^{205}Tl(α,3nγ) 1978Lo09,1974Ra25

Type	Author	History Citation	Literature Cutoff Date
Full Evaluation	F. G. Kondev	NDS 201,346 (2025)	21-Jan-2025

1978Lo09: Eα=35-51 MeV, pulsed beam measurements at Eα=43 MeV with pulse separation of 112 ns; Detectors: Ge(Li), Si(Li); Measured: Eγ,Iγ,$\gamma\gamma$ singles, excitation functions, $\gamma\gamma$ coin, γ(t), $\gamma(\theta)$, ce; Deduced: level scheme, J^π, transition multipolarities, $T_{1/2}$.

1974Ra25: Eα=37.8 MeV, pulsed beam measurements; Detectors: orange type beta spectrometer; Measured: ce, $T_{1/2}$.

Others: 1991Sc14, 1975GoZB, 1973Co30, 1973Sc21.

^{206}Bi Levels

E(level)†	J$^\pi$‡	$T_{1/2}$	Comments
0.0	6$^+$	6.243 d *3*	$T_{1/2}$: From Adopted Levels. Configuration=$\pi(h^{+1}_{9/2})\otimes\nu(f^{-1}_{5/2})$.
141.2 *5*	7$^+$		Configuration=$\pi(h^{+1}_{9/2})\otimes\nu(f^{-1}_{5/2})$.
815.8 *7*	8$^+$		
1044.8 *7*	10$^-$	0.89 ms *1*	μ=2.644 *14*; Q=0.049 *9* μ: From g-factor=0.2644 *14* in 1985No09, based on g-factor=0.2623 *13* (1973Sc21) using the in-beam NMR-PAC technique, but corrected for diamagnetic and Knight shifts in 1985No09. Q: Using the level mixing spectroscopy technique (1991Sc14). $T_{1/2}$: From ce(t) in 1974Ra25. Other: 1.0 ms *1* using 141γ(t), 229.4γ(t) and x-ray(t) in 1973Co30. Configuration=$\pi(h^{+1}_{9/2})\otimes\nu(i^{-1}_{13/2})$.
1080.9 *7*	8$^-$		Configuration=$\pi(h^{+1}_{9/2})\otimes\nu(i^{-1}_{13/2})$.
1258.3	9$^-$		Configuration=$\pi(h^{+1}_{9/2})\otimes\nu(i^{-1}_{13/2})$. The assignment is tentative.
1266.9 *9*	9$^+$		
1639.3 *8*	11$^-$		
1789.2 *8*	12$^-$		
2055.6 *10*	13$^-$		
2499.4 *10*	13$^-$		
2603.6 *11*	14$^-$		
3147.1 *12*	15$^+$	15.6 ns *3*	$T_{1/2}$: Weighted average of 16.3 ns *4* (543.5γ(t)), 15.9 ns *3* (548.0γ(t)), 15.5 ns *3* (266.4γ(t)), 15.1 ns *5* (149.9γ(t)) and 14.3 ns *5* (594.6γ(t)) in 1978Lo09. Configuration=$\pi(h^{+1}_{9/2})\otimes\nu(p^{-1}_{1/2},i^{-2}_{13/2})$.
3603.5? *13*	17$^+$		
3652.5? *13*	16$^+$		
4305.2? *14*	18$^+$		

† From a least-squares fit to Eγ.

‡ From 1978Lo09.

γ(^{206}Bi)

E$_\gamma$†	I$_\gamma$‡	E$_i$(level)	J$_i^\pi$	E$_f$	J$_f^\pi$	Mult.#	δ@	α&	Comments
141.2 *5*	100	141.2	7$^+$	0.0	6$^+$	M1+E2	−0.13 *3*	3.77 *7*	α(K)=3.05 *6*; α(L)=0.549 *11*; α(M)=0.1297 *25*; α(N+..)=0.0407 *8* α(N)=0.0332 *7*; α(O)=0.00676 *13*; α(P)=0.000796 *14* Mult.: A_2=−0.02 *3*, A_4=0.02 *7* (1978Lo09); K/L=5.4 *5* (1974Ra25); α(exp)>3.3 (1973Co30).
149.9 *5*	68	1789.2	12$^-$	1639.3	11$^-$	M1+E2	−0.05 *2*	3.21 *6*	α(K)=2.61 *5*; α(L)=0.458 *8*; α(M)=0.1078 *19*; α(N+..)=0.0339 *6* α(N)=0.0276 *5*; α(O)=0.00563 *10*; α(P)=0.000669 *12*

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^{205}Tl(α,3nγ) 1978Lo09,1974Ra25 (continued)

$\gamma(^{206}Bi)$ (continued)

E_γ[†]	I_γ[‡]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[#]	δ[@]	α[&]	Comments
									Mult.: A_2=−0.19 *4*, A_4=0.08 *7* and α(K)exp=0.25 *19* (1978Lo09).
213.5[a] *10*	12	1258.3	9$^-$	1044.8	10$^-$				
229.0 *5*	80	1044.8	10$^-$	815.8	8$^+$	M2		4.26 *7*	α(K)=3.11 *5*; α(L)=0.863 *14*; α(M)=0.216 *4*; α(N+..)=0.0684 *12* α(N)=0.0558 *9*; α(O)=0.01129 *19*; α(P)=0.001287 *21* Mult.: K/L=3.5 *1* and K/(L+M)=2.79 *9* (1974Ra25); α(exp)>4.8 *10* (1973Co30).
266.4 *5*	180	2055.6	13$^-$	1789.2	12$^-$	M1(+E2)	−0.01 *1*	0.643 *10*	α(K)=0.524 *8*; α(L)=0.0907 *14*; α(M)=0.0213 *4*; α(N+..)=0.00670 *10* α(N)=0.00545 *9*; α(O)=0.001115 *17*; α(P)=0.0001327 *20* Mult.: A_2=−0.21 *2*, A_4=0.07 *5* and α(K)exp=0.40 *16* (1978Lo09).
442.5[a] *10*	9	1258.3	9$^-$	815.8	8$^+$				
451.1 *5*	28	1266.9	9$^+$	815.8	8$^+$	M1+E2	0.15 *3*	0.1516 *25*	α(K)=0.1238 *20*; α(L)=0.0213 *4*; α(M)=0.00500 *8*; α(N+..)=0.001570 *24* α(N)=0.001277 *20*; α(O)=0.000261 *4*; α(P)=3.11×10^{-5} *5* Mult.: A_2=−0.33 *3*, A_4=0.07 *7* and α(K)exp=0.099 *13* (1978Lo09).
456.4 *5*	53	3603.5?	17$^+$	3147.1	15$^+$	(E2)		0.0384	α(K)=0.0260 *4*; α(L)=0.00930 *14*; α(M)=0.00234 *4*; α(N+..)=0.000723 *11* α(N)=0.000596 *9*; α(O)=0.0001154 *17*; α(P)=1.115×10^{-5} *16* Mult.: A_2=0.09 *3*, A_4=0.04 *6* and α(K)exp=0.05 *4* (1978Lo09).
505.4 *5*	46	3652.5?	16$^+$	3147.1	15$^+$	M1+E2	0.14 *2*	0.1123 *17*	α(K)=0.0918 *14*; α(L)=0.01570 *23*; α(M)=0.00368 *6*; α(N+..)=0.001158 *17* α(N)=0.000942 *14*; α(O)=0.000193 *3*; α(P)=2.29×10^{-5} *4* Mult.: A_2=−0.46 *7*, A_4=0.10 *9* and α(K)exp>0.037 *7* (1978Lo09).
543.5 *5*	189	3147.1	15$^+$	2603.6	14$^-$	E1		0.00835	α(K)=0.00690 *10*; α(L)=0.001112 *16*; α(M)=0.000259 *4*; α(N+..)=8.06×10^{-5} *12* α(N)=6.58×10^{-5} *10*; α(O)=1.327×10^{-5} *19*; α(P)=1.521×10^{-6} *22* Mult.: A_2=−0.12 *2*, A_4=0.09 *4* and α(K)exp=0.0035 *15* (1978Lo09).
548.0 *5*	216	2603.6	14$^-$	2055.6	13$^-$	M1+E2	−0.07 *1*	0.0917	α(K)=0.0750 *11*; α(L)=0.01276 *19*; α(M)=0.00299 *5*; α(N+..)=0.000940 *14* α(N)=0.000765 *11*; α(O)=0.0001564 *23*; α(P)=1.86×10^{-5} *3* Mult.: A_2=−0.35 *2*, A_4=0.05 *5* and α(K)exp=0.036 *3* (1978Lo09).
594.6 *5*	405	1639.3	11$^-$	1044.8	10$^-$	M1+E2	0.16 *3*	0.0729 *12*	α(K)=0.0596 *10*; α(L)=0.01015 *16*; α(M)=0.00238 *4*; α(N+..)=0.000747 *12* α(N)=0.000608 *10*; α(O)=0.0001243 *20*; α(P)=1.481×10^{-5} *24* Mult.: A_2=−0.42 *3*, A_4=−0.03 *8* and α(K)exp=0.031 (1978Lo09).
674.6 *5*	447	815.8	8$^+$	141.2	7$^+$	M1+E2	0.08 *3*	0.0531	α(K)=0.0435 *7*; α(L)=0.00735 *11*;

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^{205}Tl(α,3nγ) 1978Lo09,1974Ra25 (continued)

$\gamma(^{206}Bi)$ (continued)

E_γ[†]	I_γ[‡]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[#]	δ[@]	α[&]	Comments
									α(M)=0.001721 *25*; α(N+..)=0.000541 *8* α(N)=0.000440 *7*; α(O)=9.00×10^{-5} *13*; α(P)=1.074×10^{-5} *16* Mult.: A_2=−0.08 *3*, A_4=−0.05 *6* (1978Lo09); K/(L+M)=4.66 *9* (1974Ra25).
701.7 *5*	50	4305.2?	18$^+$	3603.5?	17$^+$	M1(+E2)	−0.01 *3*	0.0481	α(K)=0.0394 *6*; α(L)=0.00665 *10*; α(M)=0.001557 *22*; α(N+..)=0.000489 *7* α(N)=0.000398 *6*; α(O)=8.14×10^{-5} *12*; α(P)=9.72×10^{-6} *14* Mult.: A_2=−0.19 *5*, A_4=0.25 *11* and α(K)exp=0.025 *6* (1978Lo09).
710.2 *5*	53	2499.4	13$^-$	1789.2	12$^-$	M1(+E2)	0.00 *3*	0.0466	α(K)=0.0382 *6*; α(L)=0.00644 *10*; α(M)=0.001509 *22*; α(N+..)=0.000474 *7* α(N)=0.000386 *6*; α(O)=7.89×10^{-5} *12*; α(P)=9.42×10^{-6} *14* Mult.: A_2=−0.44 *4*, A_4=−0.28 *7* (1978Lo09).
744.3 *5*	102	1789.2	12$^-$	1044.8	10$^-$	E2		0.01266	α(K)=0.00968 *14*; α(L)=0.00226 *4*; α(M)=0.000549 *8*; α(N+..)=0.0001708 *25* α(N)=0.0001401 *20*; α(O)=2.78×10^{-5} *4*; α(P)=2.96×10^{-6} *5* Mult.: A_2=0.22 *3*, A_4=−0.09 *5* and α(K)exp=0.0067 *23* (1978Lo09).
903.6 *5*	60	1044.8	10$^-$	141.2	7$^+$	E3		0.0207	α(K)=0.01476 *21*; α(L)=0.00448 *7*; α(M)=0.001119 *16*; α(N+..)=0.000349 *5* α(N)=0.000286 *4*; α(O)=5.64×10^{-5} *8*; α(P)=5.87×10^{-6} *9* Mult.: α(K)exp=0.011 *3* (1978Lo09); K/LM=2.9 *2* (1974Ra25).
939.7 *5*	51	1080.9	8$^-$	141.2	7$^+$	E1+M2	0.04 *3*		α(K)=0.00243 *4*; α(L)=0.000375 *6*; α(M)=8.68×10^{-5} *13*; α(N+..)=2.71×10^{-5} *4* α(N)=2.21×10^{-5} *4*; α(O)=4.49×10^{-6} *7*; α(P)=5.27×10^{-7} *8* Mult.: A_2=−0.20 *3*, A_4=−0.01 *7* and α(K)exp=0.0034 *30* (1978Lo09).

[†] From 1978Lo09. Uncertainties are assigned by the evaluator.
[‡] Prompt singles values deduced from the Eα=43 MeV data in 1978Lo09.
[#] From α(K)exp and $\gamma(\theta)$ in 1978Lo09 (α(K)exp was normalized to that for M2 229γ); α(exp) (1973Co30) and ce subshell ratios (1974Ra25).
[@] From $\gamma(\theta)$ in 1978Lo09.
[&] Total theoretical internal conversion coefficients, calculated using the BrIcc code (2008Ki07) with "Frozen Orbitals" approximation based on γ-ray energies, assigned multipolarities, and mixing ratios, unless otherwise specified.
[a] Placement of transition in the level scheme is uncertain.

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Level Scheme

Intensities: Relative I_γ

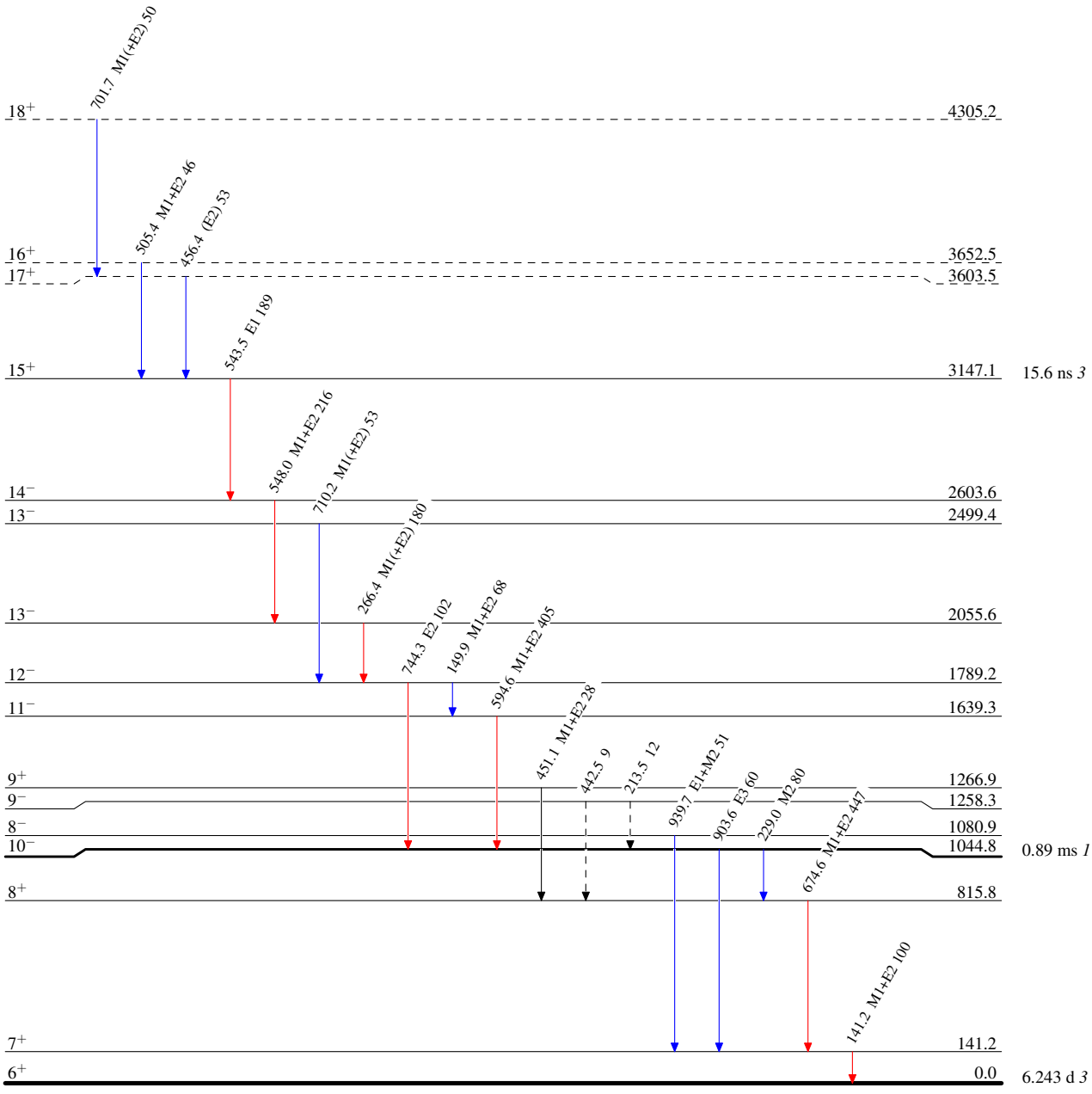
Legend

$I_\gamma < 2\% \times I_\gamma^{max}$

$I_\gamma < 10\% \times I_\gamma^{max}$

$I_\gamma > 10\% \times I_\gamma^{max}$

γ Decay (Uncertain)



$^{206}_{83}Bi_{123}$