^{201}Pb ε decay 1979Do09

History			
Type	Author	Citation	Literature Cutoff Date
Full Evaluation	F. G. Kondev	NDS 187,355 (2023)	20-Sep-2022

Parent: ^{201}Pb: E=0.0; J^π=5/2$^-$; $T_{1/2}$=9.33 h *5*; Q(ε)=1910 *19*; %ε+%$β^+$ decay=100

1979Do09: ^{201}Pb source produced using ^{203}Tl(p,3n) reaction; E(p)=27 MeV; Target: natural thallium; Detectors: Ge(Li) and NaI; Compton suppressed; Measured: Eγ, Iγ, γ singles, γγ coin; Deduced: α(K)exp, α(L)exp, subshell ratios, J^π, $T_{1/2}$, level scheme.

Others: 1974Ha18, 1971Hn04, 1970DoZT, 1964Aa01, 1961Pe05, 1960Li08.

^{201}Tl Levels

E(level)†	J^π‡	$T_{1/2}$	Comments
0.0	1/2$^+$	3.0420 d *16*	$T_{1/2}$: From Adopted Levels.
331.17 *3*	3/2$^+$	70 ps *20*	$T_{1/2}$: From 360ce-331ce(Δt) in 1960Li08.
692.52 *4*	5/2$^+$		
1098.50 *4*	5/2$^+$		
1134.86 *6*	7/2$^+$		
1157.43 *4*	3/2$^+$,5/2$^+$		
1238.83 *5*	3/2$^+$		
1277.12 *4*	3/2$^+$,5/2$^+$		
1290.12 *7*	(9/2)$^+$		
1330.42 *5*	3/2$^+$,5/2$^+$		
1401.26 *5*	3/2$^+$,5/2$^+$		
1420.04 *7*	7/2$^+$		
1445.87 *6*	(5/2)$^+$		
1479.85 *4*	5/2$^+$		
1550.58? *15*	1/2,3/2,5/2$^+$		
1575.1 *10*	(7/2)$^+$		
1617.46 *15*	1/2,3/2,5/2$^+$		
1639.36 *4*	3/2$^+$,5/2$^+$		
1671.96 *5*	3/2$^+$,5/2$^+$		
1712.4? *3*	3/2,5/2,7/2$^+$		
1755.33 *7*	3/2,5/2$^+$		

† From a least-squares fit to Eγ.

‡ From Adopted Levels, unless otherwise stated.

ε,$β^+$ radiations

E(decay)	E(level)	Iε†‡	Log *ft*	Comments
(155 *19*)	1755.33	0.176 *14*	6.68 *20*	εK=0.51 *9*; εL=0.36 *7*; εM+=0.13 *3*
(198# *19*)	1712.4?	0.034 *8*	7.73 *17*	εK=0.62 *4*; εL=0.28 *3*; εM+=0.102 *11*
(238 *19*)	1671.96	1.01 *8*	6.50 *11*	εK=0.668 *21*; εL=0.245 *15*; εM+=0.087 *6*
(271 *19*)	1639.36	1.43 *19*	6.50 *11*	εK=0.694 *14*; εL=0.227 *10*; εM+=0.080 *4*
(293 *19*)	1617.46	0.088 *6*	7.80 *9*	εK=0.707 *11*; εL=0.217 *8*; εM+=0.076 *4*
(335 *19*)	1575.1	≈0.13	≈7.8	εK=0.725 *8*; εL=0.204 *6*; εM+=0.0706 *22*
(359# *19*)	1550.58?	0.028 *3*	8.52 *8*	εK=0.733 *7*; εL=0.199 *5*; εM+=0.0682 *18*
(430 *19*)	1479.85	2.66 *18*	6.73 *6*	εK=0.750 *4*; εL=0.187 *3*; εM+=0.0634 *11*
(464 *19*)	1445.87	0.35 *3*	7.69 *6*	εK=0.756 *4*; εL=0.1823 *23*; εM+=0.0617 *9*
(490 *19*)	1420.04	1.56 *16*	7.10 *6*	εK=0.760 *3*; εL=0.1796 *20*; εM+=0.0606 *8*
(509 *19*)	1401.26	2.36 *16*	6.96 *5*	εK=0.762 *3*; εL=0.1778 *18*; εM+=0.0599 *8*
(580 *19*)	1330.42	1.02 *8*	7.45 *5*	εK=0.7699 *19*; εL=0.1724 *13*; εM+=0.0577 *6*
(620 *19*)	1290.12	0.14 *14*	8.5[1u] *5*	εK=0.713 *5*; εL=0.213 *4*; εM+=0.0746 *14*
(633 *19*)	1277.12	12.3 *9*	6.46 *5*	εK=0.7744 *15*; εL=0.1692 *11*; εM+=0.0564 *5*
(671 *19*)	1238.83	7.4 *6*	6.73 *5*	εK=0.7771 *13*; εL=0.1673 *10*; εM+=0.0557 *4*

Continued on next page (footnotes at end of table)

^{201}Pb ε decay 1979Do09 (continued)

ε,β+ radiations (continued)

E(decay)	E(level)	Iβ+ ‡	Iε†‡	Log *ft*	I(ε+β+)‡	Comments
(753 *19*)	1157.43		≈3.2	≈7.2		εK=0.7818 *10*; εL=0.1639 *7*; εM+=0.0544 *3*
(775 *19*)	1134.86		0.66 *16*	7.92 *11*		εK=0.7829 *10*; εL=0.1631 *7*; εM+=0.0540 *3*
(812 *19*)	1098.50		≈6.2	≈7.0		εK=0.7845 *9*; εL=0.1619 *6*; εM+=0.05358 *24*
(1218 *19*)	692.52		6.2 *8*	7.37 *6*		εK=0.7955 *4*; εL=0.15399 *25*; εM+=0.05046 *10*
(1579 *19*)	331.17	0.057 *11*	52 *6*	6.69 *6*	52 *6*	av Eβ=272.2 *85*; εK=0.7994; εL=0.15040 *16*; εM+=0.04907 *7*
(1910 *19*)	0.0	0.0009 *5*	0.7 *4*	9.84[1u] *25*	0.7 *4*	av Eβ=429.4 *82*; εK=0.7882 *2*; εL=0.15830 *23*; εM+=0.05222 *9* I(ε+β+): From I(ε+β+)<1.4% in 1979Do09 and by assuming uniform probability distribution.

† From intensity balances and the decay scheme, unless otherwise stated.
‡ Absolute intensity per 100 decays.
# Existence of this branch is questionable.

γ(^{201}Tl)

Iγ normalization: Deduced using Σ(I(γ+ce)[g.s. ^{201}Tl])=100 − Iβ$_0$, with Iβ$_0$=0.7% *4*.

E_γ [†]	I_γ [‡c]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[#]	α[b]	Comments
58.92 *5*	≈4.9	1157.43	3/2$^+$,5/2$^+$	1098.50	5/2$^+$	[M1]	7.37 *10*	%Iγ≈0.0846 α(L)=5.64 *8*; α(M)=1.320 *19* α(N)=0.333 *5*; α(O)=0.0647 *9*; α(P)=0.00611 *9* %Iγ≈0.083 E_γ: From 1964Aa01. I_γ: From I(ce(L)) of 1964Aa01 and assumption that Mult=M1.
120.0 *2*	1.2 *3*	1277.12	3/2$^+$,5/2$^+$	1157.43	3/2$^+$,5/2$^+$	[M1,E2]	3.9 *12*	%Iγ=0.021 *5* α(K)=2.3 *18*; α(L)=1.2 *5*; α(M)=0.31 *14* α(N)=0.077 *35*; α(O)=0.014 *6*; α(P)=0.00071 *6*
124.2 *2*	2.5 *5*	1401.26	3/2$^+$,5/2$^+$	1277.12	3/2$^+$,5/2$^+$	[M1,E2]	3.5 *11*	%Iγ=0.043 *9* α(K)=2.1 *17*; α(L)=1.1 *4*; α(M)=0.27 *12* α(N)=0.067 *29*; α(O)=0.012 *5*; α(P)=0.00063 *7*
129.95 *10*	6.4 *6*	1420.04	7/2$^+$	1290.12	(9/2)$^+$	[M1,E2]	3.0 *10*	%Iγ=0.110 *12* α(K)=1.9 *14*; α(L)=0.88 *31*; α(M)=0.22 *9* α(N)=0.056 *22*; α(O)=0.0100 *35*; α(P)=0.00054 *8*
155.31 *10*	8.2 *10*	1290.12	(9/2)$^+$	1134.86	7/2$^+$	[M1,E2]	1.7 *7*	%Iγ=0.142 *19* α(K)=1.2 *9*; α(L)=0.44 *10*; α(M)=0.110 *30* α(N)=0.028 *7*; α(O)=0.0050 *11*; α(P)=0.00030 *7*
202.79 *10*	4.0 *5*	1479.85	5/2$^+$	1277.12	3/2$^+$,5/2$^+$	[M1,E2]	0.8 *4*	%Iγ=0.069 *9* α(K)=0.6 *4*; α(L)=0.165 *5*; α(M)=0.0407 *32* α(N)=0.0102 *8*; α(O)=0.00188 *5*; α(P)=1.3×10^{-4} *5*
231.87 *10*	6.5 *8*	1330.42	3/2$^+$,5/2$^+$	1098.50	5/2$^+$	[M1,E2]	0.52 *27*	%Iγ=0.112 *15* α(K)=0.39 *27*; α(L)=0.104 *7*; α(M)=0.0254 *5* α(N)=0.00640 *15*; α(O)=0.00119 *8*; α(P)=8.5×10^{-5} *35*
241.02 *8*	10.0 *10*	1479.85	5/2$^+$	1238.83	3/2$^+$	[M1,E2]	0.47 *25*	%Iγ=0.173 *19* α(K)=0.35 *24*; α(L)=0.091 *8*; α(M)=0.0223 *10* α(N)=0.00561 *26*; α(O)=0.00104 *10*; α(P)=7.5×10^{-5} *32*
285.0[a] *10*	≈5.2[a]	1575.1	(7/2)$^+$	1290.12	(9/2)$^+$	(M1)[a]	0.451 *8*	%Iγ≈0.0898 α(K)=0.370 *6*; α(L)=0.0625 *11*; α(M)=0.01458 *25* α(N)=0.00368 *6*; α(O)=0.000715 *12*; α(P)=6.76×10^{-5} *12*
285.18[a] *13*	≈5.2[a]	1420.04	7/2$^+$	1134.86	7/2$^+$	[M1,E2][a]	0.29 *16*	%Iγ≈0.088 %Iγ≈0.0898 α(K)=0.22 *15*; α(L)=0.053 *10*; α(M)=0.0127 *18* α(N)=0.0032 *5*; α(O)=0.00060 *11*; α(P)=4.6×10^{-5} *22*
302.7[&] *4*	0.65 *15*	1401.26	3/2$^+$,5/2$^+$	1098.50	5/2$^+$	[M1,E2]	0.25 *14*	%Iγ≈0.088 %Iγ=0.0112 *27* α(K)=0.19 *13*; α(L)=0.043 *9*; α(M)=0.0105 *18* α(N)=0.0026 *5*; α(O)=0.00050 *11*; α(P)=3.9×10^{-5} *19*

^{201}Pb ε decay 1979Do09 (continued)

γ(^{201}Tl) (continued)

E_γ †	I_γ ‡ c	E_i(level)	J_i^π	E_f	J_f^π	Mult. #	δ @	α b	Comments
308.93 *15*	2.3 *3*	1639.36	3/2$^+$,5/2$^+$	1330.42	3/2$^+$,5/2$^+$	(M1)		0.362 *5*	%Iγ=0.040 *6* α(K)=0.297 *4*; α(L)=0.0500 *7*; α(M)=0.01168 *16* α(N)=0.00295 *4*; α(O)=0.000573 *8*; α(P)=5.42×10^{-5} *8* Mult.: ce(K)=3.0 *5* (1964Aa01); α(K)exp=0.67 *15* (1979Do09). Note that α(K)exp is larger than that expected from theory and one may expect E0 admixtures; α(K)exp=0.37 *13* (1971Hn04).
322.42 *15*	4.4 *6*	1479.85	5/2$^+$	1157.43	3/2$^+$,5/2$^+$	[M1,E2]		0.21 *12*	%Iγ=0.076 *11* α(K)=0.16 *11*; α(L)=0.036 *9*; α(M)=0.0086 *18* α(N)=0.0022 *5*; α(O)=0.00041 *10*; α(P)=3.2×10^{-5} *16*
331.15 *6*	455×10^1 *25*	331.17	3/2$^+$	0.0	1/2$^+$	M1+E2	+1.33 *6*	0.161 *5*	%Iγ=78.5 *6* α(K)=0.121 *5*; α(L)=0.0305 *6*; α(M)=0.00743 *13* α(N)=0.001870 *32*; α(O)=0.000348 *6*; α(P)=2.59×10^{-5} *7* Mult.: α(K)exp=0.1069 *21*, α(L3)exp=0.00365 *12*, K/L=3.76 *6* (1974Ha18) ce(K)=1000, K/L=3.9 *3*, L12/L3=7.1 *9* (1964Aa01); α(K)exp=0.113 *8* (1961Pe05); K/L12=4.2 *2*, L12/L3=6.5 *5* (1960Li08); γγ(θ) in 1961Pe05; α(K)exp=0.113 *8* (1979Do09), normalized value adopted by the authors from the data of 1961Pe05; α(K)exp=0.111 *16* (1971Hn04). δ: From 1974Ha18, by taking into account the penetration effect and using λ=+4.0 *10*.
341.51 *8*	6.8 *8*	1671.96	3/2$^+$,5/2$^+$	1330.42	3/2$^+$,5/2$^+$	[M1,E2]		0.18 *10*	%Iγ=0.117 *15* α(K)=0.14 *9*; α(L)=0.030 *8*; α(M)=0.0072 *17* α(N)=0.0018 *4*; α(O)=3.4×10^{-4} *9*; α(P)=2.7×10^{-5} *14*
344.95 *7*	18.3 *15*	1479.85	5/2$^+$	1134.86	7/2$^+$	M1(+E2)	<0.6	0.243 *26*	%Iγ=0.316 *30* α(K)=0.197 *23*; α(L)=0.0349 *22*; α(M)=0.0082 *5* α(N)=0.00207 *12*; α(O)=0.000399 *25*; α(P)=3.7×10^{-5} *4* Mult.: ce(K)=7.4 *15* (1964Aa01); α(K)exp=0.21 *11* (1979Do09); α(K)exp=0.23 *6* (1971Hn04).
361.25 *6*	560 *30*	692.52	5/2$^+$	331.17	3/2$^+$	M1+E2	0.14 *7*	0.234 *5*	%Iγ=9.7 *7* α(K)=0.191 *4*; α(L)=0.0324 *6*; α(M)=0.00755 *13* α(N)=0.001907 *32*; α(O)=0.000370 *7*; α(P)=3.49×10^{-5} *7* Mult.: α(K)exp=0.193 *4*, α(L3)exp=0.00029 *7* (1974Ha18); ce(K)=240 *10*, K/L=5.9 *6*, L12/L3=7.1 *9* (1964Aa01); α(K)exp=0.210 *25* and γγ(θ) (1961Pe05); α(K)exp=0.22 *2* (1979Do09). δ: From 1974Ha18, by taking into account the penetration effect and using λ=+0.5 *5*.
381.29 *8*	12.9 *7*	1479.85	5/2$^+$	1098.50	5/2$^+$	M1(+E2)	<0.5	0.190 *15*	%Iγ=0.223 *17*

$^{201}_{81}Tl_{120}$-4

^{201}Pb ε decay 1979Do09 (continued)

γ(^{201}Tl) (continued)

E_γ †	I_γ ‡ c	E_i(level)	J_i^π	E_f	J_f^π	Mult. #	δ @	α b	Comments
									α(K)=0.155 *13*; α(L)=0.0269 *14*; α(M)=0.00629 *30* α(N)=0.00159 *8*; α(O)=0.000307 *16*; α(P)=2.85×10^{-5} *21*
394.86 *9*	10.8 *7*	1671.96	3/2$^+$,5/2$^+$	1277.12	3/2$^+$,5/2$^+$	M1(+E2)	<0.4	0.177 *10*	Mult.: ce(K)=4.2 *7* (1964Aa01); α(K)exp=0.17 *3* (1979Do09); α(K)exp=0.16 *4* (1971Hn04). %Iγ=0.186 *15* α(K)=0.145 *8*; α(L)=0.0248 *9*; α(M)=0.00579 *20* α(N)=0.00146 *5*; α(O)=0.000283 *11*; α(P)=2.65×10^{-5} *14*
405.96 *7*	120 *6*	1098.50	5/2$^+$	692.52	5/2$^+$	M1(+E2)	<0.4	0.164 *9*	Mult.: ce(K)=3.6 *10* (1964Aa01); α(K)exp=0.17 *5* (1979Do09); α(K)exp=0.22 *7* (1971Hn04). %Iγ=2.07 *15* α(K)=0.134 *8*; α(L)=0.0230 *9*; α(M)=0.00537 *19* α(N)=0.00136 *5*; α(O)=0.000263 *10*; α(P)=2.46×10^{-5} *13*
464.90 *8*	19.8 *10*	1157.43	3/2$^+$,5/2$^+$	692.52	5/2$^+$	[M1+E2]		0.08 *4*	Mult.: ce(K)=33 *3* (1964Aa01); α(K)exp=0.14 *2* (1979Do09); α(K)exp=0.15 *3* (1971Hn04). %Iγ=0.342 *24* α(K)=0.06 *4*; α(L)=0.012 *4*; α(M)=0.0029 *10* α(N)=7.2×10^{-4} *25*; α(O)=1.4×10^{-4} *5*; α(P)=1.2×10^{-5} *6*
481.98 *9*	3.2 *6*	1639.36	3/2$^+$,5/2$^+$	1157.43	3/2$^+$,5/2$^+$	[M1+E2]		0.07 *4*	%Iγ=0.055 *11* α(K)=0.056 *34*; α(L)=0.011 *4*; α(M)=0.0026 *9* α(N)=6.5×10^{-4} *23*; α(O)=1.2×10^{-4} *5*; α(P)=1.1×10^{-5} *6*
514.38 *9*	9.1 *20*	1671.96	3/2$^+$,5/2$^+$	1157.43	3/2$^+$,5/2$^+$	[M1+E2]		0.059 *33*	%Iγ=0.157 *35* α(K)=0.047 *28*; α(L)=0.0091 *35*; α(M)=0.0022 *8* α(N)=5.4×10^{-4} *20*; α(O)=1.0×10^{-4} *4*; α(P)=9.E−6 *5*
540.90 *9*	16.2 *10*	1639.36	3/2$^+$,5/2$^+$	1098.50	5/2$^+$	[M1+E2]		0.052 *29*	%Iγ=0.280 *22* α(K)=0.042 *25*; α(L)=0.0079 *31*; α(M)=0.0019 *7* α(N)=4.7×10^{-4} *18*; α(O)=9.E−5 *4*; α(P)=8.E−6 *4*
546.28 *9*	16.5 *10*	1238.83	3/2$^+$	692.52	5/2$^+$	M1+E2	0.31 *24*	0.074 *8*	%Iγ=0.285 *23* α(K)=0.061 *7*; α(L)=0.0102 *9*; α(M)=0.00238 *20* α(N)=0.00060 *5*; α(O)=0.000117 *10*; α(P)=1.10×10^{-5} *12*
x562.81 & *10*	1.8 *4*								Mult.: ce(K)=1.9 *2* (1964Aa01); α(K)exp=0.059 *8* (1979Do09); α(K)exp=0.065 *14* (1971Hn04). %Iγ=0.031 *7*
584.60 *8*	211 *10*	1277.12	3/2$^+$,5/2$^+$	692.52	5/2$^+$	M1(+E2)	<0.5	0.061 *5*	%Iγ=3.64 *25* α(K)=0.050 *4*; α(L)=0.0085 *5*; α(M)=0.00198 *12* α(N)=0.000499 *30*; α(O)=9.7×10^{-5} *6*; α(P)=9.1×10^{-6} *7* Mult.: ce(K)=21 *2* (1964Aa01); α(K)exp=0.051 *6* (1979Do09); α(K)exp=0.06 *1* and γγ(θ) (1961Pe05); α(K)exp=0.049 *10* (1971Hn04).

$^{201}_{81}Tl_{120}$-5

γ(^{201}Tl) (continued)

E_γ [†]	I_γ [‡ c]	E_i(level)	J_i^π	E_f	J_f^π	Mult. [#]	δ [@]	α [b]	Comments
597.60 *9*	19.0 *10*	1290.12	$(9/2)^+$	692.52	$5/2^+$	E2		0.01856 *26*	%Iγ=0.328 *24* α(K)=0.01385 *19*; α(L)=0.00357 *5*; α(M)=0.000872 *12* α(N)=0.0002194 *31*; α(O)=4.07×10^{-5} *6*; α(P)=2.97×10^{-6} *4* Mult.: ce(K)=0.6 *2* (1964Aa01); α(K)exp=0.016 *6* (1979Do09); α(K)exp=0.017 *5* (1971Hn04).
637.90 *9*	21.7 *10*	1330.42	$3/2^+$,$5/2^+$	692.52	$5/2^+$	[M1+E2]		0.034 *18*	%Iγ=0.375 *26* α(K)=0.028 *16*; α(L)=0.0051 *21*; α(M)=0.0012 *5* α(N)=3.0×10^{-4} *12*; α(O)=5.8×10^{-5} *24*; α(P)=5.1×10^{-6} *26*
692.41 *8*	254 *12*	692.52	$5/2^+$	0.0	$1/2^+$	E2		0.01342 *19*	%Iγ=4.38 *30* α(K)=0.01029 *14*; α(L)=0.002385 *33*; α(M)=0.000577 *8* α(N)=0.0001451 *20*; α(O)=2.71×10^{-5} *4*; α(P)=2.089×10^{-6} *29* Mult.: ce(K)=5.0 *5* (1964Aa01); α(K)exp=0.010 *1* (1979Do09); α(K)exp=0.017 *5* (1971Hn04).
708.75 *9*	46.2 *20*	1401.26	$3/2^+$,$5/2^+$	692.52	$5/2^+$	M1		0.0399 *6*	%Iγ=0.80 *5* α(K)=0.0329 *5*; α(L)=0.00541 *8*; α(M)=0.001259 *18* α(N)=0.000318 *4*; α(O)=6.18×10^{-5} *9*; α(P)=5.87×10^{-6} *8* Mult.: ce(K)=4.0 *5* (1964Aa01); α(K)exp=0.044 *7* (1979Do09); α(K)exp=0.049 *10* (1971Hn04).
727.50 *9*	7.1 *7*	1420.04	$7/2^+$	692.52	$5/2^+$	[M1+E2]		0.025 *13*	%Iγ=0.123 *14* α(K)=0.020 *11*; α(L)=0.0036 *15*; α(M)=8.4×10^{-4} *34* α(N)=2.1×10^{-4} *8*; α(O)=4.1×10^{-5} *17*; α(P)=3.7×10^{-6} *18*
753.35 *9*	8.8 *8*	1445.87	$(5/2)^+$	692.52	$5/2^+$	(E0+M1)			%Iγ=0.152 *16* Mult.: ce(K)=1.5 *2* (1964Aa01); α(K)exp=0.087 *16* (1979Do09).
767.26 *8*	194 *10*	1098.50	$5/2^+$	331.17	$3/2^+$	M1+E2	0.33 *19*	0.0304 *25*	%Iγ=3.35 *24* α(K)=0.0250 *21*; α(L)=0.00415 *30*; α(M)=0.00097 *7* α(N)=0.000244 *17*; α(O)=4.73×10^{-5} *34*; α(P)=4.5×10^{-6} *4* Mult.: ce(K)=9 *1* (1964Aa01); α(K)exp=0.024 *3* (1979Do09); α(K)exp=0.026 *3* (1971Hn04).
787.29 *10*	34 *4*	1479.85	$5/2^+$	692.52	$5/2^+$	[M1+E2]		0.020 *10*	%Iγ=0.59 *8* α(K)=0.017 *9*; α(L)=0.0029 *12*; α(M)=6.8×10^{-4} *27* α(N)=1.7×10^{-4} *7*; α(O)=3.3×10^{-5} *14*; α(P)=3.0×10^{-6} *15*
803.66 *7*	90 *6*	1134.86	$7/2^+$	331.17	$3/2^+$	E2		0.00982 *14*	%Iγ=1.55 *13* α(K)=0.00768 *11*; α(L)=0.001627 *23*; α(M)=0.000390 *5* α(N)=9.81×10^{-5} *14*; α(O)=1.850×10^{-5} *26*; α(P)=1.490×10^{-6} *21* Mult.: ce(K)=1.3 *2* (1964Aa01); α(K)exp=0.0074 *16* (1979Do09); α(K)exp=0.0079 *16* (1971Hn04).
826.26 *8*	141 *7*	1157.43	$3/2^+$,$5/2^+$	331.17	$3/2^+$	M1+E2	1.98 *+43−29*	0.0129 *10*	%Iγ=2.43 *17*

$^{201}_{81}Tl_{120}$-6

γ(^{201}Tl) (continued)

E_γ [†]	I_γ [‡c]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[#]	δ[@]	α[b]	Comments
									α(K)=0.0103 *8*; α(L)=0.00195 *12*; α(M)=0.000461 *28* α(N)=0.000116 *7*; α(O)=2.22×10^{-5} *14*; α(P)=1.92×10^{-6} *15*
907.67 *8*	362 *20*	1238.83	3/2$^+$	331.17	3/2$^+$	M1+E2	0.43 *+23−34*	0.0190 *20*	Mult.: ce(K)=2.8 *3* (1964Aa01); α(K)exp=0.010 *1* (1979Do09); α(K)exp=0.0110 *15* (1971Hn04). %Iγ=6.2 *5* α(K)=0.0156 *17*; α(L)=0.00259 *24*; α(M)=0.00060 *6* α(N)=0.000152 *14*; α(O)=2.95×10^{-5} *28*; α(P)=2.78×10^{-6} *29*
945.96 *8*	424 *30*	1277.12	3/2$^+$,5/2$^+$	331.17	3/2$^+$	M1(+E2)	<0.6	0.0174 *16*	Mult.: ce(K)=10.7 *10* (1964Aa01); α(K)exp=0.015 *2* (1979Do09); α(K)exp=0.017 *3* (1971Hn04). %Iγ=7.3 *6* α(K)=0.0143 *13*; α(L)=0.00236 *20*; α(M)=0.00055 *4* α(N)=0.000139 *11*; α(O)=2.69×10^{-5} *22*; α(P)=2.55×10^{-6} *23*
946.78 *4*	28 *10*	1639.36	3/2$^+$,5/2$^+$	692.52	5/2$^+$	[M1+E2]		0.013 *6*	Mult.: ce(K)=12 *1* (1964Aa01); α(K)exp=0.014 *2* (1979Do09); α(K)exp=0.0160 *25* (1971Hn04). %Iγ=0.48 *17* α(K)=0.011 *5*; α(L)=0.0018 *7*; α(M)=4.3×10^{-4} *17* α(N)=1.1×10^{-4} *4*; α(O)=2.1×10^{-5} *8*; α(P)=1.9×10^{-6} *9*
979.4 *3*	1.1 *3*	1671.96	3/2$^+$,5/2$^+$	692.52	5/2$^+$	[M1+E2]		0.012 *5*	%Iγ=0.019 *5* α(K)=0.010 *5*; α(L)=0.0017 *7*; α(M)=3.9×10^{-4} *15* α(N)=1.0×10^{-4} *4*; α(O)=1.9×10^{-5} *8*; α(P)=1.8×10^{-6} *8*
999.23 *7*	38.3 *20*	1330.42	3/2$^+$,5/2$^+$	331.17	3/2$^+$	[M1+E2]		0.011 *5*	%Iγ=0.66 *5* α(K)=0.009 *4*; α(L)=0.0016 *6*; α(M)=3.7×10^{-4} *14* α(N)=9.E−5 *4*; α(O)=1.8×10^{-5} *7*; α(P)=1.7×10^{-6} *7*
[x]1010.3[&] *3*	1.0 *2*								%Iγ=0.017 *4*
1019.8[&] *3*	0.9 *4*	1712.4?	3/2,5/2,7/2$^+$	692.52	5/2$^+$				%Iγ=0.016 *7*
1062.79 *15*	4.0 *5*	1755.33	3/2,5/2$^+$	692.52	5/2$^+$				%Iγ=0.069 *9*
1070.04 *8*	72 *4*	1401.26	3/2$^+$,5/2$^+$	331.17	3/2$^+$	E2+M1	1.8 *+10−5*	0.0075 *11*	%Iγ=1.24 *9* α(K)=0.0061 *9*; α(L)=0.00107 *14*; α(M)=0.000252 *32* α(N)=6.3×10^{-5} *8*; α(O)=1.22×10^{-5} *16*; α(P)=1.10×10^{-6} *16*
1088.85 *9*	53 *3*	1420.04	7/2$^+$	331.17	3/2$^+$	[E2]		0.00537 *8*	Mult.: ce(K)=0.8 *1* (1964Aa01); α(K)exp=0.0057 *10* (1979Do09); α(K)exp=0.0069 *15* (1971Hn04). %Iγ=0.91 *7* α(K)=0.00433 *6*; α(L)=0.000799 *11*; α(M)=0.0001886 *26* α(N)=4.75×10^{-5} *7*; α(O)=9.06×10^{-6} *13*; α(P)=7.82×10^{-7} *11*
1098.52 *7*	111 *6*	1098.50	5/2$^+$	0.0	1/2$^+$	E2		0.00528 *7*	%Iγ=1.92 *14*

^{201}Pb ε decay 1979Do09 (continued)

γ(^{201}Tl) (continued)

E_γ[†]	I_γ[‡c]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[#]	δ[@]	α[b]	Comments
									α(K)=0.00426 *6*; α(L)=0.000784 *11*; α(M)=0.0001849 *26* α(N)=4.66×10^{-5} *7*; α(O)=8.89×10^{-6} *12*; α(P)=7.68×10^{-7} *11* Mult.: ce(K)=1.2 *2* (1964Aa01); α(K)exp=0.0055 *11* (1979Do09); α(K)exp=0.0061 *15* (1971Hn04).
1114.73 *8*	9.8 *6*	1445.87	(5/2)$^+$	331.17	3/2$^+$	M1(+E2)	<0.3	0.01218 *35*	%Iγ=0.169 *13* α(K)=0.01004 *29*; α(L)=0.00164 *4*; α(M)=0.000380 *10* α(N)=9.58×10^{-5} *26*; α(O)=1.86×10^{-5} *5*; α(P)=1.77×10^{-6} *5*; α(IPF)=4.97×10^{-7} *12* Mult.: ce(K)=0.20 *3* (1964Aa01); α(K)exp=0.010 *2* (1979Do09); α(K)exp=0.011 *3* (1971Hn04).
[x]1124.9[&] *2*	0.57 *10*								%Iγ=0.0098 *18*
1148.75 *8*	47.3 *25*	1479.85	5/2$^+$	331.17	3/2$^+$	M1+E2	1.1 *+4−3*	0.0079 *11*	%Iγ=0.82 *6* α(K)=0.0065 *9*; α(L)=0.00109 *13*; α(M)=0.000254 *30* α(N)=6.4×10^{-5} *8*; α(O)=1.24×10^{-5} *15*; α(P)=1.15×10^{-6} *16*; α(IPF)=1.34×10^{-6} *12* Mult.: ce(K)=0.6 *1* (1964Aa01); α(K)exp=0.0065 *10* (1979Do09); α(K)exp=0.0076 *20* (1971Hn04).
1157.45 *9*	7.2 *4*	1157.43	3/2$^+$,5/2$^+$	0.0	1/2$^+$	[M1,E2]		0.0081 *33*	%Iγ=0.124 *9* α(K)=0.0066 *27*; α(L)=0.0011 *4*; α(M)=2.6×10^{-4} *9* α(N)=6.5×10^{-5} *24*; α(O)=1.3×10^{-5} *5*; α(P)=1.2×10^{-6} *5*; α(IPF)=1.8×10^{-6} *5*
1219.40[d] *15*	1.4 *1*	1550.58?	1/2,3/2,5/2$^+$	331.17	3/2$^+$				%Iγ=0.0242 *21*
1238.82 *7*	68 *4*	1238.83	3/2$^+$	0.0	1/2$^+$	M1+E2	1.17 *+57−35*	0.0065 *9*	%Iγ=1.17 *9* α(K)=0.0053 *8*; α(L)=0.00089 *12*; α(M)=0.000207 *27* α(N)=5.2×10^{-5} *7*; α(O)=1.01×10^{-5} *14*; α(P)=9.3×10^{-7} *14*; α(IPF)=1.02×10^{-5} *10* Mult.: ce(K)=0.7 *1* (1964Aa01); α(K)exp=0.0053 *9* (1979Do09); α(K)exp=0.0053 *15* (1971Hn04).
1277.11 *7*	100	1277.12	3/2$^+$,5/2$^+$	0.0	1/2$^+$	[M1,E2]		0.0064 *24*	%Iγ=1.73 *9* α(K)=0.0053 *20*; α(L)=8.7×10^{-4} *31*; α(M)=2.0×10^{-4} *7* α(N)=5.1×10^{-5} *18*; α(O)=9.9×10^{-6} *35*; α(P)=9.E−7 *4*; α(IPF)=1.7×10^{-5} *4*
1286.3[d] *2*	3.75 *20*	1617.46	1/2,3/2,5/2$^+$	331.17	3/2$^+$				%Iγ=0.065 *5*
1308.32 *8*	32.6 *16*	1639.36	3/2$^+$,5/2$^+$	331.17	3/2$^+$	M1(+E2)	<0.6	0.0077 *6*	%Iγ=0.56 *4*

$^{201}_{81}Tl_{120}$-8

^{201}Pb ε decay 1979Do09 (continued)

γ(^{201}Tl) (continued)

E_γ [†]	I_γ [‡c]	E_i(level)	J_i^π	E_f	J_f^π	Mult. [#]	α [b]	Comments
								α(K)=0.0064 *5*; α(L)=0.00103 *8*; α(M)=0.000240 *18* α(N)=6.1×10^{-5} *4*; α(O)=1.18×10^{-5} *9*; α(P)=1.12×10^{-6} *9*; α(IPF)=2.77×10^{-5} *16* Mult.: ce(K)=0.6 *2* (1964Aa01); α(K)exp=0.009 *4* (1979Do09); α(K)exp=0.010 *3* (1971Hn04).
1330.50 *15*	0.86 *15*	1330.42	3/2$^+$,5/2$^+$	0.0	1/2$^+$	[M1,E2]	0.0058 *22*	%Iγ=0.0148 *27* α(K)=0.0048 *18*; α(L)=7.9×10^{-4} *27*; α(M)=1.8×10^{-4} *6* α(N)=4.6×10^{-5} *16*; α(O)=9.0×10^{-6} *31*; α(P)=8.4×10^{-7} *32*; α(IPF)=2.8×10^{-5} *7*
1340.88 *9*	26.9 *15*	1671.96	3/2$^+$,5/2$^+$	331.17	3/2$^+$	[M1+E2]	0.0057 *21*	%Iγ=0.464 *35* α(K)=0.0047 *17*; α(L)=7.8×10^{-4} *27*; α(M)=1.8×10^{-4} *6* α(N)=4.6×10^{-5} *15*; α(O)=8.8×10^{-6} *30*; α(P)=8.2×10^{-7} *31*; α(IPF)=3.1×10^{-5} *8*
1381.4 *3*	1.1 *2*	1712.4?	3/2,5/2,7/2$^+$	331.17	3/2$^+$			%Iγ=0.019 *4*
1401.30 *8*	7.9 *4*	1401.26	3/2$^+$,5/2$^+$	0.0	1/2$^+$	[M1,E2]	0.0052 *18*	%Iγ=0.136 *10* α(K)=0.0042 *15*; α(L)=7.0×10^{-4} *23*; α(M)=1.6×10^{-4} *5* α(N)=4.1×10^{-5} *14*; α(O)=7.9×10^{-6} *27*; α(P)=7.4×10^{-7} *27*; α(IPF)=4.9×10^{-5} *13*
1424.16 *9*	5.8 *3*	1755.33	3/2,5/2$^+$	331.17	3/2$^+$			%Iγ=0.100 *7*
1445.80 *10*	2.10 *10*	1445.87	(5/2)$^+$	0.0	1/2$^+$	[E2]	0.00319 *4*	%Iγ=0.0362 *25* α(K)=0.00257 *4*; α(L)=0.000437 *6*; α(M)=0.0001021 *14* α(N)=2.57×10^{-5} *4*; α(O)=4.95×10^{-6} *7*; α(P)=4.45×10^{-7} *6*; α(IPF)=4.84×10^{-5} *7*
1479.91 *10*	10.4 *5*	1479.85	5/2$^+$	0.0	1/2$^+$	[E2]	0.00307 *4*	%Iγ=0.180 *13* α(K)=0.002468 *35*; α(L)=0.000417 *6*; α(M)=9.73×10^{-5} *14* α(N)=2.451×10^{-5} *34*; α(O)=4.72×10^{-6} *7*; α(P)=4.26×10^{-7} *6*; α(IPF)=5.82×10^{-5} *8* E_γ: In table II of 1979Do09 Eγ=1470.91 keV is listed, which is a typo as evident from the spectrum shown in Figure 2 in 1979Do09.
[x]1486.20 *12*	1.1 *1*							%Iγ=0.0190 *20*
1550.5[d] *4*	0.27 *4*	1550.58?	1/2,3/2,5/2$^+$	0.0	1/2$^+$			%Iγ=0.0047 *7*
[x]1587.6[&] *5*	0.15 *5*							%Iγ=0.0026 *9*
1617.45 *15*	1.4 *1*	1617.46	1/2,3/2,5/2$^+$	0.0	1/2$^+$			%Iγ=0.0242 *21*
[x]1630.9[&] *6*	0.14 *4*							%Iγ=0.0024 *7*
1639.1 *5*	0.20 *5*	1639.36	3/2$^+$,5/2$^+$	0.0	1/2$^+$	[M1,E2]	0.0037 *11*	%Iγ=0.0035 *9* α(K)=0.0030 *9*; α(L)=4.8×10^{-4} *14*; α(M)=1.12×10^{-4} *33* α(N)=2.8×10^{-5} *8*; α(O)=5.5×10^{-6} *16*; α(P)=5.1×10^{-7} *16*; α(IPF)=0.00015 *4*
1672.02 *10*	1.45 *10*	1671.96	3/2$^+$,5/2$^+$	0.0	1/2$^+$	[M1,E2]	0.0036 *11*	%Iγ=0.0250 *21*

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γ(^{201}Tl) (continued)

E_γ [†]	I_γ [‡ c]	E_i(level)	J_i^π	E_f	J_f^π	Comments
						α(K)=0.0028 *9*; α(L)=4.6×10^{-4} *13*; α(M)=1.07×10^{-4} *31*
						α(N)=2.7×10^{-5} *8*; α(O)=5.2×10^{-6} *15*; α(P)=4.9×10^{-7} *15*; α(IPF)=0.00017 *4*
[x] 1678.96 *13*	0.24 *3*					%Iγ=0.0041 *6*
1755.32 *10*	0.65 *6*	1755.33	3/2,5/2$^+$	0.0	1/2$^+$	%Iγ=0.0112 *12*
[x] 1813.1[&] *3*	0.26 *5*					%Iγ=0.0045 *9*

[†] From 1979Do09, unless otherwise stated.
[‡] From singles measurements in 1979Do09, unless otherwise stated. Iγ(x-ray)=4980 *250* and Iγ(γ$^\pm$)=6 *1* in 1979Do09.
[#] From α(K)exp, α(L)exp, K/L, γγ(θ) and multiple decay branches in 1979Do09, 1960Li08, 1961Pe05, 1964Aa01 and 1974Ha18, unless otherwise stated.
[@] From α(K)exp and sub-shell ratios in 1979Do09, 1974Ha18, 1971Hn04, 1964Aa01, and 1961Pe05 and the briccmixing program, unless otherwise stated.
[&] Assignment to ^{201}Pb ε decay is uncertain (1979Do09).
[a] The authors in 1979Do09 report a transition with Eγ=285.04 keV *7* and Iγ=10.3 *10* doubly placed from the 1420 and 1575 keV levels with roughly equal intensities. α(K)exp=0.37 *8*, assuming Mult=M1 for the doublet. The transition is not included in the least-squares fit. For placement from the 1420 keV level, the evaluator chooses Eγ=285.18 keV 13, as given from the levels energy difference in the least-squares fit. For placement from the 1575 keV level, where the 285γ is the only deexciting transition, the evaluator adopts Eγ=285.0 keV *10*. The evaluator adopts Iγ≈5.2 for each placement. Both transitions involve ΔJ=0 or 1 and Δπ=no, and since Iγ′s are roughly equal, Mult.=M1 can be assigned to both placements.
[b] Additional information 1.
[c] For absolute intensity per 100 decays, multiply by 0.0173 *9*.
[d] Placement of transition in the level scheme is uncertain.
[x] γ ray not placed in level scheme.

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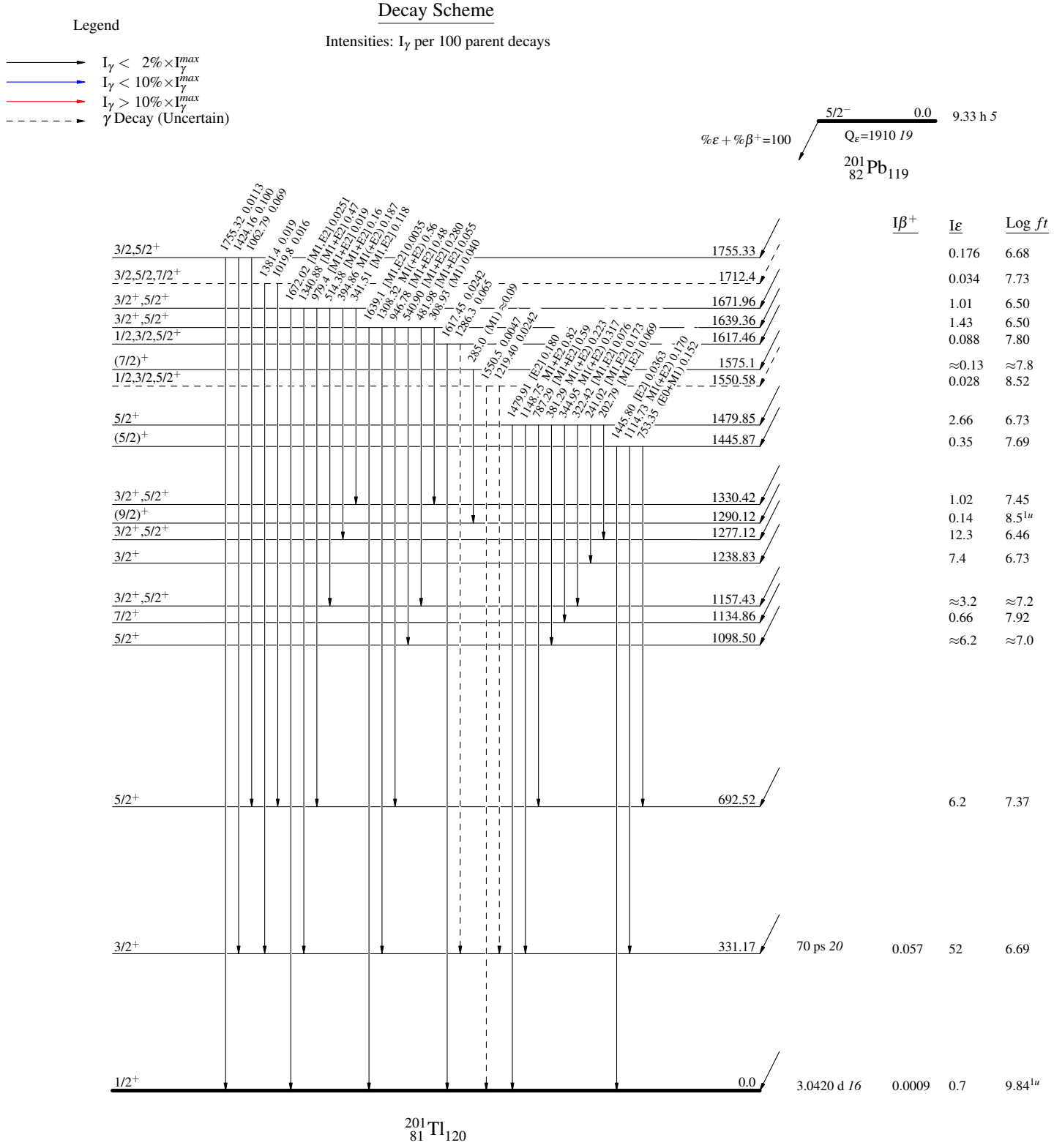
^{201}Pb ε decay 1979Do09

Decay Scheme

Intensities: I_γ per 100 parent decays



^{201}Pb ε decay 1979Do09

Decay Scheme (continued)

Intensities: I_γ per 100 parent decays