

$^{205}\text{Tl}(^9\text{Be},4n\gamma)$ 1987Dr01

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

Target: 96.4% enriched ^{205}Tl , E=55 MeV. Measured $E_\gamma, I_\gamma, \gamma(t), \gamma\gamma(t)$. Deduced level half-lives. Detectors: Ge(Li), Ge(Li) Compton suppressed. Others: 1999Pa54, 1994Si23, 1992Si26, 1992Ra29.

 ^{210}At Levels

The isomers at 2550 keV ($J^\pi=15^-$) and 4028 keV ($J^\pi=19^+$) in ^{210}At , and those at 2429 keV ($J^\pi=29/2^+$) in ^{209}At , and at 4816 keV ($J^\pi=39/2^-$) in ^{211}At have related configurations formed by aligning the valence protons. The similarity of B(E3) values for the transitions which deexcite these isomers, and also that of the corresponding g-factors, confirm this interpretation. See 1987Dr01 for a calculation of these quantities using a model that includes coupling to the $J^\pi=3^-$ core vibration.

<u>E(level)[†]</u>	<u>J^π#</u>	<u>T_{1/2}[‡]</u>	<u>E(level)[†]</u>	<u>J^π#</u>	<u>T_{1/2}[‡]</u>	<u>E(level)[†]</u>	<u>J^π#</u>	<u>T_{1/2}[‡]</u>
0.0	(5) ⁺		1906 1	(12) ⁺		3108 1	(16) ⁻	
507.2 5	(6) ⁺		2044 1	(13) ⁺		3543 1	(17) ⁻	
576.6 5	(7) ⁺		2550 1	(15) ⁻	0.48 μs 1	3552 1		
1252.3 7	(9) ⁺		2573 1	(14) ⁻		3656 1	(16) ⁻	
1364 1	(11) ⁺	28.4 ns 14	2784 1	(15) ⁻		4028 1	(19) ⁺	5.90 μs 17

[†] Deduced by evaluator from a least-squares fit to γ -ray energies using an estimated $\Delta E=0.5$ keV for all γ rays.

[‡] From $\gamma(t)$ pulsed beam method, and $\gamma\gamma(t)$.

From Adopted Levels.

 $\gamma(^{210}\text{At})$

<u>E_γ</u>	<u>I_γ[†]</u>	<u>E_i(level)</u>	<u>J_i^π</u>	<u>E_f</u>	<u>J_f^π</u>	<u>Mult.</u>	<u>α[‡]</u>	<u>Comments</u>
103.9	≤33	3656	(16) ⁻	3552				I _γ : partially resolved from a 103.5 keV activity line.
111.4	173 7	1364	(11) ⁺	1252.3	(9) ⁺			
137.6	10.2 7	2044	(13) ⁺	1906	(12) ⁺			
211.3	38.9 7	2784	(15) ⁻	2573	(14) ⁻			
372.3	280 4	4028	(19) ⁺	3656	(16) ⁻	[E3]	0.324	
								α(K)=0.1106 16; α(L)=0.1571 22; α(M)=0.0424 6 α(N)=0.01104 16; α(O)=0.00221 3; α(P)=0.000243 4
435.2	245 4	3543	(17) ⁻	3108	(16) ⁻			
485.1	181 4	4028	(19) ⁺	3543	(17) ⁻			
507.2	182 20	507.2	(6) ⁺	0.0	(5) ⁺			
529.3	141 3	2573	(14) ⁻	2044	(13) ⁺			
^x 540.1 [#]	60 6							
542.1	794 12	1906	(12) ⁺	1364	(11) ⁺			
557.7	225 11	3108	(16) ⁻	2550	(15) ⁻			
576.6	878 16	576.6	(7) ⁺	0.0	(5) ⁺			
^x 611.8	77 2							
644.5	761 13	2550	(15) ⁻	1906	(12) ⁺	[E3]	0.0549	α(K)=0.0329 5; α(L)=0.01640 23; α(M)=0.00425 6 α(N)=0.001106 16; α(O)=0.000226 4; α(P)=2.68×10 ⁻⁵ 4
675.7	1000 32	1252.3	(9) ⁺	576.6	(7) ⁺			
679.8	88 4	2044	(13) ⁺	1364	(11) ⁺			
768.3	112 3	3552		2784	(15) ⁻			
979.6	15 2	3552		2573	(14) ⁻			
1105.7	110 7	3656	(16) ⁻	2550	(15) ⁻			

Continued on next page (footnotes at end of table)

$^{205}\text{Tl}(^9\text{Be},4\text{n}\gamma)$ **1987Dr01 (continued)**

$\gamma(^{210}\text{At})$ (continued)

[†] Delayed intensities measured in the 0.2 to 18 μs interval after the 1 μs beam pulse.

[‡] [Additional information 1.](#)

[#] Placement of transition in the level scheme is uncertain.

^x γ ray not placed in level scheme.

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Level Scheme

Intensities: Relative I_γ

Legend

- $\longrightarrow$ $I_\gamma < 2\% \times I_\gamma^{\max}$
 $\longrightarrow$ $I_\gamma < 10\% \times I_\gamma^{\max}$
 $\longrightarrow$ $I_\gamma > 10\% \times I_\gamma^{\max}$

