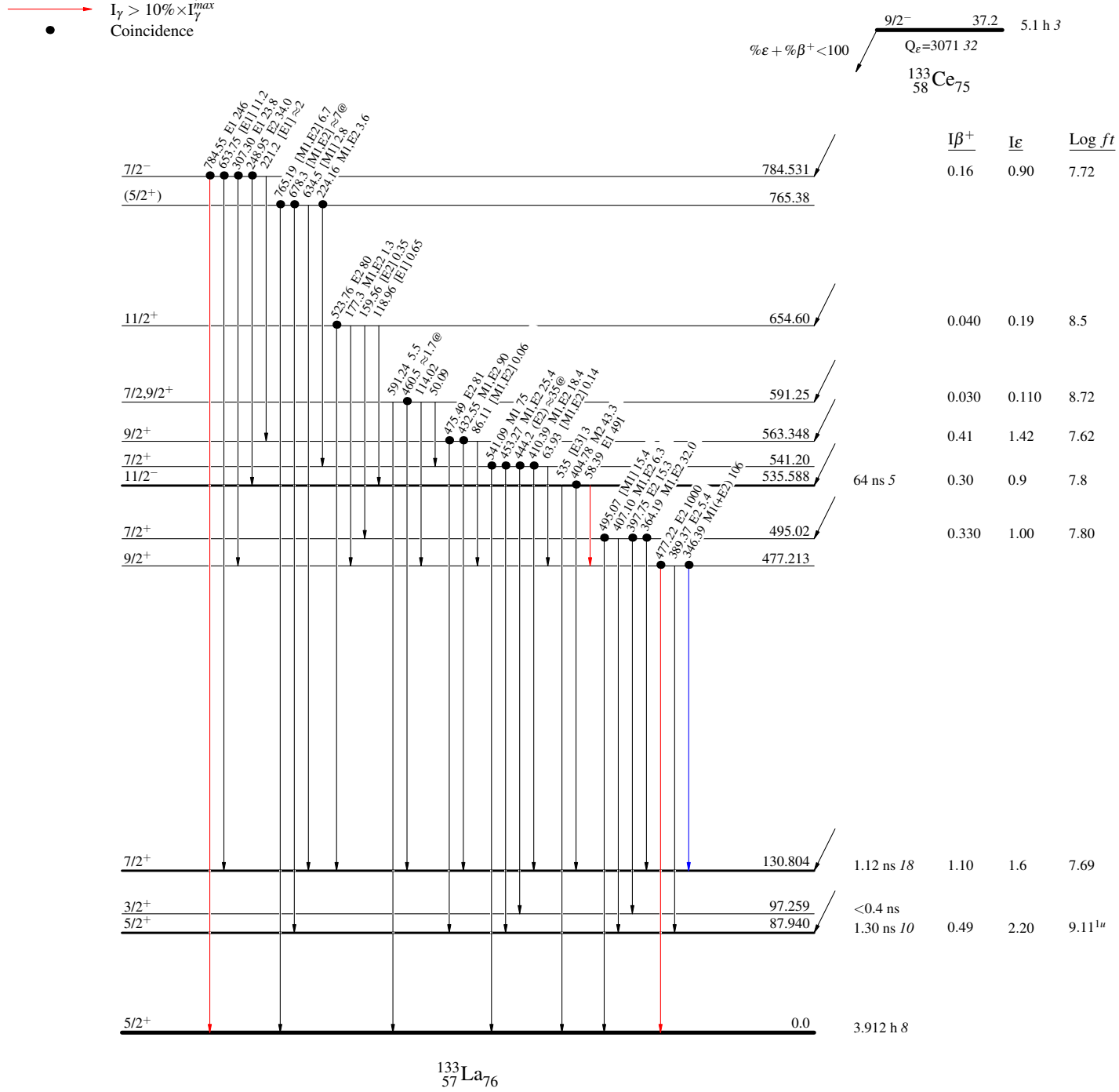


^{133}Ce ε decay (5.1 h) 1978He16

Decay Scheme (continued)

Intensities: Relative I_γ
@ 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



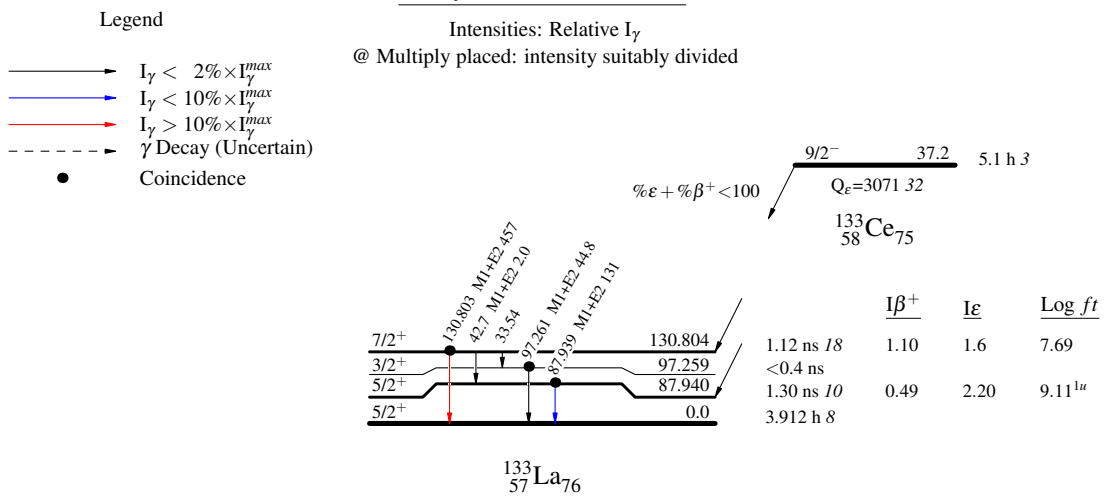
$^{133}_{57}La_{76}$

^{133}Ce ε decay (5.1 h) 1978He16

Decay Scheme (continued)

Intensities: Relative I_γ

@ Multiply placed: intensity suitably divided



	Iβ⁺	Iε	Log *ft*
130.804	1.10	1.6	7.69
97.259			
87.940	0.49	2.20	9.11[1u]
0.0			