

$^{205}\text{Tl}(\text{n},\text{n}'\gamma)$ 1981He14

Type	Author	History Citation	Literature Cutoff Date
Full Evaluation	F. G. Kondev	NDS 166, 1 (2020)	20-Apr-2020

1981He14: E(n)=2.75 MeV; Target: natural thallium; Detectors:Ge(Li); Measured: E γ , I γ ; Deduced: absolute cross sections for γ emission.

Others: 1970Ba38, 1970Fe07, 1975Ah02, 1977Da06.

 ^{205}Tl Levels

$\sigma(\text{n},\text{n}')$ in millibarns from 1981He14.

E(level) [†]	J π [‡]	Comments
0	1/2 ⁺	
203.71 3	3/2 ⁺	$\sigma(\text{n},\text{n}')=461$ 144.
619.41 4	5/2 ⁺	$\sigma(\text{n},\text{n}')=307$ 36.
923.73 5	(7/2 ⁺)	$\sigma(\text{n},\text{n}')=305$ 41.
1140.73 4	3/2 ⁺	$\sigma(\text{n},\text{n}')=136$ 15.
1180.00 6	(5/2 ⁺)	J π : From Adopted Levels. $\sigma(\text{n},\text{n}')=160$ 16.
1219.08 7	1/2 ⁺	
1340.29 6	3/2 ⁺	$\sigma\geq 57$.
1429.55 5	(9/2 ⁺)	$\sigma(\text{n},\text{n}')=183$ 15.
1433.79 10	(1/2 ⁺)	$\sigma(\text{n},\text{n}')=28$ 5.
1438.45 10	(1/2,3/2,5/2 ⁺)	$\sigma(\text{n},\text{n}')=69$ 7.
1554.60 6	(3/2 ⁺)	J π : From Adopted Levels. $\sigma(\text{n},\text{n}')=88$ 6.
1574.03 8	(1/2 ⁺ ,3/2 ⁺)	$\sigma(\text{n},\text{n}')=28$ 3.
1710.99 7	(1/2,3/2,5/2 ⁺)	$\sigma(\text{n},\text{n}')=54$ 4.
1866.4 4	(5/2 ⁺)	
1966.39 9	(1/2 ⁺ ,3/2 ⁺)	$\sigma(\text{n},\text{n}')=14.7$ 13.
2002.45 8	(3/2 ⁺)	$\sigma(\text{n},\text{n}')=16.2$ 16.
2089.04 9	(1/2 ⁺ ,3/2 ⁺)	$\sigma(\text{n},\text{n}')=12.6$ 12.
2098.22 14	(1/2 ⁺ ,3/2,5/2 ⁺)	$\sigma(\text{n},\text{n}')=5.4$ 7.
2163.25 9	(1/2 ⁺ ,3/2,5/2 ⁺)	$\sigma(\text{n},\text{n}')=14.8$ 13.
2220.0? 6	(1/2 ⁺ ,3/2 ⁺)	
2303.96 16	(1/2 ⁺ ,3/2 ⁺)	
2316.26 7	(1/2 ⁺ ,3/2 ⁺)	$\sigma(\text{n},\text{n}')=26.8$ 23.
2488.47 13	(3/2 ⁺ ,5/2,7/2 ⁺)	$\sigma(\text{n},\text{n}')=5.7$ 6.
2554.10 15	(1/2 ⁺ ,3/2 ⁺)	
2623.08 8	(5/2 ⁻)	$\sigma(\text{n},\text{n}')=17.5$ 16.
2720.8 3	(1/2 ⁺ ,3/2 ⁺)	$\sigma>5.6$.

[†] From a least-squares fit to E γ .

[‡] From 1981He14, unless otherwise stated.

 $\gamma(^{205}\text{Tl})$

E γ [†]	I γ [†]	E $_i$ (level)	J π _i	E $_f$	J π _f	Mult. [‡]	δ [‡]
203.74 4	100	203.71	3/2 ⁺	0	1/2 ⁺	M1+E2	+1.7 +54-9
256.14 13	16.4 20	1180.00	(5/2 ⁺)	923.73	(7/2 ⁺)		
374.70 19	18 3	1554.60	(3/2 ⁺)	1180.00	(5/2 ⁺)		
415.71 5	92.8 9	619.41	5/2 ⁺	203.71	3/2 ⁺	M1+E2	+0.09 12

Continued on next page (footnotes at end of table)

$^{205}\text{Tl}(n,n'\gamma)$ **1981He14** (continued) $\gamma(^{205}\text{Tl})$ (continued)

$E_\gamma^\dagger$	$I_\gamma^\dagger$	$E_i(\text{level})$	J_i^π	E_f	J_f^π	Mult. ‡	$\delta^\ddagger$
491.88 5	67 3	1710.99	(1/2,3/2,5/2 ⁺)	1219.08	1/2 ⁺		
505.82 5	82.5 21	1429.55	(9/2 ⁺)	923.73	(7/2 ⁺)		
521.30 5	20.1 24	1140.73	3/2 ⁺	619.41	5/2 ⁺	M1+E2	>2.2
560.7 3	32 5	1180.00	(5/2 ⁺)	619.41	5/2 ⁺		
570.33 7	33 3	1710.99	(1/2,3/2,5/2 ⁺)	1140.73	3/2 ⁺		
619.35 7	7.2 9	619.41	5/2 ⁺	0	1/2 ⁺		
630.90 5	48 3	1554.60	(3/2 ⁺)	923.73	(7/2 ⁺)		
720.03 5	100	923.73	(7/2 ⁺)	203.71	3/2 ⁺		
747.3 3	23 4	1966.39	(1/2 ⁺ ,3/2 ⁺)	1219.08	1/2 ⁺		
810.13 5	17.5 21	1429.55	(9/2 ⁺)	619.41	5/2 ⁺		
854.42 23		2720.8	(1/2 ⁺ ,3/2 ⁺)	1866.4	(5/2 ⁺)		
937.08 7	60.0 4	1140.73	3/2 ⁺	203.71	3/2 ⁺	M1+E2	>4
964.85 [#] 20		2303.96	(1/2 ⁺ ,3/2 ⁺)	1340.29	3/2 ⁺		
976.30 5	50 5	1180.00	(5/2 ⁺)	203.71	3/2 ⁺		
1000.9 6		2220.0 [?]	(1/2 ⁺ ,3/2 ⁺)	1219.08	1/2 ⁺		
1077.8 5	10 4	2002.45	(3/2 ⁺)	923.73	(7/2 ⁺)		
1136.56 6		1340.29	3/2 ⁺	203.71	3/2 ⁺	M1+E2	>0.5
1140.74 6	20.1 24	1140.73	3/2 ⁺	0	1/2 ⁺	M1(+E2)	-0.25 24
1163.23 15		2303.96	(1/2 ⁺ ,3/2 ⁺)	1140.73	3/2 ⁺		
1180.2 5	1.7 3	1180.00	(5/2 ⁺)	0	1/2 ⁺		
1218.96 9		1219.08	1/2 ⁺	0	1/2 ⁺		
1230.11 10	35 6	1433.79	(1/2 ⁺)	203.71	3/2 ⁺		
1234.75 10	93.8 10	1438.45	(1/2,3/2,5/2 ⁺)	203.71	3/2 ⁺		
1247.2 [#] 14		1866.4	(5/2 ⁺)	619.41	5/2 ⁺		
1282.75 8	50 5	2623.08	(5/2 ⁻)	1340.29	3/2 ⁺		
1340.28 16		1340.29	3/2 ⁺	0	1/2 ⁺		
1350.73 10	34 3	1554.60	(3/2 ⁺)	203.71	3/2 ⁺		
1383.05 7	90 4	2002.45	(3/2 ⁺)	619.41	5/2 ⁺		
1433.4 3	65 6	1433.79	(1/2 ⁺)	0	1/2 ⁺		
1438.34 21	6.2 10	1438.45	(1/2,3/2,5/2 ⁺)	0	1/2 ⁺		
1469.60 20	37 5	2089.04	(1/2 ⁺ ,3/2 ⁺)	619.41	5/2 ⁺		
1478.4 10	24 11	2098.22	(1/2 ⁺ ,3/2,5/2 ⁺)	619.41	5/2 ⁺		
1481.6 4	22 5	2623.08	(5/2 ⁻)	1140.73	3/2 ⁺		
1543.7 4	31 5	2163.25	(1/2 ⁺ ,3/2,5/2 ⁺)	619.41	5/2 ⁺		
1564.9 4	30 5	2488.47	(3/2 ⁺ ,5/2,7/2 ⁺)	923.73	(7/2 ⁺)		
1574.02 8	100	1574.03	(1/2 ⁺ ,3/2 ⁺)	0	1/2 ⁺		
1696.82 7	79 3	2316.26	(1/2 ⁺ ,3/2 ⁺)	619.41	5/2 ⁺		
1762.5 4	15 3	1966.39	(1/2 ⁺ ,3/2 ⁺)	203.71	3/2 ⁺		
1868.6 4	30 5	2488.47	(3/2 ⁺ ,5/2,7/2 ⁺)	619.41	5/2 ⁺		
1885.24 14	33 4	2089.04	(1/2 ⁺ ,3/2 ⁺)	203.71	3/2 ⁺		
1959.46 11	48 4	2163.25	(1/2 ⁺ ,3/2,5/2 ⁺)	203.71	3/2 ⁺		
1966.39 9	62 4	1966.39	(1/2 ⁺ ,3/2 ⁺)	0	1/2 ⁺		
2003.79 12	28 4	2623.08	(5/2 ⁻)	619.41	5/2 ⁺		
2089.09 12	30 4	2089.04	(1/2 ⁺ ,3/2 ⁺)	0	1/2 ⁺		
2098.22 14	76 11	2098.22	(1/2 ⁺ ,3/2,5/2 ⁺)	0	1/2 ⁺		
2101.4 3		2720.8	(1/2 ⁺ ,3/2 ⁺)	619.41	5/2 ⁺		
2112.57 10	21 3	2316.26	(1/2 ⁺ ,3/2 ⁺)	203.71	3/2 ⁺		
2163.36 14	21 3	2163.25	(1/2 ⁺ ,3/2,5/2 ⁺)	0	1/2 ⁺		
2284.77 13	40 5	2488.47	(3/2 ⁺ ,5/2,7/2 ⁺)	203.71	3/2 ⁺		
2554.08 15		2554.10	(1/2 ⁺ ,3/2 ⁺)	0	1/2 ⁺		

[†] From 1981He14.[‡] From $\gamma(\theta)$ in 1977Da06.[#] Placement of transition in the level scheme is uncertain.

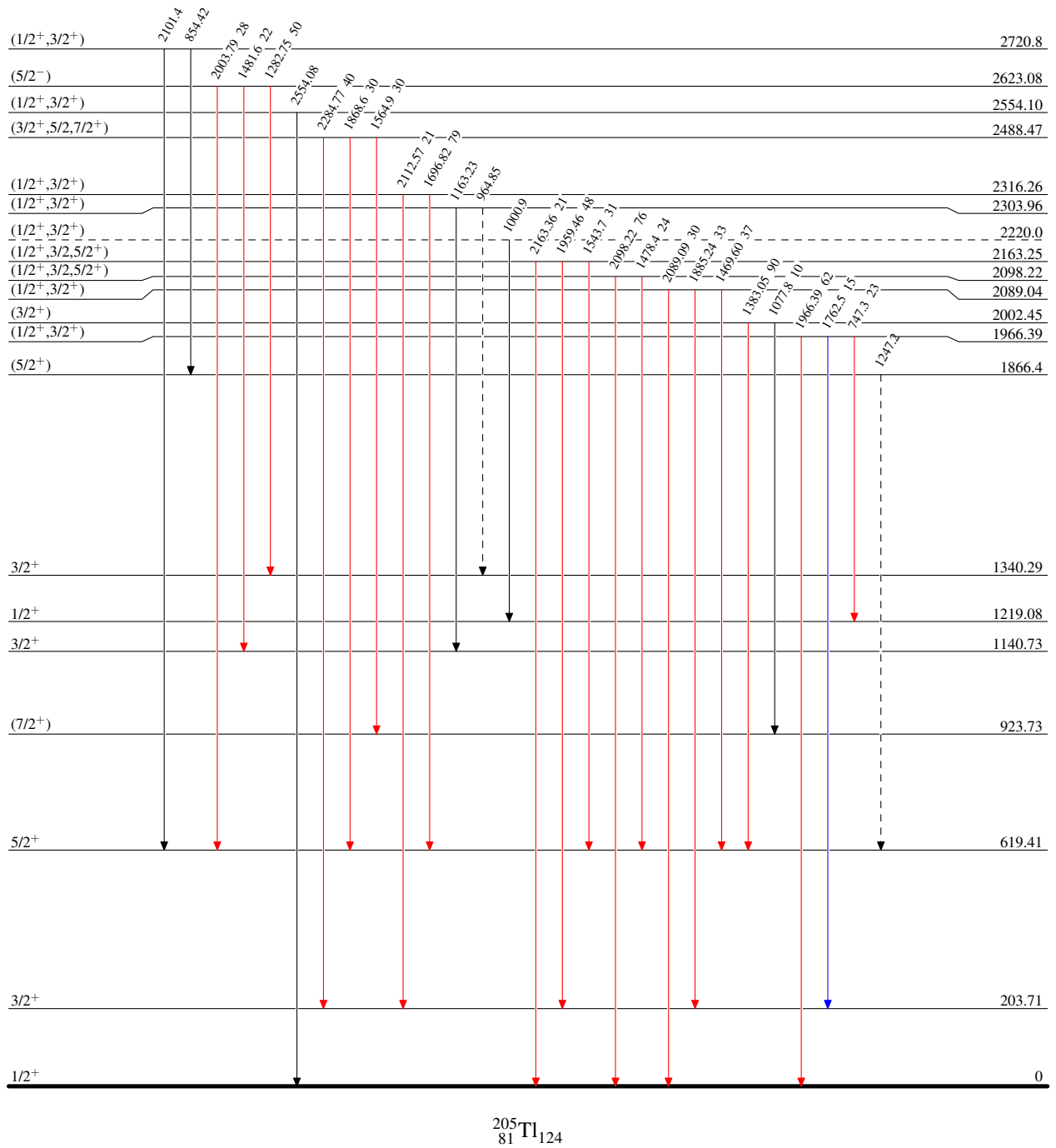
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Legend

Level Scheme

Intensities: Relative I_γ

- $\longrightarrow$ $I_\gamma < 2\% \times I_\gamma^{\max}$
 $\longrightarrow$ $I_\gamma < 10\% \times I_\gamma^{\max}$
 $\longrightarrow$ $I_\gamma > 10\% \times I_\gamma^{\max}$
 $\cdots\cdots\cdots\longrightarrow$ γ Decay (Uncertain)



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Level Scheme (continued)

Intensities: Relative I_γ

Legend

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

