

Adopted Levels, Gammas

Type	Author	History	Citation	Literature Cutoff Date
Full Evaluation	T. D. Johnson, D. Symochko(a), M. Fadil(b), and J. K. Tuli		NDS 112, 1949 (2011)	1-Jun-2010

$Q(\beta^-) = -6.44 \times 10^3$ SY; $S(n) = 1.01 \times 10^4$ 7; $S(p) = 6. \times 10^2$ 7; $Q(\alpha) = 2.8 \times 10^3$ 7 [2012Wa38](#)

Note: Current evaluation has used the following Q record.

Estimated uncertainty for $Q(\beta^-)$: $\Delta Q(\beta^-)$ 20 [2011AuZZ](#).

$Q(\beta^- n) = -1.94 \times 10^4$ 8 (syst.) $Q(\epsilon p) = 6.1 \times 10^3$ 7 (syst.) [2011AuZZ](#).

Values in [2003Au03](#): $Q(\beta^-) = -7.10 \times 10^3$ 20, $S(n) = 1.06 \times 10^4$ 3 (syst.), $S(p) = 1.1 \times 10^3$ 3 (syst.) $Q(\alpha) = 2.3 \times 10^3$ 3 (syst.),

$Q(\beta^- n) = -1.98 \times 10^4$ 4 (syst.) $Q(\epsilon p) = 5.6 \times 10^3$ 3 (syst.).

$Q(\beta^-) = -6.70 \times 10^3$ SY; $S(n) = 1.01 \times 10^4$ 7; $S(p) = 6. \times 10^2$ 7; $Q(\alpha) = 2.8 \times 10^3$ 7 [2011AuZZ](#)

 ^{142}Tb LevelsCross Reference (XREF) Flags

- A** ^{142}Tb IT decay (25 μs)
- B** ^{142}Tb IT decay (303 ms)
- C** ^{142}Dy ϵ decay (2.3 s)
- D** $^{92}\text{Mo} (^{54}\text{Fe}, n3p\gamma)$

E(level) [‡]	J π [†]	T _{1/2}	XREF	Comments
0.0	1 ⁺	597 ms 17	ABC	$\% \epsilon + \% \beta^+ = 100$; $\% \beta^+ p = 2.2 \times 10^{-3}$ 11 (1991Fi03) J^π : $\log ft = 4.5$ to 0^+ . $T_{1/2}$: from 515.3 $\gamma(t)$ (1991Fi03). Configuration= $\pi d_{5/2} \otimes v d_{3/2}$ (2006Ta08).
181.6 6	(2 ⁺)		ABC	
211.5 3	(3 ⁺)		AB	
279.7 4	5 ⁻	303 ms 17	AB D	$\% \text{IT} = 100$ $T_{1/2}$: 1991Fi03 give 303 ms 17 in the abstract but 303 ms 7 in the paper, the latter is a misprint (as per priv comm from one of the authors). Configuration= $[\pi h_{11/2} \otimes v s_{1/2}] + [\pi h_{11/2} \otimes v d_{3/2}]$ (2006Ta08).
311.9 5	(5 ⁻)		A D	
395.6 5	6 ⁻		A D	
477.2 5	6 ⁻		A D	
614.9 ^a 5	7 ⁻		A D	
652.1 [#] 6	8 ⁺	26 μs 1	A D	$T_{1/2}$: from isomer-tagged $\gamma\gamma$ coin (2009Ma06). Configuration= $\pi h_{11/2} \otimes v h_{11/2}$ (2009Ma06).
709.9 6			D	
843.5 ^b 6			D	
851.9 6			D	
1019.4 [@] 6	9 ⁺		D	
1117.3 ^a 6	(9 ⁻)		D	
1209.3 [#] 6	10 ⁺		D	
1245.5 ^b 6			D	
1558.2 ^{&} 6			D	
1647.8 [@] 6	(11 ⁺)		D	
1790.1 ^a 7	(11 ⁻)		D	
1831.7 ^b 7			D	
1969.3 [#] 6	12 ⁺		D	
2245.8 ^{&} 6			D	
2436.8 [@] 6	(13 ⁺)		D	

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Adopted Levels, Gammas (continued) ^{142}Tb Levels (continued)

$E(\text{level})^{\ddagger}$	$J^{\pi\dagger}$	XREF	$E(\text{level})^{\ddagger}$	$J^{\pi\dagger}$	XREF	$E(\text{level})^{\ddagger}$	XREF
2538.5 ^b 7		D	3339.4 ^a 8	(15 ⁻)	D	5725.9 ^b 9	D
2567.0 ^a 7	(13 ⁻)	D	3699.5 [#] 7	(16 ⁺)	D	6786.3 ^b 10	D
2846.9 [#] 6	(14 ⁺)	D	4017.0 ^b 9		D	7987.5 ^b 10	D
2967.8 ^{&} 7		D	4530.4 [#] 6	(18 ⁺)	D		
3285.1 ^b 8		D	4805.5 ^b 9		D		

[†] From 1991Fi03, based on systematics of odd-odd Tb nuclides, $\pi=-$ isomer is expected. They assign 5⁻ to the isomer and 3⁺, 2⁺ to 221 and 181 levels which are fed by M2, [E3] transitions by the isomer.

[‡] From least-squares fit to E_{γ} . Assumed uncertainty as 1 keV when not known.

[#] Band(A): Band based on 8⁺, $\alpha=0$. Configuration= $\pi h_{11/2} \otimes \nu h_{11/2}$. For detailed configuration, see 2009Ma06.

@ Band(a): Band based on 9⁺, $\alpha=1$. Configuration= $\pi h_{11/2} \otimes \nu h_{11/2}$. For detailed configuration, see 2009Ma06.

& Band(B): Band based on 1559 level.

^a Band(C): Band based on 7⁻. Configuration= $\pi h_{11/2} \otimes \nu h_{11/2}$. For detailed configuration, see 2009Ma06.

^b Band(D): Band based on 844 level. Configuration= $\pi h_{11/2} \otimes \nu h_{11/2}$. For detailed configuration, see 2009Ma06.

 $\gamma(^{142}\text{Tb})$

$E_i(\text{level})$	J_i^{π}	E_{γ}	I_{γ}	E_f	J_f^{π}	Mult.	$\alpha^{\dagger}$	Comments
181.6	(2 ⁺)	181.8	100	0.0	1 ⁺	M1+E2	0.36 5	$\alpha(K)=0.28$ 7; $\alpha(L)=0.066$ 17; $\alpha(M)=0.015$ 5; $\alpha(N+..)=0.0039$ 11
								$\alpha(N)=0.0034$ 10; $\alpha(O)=0.00049$ 10; $\alpha(P)=1.9 \times 10^{-5}$ 7
								Mult.: D,E2 from K x ray data (1991Fi03).
211.5	(3 ⁺)	29.9 9		181.6	(2 ⁺)	M1+E2	2.5 $\times 10^2$ 25	$\alpha(\text{exp})=44$ 15 (1991Fi03)
								$\alpha(L)=1.9 \times 10^2$ 19; $\alpha(M)=5.1$ 5; $\alpha(N+..)=12$ 12
								$\alpha(N)=10$ 10; $\alpha(O)=1.3$ 13; $\alpha(P)=0.0028$ 20
		211.5 3		0.0	1 ⁺	E2	0.190	$\alpha(K)=0.1326$ 20; $\alpha(L)=0.0447$ 7; $\alpha(M)=0.01037$ 16; $\alpha(N+..)=0.00267$ 4
								$\alpha(N)=0.00234$ 4; $\alpha(O)=0.000319$ 5; $\alpha(P)=7.68 \times 10^{-6}$ 12
								Mult.: D,E2 from K x ray data (1991Fi03).
279.7	5 ⁻	68.2 3	100 8	211.5	(3 ⁺)	M2	90.9 21	$\alpha(K)=64.0$ 14; $\alpha(L)=20.7$ 5; $\alpha(M)=4.89$ 12; $\alpha(N+..)=1.32$ 4
								$\alpha(N)=1.14$ 3; $\alpha(O)=0.168$ 4; $\alpha(P)=0.00915$ 22
		98.3 9	<6	181.6	(2 ⁺)	E3	48 3	$\alpha(K)=4.27$ 11; $\alpha(L)=33.5$ 19; $\alpha(M)=8.4$ 5; $\alpha(N+..)=2.13$ 12
								$\alpha(N)=1.89$ 11; $\alpha(O)=0.239$ 14; $\alpha(P)=0.000325$ 12
311.9	(5 ⁻)	32.1 2	100.0	279.7	5 ⁻			
395.6	6 ⁻	83.7 3	100	311.9	(5 ⁻)			
		115.8 3	100	279.7	5 ⁻			
477.2	6 ⁻	81.5 3	9 3	395.6	6 ⁻	M1	3.96 7	$\alpha(K)=3.33$ 6; $\alpha(L)=0.488$ 9; $\alpha(M)=0.1066$ 19; $\alpha(N+..)=0.0287$ 5
								$\alpha(N)=0.0246$ 5; $\alpha(O)=0.00379$ 7; $\alpha(P)=0.000249$ 5
		165.4 3	100 9	311.9	(5 ⁻)	M1+E2	0.48 5	$\alpha(K)=0.36$ 9; $\alpha(L)=0.09$ 3; $\alpha(M)=0.021$ 8; $\alpha(N+..)=0.0056$ 18
								$\alpha(N)=0.0049$ 17; $\alpha(O)=0.00068$ 19; $\alpha(P)=2.4 \times 10^{-5}$ 9
		197.6 3	15 3	279.7	5 ⁻	M1+E2	0.28 5	$\alpha(K)=0.22$ 6; $\alpha(L)=0.049$ 10; $\alpha(M)=0.011$ 3; $\alpha(N+..)=0.0029$ 6
								$\alpha(N)=0.0025$ 6; $\alpha(O)=0.00036$ 6; $\alpha(P)=1.5 \times 10^{-5}$ 6
614.9	7 ⁻	137.7 3	38 3	477.2	6 ⁻	M1+E2	0.85 4	$\alpha(K)=0.61$ 14; $\alpha(L)=0.19$ 8; $\alpha(M)=0.044$ 20;

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Adopted Levels, Gammas (continued)

$\gamma(^{142}\text{Tb})$ (continued)							
$E_i(\text{level})$	J_i^π	E_γ	I_γ	E_f	J_f^π	Mult.	$\alpha^\dagger$
Comments							
614.9	7^-	219.4 3	13 1	395.6 6^-	M1+E2	0.21 4	$\alpha(\text{N}+..)=0.011$ 5 $\alpha(\text{N})=0.010$ 5; $\alpha(\text{O})=0.0014$ 6; $\alpha(\text{P})=4.0\times 10^{-5}$ 16
		302.9 3	100 8	311.9 (5^-)	M1+E2	0.081 21	$\alpha(\text{K})=0.16$ 5; $\alpha(\text{L})=0.034$ 5; $\alpha(\text{M})=0.0077$ 13; $\alpha(\text{N}+..)=0.0020$ 3 $\alpha(\text{N})=0.0018$ 3; $\alpha(\text{O})=0.000252$ 24; $\alpha(\text{P})=1.1\times 10^{-5}$ 5
		335.1 6	1 1	279.7 5^-	E2	0.0446	$\alpha(\text{K})=0.066$ 20; $\alpha(\text{L})=0.0118$ 5; $\alpha(\text{M})=0.00263$ 6; $\alpha(\text{N}+..)=0.000696$ 24 $\alpha(\text{N})=0.000603$ 16; $\alpha(\text{O})=8.9\times 10^{-5}$ 7; $\alpha(\text{P})=4.6\times 10^{-6}$ 18
							$\alpha(\text{K})=0.0344$ 6; $\alpha(\text{L})=0.00793$ 13; $\alpha(\text{M})=0.00180$ 3; $\alpha(\text{N}+..)=0.000470$ 8 $\alpha(\text{N})=0.000410$ 7; $\alpha(\text{O})=5.81\times 10^{-5}$ 9; $\alpha(\text{P})=2.19\times 10^{-6}$ 4
652.1	8^+	37.2 3	100.0	614.9 7^-	E1	0.786 21	$\alpha(\text{L})=0.616$ 17; $\alpha(\text{M})=0.135$ 4; $\alpha(\text{N}+..)=0.0343$ 10
		340.1 6	1.3 13	311.9 (5^-)	M2	0.290	$\alpha(\text{N})=0.0302$ 8; $\alpha(\text{O})=0.00402$ 11; $\alpha(\text{P})=0.000153$ 4 $\alpha(\text{K})=0.237$ 4; $\alpha(\text{L})=0.0416$ 7; $\alpha(\text{M})=0.00931$ 15; $\alpha(\text{N}+..)=0.00251$ 4 $\alpha(\text{N})=0.00216$ 4; $\alpha(\text{O})=0.000329$ 5; $\alpha(\text{P})=2.06\times 10^{-5}$ 4
709.9		232.7 3	100.0	477.2 6^-			
843.5		133.6 2	100.0	709.9			
851.9		141.9 2	100.0	709.9			
1019.4	9^+	367.3 1	100.0	652.1 8^+			
1117.3	(9^-)	502.4 3	100.0	614.9 7^-			
1209.3	10^+	189.2 [‡] 5	5.0 20	1019.4 9^+			
		557.3 1	100 6	652.1 8^+			
1245.5		393.5 3	90 24	851.9			
		402.2 3	1.0×10^2 3	843.5			
1558.2		538.6 2	100.0	1019.4 9^+			
1647.8	(11^+)	438.4 1	100 4	1209.3 10^+			
		629.0 5	13 4	1019.4 9^+			
1790.1	(11^-)	672.8 3	100.0	1117.3 (9^-)			
1831.7		586.2 3	100.0	1245.5			
1969.3	12^+	321.1 2	20 8	1647.8 (11^+)			
		760.1 1	100 4	1209.3 10^+			
2245.8		598.4 3	100 17	1647.8 (11^+)			
		687.2 3	89 23	1558.2			
2436.8	(13^+)	468.1 3	100 8	1969.3 12^+			
		788.7 2	100 16	1647.8 (11^+)			
2538.5		706.8 2	100.0	1831.7			
2567.0	(13^-)	776.9 3	100.0	1790.1 (11^-)			
2846.9	(14^+)	410.4 [‡] 2	23 9	2436.8 (13^+)			
		877.6 2	100 9	1969.3 12^+			
2967.8		722.0 4	100.0	2245.8			
3285.1		746.6 3	100.0	2538.5			
3339.4	(15^-)	772.4 3	100.0	2567.0 (13^-)			
3699.5	(16^+)	852.6 3	100.0	2846.9 (14^+)			
4017.0		731.9 3	100.0	3285.1			
4530.4	(18^+)	830.2 [‡] 3	100.0	3699.5 (16^+)			
4805.5		788.5 3	100.0	4017.0			

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Adopted [Levels, Gammas](#) (continued)

 $\gamma(^{142}\text{Tb})$ (continued)

<u>$E_i(\text{level})$</u>	<u>E_γ</u>	<u>I_γ</u>	<u>E_f</u>
5725.9	920.4 2	100.0	4805.5
6786.3	1060.4 3	100.0	5725.9

[†] [Additional information 1.](#)

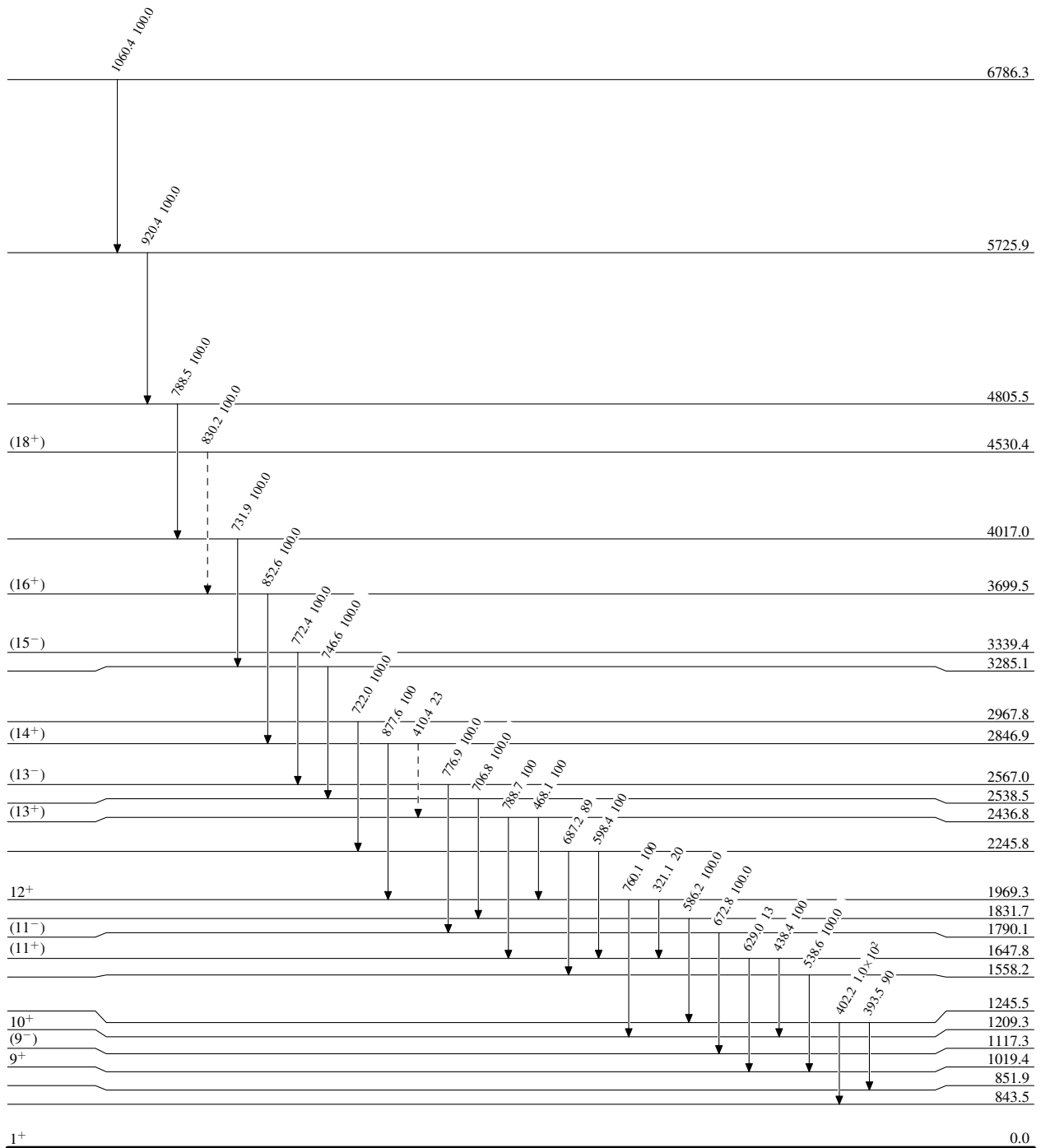
[‡] Placement of transition in the level scheme is uncertain.

Adopted Levels, Gammas

Legend

Level Scheme

Intensities: Relative photon branching from each level

-----► γ Decay (Uncertain)


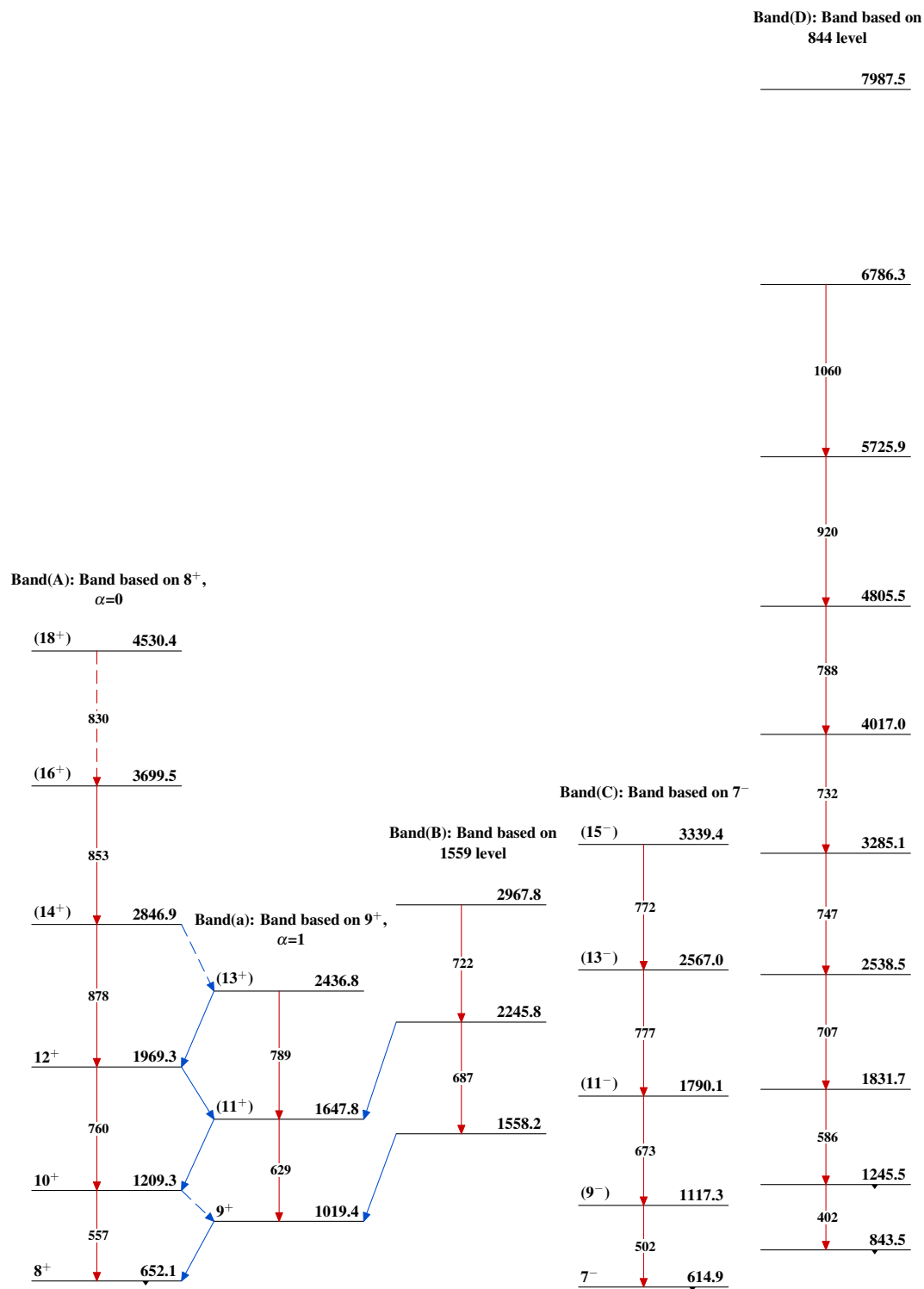
Adopted Levels, Gammas

Legend

Level Scheme (continued)

Intensities: Relative photon branching from each level

-----► γ Decay (Uncertain) $^{142}_{65}\text{Tb}_{77}$

Adopted Levels, Gammas $^{142}_{65}\text{Tb}_{77}$