

Adopted Levels, Gammas

Type	Author	History Citation	Literature Cutoff Date
Full Evaluation	M. S. Basunia	NDS 110, 999 (2009)	1-Nov-2008

$Q(\beta^-) = -7464$ 12; $S(n) = 10.32 \times 10^3$ 18; $S(p) = 1193$ 14; $Q(\alpha) = 5318$ 8 [2003Au03](#)

Transition quadrupole moment Q_t is related to the level lifetime by $Q_t(J \rightarrow J-2) = 0.906 \sqrt{(p_\gamma(J \rightarrow J-2) / (\tau \times E_\gamma^5(J \rightarrow J-2)))} \times \text{JK20 I J-2K>} [\text{eb}]$ and is reported by [2005Ch38](#) ($^{159}\text{Tb}(^{32}\text{S}, 4n\gamma)$) for some levels.

Measured Mass Excess: $^{187}\text{Tl}^m = -22154$ keV 23 ([2008We02](#)).

 ^{187}Tl Levels

The band structure is adopted from ($^{32}\text{S}, 4n\gamma$), for which the data are more extensive than that by the $^{156}\text{Gd}(^{35}\text{Cl}, 4n\gamma)$ study.

While the gross structure of the level schemes deduced from the two reactions is in agreement, there are many smaller differences which are noted in the ($^{35}\text{Cl}, 4n\gamma$) data set.

Cross Reference (XREF) Flags

A	^{187}Tl IT decay (15.60 s)	E	^{191}Bi α decay (125 ms)
B	^{187}Pb ε decay (15.2 s)	F	$^{156}\text{Gd}(^{35}\text{Cl}, 4n\gamma)$
C	^{187}Pb ε decay (18.3 s)	G	$^{159}\text{Tb}(^{32}\text{S}, 4n\gamma)$,
D	^{191}Bi α decay (12.4 s)		

E(level) [†]	J^π [‡]	$T_{1/2}$ [#]	XREF	Comments
0.0 ^a	(1/2 ⁺)	≈51 s	ABCDE	$\% \varepsilon + \% \beta^+ = 100$; $\% \alpha \approx 0.03$ $\mu = 1.55$ 6 μ : From 1992Sc25 (collinear fast beam laser spectroscopy); ^{205}Tl standard. μ consistent with that expected for a pure $\pi s_{1/2}$ shell-model configuration (1992Sc25). Same value in 2005St24 . J^π : systematics of heavier odd-A Tl isotopes; supported by μ . $T_{1/2}$: the decay of ^{187}Tl g.s. to ^{187}Hg was observed by 1980WoZP . $T_{1/2}$ should be considered preliminary (private communication). $\% \alpha$: Estimated by the evaluator using α t, calculated by 1997Mo25 . J^π : 299.5 γ M1+E2 to (1/2 ⁺); energy systematics of 3/2 ⁺ levels.
299.33 ^a 25	(3/2 ⁺)		ABC	J^π : 299.5 γ M1+E2 to (1/2 ⁺); energy systematics of 3/2 ⁺ levels.
334 [@] 4	(9/2 ⁻)	15.60 s 12	A CD FG	$\% \alpha = 0.15$ 5 (1991Wa21); $\% \varepsilon + \% \beta^+ < 99.9$; $\% \text{IT} < 99.9$ $\mu = (+)3.79$ 2; $Q = -2.43$ 5 Additional information 1. E(level): From ^{191}Bi α decay (12.4 s). μ, Q : both from 1992Sc25 (collinear fast beam laser spectroscopy). μ is consistent with that expected for a pure $\pi h_{9/2}$ shell model configuration (1992Sc25). J^π : systematics of heavier odd-A Tl isotopes; supported by μ . $T_{1/2}$: from 1981Mi12 in ^{187}Tl IT decay. Other values: 18 s 3 (1976To06), 16 s 1 (1977Sc03). J^π : γ to (9/2 ⁻) 335 level.
677.80 20	(≥5/2)		C G	J^π : γ to (9/2 ⁻) 335 level.
728.10 [@] 8	(11/2 ⁻)		C FG	J^π : 394.1 γ (M1+E2) to (9/2 ⁻).
747.87 ^a 25	(5/2 ⁺)		B	J^π : based on systematics of lowest-energy 5/2 ⁺ states in odd-A Tl isotopes (1981Mi12).
871.8? 4			C	
950.90 ^b 20	(11/2 ⁻)		G	J^π : 616.9 γ to (9/2 ⁻), band assignment.
996.34 [@] 8	(13/2 ⁻)	2.0 ps 2	FG	J^π : 662.3 γ E2 to (9/2 ⁻), 268.3 γ D to (11/2 ⁻).

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Adopted Levels, Gammas (continued)

^{187}Tl Levels (continued)					
E(level) [†]	J ^π [‡]	T _{1/2} [#]	XREF	Comments	
1059.65 ^c 13	(13/2 ⁺)	0.69 ns 14	C FG	Q _t =2.6 eb 3 (³² S,4nγ). J ^π : 331.5γ (E1) to (11/2 ⁻). T _{1/2} : from γγ(t) ((³² S,4nγ)–1995La08). J ^π : 343.5γ to (11/2 ⁻). J ^π : 476.9γ to (11/2 ⁻). J ^π : 309.8γ to (11/2 ⁻) and band assignment.	
1072.6? 4	(≥7/2)		C		
1204.90 20	(≥9/2)		G		
1260.8 ^b 3	(13/2 ⁻)		G		
1374.51 22			G		
1425.7 3	(15/2 ⁻)		G	J ^π : 474.9γ to (11/2 ⁻) and 164.8γ to (13/2 ⁻).	
1433.23 ^d 19	(15/2 ⁻)		G	J ^π : 436.9γ D to (13/2 ⁻) and 705.1γ to (11/2 ⁻).	
1433.23+x		1.11 μs	G	Additional information 2. T _{1/2} : Estimated from 191 and 201 keV γ-t. Possible contamination of the 191 and 201 keV lines from ¹⁸⁴ Ir and ¹⁸⁷ Ir is noted ((³² S,4nγ)–2000By02).	
1444.53 [@] 23	(15/2 ⁻)		G	J ^π : 716.2γ to (11/2 ⁻), 448.4γ to (13/2 ⁻), and band assignment.	
1447.46 ^e 13	(17/2 ⁻)	19.6 ps +20–22	FG	Q _t =2.1 eb 1 (³² S,4nγ). J ^π : 451.1γ E2 to (13/2 ⁻).	
1452.45 ^{&} 16	(17/2 ⁺)	44 ps +5–6	FG	XREF: G(1345). Q _t =1.8 eb 1 (³² S,4nγ). J ^π : 392.8 E2 to (13/2 ⁺).	
1463.85 ^c 24	(15/2 ⁺)		FG	XREF: G(1434). J ^π : 404.2 D+Q to (13/2 ⁺).	
1585.9 ^b 4	(15/2 ⁻)		G	J ^π : 325.1γ to (13/2 ⁻) and band assignment.	
1630.9 3			G		
1729.8 3	(17/2 ⁻)		G	J ^π : 468.8γ to (13/2 ⁻), 304.2γ to (15/2 ⁻).	
1737.95 ^{&} 19	(21/2 ⁺)	24.7 ps 24	FG	Q _t =5.6 eb 3 (³² S,4nγ). J ^π : 285.5γ E2 to (17/2 ⁺).	
1822.03 ^d 21	(19/2 ⁻)		G	J ^π : 388.8γ Q to (15/2 ⁻).	
1838.0 ^c 3	(17/2 ⁺)		FG	J ^π : 778.6γ to (13/2 ⁺), 374.1γ D to (15/2 ⁺).	
1874.76 ^e 16	(21/2 ⁻)	2.3 ps +7–6	FG	Q _t =6.4 eb +7-6 (³² S,4nγ). J ^π : 427.3γ E2 to (17/2 ⁻).	
1930.7 4			G		
1948.6 ^b 4	(17/2 ⁻)		G	J ^π : 362.7 to (15/2 ⁻) and band assignment.	
2104.25 ^{&} 22	(25/2 ⁺)	3.6 ps +7–6	FG	Q _t =7.7 eb +9-6 (³² S,4nγ). J ^π : 366.3γ E2 to (21/2 ⁺).	
2254.7 4			G		
2275.8 ^d 3	(23/2 ⁻)		G	J ^π : 453.8γ Q to (19/2 ⁻) and band assignment.	
2300.7 3			FG		
2363.16 ^e 19	(25/2 ⁻)	<1.1 ps	FG	Q _t >6.6 eb (³² S,4nγ). J ^π : 488.4γ (E2) to (21/2 ⁻).	
2439.2 3			G		
2546.85 ^{&} 24	(29/2 ⁺)	<1.4 ps	FG	Q _t >8.1 eb (³² S,4nγ). J ^π : 442.6γ E2 to (25/2 ⁺).	
2582.5 3	(25/2 ⁻ ,27/2,29/2 ⁺)	0.69 μs 4	G	J ^π : From possible mult E1,M1 and E2 of 478.2γ. T _{1/2} : From gated 286+366+479 keV γ-t ((³² S,4nγ)–2000By02).	
2639.9 3			G		
2673.6 3			G		
2792.9 ^d 4	(27/2 ⁻)		G	J ^π : 517.1γ Q to (23/2 ⁻) and band assignment.	
2909.46 ^e 22	(29/2 ⁻)		FG	J ^π : 546.3γ Q to (25/2 ⁻) and band assignment.	
2947.8 3			FG	XREF: G(3492).	
3057.5 ^{&} 3	(33/2 ⁺)		FG	J ^π : 510.6γ Q to (29/2 ⁺) and band assignment.	
3363.6 ^d 4	(31/2 ⁻)		G	J ^π : 570.7γ to (27/2 ⁻) and band assignment.	

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Adopted Levels, Gammas (continued) ^{187}Tl Levels (continued)

E(level) [†]	J ^π [‡]	XREF	Comments
3485.3 4		G	
3510.9 ^e 3	(33/2 ⁻)	G	J ^π : 601.4γ to (29/2 ⁻) and band assignment.
3627.4& 3	(37/2 ⁺)	FG	J ^π : 569.9γ Q to (33/2 ⁺) and band assignment.
3744.7 4		G	
3975.5 ^d 6	(35/2 ⁻)	G	J ^π : 611.9γ to (31/2 ⁻) and band assignment.
4138.5 ^e 5	(37/2 ⁻)	G	J ^π : 627.6γ to (33/2 ⁻) and band assignment.
4248.0& 3	(41/2 ⁺)	FG	XREF: G(4246). J ^π : 620.6γ to (37/2 ⁺) and band assignment.
4910.4& 3	(45/2 ⁺)	FG	XREF: G(4908). J ^π : 662.4γ to (41/2 ⁺) and band assignment.
5608.0& 5	(49/2 ⁺)	FG	XREF: G(5604). J ^π : 697.6γ to (45/2 ⁺) and band assignment.

[†] From a least-squares adjustment to E_γ with 334-keV level holding fixed and level energies are relative to E=334-keV. For absolute uncertainty of the level energy, ΔE=4 keV of the 334-keV level should be considered in quadrature.

[‡] Based on band structure and γ-ray multipolarity. Note that J values deduced in the ($^{35}\text{Cl}, 4n\gamma$) reaction are two units lower than the adopted value for levels in both the 1/2[660] and the h_{9/2} bands.

From ($^{32}\text{S}, 4n\gamma$), except otherwise noted. T_{1/2} is measured through the recoil distance Doppler shift technique ($^{32}\text{S}, 4n\gamma$).

@ Band(A): 9/2[505] band – Prolate band.

& Band(B): 1/2[660], α=+1/2 band – Decoupled prolate band.

^a Band(C): possible g.s. band.

^b Band(D): Possible 11/2[505] band – Weakly prolate.

^c Band(E): 13/2[606] band – Oblate band.

^d Band(F): 1/2[530], α=-1/2 band – f_{7/2}, decoupled, rotation-aligned prolate band.

^e Band(G): 3/2[532], α=+1/2 band – h_{9/2}, decoupled, rotation-aligned prolate band.

Adopted Levels, Gammas (continued)

$\gamma(^{187}\text{Tl})$									
$E_i(\text{level})$	J_i^π	$E_\gamma^\dagger$	$I_\gamma^\ddagger$	E_f	J_f^π	Mult. [†]	δ	$\alpha^@$	Comments
299.33	(3/2 ⁺)	299.5 [#] 3	100	0.0	(1/2 ⁺)	M1+E2	2.0 +5-3	0.168 18	$\alpha(\text{K})=0.116$ 17; $\alpha(\text{L})=0.0392$ 14; $\alpha(\text{M})=0.0098$ 3; $\alpha(\text{N}+..)=0.00293$ 9 $\alpha(\text{N})=0.00245$ 7; $\alpha(\text{O})=0.000447$ 16; $\alpha(\text{P})=2.85\times 10^{-5}$ 24 Mult., δ : from $\alpha(\text{K})$ exp in IT decay.
334	(9/2 ⁻)	(35 4)		299.33	(3/2 ⁺)	[E3]		6.58×10^4	$\alpha(\text{L})\approx 4.58\times 10^4$; $\alpha(\text{M})\approx 1.532\times 10^4$; $\alpha(\text{N}+..)\approx 4.65\times 10^3$ $\alpha(\text{N})\approx 3.97\times 10^3$; $\alpha(\text{O})\approx 661$; $\alpha(\text{P})\approx 17.46$ $\text{B}(\text{E}3)(\text{W.u.})=0.004$ +6-4 E_γ : from level energy difference; $E_\gamma\approx 30$ from ^{187}Tl IT decay.
677.80	($\geq 5/2$)	343.8 2	100	334	(9/2 ⁻)				
728.10	(11/2 ⁻)	394.1 1	100	334	(9/2 ⁻)	(M1+E2)	≈ -0.4	≈ 0.1686	$\alpha(\text{K})\approx 0.1373$; $\alpha(\text{L})\approx 0.0240$; $\alpha(\text{M})\approx 0.00564$; $\alpha(\text{N}+..)\approx 0.001722$ $\alpha(\text{N})\approx 0.001422$; $\alpha(\text{O})\approx 0.000275$; $\alpha(\text{P})\approx 2.53\times 10^{-5}$ Mult., δ : significantly mixed D+Q transition from $\gamma(\theta)$ and DCO ratios in ($^{32}\text{S}, 4n\gamma$).
747.87	(5/2 ⁺)	448.7 [#] 3	100 5	299.33	(3/2 ⁺)	[M1,E2]		0.08 5	$\alpha(\text{K})=0.07$ 5; $\alpha(\text{L})=0.013$ 5; $\alpha(\text{M})=0.0032$ 11; $\alpha(\text{N}+..)=0.0010$ 4 $\alpha(\text{N})=0.0008$ 3; $\alpha(\text{O})=0.00015$ 6; $\alpha(\text{P})=1.3\times 10^{-5}$ 7
		747.7 [#] 3	75 4	0.0	(1/2 ⁺)	[E2]		0.01141	$\alpha(\text{K})=0.00884$ 13; $\alpha(\text{L})=0.00195$ 3; $\alpha(\text{M})=0.000470$ 7; $\alpha(\text{N}+..)=0.0001422$ 20 $\alpha(\text{N})=0.0001182$ 17; $\alpha(\text{O})=2.22\times 10^{-5}$ 4; $\alpha(\text{P})=1.751\times 10^{-6}$ 25
871.8?		193.0 ^{#&} 3	100	677.80	($\geq 5/2$)				
950.90	(11/2 ⁻)	616.9 2	100	334	(9/2 ⁻)				
996.34	(13/2 ⁻)	268.3 1	18.3 26	728.10	(11/2 ⁻)	D			Other I_γ : 24 in ($^{35}\text{Cl}, 4n\gamma$), 48 12 in table 5 of 1995La08 in ($^{32}\text{S}, 4n\gamma$).
		662.3 1	100 4	334	(9/2 ⁻)	E2		0.01478	Mult.: From ($^{35}\text{Cl}, 4n\gamma$). $\alpha(\text{K})=0.01124$ 16; $\alpha(\text{L})=0.00269$ 4; $\alpha(\text{M})=0.000652$ 10; $\alpha(\text{N}+..)=0.000197$ 3 $\alpha(\text{N})=0.0001639$ 23; $\alpha(\text{O})=3.06\times 10^{-5}$ 5; $\alpha(\text{P})=2.32\times 10^{-6}$ 4 $\text{B}(\text{E}2)(\text{W.u.})=29$ 4
1059.65	(13/2 ⁺)	331.5 1	100 7	728.10	(11/2 ⁻)	(E1)		0.0227	$\text{B}(\text{E}1)(\text{W.u.})=7.8\times 10^{-6}$ 18 $\alpha(\text{K})=0.0187$ 3; $\alpha(\text{L})=0.00309$ 5; $\alpha(\text{M})=0.000719$ 10; $\alpha(\text{N}+..)=0.000217$ 3 $\alpha(\text{N})=0.000180$ 3; $\alpha(\text{O})=3.41\times 10^{-5}$ 5; $\alpha(\text{P})=2.83\times 10^{-6}$ 4 Mult.: from $\gamma(\theta)$ and DCO ratio, E1 favored by intensity balance in ($^{32}\text{S}, 4n\gamma$).

Adopted Levels, Gammas (continued)

$\gamma(^{187}\text{Tl})$ (continued)

$E_i(\text{level})$	J_i^π	$E_\gamma^\dagger$	$I_\gamma^\ddagger$	E_f	J_f^π	Mult. [†]	$\alpha^@$	Comments
1059.65	(13/2 ⁺)	726.4 4	3.3 7	334	(9/2 ⁻)	[M2]	0.0976	B(M2)(W.u.)=0.21 7 $\alpha(\text{K})=0.0780$ 11; $\alpha(\text{L})=0.01500$ 22; $\alpha(\text{M})=0.00357$ 5; $\alpha(\text{N}+..)=0.001095$ 16 $\alpha(\text{N})=0.000904$ 13; $\alpha(\text{O})=0.0001751$ 25; $\alpha(\text{P})=1.620\times 10^{-5}$ 23
1072.6?	($\geq 7/2$)	343.5 ^{#&} 3	100	728.10	(11/2 ⁻)			E_γ : for doubly-placed γ .
1204.90	($\geq 9/2$)	476.9 3	100	728.10	(11/2 ⁻)			
1260.8	(13/2 ⁻)	309.8 2	100	950.90	(11/2 ⁻)			
1374.51		646.4 2	100	728.10	(11/2 ⁻)			
1425.7	(15/2 ⁻)	164.8 2	26 7	1260.8	(13/2 ⁻)			
		474.9 2	100 13	950.90	(11/2 ⁻)			
1433.23	(15/2 ⁻)	436.9 2	84 13	996.34	(13/2 ⁻)	D		
		705.1 3	100 16	728.10	(11/2 ⁻)			
1444.53	(15/2 ⁻)	448.4 3	71 13	996.34	(13/2 ⁻)			
		716.2 3	100 18	728.10	(11/2 ⁻)			
1447.46	(17/2 ⁻)	242.6 2	16 4	1204.90	($\geq 9/2$)			
		451.1 1	100 4	996.34	(13/2 ⁻)	E2	0.0362	$\alpha(\text{K})=0.0251$ 4; $\alpha(\text{L})=0.00838$ 12; $\alpha(\text{M})=0.00209$ 3; $\alpha(\text{N}+..)=0.000626$ 9 $\alpha(\text{N})=0.000524$ 8; $\alpha(\text{O})=9.56\times 10^{-5}$ 14; $\alpha(\text{P})=6.16\times 10^{-6}$ 9
1452.45	(17/2 ⁺)	392.8 1	100	1059.65	(13/2 ⁺)	E2	0.0518	B(E2)(W.u.)=20.3 +27-25 $\alpha(\text{K})=0.0342$ 5; $\alpha(\text{L})=0.01329$ 19; $\alpha(\text{M})=0.00334$ 5; $\alpha(\text{N}+..)=0.000999$ 14 $\alpha(\text{N})=0.000838$ 12; $\alpha(\text{O})=0.0001516$ 22; $\alpha(\text{P})=9.09\times 10^{-6}$ 13
								B(E2)(W.u.)=20.6 +28-24
1463.85	(15/2 ⁺)	404.2 2	100	1059.65	(13/2 ⁺)	D+Q		
1585.9	(15/2 ⁻)	325.1 2	100	1260.8	(13/2 ⁻)			
1630.9		256.4 2	100	1374.51				
1729.8	(17/2 ⁻)	304.2 2	100 17	1425.7	(15/2 ⁻)			
		468.8 2	83 14	1260.8	(13/2 ⁻)			
1737.95	(21/2 ⁺)	285.5 1	100	1452.45	(17/2 ⁺)	E2	0.1286	$\alpha(\text{K})=0.0721$ 11; $\alpha(\text{L})=0.0425$ 6; $\alpha(\text{M})=0.01087$ 16; $\alpha(\text{N}+..)=0.00323$ 5 $\alpha(\text{N})=0.00273$ 4; $\alpha(\text{O})=0.000484$ 7; $\alpha(\text{P})=2.44\times 10^{-5}$ 4 B(E2)(W.u.)=168 17
1822.03	(19/2 ⁻)	388.8 1	100	1433.23	(15/2 ⁻)	Q		
1838.0	(17/2 ⁺)	374.1 2	100 19	1463.85	(15/2 ⁺)	D		
		778.6 ^{&} 5	≤ 41	1059.65	(13/2 ⁺)			
1874.76	(21/2 ⁻)	427.3 1	100	1447.46	(17/2 ⁻)	E2	0.0416	$\alpha(\text{K})=0.0283$ 4; $\alpha(\text{L})=0.01001$ 14; $\alpha(\text{M})=0.00250$ 4; $\alpha(\text{N}+..)=0.000749$ 11 $\alpha(\text{N})=0.000628$ 9; $\alpha(\text{O})=0.0001142$ 16; $\alpha(\text{P})=7.15\times 10^{-6}$ 10 B(E2)(W.u.)= 2.6×10^2 +7-8
1930.7		299.8 2	100	1630.9				
1948.6	(17/2 ⁻)	362.7 2	100	1585.9	(15/2 ⁻)			
2104.25	(25/2 ⁺)	366.3 1	100	1737.95	(21/2 ⁺)	E2	0.0626	$\alpha(\text{K})=0.0401$ 6; $\alpha(\text{L})=0.01694$ 24; $\alpha(\text{M})=0.00427$ 6; $\alpha(\text{N}+..)=0.001277$ 18 $\alpha(\text{N})=0.001073$ 15; $\alpha(\text{O})=0.000193$ 3; $\alpha(\text{P})=1.117\times 10^{-5}$ 16 B(E2)(W.u.)= 3.5×10^2 +6-7
2254.7		324.0 2	100	1930.7				
2275.8	(23/2 ⁻)	453.8 2	100	1822.03	(19/2 ⁻)	Q		
2300.7		562.7 2	100	1737.95	(21/2 ⁺)			

Adopted Levels, Gammas (continued)

$\gamma(^{187}\text{Tl})$ (continued)

$E_i(\text{level})$	J_i^π	$E_\gamma^\dagger$	$I_\gamma^\ddagger$	E_f	J_f^π	Mult. [†]	$\alpha^@$	Comments
2363.16	(25/2 ⁻)	488.4 1	100	1874.76	(21/2 ⁻)	(E2)	0.0298	$\alpha(\text{K})=0.0212$ 3; $\alpha(\text{L})=0.00652$ 10; $\alpha(\text{M})=0.001613$ 23; $\alpha(\text{N}+..)=0.000484$ 7 $\alpha(\text{N})=0.000405$ 6; $\alpha(\text{O})=7.43\times 10^{-5}$ 11; $\alpha(\text{P})=4.97\times 10^{-6}$ 7 $\text{B}(\text{E}2)(\text{W.u.})>2.8\times 10^2$
2439.2		564.4 2	100	1874.76	(21/2 ⁻)			
2546.85	(29/2 ⁺)	442.6 1	100	2104.25	(25/2 ⁺)	E2	0.0380	$\alpha(\text{K})=0.0262$ 4; $\alpha(\text{L})=0.00892$ 13; $\alpha(\text{M})=0.00222$ 4; $\alpha(\text{N}+..)=0.000666$ 10 $\alpha(\text{N})=0.000558$ 8; $\alpha(\text{O})=0.0001017$ 15; $\alpha(\text{P})=6.49\times 10^{-6}$ 9 $\text{B}(\text{E}2)(\text{W.u.})>3.6\times 10^2$
2582.5	(25/2 ⁻ ,27/2,29/2 ⁺)	478.2 2	100	2104.25	(25/2 ⁺)	(E1,M1,E2)		Mult.: $\alpha(\text{exp})=0.15$ 18, determined from an intensity balance (³² S,4n γ).
2639.9		535.6 2	100	2104.25	(25/2 ⁺)			
2673.6		798.8 2	100	1874.76	(21/2 ⁻)			
2792.9	(27/2 ⁻)	517.1 2	100	2275.8	(23/2 ⁻)	Q		
2909.46	(29/2 ⁻)	546.3 1	100	2363.16	(25/2 ⁻)	Q		
2947.8		584.6 2	100	2363.16	(25/2 ⁻)			
3057.5	(33/2 ⁺)	510.6 1	100	2546.85	(29/2 ⁺)	Q		
3363.6	(31/2 ⁻)	570.7 2	100	2792.9	(27/2 ⁻)			
3485.3		575.8 3	100	2909.46	(29/2 ⁻)			
3510.9	(33/2 ⁻)	601.4 2	100	2909.46	(29/2 ⁻)			
3627.4	(37/2 ⁺)	569.9 1	100	3057.5	(33/2 ⁺)	Q		
3744.7		687.2 2	100	3057.5	(33/2 ⁺)			
3975.5	(35/2 ⁻)	611.9 4	100	3363.6	(31/2 ⁻)			
4138.5	(37/2 ⁻)	627.6 3	100	3510.9	(33/2 ⁻)			
4248.0	(41/2 ⁺)	620.6 1	100	3627.4	(37/2 ⁺)			
4910.4	(45/2 ⁺)	662.4 1	100	4248.0	(41/2 ⁺)			
5608.0	(49/2 ⁺)	697.6 3	100	4910.4	(45/2 ⁺)			

[†] From (³²S,4n γ), except otherwise noted.

[‡] Relative photon intensity deexciting each level; from (³²S,4n γ), except as noted.

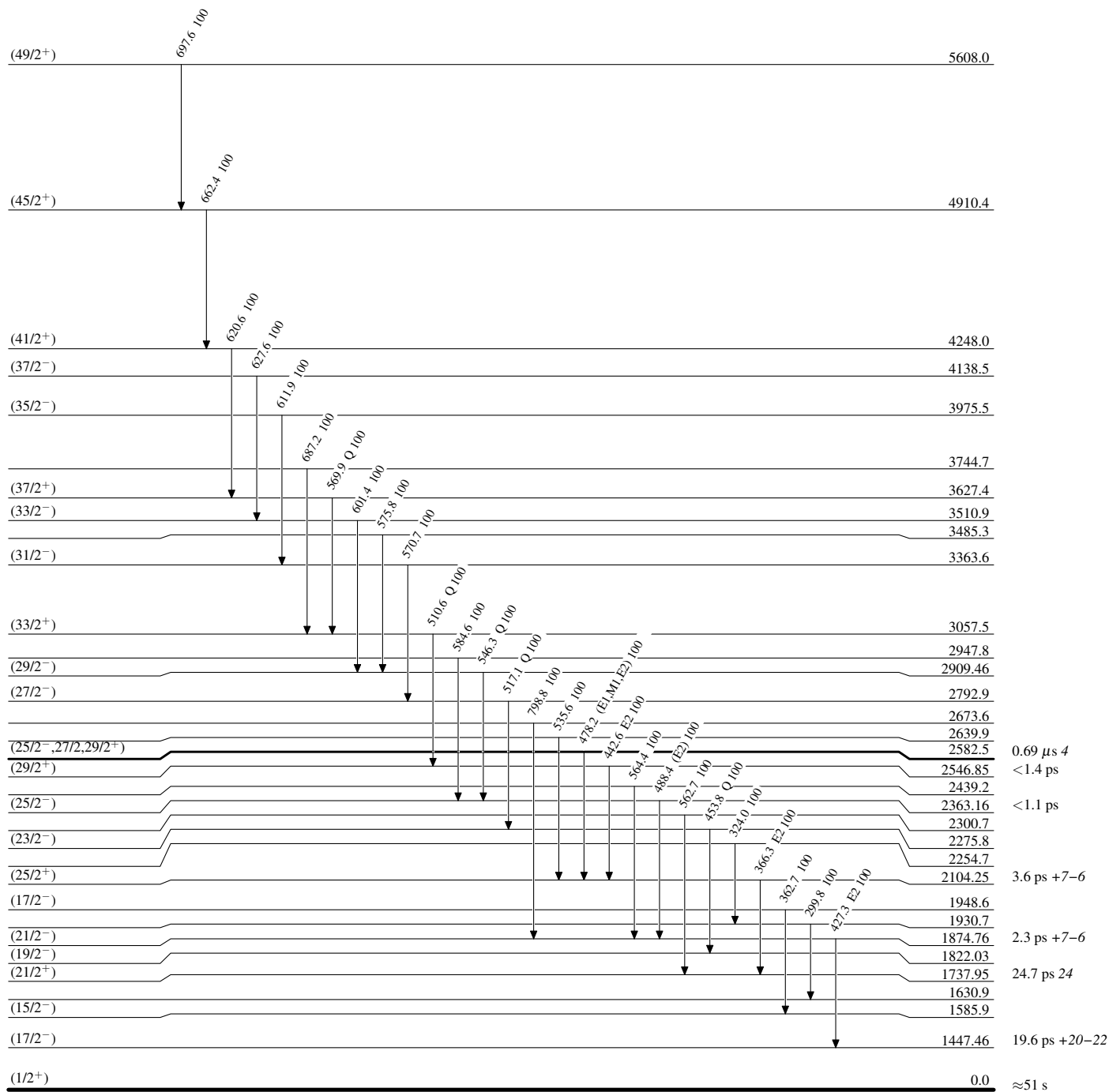
From ¹⁸⁷Pb ϵ decay.

@ 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**Level Scheme**

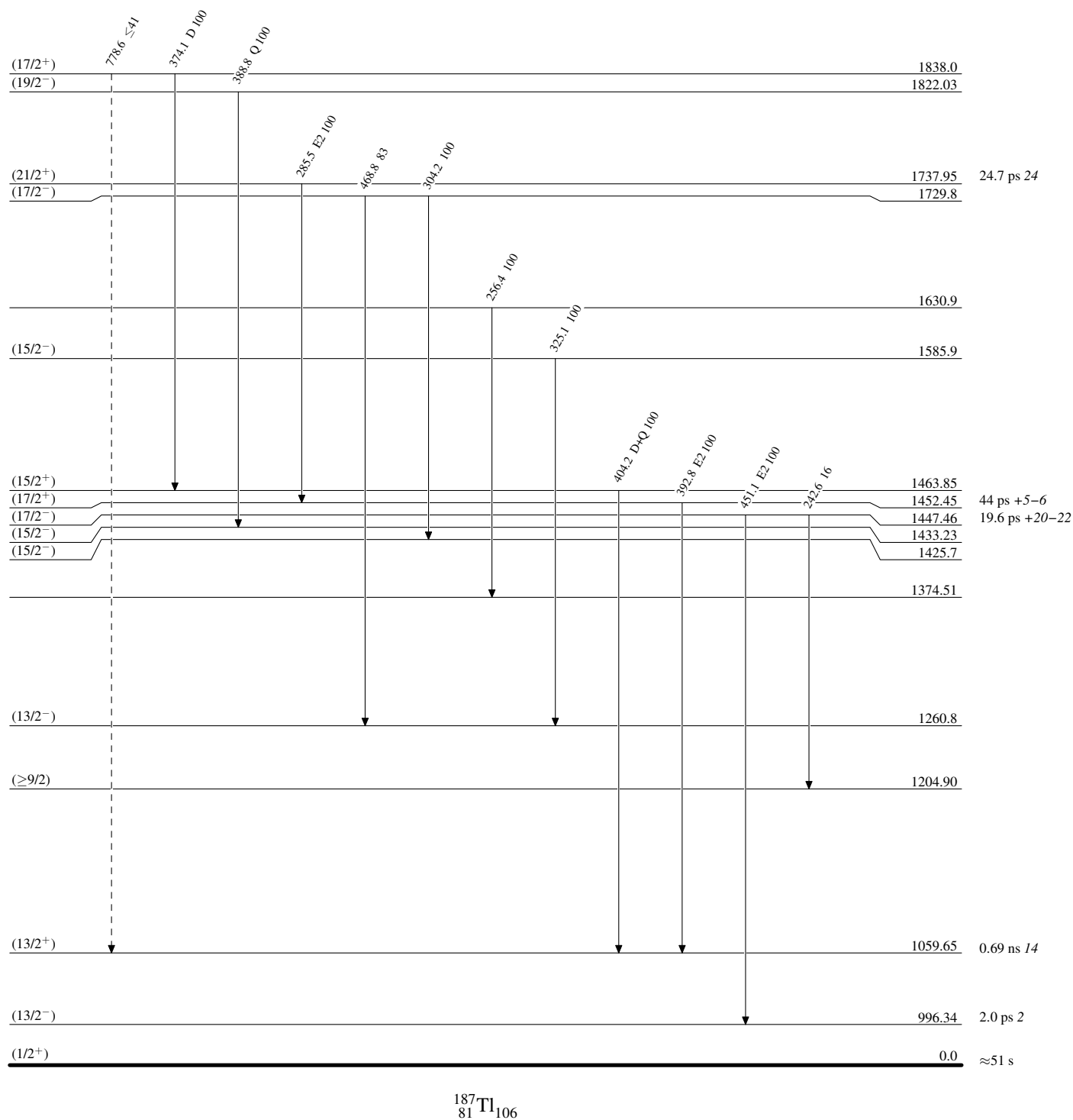
Intensities: Relative photon branching from each level



Legend

Intensities: Relative photon branching from each level

-----► γ Decay (Uncertain)

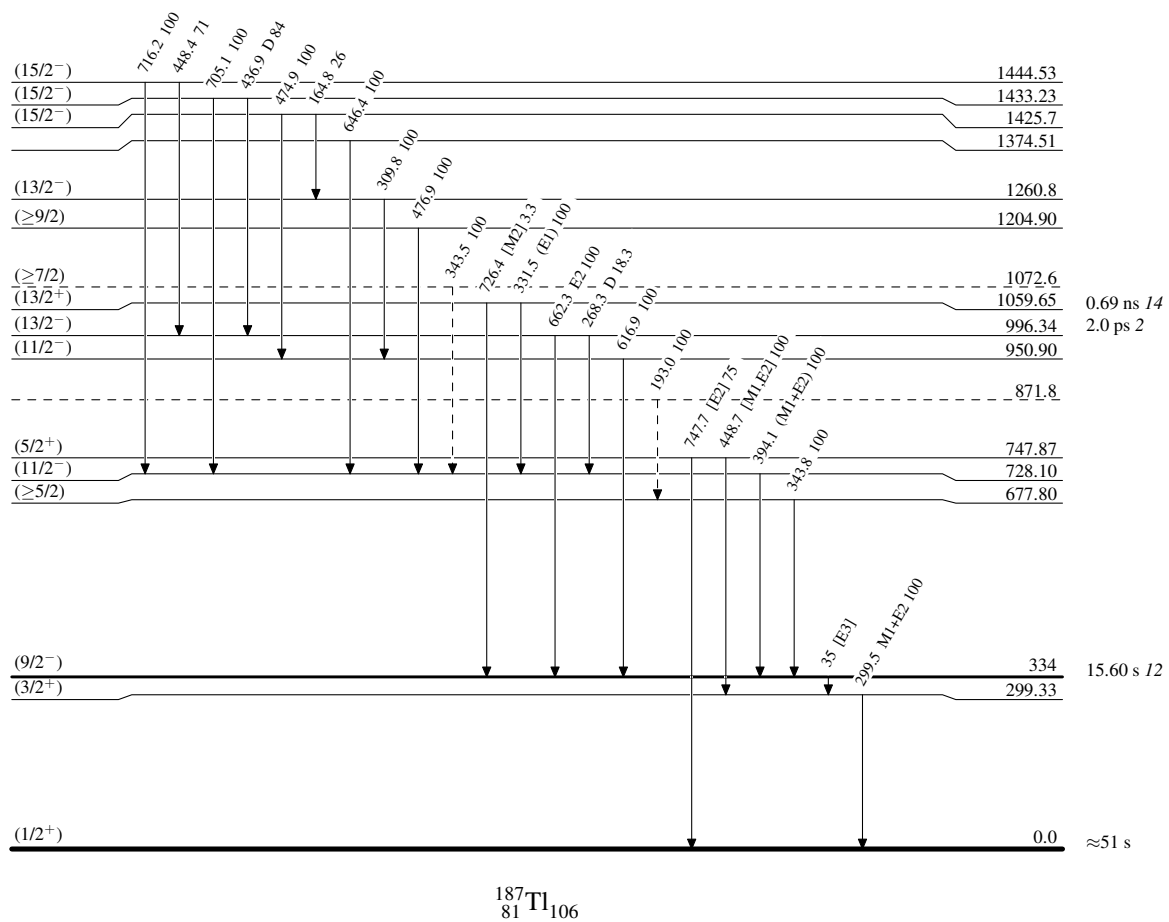


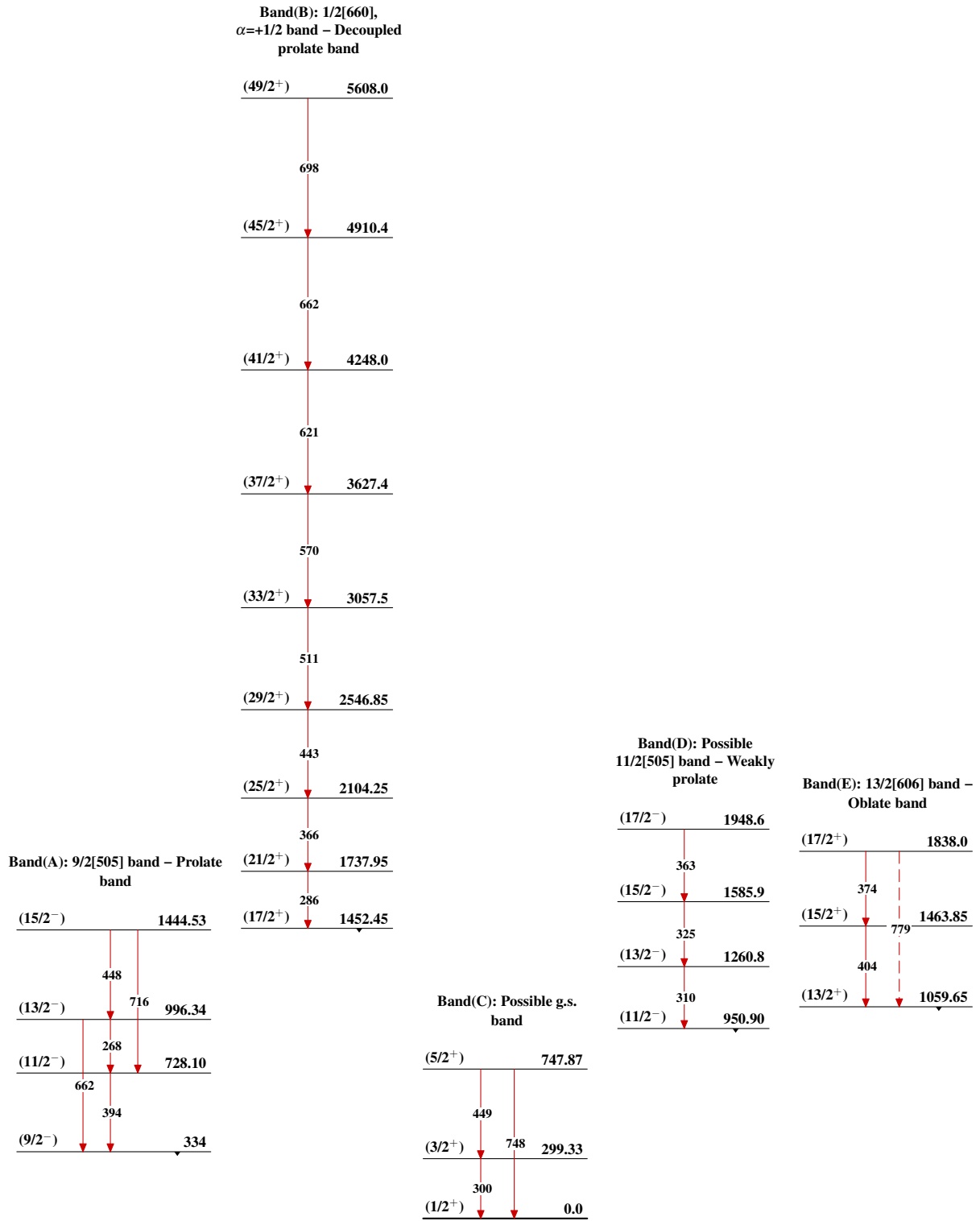
Adopted Levels, Gammas

Legend

Level Scheme (continued)

Intensities: Relative photon branching from each level

-----► γ Decay (Uncertain) $^{187}_{81}\text{Tl}_{106}$

Adopted Levels, Gammas

Adopted Levels, Gammas (continued)