Adopted Levels, Gammas

Type	Author	History Citation	Literature Cutoff Date
Full Evaluation	Balraj Singh	NDS 105,223 (2005)	22-Jun-2005

Q(β^-)=−5.6×10^3 *15*; S(n)=1.09×10^4 *5*; S(p)=2959 *11*; Q(α)=−3093 *7* 2012Wa38
Note: Current evaluation has used the following Q record $ −5.7E3 15 *10*.93E348 3.03E3 18 −3.16E318 2003Au03.
Q(εp)=2300 *180* (2003Au03).
2001La31: Measured mass excess.
2003Ba18: deduced mass excess from Q(ε)≥8929 *83* from measured $\beta^+\gamma$.
1998Is06: Measured mass, tof spectrometer.
Additional information 1.

^{80}Y Levels

Cross Reference (XREF) Flags

- A ^{80}Y IT decay (4.8 s)
- B ^{80}Y IT decay (4.7 μs)
- C ^{80}Zr ε decay (4.6 s)
- D (HI,xnγ)

E(level)†	J$^\pi$‡	T$_{1/2}$#	XREF	Comments
0&	(4$^-$)	30.1 s *5*	ABCD	%ε+%β^+=100; %εp=? T$_{1/2}$: from 1998Do04. Others: 33.8 s *6* (1981Li12) and 38 s *1* (1982De36). J$^\pi$: probable ε,β^+ feedings to 2$^+$, 4$^+$ and 6$^+$ levels in ^{80}Sr (see ^{80}Y ε decay); configuration=π5/2[422]+ν3/2[301] (2000Do10).
228.5^i *1*	(1$^-$)	4.8 s *3*	ABCD	%ε+%β^+=19 *2*; %IT=81 *2* (1998Do04,2000Do10) T$_{1/2}$: weighted average of 5.0 s *5* (2001No07) and 4.7 s *3* (1998Do04). T$_{1/2}$: 6.8 s *5* for fully-ionized (bare) ^{80}Y (2001No07). J$^\pi$: M3(+E4) γ to (4$^-$); configuration=π5/2[422]-ν3/2[301] (2000Do10). β_2=0.37 (2000Do10).
257.1^a *8*	(5$^-$)		D	J$^\pi$: from 1998Do04, possible bandhead of configuration=π5/2[422]ν3/2[301], α=1.
312.6^g *9*	(2$^+$)	4.7 μs *3*	BCD	%IT=100 T$_{1/2}$: From 2000Ch07.
324.2^h *8*	(2$^-$)		D	
443.6 *11*			D	
455.6^f *10*	(3$^+$)		D	
460.7^i *8*	(3$^-$)		D	
570.0& *7*	(6$^-$)		D	
623	(1$^+$)		C	J$^\pi$: possible allowed β transition from 0$^+$.
648.7^g *9*	(4$^+$)		D	
663.7^h *10*	(4$^-$)		D	
676.1 *11*			D	
878.8^i *11*	(5$^-$)		D	
886.6^f *10*	(5$^+$)		D	
937.5^a *9*	(7$^-$)		D	
1059.3^d *9*	(6$^+$)		D	
1175.8^e *9*	(6$^+$)		D	
1185.7^g *10*	(6$^+$)		D	
1207.1^h *12*	(6$^-$)		D	
1290.2^c *9*	(7$^+$)		D	

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Adopted Levels, Gammas (continued)

^{80}Y Levels (continued)

E(level)†	Jπ‡	$T_{1/2}$#	XREF	E(level)†	Jπ‡	$T_{1/2}$#	XREF
1358.6[&] *10*	(8^-)	0.79 ps *+42−21*	D	4973.7[e] *20*	(14^+)		D
1488.7[i] *13*	(7^-)		D	5323.5[g] *18*	(14^+)		D
1490.5[d] *9*	(8^+)		D	5438.3[h] *21*	(14^-)		D
1509.6[f] *10*	(7^+)		D	5446.6[a] *21*	(15^-)	0.11 ps *6*	D
1764.6[e] *10*	(8^+)		D	5603.5[b] *21*	(15)		D
1823.9[c] *10*	(9^+)		D	5681.8[i] *23*	(15^-)		D
1825.1[a] *11*	(9^-)	0.35 ps *+6−5*	D	5874.9[f] *20*	(15^+)		D
1916.2[g] *11*	(8^+)		D	5999.1[d] *19*	(16^+)	0.06 ps *+20−3*	D
1957.3[h] *13*	(8^-)		D	6097.6[&] *21*	(16^-)	0.12 ps *8*	D
2267.9[d] *11*	(10^+)		D	6242.8[c] *20*	(17^+)	0.08 ps *+17−6*	D
2305.6[i] *14*	(9^-)	0.8 ps *+26−4*	D	6433.3[e] *23*	(16^+)		D
2323.3[f] *12*	(9^+)	0.73 ps *+35−19*	D	6654.9[a] *23*	(17^-)	<0.25[@] ps	D
2350.9[&] *12*	(10^-)	0.17 ps *+6−5*	D	6784.9[g] *21*	(16^+)		D
2615.4[c] *12*	(11^+)	0.66 ps *+53−22*	D	6968.5[h] *23*	(16^-)		D
2618.5[e] *14*	(10^+)		D	7034.2[b] *23*	(17)		D
2867.1[g] *13*	(10^+)	0.30 ps *+12−8*	D	7089.7[i] *25*	(17^-)		D
2901.1[a] *15*	(11^-)	0.12 ps *+7−5*	D	7422.6[f] *22*	(17^+)		D
2916.3[h] *15*	(10^-)	<0.41[@] ps	D	7450.2[&] *24*	(18^-)	0.17 ps *+12−9*	D
3298.6[d] *13*	(12^+)	0.17 ps *10*	D	7528.1[d] *22*	(18^+)	<0.14[@] ps	D
3328.4[f] *14*	(11^+)	<0.23[@] ps	D	7789.1[c] *22*	(19^+)	<0.14[@] ps	D
3333.0[i] *17*	(11^-)	0.30 ps *+18−11*	D	8029.2[a] *25*	(19^-)		D
3531.0[&] *16*	(12^-)	0.11 ps *+8−5*	D	8036.1[e] *25*	(18^+)		D
3628.2[c] *14*	(13^+)	0.19 ps *4*	D	8568.7[b] *25*	(19)		D
3689.7[e] *18*	(12^+)		D	9001[&] *3*	(20^-)	<0.08[@] ps	D
4013.9[g] *15*	(12^+)	<0.26[@] ps	D	9148.9[d] *24*	(20^+)		D
4090.0[h] *18*	(12^-)		D	9496.1[c] *25*	(21^+)		D
4146.0[a] *18*	(13^-)	0.15 ps *+7−6*	D	9613[a] *3*	(21^-)		D
4442.7[i] *20*	(13^-)	<0.22[@] ps	D	10663[&] *3*	(22^-)		D
4509.6[f] *17*	(13^+)	<0.19[@] ps	D	10918[d] *3*	(22^+)		D
4558.9[d] *16*	(14^+)	0.12 ps *+11−10*	D	11379[c] *3*	(23^+)		D
4842.6[&] *19*	(14^-)	0.12 ps *+10−7*	D	11401[a] *3*	(23^-)		D
4848.5[c] *17*	(15^+)	0.12 ps *+9−6*	D	12460[&] *3*	(24^-)		D

† From least-squares fit to Eγ's, assuming Δ(Eγ)=0.3 keV for each γ ray, when quoted to tenth of a keV, otherwise 1 keV is assumed.

‡ As proposed by 2002Bu16 based on γ(θ), γγ(θ)(DCO) data and band assignments. The parentheses on many assignments have been added by the evaluator when strong arguments are lacking.

From DSAM (2004Ka32) for all levels above 313 keV.

@ Effective half-life (2004Ka32), not corrected for side feeding.

& Band(A): π5/2[422]ν3/2[301], α=0.

a Band(a): π5/2[422]ν3/2[301], α=1.

b Band(B): Band based on (15).

c Band(C): π5/2[422]ν5/2[422], α=1.

d Band(c): π5/2[422]ν5/2[422], α=0.

e Band(D): $\pi g_{9/2}\nu g_{9/2}$.

f Band(E): π5/2[422]ν1/2[431], α=1.

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Adopted Levels, Gammas (continued)

^{80}Y Levels (continued)

[g] Band(e): $\pi 5/2[422]\nu 1/2[431]$, $\alpha=0$.
[h] Band(F): Band based on 2^-, $\alpha=0$. Several configurations contribute: $\pi 5/2[422]\nu 3/2[301]$; $\pi 1/2[431]\nu 3/2[301]$; $\pi 3/2[301]\nu 1/2[431]$.
[i] Band(f): Band based on 1^-, $\alpha=1$. Several configurations contribute: $\pi 5/2[422]\nu 3/2[301]$; $\pi 1/2[431]\nu 3/2[301]$; $\pi 3/2[301]\nu 1/2[431]$.

$\gamma(^{80}Y)$

E_i(level)	J_i^π	E_γ	I_γ	E_f	J_f^π	Mult.[†]	δ	α[‡]	Comments
228.5	(1^-)	228.5 *1*	100	0	(4^-)	M3(+E4)	<0.05	0.53	B(M3)(W.u.)=0.66 *5* Mult.: from ce data in (HI,xnγ) (2001No07). δ: ce data (2001No07) give δ<0.65; RUL=100 for E4 gives δ<0.05.
257.1	(5^-)	257.0	100	0	(4^-)	D			
312.6	(2^+)	84	100	228.5	(1^-)	[E1]		0.18	B(E1)(W.u.)=1.11×10^{-7} *9*
324.2	(2^-)	95.5	100	228.5	(1^-)	D			
443.6		186.3	100	257.1	(5^-)				
455.6	(3^+)	143.0	100	312.6	(2^+)	D			
460.7	(3^-)	136.2	100 *10*	324.2	(2^-)	D			
		232.5	10 *4*	228.5	(1^-)				
570.0	(6^-)	312.9	30 *4*	257.1	(5^-)	D			
		570.1	100 *11*	0	(4^-)	(Q)			
623	(1^+)	311		312.6	(2^+)				
648.7	(4^+)	192.9	100 *6*	455.6	(3^+)	D			
		336.1	3.0 *5*	312.6	(2^+)	(Q)			
663.7	(4^-)	203.0	100 *6*	460.7	(3^-)	D			
		339.7	9.9 *11*	324.2	(2^-)	(Q)			
676.1		232.4	100	443.6					
878.8	(5^-)	215.1	100 *7*	663.7	(4^-)	D			
		418.0	29.9 *17*	460.7	(3^-)	(Q)			
886.6	(5^+)	237.9	100 *20*	648.7	(4^+)	D			
		431.1	40.0 *14*	455.6	(3^+)				
937.5	(7^-)	367.6	9 *4*	570.0	(6^-)				
		680.6	100.0 *23*	257.1	(5^-)	(Q)			
1059.3	(6^+)	383.0	4.57 *22*	676.1					
		489.9	8.04 *22*	570.0	(6^-)	(D)			
		802.1	100 *11*	257.1	(5^-)	D			
1175.8	(6^+)	289.0	100.0 *13*	886.6	(5^+)	D			
		527.1	73 *3*	648.7	(4^+)	(Q)			
1185.7	(6^+)	299.2	100.0 *16*	886.6	(5^+)	D			
		537.0	50.8 *16*	648.7	(4^+)	(Q)			
1207.1	(6^-)	328.2	100 *9*	878.8	(5^-)	D			
		543.4	40.1 *12*	663.7	(4^-)				
1290.2	(7^+)	114.1	7 *3*	1175.8	(6^+)				
		231.0	100 *5*	1059.3	(6^+)	D			
		720.1	36 *6*	570.0	(6^-)				
1358.6	(8^-)	421.2	13.2 *18*	937.5	(7^-)				
		788.4	100 *5*	570.0	(6^-)	(E2)			B(E2)(W.u.)=100 *35*
1488.7	(7^-)	281.6	94 *9*	1207.1	(6^-)	D			
		609.9	100 *12*	878.8	(5^-)				
1490.5	(8^+)	200.0	24 *3*	1290.2	(7^+)	D			
		304.7	3.3 *3*	1185.7	(6^+)	(Q)			
		315.0	7.2 *3*	1175.8	(6^+)	(Q)			
		431.3	100.0 *17*	1059.3	(6^+)	(Q)			
		553.0	13.1 *6*	937.5	(7^-)	D			

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Adopted Levels, Gammas (continued)

$\gamma(^{80}Y)$ (continued)

E_i(level)	J_i^π	E_γ	I_γ	E_f	J_f^π	Mult.[†]	Comments
1509.6	(7^+)	323.9	55.6 *16*	1185.7	(6^+)	D	
		333.7	38 *15*	1175.8	(6^+)	D+Q	
		623.0	100 *21*	886.6	(5^+)	(Q)	
1764.6	(8^+)	474.2	70 *30*	1290.2	(7^+)	D+Q	
		578.9	50 *4*	1185.7	(6^+)		
		588.9	100 *4*	1175.8	(6^+)	(Q)	
1823.9	(9^+)	333.5	100 *7*	1490.5	(8^+)	D	
		533.7	25.4 *25*	1290.2	(7^+)	(Q)	
1825.1	(9^-)	466.6	6.0 *19*	1358.6	(8^-)		
		887.6	100 *3*	937.5	(7^-)	E2	B(E2)(W.u.)=135 *+21−13*
1916.2	(8^+)	406.6	100 *4*	1509.6	(7^+)		
		730.5	94 *4*	1185.7	(6^+)		
1957.3	(8^-)	468.6	100 *6*	1488.7	(7^-)	D+Q	
		750.2	88 *6*	1207.1	(6^-)	(Q)	
2267.9	(10^+)	443.9	10.6 *16*	1823.9	(9^+)		
		777.3	100.0 *24*	1490.5	(8^+)	(Q)	
2305.6	(9^-)	348.4	28 *4*	1957.3	(8^-)	D	
		816.8	100 *5*	1488.7	(7^-)	[E2]	B(E2)(W.u.)=70 *+70−54*
2323.3	(9^+)	406.8	39 *13*	1916.2	(8^+)		
		813.8	100 *40*	1509.6	(7^+)	[E2]	B(E2)(W.u.)=80 *55*
2350.9	(10^-)	525.9	2.5 *5*	1825.1	(9^-)		
		992.3	100 *7*	1358.6	(8^-)	E2	B(E2)(W.u.)=160 *60*
2615.4	(11^+)	347.6	32 *3*	2267.9	(10^+)	D	
		791.5	100 *24*	1823.9	(9^+)	(E2)	B(E2)(W.u.)=100 *+50−90*
2618.5	(10^+)	853.9	100	1764.6	(8^+)	Q	
2867.1	(10^+)	543.7	16 *6*	2323.3	(9^+)		
		951.0	100 *40*	1916.2	(8^+)	[E2]	B(E2)(W.u.)=100 *65*
2901.1	(11^-)	1076.0	100	1825.1	(9^-)	(E2)	B(E2)(W.u.)=160 *+110−60*
2916.3	(10^-)	610.7	48 *11*	2305.6	(9^-)		
		959.0	100 *18*	1957.3	(8^-)	(E2)	B(E2)(W.u.)>56
3298.6	(12^+)	683.4	5.9 *18*	2615.4	(11^+)		
		1030.6	100 *24*	2267.9	(10^+)	(E2)	B(E2)(W.u.)=130 *90*
3328.4	(11^+)	461.2	23 *6*	2867.1	(10^+)		
		1005.0	100 *8*	2323.3	(9^+)	(E2)	B(E2)(W.u.)>95
3333.0	(11^-)	1027.4	100	2305.6	(9^-)	(E2)	B(E2)(W.u.)=80 *+30−50*
3531.0	(12^-)	1180.1	100	2350.9	(10^-)	(E2)	B(E2)(W.u.)=110 *+50−80*
3628.2	(13^+)	329.5	7.7 *19*	3298.6	(12^+)		
		1012.8	100 *23*	2615.4	(11^+)	(E2)	B(E2)(W.u.)=130 *50*
3689.7	(12^+)	1071.2	100	2618.5	(10^+)	(Q)	
4013.9	(12^+)	685.3	21 *11*	3328.4	(11^+)		
		1147.0	100 *18*	2867.1	(10^+)	[E2]	B(E2)(W.u.)>44
4090.0	(12^-)	1173.7	100	2916.3	(10^-)		
4146.0	(13^-)	1244.9	100	2901.1	(11^-)	(E2)	B(E2)(W.u.)=62 *27*
4442.7	(13^-)	1109.7	100	3333.0	(11^-)	E2	B(E2)(W.u.)>75
4509.6	(13^+)	1181.2	100	3328.4	(11^+)	[E2]	B(E2)(W.u.)>63
4558.9	(14^+)	1260.3	100	3298.6	(12^+)	[E2]	B(E2)(W.u.)=70 *+350−35*
4842.6	(14^-)	1311.5	100	3531.0	(12^-)	(E2)	B(E2)(W.u.)=60 *45*
4848.5	(15^+)	1220.3	100	3628.2	(13^+)	(E2)	B(E2)(W.u.)=90 *60*
4973.7	(14^+)	1284.0	100	3689.7	(12^+)	(Q)	
5323.5	(14^+)	1309.6	100	4013.9	(12^+)		
5438.3	(14^-)	1348.3	100	4090.0	(12^-)		
5446.6	(15^-)	1300.6	100	4146.0	(13^-)	(E2)	B(E2)(W.u.)=70 *40*
5603.5	(15)	1457.5	100	4146.0	(13^-)	(Q)	
5681.8	(15^-)	1239.1	100	4442.7	(13^-)		
5874.9	(15^+)	1365.3	100	4509.6	(13^+)		

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Adopted Levels, Gammas (continued)

$\gamma(^{80}Y)$ (continued)

E_i(level)	J_i^π	E_γ	I_γ	E_f	J_f^π	Mult.[†]	Comments
5999.1	(16^+)	1440.1	100	4558.9	(14^+)	(E2)	B(E2)(W.u.)=70 *+70−54*
6097.6	(16^-)	1255.0	100	4842.6	(14^-)	(E2)	B(E2)(W.u.)=70 *50*
6242.8	(17^+)	1394.3	100	4848.5	(15^+)	[E2]	B(E2)(W.u.)=70 *+210−50*
6433.3	(16^+)	1459.6	100	4973.7	(14^+)		
6654.9	(17^-)	1208.2	100	5446.6	(15^-)	[E2]	B(E2)(W.u.)>43
6784.9	(16^+)	1461.4	100	5323.5	(14^+)		
6968.5	(16^-)	1530.2	100	5438.3	(14^-)		
7034.2	(17)	1430.6	100	5603.5	(15)		
7089.7	(17^-)	1407.9	100	5681.8	(15^-)		
7422.6	(17^+)	1547.7	100	5874.9	(15^+)		
7450.2	(18^-)	1352.6	100	6097.6	(16^-)	(E2)	B(E2)(W.u.)=36 *+19−26*
7528.1	(18^+)	1529.0	100	5999.1	(16^+)	[E2]	B(E2)(W.u.)>24
7789.1	(19^+)	1546.3	100	6242.8	(17^+)	[E2]	B(E2)(W.u.)>22
8029.2	(19^-)	1374.3	100	6654.9	(17^-)		
8036.1	(18^+)	1602.8	100	6433.3	(16^+)		
8568.7	(19)	1534.5	100	7034.2	(17)		
9001	(20^-)	1550.4	100	7450.2	(18^-)	[E2]	B(E2)(W.u.)>38
9148.9	(20^+)	1620.8	100	7528.1	(18^+)		
9496.1	(21^+)	1707.0	100	7789.1	(19^+)		
9613	(21^-)	1583.5	100	8029.2	(19^-)		
10663	(22^-)	1662.5	100	9001	(20^-)		
10918	(22^+)	1768.9	100	9148.9	(20^+)		
11379	(23^+)	1882.6	100	9496.1	(21^+)		
11401	(23^-)	1788	100	9613	(21^-)		
12460	(24^-)	1797.0	100	10663	(22^-)		

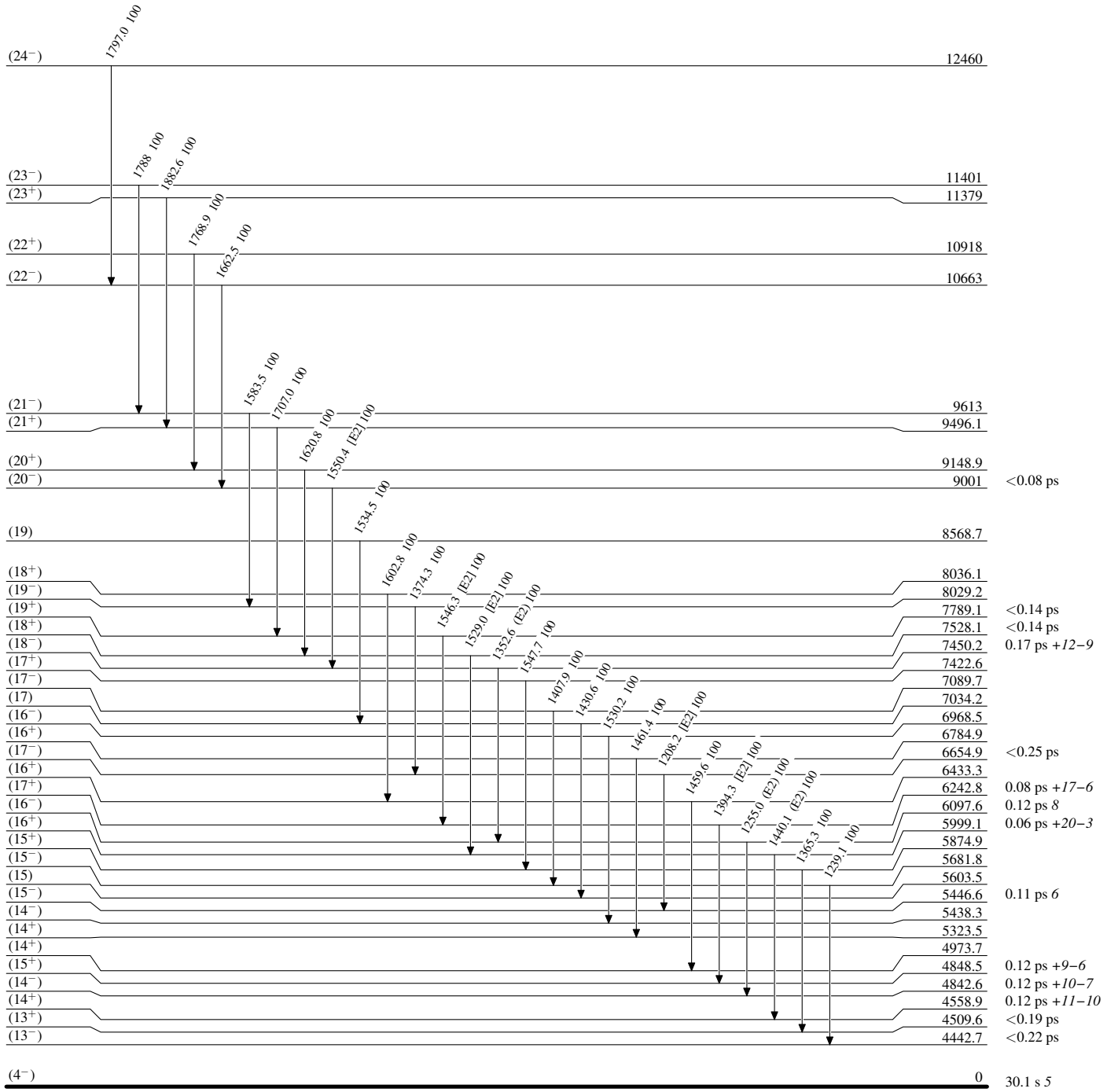
[†] From $\gamma(\theta)$ data of 2002Bu16. The mult=Q when $\gamma(\theta)$ data are consistent with ΔJ=2, quadrupole; and mult=D or D+Q when $\gamma(\theta)$ are consistent with ΔJ=1 or in some rare cases with ΔJ=0. RUL for E2 and M2 are used when level lifetimes are known.

[‡] 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.

Adopted Levels, Gammas

Level Scheme

Intensities: Relative photon branching from each level

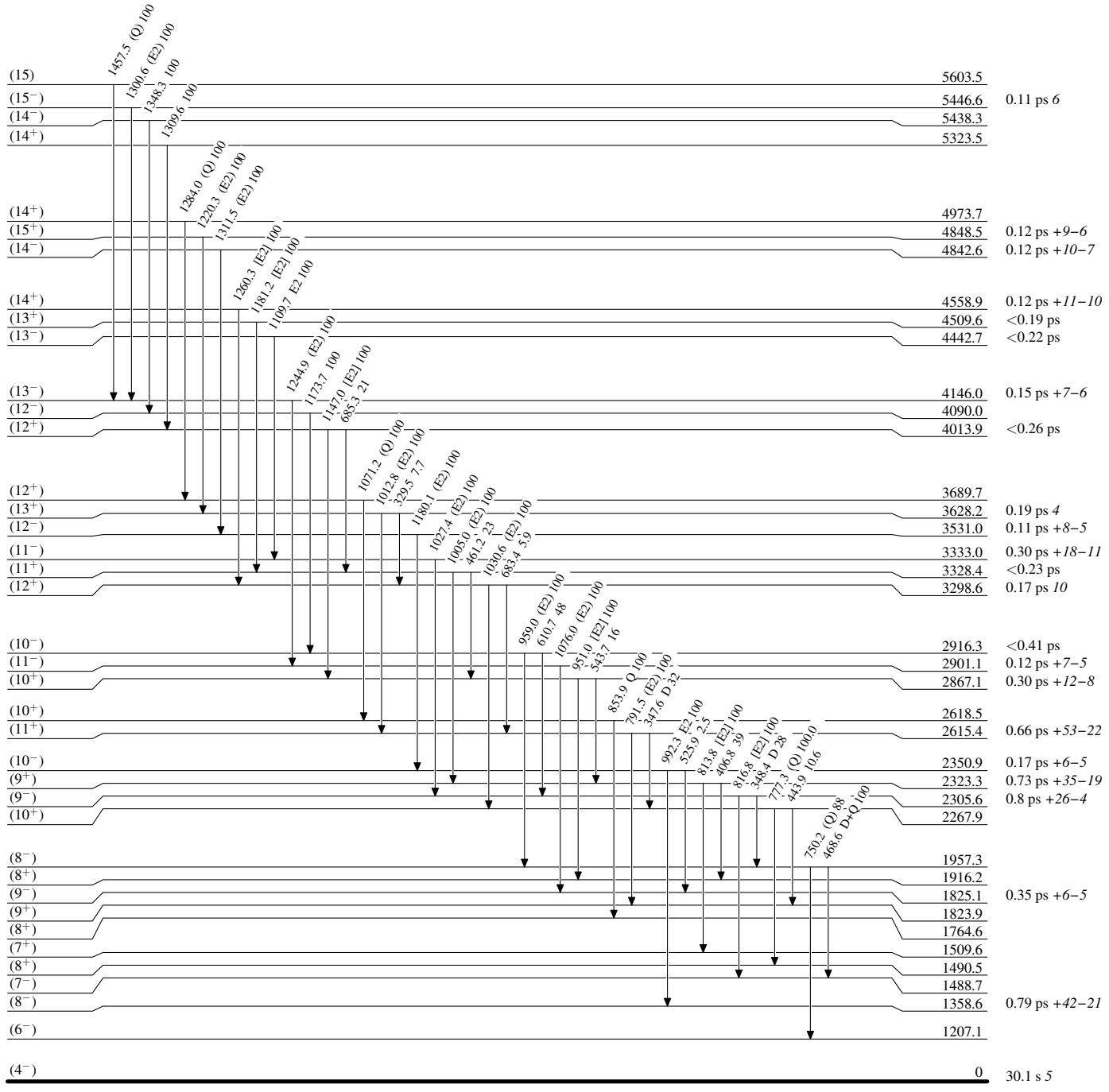


$^{80}_{39}Y_{41}$

Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Relative photon branching from each level

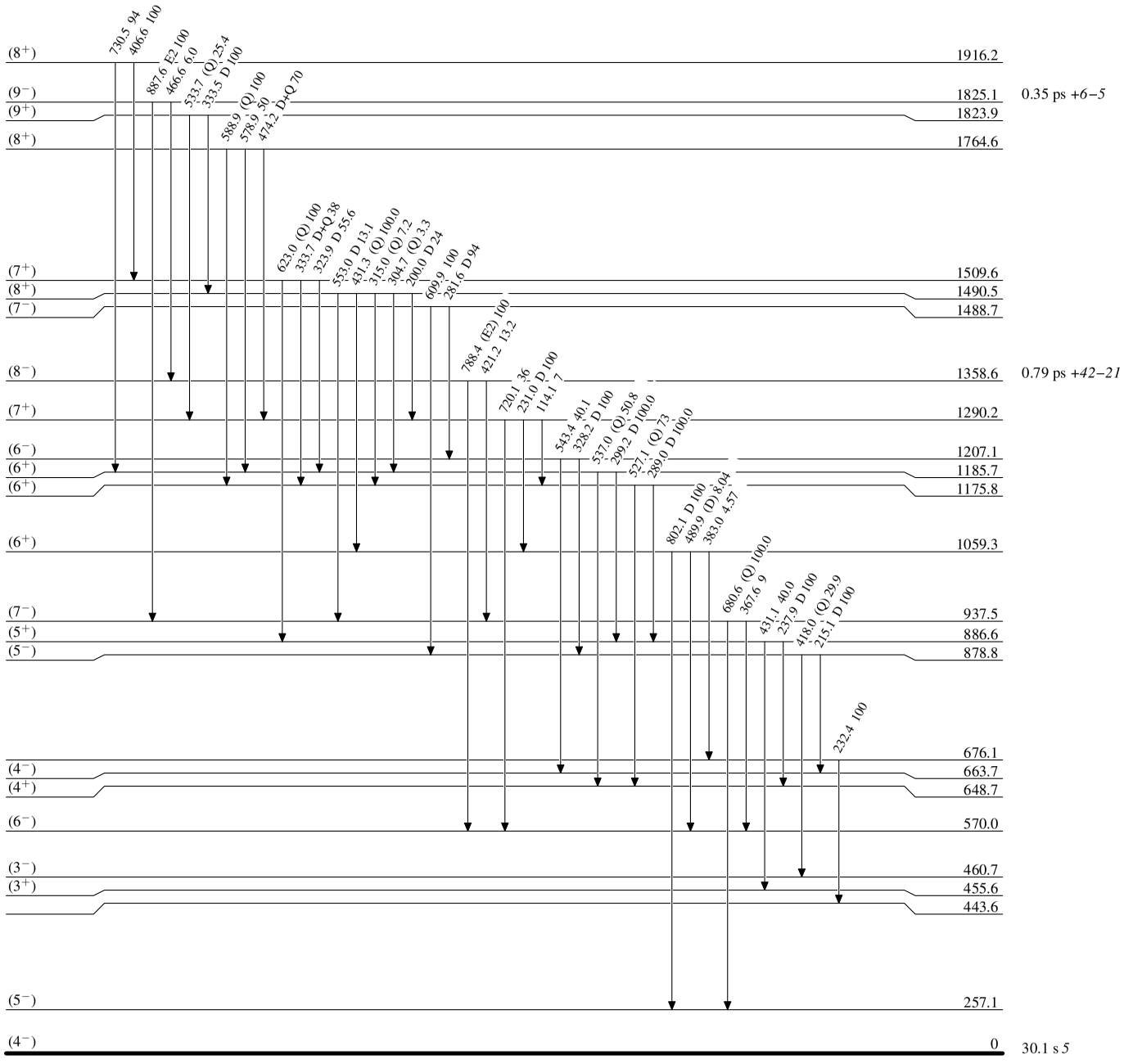


$^{80}_{39}Y_{41}$

Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Relative photon branching from each level

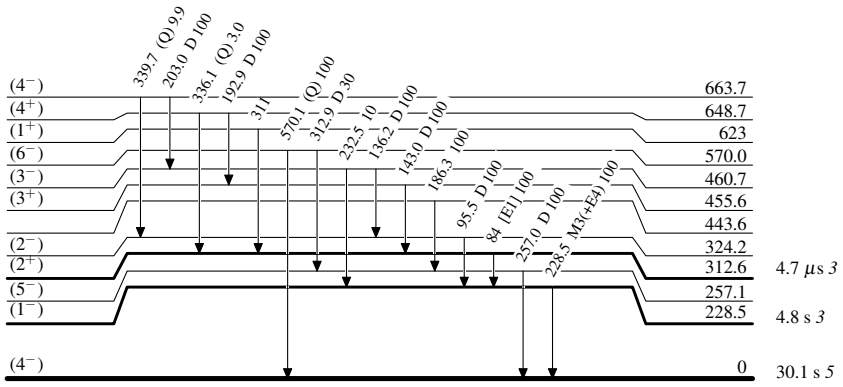


$^{80}_{39}Y_{41}$

Adopted Levels, Gammas

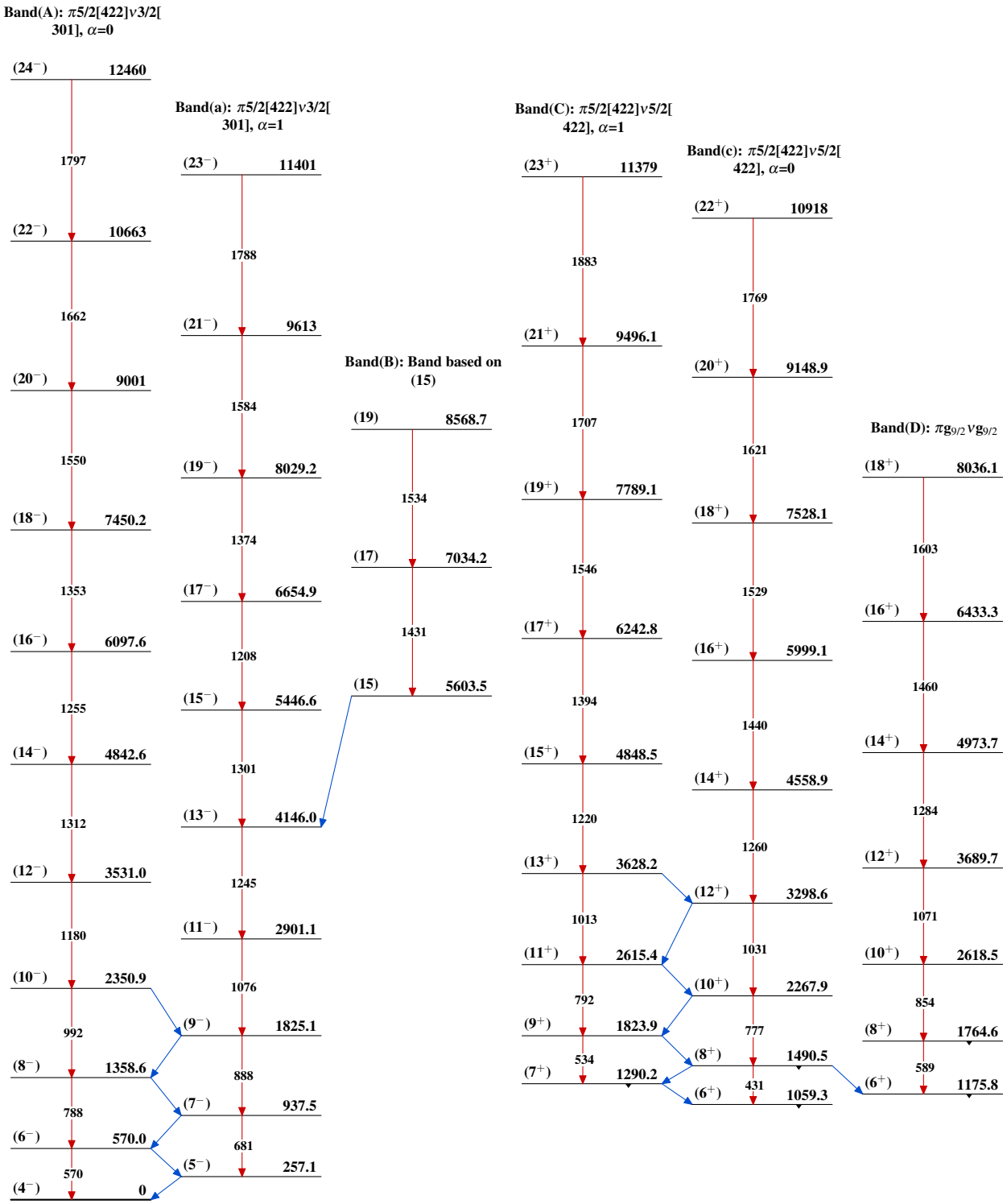
Level Scheme (continued)

Intensities: Relative photon branching from each level



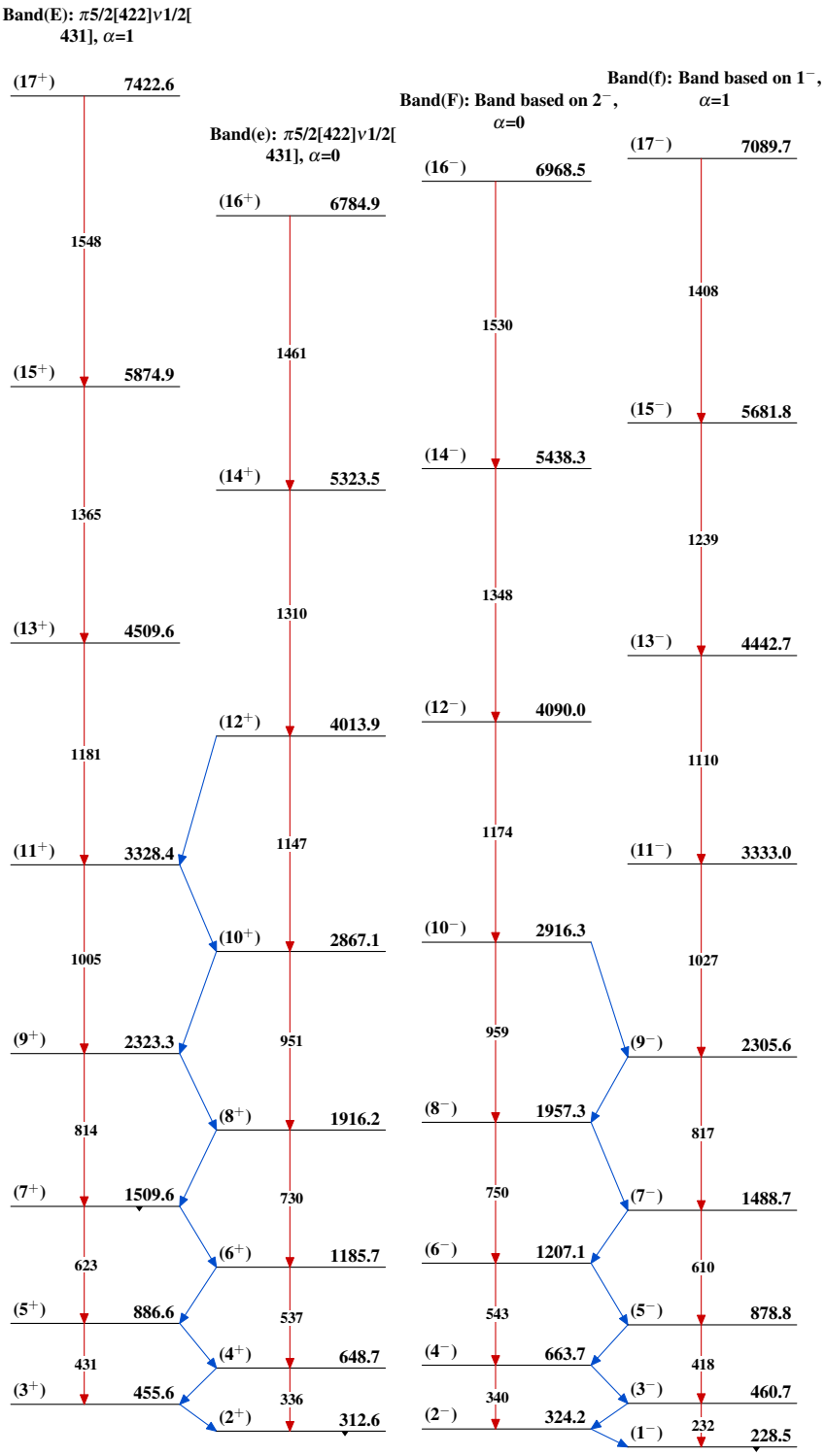
$^{80}_{39}Y_{41}$

Adopted Levels, Gammas



$^{80}_{39}Y_{41}$

Adopted Levels, Gammas (continued)



$^{80}_{39}Y_{41}$