Adopted Levels, Gammas

Type	Author	History Citation	Literature Cutoff Date
Full Evaluation	S. -c. Wu	NDS 106,367 (2005)	31-Aug-2005

Q(β^-)=−7862 *18*; S(n)=8482 *20*; S(p)=2.36×10^3 *3*; Q(α)=6284 *5* 2012Wa38
Note: Current evaluation has used the following Q record −7860 18 8488 *21* 2354 *26* 6284 *4* 2003Au03.
For isotope shift data, see 1976Bo09 and 1986Ul02.

^{181}Hg Levels

Cross Reference (XREF) Flags

A ^{185}Pb α decay (6.3 s)
B ^{185}Pb α decay (4.3 s)
C ^{144}Sm(^{40}Ar,3nγ)

E(level)‡	J$^\pi$†	$T_{1/2}$	XREF	Comments
0.0#	1/2$^-$	3.6[c] s *1*	A C	%ε+%β^+=73 *2*; %α=27 *2*; %εp=0.013 *3*; %$\varepsilon\alpha$=9×10^{-6} *6* μ=+0.5071 *7* μ: NMR of nuclei polarized by optical pumping with beta asymmetry detection (2001StZZ, from 1976Bo09); diamagnetic correction included. %α: weighted average of 24 *3* (2004An07), 36 *4* (1982HeZM), 23 *4* (1979Ha10) and 26 *4* (1975Ho02). Other value: 27 (1971Ho07). %εp: from I(p)/Iα=5.0x10^{-4} 8 (1971Ho07), assuming %α=27 *2*. %$\varepsilon\alpha$: based on %$\varepsilon\alpha$=9x10^{-6} 3 if %α=26 *4* (1975Ho02). J$^\pi$: J from nuclear radiation detected optical pumping (1976Bo09); π based on systematics of the neighboring odd-A Hg and Pb isotopes. Δ<r^2>(198-181)=−0.095 *3* (1986Ul02). <r^2>$^{1/2}$=5.437 fm 3 for ^{181}Hg based on a global fit to charge radius data for all nuclides (2004An14).
0.0+x&	(7/2$^-$)		C	
0.0+y	13/2$^+$		BC	J$^\pi$: Populated by α-decay from the 13/2$^+$ state of ^{185}Pb with HF=1.7 *9*. Probably the oblate deformed $i_{13/2}$ isomeric state known in A≥185 odd-A Hg isotopes.
64	3/2$^-$		A	J$^\pi$: populated by α-decay from the 13/2$^+$ state of ^{185}Pb with HF=1.7 *9*. J$^\pi$: populated by α-decay from the 3/2$^-$ state of ^{185}Pb with HF=11 *6*.
75.2+y[b] *13*	(11/2$^+$)		C	
80.5# *10*	(5/2$^-$)		C	
90.7+x@ *13*	(9/2$^-$)		C	
248.4+x& *10*	(11/2$^-$)		C	
263.9# *15*	(9/2$^-$)		C	
269	3/2$^-$		A	J$^\pi$: populated by α-decay from the 3/2$^-$ state of ^{185}Pb with HF=1.5 *8*.
315.7+y[b] *8*	(15/2$^+$)		C	
400.1+x@ *13*	(13/2$^-$)		C	
416.8+y[a] *8*	(17/2$^+$)		C	
535.2# *18*	(13/2$^-$)		C	
575.7+x& *13*	(15/2$^-$)		C	
656.3+y[b] *10*	(19/2$^+$)		C	
766.3+x@ *14*	(17/2$^-$)		C	
794.2+y[a] *11*	(21/2$^+$)		C	
889.7# *20*	(17/2$^-$)		C	

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Adopted Levels, Gammas (continued)

^{181}Hg Levels (continued)

E(level)‡	Jπ†	XREF	E(level)‡	Jπ†	XREF	E(level)‡	Jπ†	XREF
979.5+x& *15*	(19/2⁻)	C	1587.9+y[b] *16*	(27/2⁺)	C	2240.6+x@ *22*	(29/2⁻)	C
1083.9+y[b] *12*	(23/2⁺)	C	1691.1+x@ *20*	(25/2⁻)	C	2323.2+y[a] *21*	(33/2⁺)	C
1198.6+x@ *17*	(21/2⁻)	C	1749.4+y[a] *18*	(29/2⁺)	C	2411# *3*	(29/2⁻)	C
1238.2+y[a] *15*	(25/2⁺)	C	1835.9# *25*	(25/2⁻)	C	2786.0+y?[b] *21*	(35/2⁺)	C
1325.3# *23*	(21/2⁻)	C	1987.0+x& *21*	(27/2⁻)	C	2952.7+y?[a] *23*	(37/2⁺)	C
1453.6+x& *18*	(23/2⁻)	C	2161.0+y[b] *19*	(31/2⁺)	C			

† Values given without comment are from (^{40}Ar,3nγ), based on unenumerated DCO ratios, level systematics for heavier Hg isotopes and deduced band structure.

‡ From least-squares adjustment of Eγ, allowing ΔE_γ=1 keV for all transitions, except as noted.

Band(A): 1/2[521] band, α=+1/2. The unfavored−signature partner of this band was not observed in (HI,xnγ); large signature splitting is expected for the 1/2[521] orbital. Decoupled band built on prolate strongly deformed g.s.

@ Band(B): 5/2[512] band, α=+1/2. No signature splitting and very gradual alignment (as for 5/2[512] bands in N=101 isotones, where bandheads lie at 100-150 keV); B(M1)/B(E2) for ΔJ=1 and ΔJ=2 inband transitions from levels in this band indicate assignment of 5/2[512] orbital rather than the 7/2[514] orbital known in heavier Hg isotopes.

& Band(b): 5/2[512] band, α=−1/2. No signature splitting and very gradual alignment (as for 5/2[512] bands in N=101 isotones, where bandheads lie at 100-150 keV); B(M1)/B(E2) for ΔJ=1 and ΔJ=2 inband transitions from levels in this band indicate assignment of 5/2[512] orbital rather than the 7/2[514] orbital known in heavier Hg isotopes.

[a] Band(C): 7/2[633] band, α=+1/2. Probably analogous to mixed (ν $i_{13/2}$) bands in ^{183}Hg, ^{185}Hg and ^{187}Hg except that, here, the 7/2[633] rather than the 9/2[624] orbital is the predominant one. Prolate deformed structure.

[b] Band(c): 7/2[633] band, α=−1/2. Probably analogous to mixed (ν $i_{13/2}$) bands in ^{183}Hg, ^{185}Hg and ^{187}Hg except that, here, the 7/2[633] rather than the 9/2[624] orbital is the predominant one. Prolate deformed structure.

[c] From 6006α(t) (1979Ha10). Note that the flag attributing this datum to 1970Ha18 in table 1 of 1979Ha10 almost certainly belongs with the datum for I(6006α)/Iα(total). Other data: 3.6 s *3* (1969Ha03), 3.6 s *3* (1970Ha18), 3.2 s *7* (1982HeZM), 3.3 s *4* (1979Ha10), 3.4 s *3* (for each of three lines, 1979Ha10). The weighted average of all data is 3.54 s *8*, and the unweighted average is 3.44 s *5*.

γ(^{181}Hg)

E_i(level)	J_i^π	E_γ†	E_f	J_f^π	Mult.	Comments
64	3/2⁻	(64)	0.0	1/2⁻	[E2]	
80.5	(5/2⁻)	80.5#	0.0	1/2⁻		
248.4+x	(11/2⁻)	157.7	90.7+x	(9/2⁻)		
		248.4‡	0.0+x	(7/2⁻)		
263.9	(9/2⁻)	183.4	80.5	(5/2⁻)		
269	3/2⁻	205 *1*	64	3/2⁻	M1	Mult.: α(K)=1.2 *3* if the observed K X-rays result from the 205 keV γ′s only(2002An15).
		269 *1*	0.0	1/2⁻	M1	Mult.: α(K)=0.65 *15* if the observed K X-rays result from the 269 keV γ′s only(2002An15).
315.7+y	(15/2⁺)	240.5	75.2+y	(11/2⁺)		
		315.7	0.0+y	13/2⁺		
400.1+x	(13/2⁻)	151.7	248.4+x	(11/2⁻)		
		309.4‡	90.7+x	(9/2⁻)		
416.8+y	(17/2⁺)	101.1	315.7+y	(15/2⁺)		
		416.8‡	0.0+y	13/2⁺		
535.2	(13/2⁻)	271.3	263.9	(9/2⁻)		
575.7+x	(15/2⁻)	175.6	400.1+x	(13/2⁻)		
		327.3‡	248.4+x	(11/2⁻)		

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Adopted Levels, Gammas (continued)

$\gamma(^{181}Hg)$ (continued)

E_i(level)	J_i^π	E_γ[†]	E_f	J_f^π	E_i(level)	J_i^π	E_γ[†]	E_f	J_f^π
656.3+y	$(19/2^+)$	239.5	416.8+y	$(17/2^+)$	1325.3	$(21/2^-)$	435.6	889.7	$(17/2^-)$
		340.6[‡]	315.7+y	$(15/2^+)$	1453.6+x	$(23/2^-)$	474.1	979.5+x	$(19/2^-)$
766.3+x	$(17/2^-)$	190.6	575.7+x	$(15/2^-)$	1587.9+y	$(27/2^+)$	504.0	1083.9+y	$(23/2^+)$
		366.2[‡]	400.1+x	$(13/2^-)$	1691.1+x	$(25/2^-)$	492.5	1198.6+x	$(21/2^-)$
794.2+y	$(21/2^+)$	137.9	656.3+y	$(19/2^+)$	1749.4+y	$(29/2^+)$	511.2	1238.2+y	$(25/2^+)$
		377.4[‡]	416.8+y	$(17/2^+)$	1835.9	$(25/2^-)$	510.6	1325.3	$(21/2^-)$
889.7	$(17/2^-)$	354.5	535.2	$(13/2^-)$	1987.0+x	$(27/2^-)$	533.4	1453.6+x	$(23/2^-)$
979.5+x	$(19/2^-)$	213.2	766.3+x	$(17/2^-)$	2161.0+y	$(31/2^+)$	573.1	1587.9+y	$(27/2^+)$
		403.8[‡]	575.7+x	$(15/2^-)$	2240.6+x	$(29/2^-)$	549.5	1691.1+x	$(25/2^-)$
1083.9+y	$(23/2^+)$	289.7	794.2+y	$(21/2^+)$	2323.2+y	$(33/2^+)$	573.8	1749.4+y	$(29/2^+)$
		427.6[‡]	656.3+y	$(19/2^+)$	2411	$(29/2^-)$	575.2	1835.9	$(25/2^-)$
1198.6+x	$(21/2^-)$	432.3	766.3+x	$(17/2^-)$	2786.0+y?	$(35/2^+)$	625.0[@]	2161.0+y	$(31/2^+)$
1238.2+y	$(25/2^+)$	444.0	794.2+y	$(21/2^+)$	2952.7+y?	$(37/2^+)$	629.5[@]	2323.2+y	$(33/2^+)$

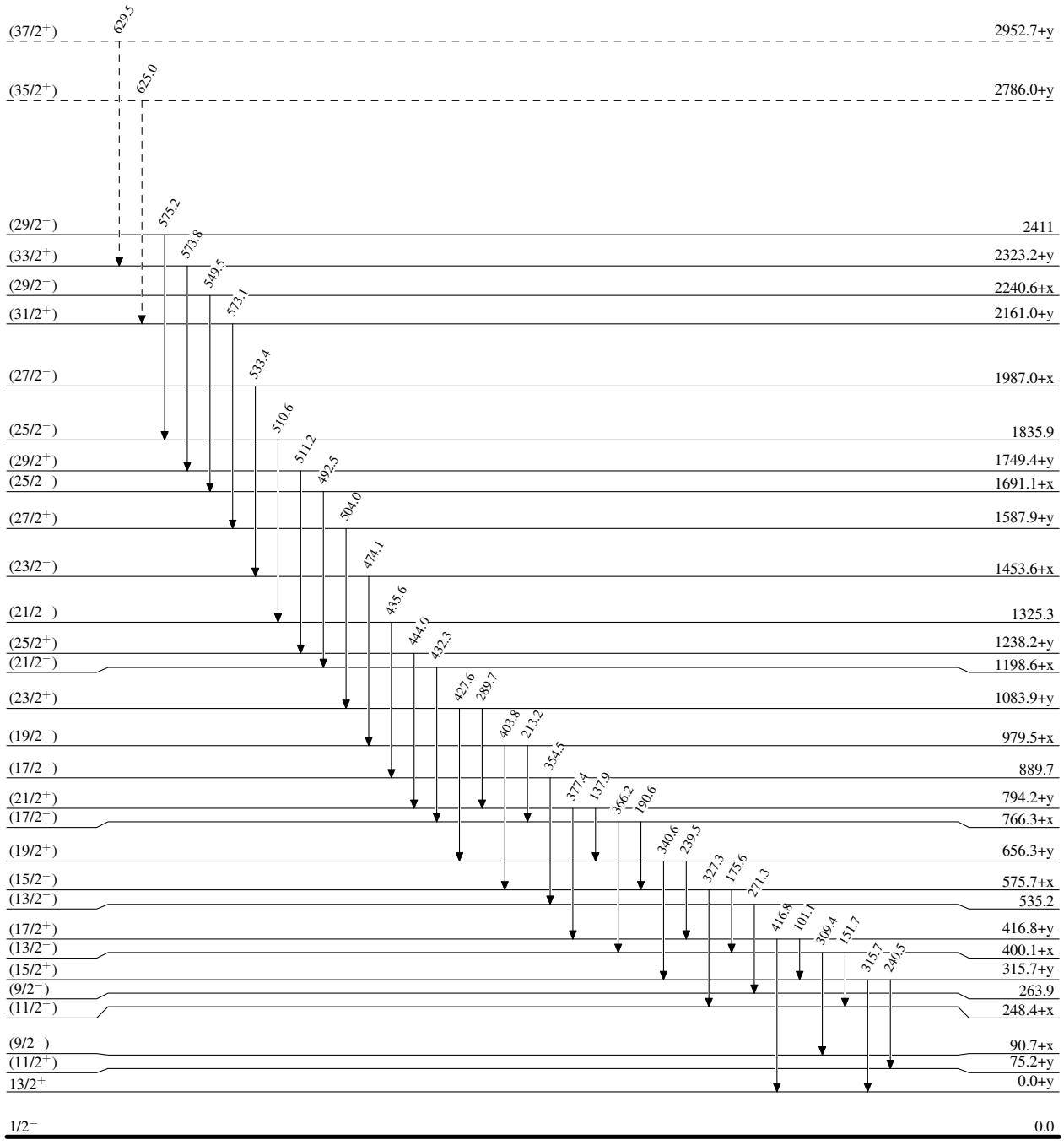
[†] From (^{40}Ar,3nγ); uncertainties unstated by authors.
[‡] Based on width of transition drawn in the level scheme of 1997Va17, this is the stronger of the pair of γ's deexciting the parent level.
[#] Includes contribution from Hg Kβ x ray.
[@] Placement of transition in the level scheme is uncertain.

Legend

Adopted Levels, Gammas

Level Scheme

γ Decay (Uncertain)



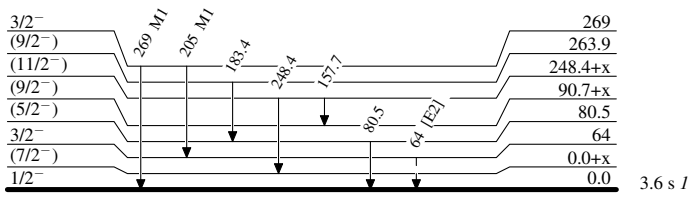
$^{181}_{80}Hg_{101}$

Adopted Levels, Gammas

Legend

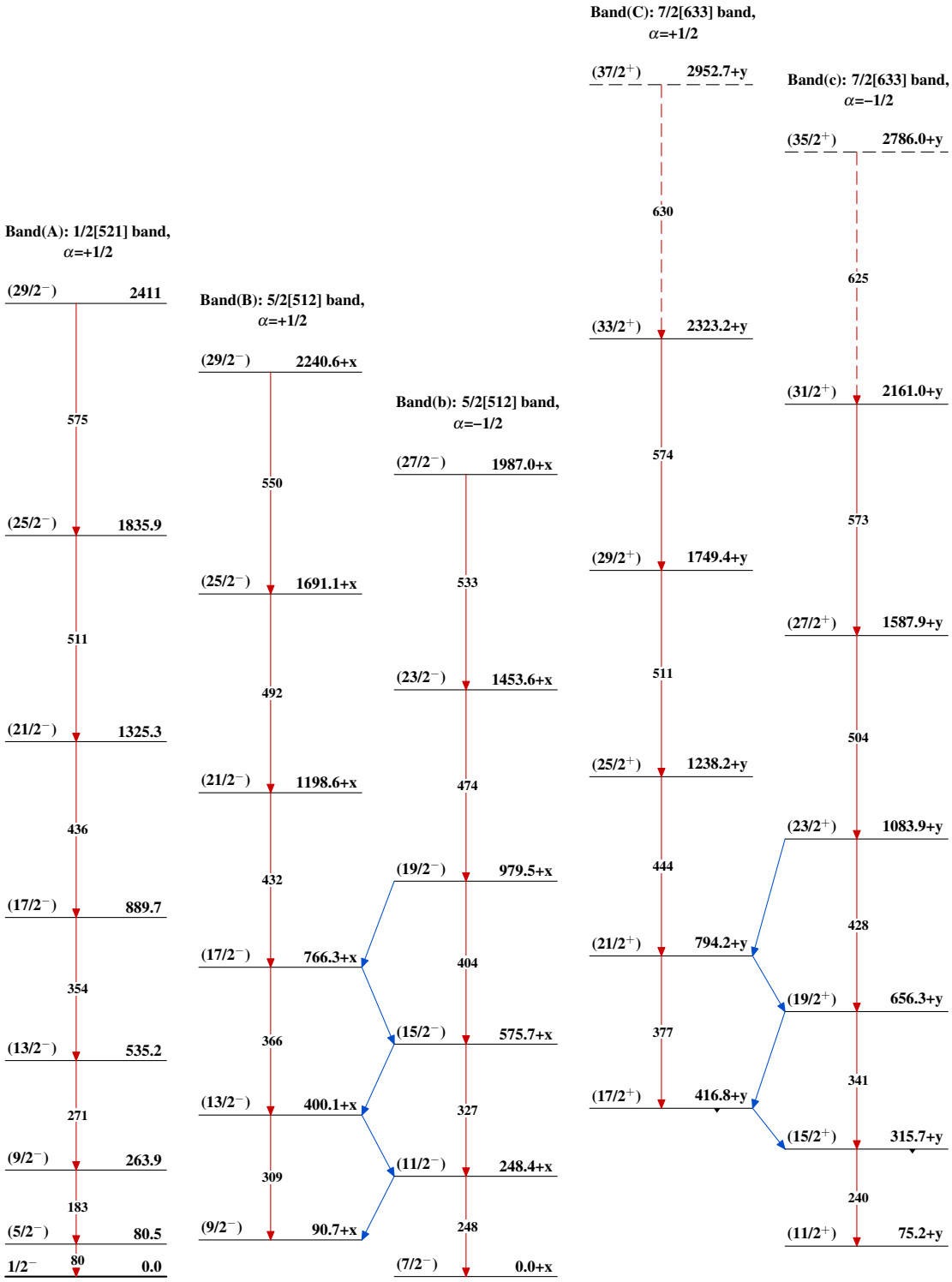
Level Scheme (continued)

γ Decay (Uncertain)



$^{181}_{80}Hg_{101}$

Adopted Levels, Gammas



$^{181}_{80}Hg_{101}$