Adopted Levels, Gammas

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

Q(β^-)=−7.21×10^3 *3*; S(n)=1.035×10^4 *3*; S(p)=725 *23*; Q(α)=5751 *3* 2012Wa38
Note: Current evaluation has used the following Q record −7210 25 *10346* 29 *724* 23 *5751* 3 2003Au03.

^{181}Au Levels

Cross Reference (XREF) Flags

A ^{185}Tl α decay (1.93 s)
B (HI,xnγ)
C ^{181}Hg ε decay

E(level)†	J$^\pi$‡	T$_{1/2}$	XREF	Comments
0.0	(3/2$^-$)	13.7 s *14*	C	%α=2.7 *5*; %ε+%β^+=97.3 *5* %α: from four measurements of %ε+%β^+ based on absolute Iγ or K x ray data (^{181}Au α-decay, 1995Bi01). Others: from comparison of parent and ε decay daughter α intensities, 1970Ha18 report Iα(^{181}Au)/Iα(^{181}Hg)=0.030 *5*, but they assign to ^{181}Au only one α (i.e., 43% of all ^{181}Au α decays, based on relative Iα in 1995Bi01). Thus, if %α(^{181}Hg)=31 *5*, %α(^{181}Au)=3.1 *9*, consistent with the adopted datum. However, 1979Ha10 report 1.04% *14* for the sum of the three strongest lines (91% of all α's, according to 1995Bi01), presumably assuming %α(^{181}Hg)=26 *4* from their earlier work (viz., 1975Ho02). cf. 31% *5* adopted here. T$_{1/2}$: weighted average, using limitation of statistical weights method, of data from ^{181}Au α-decay: 1995Bi01 (11 s *3*, 14.2 s *11*, 12.7 s *24*, 15.1 s *5*, 13.3 s *17*, 14.1 s *20*, 14.3 s *5*), 1979Ha10 (13 s *3*), 1968De01 (12.0 s *12*, 11.0 s *8*) and 1968Si01 (11.5 s *10*). Others: ≈10 s (1970Ha18). J$^\pi$: unhindered α decay to (3/2$^-$) (^{177}Ir, 148) (1995Bi01); strongest ε decay branches feed π=−, J≤5/2 levels in ^{181}Pt. Note that ^{183}Au and ^{185}Au have 3/2$^-$ states at 12.8 and 35.8 keV, respectively, and 5/2$^-$ ground states, making a 3/2$^-$ g.s. for ^{181}Au entirely plausible. Any apparent ε+β^+ feeding to J>5/2 levels in ^{181}Pt is presumed to result from an incomplete decay scheme.
0.0+x#	(9/2$^-$)		B	
0.0+y^g	(11/2$^-$)		B	
0.0+z^h			A	
29.4+x@ *3*	(7/2$^-$)		B	
35+z^h *6*			A	E(level): possibly identical to the (9/2$^-$), 0.0+x level observed in (HI,xnγ).
228.98+x# *15*	(13/2$^-$)		B	
242.64+x@ *16*	(11/2$^-$)		B	
305.46+y^f *16*	(13/2$^-$)		B	
333.89+x& *17*	(11/2$^-$)		B	
458.54+y^g *16*	(15/2$^-$)		B	
529.36+x^c *19*	(13/2$^+$)		B	
571.58+x# *21*	(17/2$^-$)		B	
574.56+x@ *18*	(15/2$^-$)		B	
620.28+x& *18*	(15/2$^-$)		B	
635.1+x^b *4*			B	
685.66+x^c *22*	(17/2$^+$)		B	

Continued on next page (footnotes at end of table)

Adopted Levels, Gammas (continued)

^{181}Au Levels (continued)

E(level)[†]	Jπ[‡]	XREF	E(level)[†]	Jπ[‡]	XREF	E(level)[†]	Jπ[‡]	XREF
687.14+y[f] *20*	(17/2⁻)	B	1942.8+x[&] *3*	(27/2⁻)	B	3298.5+x[d] *5*	(37/2⁺)	B
902.64+y[g] *24*	(19/2⁻)	B	2029.1+x[e] *4*	(27/2⁺)	B	3443.1+x[#] *5*	(37/2⁻)	B
955.0+x[b] *3*		B	2095.7+x[@] *4*	(27/2⁻)	B	3500.1+x[c] *5*	(41/2⁺)	B
958.2+x[c] *3*	(21/2⁺)	B	2096.1+x[#] *4*	(29/2⁻)	B	3706.9+x[a] *5*	(39/2⁻)	B
987.97+x[&] *19*	(19/2⁻)	B	2241.6+y[f] *5*	(29/2⁻)	B	3844.6+x[&] *5*	(39/2⁻)	B
1003.1+x[#] *3*	(21/2⁻)	B	2287.4+x[c] *5*	(33/2⁺)	B	3861.0+x[d] *5*	(41/2⁺)	B
1006.0+x[@] *3*	(19/2⁻)	B	2366.4+x[b] *5*		B	4129.1+x *7*	(41/2⁻)	B
1137.43+y[f] *25*	(21/2⁻)	B	2388.7+x[d] *6*	(29/2⁺)	B	4190.5+x[c] *6*	(45/2⁺)	B
1325.7+x[c] *4*	(25/2⁺)	B	2515.9+x[&] *4*	(31/2⁻)	B	4205.1+x[#] *7*	(41/2⁻)	B
1366.4+x[b] *4*		B	2535.2+x[e] *5*	(31/2⁺)	B	4260.1+x[a] *5*	(43/2⁻)	B
1387.4+y[g] *3*	(23/2⁻)	B	2538.6+y[g] *5*	(31/2⁻)	B	4440.9+x[d] *5*	(45/2⁺)	B
1431.9+x[&] *3*	(23/2⁻)	B	2722.1+x[@] *5*	(31/2⁻)	B	4634.6+x[&] *7*	(43/2⁻)	B
1513.5+x[#] *4*	(25/2⁻)	B	2742.5+x[#] *5*	(33/2⁻)	B	4865.8+x[a] *6*	(47/2⁻)	B
1518.3+x[@] *4*	(23/2⁻)	B	2807.7+x[d] *5*	(33/2⁺)	B	4929.7+x[c] *6*	(49/2⁺)	B
1654.3+y[f] *3*	(25/2⁻)	B	2864.3+x[c] *5*	(37/2⁺)	B	5026.1+x[d] *6*	(49/2⁺)	B
1772.4+x[c] *4*	(29/2⁺)	B	2945.3+x[b] *5*		B	5650.1+x[d] *8*	(53/2⁺)	B
1837.7+x[b] *4*		B	2967.7+x[e] *5*	(35/2⁺)	B	5717.7+x[c] *6*	(53/2⁺)	B
1934.7+y[g] *3*	(27/2⁻)	B	3140.8+x[&] *5*	(35/2⁻)	B			

[†] From least-squares adjustment of Eγ. Energies assume excitations of x and y, respectively, for the lowest energy level observed in (HI,xnγ) studies (J^π=(9/2⁻)) and for the bandhead of the possible $h_{11/2}$ coupled structure. From level energy systematics for odd-A Au isotopes, x=90 *50* and y=260 *20* for the lowest 9/2 and 11/2 levels, respectively, appear to be reasonable estimates. A 5/2⁻ level also is expected very close to the g.s.

[‡] From (^{35}Cl,4nγ), based on measured DCO ratios and deduced band structure, assuming J^π=9/2⁻ for the lowest-energy level observed in that study (consistent with systematics for Au isotopes), except as noted.

[#] Band(A): (π $h_{9/2}$) band, α=+1/2.

[@] Band(a): Possible (π $h_{9/2}$) band, α=−1/2. Prolate orbital; unfavored signature.

[&] Band(B): Possible (π $f_{7/2}$) band, α=−1/2. Prolate orbital; energetically favored signature.

[a] Band(C): π=− band, α=−1/2. Yrast for J≥39/2.

[b] Band(D): Possible π=− band. May be signature partner of the (π $f_{7/2}$) band which includes the 243+x level.

[c] Band(E): 1/2[660] band, α=+1/2.

[d] Band(F): possible (π 1/2[660])⊗(ν 1/2[521])⊗(ν 5/2[512]) band.

[e] Band(G): possible 1/2[660] band, α=−1/2.

[f] Band(H): Possible (π $h_{11/2}$) band, α=+1/2. Coupled oblate band.

[g] Band(h): Possible (π $h_{11/2}$) band, α=−1/2. Coupled oblate band.

[h] Level fed by α decay from (9/2⁻) isomer of ^{185}Tl. Energy is given relative to an unknown energy 'z'; possibly identical to one of the other levels listed here for ^{181}Au.

γ(^{181}Au)

E_i(level)	J_i^π	E_γ[†]	I_γ[†]	E_f	J_f^π	Mult.[‡]	Comments
29.4+x	(7/2⁻)	(29.4 *3*)		0.0+x	(9/2⁻)		Expected but not observed. 1999So01 (HI,xnγ) suggest that the Eγ=30.8 *2* line reported in ε decay of 1/2$^{(-)}$ ^{181}Hg represents this transition, but Eγ is too high for this placement.
228.98+x	(13/2⁻)	228.9 *2*	100	0.0+x	(9/2⁻)	Q	
242.64+x	(11/2⁻)	213.2 *2*	100 *4*	29.4+x	(7/2⁻)	(Q)	

Continued on next page (footnotes at end of table)

Adopted Levels, Gammas (continued)

γ(^{181}Au) (continued)

E_i(level)	J^π_i	E_γ†	I_γ†	E_f	J^π_f	Mult.‡
242.64+x	(11/2−)	242.6 *2*	31.5	0.0+x	(9/2−)	D
305.46+y	(13/2−)	305.4 *2*	100	0.0+y	(11/2−)	
333.89+x	(11/2−)	334.0 *2*	100	0.0+x	(9/2−)	
458.54+y	(15/2−)	153.1 *2*	53 *6*	305.46+y	(13/2−)	
		458.6 *2*	100 *14*	0.0+y	(11/2−)	
529.36+x	(13/2+)	286.7 *2*	100 *3*	242.64+x	(11/2−)	D
		300.4 *2*	24.0 *8*	228.98+x	(13/2−)	Q
571.58+x	(17/2−)	342.6 *2*	100	228.98+x	(13/2−)	
574.56+x	(15/2−)	331.9 *2*	100 *4*	242.64+x	(11/2−)	Q
		345.6 *2*	19.5 *13*	228.98+x	(13/2−)	
620.28+x	(15/2−)	286.5 *2*	93 *6*	333.89+x	(11/2−)	
		391.2 *2*	100 *7*	228.98+x	(13/2−)	D
685.66+x	(17/2+)	111.1 *2*	12.9 *5*	574.56+x	(15/2−)	(D)
		156.3 *2*	100 *3*	529.36+x	(13/2+)	Q
687.14+y	(17/2−)	228.7 *2*	100 *7*	458.54+y	(15/2−)	
		381.6 *2*	60 *6*	305.46+y	(13/2−)	
902.64+y	(19/2−)	215.5 *2*	100 *6*	687.14+y	(17/2−)	
		444.0 *5*	78 *8*	458.54+y	(15/2−)	
955.0+x		319.9 *2*	91 *18*	635.1+x		
		380.4 *2*	100 *18*	574.56+x	(15/2−)	
958.2+x	(21/2+)	272.5 *2*	100	685.66+x	(17/2+)	Q
987.97+x	(19/2−)	367.7 *2*	100 *5*	620.28+x	(15/2−)	
		413.4 *2*	26.1 *24*	574.56+x	(15/2−)	
		416.4 *2*	11.5 *24*	571.58+x	(17/2−)	D
1003.1+x	(21/2−)	431.5 *2*	100	571.58+x	(17/2−)	Q
1006.0+x	(19/2−)	431.4 *2*	100	574.56+x	(15/2−)	Q
1137.43+y	(21/2−)	234.8 *2*	75 *4*	902.64+y	(19/2−)	
		450.3 *2*	100 *7*	687.14+y	(17/2−)	
1325.7+x	(25/2+)	367.5 *2*	100	958.2+x	(21/2+)	Q
1366.4+x		411.4 *2*	100	955.0+x		
1387.4+y	(23/2−)	250.2 *2*	79 *5*	1137.43+y	(21/2−)	
		484.7 *2*	100 *7*	902.64+y	(19/2−)	
1431.9+x	(23/2−)	428.0 *5*	10.1 *14*	1003.1+x	(21/2−)	
		444.0 *2*	100 *4*	987.97+x	(19/2−)	
1513.5+x	(25/2−)	510.5 *2*	100	1003.1+x	(21/2−)	
1518.3+x	(23/2−)	512.3 *2*	100	1006.0+x	(19/2−)	
1654.3+y	(25/2−)	267.1 *2*	61 *3*	1387.4+y	(23/2−)	
		516.7 *2*	100 *6*	1137.43+y	(21/2−)	
1772.4+x	(29/2+)	446.7 *2*	100	1325.7+x	(25/2+)	Q
1837.7+x		471.3 *2*	100	1366.4+x		
1934.7+y	(27/2−)	280.5 *2*	47 *3*	1654.3+y	(25/2−)	
		547.4 *2*	100 *6*	1387.4+y	(23/2−)	
1942.8+x	(27/2−)	430.0 *5*	17.7 *17*	1513.5+x	(25/2−)	
		510.7 *2*	100 *4*	1431.9+x	(23/2−)	
2029.1+x	(27/2+)	703.5 *2*	100	1325.7+x	(25/2+)	D
2095.7+x	(27/2−)	582.2 *2*	100	1513.5+x	(25/2−)	
2096.1+x	(29/2−)	582.6 *2*	100	1513.5+x	(25/2−)	
2241.6+y	(29/2−)	308.0 *5*	61 *7*	1934.7+y	(27/2−)	
		586.0 *5*	100 *13*	1654.3+y	(25/2−)	
2287.4+x	(33/2+)	514.9 *2*	100	1772.4+x	(29/2+)	Q
2366.4+x		528.7 *2*	100	1837.7+x		
2388.7+x	(29/2+)	1063.0 *5*	100	1325.7+x	(25/2+)	
2515.9+x	(31/2−)	573.1 *2*	100	1942.8+x	(27/2−)	
2535.2+x	(31/2+)	506.2 *2*	100 *5*	2029.1+x	(27/2+)	
		763.0 *5*	31 *4*	1772.4+x	(29/2+)	
2538.6+y	(31/2−)	297.0 *5*	39 *3*	2241.6+y	(29/2−)	

Continued on next page (footnotes at end of table)

Adopted Levels, Gammas (continued)

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

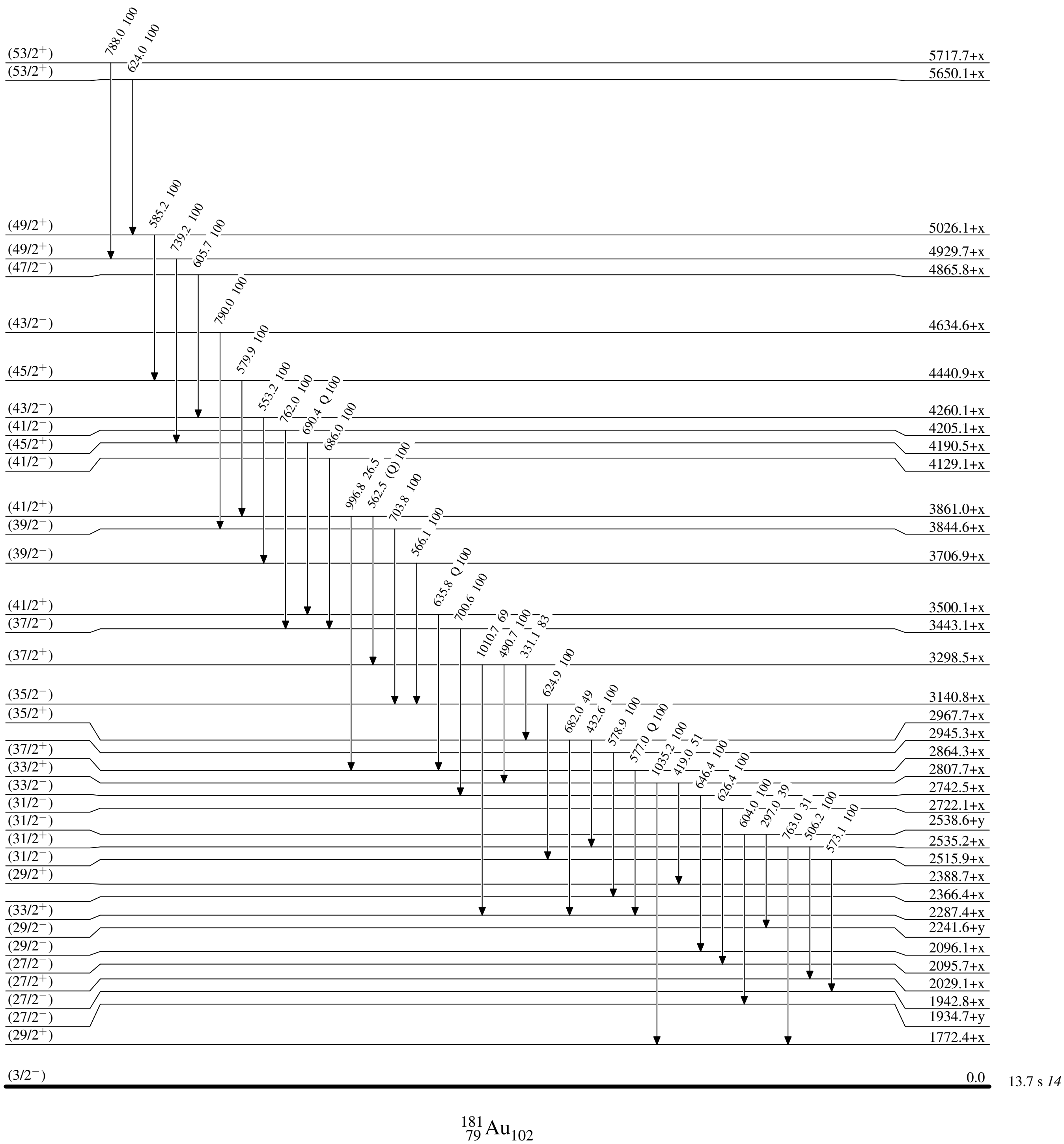
E_i(level)	J^π_i	E_γ†	I_γ†	E_f	J^π_f	Mult.‡
2538.6+y	(31/2⁻)	604.0 *5*	100 *8*	1934.7+y	(27/2⁻)	
2722.1+x	(31/2⁻)	626.4 *2*	100	2095.7+x	(27/2⁻)	
2742.5+x	(33/2⁻)	646.4 *2*	100	2096.1+x	(29/2⁻)	
2807.7+x	(33/2⁺)	419.0 *5*	51 *3*	2388.7+x	(29/2⁺)	
		1035.2 *2*	100 *6*	1772.4+x	(29/2⁺)	
2864.3+x	(37/2⁺)	577.0 *2*	100	2287.4+x	(33/2⁺)	Q
2945.3+x		578.9 *2*	100	2366.4+x		
2967.7+x	(35/2⁺)	432.6 *2*	100 *7*	2535.2+x	(31/2⁺)	
		682.0 *5*	49 *5*	2287.4+x	(33/2⁺)	
3140.8+x	(35/2⁻)	624.9 *2*	100	2515.9+x	(31/2⁻)	
3298.5+x	(37/2⁺)	331.1 *2*	83 *4*	2967.7+x	(35/2⁺)	
		490.7 *2*	100 *5*	2807.7+x	(33/2⁺)	
		1010.7 *2*	69 *4*	2287.4+x	(33/2⁺)	
3443.1+x	(37/2⁻)	700.6 *2*	100	2742.5+x	(33/2⁻)	
3500.1+x	(41/2⁺)	635.8 *2*	100	2864.3+x	(37/2⁺)	Q
3706.9+x	(39/2⁻)	566.1 *2*	100	3140.8+x	(35/2⁻)	
3844.6+x	(39/2⁻)	703.8 *2*	100	3140.8+x	(35/2⁻)	
3861.0+x	(41/2⁺)	562.5 *2*	100 *4*	3298.5+x	(37/2⁺)	(Q)
		996.8 *2*	26.5 *19*	2864.3+x	(37/2⁺)	
4129.1+x	(41/2⁻)	686.0 *5*	100	3443.1+x	(37/2⁻)	
4190.5+x	(45/2⁺)	690.4 *2*	100	3500.1+x	(41/2⁺)	Q
4205.1+x	(41/2⁻)	762.0 *5*	100	3443.1+x	(37/2⁻)	
4260.1+x	(43/2⁻)	553.2 *2*	100	3706.9+x	(39/2⁻)	
4440.9+x	(45/2⁺)	579.9 *2*	100	3861.0+x	(41/2⁺)	
4634.6+x	(43/2⁻)	790.0 *5*	100	3844.6+x	(39/2⁻)	
4865.8+x	(47/2⁻)	605.7 *2*	100	4260.1+x	(43/2⁻)	
4929.7+x	(49/2⁺)	739.2 *2*	100	4190.5+x	(45/2⁺)	
5026.1+x	(49/2⁺)	585.2 *2*	100	4440.9+x	(45/2⁺)	
5650.1+x	(53/2⁺)	624.0 *5*	100	5026.1+x	(49/2⁺)	
5717.7+x	(53/2⁺)	788.0 *2*	100	4929.7+x	(49/2⁺)	

† From $^{150}Sm(^{35}Cl,4n\gamma)$.
‡ From measured DCO ratios in $(^{35}Cl,4n\gamma)$.

Adopted Levels, Gammas

Level Scheme

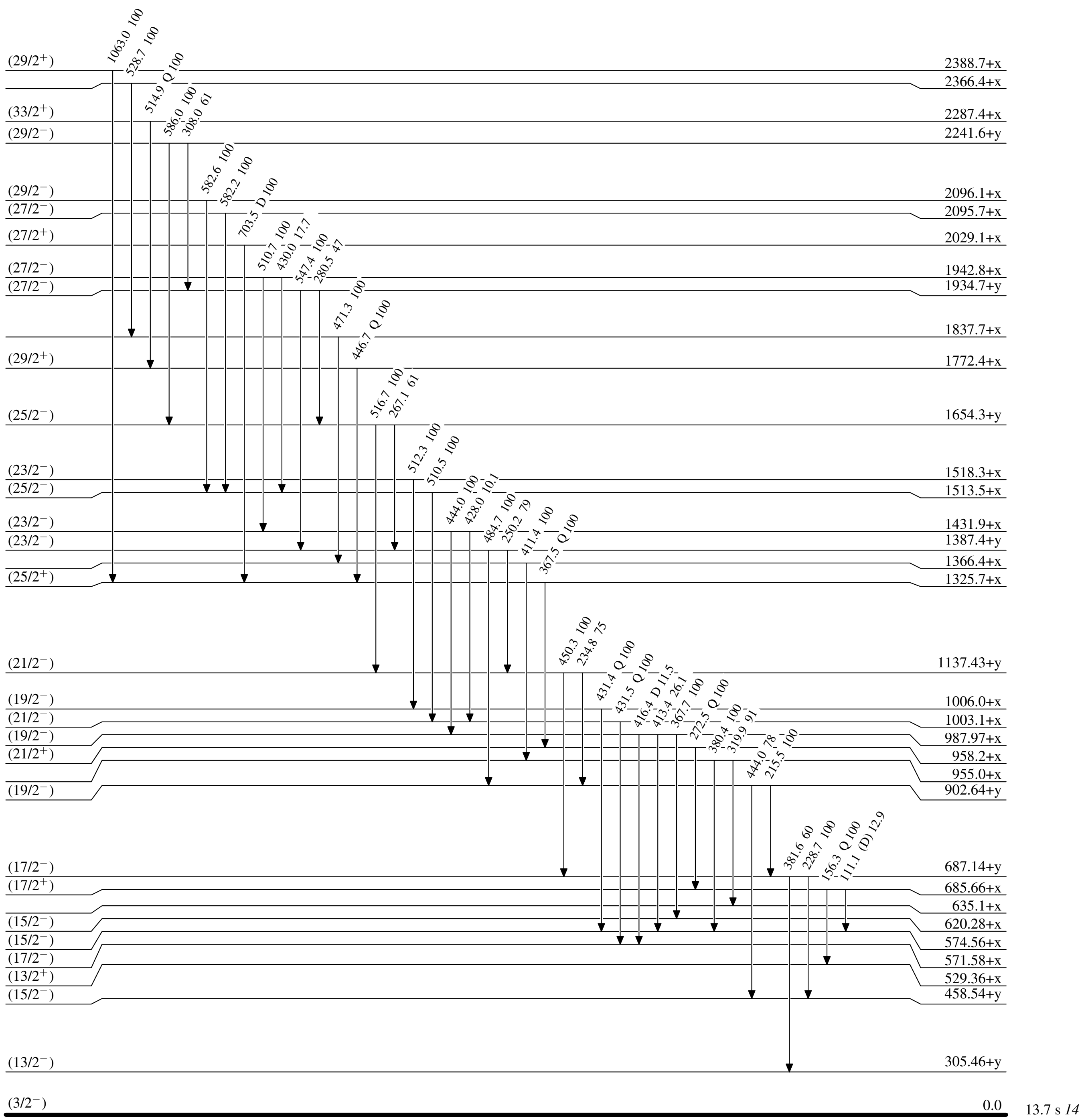
Intensities: Relative photon branching from each level



Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Relative photon branching from each level



$^{181}_{79}Au_{102}$

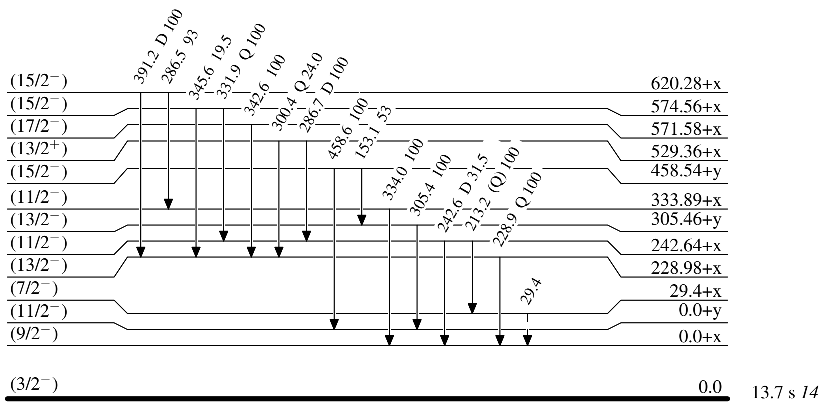
Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Relative photon branching from each level

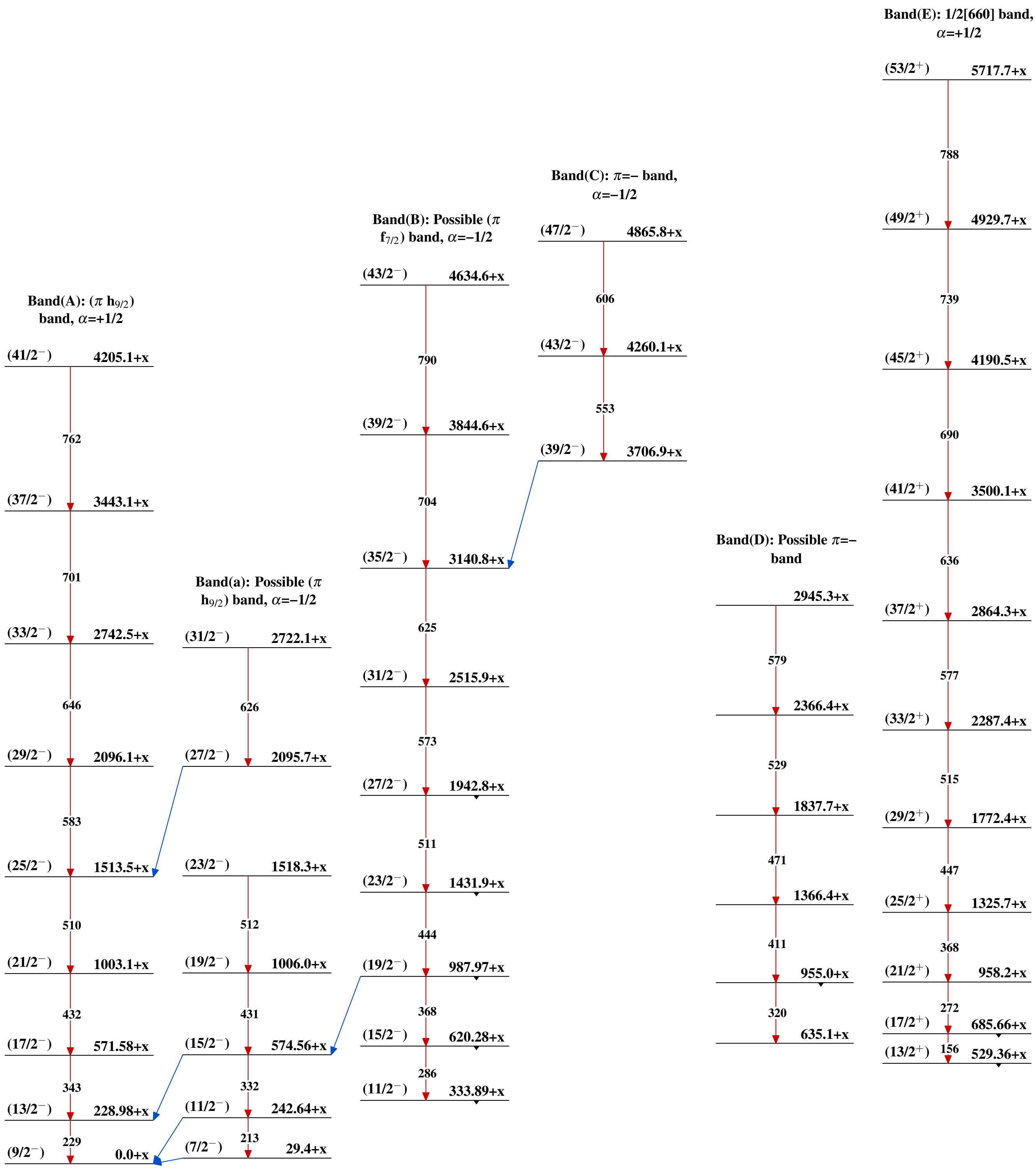
Legend

γ Decay (Uncertain)



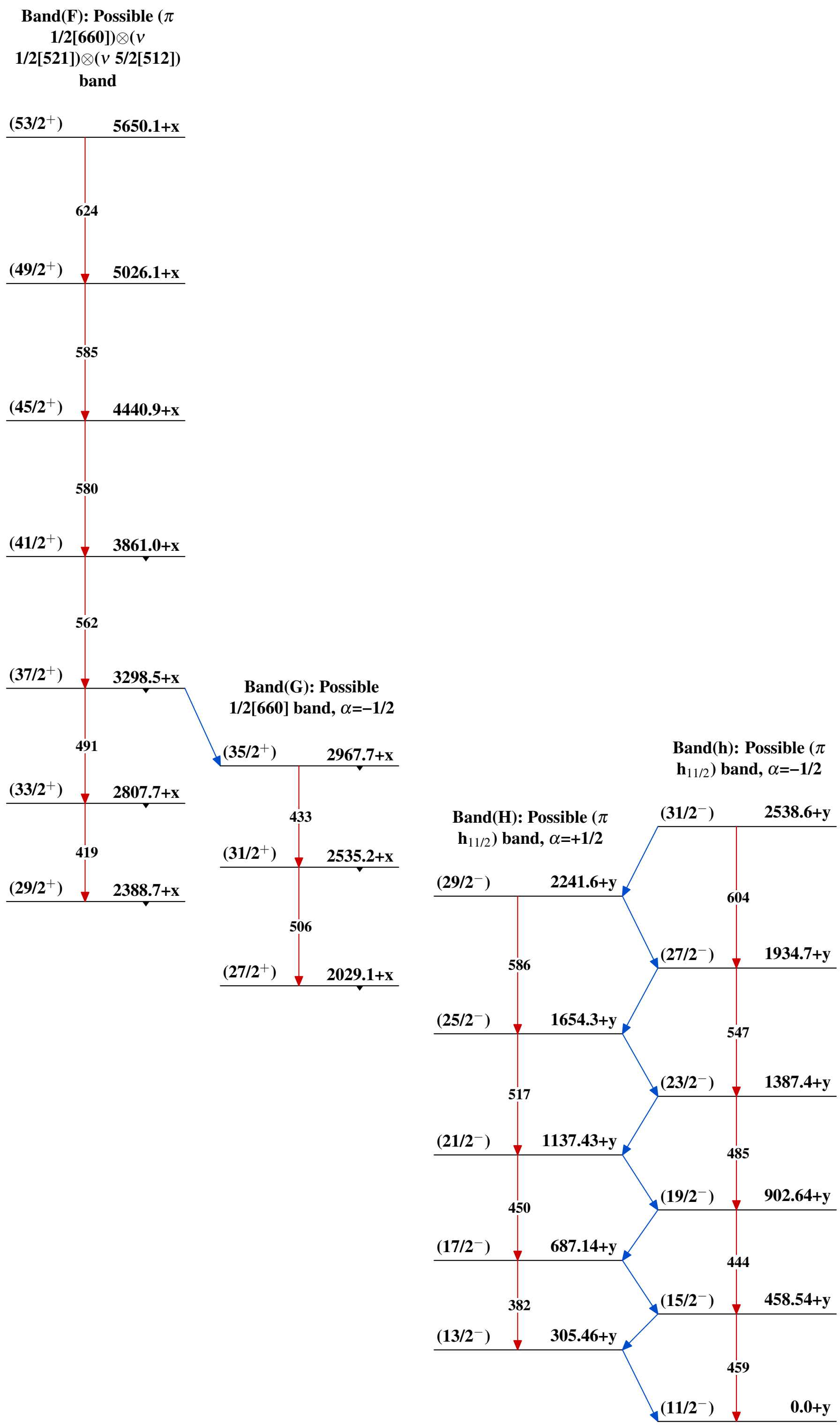
$^{181}_{79}Au_{102}$

Adopted Levels, Gammas



$^{181}_{79}Au_{102}$

Adopted Levels, Gammas (continued)



$^{181}_{79}Au_{102}$