^{210}Tl β^- decay (1.30 min) 1964We06,1981Ha54

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	M. Shamsuzzoha Basunia	NDS 121, 561 (2014)	31-Mar-2014

Parent: ^{210}Tl: E=0.0; $J^\pi=(5^+)$; $T_{1/2}$=1.30 min *3*; Q(β^-)=5482 *12*; %β^- decay=100.0

Measured Eγ, $\gamma\gamma$ coin, ce, $4\pi\beta\gamma$ coin, Eβ, Iβ. Detectors: scin, semi. Others: 1961St20, 1959Dz97, 1957We21, 1956Ma61, 1938Le07, 1937De03.

^{210}Pb Levels

E(level)‡	J^π†	$T_{1/2}$	Comments
0.0	0^+		
799.6 *3*	2^+		
1096 *3*	4^+	0.6 ns *1*	$T_{1/2}$: from $\beta(298\gamma,799\gamma)$(t) (1964We06); other value: 0.9 ns *2* (>1−MeV γ) (298γ)(t) (1961St20).
1192 *24*	6^+		
1275 *38*	8^+		
1869 *10*	3^-		
2208 *13*	(2^+)		
2412 *13*			
3069 *12*	(2^+)		
3458 *22*	(4^+)		
3622 *21*			
3879 *32*			
4102 *29*			

† From Adopted Levels.
‡ Deduced by evaluator from a least-squares fit to γ-ray energies.

β^- radiations

E(decay)	E(level)	Iβ^-‡	Log *ft*	Comments
(1.38×10^3 *3*)	4102	2 *1*	6.2 *2*	av Eβ=477 *13* Eβ=1320 *100*, Iβ=25% (1964We06).
(1.60×10^3 *4*)	3879	7 *2*	5.9 *1*	av Eβ=568 *14*
(1860 *24*)	3622	24 *5*	5.6 *1*	av Eβ=674 *10* Eβ=1870 *100*, Iβ=56% (1964We06).
(2.02×10^3 *3*)	3458	10 *3*	6.1 *1*	av Eβ=743 *11*
(2413 *17*)	3069	10 *3*	8.9^{2u} *1*	av Eβ=877.1 *69* Logf^{2u}t=8.9 is inconsistent with ΔJ=3. Eβ=2340 *100*, Iβ=19% (1964We06).
(4.21×10^3 *4*)	1275	30† *6*	10.3^{2u} *1*	av Eβ=1635 *18* Logf^{2u}t=10.3 is inconsistent with ΔJ=3.
(4386 *12*)	1096	≈20†	≈7.1	av Eβ=1762.6 *54*

† No β^- with Eβ>3 MeV was observed (1957Da03,1964We06).
‡ Absolute intensity per 100 decays.

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$\gamma(^{210}Pb)$

Iγ normalization: deduced by evaluator from decay scheme and Ti(799γ)=100%. Measured Iγ(799γ)/β^-=1.03 *10*, 4πβγ coin (1964We06).
Eγ, Iγ (scin), Ice (semi) are from 1964We06, except as noted.
α(K)exp=ce(K)/Iγ normalized to α(K)(799γ)=0.00815 (E2 theory).

E_γ	I_γ[‡][@]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[†]	α[#]	Comments
83 *30*	2.0 *4*	1275	8^+	1192	6^+	[E2]	14	α(L)=10.4 *20*; α(M)=2.7 *6* α(N)=0.69 *14*; α(O)=0.123 *24*; α(P)=0.0046 *9* α: Calculate using ΔE=3. For ΔE=30, α is 10 *110*. I_γ: calc from measured I(ce(L))=20 *4* and α(L)=10.
97 *30*	4 *2*	1192	6^+	1096	4^+	[E2]	7.2	α(K)=0.513 *16*; α(L)=5.0 *8*; α(M)=1.32 *21* α(N)=0.33 *6*; α(O)=0.059 *10*; α(P)=0.0023 *4* α: Calculate using ΔE=3. For ΔE=30, α is 10 *40*. Ice(L)=3.3 *16* for unresolved peak.
296 *3*	80 *10*	1096	4^+	799.6	2^+	E2	0.120 *4*	α(K)=0.0671 *19*; α(L)=0.0399 *17*; α(M)=0.0102 *5* α(N)=0.00259 *11*; α(O)=0.000475 *20*; α(P)=2.89×10^{-5} *11* E_γ: other value: 298 *1* (1976Ku08). Other: 1961St20. Mult.: from α(K)exp=0.059 *13*, K/L=2.1 *5*.
[x]356 *10*	4 *2*					(M1)	0.268 *22*	α(K)=0.219 *18*; α(L)=0.037 *3*; α(M)=0.0087 *8* α(N)=0.00222 *19*; α(O)=0.00044 *4*; α(P)=4.7×10^{-5} *4* Mult.: from α(K)exp=0.22 *12*.
[x]382 *10*	3 *2*							α(K)exp≈0.2.
480 *20*	2 *1*	4102		3622				
[x]670 *20*	2 *1*							
799.6 *3*	100	799.6	2^+	0.0	0^+	E2	0.01041	α(K)=0.00809 *12*; α(L)=0.001760 *25*; α(M)=0.000424 *6* α(N)=0.0001075 *15*; α(O)=2.08×10^{-5} *3*; α(P)=1.91×10^{-6} *3* E_γ: from 1975HaZA. Others: 795 *3* (1964We06).
860 *30*	7 *2*	3069	(2^+)	2208	(2^+)			
[x]910 *30*	3 *2*							
1070 *10*	12 *5*	1869	3^-	799.6	2^+	[E1]	0.00222 *5*	α(K)=0.00185 *4*; α(L)=0.000281 *7*; α(M)=6.48×10^{-5} *15* α(N)=1.64×10^{-5} *4*; α(O)=3.25×10^{-6} *8*; α(P)=3.37×10^{-7} *8* E_γ: from 1975HaZA. Other value: 1060 *20* (1964We06).
1110 *20*	7 *2*	2208	(2^+)	1096	4^+			
1210 *20*	17 *4*	3622		2412				
1316 *13*	21 *5*	2412		1096	4^+			E_γ: from 1975HaZA. Other value: 1310 *20* (1964We06).
1410 *20*	5 *2*	2208	(2^+)	799.6	2^+			
[x]1490 *20*	2 *1*							
[x]1540 *30*	2 *1*							
1590 *30*	2 *1*	3458	(4^+)	1869	3^-			
[x]1650 *30*	2 *1*							
2010 *30*	7 *2*	3879		1869	3^-			
[x]2090 *30*	5 *2*							

Continued on next page (footnotes at end of table)

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$\gamma(^{210}Pb)$ (continued)

E_γ	I_γ ‡@	E_i(level)	J_i^π	E_f	J_f^π	Comments
2270 *13*	3 *2*	3069	(2^+)	799.6	2^+	E_γ: from 1975HaZA. Other value: 2280 *30* (1964We06).
2360 *30*	8 *3*	3458	(4^+)	1096	4^+	
2430 *30*	9 *3*	3622		1192	6^+	

† Deduced from measured α(K)exp and K/L, unless otherwise noted.
‡ I(K x ray)=10 *1* deduced by evaluator (2003Br13) from γ-ray intensities and theoretical α, disagrees with measured I(K x ray)=20 *4* (1964We06).
# Additional information 1.
@ For absolute intensity per 100 decays, multiply by 0.9896 *3*.
x γ ray not placed in level scheme.

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Decay Scheme

Intensities: $I_{(\gamma+ce)}$ per 100 parent decays