Adopted Levels, Gammas

Type	Author	History Citation	Literature Cutoff Date
Full Evaluation	Balraj Singh	NDS 130, 21 (2015)	15-Jul-2015

Q(β^-)=−10270 *60*; S(n)=10987 *18*; S(p)=2994 *22*; Q(α)=5996 *5* 2012Wa38
S(n)=19469 *16*, S(2p)=3719 *15*, Q(εp)=3509 *18* (2012Wa38).
Isotope shift, RMS radii: 1986Ul02.
Mass measurements and analysis: 2001Sc41, 2001Sc54, 2002No01.
Analyzed band structures: 1994Dr04, 1989Ha13.
Nuclear structure calculations and analyses (levels, band structures, deformation, etc.): 2014Ga02, 2014Ga04, 2013No05, 2013Ya05, 2011Ga35, 2003Sa27, 1999Sh04, 1997Jo21, 1997Yo04, 1996Wa13, 1996Bi06, 1996He02, 1996Wo02, 1994Pa29, 1994Yo05, 1994Dr04, 1993Na05, 1991Tr01, 1987Be06, 1984Ba69, 1983Ba21, 1982Gi10, 1975Fr08, 1973Di12, 1972Fa11.
Additional information 1.
First identification of ^{182}Hg by 1968De01.

^{182}Hg Levels

Cross Reference (XREF) Flags

A	^{182}Tl ε decay (3.1 s)	D	^{154}Gd(^{32}S,4nγ)
B	^{186}Pb α decay (4.82 s)	E	Coulomb excitation
C	^{96}Mo(^{88}Sr,2nγ)		

E(level)[†]	J$^\pi$[‡]	T$_{1/2}$[#]	XREF	Comments
0.0[@]	0$^+$	10.83 s *6*	ABCDE	%ε+%β^+=86.2 *9*; %α=13.8 *9* <r^2>$^{1/2}$(rms charge radius)=5.3833 fm *52* (2013An02,evaluation). δ<r^2>(^{198}Hg−^{182}Hg)=−0.6384 fm^2 20 (1986Ul02). Based on deduced quadrupole invariants <Q^2> and <cos(3δ)>, ground state is weakly deformed with $\beta\approx$0.15; consistent with oblate-like deformation (2014Br05, Coulomb excitation). T$_{1/2}$: from 1993Wa03. Others: 11.3 s *2* (1992Ro21), 11.2 s *10* (1972Fi12,1971JoZK,1972HuZL), 11.3 s *5* (1970Ha18,1969Ha03), 9.6 s *2* (1968De01). Weighted average of all the values is 10.78 s *18*. %α: weighted average of 13.3 *5* (1997Ba21, from correlating α particles from ^{186}Pb decay with subsequent ^{182}Hg decays) and 15.2 *8* (1980Sc09, from a comparison of α-particle intensities of ^{182}Hg and its daughter nucleus ^{178}Pt in the same spectrum. Other: %α=9 *2* was determined from a comparison of K x ray and α-particle intensities (1970Ha18). This method is less precise because the decay scheme of ^{182}Hg is not well known, and therefore the contribution of x rays due to internal conversion cannot be accurately calculated. Additional information 2.
328 *12*	(0$^+$)		B E	Based on deduced quadrupole invariants <Q^2> and <cos(3δ)>, first excited state is prolate deformed (2014Br05, Coulomb excitation).
351.7[@] *3*	2$^+$	29.2 ps *16*	ABCDE	T$_{1/2}$: others: 28.4 ps *21* (2009Gr09), 29.7 ps *18* (deduced from B(E2) values in Coulomb excitation). Q(transition)=4.1 *2*, β_2=0.15 *1* (2010Sc03).
548.3[&] *5*	2$^+$	9.5 ps *+27−22*	CDE	T$_{1/2}$: deduced by evaluator from B(E2)=0.37 *+4−3* from g.s. and branching ratios supplied by authors in May 16, 2014 e-mail reply. Using B(E2)=2.9 *7* for 335,0$^+$ to 548,2$^+$ level gives T$_{1/2}$=9.0 ps *+60−37*, consistent with that obtained from B(E2) value for g.s. to 548 level. B(E2)(from 0,0$^+$)=0.37 *+4−3* (2014Br05). B(E2)(from 335,0$^+$)=2.9 *7* (2014Br05). B(E2)(from 352,2$^+$)=0.97 *+38−32* (2014Br05).
613.2[&] *4*	4$^+$	25.7 ps *8*	A CDE	T$_{1/2}$: others: 24.7 ps *10* (2009Gr09), 26.1 ps $^{9-8}$ (2014Br05, deduced from B(E2)

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Adopted Levels, Gammas (continued)

^{182}Hg Levels (continued)

E(level)†	Jπ‡	$T_{1/2}$#	XREF	Comments
				values in Coul. ex.). Q(transition)=7.4 *2*, β_2=0.26 *1* (2010Sc03).
946.4& *5*	6^+	6.3 ps *4*	A CDE	$T_{1/2}$: other: 5.68 ps *35* (2009Gr09). Q(transition)=8.0 *8*, β_2=0.29 *3* (2010Sc03).
1124.8@ *8*	(4^+)		CDE	
1296.4 *5*		<53 ps	CD	
1360.0& *5*	8^+	1.94 ps *21*	A CD	$T_{1/2}$: other: 2.01 ps *21* (2009Gr09). Q(transition)=8.4 *9*, β_2=0.30 *3* (2010Sc03).
1384.9b *6*		13.5 ps *16*	CD	
1532.9d *6*			CD	
1573.4c *7*			CD	
1763.7b *6*		2.63 ps *35*	CD	
1768.4a *6*	(5^-)	24 ps *8*	CD	
1823.5 *8*			CD	
1846.9& *6*	10^+	0.998 ps *22*	CD	$T_{1/2}$: other: 0.83 ps *21* (2009Gr09). Q(transition)=7.7 *11*, β_2=0.28 *6* (2010Sc03).
1946.1d *6*			CD	
2007.6a *6*	(7^-)	25.9 ps *14*	CD	Q(transition)=6.6 *12*, β_2=0.24 *4* (2010Sc03).
2013.1c *7*			CD	
2210.9b *7*		2.1 ps *16*	CD	
2314.9c *7*		15.1 ps *22*	CD	
2323.5a *6*	(9^-)	6.31 ps *35*	CD	Q(transition)=7.6 *9*, β_2=0.27 *3* (2010Sc03).
2399.4& *8*	12^+		CD	
2412.5d *8*			CD	
2687.1c *8*			CD	
2713.5a *7*	(11^-)	2.15 ps *21*	CD	Q(transition)=8.4 *12*, β_2=0.30 *4* (2010Sc03).
2722.0b *13*			CD	
2929.2d *10*			CD	
3010.1& *10*	14^+		CD	
3111.5c *9*			CD	
3165.6a *8*	(13^-)	0.97 ps *35*	CD	Q(transition)=8.0 *28*, β_2=0.29 *10* (2010Sc03).
3289.8b *15*			CD	
3486.3d *14*			CD	
3573.5c *11*			CD	
3647.1a *10*	(15^-)	<2.7 ps	CD	
3671.5& *11*	16^+		CD	
3908.8b *18*			D	
4070.9c *15*			D	
4095.3d *17*			D	
4140.6a *11*	(17^-)		CD	
4378.3& *15*	18^+		CD	
4565.8?b *21*			D	
4619.9c *18*			D	
5108.1& *18*	(20^+)		D	

† From least-squares fit to Eγ′s, assuming 0.3 keV uncertainty for Eγ values quoted to tenth of a keV and 1 keV for others.
‡ Based on γγ(θ) DCO data in (^{32}S,4nγ) (1995Bi02). The transitions are interpreted as ΔJ=2, stretched E2 from such data. In

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Adopted Levels, Gammas (continued)

^{182}Hg Levels (continued)

some cases RUL is used when level lifetimes are known.

[#] From recoil-distance Doppler-shift (RDDS) method in ^{96}Mo(^{88}Sr,2nγ) reaction (2010Sc03). See also 2009Gr09 from the same group for lifetimes measurements of 2^+ to 10^+ states in g.s. band. Values in 2009Gr09 are generally somewhat lower than those in the analysis in 2010Sc03, the values from latter are adopted by the evaluators.

[@] Band(A): $K^\pi=0^+$,oblate band.

[&] Band(B): $K^\pi=2^+$,prolate band.

[a] Band(C): Possible K=0, octupole band.

[b] Band(D): ΔJ=(2) band.

[c] Band(E): ΔJ=(2) band.

[d] Band(F): ΔJ=(2) band.

γ(^{182}Hg)

E_i(level)	J_i^π	E_γ[†]	I_γ[†]	E_f	J_f^π	Mult.[#]	α[@]	Comments
328	(0^+)	328[&]		0.0	0^+	(E0)		
351.7	2^+	351.7 *3*	100	0.0	0^+	E2	0.0672	B(E2)(W.u.)=55 *3*
548.3	2^+	196	8.8 *32*	351.7	2^+	E0+M1+E2	4.7 *13*	α(exp)=4.7 *13* (2014Br05) Mult.: from α(exp)=4.7 *13*, quoted by 2014Br05 (in reference 15) from ^{182}Tl decay results yet to be published. E_γ: γ ray reported on the basis of ^{182}Tl decay results yet to be published (reference 15 in 2014Br05).
		213	6.5 *23*	328	(0^+)	[E2]	0.315	B(E2)(W.u.)=9×10^1 *+4−5*
		548.3 *5*	100	0.0	0^+	[E2]	0.0217	B(E2)(W.u.)=12 *4*
613.2	4^+	261.5 *3*	100	351.7	2^+	E2	0.162	B(E2)(W.u.)=253 *8*
946.4	6^+	333.1 *3*	100	613.2	4^+	E2	0.0785	B(E2)(W.u.)=332 *22*
1124.8	(4^+)	576.5 *6*	100 *15*	548.3	2^+			
		773.1[&]		351.7	2^+			This γ cannot be distinguished from strong 771.8γ from 1384 level.
1296.4		682.2 *10*	22 *6*	613.2	4^+			
		748.2 *5*	100 *13*	548.3	2^+			
1360.0	8^+	413.7 *3*	100	946.4	6^+	E2	0.0433	B(E2)(W.u.)=3.8×10^2 *4*
1384.9		771.8 *8*	100	613.2	4^+			
1532.9		586.3 *4*	100	946.4	6^+			
1573.4		627.5 *6*	100	946.4	6^+			
1763.7		379.1 *4*	100 *13*	1384.9				
		816.7 *6*	88 *13*	946.4	6^+			
1768.4	(5^-)	471.9 *4*	100 *12*	1296.4				
		1156.7 *10*	19 *6*	613.2	4^+	[E1]		B(E1)(W.u.)=9.E−7 *5*
1823.5		526.7	100	1296.4				E_γ: from ^{154}Gd(^{32}S,4nγ). Other: 527 *4* in ^{96}Mo(^{88}Sr,2nγ).
1846.9	10^+	487.0 *4*	100	1360.0	8^+	E2	0.0287	B(E2)(W.u.)=328 *8*
1946.1		411.9[‡]		1532.9				
		586.3 *4*	100 *11*	1360.0	8^+			
2007.6	(7^-)	183.9 *8*	36 *5*	1823.5				
		239.4 *4*	100 *10*	1768.4	(5^-)	[E2]	0.214 *4*	B(E2)(W.u.)=2.5×10^2 *4*
		1060.9 *7*	27 *5*	946.4	6^+	[E1]		B(E1)(W.u.)=1.00×10^{-6} *21*
2013.1		441.2[‡]		1573.4				
		627.5 *6*	100 *15*	1384.9				
2210.9		447.2 *5*	100 *14*	1763.7				
		850.7 *8*	50 *10*	1360.0	8^+			
2314.9		301.8 *4*	100 *11*	2013.1				

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Adopted Levels, Gammas (continued)

γ(^{182}Hg) (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[†]	E_f	J_f^π	Mult.[#]	α[@]	Comments
2314.9		551.2[‡]	75	1763.7				I_γ: from 1995Bi02.
		955.2[‡]		1360.0	8^+			
2323.5	(9^-)	315.9 *4*	100 *9*	2007.6	(7^-)	[E2]	0.091	B(E2)(W.u.)=3.2×10^2 *5*
		963.0 *7*	37 *6*	1360.0	8^+	[E1]		B(E1)(W.u.)=9.5×10^{-6} *18*
2399.4	12^+	552.5 *5*	100	1846.9	10^+	(Q)		
2412.5		466.6 *6*	100 *17*	1946.1				
		565.1[‡]		1846.9	10^+			
2687.1		372.2 *5*	100 *19*	2314.9				
		840.0[‡]		1846.9	10^+			
2713.5	(11^-)	389.9 *4*	100 *9*	2323.5	(9^-)	[E2]	0.0508	B(E2)(W.u.)=4.0×10^2 *7*
		867.5 *10*	15 *4*	1846.9	10^+	[E1]		B(E1)(W.u.)=1.9×10^{-5} *6*
2722.0		511.1	100	2210.9				E_γ: from ^{154}Gd(^{32}S,4nγ). Other: 512 *3* in ^{96}Mo(^{88}Sr,2nγ).
2929.2		516.6 *10*	100 *33*	2412.5				
		529.8[‡]		2399.4	12^+			
3010.1	14^+	610.7 *6*	100	2399.4	12^+			
3111.5		424.4 *5*	100	2687.1				
3165.6	(13^-)	452.1 *4*	100	2713.5	(11^-)	[E2]	0.0345	B(E2)(W.u.)=4.9×10^2 *18*
3289.8		567.8 *9*	100	2722.0				
3486.3		557.1 *9*	100	2929.2				E_γ: 559.2 in ^{154}Gd(^{32}S,4nγ).
3573.5		462.0 *5*	100	3111.5				
3647.1	(15^-)	481.5 *6*	100	3165.6	(13^-)	[E2]	0.0295	B(E2)(W.u.)>1.3×10^2
3671.5	16^+	661.4 *5*	100	3010.1	14^+			E_γ: 663.1 in ^{154}Gd(^{32}S,4nγ).
3908.8		619[‡]		3289.8				
4070.9		497.4[‡]	100	3573.5				
4095.3		609[‡]		3486.3				
4140.6	(17^-)	493.4 *5*	100	3647.1	(15^-)			
4378.3	18^+	706.8 *9*	100	3671.5	16^+			
4565.8?		657[‡&]		3908.8				
4619.9		549[‡]		4070.9				
5108.1	(20^+)	729.8[‡]		4378.3	18^+			

[†] From ^{96}Mo(^{88}Sr,2nγ), unless otherwise stated.
[‡] Weak γ from ^{154}Gd(^{32}S,4nγ) only (1995Bi02), intensity not given in 1995Bi02.
[#] From ΔJ=2, quadrupole from DCO data and RUL.
[@] 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.

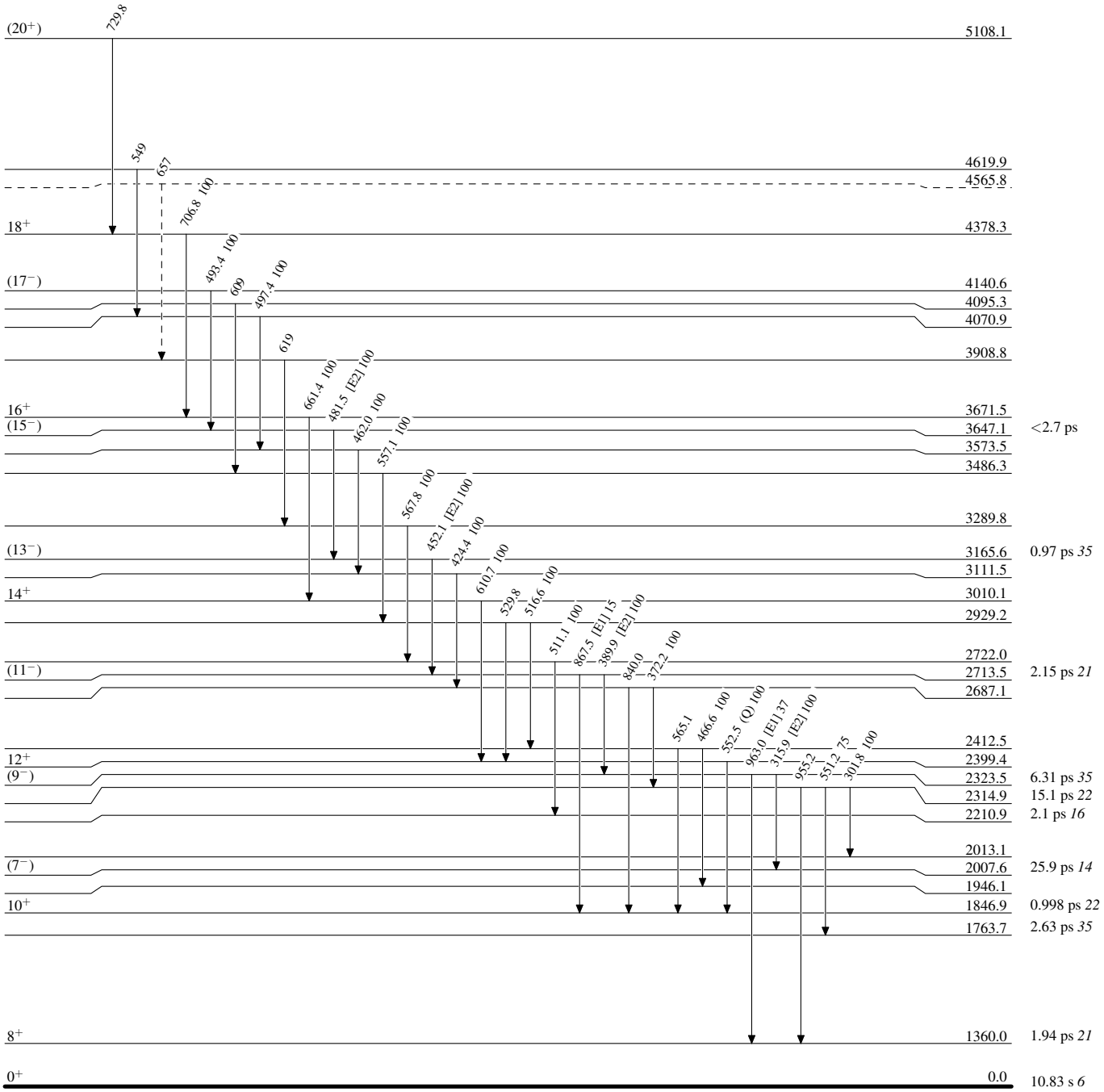
Adopted Levels, Gammas

Legend

Level Scheme

Intensities: Relative photon branching from each level

γ Decay (Uncertain)



$^{182}_{80}Hg_{102}$

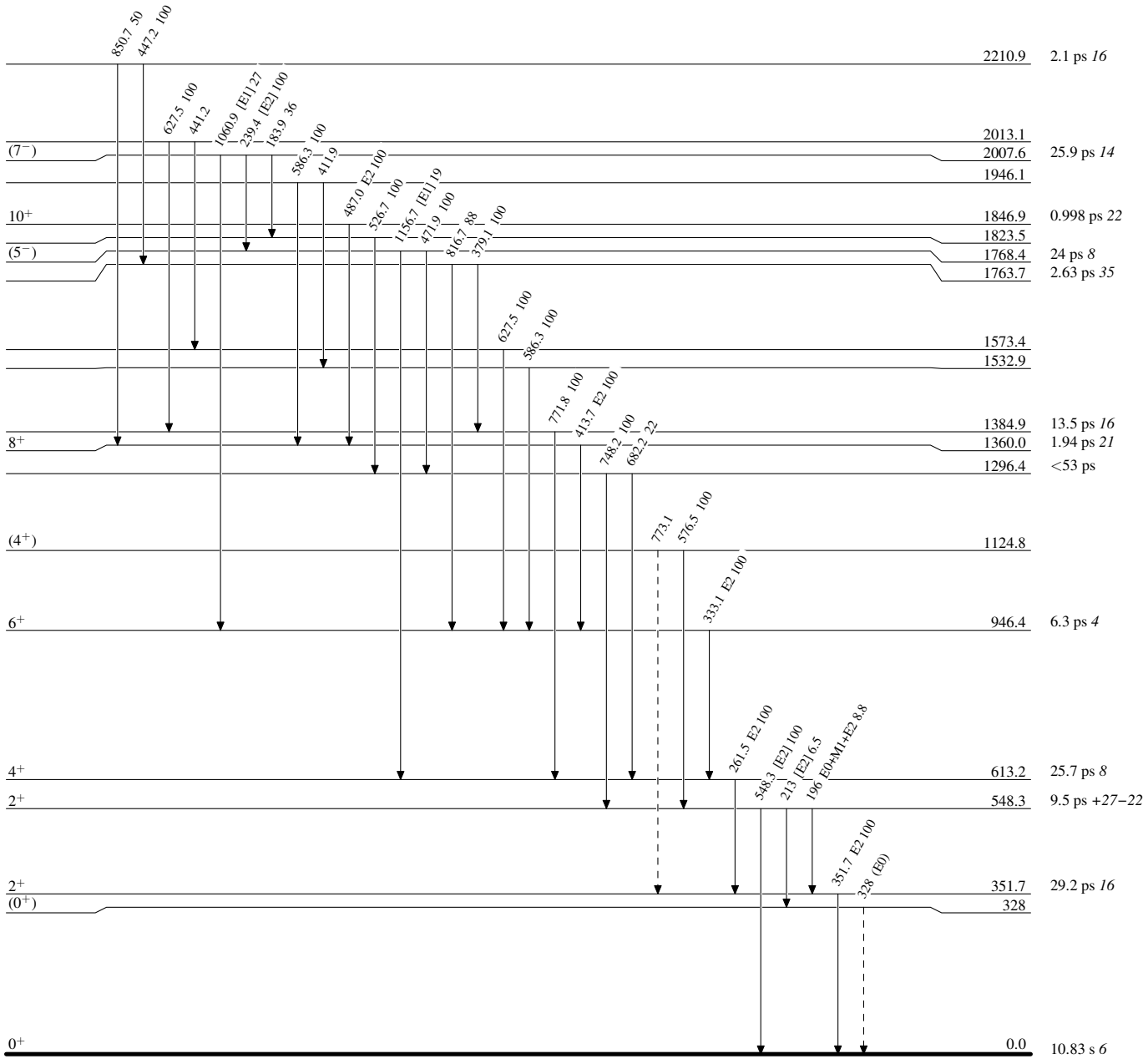
Adopted Levels, Gammas

Legend

Level Scheme (continued)

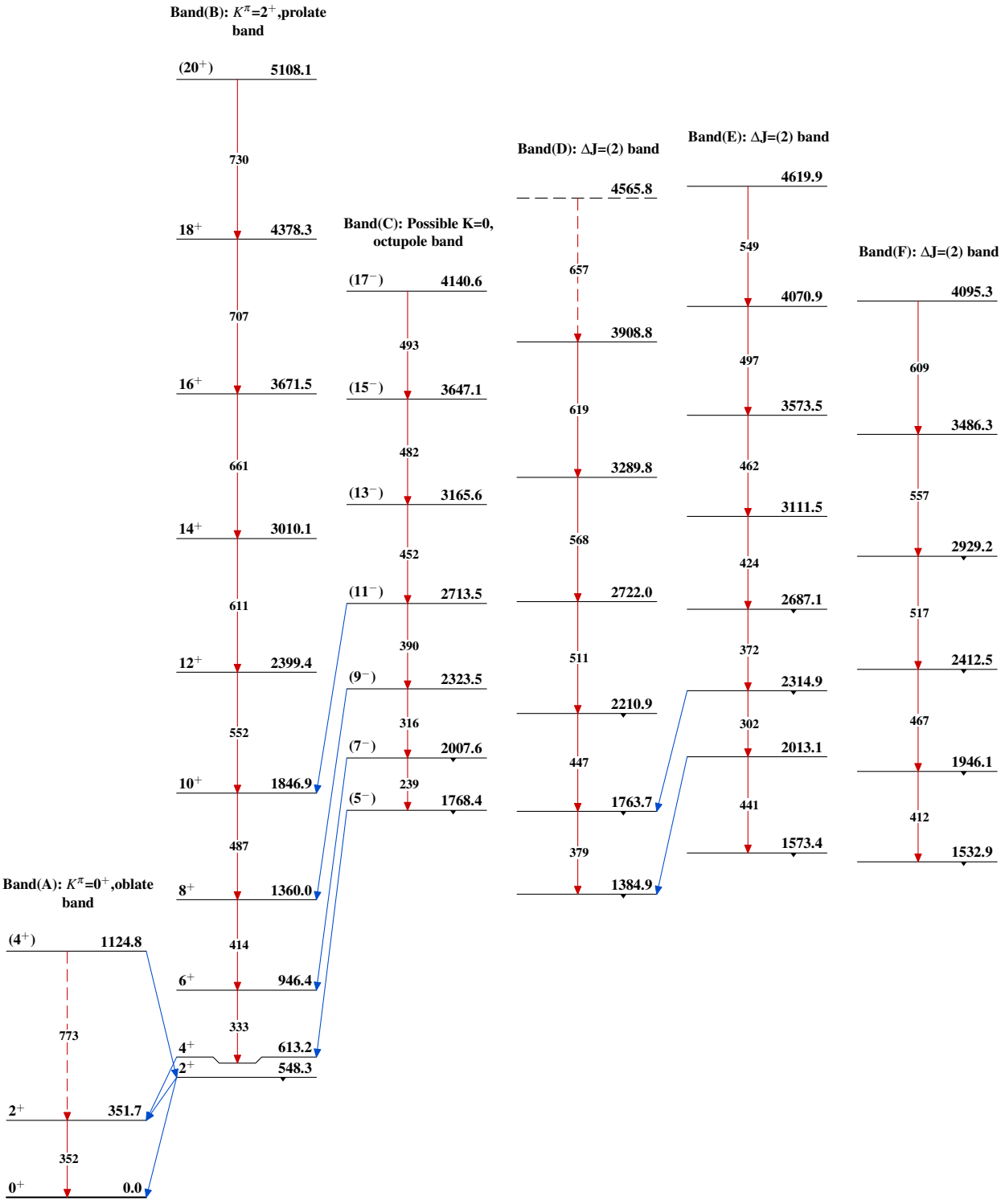
Intensities: Relative photon branching from each level

- - - - - - ► γ Decay (Uncertain)



$^{182}_{80}Hg_{102}$

Adopted Levels, Gammas



$^{182}_{80}Hg_{102}$