Adopted Levels, Gammas

Type	Author	History Citation	Literature Cutoff Date
Full Evaluation	T. Tamura	NDS 108,455 (2007)	30-Sep-2006

Q(β^-)=−725 *13*; S(n)=7900 *8*; S(p)=4.83×10^3 *3*; Q(α)=−509 *6* 2012Wa38
Note: Current evaluation has used the following Q record −725 127864 114818 26-506 6 2003Au03.

^{122}I Levels

Cross Reference (XREF) Flags

A ^{122}Xe ε decay
B (HI,xnγ)

E(level)†	J$^\pi$‡	T$_{1/2}$	XREF	Comments
0.0	1$^+$	3.63 min *6*	AB	%ε+%β^+=100 μ=+0.94 *3* μ: from static nuclear orientation, value relative to ^{131}I,^{132}I (1986Gr06,1989Ra17); positive sign (1988As06). J$^\pi$: log *ft*=5.19 from 0$^+$. T$_{1/2}$: from 1970LaZX. Others: 3.6 min (1951Yo06), 3.4 min *1* (1952Dr18), 3.5 min (1954Ma75).
53.114 *15*	0,1,2,3$^+$		A	J$^\pi$: log *ft*≥7.4 from 0$^+$.
61.625 *4*	0$^+$,1$^+$	7.4 ns *3*	AB	J$^\pi$: log *ft*=7.04 from 0$^+$, M1 γ to 1$^+$. T$_{1/2}$: weighted average of 7.55 ns *40* from (61.8γ)(K x ray)(t) and 7.2 ns *7* from (61.8L+90.5K)(K x ray)(t) (1973Lo10).
90.596 *6*	1$^+$,2$^+$	1.9 ns *3*	AB	J$^\pi$: M1+E2 γ to 1$^+$. T$_{1/2}$: average value of (90.6γ)(K x ray)(t) and (61.8L+90.5K)(K x ray)(t) (1973Lo10).
109.68 *18*			B	
148.612 *4*	1$^+$	≤80 ps	A	J$^\pi$: log *ft*=6.33 from 0$^+$; M1 γ to 1$^+$. T$_{1/2}$: from (148.6K)(KLL Auger)(t) and (148.6K)(K x ray)(t).
154.35 *23*			B	
155.7 *4*	(4$^+$)	16.6# ns	B	
163.066 *7*	1$^+$,2$^+$		AB	J$^\pi$: M1,E2 γ to 1$^+$.
175.574 *10*			A	
176.72 *23*			B	
246.66 *20*			B	
279.428 *9*	0,1		A	J$^\pi$: log *ft*=7.20 from 0$^+$.
299.3 *3*			B	
314.9 *4*	(7$^-$)	190# ns	B	
342.9 *4*	(6$^+$)		B	
350.052 *8*	1$^+$		A	J$^\pi$: log *ft*=5.54 from 0$^+$, M1,E2 γ to 1$^+$.
356.7 *4*			B	
379.4 *5*	(7$^-$)	80@ μs *8*	B	
389.9 *5*	(8$^+$)		B	
394.1 *5*	(8$^+$)	80@ μs *8*	B	
416.675 *19*	1$^+$		A	J$^\pi$: log *ft*=5.92 from 0$^+$, M1 γ to 1$^+$.
444.1g *5*	(8$^-$)	148# ns	B	
453.0 *4*			B	
458.3b *5*	(8$^-$)		B	
502.1 *5*			B	
519.2c *5*	(8$^-$)		B	
534.4 *5*			B	
581.3 *5*	(6$^+$)		B	

Continued on next page (footnotes at end of table)

Adopted Levels, Gammas (continued)

^{122}I Levels (continued)

E(level)†	Jπ‡	XREF	E(level)†	Jπ‡	XREF	E(level)†	Jπ‡	XREF
717.5[g] 5	(9⁻)	B	2012.5[f] 5	(11⁻)	B	3597.4 6	(15⁻)	B
731.6[i] 5	(5⁺)	B	2067.3[h] 6	(12⁻)	B	3641.5[b] 5	(16⁻)	B
746.0[a] 5	(9⁻)	B	2071.4[c] 6	(12⁻)	B	3649.2 6	(17⁺)	B
786.3 5	(8⁺)	B	2184.2[&] 5	(13⁺)	B	3674.1[g] 6	(16⁻)	B
857.7 6	(7⁺)	B	2187.6[i] 7	(9⁺)	B	3774.0[e] 5	(16⁻)	B
1016.9 5	(9⁻)	B	2272.9[g] 5	(13⁻)	B	3949.3[&] 6	(17⁺)	B
1068.2[g] 5	(10⁻)	B	2333.8[e] 5	(12⁻)	B	4166.7[a] 7	(17⁻)	B
1091.9 5		B	2355.8[a] 5	(13⁻)	B	4204.7[f] 6	(17⁻)	B
1108.7[b] 5	(10⁻)	B	2502.1[d] 6		B	4217.1[&] 6	(18⁺)	B
1166.2[&] 5	(10⁺)	B	2523.6[&] 5	(14⁺)	B	4247.1[d] 7		B
1208.9 5		B	2546.0[h] 6	(13⁻)	B	4517.7[e] 6	(18⁻)	B
1244.0[c] 5	(10⁻)	B	2649.1[f] 5	(13⁻)	B	4605.3[b] 6	(18⁻)	B
1260.2[h] 5	(10⁻)	B	2679.9[b] 5	(14⁻)	B	4610.8 7		B
1429.1[i] 6	(7⁺)	B	2729.7[g] 5	(14⁻)	B	4775.4 7		B
1444.1[g] 5	(11⁻)	B	2824.0[&] 5	(15⁺)	B	4953.0[f] 6	(19⁻)	B
1489.2[a] 5	(11⁻)	B	2987.6[e] 5	(14⁻)	B	5144.1[&] 7	(20⁺)	B
1536.0[&] 5	(11⁺)	B	3007.9[&] 5	(16⁺)	B	5220.5[e] 7	(20⁻)	B
1623.9[h] 5	(11⁻)	B	3045.9[c] 7	(14⁻)	B	5460.7 7		B
1719.8[d] 5		B	3052.0[h] 7	(14⁻)	B	5493.4[&] 7	(22⁺)	B
1774.8[e] 5	(10⁻)	B	3216.3[g] 6	(15⁻)	B	6008.6[e] 7		B
1824.9[&] 5	(12⁺)	B	3290.2[d] 7		B	6217.4[&] 8	(23⁺)	B
1841.4[g] 5	(12⁻)	B	3342.5[a] 6	(15⁻)	B	7023.5[&] 9	(24⁺)	B
1849.4[b] 5	(12⁻)	B	3405.9[f] 5	(15⁻)	B	8323.2[&] 9		B

† From combined fit of levels and gammas from ^{122}Xe ε decay and (HI,xnγ).

‡ From multipolarities of associated γ rays and the band structure in ^{120}Sn(^{7}Li,5nγ) as proposed by 2004MoZT, except noted otherwise.

From γ-γ delayed coincidence spectrometry; no details are presented in 2003Mo22, 2003MoZR and 2004MoZT.

@ From γγ(t) in ^{116}Cd(^{11}B,5nγ) (1990Wu01). 1990Wu01 reported $T_{1/2}$=80 μs isomer associated with with 32.5-, 51.5-, 61.9-, 95.0-, 160.1-, and 188.0-keV. The isomer(s) was (were) assigned to 379.4- and 393.9-keV levels by 2003Mo22, 2003MoZR and 2004MoZT.

& Band(A): Band 1 positive parity band based on (10⁺); possible configuration=(π $h_{11/2}$)⊗(ν $h_{11/2}$).

[a] Band(B): Band 2 negative-parity band based on (9⁻); α=1 partner of band 3.

[b] Band(C): Band 3 negative-parity band based on (8⁻); α=0.

[c] Band(D): Band 4 negative-parity band based on (10⁻).

[d] Band(E): Band 5 band based on 1720.0-keV level.

[e] Band(F): Band 6 negative-parity band based on (10⁻); α=0.

[f] Band(G): Band 7 negative-parity band based on (11⁻); α=1 partner of band 6.

[g] Band(H): Band 8 negative-parity band based on (8⁻); ΔJ=1 band.

[h] Band(I): Band 9 negative-parity band based on (10⁻).

[i] Band(J): Band 10 positive-parity band based on (5⁺).

Adopted Levels, Gammas (continued)

γ(^{122}I)

E_i(level)	J_i^π	E_γ[†]	I_γ[‡]	E_f	J_f^π	Mult.[#]	δ[@]	α[a]	Comments
53.114	0,1,2,3$^+$	53.080 *18*	100	0.0	1$^+$	[M1,E2]			
61.625	0$^+$,1$^+$	61.626 *4*	100	0.0	1$^+$	M1		3.05	B(M1)(W.u.)=0.00314 *15* Mult.: Q(E2) is assigned in ^{120}Sn(^{7}Li,5nγ).
90.596	1$^+$,2$^+$	90.596 *7*	100	0.0	1$^+$	M1+E2	0.49 *25*	1.30	B(M1)(W.u.)=0.0055 *14*; B(E2)(W.u.)=1.1×10^2 *10* δ: from 1981Ng04.
109.68		19.1 *3*		90.596	1$^+$,2$^+$				
		109.7 *3*		0.0	1$^+$				
148.612	1$^+$	58.015 *13*	3.45 *9*	90.596	1$^+$,2$^+$	M1+E2	≤0.52	4.6 *10*	B(M1)(W.u.)>0.022
		148.612 *4*	100 *4*	0.0	1$^+$	M1		0.2485	B(M1)(W.u.)>0.058
154.35		44.7 *3*	100	109.68					
155.7	(4$^+$)	46.0 *3*		109.68					
		94.1 *7*	100	61.625	0$^+$,1$^+$				I(95.0γ)/I(160.1γ)=48 *6* (1990Wu01).
163.066	1$^+$,2$^+$	72.470 *6*	100 *7*	90.596	1$^+$,2$^+$	M1(+E2)	≤0.46		
		109.897 *23*	22 *2*	53.114	0,1,2,3$^+$	[M1,E2]			
		163.052 *22*	72 *3*	0.0	1$^+$	M1,E2			
175.574		175.582 *14*	100	0.0	1$^+$	[M1,E2]			
176.72		13.6 *3*		163.066	1$^+$,2$^+$				
		22.4 *3*		154.35					
246.66		83.6 *3*		163.066	1$^+$,2$^+$				
		92.3 *3*		154.35					
		137.0 *3*		109.68					
279.428	0,1	103.857 *7*	48 *3*	175.574		[M1,E2]			
		116.355 *9*	100 *3*	163.066	1$^+$,2$^+$	[M1,E2]			
299.3		52.7 *3*		246.66					
		122.6 *3*		176.72					
314.9	(7$^-$)	159.3 *3*	100	155.7	(4$^+$)				
342.9	(6$^+$)	27.9 *3*		314.9	(7$^-$)				
		187.2 *3*		155.7	(4$^+$)				
350.052	1$^+$	174.452 *26*	1.84 *7*	175.574		[M1,E2]			
		186.978 *10*	7.15 *23*	163.066	1$^+$,2$^+$	M1			
		201.43 *5*	1.49 *17*	148.612	1$^+$	M1,E2			
		259.4 *4*	0.7 *2*	90.596	1$^+$,2$^+$				
		288.423 *26*	5.20 *16*	61.625	0$^+$,1$^+$	[M1,E2]			
		350.065 *10*	100 *2*	0.0	1$^+$	M1,E2			
356.7		201.0 *3*	100	155.7	(4$^+$)				
379.4	(7$^-$)	64.5 *3*	100	314.9	(7$^-$)				
389.9	(8$^+$)	10.1[b] *3*	100	379.4	(7$^-$)				
394.1	(8$^+$)	51.0 *3*	100	342.9	(6$^+$)				
416.675	1$^+$	66.63 *5*	1.42 *17*	350.052	1$^+$	[M1,E2]			
		253.69 *6*	6.3 *7*	163.066	1$^+$,2$^+$	M1,E2			
		326.3 *5*	≈2	90.596	1$^+$,2$^+$				

$^{122}_{53}I_{69}$-3

Adopted Levels, Gammas (continued)

γ(^{122}I) (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[‡]	E_f	J_f^π	Mult.[#]
416.675	1^+	355.11 *4*	12.9 *21*	61.625	$0^+,1^+$	[M1,E2]
		416.633 *25*	100 *2*	0.0	1^+	M1
444.1	(8^-)	64.7 *3*	100	379.4	(7^-)	
453.0		153.7 *3*	100	299.3		
458.3	(8^-)	143.4 *3*	100	314.9	(7^-)	D
502.1		145.4 *3*	100	356.7		
519.2	(8^-)	204.3 *3*	100	314.9	(7^-)	D
534.4		219.5 *3*	100	314.9	(7^-)	
581.3	(6^+)	79.2 *3*		502.1		
		238.4 *3*		342.9	(6^+)	
717.5	(9^-)	273.4 *3*	100	444.1	(8^-)	
731.6	(5^+)	278.6 *3*	100	453.0		
746.0	(9^-)	226.8 *3*	87 *14*	519.2	(8^-)	D
		287.7 *3*	100 *14*	458.3	(8^-)	D
786.3	(8^+)	391.9 *3*	27 *3*	394.1	(8^+)	D,Q
		396.2 *3*	100 *12*	389.9	(8^+)	D,Q
857.7	(7^+)	276.4 *3*	100	581.3	(6^+)	
1016.9	(9^-)	497.8 *3*	≤47	519.2	(8^-)	
		558.7 *3*	100 *15*	458.3	(8^-)	D
		702.1 *3*	47 *10*	314.9	(7^-)	
1068.2	(10^-)	350.7 *3*		717.5	(9^-)	
		624.1 *3*		444.1	(8^-)	
1091.9		633.5 *3*		458.3	(8^-)	
		776.9 *3*		314.9	(7^-)	
1108.7	(10^-)	362.8 *3*		746.0	(9^-)	
		650.5 *3*		458.3	(8^-)	
1166.2	(10^+)	74.2 *3*		1091.9		
		149.0 *3*	16 *3*	1016.9	(9^-)	D
		380.3 *3*	100 *12*	786.3	(8^+)	Q
		420.0 *3*	33 *4*	746.0	(9^-)	D
		772.2 *3*	31 *4*	394.1	(8^+)	Q
		776.5 *3*	55 *6*	389.9	(8^+)	Q
1208.9		689.8 *3*	100	519.2	(8^-)	
1244.0	(10^-)	498.0 *3*		746.0	(9^-)	
		724.8 *3*		519.2	(8^-)	
1260.2	(10^-)	542.7 *3*		717.5	(9^-)	
		816.1 *3*		444.1	(8^-)	
1429.1	(7^+)	697.5 *3*		731.6	(5^+)	
1444.1	(11^-)	375.9 *3*		1068.2	(10^-)	
		726.6 *3*		717.5	(9^-)	
1489.2	(11^-)	743.3 *3*	100	746.0	(9^-)	Q
1536.0	(11^+)	370.0 *3*	100	1166.2	(10^+)	D
1623.9	(11^-)	363.7 *3*		1260.2	(10^-)	
		555.7 *3*		1068.2	(10^-)	
1719.8		611.1 *3*		1108.7	(10^-)	
		702.9 *3*		1016.9	(9^-)	
1774.8	(10^-)	666.4 *3*		1108.7	(10^-)	
		758.2 *3*		1016.9	(9^-)	
		987.5[&] *3*		786.3	(8^+)	
1824.9	(12^+)	288.9 *3*	13 *3*	1536.0	(11^+)	D
		658.9 *3*	100 *8*	1166.2	(10^+)	Q
1841.4	(12^-)	397.2 *3*		1444.1	(11^-)	
		732.5 *3*		1108.7	(10^-)	
		773.1 *3*		1068.2	(10^-)	
1849.4	(12^-)	360.2 *3*		1489.2	(11^-)	D
		405.4 *3*		1444.1	(11^-)	
		740.7 *3*		1108.7	(10^-)	
		781.3 *3*		1068.2	(10^-)	
2012.5	(11^-)	237.5 *3*		1774.8	(10^-)	
		803.7 *3*		1208.9		
2067.3	(12^-)	443.4 *3*		1623.9	(11^-)	
		807.1 *3*		1260.2	(10^-)	
2071.4	(12^-)	827.4 *3*	100	1244.0	(10^-)	
2184.2	(13^+)	359.3 *3*	100 *8*	1824.9	(12^+)	D
		648.2 *3*	43 *5*	1536.0	(11^+)	Q
2187.6	(9^+)	758.5 *3*		1429.1	(7^+)	
2272.9	(13^-)	431.7 *3*		1841.4	(12^-)	
		828.9 *3*		1444.1	(11^-)	
2333.8	(12^-)	321.3 *3*		2012.5	(11^-)	
		558.8 *3*		1774.8	(10^-)	
		798.0 *3*		1536.0	(11^+)	
2355.8	(13^-)	866.6 *3*	100	1489.2	(11^-)	
2502.1		782.3 *3*	100	1719.8		
2523.6	(14^+)	339.4 *3*	43 *4*	2184.2	(13^+)	D
		698.8 *3*	100 *10*	1824.9	(12^+)	Q
2546.0	(13^-)	478.7 *3*		2067.3	(12^-)	
		922.1 *3*		1623.9	(11^-)	
2649.1	(13^-)	315.3 *3*		2333.8	(12^-)	
		636.6 *3*		2012.5	(11^-)	
2679.9	(14^-)	324.2 *3*		2355.8	(13^-)	
		830.6 *3*		1849.4	(12^-)	
		838.3 *3*		1841.4	(12^-)	
2729.7	(14^-)	457.0 *3*		2272.9	(13^-)	
		888.1 *3*		1841.4	(12^-)	

$^{122}_{53}I_{69}$-4

Adopted Levels, Gammas (continued)

γ(^{122}I) (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[‡]	E_f	J_f^π	Mult.[#]
2824.0	(15$^+$)	300.4 *3*	100 *10*	2523.6	(14$^+$)	D
		639.8 *3*	87 *10*	2184.2	(13$^+$)	Q
2987.6	(14$^-$)	307.7 *3*		2679.9	(14$^-$)	
		338.5 *3*		2649.1	(13$^-$)	
		653.8 *3*		2333.8	(12$^-$)	
		803.6[b] *3*		2184.2	(13$^+$)	
3007.9	(16$^+$)	183.9 *3*	100 *10*	2824.0	(15$^+$)	
		484.3 *3*	28 *3*	2523.6	(14$^+$)	
3045.9	(14$^-$)	974.5 *3*	100	2071.4	(12$^-$)	
3052.0	(14$^-$)	506.0 *3*	100	2546.0	(13$^-$)	
3216.3	(15$^-$)	486.5 *3*		2729.7	(14$^-$)	
		943.5 *3*		2272.9	(13$^-$)	
3290.2		788.1 *3*	100	2502.1		
3342.5	(15$^-$)	986.7 *3*	100	2355.8	(13$^-$)	
3405.9	(15$^-$)	418.3 *3*		2987.6	(14$^-$)	
		756.8 *3*		2649.1	(13$^-$)	
3597.4	(15$^-$)	1073.8 *3*	100	2523.6	(14$^+$)	
3641.5	(16$^-$)	961.6 *3*	100	2679.9	(14$^-$)	
3649.2	(17$^+$)	641.3 *3*	100	3007.9	(16$^+$)	
3674.1	(16$^-$)	457.8 *3*		3216.3	(15$^-$)	
		944.3 *3*		2729.7	(14$^-$)	
3774.0	(16$^-$)	132.4 *3*		3641.5	(16$^-$)	
		368.0 *3*		3405.9	(15$^-$)	
		786.3 *3*		2987.6	(14$^-$)	
		950.1 *3*		2824.0	(15$^+$)	
3949.3	(17$^+$)	351.9 *3*		3597.4	(15$^-$)	
		941.4 *3*		3007.9	(16$^+$)	
		1125.3 *3*		2824.0	(15$^+$)	
4166.7	(17$^-$)	824.2 *3*	100	3342.5	(15$^-$)	
4204.7	(17$^-$)	430.7 *3*		3774.0	(16$^-$)	
		798.7 *3*		3405.9	(15$^-$)	
4217.1	(18$^+$)	267.8 *3*	25 *4*	3949.3	(17$^+$)	D
		1209.2 *3*	100 *10*	3007.9	(16$^+$)	Q
4247.1		956.9 *3*	100	3290.2		
4517.7	(18$^-$)	743.7 *3*	100	3774.0	(16$^-$)	(Q)
		868.0 *3*	100	3649.2	(17$^+$)	
4605.3	(18$^-$)	963.8 *3*	100	3641.5	(16$^-$)	
4610.8		961.6 *3*	100	3649.2	(17$^+$)	
4775.4		1126.2 *3*	100	3649.2	(17$^+$)	
4953.0	(19$^-$)	748.3 *3*	100	4204.7	(17$^-$)	
5144.1	(20$^+$)	927.0 *3*	100	4217.1	(18$^+$)	Q
5220.5	(20$^-$)	702.8 *3*	100	4517.7	(18$^-$)	
5460.7		240.2 *3*	100	5220.5	(20$^-$)	
5493.4	(22$^+$)	349.3 *3*	100	5144.1	(20$^+$)	Q
6008.6		547.9 *3*		5460.7		
		788.1 *3*		5220.5	(20$^-$)	
6217.4	(23$^+$)	724.0 *3*	100	5493.4	(22$^+$)	D
7023.5	(24$^+$)	806.1 *3*	100	6217.4	(23$^+$)	
8323.2		1299.7 *3*	100	7023.5	(24$^+$)	Q

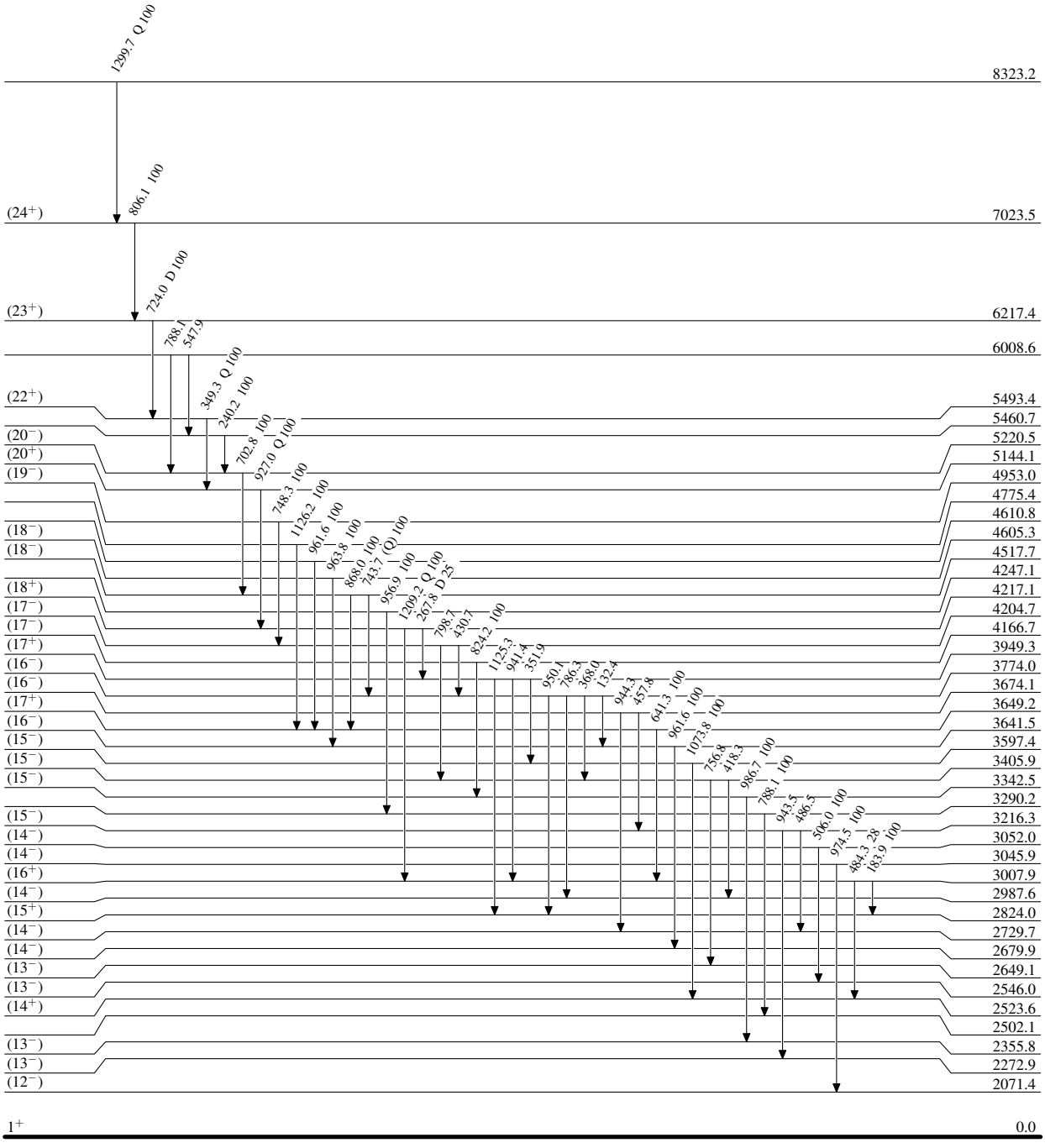
[†] From ^{122}Xe ε decay and (HI,xnγ).
[‡] From ^{122}Xe ε decay and partially available data compiled in (HI,xnγ).
[#] Multipolarities are based on α(exp) in ^{122}Xe ε decay, and γ(θ) in ^{116}Cd(^{11}B,5nγ) and DCO in ^{120}Sn(^{7}Li,5nγ).
[@] From ^{122}Xe ε decay.
[&] Poor fit: level-energy difference=988.49.
[a] 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.
[b] Placement of transition in the level scheme is uncertain.

$^{122}_{53}I_{69}$-5

Adopted Levels, Gammas

Level Scheme

Intensities: Relative photon branching from each level



$^{122}_{53}I_{69}$

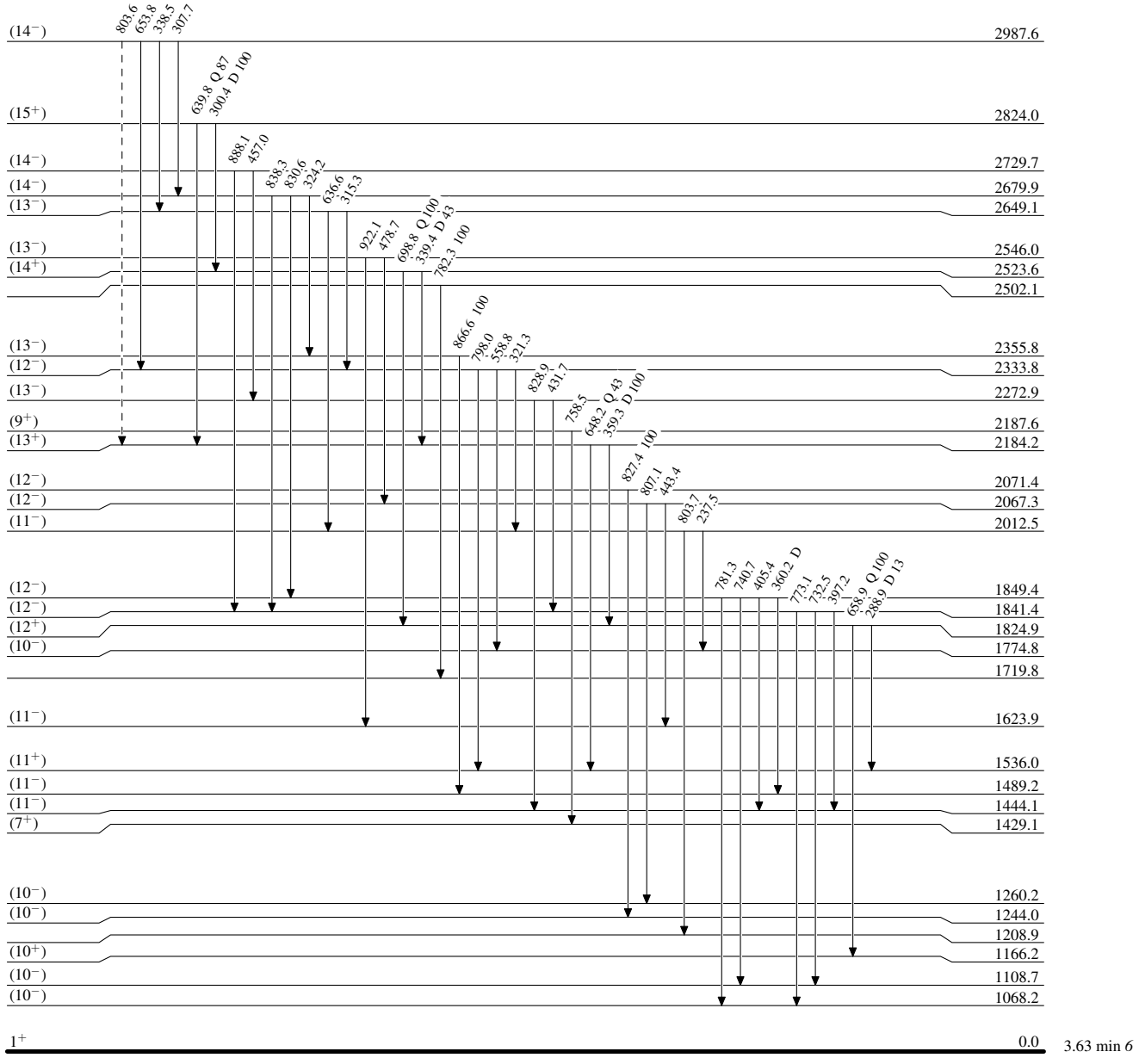
Adopted Levels, Gammas

Legend

Level Scheme (continued)

Intensities: Relative photon branching from each level

γ Decay (Uncertain)

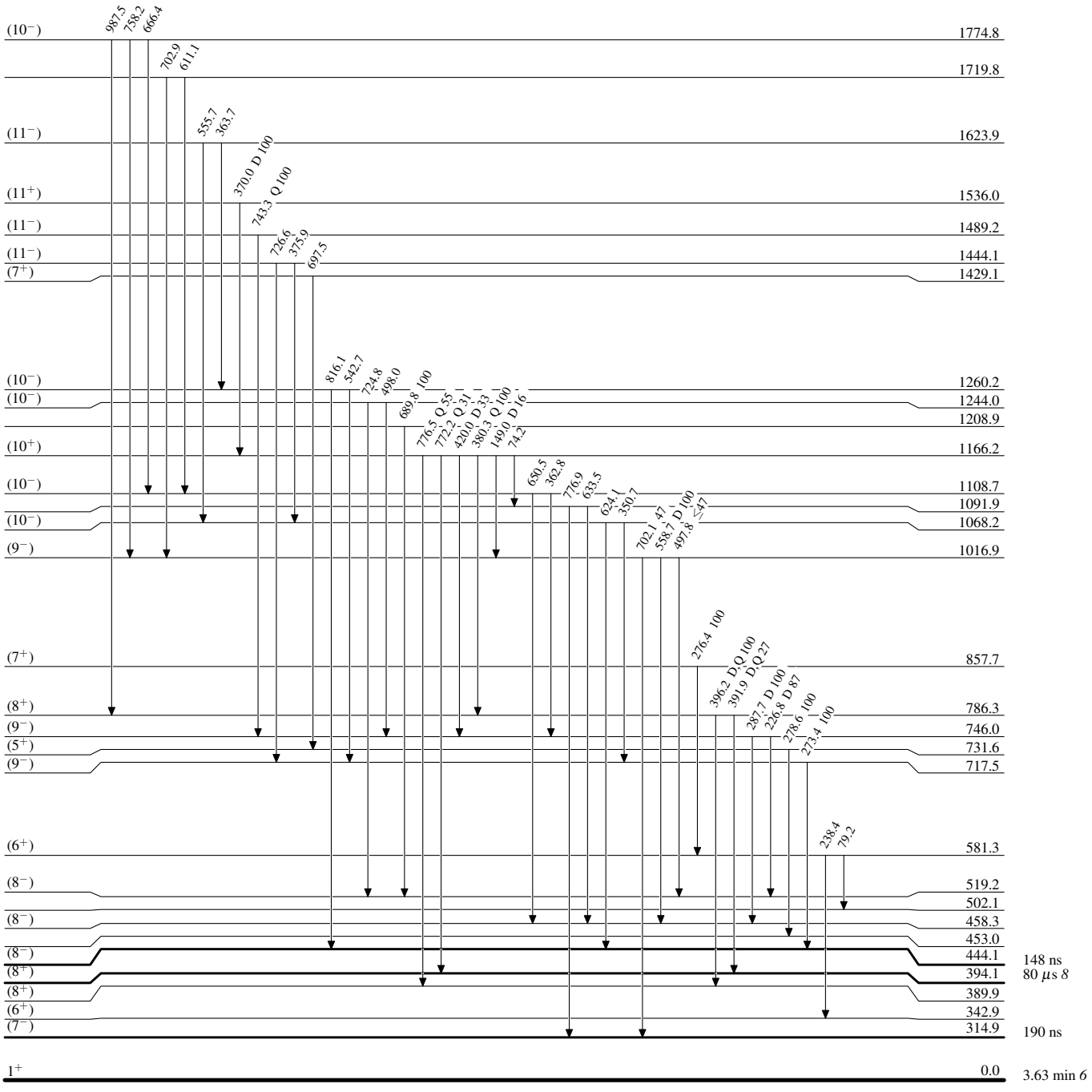


$^{122}_{53}I_{69}$

Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Relative photon branching from each level



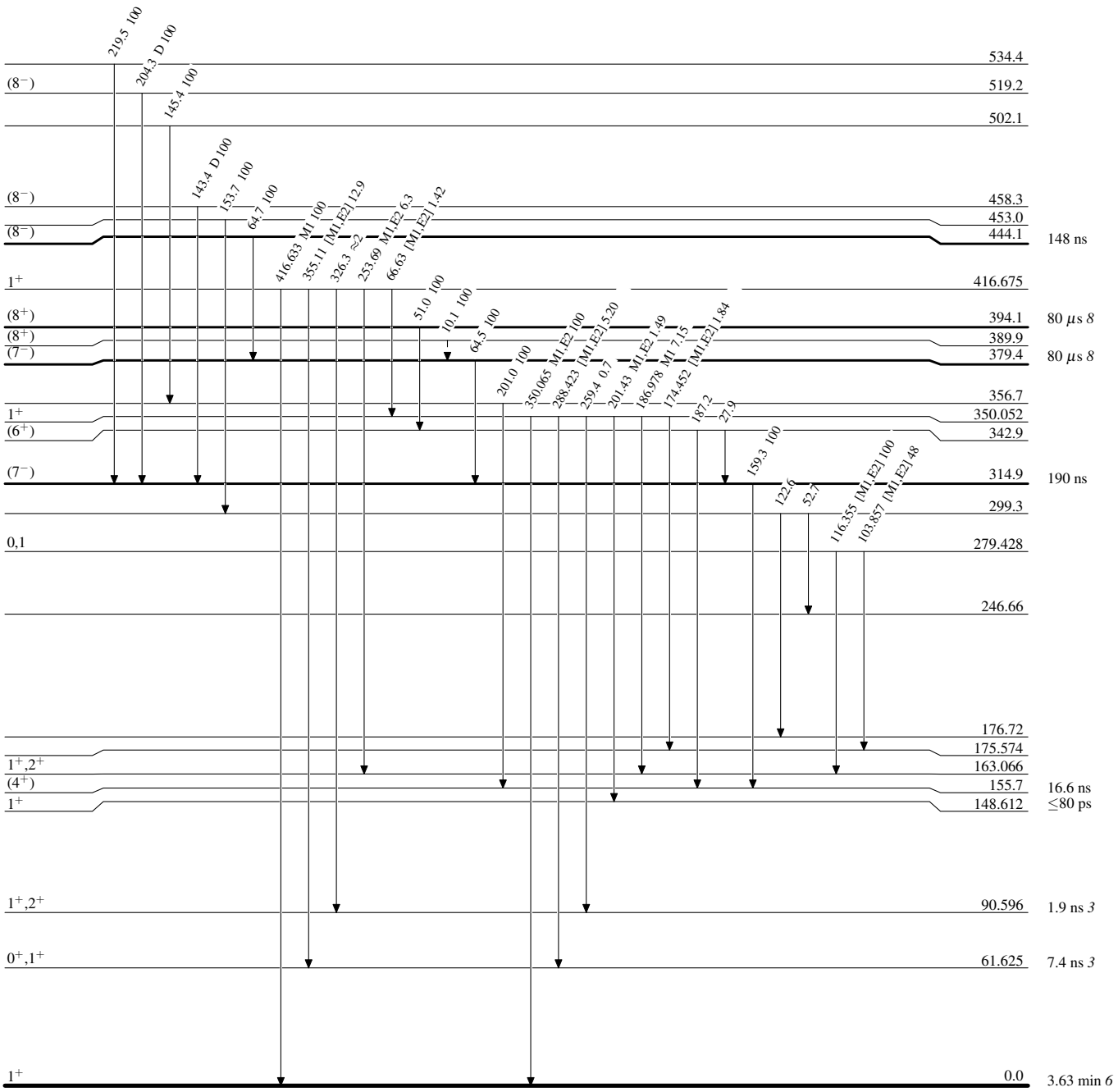
Adopted Levels, Gammas

Legend

Level Scheme (continued)

Intensities: Relative photon branching from each level

γ Decay (Uncertain)

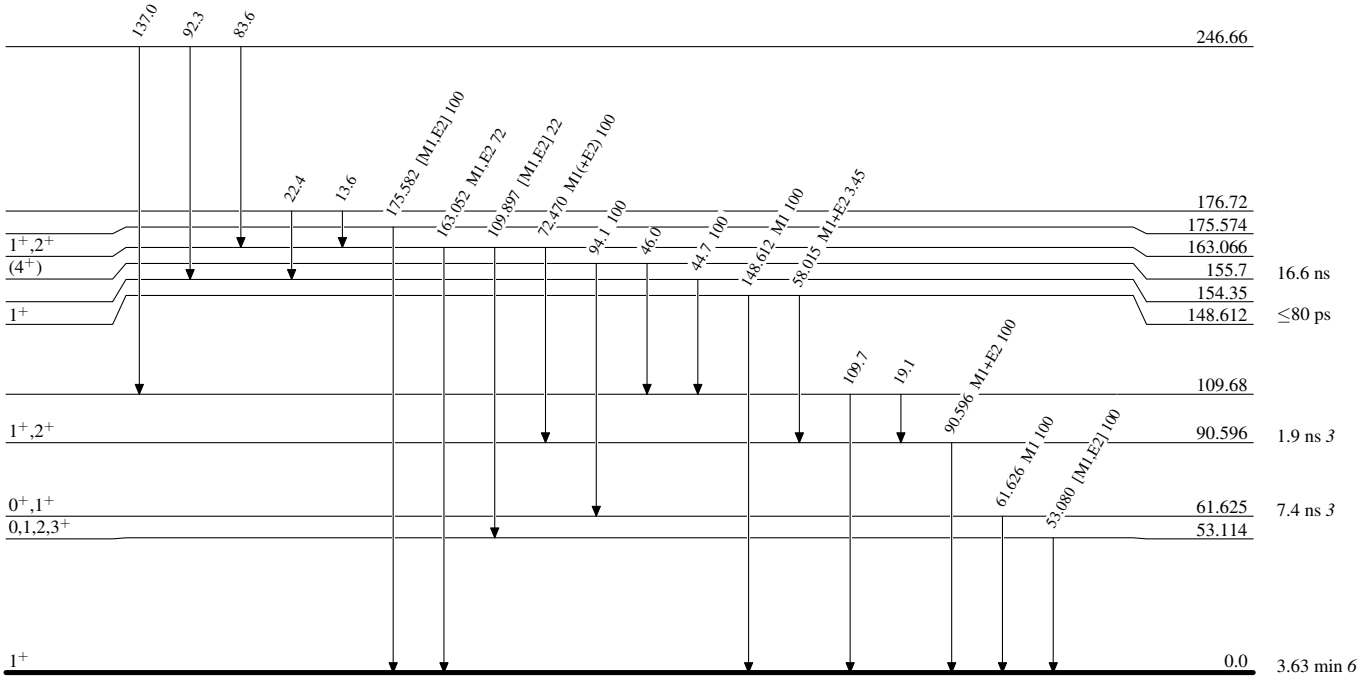


$^{122}_{53}I_{69}$

Adopted Levels, Gammas

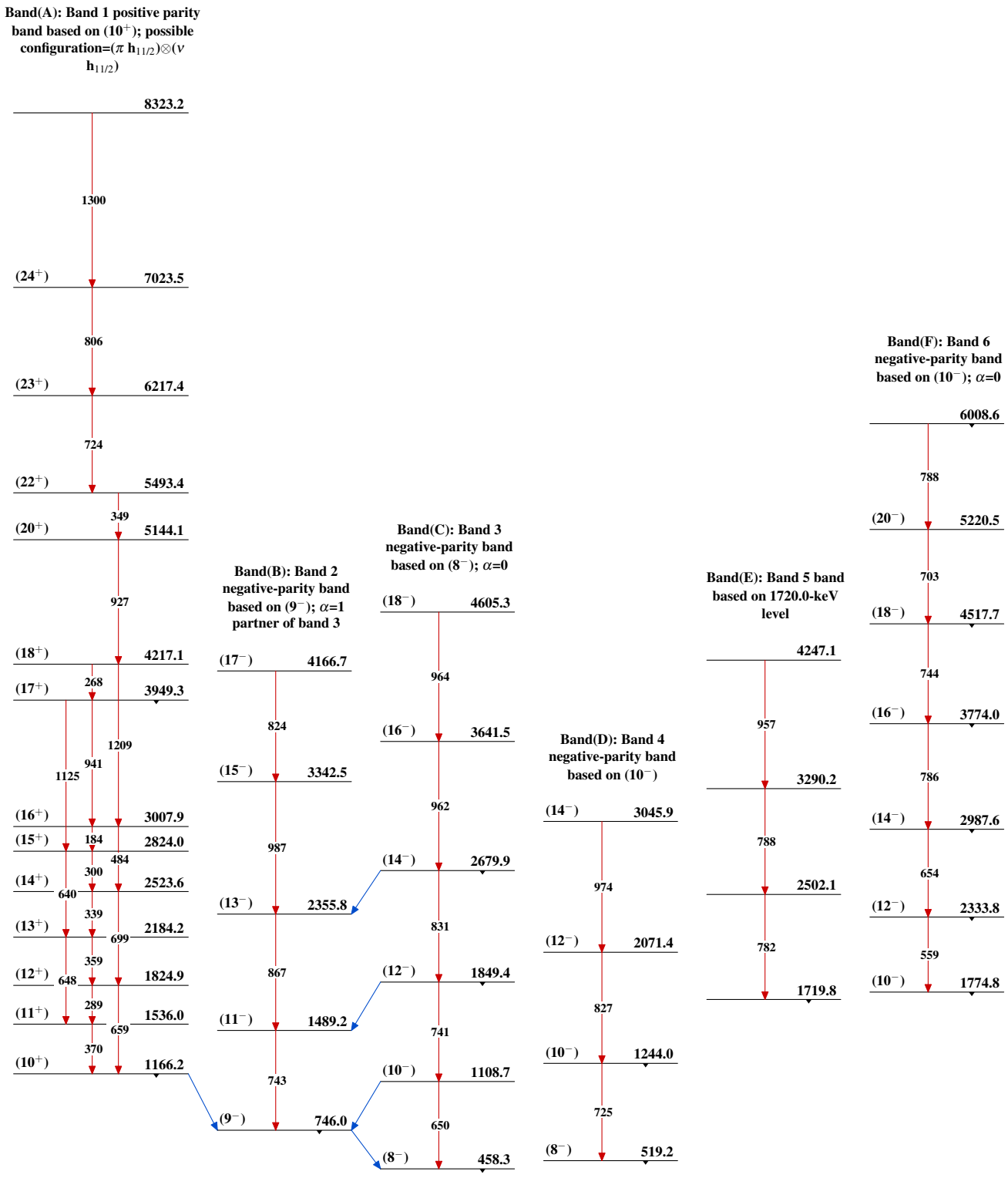
Level Scheme (continued)

Intensities: Relative photon branching from each level



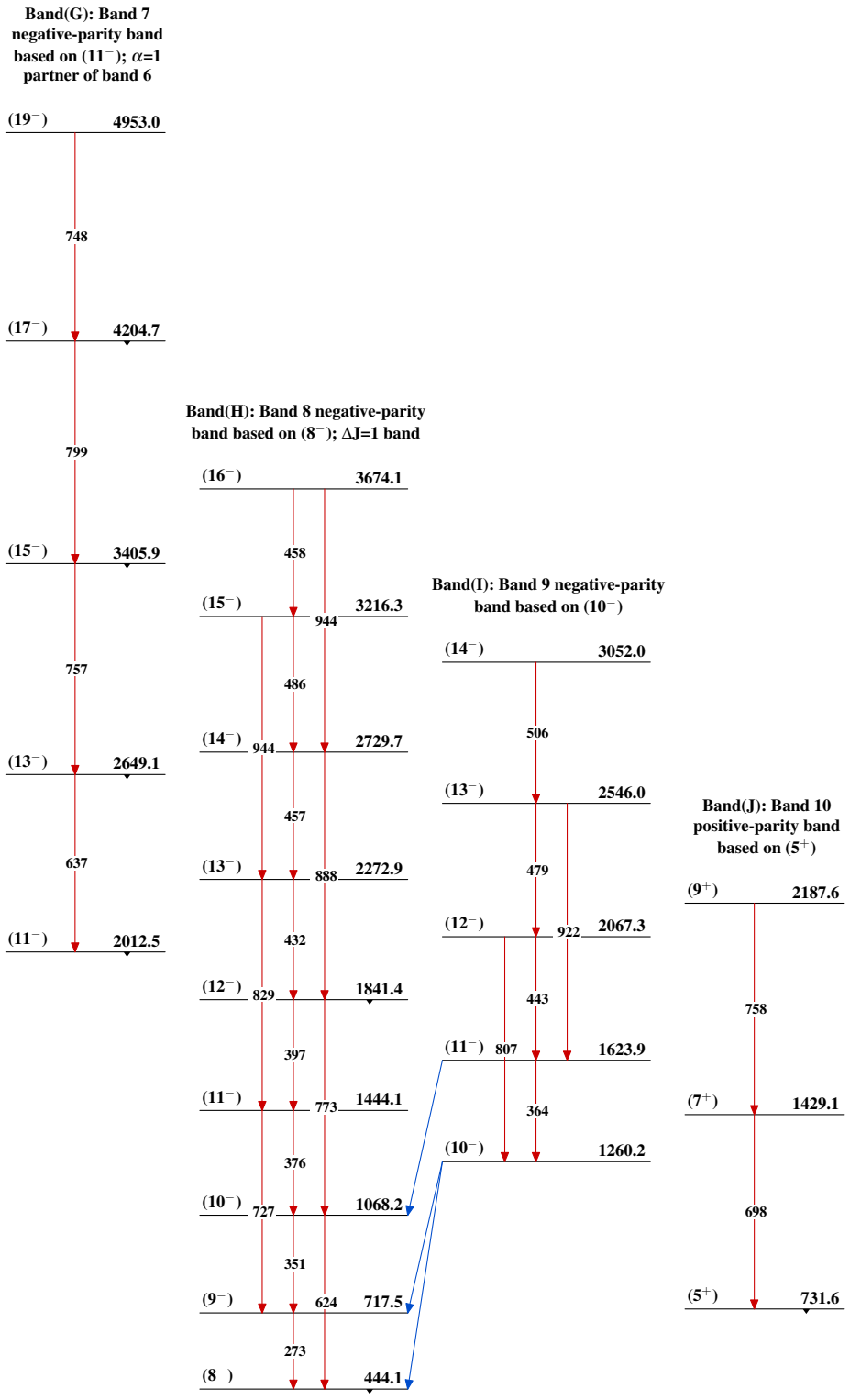
$^{122}_{53}I_{69}$

Adopted Levels, Gammas



$^{122}_{53}I_{69}$

Adopted Levels, Gammas (continued)



$^{122}_{53}I_{69}$