

Adopted Levels, Gammas

Type	Author	History Citation	Literature Cutoff Date
Full Evaluation	Coral M. Baglin	NDS 110,265 (2009)	15-Nov-2008

$Q(\beta^-) = -8.64 \times 10^3$ 5; $S(n) = 8.68 \times 10^3$ 3; $S(p) = 1.89 \times 10^3$ 7; $Q(\alpha) = 6.35 \times 10^3$ 3 [2012Wa38](#)

Note: Current evaluation has used the following Q record -8620 50 8680 30 1880 60 6344 30 [2003Au03](#).

Production: $^{103}\text{Rh}(^{78}\text{Kr}, p\gamma)$, E=340, 380 MeV ([1997Ca16](#)); $^{90}\text{Zr}(^{90}\text{Zr}, n\gamma)$, E=369, 380 MeV ([2002Ko09](#)); α -decay daughter of ^{183}Pb .

 ^{179}Hg LevelsCross Reference (XREF) Flags

- A** ^{183}Pb α decay (535 ms)
B $^{90}\text{Zr}(^{90}\text{Zr}, n\gamma)$
C ^{183}Pb α decay (415 ms)

E(level) [†]	J ^π [‡]	T _{1/2}	XREF	Comments
0.0 ^a	(7/2 ⁻)	1.05 s 3	ABC	$\% \epsilon + \% \beta^+ = 45$ 25; $\% \alpha = 55$ 25; $\% \epsilon p \approx 0.15$ $\% \alpha$: from 1982HeZM . 1971Ha03 estimate $\% \alpha \approx 53$, based on extrapolation of β strength function systematics (which predicts a partial β half-life of 2.3 s). $\% \epsilon p$: 0.15 7 from $\text{Ip}/\text{I}\alpha \exp = 0.0028$ 4 (1971Ho07) and $\text{I}\alpha = 55$ 25 (1982HeZM). T _{1/2} : weighted average of 1.09 s 4 (1971Ha03), 0.93 s 11 (1996Pa01), 1.00 s 5 (2002Ko09) and 1.08 s 9 (2002Ro17) from 6285 α (t). Other: 1.3 s +5-8 (1982HeZM). J ^π : unhindered α decay (HF<4) to (7/2 ⁻) ^{175}Pt g.s. which, in turn, exhibits unhindered α decay to 77-keV (7/2 ⁻) 5/2[523] level in ^{171}Os .
0.0+x			B	
60.6 2	(9/2 ⁻)		BC	J ^π : see comment on J ^π (603 level).
120.88 ^a 25	(9/2 ⁻)		B	J ^π : 355 γ from (11/2 ⁻) 476; 121 γ to (7/2 ⁻) g.s.
171.4 4	(13/2 ⁺)	6.4 μ s 9	BC	XREF: B(0.0+X). J ^π : M2 111 γ to (9/2 ⁻) 61; Q 480 γ from (17/2 ⁺) 651. Oblate 13/2[606] level (2001Ko13), analogous to 13/2 ⁺ states known in heavier odd-A Hg isotopes. T _{1/2} : from ^{183}Pb α decay (415 ms).
184.6+x 5			B	
217	(3/2 ⁻)		A	J ^π : E2 217 γ to (7/2 ⁻) g.s.; unhindered α decay (HF<4) from (3/2 ⁻) ^{183}Pb .
307.23 ^c 14	(11/2 ⁺)		B	J ^π : M1+E2 136 γ to (13/2 ⁺) 171; band assignment.
326.5 4	(9/2, 11/2 ⁻)		B	J ^π : 150 γ from (11/2 ⁻) 476; possible γ 's to (7/2 ⁻) g.s. and (9/2 ⁻) 61; deexciting gammas expected to feed levels with equal or lower J. J ^π =(9/2 ⁻) is proposed by 2002Ko09 .
400.4+x ^{&} 4	(5/2 ⁻)		B	E(level): the γ 's from this level appear to be associated with decay to (7/2 ⁻) g.s., but specific placements have not been established. J ^π : band assignment.
428.54 ^b 15	(13/2 ⁺)		B	J ^π : intraband D 121 γ to (11/2 ⁺) 307; $\Delta J=0, 2$ 257 γ to (13/2 ⁺) 171.
476.16 ^a 24	(11/2 ⁻)		B	J ^π : intraband 355 γ to (9/2 ⁻) 121; intraband 476 γ to (7/2 ⁻) g.s.
549.59 ^c 13	(15/2 ⁺)		B	J ^π : intraband D 121 γ to (13/2 ⁺) 429; intraband E2 242 γ to (11/2 ⁺) 307.
593.0+x ^{&} 5	(9/2 ⁻)		B	J ^π : intraband Q 193 γ to (5/2 ⁻) 400+x.
603.3 4	(13/2 ⁻)		B	J ^π : γ from (17/2 ⁻) 995 level and (stretched Q)-M1 cascade via 61 level to (7/2 ⁻) g.s. imply J ^π =(13/2 ⁻) and (9/2 ⁻), respectively, for 603 and 61 levels.
651.35 ^b 9	(17/2 ⁺)		B	J ^π : intraband 102 γ to (15/2 ⁺) 550; intraband (E2) 223 γ to (13/2 ⁺) 429.
807.7 [@] 3	(15/2 ⁻)		B	J ^π : Q 332 γ to (11/2 ⁻) 476; band assignment.
856.0+x ^{&} 5	(13/2 ⁻)		B	J ^π : intraband Q 263 γ to (9/2 ⁻) 593+x.
883.61 ^c 15	(19/2 ⁺)		B	J ^π : intraband D 232 γ to (17/2 ⁺) 651; intraband Q 334 γ to (15/2 ⁺) 550.
995.4 [#] 3	(17/2 ⁻)		B	J ^π : D intraband 188 γ to (15/2 ⁻) 808.

Continued on next page (footnotes at end of table)

Adopted Levels, Gammas (continued) ^{179}Hg Levels (continued)

E(level) [†]	J^π [‡]	XREF	Comments
1024.88 ^b 13	(21/2 ⁺)	B	J^π : intraband D 142 γ to (19/2 ⁺) 884; intraband Q 374 γ to (17/2 ⁺) 651.
1189.7+x ^{&} 5	(17/2 ⁻)	B	J^π : intraband Q 334 γ to (13/2 ⁻) 856+x.
1199.7 [@] 3	(19/2 ⁻)	B	J^π : intraband D 204 γ to (17/2 ⁻) 995; intraband 392 γ to (15/2 ⁻) 808.
1300.81 ^c 19	(23/2 ⁺)	B	J^π : intraband D 276 γ to (21/2 ⁺) 1025; intraband Q 417 γ to (19/2 ⁺) 884.
1417.7 [#] 3	(21/2 ⁻)	B	J^π : intraband 219 γ to (19/2 ⁻) 1200; intraband Q 422 γ to (17/2 ⁻) 995.
1459.57 ^b 16	(25/2 ⁺)	B	J^π : intraband 159 γ to (23/2 ⁺) 1301; intraband Q 435 γ to (21/2 ⁺) 1025.
1586.2+x ^{&} 5	(21/2 ⁻)	B	J^π : intraband Q 397 γ to (17/2 ⁻) 1190+x.
1648.4 [@] 3	(23/2 ⁻)	B	J^π : intraband 231 γ to (21/2 ⁻) 1418; intraband 448 γ to (19/2 ⁻) 1200.
1793.4 ^c 3	(27/2 ⁺)	B	J^π : intraband Q 493 γ to (23/2 ⁺) 1301.
1890.5 [#] 4	(25/2 ⁻)	B	J^π : intraband 242 γ to (23/2 ⁻) 1648; intraband 473 γ to (21/2 ⁻) 1418.
1960.67 ^b 19	(29/2 ⁺)	B	J^π : intraband Q 501 γ to (25/2 ⁺) 1460.
2037.3+x ^{&} 6	(25/2 ⁻)	B	J^π : intraband Q 451 γ to (21/2 ⁻) 1586+x.
2144.0 [@] 4	(27/2 ⁻)	B	
2353.8 ^c 4	(31/2 ⁺)	B	J^π : intraband (Q) 560 γ to (27/2 ⁺) 1793.
2404.5 [#] 4	(29/2 ⁻)	B	
2523.4 ^b 3	(33/2 ⁺)	B	J^π : intraband Q 563 γ to (29/2 ⁺) 2961.
2534.1+x ^{&} 6	(29/2 ⁻)	B	J^π : intraband Q 497 γ to (25/2 ⁻) 2037+x.
2677.6 [@] 5	(31/2 ⁻)	B	
2953.7 [#] 5	(33/2 ⁻)	B	
2974.1 ^c 5	(35/2 ⁺)	B	
3066.5+x ^{&} 7	(33/2 ⁻)	B	J^π : intraband Q 532 γ to (29/2 ⁻) 2534+x.
3143.0 ^b 4	(37/2 ⁺)	B	J^π : intraband Q 620 γ to (33/2 ⁺) 2523.
3240.7 [@] 6	(35/2 ⁻)	B	
3526.5 [#] 7	(37/2 ⁻)	B	
3639.4+x ^{&} 7	(37/2 ⁻)	B	J^π : intraband Q 573 γ to (33/2 ⁻) 3067+x.
3647.6 ^c 6	(39/2 ⁺)	B	J^π : intraband Q 674 γ to (35/2 ⁺) 2974.
3814.5 ^b 5	(41/2 ⁺)	B	J^π : intraband Q 672 γ to (37/2 ⁺) 3143.
3845.2 [@] 12	(39/2 ⁻)	B	
4142.0 [#] 13	(41/2 ⁻)	B	
4243.4+x ^{&} 8	(41/2 ⁻)	B	J^π : intraband Q 604 γ to (37/2 ⁻) 3639+x.
4362.2 ^c 12	(43/2 ⁺)	B	
4472.2? [@] 15	(43/2 ⁻)	B	
4528.3 ^b 6	(45/2 ⁺)	B	
4877.4+x? ^{&} 12	(45/2 ⁻)	B	
$\approx$ 5111.2? ^c	(47/2 ⁺)	B	
5266.9? ^b 8	(49/2 ⁺)	B	

[†] From least-squares fit to E_γ .[‡] Values are based on transition multipolarities, branching ratios, alignments, orbitals expected near the Fermi surface and comparison with neighboring odd-A nuclides, except as noted. They are consistent with values proposed in ($^{90}\text{Zr}, n\gamma$) but the evaluator has added parentheses for J^π values shown as definite in 2002Ko09 because those relied, in part, on a definite $J^\pi=7/2^-$ assignment for the ^{179}Hg g.s.[#] Band(A): ν 5/2[512], $\alpha=+1/2$ band (2002Ko09). Nearly identical to 5/2[512] band in ^{177}Pt isotone; assignment supported by $g_K=-0.36$ 3 deduced from measured branching ratios (2002Ko09). Prolate deformed band.[@] Band(a): ν 5/2[512], $\alpha=-1/2$ band (2002Ko09). Please see comment on signature partner band.

Continued on next page (footnotes at end of table)

Adopted Levels, Gammas (continued)

 ^{179}Hg Levels (continued)

- [&] Band(B): ν 1/2[521], $\alpha=+1/2$ band (2002Ko09). Assignment based on orbitals available near Fermi surface, absence of a signature partner band (typical of low- Ω configuration) and similarities with structures in heavier odd-A Hg isotopes and in the isotone ^{177}Pt (2002Ko09). Prolate deformed band.
- ^a Band(C): Ground state band (2002Ko09). Weakly-deformed prolate band; dominant configuration is probably (ν 7/2[514]) or (ν 7/2[503]) but fragmented decay of J=11/2 member to other non-yrast ($9/2^-$) states suggests configuration is mixed with other single-particle states (2002Ko09).
- ^b Band(D): ν 7/2[633], $\alpha=+1/2$ band. Feeds ($13/2^+$) isomer. Signature splitting is consistent with $i_{13/2}$ excitation built on moderately deformed prolate shape. Assignment supported by observed alignment, by first band crossing at $\hbar\omega \approx 0.37$ MeV cf. $\hbar\omega \approx 0.24$ MeV for 5/2[512] and 1/2[521] bands, and by $g_K = -0.05$ deduced from measured branching ratios (2002Ko09). Prolate deformed band.
- ^c Band(d): ν 7/2[633], $\alpha=-1/2$ band (2002Ko09). Please see comment on signature partner band.

Adopted Levels, Gammas (continued)

$\gamma(^{179}\text{Hg})$

$E_i(\text{level})$	J_i^π	$E_\gamma^\dagger$	$I_\gamma^\dagger$	E_f	J_f^π	Mult. [‡]	δ	$\alpha^\&$	Comments
60.6	(9/2 ⁻)	60.6 @ 2	100	0.0	(7/2 ⁻)	M1(+E2)	≤0.054	6.23 13	Mult.,δ: from α(exp) in ¹⁸³ Pb α decay (415 ms).
120.88	(9/2 ⁻)	121.0 3	100	0.0	(7/2 ⁻)	[M1]		4.58 8	
171.4	(13/2 ⁺)	110.8 @ 3	100	60.6	(9/2 ⁻)	M2		46.0 8	
217	(3/2 ⁻)	217	100	0.0	(7/2 ⁻)	E2		0.296	B(M2)(W.u.)=0.19 3 Mult.: from α(exp) and α(K)exp in ¹⁸³ Pb α decay (415 ms).
307.23	(11/2 ⁺)	136.2 3	100	171.4	(13/2 ⁺)	M1+E2 [#]		2.4 9	E _γ ,Mult.: from ¹⁸³ Pb α decay (535 ms). Mult based on α(K)exp.
326.5	(9/2,11/2 ⁻)	205 ^a		120.88	(9/2 ⁻)				
		326 ^a		0.0	(7/2 ⁻)				
400.4+x	(5/2 ⁻)	215.8 3	88 11	184.6+x		Q			4.54 8
		400.4 4	100 13	0.0+x		Q			
428.54	(13/2 ⁺)	121.3 3	≈50	307.23	(11/2 ⁺)	(M1)			
		257.4 3	≈100	171.4	(13/2 ⁺)				2.50
476.16	(11/2 ⁻)	149.7 3	78 9	326.5	(9/2,11/2 ⁻)	[M1]			
		355.4 3	75 10	120.88	(9/2 ⁻)				
		476.0 3	100 7	0.0	(7/2 ⁻)				4.57 8
549.59	(15/2 ⁺)	121.1 3	70 5	428.54	(13/2 ⁺)	(M1)			
		242.4 1	100 6	307.23	(11/2 ⁺)	E2 [#]		0.206	
		378.1 2	76 4	171.4	(13/2 ⁺)	D			0.445
593.0+x	(9/2 ⁻)	192.6 1	100	400.4+x	(5/2 ⁻)	(E2)			
603.3	(13/2 ⁻)	542.8 2	100	60.6	(9/2 ⁻)	Q			
651.35	(17/2 ⁺)	102.0 3	4.0 10	549.59	(15/2 ⁺)	[M1]		7.46 13	0.271
		222.9 2	8.0 9	428.54	(13/2 ⁺)	(E2)			
		479.9 1	100.0 20	171.4	(13/2 ⁺)	Q			
807.7	(15/2 ⁻)	331.5 1	100	476.16	(11/2 ⁻)	Q			0.1590
856.0+x	(13/2 ⁻)	263.0 1	100	593.0+x	(9/2 ⁻)	(E2)			
883.61	(19/2 ⁺)	232.4 2	37 5	651.35	(17/2 ⁺)	(M1)		0.728	
		334.0 2	100 5	549.59	(15/2 ⁺)	(E2)		0.0779	1.316
995.4	(17/2 ⁻)	187.9 2	30 6	807.7	(15/2 ⁻)	(M1)			
		392.1 3	100 9	603.3	(13/2 ⁻)				
1024.88	(21/2 ⁺)	141.8 3	5.1 10	883.61	(19/2 ⁺)	(M1)		2.91	0.0570
		373.5 1	100 3	651.35	(17/2 ⁺)	(E2)			
1189.7+x	(17/2 ⁻)	333.7 2	100	856.0+x	(13/2 ⁻)	(E2)		0.0781	
1199.7	(19/2 ⁻)	204.4 2	45 5	995.4	(17/2 ⁻)	(M1)		1.040	0.453
		392.0 1	100 14	807.7	(15/2 ⁻)				
1300.81	(23/2 ⁺)	276.1 3	31 5	1024.88	(21/2 ⁺)	(M1)			
		417.1 2	100 8	883.61	(19/2 ⁺)	(E2)		0.0425	0.0411
1417.7	(21/2 ⁻)	218.7 3	16.3 20	1199.7	(19/2 ⁻)				
		422.4 1	100 12	995.4	(17/2 ⁻)	(E2)			

Adopted Levels, Gammas (continued)

$\gamma(^{179}\text{Hg})$ (continued)

$E_i(\text{level})$	J_i^π	$E_\gamma^\dagger$	$I_\gamma^\dagger$	E_f	J_f^π	Mult. [‡]	$\alpha^\&$
1459.57	(25/2 ⁺)	158.7 3	7.3 11	1300.81	(23/2 ⁺)	[M1]	2.12
		434.7 1	100 3	1024.88	(21/2 ⁺)	(E2)	0.0382
1586.2+x	(21/2 ⁻)	396.5 2	100	1189.7+x	(17/2 ⁻)	(E2)	0.0485
1648.4	(23/2 ⁻)	231.1 2	20 5	1417.7	(21/2 ⁻)	[M1]	0.739
		448.2 2	100 8	1199.7	(19/2 ⁻)		
1793.4	(27/2 ⁺)	492.6 2	100	1300.81	(23/2 ⁺)	(E2)	0.0279
1890.5	(25/2 ⁻)	242.3 4	28 9	1648.4	(23/2 ⁻)	[M1]	0.649
		472.7 2	100 12	1417.7	(21/2 ⁻)		
1960.67	(29/2 ⁺)	501.1 1	100	1459.57	(25/2 ⁺)	(E2)	0.0268
2037.3+x	(25/2 ⁻)	451.1 2	100	1586.2+x	(21/2 ⁻)	(E2)	0.0347
2144.0	(27/2 ⁻)	495.6 2	100	1648.4	(23/2 ⁻)		
2353.8	(31/2 ⁺)	560.4 3	100	1793.4	(27/2 ⁺)	(E2)	0.0206
2404.5	(29/2 ⁻)	514.0 2	100	1890.5	(25/2 ⁻)		
2523.4	(33/2 ⁺)	562.7 2	100	1960.67	(29/2 ⁺)	(E2)	0.0204
2534.1+x	(29/2 ⁻)	496.8 2	100	2037.3+x	(25/2 ⁻)	(E2)	0.0274
2677.6	(31/2 ⁻)	533.6 2	100	2144.0	(27/2 ⁻)		
2953.7	(33/2 ⁻)	549.2 3	100	2404.5	(29/2 ⁻)		
2974.1	(35/2 ⁺)	620.3 3	100	2353.8	(31/2 ⁺)	(E2)	0.01632
3066.5+x	(33/2 ⁻)	532.4 2	100	2534.1+x	(29/2 ⁻)	(E2)	0.0232
3143.0	(37/2 ⁺)	619.6 2	100	2523.4	(33/2 ⁺)	(E2)	0.01636
3240.7	(35/2 ⁻)	563.1 3	100	2677.6	(31/2 ⁻)		
3526.5	(37/2 ⁻)	572.8 5	100	2953.7	(33/2 ⁻)		
3639.4+x	(37/2 ⁻)	572.9 3	100	3066.5+x	(33/2 ⁻)	(E2)	0.0195
3647.6	(39/2 ⁺)	673.5 3	100	2974.1	(35/2 ⁺)	(E2)	0.01361
3814.5	(41/2 ⁺)	671.5 3	100	3143.0	(37/2 ⁺)	(E2)	0.01370
3845.2	(39/2 ⁻)	604.5	100	3240.7	(35/2 ⁻)		
4142.0	(41/2 ⁻)	615.5	100	3526.5	(37/2 ⁻)		
4243.4+x	(41/2 ⁻)	604.0 4	100	3639.4+x	(37/2 ⁻)	(E2)	0.01732
4362.2	(43/2 ⁺)	714.6 10	100	3647.6	(39/2 ⁺)		
4472.2?	(43/2 ⁻)	627 ^a	100	3845.2	(39/2 ⁻)		
4528.3	(45/2 ⁺)	713.8 4	100	3814.5	(41/2 ⁺)		
4877.4+x?	(45/2 ⁻)	634.0 ^a 8	100	4243.4+x	(41/2 ⁻)		
≈5111.2?	(47/2 ⁺)	≈749.0 ^a	100	4362.2	(43/2 ⁺)		
5266.9?	(49/2 ⁺)	738.6 ^a 5	100	4528.3	(45/2 ⁺)		

[†] From ⁹⁰Zr(⁹⁰Zr,n γ), except as noted.

[‡] Assigned by evaluator based on $\gamma(\theta)$ and/or γ anisotropy ratio in ⁹⁰Zr(⁹⁰Zr,n γ), except as noted. Additionally, $\Delta\pi=(\text{no})$ is assigned to all intraband transitions.

[#] From (⁹⁰Zr,n γ) based on DCO, $\gamma(\theta)$ and intensity balance arguments.

[@] From ¹⁸³Pb α decay (415 ms).

Adopted Levels, Gammas (continued)

$\gamma(^{179}\text{Hg})$ (continued)

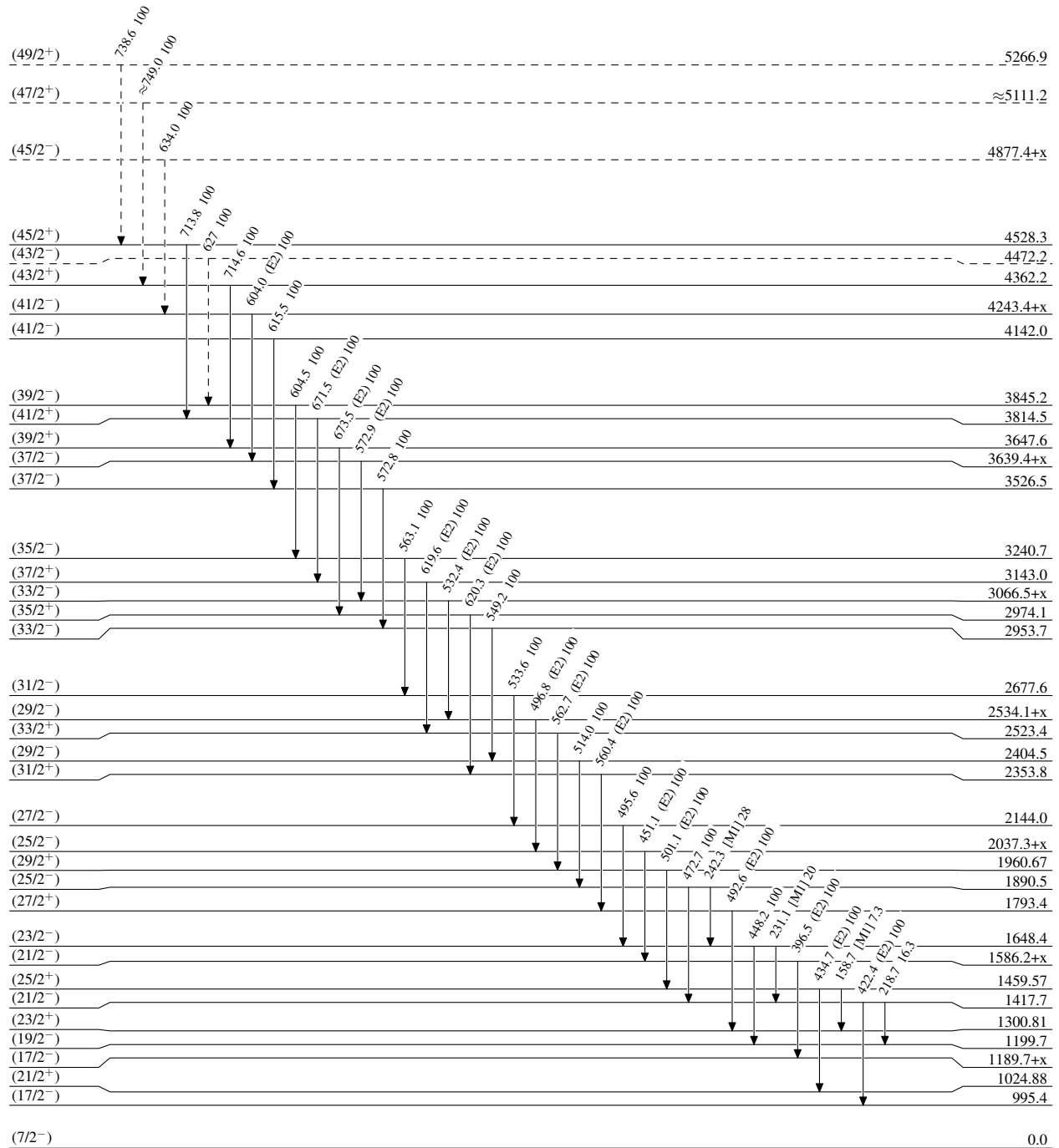
& Total theoretical internal conversion coefficients, calculated using the BrIcc code (2008Ki07) with Frozen orbital approximation based on γ -ray energies, assigned
multipolarities, and mixing ratios, unless otherwise specified.
^a Placement of transition in the level scheme is uncertain.

Adopted Levels, Gammas

Legend

Level Scheme

Intensities: Relative photon branching from each level

-----► γ Decay (Uncertain)

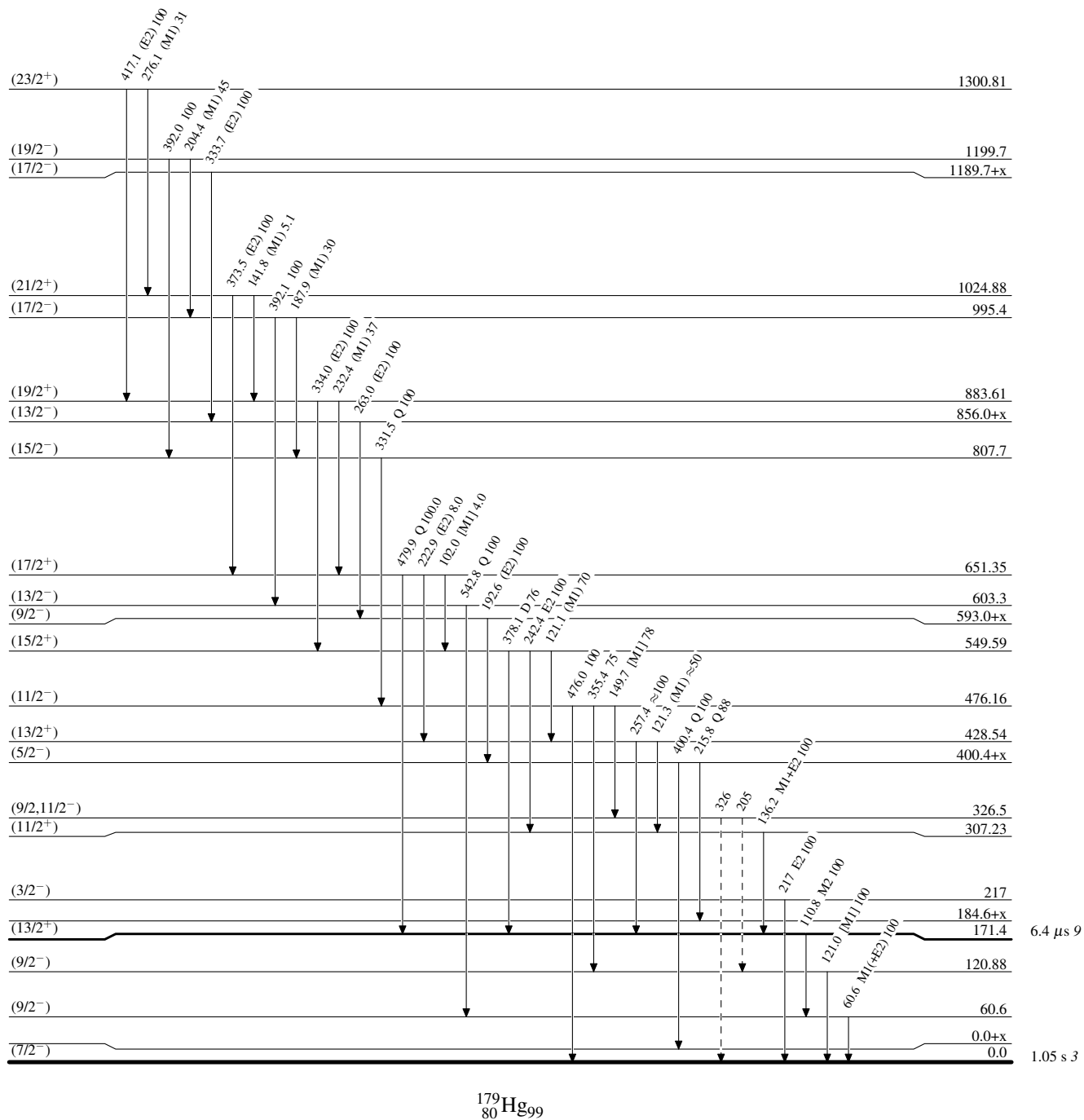
1.05 s 3

Adopted Levels, Gammas

Legend

Level Scheme (continued)

Intensities: Relative photon branching from each level

-----► γ Decay (Uncertain)

Adopted Levels, Gammas