

Adopted Levels, Gammas

Type	Author	History Citation	Literature Cutoff Date
Full Evaluation	S. -c. Wu	NDS 106,619 (2005)	1-Nov-2005

$Q(\beta^-) = -8.22 \times 10^3$ 3; $S(n) = 1.096 \times 10^4$ 3; $S(p) = 698$ 23; $Q(\alpha) = 5688$ 6 [2012Wa38](#)

Note: Current evaluation has used the following Q record -8210 60 10940 70 700 50 5690 50 [2003Au03](#).

 ^{185}Tl LevelsCross Reference (XREF) Flags

- A** ^{185}Tl IT decay (1.93 s)
B ^{189}Bi α decay (674 ms)
C ^{189}Bi α decay (5.0 ms)
D (HI,xny)

E(level) [†]	J ^π [‡]	T _{1/2}	XREF	Comments
0.0	(1/2 ⁺)	19.5 s 5	ABCD	$\% \epsilon + \% \beta^+ = ?$ T _{1/2} : From decay rate of $K\alpha_1$ x ray (Hg) (1993BoZK , 1991BoZV). Other value: 18 s 2, from growth and decay of ^{185}Hg in a ^{185}Tl source (1991BoZV). J ^π : analogy to other odd-A thallium isotopes suggests s _{1/2} assignment for the ground state.
184 9	(1/2, 3/2, 5/2)		C	E(level): From ^{189}Bi α decay (5.0 ms). J ^π : α -decay from ^{189}Bi (5.0 ms, J ^π =(1/2 ⁺)) with HF=2.
286.0 10	(3/2 ⁺)		AB D	J ^π : 284 γ M1+E2 to (1/2 ⁺). Energy systematics of 3/2 ⁺ states in odd-A thallium isotopes.
454.8 & 15	(9/2 ⁻)	1.93 s 8	AB D	$\% \text{IT} = ?$; $\% \alpha = ?$ $\% \alpha$: If $r_0 = 1.505$ 20 (based on $r_0(^{180}\text{Pt}) = 1.512$ 11 and $r_0(^{182}\text{Hg}) = 1.50$ 2 from 1998Ak04), T _{1/2} (^{185}Tl) = 1.93 s 8, $Q(\alpha) = 5744$ 50 (based on $E\alpha = 5976$ 4 from $^{185}\text{Tl}(454.8$ 15) to $^{181}\text{Au}(90$ 50)), then HF(5976 α) between 1 and 4 implies $\% \alpha(^{185}\text{Tl})$ is of the order of 2 1. However, the $Q(\alpha)$ assumed here differs from $Q(\alpha) = 5690$ 50 (2003Au03). T _{1/2} : Weighted average of 2.0 s 1 (1993BoZK), 1.7 s 2 (1976To06), 1.8 s 2 (1977Sc03), and 2.0 s 2 (1980Sc09). J ^π : 168.8 γ (E3) to (3/2 ⁺). Energy systematics of h _{9/2} states in odd-A thallium isotopes.
578 15	(11/2 ⁻)		B	E(level): from ^{189}Bi α decay (674 ms).
770.6 @ 15	(9/2 ⁻)		D	
862.2 & 15	(11/2 ⁻)		D	
983.3 @ 15	(13/2 ⁻)		D	
1004.5 a 15	(13/2 ⁺)	8.32 ns 14	D	T _{1/2} : from (HI,xny) (1995La08).
1011.8 # 15			D	
1211.6 b 15	(17/2 ⁺)		D	
1286.8 @ 15	(17/2 ⁻)		D	
1376.3 # 15			D	
1481.8 b 15	(21/2 ⁺)		D	
1665.8 @ 15	(21/2 ⁻)		D	
1792.6 # 15			D	
1844.7 b 15	(25/2 ⁺)		D	
2119.0 @ 15	(25/2 ⁻)		D	
2276.8 # 15			D	

Continued on next page (footnotes at end of table)

Adopted Levels, Gammas (continued) ^{185}Tl Levels (continued)

<u>E(level)[†]</u>	<u>$J^{\pi\ddagger}$</u>	<u>XREF</u>
2289.6 ^b 15	(29/2 ⁺)	D
2642? [@]		D
2806.9 ^b 15	(33/2 ⁺)	D
3388.1 ^b 16	(37/2 ⁺)	D
4010.1 ^b 16	(41/2 ⁺)	D
4672.4 ^b 16	(45/2 ⁺)	D

[†] From least squares fit to the E γ 's.[‡] From band structure from (HI,xn γ), except as noted.

Band(A): Band based on 1010 level.

@ Band(B): h_{9/2} band.

& Band(C): 9/2[505] band.

^a Band(D): 13/2[606] band.^b Band(E): Band based on 17/2⁺. $\gamma(^{185}\text{Tl})$

<u>E_i(level)</u>	<u>J^{π}_i</u>	<u>Eγ[†]</u>	<u>Iγ</u>	<u>E_f</u>	<u>J^{π}_f</u>	<u>Mult.[†]</u>	<u>$\delta^{\ddagger}$</u>	<u>$\alpha^{\#}$</u>	<u>Comments</u>
286.0	(3/2 ⁺)	286 1		0.0	(1/2 ⁺)	M1+E2 [‡]	0.91 20	0.318 34	E γ : From 1999An52.
454.8	(9/2 ⁻)	168.8 [‡]		286.0	(3/2 ⁺)	(E3) [‡]		8.93	
770.6	(9/2 ⁻)	315.8 2	100	454.8	(9/2 ⁻)	(D+Q)		0.23 13	
862.2	(11/2 ⁻)	407.4 2	100	454.8	(9/2 ⁻)	M1		0.178	
983.3	(13/2 ⁻)	212.7 1	100	770.6	(9/2 ⁻)	(Q)		0.336	
1004.5	(13/2 ⁺)	142.3 1	100 5	862.2	(11/2 ⁻)	E1		0.179	
		550.3 [@] 4	≈10	454.8	(9/2 ⁻)	(Q)		0.227	
1011.8		557.0 2	100	454.8	(9/2 ⁻)				
1211.6	(17/2 ⁺)	207.1 1	100	1004.5	(13/2 ⁺)	Q		0.368	
1286.8	(17/2 ⁻)	303.5 2	100	983.3	(13/2 ⁻)	(Q)		0.108	
1376.3		364.5 2	100	1011.8					
1481.8	(21/2 ⁺)	270.2 2	100	1211.6	(17/2 ⁺)	Q		0.154	
1665.8	(21/2 ⁻)	379.0 2	100	1286.8	(17/2 ⁻)	Q		0.0577	
1792.6		416.3 2	100	1376.3					
1844.7	(25/2 ⁺)	362.9 2	100	1481.8	(21/2 ⁺)	Q		0.0650	
2119.0	(25/2 ⁻)	453.2 2	100	1665.8	(21/2 ⁻)	Q		0.0362	
2276.8		484.2 3	100	1792.6					
2289.6	(29/2 ⁺)	444.9 2	100	1844.7	(25/2 ⁺)	Q		0.0379	
2642?		525 [@]		2119.0	(25/2 ⁻)				
2806.9	(33/2 ⁺)	517.3 2	100	2289.6	(29/2 ⁺)	Q		0.0262	
3388.1	(37/2 ⁺)	581.2 3	100	2806.9	(33/2 ⁺)	(Q)		0.0200	
4010.1	(41/2 ⁺)	622.0 3	100	3388.1	(37/2 ⁺)	(Q)		0.0171	
4672.4	(45/2 ⁺)	662.3 4	100	4010.1	(41/2 ⁺)	(Q)		0.0149	

[†] From (HI,xn γ), except as noted.[‡] From IT decay (1.83 s).# Total theoretical internal conversion coefficients, calculated using the BrIcc code (2008Ki07) with Frozen orbital approximation based on γ -ray energies, assigned multipolarities, and mixing ratios, unless otherwise specified.

@ Placement of transition in the level scheme is uncertain.

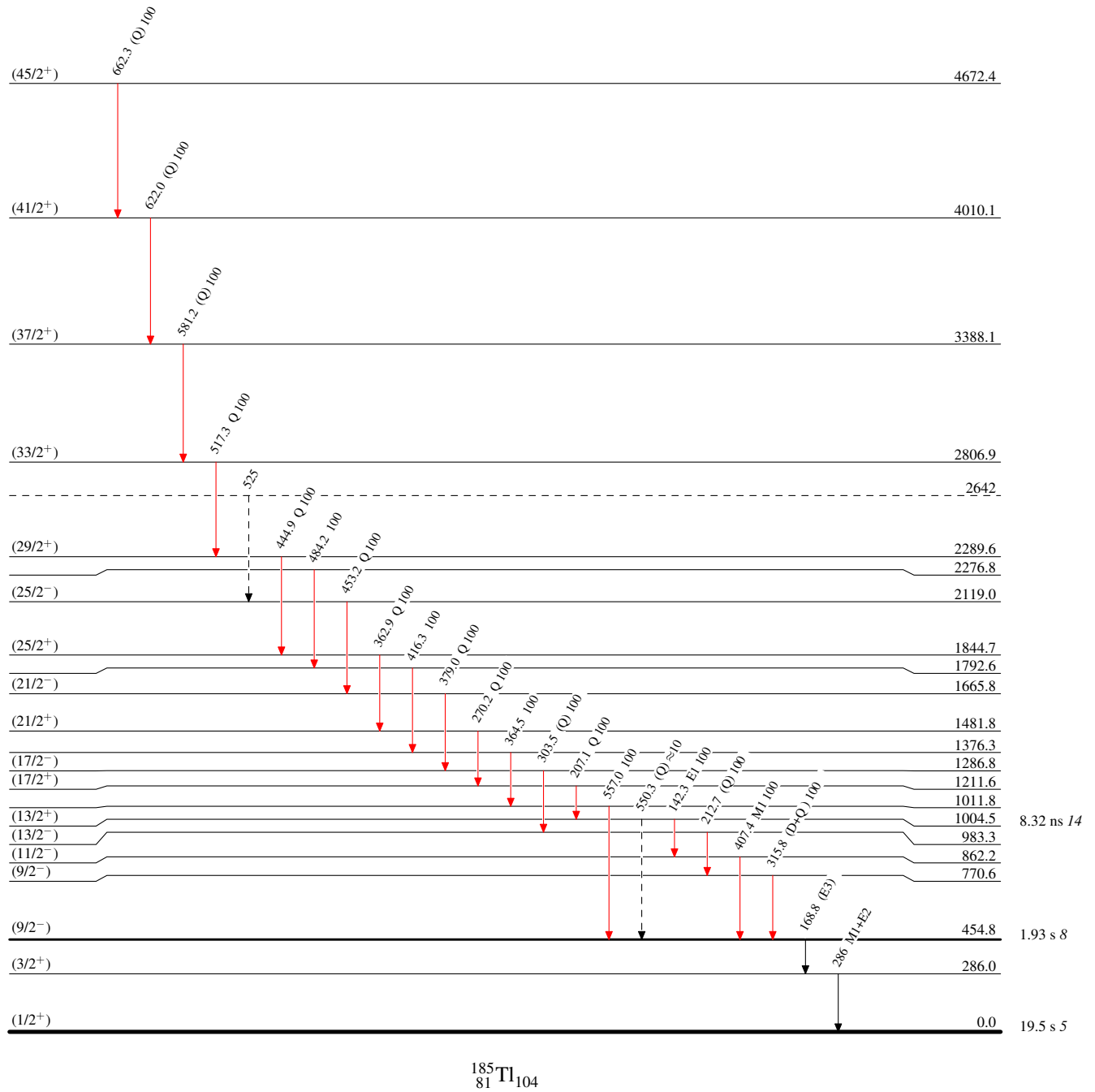
Adopted Levels, Gammas

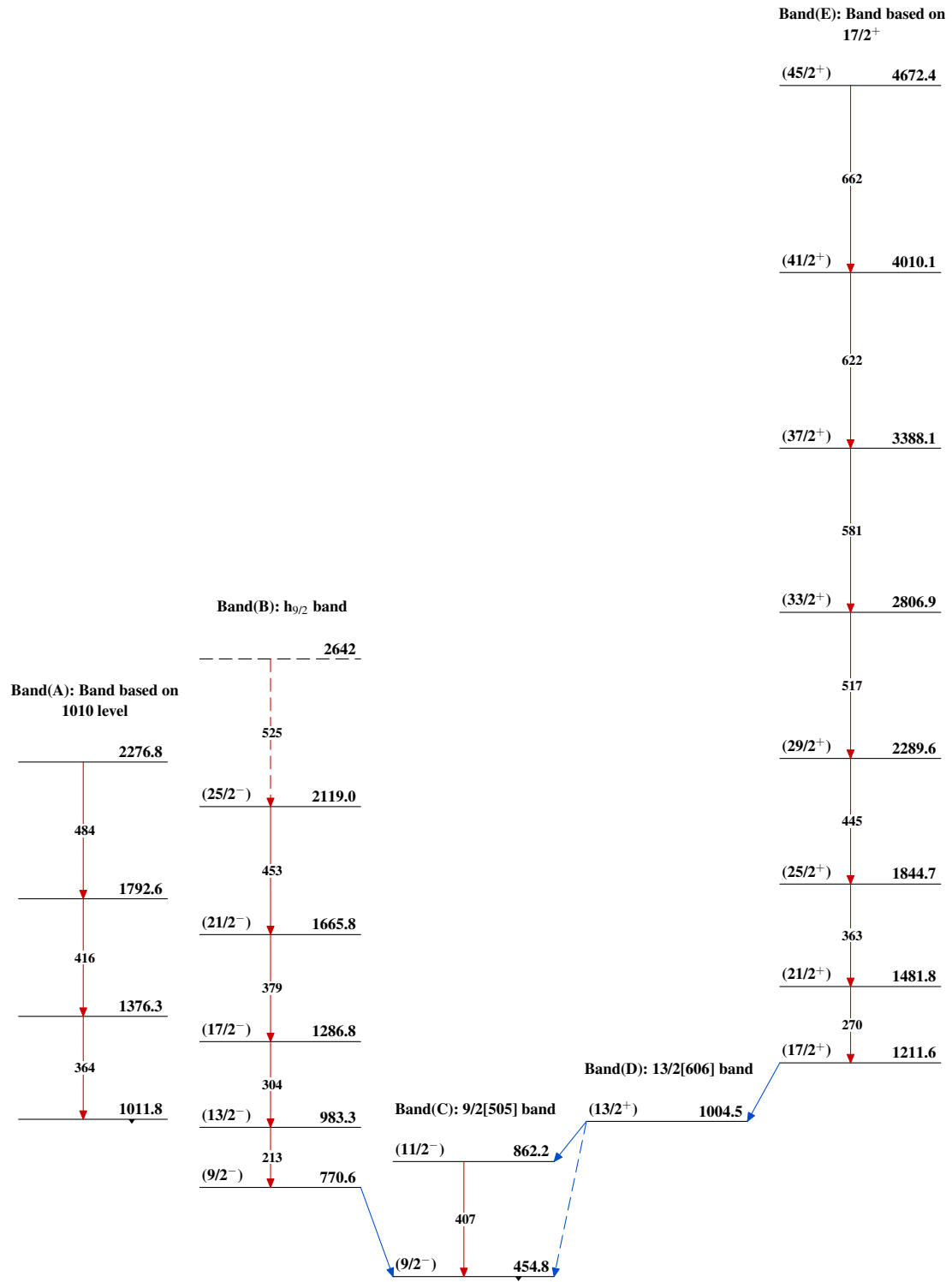
Legend

Level Scheme

Intensities: Type not specified

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



Adopted Levels, Gammas $^{185}_{81}\text{Tl}_{104}$