^{204}Pb IT decay (66.93 min) 1956He50,1971Ha39,1972Si22

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	C. J. Chiara and F. G. Kondev	NDS 111,141 (2010)	1-Oct-2009

Parent: ^{204}Pb: E=2185.88 *8*; $J^\pi=9^-$; $T_{1/2}$=66.93 min *10*; %IT decay=100.0

1956He50: isomer produced via metallic Tl bombarded with 25-MeV d′s or by ε decay of ^{204}Bi from Pb bombarded with 50-MeV p′s; permanent-magnet and double-focusing β spectrometers for E(ce), Ice(K), Ce(t) measurements.

1971Ha39: isomer produced via decay of ^{204}Bi from ^{206}Pb(d,4n), and by Tl(d,xn); Ge(Li) for γ′s, FWHM=1.8 keV at 661 keV; cooled Si(Au) detector for ce′s, FWHM=1.8 keV at 624 keV; measured Eγ, Iγ, Ice; deduced α(K)exp.

1972Si22: ^{205}Tl(p,2n) reaction; 99.99%-pure natural Tl target; E(p)=14 MeV; Ge(Li) detector; spectra recorded in≈1−h intervals; measured Eγ, Iγ(t).

^{204}Pb Levels

E(level)†	J^π‡	$T_{1/2}$	Comments
0	0^+		
899.15 *3*	2^+		
1273.99 *7*	4^+	265 ns *6*	$T_{1/2}$: Weighted average of 258 ns *12* (1963Sa19), 280 ns *12* (1967Li12), 260 ns *10* (1978So02). Q=0.68 *15* from $\gamma\gamma$(t) of ^{204}Pb implanted in crystal, TDPAC method (1974He16). μ=+0.224 *6* from weighted average of +0.216 *20* (1955Kr06) by angular correlation attenuation, +0.226 *8* (1963Sa19) and +0.220 *12* (1967Li12) by differential angular correlation method.
1563.41 *12*	4^+		
2185.88 *8*	9^-	66.93 min *10*	E(level): From Adopted Levels. $T_{1/2}$: Weighted average of 67.5 min *5* (1956He50), 66.9 min *1* (1958Ba04), 66 min *3* (1972Si22), 67.2 min *9* (1977SmZV), 68.4 min *24* (2001Li17).

† From a least-squares fit to Eγ, unless otherwise specified.
‡ From γ mult assignments, based on α(K)exp and K/L ratios.

γ(^{204}Pb)

E$_\gamma$‡	I$_\gamma$#&	E$_i$(level)	J^π_i	E$_f$	J^π_f	Mult.@	δ	α†	Comments
289.30 *15*	0.25 *5*	1563.41	4^+	1273.99	4^+	M1+E2	+0.09 *2*	0.469	α(K)=0.383 *6*; α(L)=0.0656 *10*; α(M)=0.01538 *22*; α(N+..)=0.00477 *7* α(N)=0.00391 *6*; α(O)=0.000779 *11*; α(P)=8.31×10^{-5} *12* E$_\gamma$,δ: From adopted gammas. I$_\gamma$: 0.249 *20* (relative intensity). Mult.: α(K)exp=0.39 *3*, K/L=5.4 *8* (1971Ha39).
374.76 *7*	94.20 *14*	1273.99	4^+	899.15	2^+	E2		0.0614	α(K)=0.0390 *6*; α(L)=0.01681 *24*; α(M)=0.00426 *6*; α(N+..)=0.001291 *19* α(N)=0.001077 *16*; α(O)=0.000200 *3*; α(P)=1.370×10^{-5} *20* E$_\gamma$: From adopted gammas. Eγ=374.74 keV *10* in 1970CrZY. I$_\gamma$: From intensity balances using Iγ(889.15γ)=99.174% 12 and Iγ(663.43γ)=0.0022% 22. Mult.: α(K)exp=0.0386 *13*, K/L=2.25 *5* (1971Ha39).
622.2 *2*	0.22 *4*	2185.88	9^-	1563.41	4^+	E5		0.417	α(K)=0.1596 *23*; α(L)=0.190 *3*;

Continued on next page (footnotes at end of table)

^{204}Pb IT decay (66.93 min) 1956He50,1971Ha39,1972Si22 (continued)

$\gamma(^{204}Pb)$ (continued)

E_γ[‡]	I_γ[#&]	E_i(level)	J^π_i	E_f	J^π_f	Mult.[@]	α[†]	Comments
								α(M)=0.0519 *8*; α(N+..)=0.01592 *23* α(N)=0.01329 *19*; α(O)=0.00246 *4*; α(P)=0.0001725 *25* E_γ: From 1956He50. I_γ: 0.219 *20* (relative intensity). Mult.: α(K)exp=0.159 *19*, K/L=0.83 *4* (1971Ha39).
663.43[a] *15*	0.0022 *22*	1563.41	4^+	899.15	2^+	[E2]	0.01542	α(K)=0.01165 *17*; α(L)=0.00286 *4*; α(M)=0.000697 *10*; α(N+..)=0.000213 *3* α(N)=0.0001766 *25*; α(O)=3.39×10^{-5} *5*; α(P)=2.94×10^{-6} *5* I_γ: <0.0044 (relative intensity), from adopted gammas branching ratio.
899.15 *3*	99.174 *12*	899.15	2^+	0	0^+	E2	0.00821 *12*	α=0.00821 *12*; α(K)=0.00647 *9*; α(L)=0.001323 *19*; α(M)=0.000317 *5*; α(N+..)=9.73×10^{-5} *14* α(N)=8.02×10^{-5} *12*; α(O)=1.562×10^{-5} *22*; α(P)=1.473×10^{-6} *21* E_γ: From adopted gammas. Eγ=899.15 keV *10* in 1970CrZY. I_γ: 100 *15* (relative intensity). Mult.: α(K)exp=0.0065 *4*, K/L=4.9 *3* (1971Ha39).
911.74 *15*	91.5 *13*	2185.88	9^-	1273.99	4^+	E5	0.0958	α(K)=0.0544 *8*; α(L)=0.0308 *5*; α(M)=0.00809 *12*; α(N+..)=0.00249 *4* α(N)=0.00207 *3*; α(O)=0.000390 *6*; α(P)=3.10×10^{-5} *5* I_γ: From intensity balances using Iγ(374.76γ)=94.20% 14 and Iγ(289.30γ)=0.25% 5. Mult.: α=0.099 *2* in 1988ZhZT based on Iγ(899)/Iγ(912)=1.0935 *10* and intensity balance; α(K)exp=0.056 *3* (1954Ma78), 0.0549 *20* (1956He50), 0.055 *5* (1972Gu06); K/L=1.66 *25* (1972Gu06), 1.7 *8* (1956He50). Also from $\gamma\gamma(\theta)$ of 1955Kr06, 1956Hu30, 1967Li12.
1274	0.012 *3*	1273.99	4^+	0	0^+	[E4]	0.01771	α(K)=0.01288 *18*; α(L)=0.00365 *6*; α(M)=0.000905 *13*; α(N+..)=0.000279 *4* α(N)=0.000230 *4*; α(O)=4.45×10^{-5} *7*; α(P)=4.08×10^{-6} *6* E_γ: From 1972Si22. I_γ: 0.012 *2* (relative intensity), branching ratio from 1972Si22; however, 1988ZhZT report Iγ=0.046 *3*.

† Additional information 1.
‡ From 1970CrZY, except as noted.
# From relative intensities deduced from Ice(K) of 1956He50 and α(K)exp from BrIcc, unless otherwise stated. The absolute intensities per 100 decays were obtained using the GABS program, unless othewise stated.
@ From ce data of 1971Ha39, except as noted.
& Absolute intensity per 100 decays.
a Placement of transition in the level scheme is uncertain.

^{204}Pb IT decay (66.93 min) 1956He50,1971Ha39,1972Si22