Adopted Levels, Gammas

Type	Author	History Citation	Literature Cutoff Date
Full Evaluation	Coral M. Baglin	NDS 113,1871 (2012)	15-Jun-2012

Q(β^-)=−765 *23*; S(n)=7.04×10^3 *4*; S(p)=4363 *16*; Q(α)=3151 *19* 2012Wa38
Note: Current evaluation has used the following Q record −764 22 *7036* 40 *4363* 16 *3151* 18 2011AuZZ.
Q(β^-), S(n), S(p) and Q(α) from 2003Au03 are, respectively, −765 *22*, 7040 *40*, 4368 *16* and 3127 *17*.
Q(β^-): −764 *22* from 2011AuZZ; Q(β^-)=−1870 keV *70*, as deduced from β^+ data in ^{192}Hg ε decay (1975ViZK) is inconsistent with this.
See 1985Kl09, 1985St10, 1988Le19, 1988Le22, 1994Pa37 for hfs and isotope shift data.

^{192}Au Levels

Cross Reference (XREF) Flags

A	^{192}Hg ε decay	D	^{192}Au IT decay (160 ms)
B	Ir(α,xnγ), ^{193}Ir(^{3}He,4nγ)	E	^{186}W(^{11}B,5nγ)
C	^{192}Pt(^{3}He,t)		

E(level)†	Jπ‡	$T_{1/2}$#	XREF	Comments
0.0@	1−&	4.94 h *9*	AB D	%ε+%β^+=100 μ=−0.0107 *15* (1994Pa37); Q=−0.228 *8* (1994Pa37) $\Delta<r^2>$(^{192}Au−^{197}Au)=−0.208 *5* (1985St10), −0.204 *4* (1990Sa21), −0.2065 *34* (1994Pa37). $\Delta<r^2>$(^{192}Au−^{190}Au)=+0.045 *8* (1988Le22). $<r^2>^{1/2}$(charge)=5.417 *4* (2004An14). μ: collinear laser spectroscopy. Other values: 0.009 *24*, (atomic beam, 1989Ra17 from 1980Ek04); −0.0076 *21* (resonance ionization mass spectroscopy, 1989Ra17 from data of 1990Sa21). Q: collinear laser spectroscopy. Jπ: J=1 atomic beam (1960Ew06); E1 307γ from π=+ 306. g.s. configuration=((π $d_{3/2}$)(ν $p_{1/2}$))+((π $d_{3/2}$)(ν $p_{3/2}$)) (1980Ek04), supported by μ (see also 1994Pa37). $T_{1/2}$: weighted average of 4.85 h *10* (1962Ma18) and 5.03 h *10* (1966Ny01). Others: 1949Wi08, 1952Fi06, 1953En06.
31.61@ *5*	2−&	0.69 ns *2*	AB D	Jπ: M1+E2 32γ to 1− g.s.; E3 γ from (5)+ 135.
72.61@ *25*	3−&		B D	Jπ: M1+E2 41γ to 2− 32; M2 γ from (5)+ 135.
120.09 *19*	0−,1−,2−		A	Jπ: M1 120γ to 1− g.s.
135.41a *25*	(5)+	29 ms	B D	%IT=100 Jπ: spin: by analogy with similar isomers in ^{194}Au, ^{196}Au, ^{198}Au; parity: E3 and M2 transitions to π=− states. $T_{1/2}$: ce(t) in Ir(α,xnγ), ^{193}Ir(^{3}He,4nγ) (1976RoZE,1980RoZT).
146.06 *17*	(1,2)−		A	Jπ: M1 115γ to 2− 32; M1(+E2) 146γ to 1− g.s.
157.28 *23*	0−,1−	<0.05 ns	A	Jπ: M1 157γ to 1− g.s.; log *ft*=5.9 (log $f^{1u}t$<8.5) from 0+.
167.49 *19*	(1)−		A	Jπ: M1(+E2) 136γ to 2− 32; log *ft*=6.8 (log $f^{1u}t$<8.5) from 0+; E1 139γ from 1+ 306.
204.57 *20*	0−,1−,2−		A	Jπ: E1 102γ from 1+ 306.
224.9a *4*	(6)+		B D	Jπ: M1+E2 90γ to (5)+ 135.
242.9a *4*	(7)+		B D	Jπ: E2 108γ to (5)+ 135.
245.44 *20*	0−,1−		A	Jπ: M1 245γ to 1− g.s.; log *ft*=6.1 (log $f^{1u}t$<8.5) from 0+.
262.59 *19*	0−,1−		A	Jπ: M1 263γ to 1− g.s.; log *ft*=6.2 (log $f^{1u}t$<8.5) from 0+.
306.47 *16*	1+	<0.18 ns	A	Jπ: E1 275γ to 2− 32; log *ft*=5.1 from 0+.
371.8a *4*	(8)+		B D	Jπ: M1+E2 129γ to (7)+ 243; E2 147γ to (6)+ 225.
431.6b *5*	(11−)	160 ms *20*	B DE	%IT=100 Jπ: E3 60γ to (8)+ 372; analogy with similar isomers in ^{190}Au, ^{194}Au.

Continued on next page (footnotes at end of table)

Adopted Levels, Gammas (continued)

^{192}Au Levels (continued)

E(level)[†]	Jπ[‡]	$T_{1/2}$[#]	XREF	Comments
				$T_{1/2}$: γ-ray timing spectra in Ir(α,xnγ), ^{193}Ir(^{3}He,4nγ) (1982Ne05). Other value: 167 ms (ce(t), 1976RoZE,1980RoZT).
436.59 *24*	0⁻,1⁻		A	Jπ: M1 279γ to 0⁻,1⁻ 157 level; log *ft*=6.4 (log $f^{1u}t$<8.5) from 0⁺.
659.3[c] *6*	(12⁻)		B E	
839.3[b] *6*	(13⁻)		B E	
1099.1[c] *6*	(14⁻)		B E	
1547.3[b] *6*	(15⁻)		B E	
1819.6[c] *6*	(16⁻)		B E	
1962.9[d] *6*	(15⁺)		B E	
2176.2[d] *7*	(17⁺)		B E	
2316.4[b] *7*	(17⁻)		B E	
2431.4 *7*	(18⁺)		B E	Jπ: M1 255γ to (17⁺) 2176.
2516.3 *8*	(18⁺)		B E	
2582.6[e] *8*	(20⁺)	5.4 ns *3*	B E	Likely configuration: $\pi(h^{-1}_{11/2})\nu(i^{-2}_{13/2})\nu(h^{-1}_{9/2})$. $T_{1/2}$: from 341(ce(K))-γ (2001Gu29) in (^{11}B,5nγ).
2608.0[c] *7*	(18⁻)		B E	
2642.1 *11*	(17⁺,18⁺,19⁺)		E	Jπ: M1 211γ to (18⁺) 2431.
2977.5 *9*	(20⁺)		B	Jπ: (E2) 461γ to (18⁺) 2516.
3008.9 *11*	19⁻		E	
3013.3 *10*	(20)		B	
3043.6[e] *13*			E	
3316.7 *10*	(22)		B	
3524.3 *9*	(22)		B	
3590.8 *15*			E	
3783.5[e] *15*			E	
4635.5[e] *18*			E	
14124 *16*	0⁺	108 keV *9*	C	Jπ: IAS(^{192}Pt g.s.).

[†] From least-squares fit to adopted Eγ data, assigning 1 keV uncertainty to Eγ for which uncertainty is unknown.

[‡] From γ-ray multipolarities, coincidence data, and band structure in Ir(α,xnγ), ^{193}Ir(^{3}He,4nγ), except where noted; continuing J^{π} patterns established.

[#] From (ce)(ce)(t) in ^{192}Hg ε decay (1971Ho04), except as noted.

[@] Band(A): π=− g.s. sequence.

[&] Based on smooth progression of level energies and independently established J^{π}(g.s.)=1⁻ and mult(32γ), definite J^{π} has been assigned to all members of the g.s. sequence.

[a] Band(B): π=+ sequence. Built on (5)⁺ 29 ms, 135-keV level.

[b] Band(c): α=1 rotation-aligned band. (configuration=$((\pi\ h_{11/2})^{-1}\otimes(\nu\ i_{13/2})^{-1}$). Built on 160 ms (11⁻) isomer.

[c] Band(C): α=0 rotation-aligned band. (configuration=$((\pi\ h_{11/2})^{-1}\otimes(\nu\ i_{13/2})^{-1}$). Signature partner of band built on 160 ms (11⁻) isomer.

[d] Band(D): Band fragment. Side cascade to rotation-aligned band (possible configuration=$((\pi\ h_{11/2})^{-1}(\nu\ i_{13/2})^{-2}(\nu\ j)$) (with j=$p_{1/2}$, $p_{3/2}$ or $f_{5/2}$) (15⁺ and 17⁺ members)).

[e] Band(E): π=+ band built on (20⁺) isomer. 2-quasiparticle excitation from 11⁻ isomer; likely high-spin 4-quasiparticle configurations are $(\pi\ h_{11/2})^{-1}\otimes(\nu\ i^{-2}_{13/2}h^{-1}_{9/2})$ and $(\pi\ h_{11/2})^{-1}\otimes(\nu\ i^{-2}_{13/2}f^{-1}_{7/2})$, probably the former (2001Gu29).

Adopted Levels, Gammas (continued)

γ(^{192}Au)

E_i(level)	J_i^π	E_γ[†]	I_γ[‡]	E_f	J_f^π	Mult.[†]	δ[†]	α[@]	Comments
31.61	2⁻	31.61 *5*	100	0.0	1⁻	M1+E2	0.084 *3*	46.2 *9*	B(M1)(W.u.)=0.0213 *8*; B(E2)(W.u.)=59 *5*
72.61	3⁻	41.0[#] *3*	100	31.61	2⁻	M1+E2[#]	0.063[#]	18.9 *5*	
120.09	0⁻,1⁻,2⁻	88.5 *6*		31.61	2⁻				
		120.1 *3*		0.0	1⁻	M1		4.30 *7*	
135.41	(5)⁺	62.8[#] *3*		72.61	3⁻	M2[#]		157 *4*	
		103.8[#] *3*		31.61	2⁻	E3[#]		103.3 *23*	
146.06	(1,2)⁻	114.5 *3*	76 *17*	31.61	2⁻	M1		4.92 *8*	
		146.0 *3*	100 *21*	0.0	1⁻	M1(+E2)	0.6 *+11−6*	2.1 *7*	
157.28	0⁻,1⁻	157.2 *3*	100	0.0	1⁻	M1		2.00	B(M1)(W.u.)>0.037
167.49	(1)⁻	135.9 *3*		31.61	2⁻	M1(+E2)	0.3 *+9−3*	2.9 *8*	
		167.5 *3*		0.0	1⁻				
204.57	0⁻,1⁻,2⁻	204.6 *3*	100	0.0	1⁻	(M1)		0.954	
224.9	(6)⁺	89.5[#] *3*	100	135.41	(5)⁺	M1+E2[#]	0.18[#]	9.91 *17*	
242.9	(7)⁺	(18.0[#] *7*)		224.9	(6)⁺				
		107.5[#] *3*		135.41	(5)⁺	E2[#]		3.86 *7*	
245.44	0⁻,1⁻	40.9 *3*		204.57	0⁻,1⁻,2⁻				
		99.4 *3*	39 *10*	146.06	(1,2)⁻	M1(+E2)	0.4 *+10−4*	7.1 *11*	
		245.4 *3*	100 *17*	0.0	1⁻	M1		0.576	
262.59	0⁻,1⁻	105.4 *6*	25 *6*	157.28	0⁻,1⁻	M1		6.24 *14*	
		116.5 *3*	42 *4*	146.06	(1,2)⁻	M1(+E2)	<0.2	4.65 *9*	
		142.5 *3*	100 *19*	120.09	0⁻,1⁻,2⁻	M1		2.64	
		262.6 *3*	100 *32*	0.0	1⁻	M1		0.478	
306.47	1⁺	101.9 *3*	2.4 *6*	204.57	0⁻,1⁻,2⁻	E1		0.396 *7*	B(E1)(W.u.)>2.0×10^{-5}
		139.0 *3*	1.9 *8*	167.49	(1)⁻	E1		0.180	B(E1)(W.u.)>6.3×10^{-6}
		186.4 *3*	6.5 *11*	120.09	0⁻,1⁻,2⁻	E1		0.0859	B(E1)(W.u.)>8.9×10^{-6}
		274.8 *3*	100 *4*	31.61	2⁻	E1		0.0331	B(E1)(W.u.)>4.3×10^{-5}
		306.5 *3*	10.7 *11*	0.0	1⁻	E1		0.0256	B(E1)(W.u.)>3.3×10^{-6}
371.8	(8)⁺	128.9[#] *3*		242.9	(7)⁺	M1+E2[#]	1.0[#]	2.69 *5*	
		146.9[#] *3*		224.9	(6)⁺	E2[#]		1.133 *19*	
431.6	(11⁻)	59.8[#] *3*	100	371.8	(8)⁺	E3[#]		2.44×10^3 *8*	B(E3)(W.u.)=0.52 *7*
436.59	0⁻,1⁻	279.2 *3*	63 *8*	157.28	0⁻,1⁻	M1		0.404	
		436.7 *3*	100 *16*	0.0	1⁻	(M1)		0.1209	
659.3	(12⁻)	227.7 *3*	100	431.6	(11⁻)	M1+E2	+0.09 *4*	0.705 *11*	E_γ,I_γ,δ: from (α,xnγ). Mult.: M1 from α(L)exp in (^{11}B,5nγ), D+Q from (α,xnγ).
839.3	(13⁻)	180.1 *3*	30 *4*	659.3	(12⁻)	M1(+E2)	−0.03 *7*	1.362 *22*	E_γ,I_γ,δ: from (α,xnγ). Mult.: M1 from α(K)exp in (^{11}B,5nγ), D(+Q) from (α,xnγ).
		407.7 *3*	100 *7*	431.6	(11⁻)	E2		0.0433	E_γ,I_γ: from (α,xnγ), (^{3}He,4nγ). Mult.: from (^{11}B,5nγ).

$^{192}_{79}Au_{113}$-3

Adopted Levels, Gammas (continued)

γ(^{192}Au) (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[‡]	E_f	J_f^π	Mult.[†]	δ[†]	α[@]	Comments
1099.1	(14$^-$)	259.7 *3*	100 *8*	839.3	(13$^-$)	M1+E2	+0.09 *4*	0.490 *8*	E_γ,I_γ,δ: from (α,xnγ). Mult.: M1 from α(K)exp in (^{11}B,5nγ), D+Q from (α,xnγ).
		439.8[#] *3*	28[#] *8*	659.3	(12$^-$)	(E2)[#]		0.0356	
1547.3	(15$^-$)	448.2[#] *3*	50[#] *14*	1099.1	(14$^-$)	(M1+E2)[#]	+0.05[#] *4*	0.1127 *17*	
		708.0[#] *3*	100[#] *14*	839.3	(13$^-$)	(E2)[#]		0.01167	
1819.6	(16$^-$)	272.2[#] *3*	33[#] *11*	1547.3	(15$^-$)	(M1+E2)[#]	+0.08[#] *4*	0.431 *7*	
		720.8[#] *3*	100[#] *22*	1099.1	(14$^-$)	(E2)[#]		0.01123	
1962.9	(15$^+$)	415.9[#] *3*	7[#] *3*	1547.3	(15$^-$)	D[#]			
		863.5[#] *3*	100[#] *10*	1099.1	(14$^-$)	D[#]			Mult.: γ(θ) consistent with pure D, ΔJ=1; 1982Ne05 favor E1, but evaluator considers this highly tentative.
2176.2	(17$^+$)	213.2 *3*	100 *12*	1962.9	(15$^+$)	E2		0.302	E_γ,I_γ: from (α,xnγ), (^{3}He,4nγ). Mult.: from (^{11}B,5nγ).
		356.6[#] *3*	18[#] *6*	1819.6	(16$^-$)	D[#]			
2316.4	(17$^-$)	496.6[#] *5*	50 *25*	1819.6	(16$^-$)				I_γ: from (α,xnγ), (^{3}He,4nγ).
		769.0[#] *3*	100[#] *25*	1547.3	(15$^-$)	(E2)[#]			
2431.4	(18$^+$)	255.1[#] *3*	100	2176.2	(17$^+$)	M1		0.518	Mult.: from (^{11}B,5nγ).
2516.3	(18$^+$)	340.7[#] *5*	100	2176.2	(17$^+$)	M1		0.235	Mult.: from (^{11}B,5nγ).
2582.6	(20$^+$)	68.5	100 *5*	2516.3	(18$^+$)	E2		27.3	B(E2)(W.u.)=35 *5* E_γ,Mult.,I_γ: from (^{11}B,5nγ).
		151.0 *3*	79 *16*	2431.4	(18$^+$)	E2		1.022 *17*	B(E2)(W.u.)=0.54 *12* I_γ,Mult.: from (^{11}B,5nγ). Other Eγ: 153.6 in (^{11}B,5nγ).
2608.0	(18$^-$)	291.4[#] *3*	75[#] *25*	2316.4	(17$^-$)	(M1(+E2))[#]	+0.04[#] *5*	0.359 *6*	
		788.5[#] *3*	100[#] *25*	1819.6	(16$^-$)	(E2)[#]			
2642.1	(17$^+$,18$^+$,19$^+$)	211.0	100	2431.4	(18$^+$)	M1		0.875	E_γ,Mult.: from (^{11}B,5nγ).
2977.5	(20$^+$)	461.2[#] *3*	100	2516.3	(18$^+$)	(E2)[#]		0.0315	
3008.9	19$^-$	367		2642.1	(17$^+$,18$^+$,19$^+$)				E_γ: from (^{11}B,5nγ).
		400.6		2608.0	(18$^-$)	M1		0.1522	E_γ,Mult.: from (^{11}B,5nγ).
3013.3	(20)	497.0[#] *5*	100	2516.3	(18$^+$)				
3043.6		461	100	2582.6	(20$^+$)				
3316.7	(22)	339.2 *5*	100	2977.5	(20$^+$)	(Q)		0.0716	E_γ: from (^{11}B,5nγ). Mult.: from (α,xnγ).

$^{192}_{79}Au_{113}$-4

Adopted Levels, Gammas (continued)

γ(^{192}Au) (continued)

E_i(level)	J_i^π	E_γ †	I_γ ‡	E_f	J_f^π	Mult.†	α@	Comments
3524.3	(22)	546.8# *3*	100	2977.5	(20$^+$)	(Q)#		
3590.8		547	100	3043.6				E_γ: from (^{11}B,5nγ).
3783.5		192.6		3590.8		M1	1.129	E_γ,Mult.: from (^{11}B,5nγ).
		740		3043.6				E_γ: from (^{11}B,5nγ).
4635.5		852	100	3783.5				E_γ: from (^{11}B,5nγ).

† From ^{192}Hg ε decay, except where noted.

‡ Relative photon branching from each level; values are from ^{192}Hg ε decay, except where noted.

From Ir(α,xnγ), ^{193}Ir(^{3}He,4nγ).

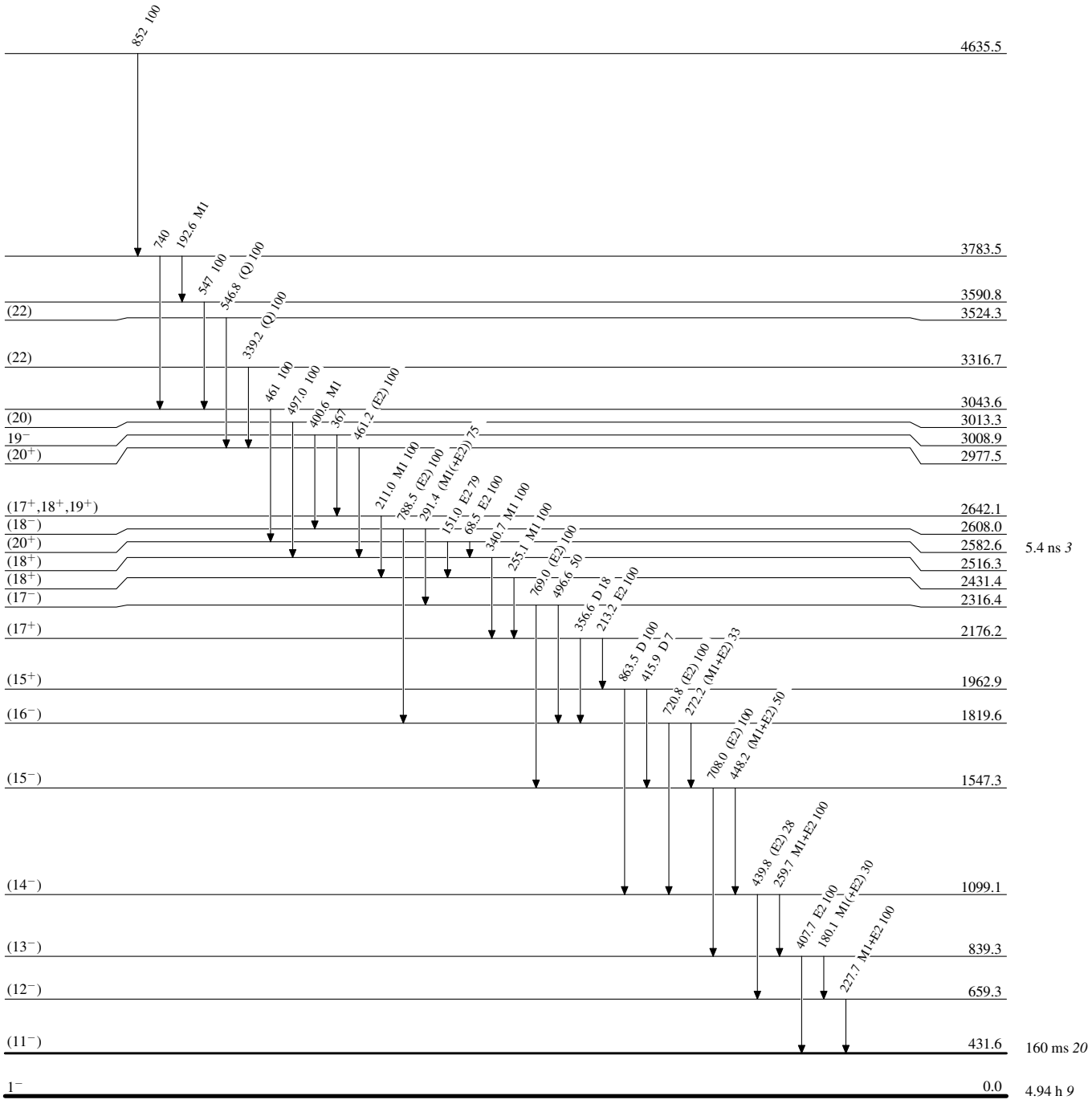
@ Total theoretical internal conversion coefficients, calculated using the BrIcc code (2008Ki07) with Frozen orbital approximation based on γ-ray energies, assigned multipolarities, and mixing ratios, unless otherwise specified.

$^{192}_{79}Au_{113}$-5

Adopted Levels, Gammas

Level Scheme

Intensities: Relative photon branching from each level



$^{192}_{79}Au_{113}$

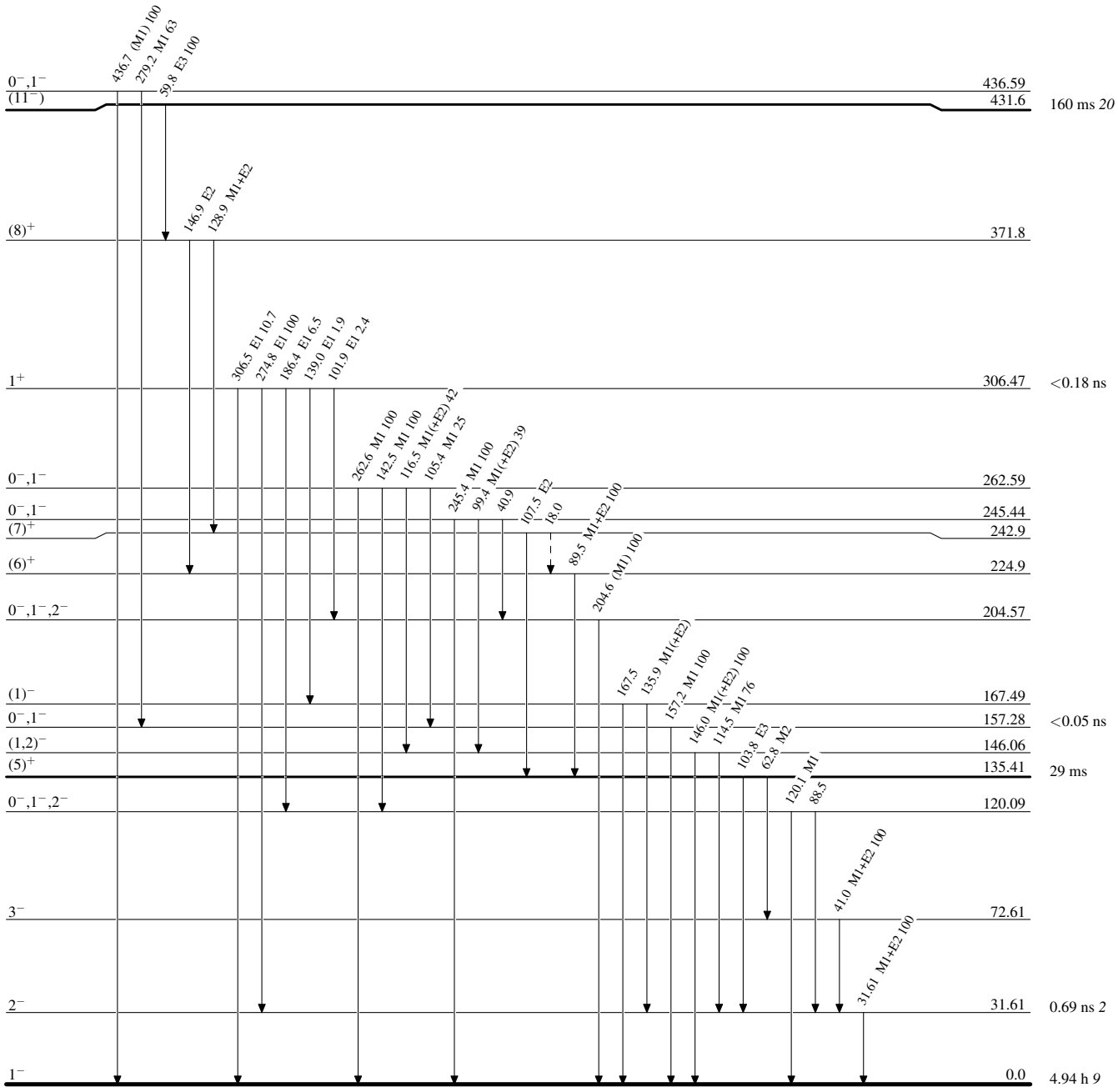
Adopted Levels, Gammas

Legend

Level Scheme (continued)

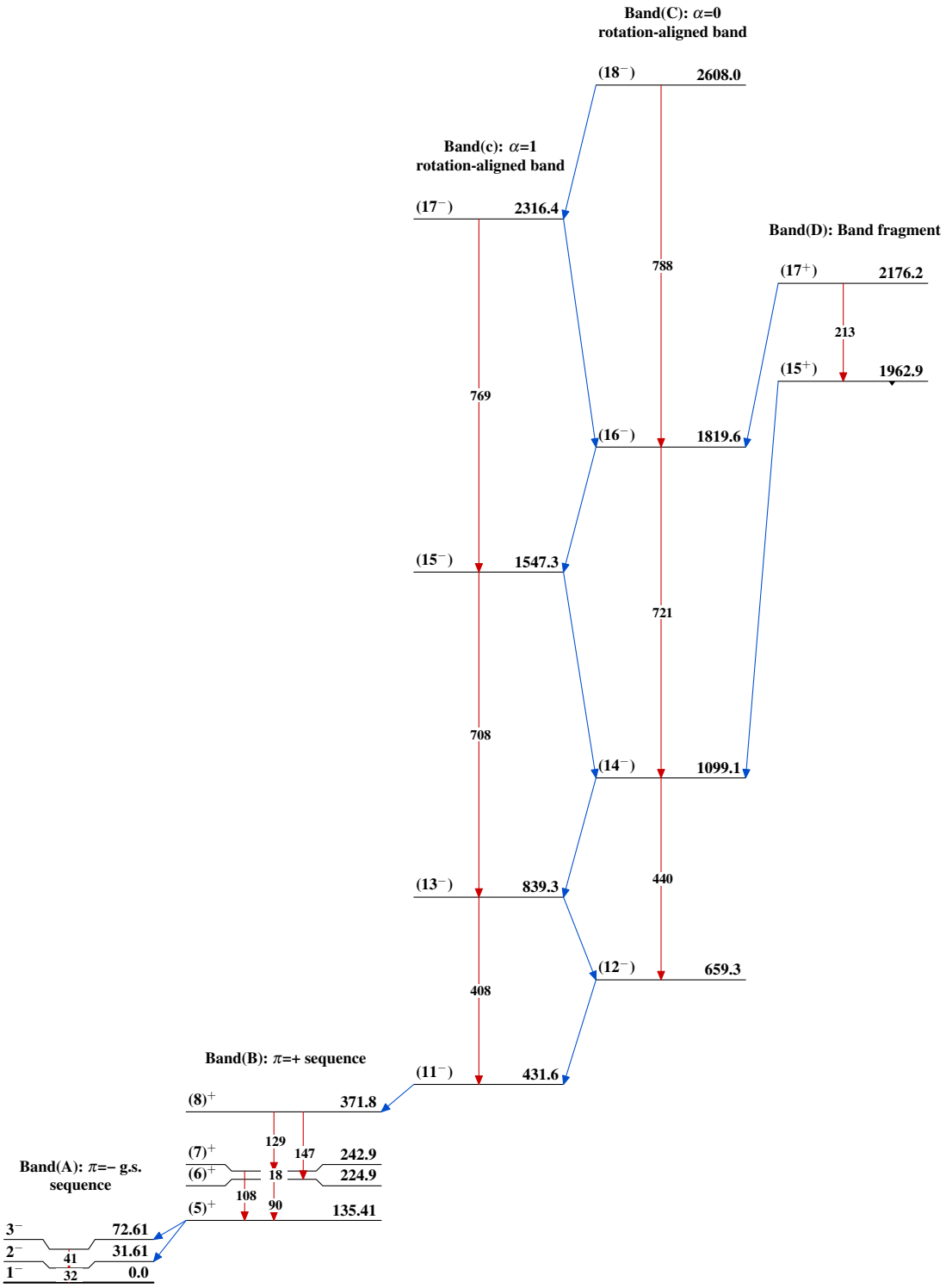
Intensities: Relative photon branching from each level

γ Decay (Uncertain)



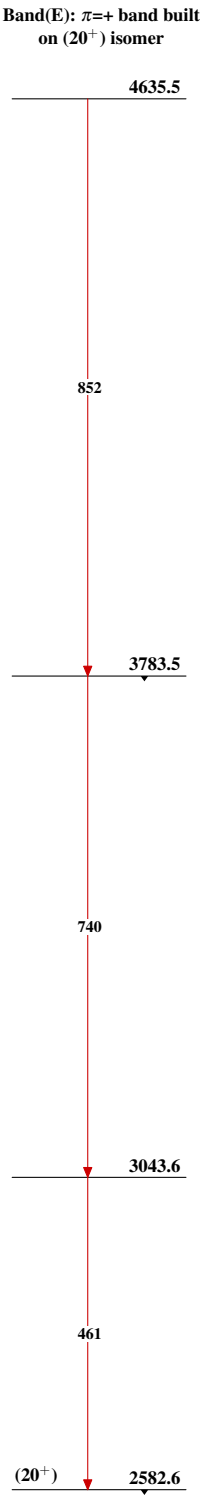
$^{192}_{79}Au_{113}$

Adopted Levels, Gammas



$^{192}_{79}Au_{113}$

Adopted Levels, Gammas (continued)



$^{192}_{79}Au_{113}$