^{205}Tl(p,2nγ),^{204}Pb(p,p′γ) 1970Go09,1986Ka07,1989Tr14

History

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

1970Go09: ^{205}Tl(p,2nγ); natural Tl; E(p)=16 MeV; ce spectrometer, NaI detector for monitoring elastic scattering; measured E(ce), Ice.
1986Ka07: ^{205}Tl(p,2nγ); 1-6 mg/cm^2 targets, natural Tl or enriched to 97% ^{205}Tl; E(p)=14.5 MeV; ce spectrometer, Ge, Si(Li); measured E(ce), Ice, Ce(t), Eγ, Iγ, $\gamma\gamma$-coin.
1989Tr14: ^{204}Pb(p,p′γ); 66% ^{204}Pb target; E(p)=12.3 MeV; measured E(ce), Ice, Eγ, Iγ.
Additional information 1.

^{204}Pb Levels

E(level)†	J$^\pi$‡	T$_{1/2}$#	Comments
0	0$^+$		
899.2 *9*	2$^+$		
1273 *5*	4$^+$		
1559 *5*	4$^+$		
1582.7 *9*	0$^+$@	65 ps *20*	J$^\pi$: 1988Ha16 in (n,n′γ) report J$^\pi$=2$^+$ for a level at 1582.8, and suggest that the 1582.7 E0 is due to an impurity; however, 1989Tr14 establish by (p,p′) that there is a doublet at 1582 keV, conclusively refuting the suggestion of 1988Ha16. 1989Tr14 determine E(level)=1582.4 *7* for the 0$^+$ level.
1582.78 *6*	2$^+$		E(level): From Adopted Levels.
1730.0 *10*	0$^+$@	<20 ps	
2433.0 *10*	0$^+$@		Interpreted by 1986Ka07 as a proton two-particle two-hole intruder state.

† From a least-squares fit to Eγ, except as noted.
‡ From Adopted Levels, except as noted.
# From Ce(t) in 1986Ka07.
@ From 1986Ka07.

γ(^{204}Pb)

ce(K) and ce(L), in arbitrary units with no uncertainties given, and K/L ratios are from 1970Go09.
Additional information 2.
1986Ka07 found no additional 0$^+$ levels up to 4 MeV, concluding that the electron lines for any such levels must have well below 10% the intensity ce(K) of the E0 from the 2433-keV 0$^+$ level.

E$_\gamma$‡	I$_\gamma$#	E$_i$(level)	J$_i^\pi$	E$_f$	J$_f^\pi$	Mult.	α†	Comments
286 *3*	11 *CA*	1559	4$^+$	1273	4$^+$	[M1+E2]	0.31 *18*	α(K)=0.24 *17*; α(L)=0.057 *12*; α(M)=0.0138 *22*; α(N+..)=0.0042 *8* α(N)=0.0035 *6*; α(O)=0.00067 *14*; α(P)=6.E−5 *3* ce(K)=21, ce(L)=6.2, K/L=3.4 *5*.
374 *5*	44 *CA*	1273	4$^+$	899.2	2$^+$	[E2]	0.0617 *25*	α(K)=0.0392 *14*; α(L)=0.0169 *9*; α(M)=0.00429 *22*; α(N+..)=0.00130 *7* α(N)=0.00109 *6*; α(O)=0.000202 *11*; α(P)=1.38×10^{-5} *6* ce(K)=8.3.
660 *8*	3.9 *CA*	1559	4$^+$	899.2	2$^+$	[E2]	0.0156 *5*	α(K)=0.0118 *4*; α(L)=0.00290 *11*; α(M)=0.00071 *3*; α(N+..)=0.000217 *8*

Continued on next page (footnotes at end of table)

^{205}Tl(p,2nγ),^{204}Pb(p,p$'\gamma$) 1970Go09,1986Ka07,1989Tr14 (continued)

γ(^{204}Pb) (continued)

E_γ[‡]	I_γ[#]	E_i(level)	J_i^π	E_f	J_f^π	Mult.	α[†]	Comments
								α(N)=0.000179 *7*; α(O)=3.44×10^{-5} *13*; α(P)=2.98×10^{-6} *10* ce(K)=0.22.
683.5 *10*	7.6 *CA*	1582.7	0$^+$	899.2	2$^+$	[E2]	0.01446	α(K)=0.01098 *16*; α(L)=0.00264 *4*; α(M)=0.000642 *10*; α(N+..)=0.000197 *3* α(N)=0.0001627 *24*; α(O)=3.13×10^{-5} *5*; α(P)=2.74×10^{-6} *4* Eγ: Results of 1989Tr14 suggest that this γ is a doublet. Eγ measured in 1986Ka07 $\gamma\gamma$-coin but quoted in 1989Tr14. Iγ: Upper limit, due to doublet. ce(K)=0.4.
899.2 *10*	100	899.2	2$^+$	0	0$^+$	[E2]	0.00821 *12*	α(K)=0.00647 *10*; 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)=1.561×10^{-5} *23*; α(P)=1.473×10^{-6} *21* ce(K)=3.1, ce(L)=0.83, K/L=3.7 *4*.
1582.7 *10*		1582.7	0$^+$	0	0$^+$	E0[@]		ce(K)=0.13, K/L=3.4 *16*. 1986Ka07 report ce(K)(E0)/ce(K)(E2)=0.60 *6* in (p,2nγ). 1989Tr14 report ce(K)(E0)/ce(K)(E2)>14 in (p,p$'\gamma$).
1730 *1*		1730.0	0$^+$	0	0$^+$	E0[@]		ce(K)(E0)/ce(K)(E2)>5 (1986Ka07).
2433 *1*		2433.0	0$^+$	0	0$^+$	E0[@]		ce(K)(E0)/ce(K)(E2)>15 (1986Ka07).

[†] Additional information 3.
[‡] From 1970Go09 for Eγ<680 keV and 1986Ka07 otherwise.
[#] Calculated from ce(K) of 1970Go09 and α(K) using Iγ=N*ce(K)/α(K), with N=0.209 to normalize Iγ(899) to 100.
[@] From ce data of 1986Ka07.

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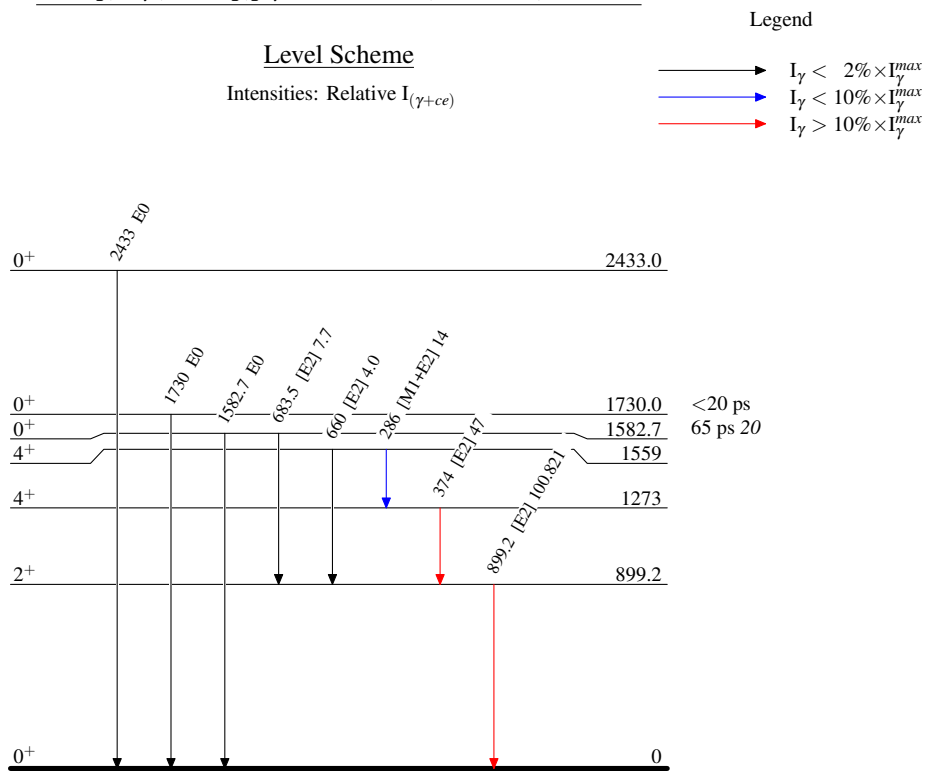
Level Scheme

Intensities: Relative $I_{(\gamma+ce)}$



$^{204}_{82}Pb_{122}$