^{201}Tl ε decay 1990Co07,1990Ka08,1979De42

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

Parent: ^{201}Tl: E=0.0; $J^\pi=1/2^+$; $T_{1/2}$=3.0420 d *16*; Q(ε)=482 *14*; %ε decay=100

1990Co07: inter-comparison data performed at NIST, NPL and PTB metrology labs using samples produced by the same solution of ^{201}Tl and the 4π-γ coincidence systems. In each case, corrections were applied for the presence of ^{200}Tl and ^{202}Tl contaminants.

Others: 2007Me12, 2004De02, 1989Pl04, 1991Dr09, 1987Dr06, 1987Fu08, 1983Fu22, 1983SC38, 1978No06, 1977Na31, 1975Ho08, 1976HiZN, 1960Gu05, 1960He05.

^{201}Hg Levels

E(level)†	J^π‡	$T_{1/2}$	Comments
0.0	$3/2^-$		
1.5648 *10*	$1/2^-$	81 ns *5*	$T_{1/2}$: From γ-ce(Δt) in 2007Me12.
26.2738 *3*	$5/2^-$	629 ps *18*	$T_{1/2}$: Other: 630 ps *50* from ce-γ(Δt)) in 1983Sc38.
32.169 *20*	$3/2^-$	55 ps *24*	$T_{1/2}$: From 1961Re12. Other: ≤2 ns in 1961Be29.
167.48 *3*	$1/2^-$	<44 ps	$T_{1/2}$: From 1961Be29.

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

ε radiations

E(decay)	E(level)	Iε†‡	Log *ft*	Comments
(315 *14*)	167.48	39.8 *4*	6.09 *5*	εK=0.723 *6*; εL=0.206 *5*; εM+=0.0707 *18*
(450 *14*)	32.169	11.9 *4*	6.99 *4*	εK=0.7582 *24*; εL=0.1810 *17*; εM+=0.0608 *7*
(456 *14*)	26.2738	≤0.5	≥8.2[1u]	εK=0.665 *8*; εL=0.247 *5*; εM+=0.0887 *22* Iε: From systematics (by the evaluator).
(480 *14*)	1.5648	≈37.8	≈6.6	εK=0.7628 *20*; εL=0.1777 *15*; εM+=0.0595 *6* Iε: From the log *ft* value for a similar transition in ^{199}Tl ε decay (by the evaluator). Iε($3/2^-$,gs)+Iε($1/2^-$,1.56 keV)=47.8% *6* from the decay scheme. Other: 47% *23* in 2002Kh12.
(482 *14*)	0.0	≈10.0	≈7.1	εK=0.7630 *20*; εL=0.1775 *15*; εM+=0.0594 *6* Iε: From the log *ft* value for a similar transition in ^{199}Tl ε decay (by the evaluator). Iε($3/2^-$,gs)+Iε($1/2^-$,1.56 keV)=47.8% *6* from the decay scheme. Other: <20.9% in 2002Kh12.

† Estimated by the evaluator from intensity balances and the adopted decay scheme, unless otherwise stated.
‡ Absolute intensity per 100 decays.

γ(^{201}Hg)

Iγ normalization: From Iγ(167γ)=10.00% *10* (1990Co07), weighted average of 9.88% *8* (NIST), 10.05% *17* (NPL) and 10.18% *10* (PTB). Others: Iγ(167γ): 9.81% *12* (1990Ka08), 10.60% *15* (1989Pl04), 10.25% *10* (1983Fu22), 10.60% *12* (1979De42), 10.00% *17* (1976HiZN), 10.00% (1975Ho08) and 8.4% *4* (1960He05). The total energy realized in ^{201}Tl ε decay is calculated using RADLST as 471 keV *14*. It is in a good agreement with Q(g.s.)=482 keV *14*.

x-ray		Eγ keV	Iγ per 100 ε decays
Kα$_1$	x ray	70.8	44.6 *5*
Kα$_2$	x ray	68.9	26.3 *3*
Kα	x ray		71.1 *5*
Kβ$_1'$	x ray	80.2	15.3 *4*
Kβ$_2'$	x ray	80.5	4.59 *15*
Kβ	x ray		20.0 *3*

Iγ - Weighted average of values given in 1976HiZN, 1979De42, 1983Fu22 and 1990Ka08.

E_γ[†]	I_γ[#]	E_i(level)	J_i^π	E_f	J_f^π	Mult.	δ	α[‡]	Comments
1.5648 *10*	≈0.011	1.5648	1/2$^-$	0.0	3/2$^-$	M1+E2	0.0105 *14*	4.7×10^4 *7*	%Iγ≈0.001100 E_γ: From 1997Ge09. Other: 1.565 keV *6* (1987Dr06). I_γ: Estimated by the evaluator from intensity balance and the adopted decay scheme. Mult.: From N1/N2=0.94 *31*, N1/N3=0.60 *20*, N2/N3=0.64 *5*, N4/N3=0.042 *18*, N5/N3=0.043 *23*, N4/N5=0.98 *32*, O1/O2=0.81 *16*, O2/N3=0.158 *30*, O3/N3=0.20 *4*, O1/O3=0.64 *12*, O1/N3=0.128 *30* and O2/O3=0.79 *19* subshell ratios in 1997Ge09 and N1/N2=1.2 *2*, N1/N3=1.1 *2*, N2/N3=0.92 *15*, N4/N3=0.03 *2* and N5/N3=0.04 *2* subshell ratios in 1987Dr06. δ: From 1987Dr06; Other: 0.0145 *+19−14* in 1997Ge09. α: 4.7E+4 7 from 1987Dr06.
(5.895 *20*)	≈0.0007	32.169	3/2$^-$	26.2738	5/2$^-$	[M1]		1441 *23*	%Iγ≈7.00×10^{-5} α(M)=1106 *17* α(N)=279 *4*; α(O)=52.6 *8*; α(P)=4.02 *6* E_γ: Not observed directly, but required from the ce-γ coincidence data in 1983Sc38. Eγ from level energy differences. I_γ: Estimated by the evaluator from intensity balance and the adopted decay scheme.

$^{201}_{80}$Hg$_{121}$-2

^{201}Tl ε decay 1990Co07,1990Ka08,1979De42 (continued)

$\gamma(^{201}Hg)$ (continued)

E_γ †	I_γ #	E_i(level)	J_i^π	E_f	J_f^π	Mult.	δ	α ‡	Comments
26.2738 *3*	0.082 *10*	26.2738	5/2$^-$	0.0	3/2$^-$	M1+E2	0.012 *8*	72.9 *13*	%Iγ=0.0082 *10* α(L)=55.9 *10*; α(M)=13.05 *24* α(N)=3.27 *6*; α(O)=0.618 *11*; α(P)=0.0470 *7* E_γ: From adopted gammas. Others: 26.34 keV *7* in 1983Sc38. I_γ: 0.082 *10* from I(ce(M1))(26.27γ)/I(ce(L1))(32.19γ)=0.0131 *15* in 1983Sc38,α(M1)(26.27γ)=11.52 *17* and α(L1)(32.19γ)=27.3 *4* and Iγ(32.19γ)=2.63 *5* from the present evaluation. Mult.,δ: From M1:M2:M3=100:12.0 *20*:1.5 *7* in 1983Sc38 and using the briccmixing program.
30.60 *3*	2.58 *5*	32.169	3/2$^-$	1.5648	1/2$^-$	M1+E2	0.013 *5*	46.4 *7*	%Iγ=0.258 *6* α(L)=35.6 *5*; α(M)=8.30 *13* α(N)=2.082 *32*; α(O)=0.393 *6*; α(P)=0.0299 *4* I_γ: Weighted average 2.2 *2* (1975Ho08), 3.10 *13* (1976HiZN), 2.57 *6* (1979De42), 2.60 *8* (1983Fu22), 2.60 *8* (1990Ka08) and 2.53 *5* (1990Co07). Mult.: From L3:L1=0.0136 *21*, L2:L1=0.105 *11* and L3:L2=0.130 *24* in 1983Sc38; L1:L2:L3:M1:M2:N:O1=50.9 *40*:5.0 *6*:0.56 *8*:14.2 *15*:1.5 *5*:4.0 *5*:0.70 *15* in 1960He05; A_2(135.5γ-30.6$\gamma(\theta)$)=0.159 *26* in 1975Ho08. δ: From L3/L1, L2/L1 and L3/L2 in 1983Sc38 and the briccmixing program. Others: ≤0.03 from $\gamma\gamma(\theta)$ in 1975Ho08; −0.0634≤δ≤+0.0515 from $\gamma\gamma(\theta)$ in 1978No06; 0.006 *16* from from L1:L2:L3 in 1960He05 and the briccmixing program.
32.19 *3*	2.63 *5*	32.169	3/2$^-$	0.0	3/2$^-$	M1+E2	0.0204 *25*	40.2 *6*	%Iγ=0.263 *6* α(L)=30.8 *4*; α(M)=7.20 *11* α(N)=1.804 *26*; α(O)=0.341 *5*; α(P)=0.0257 *4* I_γ: Weighted average 2.2 *2* (1975Ho08), 2.85 *12* (1976HiZN), 2.60 *9* (1979De42), 2.60 *7* (1983Fu22), 2.72 *6* (1990Ka08) and 2.58 *5* (1990Co07). Mult.: From L1:L2:L3=100:11.3 *5*:1.75 *15* in 1983Sc38; L3:L1=0.0130 *20*, L2:L1=0.094 *8*, L3:L2=0.138 *24*, L:M=3.9 *4*, M1:M2=8.4 *3* M:N=4.6 *6* in 1960He05; A_2(135.5γ-32.2$\gamma(\theta)$)=−0.193 *28* in 1975Ho08. δ: From L3/L1, L2/L1 and L3/L2 in 1983Sc38 and the briccmixing program. Others: ≤0.03 from $\gamma\gamma(\theta)$ in 1975Ho08; −0.0361≤δ≤+0.0506 from $\gamma\gamma(\theta)$ in 1978No06; 0.013 *11* from from L1:L2:L3 in 1960He05 and the briccmixing program.
135.34 *4*	26.05 *18*	167.48	1/2$^-$	32.169	3/2$^-$	M1+E2	−0.07 *4*	3.32 *5*	%Iγ=2.605 *32* α(K)=2.71 *4*; α(L)=0.463 *7*; α(M)=0.1080 *18* α(N)=0.0271 *4*; α(O)=0.00512 *8*; α(P)=0.000388 *6* I_γ: Weighted average 26.5 *13* (1975Ho08), 26.5 *10* (1976HiZN), 26.4 *3* (1979De42), 26.5 *4* (1983Fu22), 27.2 *5* (1990Ka08) and

$^{201}_{80}Hg_{121}$-3

γ(^{201}Hg) (continued)

E_γ [†]	I_γ [#]	E_i(level)	J_i^π	E_f	J_f^π	Mult.	δ	α [‡]	Comments
									25.65 *18* (1990Co07). Other 27.3 *2* (2004De02). Mult.: From K:L1:L2:L3:M1:N1=56.0 *4*:7.9 *7*:0.77 *15*:0.07 *3*: 2.2 *3*:0.60 *9*; γγ(θ) in 1975Ho08. δ: From γγ(θ) in 1975Ho08; other: 0.000 *4* from K:L1:L2:L3:M1:N1 in 1960He05 and the briccmixing program.
141.1 *2*	≈0.026	167.48	1/2$^-$	26.2738	5/2$^-$	[E2]		1.389 *21*	%Iγ≈0.0026 α(K)=0.374 *5*; α(L)=0.760 *12*; α(M)=0.1980 *30* α(N)=0.0491 *8*; α(O)=0.00821 *13*; α(P)=4.92×10^{-5} *7* E_γ: From 1983Sc38. I_γ: From the decay scheme and Iγ(141.1γ)/Iγ(135.34γ)=0.11 *2*, using the 26γ as a gate in 1983Sc38, and by assuming Iβ(5/2$^-$,26.27 keV)=0.5%.
165.88 *7*	1.47 *2*	167.48	1/2$^-$	1.5648	1/2$^-$	M1		1.869 *26*	%Iγ=0.1470 *25* α(K)=1.532 *22*; α(L)=0.258 *4*; α(M)=0.0602 *8* α(N)=0.01509 *21*; α(O)=0.00286 *4*; α(P)=0.0002184 *31* I_γ: Weighted average of 1.6 *1* (1975Ho08), 1.80 *20* (1976HiZN), 1.5 *2* (1979De42), 1.46 *20* (1983Fu22), 1.45 *2* (1990Ka08) and 1.55 *5* (1990Co07). Mult.: From K:L1=1.65 *20*:0.25 *5* in 1960He05.
167.43 *7*	100.0	167.48	1/2$^-$	0.0	3/2$^-$	M1+E2	0.07 *6*	1.815 *29*	%Iγ=10.00 *10* α(K)=1.486 *25*; α(L)=0.252 *4*; α(M)=0.0588 *9* α(N)=0.01474 *23*; α(O)=0.00279 *4*; α(P)=0.000212 *4* I_γ: From 1990Co07; others: 100 (1975Ho08), 100.0 *17* (1976HiZN), 100.0 *11* (1979De42), 100.0 *10* (1983Fu22) and 100.0 *12* (1990Ka08). Mult.: From K:L1:L2:L3:M1:N1:O1=100:14.6 *12*:1.6 *2*:0.18 *4*:4.0 *4*: 1.10 *15*:0.27 *6* in 1960He05. δ: From K:L1:L2:L3 in 1960He05 and the briccmixing program.

† From 1960He05, unless otherwise stated.
‡ Additional information 1.
# For absolute intensity per 100 decays, multiply by 0.1000 *10*.

$^{201}_{80}Hg_{121}$-4

^{201}Tl ε decay 1990Co07,1990Ka08,1979De42

Decay Scheme

Intensities: I_γ per 100 parent decays