^{177}Yb β^- decay 1995Ya21

Type	Author	History Citation	Literature Cutoff Date
Full Evaluation	F. G. Kondev	NDS 159, 1 (2019)	30-Aug-2019

Parent: ^{177}Yb: E=0.0; $J^\pi=9/2^+$; $T_{1/2}$=1.911 h *3*; Q(β^-)=1397.4 *12*; %β^- decay=100.0

1995Ya21: Source produced following neutron irradiation. Target: Yb_2O_3 powder, enriched to 97.8% in ^{176}Yb. Detectors: 31% and 33% HPGe detectors, 32% Ge(Li) detector and a planar HPGe detector, 4π gas flow β^- counter. Measured: γ-ray singles, $\gamma\gamma$ coin, Eγ, Iγ, $\gamma\gamma(\theta)$, β^- decay branch to the ^{177}Lu g.s.

Other: 1949Mc41, 1955De18, 1956Mi47, 1963Li05, 1964Ew04, 1964Jo03, 1965Sc01, 1966He01, 1970Br38, 1972Ag05, 1972Be85, 1974Iv02, 1974Kr12, 1979Be54.

^{177}Lu Levels

E(level)†	J^π‡	$T_{1/2}$‡	Comments
0.0#	7/2+	6.6443 d *9*	
121.6214# *4*	9/2+	0.117 ns *4*	$T_{1/2}$: Others: 0.116 ns *8* (1965Sc01), 0.118 ns *5* (1979Be54) and 0.26 ns *3* (1963Li05).
150.3986@ *10*	9/2−	133.1 ns *24*	$T_{1/2}$: Others: 130 ns *20* (1949Mc41), 122 ns *5* (1955De18) and 94 ns *14* (1974Iv02).
268.7850# *5*	11/2+		
289.0142@ *13*	11/2−		
440.6426# *6*	13/2+		
451.5141@ *13*	13/2−		
457.9584& *16*	5/2+	≤0.45 ns	
552.0993& *16*	7/2+		
671.9444& *16*	9/2+		
1049.44[a] *6*	9/2−		
1149.97 *13*	7/2+		J^π: From $\gamma\gamma(\theta)$ in 1995Ya21.
1165.71 *12*	9/2−,11/2		
1230.620[b] *18*	11/2+	60 ps *15*	$T_{1/2}$: From $\beta\gamma(\Delta t)$ in 1979Be54.
1236.37 *12*	7/2+		
1241.50 *21*	7/2+	25 ps *8*	J^π: From $\gamma\gamma(\theta)$ in 1995Ya21. $T_{1/2}$: From $\beta\gamma(\Delta t)$ in 1979Be54.
1337.16[c] *16*	7/2+		

† From least-squares fit to Eγ.
‡ From Adopted Levels. Additional details are given with some levels.
# $K^\pi=7/2^+$, π7/2[404].
@ $K^\pi=9/2^-$, π9/2[514].
& $K^\pi=5/2^+$, π5/2[402].
[a] $K^\pi=9/2^-$, $\pi(7/2[404])\otimes\nu^2(7/2[514],9/2[624])$.
[b] $K^\pi=11/2^+$, $\pi(9/2[514])\otimes\nu^2(7/2[514],9/2[624])$.
[c] $K^\pi=7/2^+$, $\pi(9/2[514])\otimes\nu^2(7/2[514],9/2[624])$.

^{177}Yb β^- decay 1995Ya21 (continued)

β^- radiations

E(decay)	E(level)	Iβ^-[†][‡]	Log *ft*	Comments
(60.2 *12*)	1337.16	0.044 *3*	5.12 *4*	av Eβ=15.44 *32*
(155.9 *12*)	1241.50	3.60 *17*	4.474 *24*	av Eβ=41.65 *35*
(161.0 *12*)	1236.37	0.065 *5*	6.26 *4*	av Eβ=43.11 *35*
(166.8 *12*)	1230.620	6.6 *3*	4.302 *22*	av Eβ=44.75 *35*
(231.7 *12*)	1165.71	0.033 *4*	7.05 *6*	av Eβ=63.75 *36*
(247.4 *12*)	1149.97	1.17 *5*	5.594 *20*	av Eβ=68.48 *37*
(348.0 *12*)	1049.44	0.68 *3*	6.306 *20*	av Eβ=99.74 *39*
(725.5 *12*)	671.9444	0.016 *8*	9.00 *22*	av Eβ=230.38 *45*
(845.3 *12*)	552.0993	0.012 *10*	9.4 *4*	av Eβ=275.31 *46*
(939.4 *12*)	457.9584	≤0.018	≥9.3	av Eβ=311.47 *47*
(945.9 *12*)	451.5141	≤0.021	≥9.8[1*u*]	av Eβ=319.83 *45*
(956.8 *12*)	440.6426	≤0.004	≥10.0	av Eβ=318.17 *47*
(1108.4 *12*)	289.0142	1.86 *21*	7.59 *5*	av Eβ=378.02 *48*
(1128.6 *12*)	268.7850	0.46 *7*	8.23 *7*	av Eβ=386.12 *49*
(1247.0 *12*)	150.3986	18.5 *17*	6.78 *4*	av Eβ=434.01 *49*
(1275.8 *12*)	121.6214	7.5 *6*	7.21 *4*	av Eβ=445.76 *50*
(1397.4 *12*)	0.0	59.4 *5*	6.460 *4*	av Eβ=495.89 *50*

E(decay): 1400 keV *20* (1964Jo03). Other: 1955De18, 1956Mi47.
Iβ^-: From 1995Ya21.

[†] From intensity balances, unless otherwise stated.
[‡] Absolute intensity per 100 decays.

$\gamma(^{177}Lu)$

Iγ normalization: From Σ I(γ+ce)[to ^{177}Lu g.s.]=100−%Iβ−(g.s.), where the direct feeding to the ^{177}Lu g.s., %Iβ-(g.s.)=59.4% 5 (1995Ya21). Others: 0.044 *5* from Ice(121γ)=5.25% (1964Jo03) and α=2.00 *4*; 0.039 *5* from Ice(150γ)=7.0% (1964Jo03) and α=0.512 *32*; and 0.044 *5* from Ice(138γ)=1.5% (1964Jo03) and α=1.43 *3*.

E_γ[†]	I_γ[†@]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[‡]	δ[‡]	α[#]	Comments
94.140[‡] *4*	0.08 *2*	552.0993	7/2$^+$	457.9584	5/2$^+$	M1		4.37	%Iγ=0.0041 *10* α(K)=3.65 *6*; α(L)=0.565 *8*; α(M)=0.1270 *18* α(N)=0.0300 *5*; α(O)=0.00445 *7*; α(P)=0.000274 *4* E_γ: 94.4 *3* (1995Ya21).
119.845[‡] *1*	0.08 *5*	671.9444	9/2$^+$	552.0993	7/2$^+$	M1+E2	0.34 *22*	2.14 *8*	%Iγ=0.0041 *25* α(K)=1.71 *16*; α(L)=0.33 *7*; α(M)=0.077 *18* α(N)=0.018 *4*; α(O)=0.0026 *5*; α(P)=0.000126 *14* E_γ: 119.7 *1* (1995Ya21).
121.6211[‡] *5*	60 *3*	121.6214	9/2$^+$	0.0	7/2$^+$	M1+E2	+0.51 *5*	2.00 *4*	%Iγ=3.05 *20* α(K)=1.52 *5*; α(L)=0.367 *16*; α(M)=0.086 *5* α(N)=0.0201 *10*; α(O)=0.00275 *11*; α(P)=0.000111 *4* E_γ: 121.6 *1* (1995Ya21). I_γ: Weighted average of 59 *4* (1995Ya21) and 62 *6* (1970Br38). Mult.: Others: (K/L1)exp=3.6 *3*, (K/L2)exp=7.2 *6* and (K/L3)exp=10.8 *12* (1972Ag05); (K/L)exp=4.5 *6* and ((L1+L2))/L3)exp=4.5 *6* (1964Jo03).
138.616[‡] *1*	24.1 *15*	289.0142	11/2$^-$	150.3986	9/2$^-$	M1+E2	+0.23 *8*	1.43 *3*	%Iγ=1.22 *9* α(K)=1.17 *4*; α(L)=0.197 *9*; α(M)=0.0448 *24* α(N)=0.0106 *6*; α(O)=0.00154 *6*; α(P)=8.7×10^{-5} *3* E_γ: 138.6 *1* (1995Ya21). I_γ: Weighted average of 24 *2* (1995Ya21) and 24.2 *24* (1970Br38). Mult.: Others: α(K)exp=1.17 *16*, α(L1)exp=0.20 *3*, α(L2)exp=0.028 *8*, and α(L3)exp=0.014 *7* (1972Ag05); (K/L)exp=5 *1* (1964Jo03); $\delta(\gamma\gamma(\theta))$=0.18 *4* (1995Ya21) and +0.28 *6* (1973Il02).
147.1637[‡] *5*	3.2 *6*	268.7850	11/2$^+$	121.6214	9/2$^+$	M1+E2	+0.59 *7*	1.114 *25*	%Iγ=0.163 *31* α(K)=0.86 *4*; α(L)=0.198 *8*; α(M)=0.0463 *21* α(N)=0.0108 *5*; α(O)=0.00149 *5*; α(P)=6.2×10^{-5} *3* E_γ: 147.3 *1* (1995Ya21). I_γ: Weighted average of 3.1 *7* (1995Ya21) and 3.3 *10* (1970Br38). Mult.: Others: α(K)exp=1.22 *54* (1972Ag05); $\delta(\gamma\gamma(\theta))$=0.58 *+13−15* (1995Ya21).
150.399[‡] *1*	354 *19*	150.3986	9/2$^-$	0.0	7/2$^+$	E1		0.512 *32*	%Iγ=18.0 *12*

$^{177}_{71}Lu_{106}$-3

$\gamma(^{177}Lu)$ (continued)

E_γ †	I_γ †@	E_i(level)	J_i^π	E_f	J_f^π	Mult.‡	δ‡	α#	Comments
									α(K)=0.0998 *14*; α(L)=0.01575 *22*; α(M)=0.00354 *5* α(N)=0.000823 *12*; α(O)=0.0001151 *17*; α(P)=5.69×10^{-6} *8* E_γ: 150.3 *1* (1995Ya21). I_γ: Weighted average of 347 *24* (1995Ya21) and 364 *30* (1970Br38). Mult.: Others: α(K)exp=0.383 *30*; α(L1)exp=0.088 *8*; α(L2)exp=0.036 *5*; α(L3)exp=0.0046 *12* (1972Ag05); L1/L3=27 *7*, L2/L3=10 *3* (1966He01); anomalous E1 transition. α: Experimental value of α_{tot}=0.512 *32* (1972Ag05).
162.500‡ *1*	1.1 *1*	451.5141	13/2$^-$	289.0142	11/2$^-$	M1+E2	0.33 *13*	0.89 *3*	%Iγ=0.056 *6* α(K)=0.73 *4*; α(L)=0.127 *7*; α(M)=0.0290 *19* α(N)=0.0068 *5*; α(O)=0.00098 *5*; α(P)=5.4×10^{-5} *4* E_γ: 162.5 *1* (1995Ya21).
171.8574‡ *6*	0.037 *18*	440.6426	13/2$^+$	268.7850	11/2$^+$	M1+E2	+0.47 *21*	0.73 *5*	%Iγ=0.0019 *9* α(K)=0.59 *6*; α(L)=0.112 *9*; α(M)=0.0258 *23* α(N)=0.0061 *6*; α(O)=0.00086 *5*; α(P)=4.3×10^{-5} *5* E_γ: 171.5 *4* (1995Ya21). I_γ: From Iγ(171γ)/Iγ(319γ)=0.457 *7* in adopted gammas and Iγ(319γ)=0.08 *4* from 1995Ya21.
213.986‡ *3*	0.010 *6*	671.9444	9/2$^+$	457.9584	5/2$^+$	[E2]		0.222	%Iγ=0.00051 *31* α(K)=0.1375 *20*; α(L)=0.0647 *9*; α(M)=0.01572 *22* α(N)=0.00363 *5*; α(O)=0.000461 *7*; α(P)=8.04×10^{-6} *12* E_γ: 214.2 *3* (1995Ya21). I_γ: From Iγ(552.102γ)/Iγ(119.845γ)=0.125 *20* in adopted gammas and Iγ(119.845γ)=0.08 *5* from 1995Ya21.
231.262‡ *13*	0.0005 *3*	671.9444	9/2$^+$	440.6426	13/2$^+$	[E2]		0.1724	%Iγ=2.5×10^{-5} *15* α(K)=0.1106 *16*; α(L)=0.0473 *7*; α(M)=0.01146 *16* α(N)=0.00265 *4*; α(O)=0.000339 *5*; α(P)=6.58×10^{-6} *10* I_γ: From Iγ(552.102γ)/Iγ(119.845γ)=0.0057 *19* in adopted gammas and Iγ(119.845γ)=0.08 *5* from 1995Ya21.
268.7847‡ *6*	3.1 *2*	268.7850	11/2$^+$	0.0	7/2$^+$	E2		0.1071	%Iγ=0.157 *12* α(K)=0.0728 *11*; α(L)=0.0263 *4*; α(M)=0.00633 *9* α(N)=0.001467 *21*; α(O)=0.000190 *3*; α(P)=4.47×10^{-6} *7* E_γ: 268.7 *1* (1995Ya21).
283.33‡ *3*	0.00018 *18*	552.0993	7/2$^+$	268.7850	11/2$^+$	[E2]		0.0910	%Iγ=9.E−6 *9* α(K)=0.0629 *9*; α(L)=0.0216 *3*; α(M)=0.00517 *8* α(N)=0.001199 *17*; α(O)=0.0001562 *22*; α(P)=3.91×10^{-6} *6* I_γ: From Iγ(283.33γ)/Iγ(94.14γ)=0.0022 *22* in adopted gammas and Iγ(94.14γ)=0.08 *2* from 1995Ya21.
301.115‡ *1*	0.127 *22*	451.5141	13/2$^-$	150.3986	9/2$^-$	E2		0.0757	%Iγ=0.0065 *11* α(K)=0.0533 *8*; α(L)=0.01719 *24*; α(M)=0.00411 *6* α(N)=0.000954 *14*; α(O)=0.0001250 *18*; α(P)=3.35×10^{-6} *5*

$^{177}_{71}Lu_{106}$-4

^{177}Yb β^- decay 1995Ya21 (continued)

$\gamma(^{177}Lu)$ (continued)

E_γ [†]	I_γ [†@]	E_i(level)	J_i^π	E_f	J_f^π	Mult. [‡]	δ [‡]	α [#]	Comments
									E_γ: 300.5 *5* (1995Ya21). I_γ: From Iγ(300γ)/Iγ(162γ)=0.116 *17* in adopted gammas and Iγ(162γ)=1.1 *1* from 1995Ya21.
319.0210‡ *6*	0.08 *4*	440.6426	13/2$^+$	121.6214	9/2$^+$	E2		0.0637	%Iγ=0.0041 *20* α(K)=0.0456 *7*; α(L)=0.01393 *20*; α(M)=0.00332 *5* α(N)=0.000771 *11*; α(O)=0.0001016 *15*; α(P)=2.90×10^{-6} *4* E_γ: 319.1 *1* (1995Ya21).
336.335‡ *2*	0.0141 *21*	457.9584	5/2$^+$	121.6214	9/2$^+$	E2		0.0546	%Iγ=0.00072 *11* α(K)=0.0396 *6*; α(L)=0.01153 *17*; α(M)=0.00274 *4* α(N)=0.000637 *9*; α(O)=8.44×10^{-5} *12*; α(P)=2.54×10^{-6} *4* E_γ: 336.6 *3* (1995Ya21). I_γ: From Iγ(336.3γ)/Iγ(457.96γ)=0.0193 *27* in adopted gammas and Iγ(456.96γ)=0.73 *3* from 1995Ya21.
382.939‡ *7*	0.0008 *6*	671.9444	9/2$^+$	289.0142	11/2$^-$	[E1]		0.01153	%Iγ=4.1×10^{-5} *31* α(K)=0.00970 *14*; α(L)=0.001421 *20*; α(M)=0.000317 *5* α(N)=7.44×10^{-5} *11*; α(O)=1.078×10^{-5} *15*; α(P)=6.13×10^{-7} *9* I_γ: From Iγ(552.102γ)/Iγ(119.845γ)=0.010 *4* in adopted gammas and Iγ(119.845γ)=0.08 *5* from 1995Ya21.
401.721‡ *9*	0.0015 *6*	552.0993	7/2$^+$	150.3986	9/2$^-$	[E1]		0.01032	%Iγ=7.6×10^{-5} *31* α(K)=0.00869 *13*; α(L)=0.001269 *18*; α(M)=0.000283 *4* α(N)=6.64×10^{-5} *10*; α(O)=9.63×10^{-6} *14*; α(P)=5.51×10^{-7} *8* I_γ: From Iγ(401.721γ)/Iγ(94.14γ)=0.019 *5* in adopted gammas and Iγ(94.14γ)=0.08 *2* from 1995Ya21.
403.222‡ *11*	0.0016 *11*	671.9444	9/2$^+$	268.7850	11/2$^+$	[M1]		0.0778	%Iγ=8.E−5 *6* α(K)=0.0652 *10*; α(L)=0.00979 *14*; α(M)=0.00220 *3* α(N)=0.000519 *8*; α(O)=7.71×10^{-5} *11*; α(P)=4.81×10^{-6} *7* I_γ: From Iγ(552.102γ)/Iγ(119.845γ)=0.020 *4* in adopted gammas and Iγ(119.845γ)=0.08 *5* from 1995Ya21.
430.473‡ *3*	0.0048 *15*	552.0993	7/2$^+$	121.6214	9/2$^+$	M1(+E2)	≤1.1	0.055 *11*	%Iγ=0.00024 *8* α(K)=0.046 *10*; α(L)=0.0073 *9*; α(M)=0.00166 *19* α(N)=0.00039 *5*; α(O)=5.7×10^{-5} *8*; α(P)=3.3×10^{-6} *8* E_γ: 430.5 *3* (1995Ya21). I_γ: From Iγ(430.473γ)/Iγ(94.14γ)=0.061 *12* in adopted gammas and Iγ(94.14γ)=0.08 *2* from 1995Ya21.
457.964‡ *4*	0.73 *3*	457.9584	5/2$^+$	0.0	7/2$^+$	M1(+E2)	≤0.6	0.051 *5*	%Iγ=0.0371 *22* α(K)=0.043 *4*; α(L)=0.0066 *4*; α(M)=0.00149 *9* α(N)=0.000351 *20*; α(O)=5.2×10^{-5} *4*; α(P)=3.1×10^{-6} *3* E_γ: 458.0 *1* (1995Ya21).
550.318‡ *3*	0.0380 *24*	671.9444	9/2$^+$	121.6214	9/2$^+$	M1+E2	1.3 *6*	0.022 *6*	%Iγ=0.00193 *15* α(K)=0.018 *6*; α(L)=0.0031 *6*; α(M)=0.00070 *13*

$^{177}_{71}Lu_{106}$-5

^{177}Yb β^- decay 1995Ya21 (continued)

$\gamma(^{177}Lu)$ (continued)

E_γ[†]	I_γ[†@]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[‡]	δ[‡]	α[#]	Comments
									α(N)=0.00017 *3*; α(O)=2.4×10^{-5} *5*; α(P)=1.3×10^{-6} *4* E_γ: 549.9 *4* (1995Ya21). I_γ: From Iγ(552.102γ)/Iγ(119.845γ)=0.48 *7* in adopted gammas and Iγ(119.845γ)=0.08 *5* from 1995Ya21.
552.102[‡] *4*	0.059 *17*	552.0993	7/2$^+$	0.0	7/2$^+$	M1+E2	1.8 *5*	0.019 *3*	%Iγ=0.0030 *9* α(K)=0.0156 *24*; α(L)=0.0028 *3*; α(M)=0.00064 *6* α(N)=0.000150 *14*; α(O)=2.15×10^{-5} *22*; α(P)=1.09×10^{-6} *19* E_γ: 552.0 *1* (1995Ya21). I_γ: From Iγ(552.102γ)/Iγ(94.14γ)=0.74 *11* in adopted gammas and Iγ(94.14γ)=0.08 *2* from 1995Ya21.
671.944[‡] *8*	0.0131 *9*	671.9444	9/2$^+$	0.0	7/2$^+$	M1(+E2)	≤0.3	0.0203 *6*	%Iγ=0.00067 *5* α(K)=0.0171 *5*; α(L)=0.00253 *7*; α(M)=0.000567 *14* α(N)=0.000134 *4*; α(O)=1.99×10^{-5} *5*; α(P)=1.25×10^{-6} *4* I_γ: From Iγ(552.102γ)/Iγ(119.845γ)=0.164 *25* in adopted gammas and Iγ(119.845γ)=0.08 *5* from 1995Ya21.
691.9 *2*	0.06 *3*	1149.97	7/2$^+$	457.9584	5/2$^+$	[M1]		0.0193	%Iγ=0.0030 *15* α(K)=0.01626 *23*; α(L)=0.00240 *4*; α(M)=0.000537 *8* α(N)=0.0001268 *18*; α(O)=1.89×10^{-5} *3*; α(P)=1.186×10^{-6} *17*
714.2 *2*	0.10 *3*	1165.71	9/2$^-$,11/2	451.5141	13/2$^-$				%Iγ=0.0051 *15*
760.5 *1*	1.07 *8*	1049.44	9/2$^-$	289.0142	11/2$^-$	M1+E2	0.55 *+111−4*	0.013 *5*	%Iγ=0.054 *5* α(K)=0.011 *4*; α(L)=0.0017 *5*; α(M)=0.00038 *10* α(N)=8.9×10^{-5} *24*; α(O)=1.3×10^{-5} *4*; α(P)=8.E−7 *3* I_γ: Weighted average of 1.1 *1* (1995Ya21) and 1.00 *14* (1970Br38). δ: From $\gamma\gamma(\theta)$ in 1995Ya21.
779.3 *2*	1.93 *10*	1230.620	11/2$^+$	451.5141	13/2$^-$	[E1]		0.00252	%Iγ=0.098 *6* α(K)=0.00213 *3*; α(L)=0.000299 *5*; α(M)=6.64×10^{-5} *10* α(N)=1.562×10^{-5} *22*; α(O)=2.30×10^{-6} *4*; α(P)=1.396×10^{-7} *20* I_γ: Weighted average of 1.9 *1* (1995Ya21) and 2.2 *3* (1970Br38).
783.3 *3*	0.04 *2*	1241.50	7/2$^+$	457.9584	5/2$^+$	[M1+E2]		0.01416	%Iγ=0.0020 *10* α(K)=0.01191 *17*; α(L)=0.001749 *25*; α(M)=0.000391 *6* α(N)=9.24×10^{-5} *13*; α(O)=1.376×10^{-5} *20*; α(P)=8.67×10^{-7} *13*

$^{177}_{71}Lu_{106}$-6

$\gamma(^{177}Lu)$ (continued)

E_γ[†]	I_γ[†@]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[‡]	δ[‡]	α[#]	Comments
790.3 *2*	0.15 *5*	1230.620	11/2$^+$	440.6426	13/2$^+$	[M1+E2]		0.01385	%Iγ=0.0076 *26* α(K)=0.01165 *17*; α(L)=0.001710 *24*; α(M)=0.000383 *6* α(N)=9.04×10^{-5} *13*; α(O)=1.345×10^{-5} *19*; α(P)=8.48×10^{-7} *12*
876.8 *2*	0.38 *4*	1165.71	9/2$^-$,11/2	289.0142	11/2$^-$				%Iγ=0.0193 *22*
881.3[&] *2*	<0.04	1149.97	7/2$^+$	268.7850	11/2$^+$	[E2]		0.00505	%Iγ=0.00203 *8* α(K)=0.00416 *6*; α(L)=0.000692 *10*; α(M)=0.0001570 *22* α(N)=3.69×10^{-5} *6*; α(O)=5.31×10^{-6} *8*; α(P)=2.87×10^{-7} *4*
899.2 *1*	11.8 *4*	1049.44	9/2$^-$	150.3986	9/2$^-$	E2(+M1)		0.01004	%Iγ=0.599 *32* α(K)=0.00845 *12*; α(L)=0.001235 *18*; α(M)=0.000276 *4* α(N)=6.52×10^{-5} *10*; α(O)=9.71×10^{-6} *14*; α(P)=6.14×10^{-7} *9* I_γ: Weighted average of 11.8 *5* (1995Ya21) and 11.7 *8* (1970Br38). Mult.: From α(K)exp (1964Ew04).
941.8 *1*	18.3 *5*	1230.620	11/2$^+$	289.0142	11/2$^-$	E1		1.75×10^{-3}	%Iγ=0.93 *5* α(K)=0.001486 *21*; α(L)=0.000206 *3*; α(M)=4.57×10^{-5} *7* α(N)=1.077×10^{-5} *15*; α(O)=1.589×10^{-6} *23*; α(P)=9.78×10^{-8} *14* Mult.: From α(K)exp (1964Ew04).
962.0 *5*	0.32 *2*	1230.620	11/2$^+$	268.7850	11/2$^+$	M1(+E2)		0.00849	%Iγ=0.0163 *12* α(K)=0.00715 *10*; α(L)=0.001043 *15*; α(M)=0.000233 *4* α(N)=5.51×10^{-5} *8*; α(O)=8.20×10^{-6} *12*; α(P)=5.19×10^{-7} *8* I_γ: Other: 0.35 *10* (1970Br38).
967.3 *2*	0.55 *6*	1236.37	7/2$^+$	268.7850	11/2$^+$	[E2]		0.00417	%Iγ=0.0279 *33* α(K)=0.00345 *5*; α(L)=0.000557 *8*; α(M)=0.0001261 *18* α(N)=2.96×10^{-5} *5*; α(O)=4.29×10^{-6} *6*; α(P)=2.38×10^{-7} *4* I_γ: Other: 0.6 *1* (1970Br38).
973.1[&] *2*	<0.04	1241.50	7/2$^+$	268.7850	11/2$^+$	[E2]		0.00412	%Iγ=0.00203 *8* α(K)=0.00341 *5*; α(L)=0.000550 *8*; α(M)=0.0001244 *18* α(N)=2.92×10^{-5} *4*; α(O)=4.24×10^{-6} *6*; α(P)=2.35×10^{-7} *4*
1015.2 *2*	0.16 *3*	1165.71	9/2$^-$,11/2	150.3986	9/2$^-$				%Iγ=0.0081 *16*

$^{177}_{71}Lu_{106}$-7

$\gamma(^{177}Lu)$ (continued)

E_γ[†]	I_γ[†@]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[‡]	δ[‡]	α[#]	Comments
1028.3 *3*	11.2 *4*	1149.97	$7/2^+$	121.6214	$9/2^+$	M1+E2	−0.10 *4*	0.00717 *11*	%Iγ=0.569 *31* α(K)=0.00604 *9*; α(L)=0.000879 *13*; α(M)=0.000197 *3* α(N)=4.64×10^{-5} *7*; α(O)=6.92×10^{-6} *11*; α(P)=4.37×10^{-7} *7* I_γ: Weighted average of 11.1 *4* (1995Ya21) and 11.5 *8* (1970Br38). δ: From γγ(θ) in 1995Ya21 and α(K)exp (1964Ew04).
1049.2 *1*	0.3 *1*	1049.44	$9/2^-$	0.0	$7/2^+$	[E1]		1.43×10^{-3}	%Iγ=0.015 *5* α(K)=0.001218 *17*; α(L)=0.0001680 *24*; α(M)=3.73×10^{-5} *6* α(N)=8.77×10^{-6} *13*; α(O)=1.297×10^{-6} *19*; α(P)=8.03×10^{-8} *12*
1068.3 *3*	0.15 *3*	1337.16	$7/2^+$	268.7850	$11/2^+$	[E2]		0.00341	%Iγ=0.0076 *16* α(K)=0.00283 *4*; α(L)=0.000446 *7*; α(M)=0.0001006 *15* α(N)=2.37×10^{-5} *4*; α(O)=3.44×10^{-6} *5*; α(P)=1.96×10^{-7} *3*
1080.204[‡] *18*	100 *3*	1230.620	$11/2^+$	150.3986	$9/2^-$	E1		1.36×10^{-3}	%Iγ=5.08 *26* α(K)=0.001155 *17*; α(L)=0.0001591 *23*; α(M)=3.53×10^{-5} *5* α(N)=8.31×10^{-6} *12*; α(O)=1.229×10^{-6} *18*; α(P)=7.62×10^{-8} *11* Mult.: α(K)exp>0.0009 (1964Jo03); α(K)exp (1964Ew04).
1109.2 *2*	3.5 *1*	1230.620	$11/2^+$	121.6214	$9/2^+$	M1+E2	0.7 *+6−2*	0.0051 *9*	%Iγ=0.178 *9* α(K)=0.0043 *8*; α(L)=0.00063 *10*; α(M)=0.000140 *22* α(N)=3.3×10^{-5} *5*; α(O)=4.9×10^{-6} *8*; α(P)=3.0×10^{-7} *6*; α(IPF)=4.0×10^{-7} *4* I_γ: Other: 3.2 *3* (1970Br38). δ: From γγ(θ) in 1995Ya21.
1114.6 *2*	0.06 *3*	1236.37	$7/2^+$	121.6214	$9/2^+$	[M1+E2]		0.00591	%Iγ=0.0030 *15* α(K)=0.00499 *7*; α(L)=0.000723 *11*; α(M)=0.0001616 *23* α(N)=3.82×10^{-5} *6*; α(O)=5.69×10^{-6} *8*; α(P)=3.60×10^{-7} *5*; α(IPF)=5.35×10^{-7} *9*
1120.0 *4*	10.1 *3*	1241.50	$7/2^+$	121.6214	$9/2^+$	M1+E2	−0.07 *3*	0.00583	%Iγ=0.513 *26* α(K)=0.00492 *7*; α(L)=0.000713 *11*; α(M)=0.0001593 *23*

$^{177}_{71}Lu_{106}$-8

^{177}Yb β^- decay 1995Ya21 (continued)

$\gamma(^{177}Lu)$ (continued)

E_γ [†]	I_γ [†@]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[‡]	α[#]	Comments
								α(N)=3.76×10^{-5} *6*; α(O)=5.61×10^{-6} *8*; α(P)=3.55×10^{-7} *5*; α(IPF)=6.56×10^{-7} *14* I_γ: Other: 9.9 *7* (1970Br38). δ: From $\gamma\gamma(\theta)$ in 1995Ya21.
1150.1 *2*	11.7 *4*	1149.97	7/2$^+$	0.0	7/2$^+$	[M1+E2]	0.00548	%Iγ=0.594 *32* α(K)=0.00462 *7*; α(L)=0.000669 *10*; α(M)=0.0001495 *21* α(N)=3.53×10^{-5} *5*; α(O)=5.26×10^{-6} *8*; α(P)=3.34×10^{-7} *5*; α(IPF)=1.81×10^{-6} *3*
1215.4 *6*	0.49 *3*	1337.16	7/2$^+$	121.6214	9/2$^+$	M1(+E2)	0.00480	%Iγ=0.0249 *18* α(K)=0.00404 *6*; α(L)=0.000584 *9*; α(M)=0.0001305 *19* α(N)=3.08×10^{-5} *5*; α(O)=4.59×10^{-6} *7*; α(P)=2.92×10^{-7} *4*; α(IPF)=8.37×10^{-6} *15* I_γ: Other: 0.50 *7* (1970Br38).
1231.0 *3*	6.1 *2*	1230.620	11/2$^+$	0.0	7/2$^+$	E2	0.00258	%Iγ=0.310 *16* α(K)=0.00215 *3*; α(L)=0.000329 *5*; α(M)=7.38×10^{-5} *11* α(N)=1.738×10^{-5} *25*; α(O)=2.54×10^{-6} *4*; α(P)=1.486×10^{-7} *21*; α(IPF)=8.27×10^{-6} *13* I_γ: Other: 6.7 *6* (1970Br38). Mult.: α(K)exp=0.0021 (1964Jo03).
1236.8 *2*	0.66 *6*	1236.37	7/2$^+$	0.0	7/2$^+$	[M1+E2]	0.00460	%Iγ=0.0335 *33* α(K)=0.00387 *6*; α(L)=0.000560 *8*; α(M)=0.0001250 *18* α(N)=2.95×10^{-5} *5*; α(O)=4.40×10^{-6} *7*; α(P)=2.79×10^{-7} *4*; α(IPF)=1.166×10^{-5} *17*
1241.8 *4*	60.4 *24*	1241.50	7/2$^+$	0.0	7/2$^+$	E2+M1	0.00456	%Iγ=3.07 *18* α(K)=0.00383 *6*; α(L)=0.000554 *8*; α(M)=0.0001237 *18* α(N)=2.92×10^{-5} *4*; α(O)=4.36×10^{-6} *7*; α(P)=2.77×10^{-7} *4*; α(IPF)=1.248×10^{-5} *19* I_γ: Weighted average of 60 *3* (1995Ya21) and 61 *4* (1970Br38). Mult.: From α(K)exp (1964Ew04).
1337.2 *2*	0.22 *1*	1337.16	7/2$^+$	0.0	7/2$^+$	M1(+E2)	0.00383	%Iγ=0.0112 *7* α(K)=0.00320 *5*; α(L)=0.000462 *7*; α(M)=0.0001032 *15* α(N)=2.44×10^{-5} *4*; α(O)=3.63×10^{-6} *5*; α(P)=2.31×10^{-7} *4*; α(IPF)=3.29×10^{-5} *5* I_γ: Other: 0.24 *4* (1970Br38).

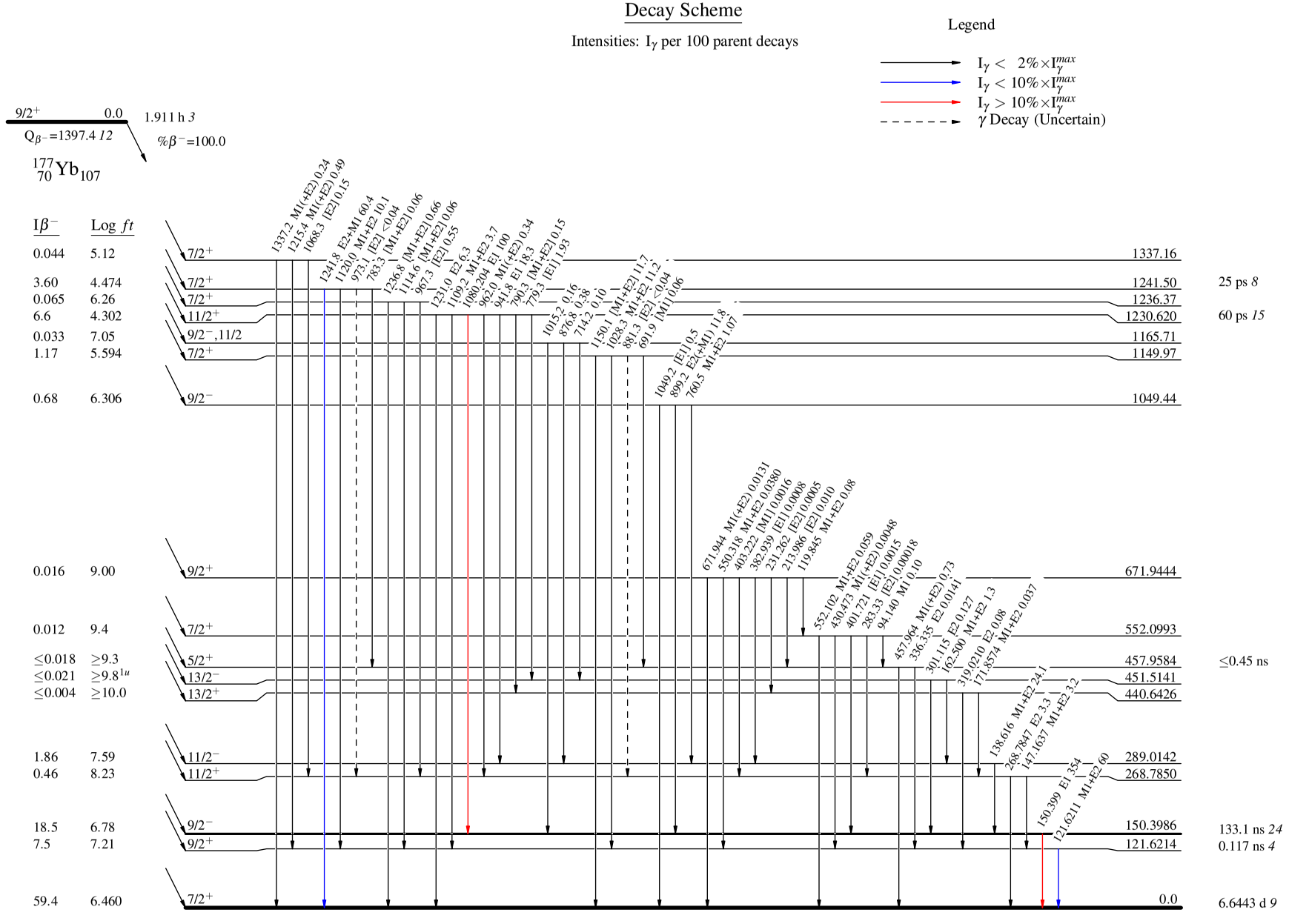
† From 1995Ya21, unless otherwise stated.
‡ From adopted gammas. Multipolarities given in brackets are from the assigned J^π in the decay scheme.
# Additional information 1.
@ For absolute intensity per 100 decays, multiply by 0.0508 *21*.
& Placement of transition in the level scheme is uncertain.

$^{177}_{71}Lu_{106}$-9

^{177}Yb β^- decay 1995Ya21

Decay Scheme

Intensities: I_γ per 100 parent decays



$^{177}_{71}Lu_{106}$-10