^{133}La ε decay (3.912 h) 1976He11,1980VyZZ

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}La: E=0.0; $J^\pi=5/2^+$; $T_{1/2}$=3.912 h *8*; Q(ε)=2059 *28*; %ε+%$β^+$ decay=100

1976He11: ^{133}La ε decay [from ^{133}Ce ε decay, produced in ^{132}Ba(α,3n)]; measured γ, γ(t), γγ coin.; deduced levels, J^π, α(exp), log *ft*, $T_{1/2}$(^{133}La). Cyclotron, chemical and mass separations, Ge(Li) detectors.

1980VyZZ, 1983JoZX: ^{133}La ε decay [from Gd(p,X) E=660 MeV]; measured γ, ce; deduced levels, J^π. Synchrocyclotron, chemical and mass separations, particle-vibrational coupling model. Others: 1966Ha23, 1973Re05.

^{133}Ba Levels

E(level)†	J^π‡	$T_{1/2}$‡	Comments
0.0	$1/2^+$	10.551 y *11*	
12.326 *6*	$3/2^+$	7.0 ns *3*	
288.251 *9*	$11/2^-$	38.93 h *10*	0.3% of all ^{133}La decays populate the ^{133}Ba isomer (1966Ha23).
291.186 *9*	$5/2^+$		
302.395 *11*	$3/2^+$		
539.800 *13*	$1/2^+$		
577.553 *13*	$7/2^+$		
630.567 *10*	$5/2^+$		
676.486 *12*	$3/2^+$,$5/2^+$		
858.499 *11*	$3/2^+$		
862.80 *9*	$(7/2)^+$		
883.39 *5*	$9/2^+$		
887.134 *12*	$5/2^+$		
923.955 *10*	$5/2^+$		
1021.584 *23*	$3/2^+$		
1112.344 *12*	$3/2^+$,$5/2^+$,$7/2^+$		
1211.792 *12*	$3/2^+$,$5/2^+$		
1283.959 *24*	$3/2^-$		
1329.316 *18*	$5/2^+$		
1352.76 *5*	$7/2^+$		
1528.64 *9*	3/2,$5/2^+$		
1532.40 *8*	3/2,5/2,$7/2^+$		
1563.399 *24*	$5/2^+$		
1620.56 *4*	$5/2^+$		
1689.74 *6*	$3/2^+$,5/2,$7/2^+$		
1706.94 *19*	3/2,$5/2^+$		
1769.70 *5*	3/2,$5/2^+$		
1830.22 *3*	3/2,$5/2^+$		

† From a least-squares fit to Eγ's.
‡ From 'Adopted Levels'.

ε,$β^+$ radiations

E(decay)	E(level)	Iε‡	Log *ft*	I(ε+$β^+$)†‡	Comments
(229 *28*)	1830.22	0.0027 *6*	7.98 *17*	0.0027 *6*	εK=0.811 *8*; εL=0.147 *6*; εM+=0.0424 *20*
(289 *28*)	1769.70	0.0111 *6*	7.60 *11*	0.0111 *6*	εK=0.822 *5*; εL=0.139 *4*; εM+=0.0398 *11*
(352 *28*)	1706.94	0.0120 *9*	7.75 *9*	0.0120 *9*	εK=0.828 *3*; εL=0.1336 *20*; εM+=0.0381 *7*
(369 *28*)	1689.74	0.0177 *22*	7.63 *10*	0.0177 *22*	εK=0.8297 *24*; εL=0.1326 *18*; εM+=0.0378 *6*
(438 *28*)	1620.56	0.061 *4*	7.25 *7*	0.061 *4*	εK=0.8340 *16*; εL=0.1293 *12*; εM+=0.0367 *4*
(496 *28*)	1563.399	0.055 *4*	7.41 *7*	0.055 *4*	εK=0.8366 *12*; εL=0.1274 *9*; εM+=0.0360 *3*
(527 *28*)	1532.40	0.0061 *7*	8.42 *8*	0.0061 *7*	εK=0.8377 *11*; εL=0.1265 *8*; εM+=0.0358 *3*

Continued on next page (footnotes at end of table)

^{133}La ε decay (3.912 h) 1976He11,1980VyZZ (continued)

ε,β+ radiations (continued)

E(decay)	E(level)	Iβ+ ‡	Iε‡	Log *ft*	I(ε+β+)†‡	Comments
(530 *28*)	1528.64		0.0054 *8*	8.48 *9*	0.0054 *8*	εK=0.8379 *11*; εL=0.1264 *8*; εM+=0.0357 *3*
(706 *28*)	1352.76		0.131 *9*	7.36 *5*	0.131 *9*	εK=0.8423 *6*; εL=0.1231 *4*; εM+=0.03463 *14*
(730 *28*)	1329.316		0.079 *5*	7.61 *5*	0.079 *5*	εK=0.8427 *5*; εL=0.1228 *4*; εM+=0.03453 *13*
(775 *28*)	1283.959		0.062 *5*	7.77 *5*	0.062 *5*	εK=0.8434 *5*; εL=0.1222 *4*; εM+=0.03435 *11*
(847 *28*)	1211.792		0.168 *11*	7.42 *5*	0.168 *11*	εK=0.8444 *4*; εL=0.1215 *3*; εM+=0.03410 *9*
(947 *28*)	1112.344		0.318 *17*	7.24 *4*	0.318 *17*	εK=0.8455 *3*; εL=0.12067 *22*; εM+=0.03383 *7*
(1037 *28*)	1021.584		0.115 *7*	7.77 *4*	0.115 *7*	εK=0.8463 *3*; εL=0.12005 *18*; εM+=0.03363 *6*
(1135 *28*)	923.955		1.59 *8*	6.71 *4*	1.59 *8*	εK=0.8470 *2*; εL=0.11950 *15*; εM+=0.03345 *5*
(1172 *28*)	887.134		0.64 *3*	7.13 *3*	0.64 *3*	εK=0.8473 *2*; εL=0.11932 *14*; εM+=0.03339 *5*
(1196 *28*)	862.80		0.066 *7*	8.13 *5*	0.066 *7*	εK=0.8474 *2*; εL=0.11920 *14*; εM+=0.03335 *5*
(1201 *28*)	858.499		1.16 *6*	6.89 *3*	1.16 *6*	εK=0.8474 *2*; εL=0.11918 *14*; εM+=0.03334 *5*
(1383 *28*)	676.486	0.00031 *12*	0.192 *17*	7.80 *5*	0.192 *17*	av Eβ=172 *13*; εK=0.8470 *4*; εL=0.11828 *17*; εM+=0.03306 *5*
(1428 *28*)	630.567	0.0025 *8*	0.95 *5*	7.13 *3*	0.95 *5*	av Eβ=192 *13*; εK=0.8464 *6*; εL=0.11800 *19*; εM+=0.03297 *6*
(1481 *28*)	577.553	0.0019 *5*	0.43 *3*	7.51 *4*	0.43 *3*	av Eβ=216 *13*; εK=0.8451 *9*; εL=0.11764 *22*; εM+=0.03286 *7*
(1757 *28*)	302.395	0.054 *8*	2.10 *11*	6.97 *3*	2.15 *11*	av Eβ=336 *13*; εK=0.828 *3*; εL=0.1145 *5*; εM+=0.03195 *14*
(1768 *28*)	291.186	0.030 *5*	1.10 *11*	7.26 *5*	1.13 *11*	av Eβ=341 *13*; εK=0.827 *3*; εL=0.1143 *5*; εM+=0.03190 *14*
(2047 *28*)	12.326	7.1 *8*	84 *6*	5.51 *4*	91 *7*	av Eβ=463 *13*; εK=0.784 *6*; εL=0.1079 *9*; εM+=0.03008 *24*

† From intensity balances.
‡ Absolute intensity per 100 decays.

^{133}La ε decay (3.912 h) 1976He11,1980VyZZ (continued)

γ(^{133}Ba)

Iγ normalization: from Σ(I(γ+ce) to g.s.)=100 and by assuming that there is no direct ε-decay feeding to the ^{133}Ba g.s. ($J^\pi=1/2^+$); I($\gamma^\pm$)/Iγ(278γ)=4.58 *11* (1976He11).

E_γ ‡	I_γ ‡&	E_i(level)	J_i^π	E_f	J_f^π	Mult.#	δ	α†	Comments
12.327 *6*	56.4 *28*	12.326	$3/2^+$	0.0	$1/2^+$	M1+E2	≤0.013	69.5 *19*	α(L)=55.2 *15*; α(M)=11.4 *3*; α(N+..)=2.86 *8* α(N)=2.46 *7*; α(O)=0.373 *9*; α(P)=0.0261 *4* Mult.,δ: from 'Adopted Levels and gammas'. Iγ: from I(γ+ce)=3976 *164* deduced using Iγ(±)=458 *11* (1976He11), ε/β$^+$=15.2 (theory 1972Dz09 with assumed uncertainty of 3%) and ΣI(γ+ce)=266 *4*, the total intensity feeding this state.
x113.43 *6*	0.21 *4*					M1,E2		1.0 *3*	ce(K)=38 *6*; ce(L2)+ce(L3)=9 *2*; ce(M)=2.3 *4*; α(K)exp=0.8 *2* (1966Ha23) α(K)=0.71 *12*; α(L)=0.20 *13*; α(M)=0.04 *3*; α(N+..)=0.010 *7* α(N)=0.009 *6*; α(O)=0.0012 *7*; α(P)=3.89×10^{-5} *6*
136.7@ *2*	0.8@ *3*	676.486	$3/2^+$,$5/2^+$	539.800	$1/2^+$	M1,E2		0.52 *12*	ce(K)=7 *1* (1966Ha23) α(K)exp=0.4 *2* α(K)=0.40 *6*; α(L)=0.10 *5*; α(M)=0.020 *11*; α(N+..)=0.005 *3* α(N)=0.0043 *23*; α(O)=0.0006 *3*; α(P)=2.27×10^{-5} *5*
158.4@ *3*	0.07@ *3*	1021.584	$3/2^+$	862.80	$(7/2)^+$	E2		0.33 *6*	ce(K)=4 *1*; α(K)exp=0.26 *12* (1966Ha23) α(K)=0.26 *3*; α(L)=0.055 *24*; α(M)=0.012 *6*; α(N+..)=0.0028 *12* α(N)=0.0024 *11*; α(O)=0.00035 *14*; α(P)=1.48×10^{-5} *5* Eγ: this transition questionably populates the 862.80-keV level in 1976He11, however, the level energy difference (158.78 *9*) fits.
210.54 *6*	0.20 *5*	887.134	$5/2^+$	676.486	$3/2^+$,$5/2^+$	M1,E2		0.135 *11*	ce(K)=10 *2* (1966Ha23) α(K)exp=0.23 *8* α(K)=0.110 *4*; α(L)=0.020 *6*; α(M)=0.0041 *13*; α(N+..)=0.0010 *3* α(N)=0.00087 *25*; α(O)=0.00013 *3*; α(P)=6.5×10^{-6} *5*
227.82 *6*	0.31 *5*	858.499	$3/2^+$	630.567	$5/2^+$	M1,E2		0.106 *6*	ce(K)=8 *2* (1966Ha23) α(K)exp=0.15 *4* α(K)=0.0870 *15*; α(L)=0.015 *4*; α(M)=0.0031 *8*; α(N+..)=0.00077 *18* α(N)=0.00067 *16*; α(O)=9.7×10^{-5} *20*; α(P)=5.2×10^{-6} *5*
256.57@ *6*	0.91@ *6*	887.134	$5/2^+$	630.567	$5/2^+$	M1,E2		0.0741 *14*	ce(K)=16.5 *25* (1966Ha23) α(K)exp=0.076 *12*

$^{133}_{56}Ba_{77}$-3

^{133}La ε decay (3.912 h) 1976He11,1980VyZZ (continued)

γ(^{133}Ba) (continued)

E_γ [‡]	I_γ [‡&]	E_i(level)	J_i^π	E_f	J_f^π	Mult. [#]	δ	α [†]	Comments
									α(K)=0.0614 *17*; α(L)=0.0100 *18*; α(M)=0.0021 *4*; α(N+..)=0.00052 *9* α(N)=0.00045 *8*; α(O)=6.6×10^{-5} *10*; α(P)=3.7×10^{-6} *4* E_γ: level energy difference is 256.547 *14*; 256.340 *26* in 1980VyZZ.
275.925 *7*		288.251	11/2$^-$	12.326	3/2$^+$	M4		4.65	α(K)=3.34 *5*; α(L)=1.018 *15*; α(M)=0.229 *4*; α(N+..)=0.0565 *8* α(N)=0.0491 *7*; α(O)=0.00705 *10*; α(P)=0.000352 *5* E_γ,Mult.: from 'Adopted Levels and gammas'.
278.835 *17*	100.0 *32*	291.186	5/2$^+$	12.326	3/2$^+$	M1+E2	0.9 *16*	0.0580 *11*	ce(K)=100×10^1 *15*; ce(L)=145 *25*; ce(M)=35 *6* (1966Ha23) α(K)exp=0.044 *7*; α(L)exp=0.0064 *11*; α(M)exp=0.0016 *3* α(K)=0.0485 *21*; α(L)=0.0075 *10*; α(M)=0.00157 *22*; α(N+..)=0.00039 *5* α(N)=0.00034 *5*; α(O)=5.0×10^{-5} *5*; α(P)=3.0×10^{-6} *4* δ: calculated by evaluators from I(ce) data (1966Ha23) using the BrIccMixing program.
[x]281.8[@] *2*	0.5[@] *2*								
286.4[@] *4*	1.22[@] *4*	577.553	7/2$^+$	291.186	5/2$^+$	M1,E2		0.0536 *14*	ce(K)=11 *2* (1966Ha23); α(K)exp=0.041 *8* α(K)=0.0447 *24*; α(L)=0.0070 *9*; α(M)=0.00147 *20*; α(N+..)=0.00036 *5* α(N)=0.00031 *4*; α(O)=4.6×10^{-5} *5*; α(P)=2.7×10^{-6} *4*
290.06[@] *5*	56.5[@] *5*	302.395	3/2$^+$	12.326	3/2$^+$	M1+E2	1.0 *12*	0.0521 *13*	ce(K)=520 *80*; ce(L)=70 *10*; ce(M)=18 *3* (1966Ha23) α(K)exp=0.041 *6*; α(L)exp=0.0056 *8*; α(M)exp=0.0014 *2* α(K)=0.0439 *21*; α(L)=0.0065 *7*; α(M)=0.00135 *16*; α(N+..)=0.00033 *4* α(N)=0.00029 *3*; α(O)=4.3×10^{-5} *4*; α(P)=2.8×10^{-6} *3* δ: Calculated by evaluators with BrIccMixing program from ce(K)=520 *80*, ce(L1)=70 *10* and ce(M)=18 *3* (1966Ha23). E_γ: level energy difference is 290.044 *8*; 290.275 *22* in 1980VyZZ.
291.17[@] *5*	17.4[@] *3*	291.186	5/2$^+$	0.0	1/2$^+$	(E2)		0.0497	ce(K)≈120; ce(L)≈25 (1966Ha23) α(K)exp≈0.030; α(L)exp≈0.0065 α(K)=0.0403 *6*; α(L)=0.00743 *11*; α(M)=0.001568 *22*; α(N+..)=0.000382 *6* α(N)=0.000332 *5*; α(O)=4.76×10^{-5} *7*; α(P)=2.28×10^{-6} *4*
293.17[@b] *11*	1.0[@] *2*	923.955	5/2$^+$	630.567	5/2$^+$	M1,E2		0.0501 *16*	ce(K)≈11; ce(L)≈2 (1966Ha23) α(K)exp≈0.050; α(L)exp≈0.009 α(K)=0.0419 *25*; α(L)=0.0065 *8*; α(M)=0.00136 *17*; α(N+..)=0.00034 *4* α(N)=0.00029 *4*; α(O)=4.3×10^{-5} *4*; α(P)=2.6×10^{-6} *4* E_γ: this transition questionably populates the 630.567-keV level (1976He11), poor fit, the level energy difference = 293.388 *12*.

$^{133}_{56}Ba_{77}$-4

^{133}La ε decay (3.912 h) 1976He11,1980VyZZ (continued)

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

E_γ[‡]	I_γ[‡&]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[#]	α[†]	Comments
302.38[@] *4*	65.9[@] *21*	302.395	$3/2^+$	0.0	$1/2^+$	M1	0.0475	ce(K)=604 *21*; ce(L)=69 *8*; ce(M)=15 *4* α(L)exp=0.0047 *6*; α(M)exp=0.0010 *3* α(K)=0.0408 *6*; α(L)=0.00534 *8*; α(M)=0.001098 *16*; α(N+..)=0.000276 *4* α(N)=0.000237 *4*; α(O)=3.63×10^{-5} *5*; α(P)=2.66×10^{-6} *4*
309.56 *5*	0.55 *5*	887.134	$5/2^+$	577.553	$7/2^+$	M1,E2	0.0428 *20*	ce(K)=5.8 *18*; α(K)exp=0.047 *15* α(K)=0.036 *3*; α(L)=0.0055 *5*; α(M)=0.00115 *12*; α(N+..)=0.000283 *25* α(N)=0.000245 *23*; α(O)=3.63×10^{-5} *22*; α(P)=2.2×10^{-6} *3*
324.76 *10*	0.32 *5*	1211.792	$3/2^+$,$5/2^+$	887.134	$5/2^+$			
328.18 *3*	1.19 *7*	630.567	$5/2^+$	302.395	$3/2^+$	M1+E2	0.0362 *23*	ce(L)=1.2 *3*; α(L)exp=0.0046 *12* α(K)=0.030 *3*; α(L)=0.0046 *3*; α(M)=0.00095 *8*; α(N+..)=0.000236 *15* α(N)=0.000204 *14*; α(O)=3.04×10^{-5} *12*; α(P)=1.9×10^{-6} *3*
339.35 *4*	1.63 *16*	630.567	$5/2^+$	291.186	$5/2^+$	M1+E2	0.0329 *23*	ce(K)=11 *3*; ce(L)=1.4 *4*; α(K)exp=0.030 *8*; α(L)exp=0.0039 *11* α(K)=0.028 *3*; α(L)=0.00414 *21*; α(M)=0.00086 *6*; α(N+..)=0.000213 *11* α(N)=0.000184 *10*; α(O)=2.74×10^{-5} *8*; α(P)=1.7×10^{-6} *3*
345.1[@] *4*	0.06[@] *5*	1021.584	$3/2^+$	676.486	$3/2^+$,$5/2^+$			E_γ: this transition questionably populates the 676.486-keV level in 1976He11, however, the level energy difference (345.098 *25*) fits.
347.1[@] *3*	0.13[@] *6*	887.134	$5/2^+$	539.800	$1/2^+$			
353.28 *4*	0.94 *7*	1211.792	$3/2^+$,$5/2^+$	858.499	$3/2^+$	E2	0.0271	ce(K)=3.8 *7*; α(K)exp=0.018 *4* α(K)=0.0223 *4*; α(L)=0.00378 *6*; α(M)=0.000794 *12*; α(N+..)=0.000195 *3* α(N)=0.0001687 *24*; α(O)=2.45×10^{-5} *4*; α(P)=1.296×10^{-6} *19*
[x]355.97 *3*	1.19 *6*					E1	0.00738 *11*	ce(K)=1.3 *3*; α(K)exp=0.0041 *12* α(K)=0.00636 *9*; α(L)=0.000810 *12*; α(M)=0.0001659 *24*; α(N+..)=4.14×10^{-5} *6* α(N)=3.56×10^{-5} *5*; α(O)=5.39×10^{-6} *8*; α(P)=3.75×10^{-7} *6*
374.13 *9*	0.33 *5*	676.486	$3/2^+$,$5/2^+$	302.395	$3/2^+$			
385.295 *14*	3.10 *11*	676.486	$3/2^+$,$5/2^+$	291.186	$5/2^+$	M1+E2	0.0231 *23*	ce(K)=16 *5*; ce(L)=2.5 *7*; ce(M)=0.7 *3* α(K)exp=0.023 *8*; α(L)exp=0.0036 *3*; α(M)exp=0.0010 *4* α(K)=0.0196 *23*; α(L)=0.00283 *4*; α(M)=0.000588 *10*; α(N+..)=0.0001461 *21* α(N)=0.0001260 *18*; α(O)=1.89×10^{-5} *5*; α(P)=1.22×10^{-6} *21*
428.7[@] *2*	0.17[@] *6*	1352.76	$7/2^+$	923.955	$5/2^+$	M1	0.0194	ce(K)=1.0 *3*; α(K)exp=0.021 *6* α(K)=0.01665 *24*; α(L)=0.00215 *3*; α(M)=0.000443 *7*; α(N+..)=0.0001113 *16* α(N)=9.56×10^{-5} *14*; α(O)=1.467×10^{-5} *21*; α(P)=1.081×10^{-6} *16*

$^{133}_{56}Ba_{77}$-5

^{133}La ε decay (3.912 h) 1976He11,1980VyZZ (continued)

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

E_γ[‡]	I_γ[‡&]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[#]	α[†]	Comments
								E_γ: 428.53 *9* is placed from the 1351-keV $(3/2^+,5/2^+)$ level (1980VyZZ), but this level is not supported by others, the level energy difference is equal to 428.74 *5*.
[x]432.3[@b] *3*	0.09[@] *5*							
435.82 *3*	1.02 *6*	1112.344	$3/2^+,5/2^+,7/2^+$	676.486	$3/2^+,5/2^+$	E2	0.01452	ce(K)=2.6 *5*; α(K)exp=0.012 *3* α(K)=0.01212 *17*; α(L)=0.00190 *3*; α(M)=0.000398 *6*; α(N+..)=9.79×10^{-5} *14* α(N)=8.47×10^{-5} *12*; α(O)=1.247×10^{-5} *18*; α(P)=7.20×10^{-7} *10*
441.9[@] *4*	0.07[@] *5*	1329.316	$5/2^+$	887.134	$5/2^+$	M1,E2	0.0159 *20*	ce(K)=0.35 *12*; α(K)exp=0.023 *10* α(K)=0.0135 *19*; α(L)=0.00191 *9*; α(M)=0.000395 *16*; α(N+..)=9.8×10^{-5} *5* α(N)=8.5×10^{-5} *4*; α(O)=1.28×10^{-5} *9*; α(P)=8.5×10^{-7} *16* E_γ: this transition questionably populates the 887.134-keV level in 1976He11, the level energy difference = 442.182 *19*.
445.3[@] *3*	0.17[@] *10*	1329.316	$5/2^+$	883.39	$9/2^+$	(E2)	0.01365	ce(K)=0.7 *3*; α(K)exp=0.019 *12* α(K)=0.01141 *17*; α(L)=0.00178 *3*; α(M)=0.000371 *6*; α(N+..)=9.15×10^{-5} *13* α(N)=7.92×10^{-5} *12*; α(O)=1.166×10^{-5} *17*; α(P)=6.79×10^{-7} *10* E_γ: poor fit, the level energy difference = 445.93 *5*. Mult.: M1,E2 from conversion data. M1 ruled out from placement in level scheme.
465.53[@] *11*	0.42[@] *6*	1352.76	$7/2^+$	887.134	$5/2^+$			
469.41 *5*	0.85 *6*	1352.76	$7/2^+$	883.39	$9/2^+$	M1	0.01541	ce(K)=2.5 *3*; α(K)exp=0.013 *2* α(K)=0.01326 *19*; α(L)=0.001709 *24*; α(M)=0.000351 *5*; α(N+..)=8.84×10^{-5} *13* α(N)=7.58×10^{-5} *11*; α(O)=1.164×10^{-5} *17*; α(P)=8.60×10^{-7} *12*
481.73 *3*	1.39 *8*	1021.584	$3/2^+$	539.800	$1/2^+$	M1,E2	0.0127 *18*	ce(K)=3.0 *4*; α(K)exp=0.0096 *13* α(K)=0.0108 *17*; α(L)=0.00150 *11*; α(M)=0.000310 *20*; α(N+..)=7.7×10^{-5} *6* α(N)=6.7×10^{-5} *5*; α(O)=1.00×10^{-5} *9*; α(P)=6.8×10^{-7} *13*
494.5[@] *3*	0.12[@] *6*	1352.76	$7/2^+$	858.499	$3/2^+$			E_γ: this transition populates the 858.499-keV level questionably (1976He11), the level energy difference = 494.20 *5*.
[x]519.1[@] *4*	0.9[@] *3*							
527.464 *15*	3.22 *11*	539.800	$1/2^+$	12.326	$3/2^+$	M1,E2	0.0100 *16*	ce(K)=6.0 *5*; α(K)exp=0.0083 *8* α(K)=0.0085 *14*; α(L)=0.00117 *11*; α(M)=0.000242 *21*; α(N+..)=6.0×10^{-5} *6* α(N)=5.2×10^{-5} *5*; α(O)=7.9×10^{-6} *9*; α(P)=5.4×10^{-7} *11*
534.796 *10*	2.00 *7*	1112.344	$3/2^+,5/2^+,7/2^+$	577.553	$7/2^+$	M1,E2	0.0097 *15*	ce(K)=3.7 *4*; α(K)exp=0.0082 *9* α(K)=0.0083 *14*; α(L)=0.00113 *11*; α(M)=0.000233 *21*;

$^{133}_{56}Ba_{77}$-6

^{133}La ε decay (3.912 h) 1976He11,1980VyZZ (continued)

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

E_γ[‡]	I_γ[‡&]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[#]	α[†]	Comments
								α(N+..)=5.8×10^{-5} *6*
								α(N)=5.0×10^{-5} *5*; α(O)=7.6×10^{-6} *9*; α(P)=5.2×10^{-7} *11*
[x]540.45 *3*	0.553 *28*							ce(K)=0.7 *3*; α(K)exp=0.006 *3*
556.03 *22*	5.7 *12*	858.499	3/2$^+$	302.395	3/2$^+$	M1,E2	0.0088 *14*	ce(K)=8.3 *8*; ce(L)=0.7 *3*; α(K)exp=0.0065 *14*; α(L)exp=0.0006 *3*
								α(K)=0.0075 *13*; α(L)=0.00102 *11*; α(M)=0.000210 *20*;
								α(N+..)=5.2×10^{-5} *6*
								α(N)=4.5×10^{-5} *5*; α(O)=6.8×10^{-6} *8*; α(P)=4.7×10^{-7} *10*
560.28 *21*	0.73 *21*	862.80	(7/2)$^+$	302.395	3/2$^+$			
565.231 *20*	21.6 *8*	577.553	7/2$^+$	12.326	3/2$^+$	E2	0.00708 *10*	ce(K)=34.8 *13*; α(K)exp= 0.0072 *4*
								α(K)=0.00598 *9*; α(L)=0.000872 *13*; α(M)=0.000181 *3*;
								α(N+..)=4.49×10^{-5} *7*
								α(N)=3.87×10^{-5} *6*; α(O)=5.78×10^{-6} *8*; α(P)=3.63×10^{-7} *5*
								Mult.: E2,M1 from conversion data. M1 ruled out from placement in the level scheme.
567.26 *4*	8.4 *4*	858.499	3/2$^+$	291.186	5/2$^+$	M1,E2	0.0083 *14*	ce(K)=9.7 *6*; α(K)exp=0.0051 *4*
								α(K)=0.0071 *12*; α(L)=0.00096 *10*; α(M)=0.000199 *20*;
								α(N+..)=5.0×10^{-5} *6*
								α(N)=4.3×10^{-5} *5*; α(O)=6.5×10^{-6} *8*; α(P)=4.5×10^{-7} *9*
571.9 *3*	1.08 *10*	862.80	(7/2)$^+$	291.186	5/2$^+$	M1,E2	0.0082 *13*	ce(K)=1.2 *3*; α(K)exp=0.0050 *13*
								α(K)=0.0070 *12*; α(L)=0.00094 *10*; α(M)=0.000195 *20*;
								α(N+..)=4.9×10^{-5} *6*
								α(N)=4.2×10^{-5} *5*; α(O)=6.3×10^{-6} *8*; α(P)=4.4×10^{-7} *9*
581.39 *8*	0.48 *5*	1211.792	3/2$^+$,5/2$^+$	630.567	5/2$^+$	M1,E2	0.0078 *13*	ce(K)=0.98 *30*; α(K)exp=0.0083 *30*
								α(K)=0.0067 *12*; α(L)=0.00090 *10*; α(M)=0.000186 *20*;
								α(N+..)=4.7×10^{-5} *6*
								α(N)=4.0×10^{-5} *5*; α(O)=6.1×10^{-6} *8*; α(P)=4.2×10^{-7} *9*
								E_γ: poor fit, the level energy difference = 581.224 *14*.
								Mult.: M1,(E2) in 1983JoZX.
584.734 *10*	7.01 *23*	887.134	5/2$^+$	302.395	3/2$^+$	M1+E2	0.0077 *13*	ce(K)=9.8 *3*; α(K)exp=0.0063 *3*
								α(K)=0.0066 *12*; α(L)=0.00089 *10*; α(M)=0.000183 *20*;
								α(N+..)=4.6×10^{-5} *6*
								α(N)=3.9×10^{-5} *5*; α(O)=6.0×10^{-6} *8*; α(P)=4.2×10^{-7} *9*
592.22 *5*	1.30 *8*	883.39	9/2$^+$	291.186	5/2$^+$	E2	0.00626 *9*	ce(K)=2.0 *5*; α(K)exp=0.0068 *18*
								α(K)=0.00530 *8*; α(L)=0.000764 *11*; α(M)=0.0001586 *23*;
								α(N+..)=3.93×10^{-5} *6*
								α(N)=3.39×10^{-5} *5*; α(O)=5.07×10^{-6} *8*; α(P)=3.23×10^{-7} *5*
								Mult.: E2,M1 from conversion data. M1 ruled out from placement in level scheme.
595.94 *9*	15.9 *5*	887.134	5/2$^+$	291.186	5/2$^+$	M1(+E2)	0.0074 *12*	ce(K)=28.4 *11*; ce(L)=5.0 *10*; α(K)exp=0.0079 *5*; α(L)exp=0.0014 *3*
								α(K)=0.0063 *11*; α(L)=0.00085 *10*; α(M)=0.000174 *19*;

$^{133}_{56}Ba_{77}$-7

^{133}La ε decay (3.912 h) 1976He11,1980VyZZ (continued)

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

E_γ[‡]	I_γ[‡&]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[#]	α[†]	Comments
								α(N+..)=4.4×10^{-5} *5* α(N)=3.8×10^{-5} *5*; α(O)=5.7×10^{-6} *8*; α(P)=4.0×10^{-7} *8*
[x]604.37 *22*	0.12 *5*							
618.241 *11*	32.9 *12*	630.567	5/2$^+$	12.326	3/2$^+$	M1	0.00781 *11*	ce(K)=52.7 *20*; ce(L)=6.5 *3*; α(K)exp=0.0074 *4*; α(L)exp=0.00089 *5* α(K)=0.00673 *10*; α(L)=0.000859 *12*; α(M)=0.0001764 *25*; α(N+..)=4.44×10^{-5} α(N)=3.81×10^{-5} *6*; α(O)=5.85×10^{-6} *9*; α(P)=4.34×10^{-7} *6*
621.542 *14*	21.5 *3*	923.955	5/2$^+$	302.395	3/2$^+$	M1,E2	0.0066 *11*	ce(K)=24 *5*; ce(L)=4.1 *4*; α(K)exp=0.0049 *11*; α(L)exp=0.00085 *9* α(K)=0.0057 *10*; α(L)=0.00076 *9*; α(M)=0.000156 *18*; α(N+..)=3.9×10^{-5} *5* α(N)=3.4×10^{-5} *4*; α(O)=5.1×10^{-6} *7*; α(P)=3.6×10^{-7} *8*
630.578 *25*	5.6 *2*	630.567	5/2$^+$	0.0	1/2$^+$	E2	0.00533 *8*	ce(K)=5.6 *4*; α(K)exp=0.0045 *4* α(K)=0.00452 *7*; α(L)=0.000643 *9*; α(M)=0.0001332 *19*; α(N+..)=3.31×10^{-5} *5* α(N)=2.85×10^{-5} *4*; α(O)=4.27×10^{-6} *6*; α(P)=2.76×10^{-7} *4*
632.765 *8*	39.0 *12*	923.955	5/2$^+$	291.186	5/2$^+$	M1	0.00738 *11*	ce(K)=59 *3*; ce(L)=8.3 *5*; ce(M)=1.3 *4* α(K)exp=0.0067 *4*; α(L)exp=0.00095 *6*; α(M)exp=0.00015 *5* α(K)=0.00636 *9*; α(L)=0.000812 *12*; α(M)=0.0001666 *24*; α(N+..)=4.19×10^{-5} *6* α(N)=3.60×10^{-5} *5*; α(O)=5.53×10^{-6} *8*; α(P)=4.10×10^{-7} *6*
653.04 *11*	0.41 *7*	1329.316	5/2$^+$	676.486	3/2$^+$,5/2$^+$			
664.21[@] *13*	3.77[@] *10*	676.486	3/2$^+$,5/2$^+$	12.326	3/2$^+$	M1+E2	0.0056 *10*	ce(K)=4.0 *9*; α(K)exp=0.0047 *11* α(K)=0.0048 *9*; α(L)=0.00064 *9*; α(M)=0.000132 *17*; α(N+..)=3.3×10^{-5} *5* α(N)=2.8×10^{-5} *4*; α(O)=4.3×10^{-6} *6*; α(P)=3.0×10^{-7} *6* E_γ: level energy difference is 664.155 *12*; 664.009 *23* in 1980VyZZ.
671.997 *17*	1.4 *3*	1211.792	3/2$^+$,5/2$^+$	539.800	1/2$^+$	M1,E2	0.0055 *10*	ce(K)=1.3 *3*; α(K)exp=0.0041 *13* α(K)=0.0047 *9*; α(L)=0.00062 *8*; α(M)=0.000128 *16*; α(N+..)=3.2×10^{-5} *5* α(N)=2.8×10^{-5} *4*; α(O)=4.2×10^{-6} *6*; α(P)=3.0×10^{-7} *6*
676.47 *2*	1.1 *3*	676.486	3/2$^+$,5/2$^+$	0.0	1/2$^+$	M1,E2	0.0054 *9*	ce(K)=1.1 *3*; α(K)exp=0.0044 *17* α(K)=0.0046 *8*; α(L)=0.00061 *8*; α(M)=0.000126 *16*; α(N+..)=3.1×10^{-5} *5* α(N)=2.7×10^{-5} *4*; α(O)=4.1×10^{-6} *6*; α(P)=2.9×10^{-7} *6*
[x]682.0[@] *5*	0.09[@] *5*							
[x]684.3[@] *5*	0.08[@] *5*							

$^{133}_{56}Ba_{77}$-8

^{133}La ε decay (3.912 h) 1976He11,1980VyZZ (continued)

γ(^{133}Ba) (continued)

E_γ ‡	I_γ ‡&	E_i(level)	J_i^π	E_f	J_f^π	Mult.#	α†	Comments
x689.5@ 3	0.10@ 5							
719.44 14	0.14 3	1021.584	3/2+	302.395	3/2+			
722.01 15	0.127 23	1352.76	7/2+	630.567	5/2+			
733.63b 10	0.094 15	1620.56	5/2+	887.134	5/2+			ce(K)=0.26 8; α(K)exp=0.012 4 E_γ: poor fit: the level energy difference is equal to 733.36 3. Mult.: α(K)exp value does not correspond to mult.=D or E2.
751.753 15	1.96 7	1329.316	5/2+	577.553	7/2+	M1	0.00488 7	ce(K)=1.9 4; α(K)exp=0.0044 8 α(K)=0.00421 6; α(L)=0.000534 8; α(M)=0.0001095 16; α(N+..)=2.76×10^{-5} 4 α(N)=2.36×10^{-5} 4; α(O)=3.64×10^{-6} 5; α(P)=2.71×10^{-7} 4
775.31 18	0.109 25	1352.76	7/2+	577.553	7/2+	M1	0.00453 7	ce(K)=0.15 5; α(K)exp=0.006 3 α(K)=0.00391 6; α(L)=0.000495 7; α(M)=0.0001017 15; α(N+..)=2.56×10^{-5} 4 α(N)=2.20×10^{-5} 3; α(O)=3.38×10^{-6} 5; α(P)=2.51×10^{-7} 4
802.3@ 4	0.12@ 6	1689.74	3/2+,5/2,7/2+	887.134	5/2+			
809.976 19	1.69 6	1112.344	3/2+,5/2+,7/2+	302.395	3/2+	M1,E2	0.0035 6	ce(K)=1.0 2; ce(L)=0.16 4; α(K)exp=0.0026 6; α(L)exp=0.00043 11 α(K)=0.0030 6; α(L)=0.00039 6; α(M)=8.0×10^{-5} 12; α(N+..)=2.0×10^{-5} 3 α(N)=1.73×10^{-5} 25; α(O)=2.6×10^{-6} 4; α(P)=1.9×10^{-7} 4
821.13 3	0.50 3	1112.344	3/2+,5/2+,7/2+	291.186	5/2+	M1	0.00395 6	ce(K)=0.40 5; α(K)exp=0.0036 5 α(K)=0.00341 5; α(L)=0.000432 6; α(M)=8.86×10^{-5} 13; α(N+..)=2.23×10^{-5} 4 α(N)=1.91×10^{-5} 3; α(O)=2.94×10^{-6} 5; α(P)=2.19×10^{-7} 3
846.183 15	18.9 6	858.499	3/2+	12.326	3/2+	M1,E2	0.0032 6	ce(K)=10 3; ce(L)=1.0 3; ce(M)=0.17 8 α(K)exp=0.0024 8; α(L)exp=0.00024 8; α(M)exp=0.00004 2 α(K)=0.0027 5; α(L)=0.00035 5; α(M)=7.2×10^{-5} 11; α(N+..)=1.8×10^{-5} 3 α(N)=1.56×10^{-5} 23; α(O)=2.4×10^{-6} 4; α(P)=1.7×10^{-7} 4
848.4@b 3	0.34@ 7	1706.94	3/2,5/2+	858.499	3/2+			
850.43 10	0.97 11	862.80	(7/2)+	12.326	3/2+	E2	0.0031 6	ce(K)=1.0 3; α(K)exp=0.005 2 (1966Ha23) α(K)=0.0027 5; α(L)=0.00035 5; α(M)=7.1×10^{-5} 10; α(N+..)=1.8×10^{-5} 3 α(N)=1.54×10^{-5} 22; α(O)=2.4×10^{-6} 4; α(P)=1.7×10^{-7} 4
858.496 15	15.4 5	858.499	3/2+	0.0	1/2+	M1,E2	0.0031 6	ce(K)=9.0 4; ce(L)=0.87 15; ce(M)=0.32 11 α(K)exp=0.0026 2; α(L)exp=0.00026 5; α(M)exp=0.00009 3 α(K)=0.0026 5; α(L)=0.00034 5; α(M)=7.0×10^{-5} 10; α(N+..)=1.8×10^{-5} 3 α(N)=1.51×10^{-5} 22; α(O)=2.3×10^{-6} 4; α(P)=1.7×10^{-7} 4
874.83 3	1.66 8	887.134	5/2+	12.326	3/2+	M1,E2	0.0029 5	ce(K)=0.69 10; ce(L)=0.14 4; α(K)exp=0.0019 3; α(L)exp=0.00038

$^{133}_{56}Ba_{77}$-9

^{133}La ε decay (3.912 h) 1976He11,1980VyZZ (continued)

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

E_γ ‡	I_γ ‡&	E_i(level)	J_i^π	E_f	J_f^π	Mult.#	α †	Comments
								11 α(K)=0.0025 *5*; α(L)=0.00032 *5*; α(M)=6.7×10^{-5} *10*; α(N+..)=1.67×10^{-5} *25* α(N)=1.44×10^{-5} *21*; α(O)=2.2×10^{-6} *4*; α(P)=1.6×10^{-7} *3*
887.164 *24*	0.88 *4*	887.134	5/2$^+$	0.0	1/2$^+$			
x892.29 *22*	0.14 *6*							
x899.38 *5*	0.30 *2*							
909.27 *8*	0.38 *2*	1211.792	3/2$^+$,5/2$^+$	302.395	3/2$^+$	M1	0.00311 *5*	ce(K)=0.21 *4*; α(K)exp=0.0025 *5* α(K)=0.00269 *4*; α(L)=0.000339 *5*; α(M)=6.95×10^{-5} *10*; α(N+..)=1.749×10^{-5} *25* α(N)=1.501×10^{-5} *21*; α(O)=2.31×10^{-6} *4*; α(P)=1.724×10^{-7} *25*
911.647 *13*	3.88 *16*	923.955	5/2$^+$	12.326	3/2$^+$	M1,E2	0.0027 *5*	ce(K)=1.9 *4*; α(K)exp=0.0022 *5* α(K)=0.0023 *4*; α(L)=0.00029 *5*; α(M)=6.1×10^{-5} *9*; α(N+..)=1.52×10^{-5} *22* α(N)=1.30×10^{-5} *19*; α(O)=2.0×10^{-6} *3*; α(P)=1.4×10^{-7} *3*
920.623 *24*	0.77 *4*	1211.792	3/2$^+$,5/2$^+$	291.186	5/2$^+$	M1	0.00302 *5*	ce(K)=0.51 *10*; α(K)exp=0.0029 *6* α(K)=0.00261 *4*; α(L)=0.000329 *5*; α(M)=6.75×10^{-5} *10*; α(N+..)=1.699×10^{-5} *24* α(N)=1.458×10^{-5} *21*; α(O)=2.24×10^{-6} *4*; α(P)=1.675×10^{-7} *24*
923.9@ *2*	0.90@ *5*	923.955	5/2$^+$	0.0	1/2$^+$			
932.98 *7*	0.51 *4*	1563.399	5/2$^+$	630.567	5/2$^+$	M1	0.00293 *5*	ce(K)=0.34 *9*; α(K)exp=0.0030 *8* α(K)=0.00253 *4*; α(L)=0.000319 *5*; α(M)=6.54×10^{-5} *10*; α(N+..)=1.646×10^{-5} *23* α(N)=1.413×10^{-5} *20*; α(O)=2.17×10^{-6} *3*; α(P)=1.623×10^{-7} *23* E_γ: poor fit: the level energy difference is equal to 932.831 *25*.
x981.06 *8*	0.23 *2*							
x992.99 *9*	0.25 *2*							
1009.31 *4*	2.80 *13*	1021.584	3/2$^+$	12.326	3/2$^+$	M1	0.00244 *4*	ce(K)=1.28 *13*; ce(L)=0.16 *4*; α(K)exp=0.0021 *2*; α(L)exp=0.00026 *7* α(K)=0.00211 *3*; α(L)=0.000265 *4*; α(M)=5.44×10^{-5} *8*; α(N+..)=1.369×10^{-5} *20* α(N)=1.175×10^{-5} *17*; α(O)=1.81×10^{-6} *3*; α(P)=1.352×10^{-7} *19*
1021.62 *5*	0.215 *15*	1021.584	3/2$^+$	0.0	1/2$^+$			
1038.18 *5*	0.27 *2*	1329.316	5/2$^+$	291.186	5/2$^+$	M1	0.00229 *4*	ce(K)=0.15 *4*; α(K)exp=0.0025 *7* α(K)=0.00198 *3*; α(L)=0.000248 *4*; α(M)=5.09×10^{-5} *8*; α(N+..)=1.282×10^{-5} *18* α(N)=1.100×10^{-5} *16*; α(O)=1.693×10^{-6} *24*; α(P)=1.266×10^{-7} *18*
1043.02 *4*	0.33 *3*	1620.56	5/2$^+$	577.553	7/2$^+$	M1	0.00227 *4*	ce(K)=0.16 *4*; α(K)exp=0.0022 *6* α(K)=0.00196 *3*; α(L)=0.000246 *4*; α(M)=5.04×10^{-5} *7*;

$^{133}_{56}Ba_{77}$-10

^{133}La ε decay (3.912 h) 1976He11,1980VyZZ (continued)

γ(^{133}Ba) (continued)

E_γ[‡]	I_γ[‡&]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[#]	α[†]	Comments
								α(N+..)=1.268×10^{-5} *18* α(N)=1.088×10^{-5} *16*; α(O)=1.674×10^{-6} *24*; α(P)=1.253×10^{-7} *18*
1061.56 *22*	3.38 *23*	1352.76	7/2$^+$	291.186	5/2$^+$	M1+E2	0.0019 *3*	ce(K)=1.09 *10*; ce(L)=0.22 *4*; α(K)exp=0.0015 *2*; α(L)exp=0.00029 *6* α(K)=0.0016 *3*; α(L)=0.00021 *3*; α(M)=4.2×10^{-5} *6*; α(N+..)=1.07×10^{-5} *16* α(N)=9.2×10^{-6} *13*; α(O)=1.40×10^{-6} *21*; α(P)=1.03×10^{-7} *18*
1080.9[@] *4*	0.13[@] *2*	1620.56	5/2$^+$	539.800	1/2$^+$			E_γ: 1081.04 *11* in 1980VyZZ.
1099.99 *2*	7.7 *4*	1112.344	3/2$^+$,5/2$^+$,7/2$^+$	12.326	3/2$^+$	E2	0.001477 *21*	ce(K)=2.4 *2*; ce(L)=0.26 *3*; ce(M)=0.11 *3* α(K)exp=0.0014 *2*; α(L)exp=0.00015 *2*; α(M)exp=0.00006 *2* α(K)=0.001270 *18*; α(L)=0.0001646 *23*; α(M)=3.38×10^{-5} *5*; α(N+..)=8.5×10^{-6} *4* α(N)=7.28×10^{-6} *11*; α(O)=1.109×10^{-6} *16*; α(P)=7.89×10^{-8} *11*
1111.9[@] *4*	0.09[@] *4*	1112.344	3/2$^+$,5/2$^+$,7/2$^+$	0.0	1/2$^+$			E_γ: this transition questionably populates the g.s. in 1976He11, the level energy difference = 1112.344 *12*.
1111.9[@] *4*	0.09[@] *4*	1689.74	3/2$^+$,5/2,7/2$^+$	577.553	7/2$^+$			E_γ: this transition questionably populates the 577.553-keV level (1976He11), the level energy difference = 1112.19 *6*.
[x]1175.98 *7*	0.19 *2*							
[x]1181.99 *13*	0.046 *13*							
[x]1192.3[@] *3*	0.006[@] *3*							
1199.447 *22*	0.83 *6*	1211.792	3/2$^+$,5/2$^+$	12.326	3/2$^+$	M1	0.001653 *24*	ce(K)=0.28 *3*; α(K)exp=0.0015 *2* α(K)=0.001423 *20*; α(L)=0.0001780 *25*; α(M)=3.65×10^{-5} *6*; α(N+..)=1.517×10^{-5} α(N)=7.88×10^{-6} *11*; α(O)=1.213×10^{-6} *17*; α(P)=9.09×10^{-8} *13*; α(IPF)=5.99×10^{-6} *9*
1211.760 *25*	1.76 *12*	1211.792	3/2$^+$,5/2$^+$	0.0	1/2$^+$	M1,E2	0.00142 *21*	ce(K)=0.9 *3*; α(K)exp=0.0022 *7* (1966Ha23) α(K)=0.00122 *18*; α(L)=0.000154 *21*; α(M)=3.2×10^{-5} *5*; α(N+..)=1.55×10^{-5} *10* α(N)=6.8×10^{-6} *9*; α(O)=1.04×10^{-6} *15*; α(P)=7.7×10^{-8} *13*; α(IPF)=7.58×10^{-6} *19*
[x]1219.2 *3*	0.09 *2*							
1230.06 *9*	0.16 *2*	1532.40	3/2,5/2,7/2$^+$	302.395	3/2$^+$			
1241.04 *15*	0.092 *16*	1532.40	3/2,5/2,7/2$^+$	291.186	5/2$^+$			
1261.01 *3*	0.98 *7*	1563.399	5/2$^+$	302.395	3/2$^+$			
1283.952 *24*	2.55 *17*	1283.959	3/2$^-$	0.0	1/2$^+$	(E1)	0.000555 *8*	α(K)=0.000419 *6*; α(L)=5.10×10^{-5} *8*; α(M)=1.041×10^{-5} *15*; α(N+..)=7.49×10^{-5} *11* α(N)=2.24×10^{-6} *4*; α(O)=3.44×10^{-7} *5*; α(P)=2.56×10^{-8} *4*;

$^{133}_{56}Ba_{77}$-11

^{133}La ε decay (3.912 h) 1976He11,1980VyZZ (continued)

γ(^{133}Ba) (continued)

E_γ ‡	I_γ ‡&	E_i(level)	J_i^π	E_f	J_f^π	Comments
						α(IPF)=7.22×10^{-5} *11* Mult.: this transition populates the 1/2$^+$, g.s.; in ^{132}Ba(pol d,p) L=1 for the 1283.9-keV state. Comparison of Iγ and ce for 1283.9- and 1199.5-keV (M1) transitions point at mult.=(E1) for the former.
1317.24[b] *5*	0.92 *7*	1329.316	5/2$^+$	12.326	3/2$^+$	E_γ: poor fit: the level energy difference is equal to 1316.973 *17*.
1329.33[a] *5*	0.34 *3*	1329.316	5/2$^+$	0.0	1/2$^+$	E_γ: other transition questionably populates the 291.186-keV level from the 1620.56-keV level (1976He11).
1329.33[a] *5*	0.34 *3*	1620.56	5/2$^+$	291.186	5/2$^+$	E_γ: questionable population in 1976He11, the level energy difference = 1329.38 *4*; other transition populates the g.s. from the 1329.3-keV level.
1340.2[@] *3*	0.18[@] *3*	1352.76	7/2$^+$	12.326	3/2$^+$	
1387.41 *7*	0.136 *15*	1689.74	3/2$^+$,5/2,7/2$^+$	302.395	3/2$^+$	
1398.49 *8*	0.19 *2*	1689.74	3/2$^+$,5/2,7/2$^+$	291.186	5/2$^+$	
1404.7[@] *4*	0.117[@] *17*	1706.94	3/2,5/2$^+$	302.395	3/2$^+$	
1415.9[@] *3*	0.158[@] *18*	1706.94	3/2,5/2$^+$	291.186	5/2$^+$	
1467.28 *13*	0.074 *10*	1769.70	3/2,5/2$^+$	302.395	3/2$^+$	
1478.72 *9*	0.069 *7*	1769.70	3/2,5/2$^+$	291.186	5/2$^+$	E_γ: poor fit: the level energy difference is equal to 1478.51 *5*.
1516.34 *20*	0.07 *2*	1528.64	3/2,5/2$^+$	12.326	3/2$^+$	
1528.62 *10*	0.15 *2*	1528.64	3/2,5/2$^+$	0.0	1/2$^+$	
[x]1540.01 *20*	0.06 *1*					
1550.97 *5*	0.41 *3*	1563.399	5/2$^+$	12.326	3/2$^+$	
1563.36 *6*	0.36 *3*	1563.399	5/2$^+$	0.0	1/2$^+$	
[x]1581.66 *12*	0.12 *2*					
[x]1592.33 *13*	0.030 *8*					
[x]1595.6[@b] *5*	0.3[@] *2*					
1608.35[@] *13*	1.67[@] *11*	1620.56	5/2$^+$	12.326	3/2$^+$	E_γ: the level energy difference is equal to 1608.24 *4*; 1608.09 *3* in 1980VyZZ.
1620.9[@] *7*	0.05[@] *2*	1620.56	5/2$^+$	0.0	1/2$^+$	
[x]1659.6[@] *5*	0.05[@] *2*					
1677.3[@] *3*	0.19[@] *3*	1689.74	3/2$^+$,5/2,7/2$^+$	12.326	3/2$^+$	E_γ: 1677.01 *9* in 1980VyZZ.
1694.4[@] *4*	0.178[@] *16*	1706.94	3/2,5/2$^+$	12.326	3/2$^+$	
1706.7[@] *4*	0.038[@] *10*	1706.94	3/2,5/2$^+$	0.0	1/2$^+$	
[x]1720.2[@] *2*	0.03[@] *2*					
1757.06 *20*	0.063 *10*	1769.70	3/2,5/2$^+$	12.326	3/2$^+$	
1769.60 *7*	0.25 *2*	1769.70	3/2,5/2$^+$	0.0	1/2$^+$	
[x]1782.9[@] *5*	0.05[@] *3*					
[x]1805.83 *10*	0.055 *6*					
1818.1[@] *4*	0.05[@] *1*	1830.22	3/2,5/2$^+$	12.326	3/2$^+$	

$^{133}_{56}Ba_{77}$-12

^{133}La ε decay (3.912 h) 1976He11,1980VyZZ (continued)

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

E_γ ‡	I_γ ‡&	E_i(level)	J_i^π	E_f	J_f^π
1830.21@ *3*	0.06@ *2*	1830.22	3/2,5/2$^+$	0.0	1/2$^+$
x1851.7@b *6*	0.02@ *1*				
x1886.7@b *4*	0.03@ *1*				

† Additional information 1.
‡ From 1980VyZZ, except as noted. Since some of the quoted uncertainties are unrealistically small, the evaluators added 3% in quadrature to the uncertainties of 1980VyZZ. There are systematic discrepancies between Iγ values measured by 1976He11 and 1980VyZZ.
# From α(K)exp, α(L)exp and α(M)exp. Ice are from 1983JoZX, except as noted; α(exp)=Ice/Iγ for 302.35γ (mult.=M1 in 1983JoZX, 1976He11) is normalized to α(K)=0.0408 by evaluators.
@ From 1976He11.
& For absolute intensity per 100 decays, multiply by 0.0244 *10*.
a Multiply placed.
b Placement of transition in the level scheme is uncertain.
x γ ray not placed in level scheme.

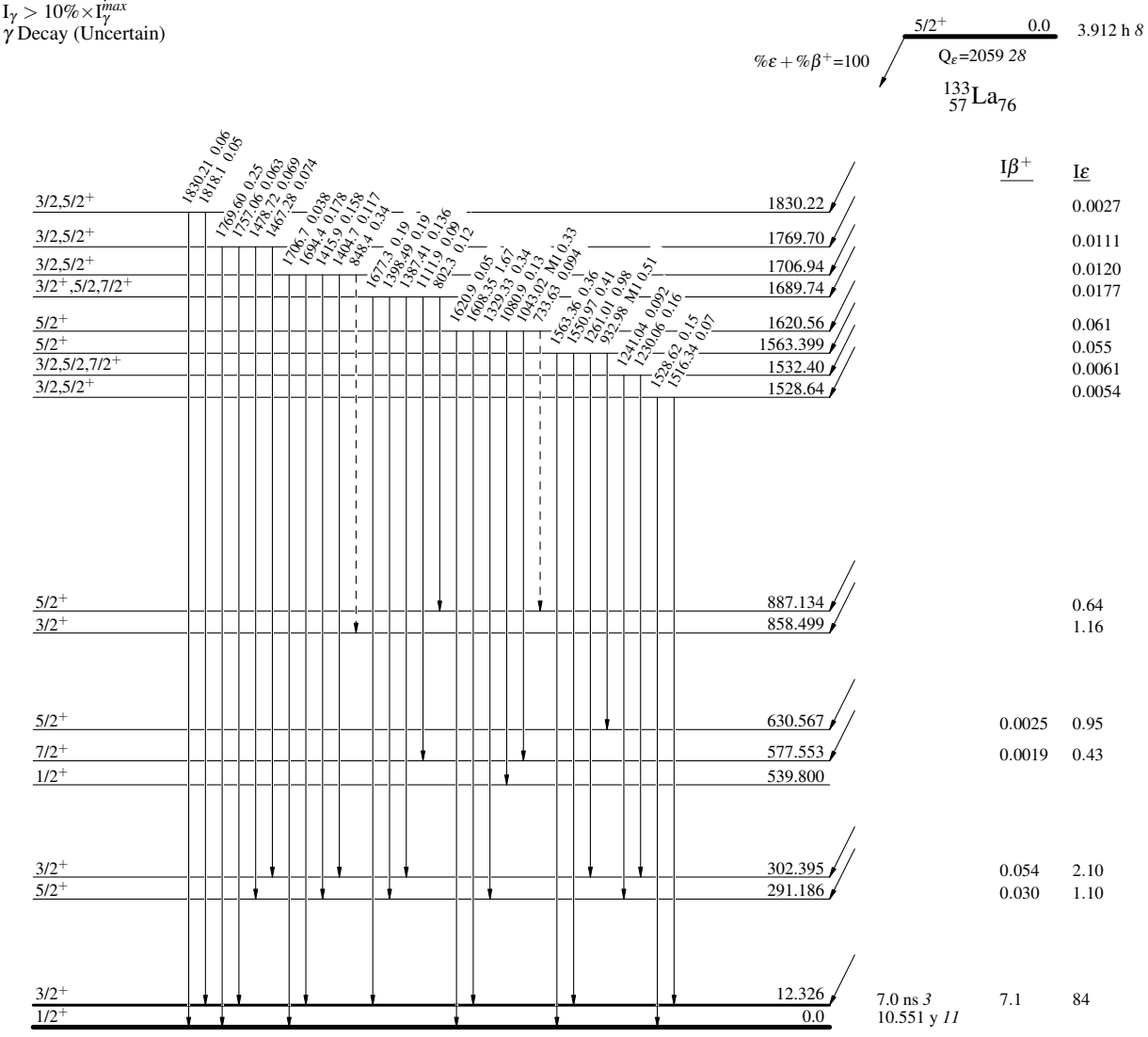
$^{133}_{56}Ba_{77}$-13

^{133}La ε decay (3.912 h) 1976He11,1980VyZZ

Decay Scheme

Intensities: Relative I_γ

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

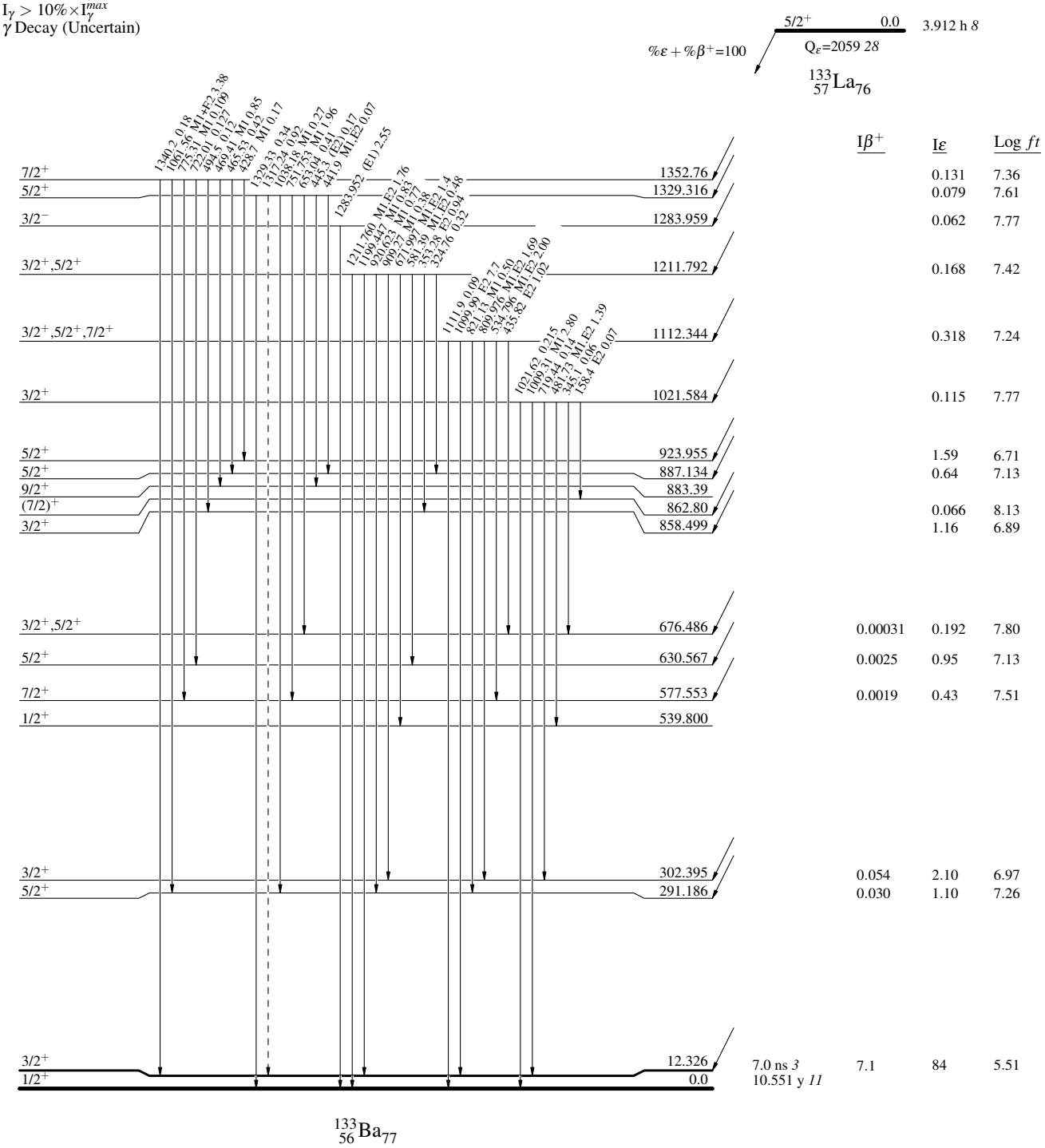


^{133}La ε decay (3.912 h) 1976He11,1980VyZZ

Decay Scheme (continued)

Intensities: Relative I_γ

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



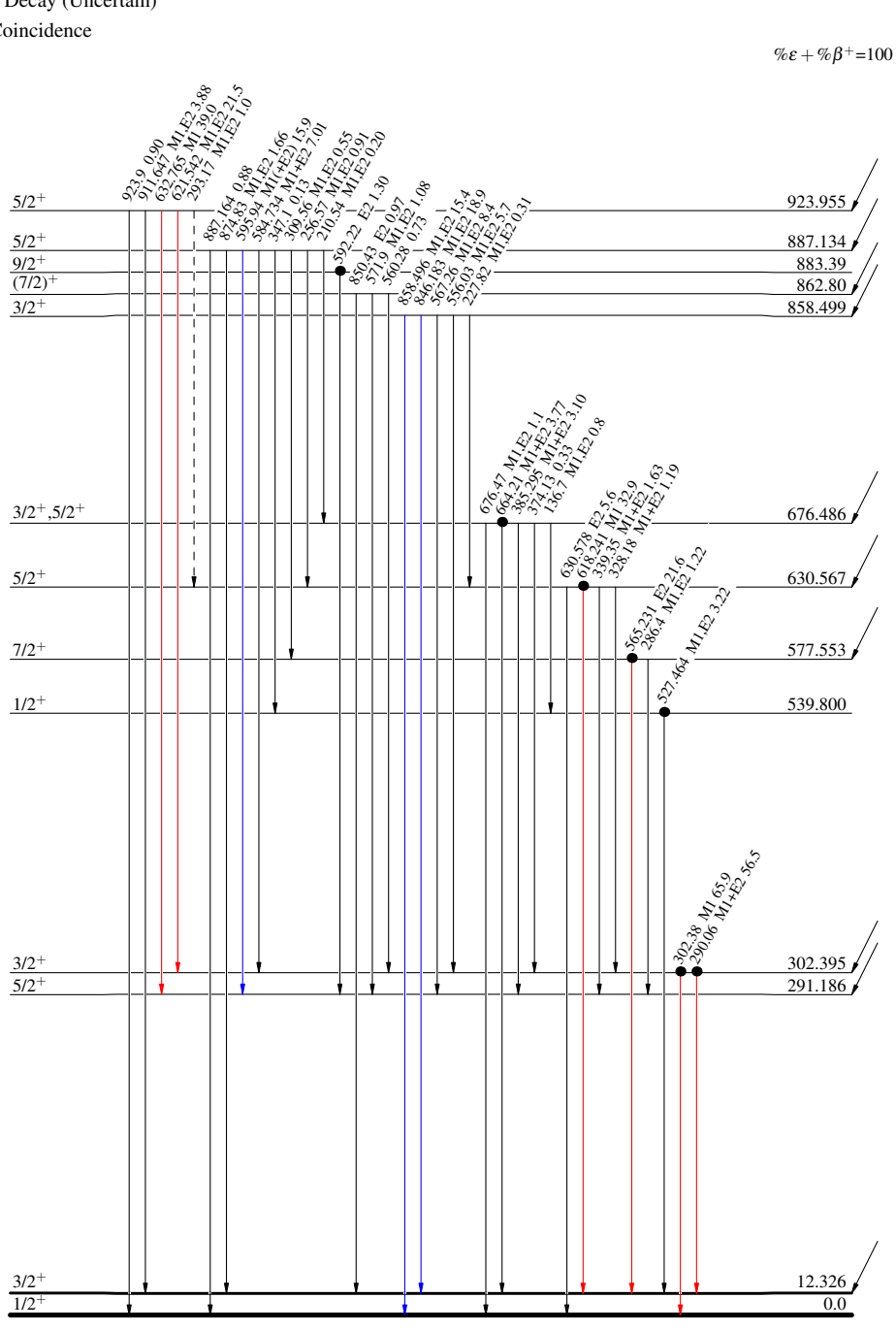
$^{133}_{56}Ba_{77}$

^{133}La ε decay (3.912 h) 1976He11,1980VyZZ

Decay Scheme (continued)

Intensities: Relative I_γ

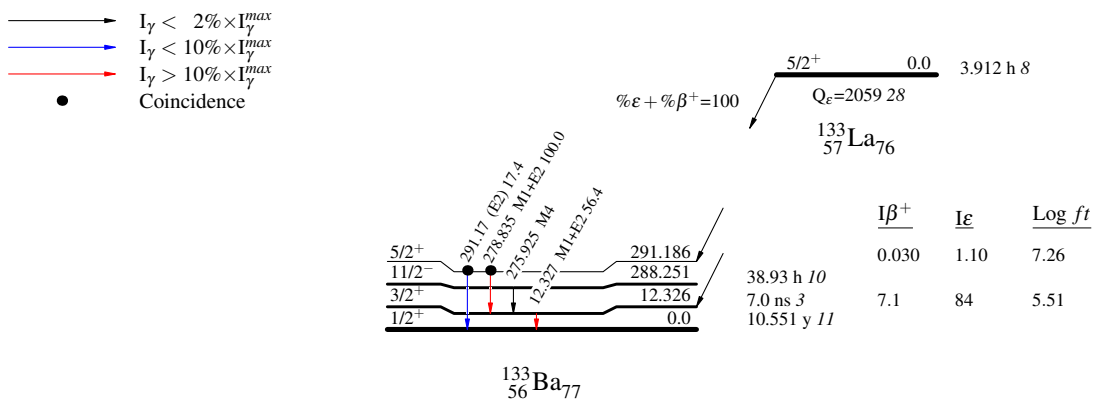
Legend
- $I_\gamma < 2\% \times I_\gamma^{max}$
- $I_\gamma < 10\% \times I_\gamma^{max}$
- $I_\gamma > 10\% \times I_\gamma^{max}$
- γ Decay (Uncertain)
- Coincidence



^{133}La ε decay (3.912 h) 1976He11,1980VyZZ

Decay Scheme (continued)

Intensities: Relative I_γ



	Iβ+	Iε	Log ft
	0.030	1.10	7.26
	7.1	84	5.51