Adopted Levels, Gammas

History			
Type	Author	Citation	Literature Cutoff Date
Full Evaluation	Coral M. Baglin	NDS 111,1807 (2010)	15-Jun-2010

Q(β^-)=−9.10×10^3 *4*; S(n)=10865 *23*; S(p)=3.83×10^3 *3*; Q(α)=4500 *12* 2012Wa38
Note: Current evaluation has used the following Q record −9100 30 *10873* 25 *3830* 30 *4506* 12 2003Au03,2009AuZZ.
Identification: excitation functions for ^{136}Ba(^{36}Ar,xn), compared with excitation functions for ^{133}Cs(^{36}Ar,xn) (1990Me12).

^{168}W Levels

Cross Reference (XREF) Flags

A ^{168}Re ε decay
B ^{172}Os α decay
C (HI,xnγ)

E(level)†	Jπ‡	$T_{1/2}$#	XREF	Comments
0.0&	0$^+$@	50.9 s *19*	ABC	%ε+%β^+≈100; %α=3.2×10^{-3} *10* %α: deduced from Iα/Iγ(178.5γ in ^{168}Ta)=4.1×10^{-5} *6* and conclusion that 178.5γ represents >90% of the β-decay strength of ^{168}W (1991Me05). $T_{1/2}$: from α(t); weighted average of 53 s *2* (1990Me12, 1987ScZL), 49 s *5* (1991Me05), 47 s *3* (1992HeZV).
199.3& *2*	2$^+$@	213 ps *10*	A C	μ=+0.50 *10* μ: IMPAC (1986Bi11). Other: 1986RoZL. Jπ: E2 199γ to 0$^+$.
562.3& *3*	4$^+$@	12 ps *3*	A C	μ=+1.4 *8* μ: IMPAC (1986Bi11).
858.9 *3*			A	Jπ: 660γ to 2$^+$ 199.
1042.1& *4*	6$^+$@	<7 ps	A C	
1117.5 *4*			A	Jπ: 918γ to 2$^+$ 199.
1278.8 *3*			A	Jπ: 717γ to 4$^+$ 562.
1536.4[a] *4*	5$^{(-)}$		A C	Jπ: D 974γ to 4$^+$ 562; D 494γ to 6$^+$ 1042; stretched Q intraband 298γ from 7$^{(-)}$ 1834.
1577.5[b] *5*	(4$^-$,5$^-$)		A C	Jπ: 1015γ to 4$^+$ 562; band assignment.
1586.8 *6*			A	Jπ: 1025γ to 4$^+$ 562.
1600.3& *4*	8$^+$@	<2.1 ps	A C	
1698.6 *4*			A	
1760.8 *4*			A	Jπ: 719γ to 6$^+$ 1042.
1834.2[a] *4*	7$^{(-)}$	>3.1 ps	A C	Jπ: D 792γ to 6$^+$ 1042; D 234γ to 8$^+$ 1601.
1915.8[b] *6*	(6$^-$)		C	Jπ: 874γ to 6$^+$ 1042; 379γ to 5$^{(-)}$ 1536; band assignment.
2202.1& *8*	10$^+$@	0.69 ps *14*	C	
2212.5[a] *7*	(9$^-$)	<12 ps	C	
2219.5 *7*			A	Jπ: 1177γ to 6$^+$ 1042.
2318.4[b] *8*	(8$^-$)		C	
2430.1 *7*			A	Jπ: 1388γ to 6$^+$ 1042.
2479.9 *7*			A	Jπ: 1438γ to 6$^+$ 1042.
2581.6[c] *9*	(10$^+$)	>104 ps	C	
2620.7[b] *9*	(10$^-$)		C	
2628.4[a] *9*	(11$^-$)	5.2 ps *3*	C	
2722.2[c] *9*	(12$^+$)	60.6 ps *23*	C	μ=−2.5 *8* μ: IMPAC (1986Bi11). Other: 1986RoZL.
2817.1& *13*	12$^+$@		C	

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Adopted Levels, Gammas (continued)

^{168}W Levels (continued)

E(level)[†]	J$^{\pi}$[‡]	T$_{1/2}$[#]	XREF	E(level)[†]	J$^{\pi}$[‡]	XREF
2967.4[b] *10*	(12$^-$)		C	5914[a] *3*	(23$^-$)	C
3010.0[c] *10*	(14$^+$)	26.5 ps *10*	C	6245.8[c] *21*	(24$^+$)	C
3073.2[a] *13*	(13$^-$)	3.7 ps *3*	C	6308[b] *3*	(24$^-$)	C
3419.6[&] *16*	(14$^+$)[@]		C	6585[&] *3*	(24$^+$)[@]	C
3445.9[b] *14*	(14$^-$)		C	6607[a] *3*	(25$^-$)	C
3446.6[c] *11*	(16$^+$)	3.5 ps *4*	C	7057[b] *3*	(26$^-$)	C
3576.6[a] *17*	(15$^-$)	1.5 ps *4*	C	7077[c] *3*	(26$^+$)	C
4003.1[&] *19*	(16$^+$)[@]		C	7376[a] *3*	(27$^-$)	C
4011.6[c] *12*	(18$^+$)	1.04 ps *21*	C	7402?[&] *3*	(26$^+$)[@]	C
4029.0[b] *15*	(16$^-$)		C	7898[b] *3*	(28$^-$)	C
4130.4[a] *19*	(17$^-$)	0.8 ps *4*	C	7920[c] *3*	(28$^+$)	C
4570.3[&] *22*	(18$^+$)[@]		C	8223[a] *3*	(29$^-$)	C
4587.8[b] *18*	(18$^-$)		C	8788[c] *3*	(30$^+$)	C
4682.9[c] *16*	(20$^+$)		C	8815[b] *3*	(30$^-$)	C
4702.8[a] *22*	(19$^-$)		C	9137[a] *3*	(31$^-$)	C
5097.6[b] *21*	(20$^-$)		C	9696[c] *3*	(32$^+$)	C
5174.1[&] *24*	(20$^+$)[@]		C	9790[b] *3*	(32$^-$)	C
5287.7[a] *24*	(21$^-$)		C	10108[a] *3*	(33$^-$)	C
5437.2[c] *19*	(22$^+$)		C	10653[c] *3*	(34$^+$)	C
5658.2[b] *23*	(22$^-$)		C	10813?[b] *3*	(34$^-$)	C
5843[&] *3*	(22$^+$)[@]		C	11128[a] *4*	(35$^-$)	C

[†] From least-squares fit to adopted Eγ.
[‡] From γ-ray multipolarities and analysis of band structure in (HI,xnγ), except where noted.
[#] Recoil-distance in (HI,xnγ), except as noted.
[@] Smooth progression of level energies within g.s. band, established $J^{\pi}=0^+$ for g.s. and multipolarity of E2 for the J=2 to 0 transition enable assignment of definite J^{π} to J≤12 band members.
[&] Band(A): K$^{\pi}=0^+$, α=0 g.s. band.
[a] Band(B): π=(−), α=1 side band.
[b] Band(C): π=(−), α=0 side band.
[c] Band(D): π=+, α=0 yrast band. Becomes yrast for J≥12.

$\gamma(^{168}W)$

E$_i$(level)	J$_i^{\pi}$	E$_{\gamma}$[†]	I$_{\gamma}$[‡]	E$_f$	J$_f^{\pi}$	Mult.[†]	α[a]	Comments
199.3	2$^+$	199.3[#] *2*	100	0.0	0$^+$	E2[&]	0.312	B(E2)(W.u.)=117 *6*
562.3	4$^+$	363.2[#] *2*	100	199.3	2$^+$	E2[&]	0.0489	B(E2)(W.u.)=130 *40*
858.9		659.5[@] *2*	100	199.3	2$^+$			
1042.1	6$^+$	479.8[#] *2*	100	562.3	4$^+$	E2[&]	0.0233	B(E2)(W.u.)>56
1117.5		918.2[@] *2*	100	199.3	2$^+$			
1278.8		419.8[@] *2*	23[@] *3*	858.9				
		716.6[@] *2*	100[@] *8*	562.3	4$^+$			
1536.4	5$^{(-)}$	494.1[#] *2*	100[@] *8*	1042.1	6$^+$	(E1)	0.00729	Mult.: D from (HI,xnγ); $\Delta\pi$=no from level scheme.
		974.0[@] *2*	55[@] *6*	562.3	4$^+$	(E1)	0.00187	Mult.: D from (HI,xnγ); $\Delta\pi$=no from level scheme. Other Iγ: 93 *15* from (HI,xnγ).

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Adopted Levels, Gammas (continued)

$\gamma(^{168}W)$ (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[‡]	E_f	J_f^π	Mult.[†]	α[a]	Comments
1577.5	$(4^-,5^-)$	1015.0[#] *4*	100	562.3	4^+			
1586.8		1024.5[@] *4*	100	562.3	4^+			
1600.3	8^+	558.2[#] *2*	100	1042.1	6^+	E2[&]	0.01604	B(E2)(W.u.)>93
1698.6		839.7[@] *2*	100	858.9				
1760.8		481.9[@] *2*	66[@] *4*	1278.8				
		718.8[@] *2*	100[@] *11*	1042.1	6^+			
1834.2	$7^{(-)}$	234.3 *10*	18.1 *25*	1600.3	8^+	D		B(E1)(W.u.)<0.00061
		297.7[#] *2*	43.3[#] *23*	1536.4	$5^{(-)}$	(E2)	0.0870	B(E2)(W.u.)<370
		792.2[#] *2*	100[#] *5*	1042.1	6^+	D		B(E1)(W.u.)<8.7×10^{-5}
1915.8	(6^-)	337.8 *10*	10.6 *18*	1577.5	$(4^-,5^-)$			
		379.3 *10*	100 *5*	1536.4	$5^{(-)}$			
		874.2 *10*	8.8 *18*	1042.1	6^+			
2202.1	10^+	601.9 *10*	100	1600.3	8^+	E2[&]	0.01343	B(E2)(W.u.)=190 *40*
2212.5	(9^-)	378.0 *10*	≤364	1834.2	$7^{(-)}$	E2[&]	0.0437	B(E2)(W.u.)>69 I_γ: may include contribution from 379.3γ.
		612.5 *10*	100 *26*	1600.3	8^+	D(+Q)[&]		B(E1)(W.u.)>2.8×10^{-5}
2219.5		1177.4[@] *4*	100	1042.1	6^+			
2318.4	(8^-)	402.6 *10*	100 *12*	1915.8	(6^-)			
		484.0 *10*	<88	1834.2	$7^{(-)}$			
2430.1		1388.0[@] *4*	100	1042.1	6^+			
2479.9		1437.8[@] *4*	100	1042.1	6^+			
2581.6	(10^+)	379.4 *10*	100 *37*	2202.1	10^+			
		981.3 *10*	69 *20*	1600.3	8^+			
2620.7	(10^-)	302.2 *10*	64 *7*	2318.4	(8^-)			
		408.2 *10*	100 *7*	2212.5	(9^-)			
2628.4	(11^-)	415.8 *10*	100.0 *25*	2212.5	(9^-)	E2[&]	0.0338 *6*	B(E2)(W.u.)=140 *11*
		426.4 *10*	10 *4*	2202.1	10^+			
2722.2	(12^+)	140.5 *10*	6.3 *15*	2581.6	(10^+)			
		520.1 *5*	100 *10*	2202.1	10^+	E2[&]	0.0190	B(E2)(W.u.)=4.1 *6*
2817.1	12^+	615.0 *10*	100	2202.1	10^+			
2967.4	(12^-)	339.1 *10*		2628.4	(11^-)			
		346.7 *10*		2620.7	(10^-)			
3010.0	(14^+)	287.8 *5*	100	2722.2	(12^+)	E2[&]	0.0963 *15*	B(E2)(W.u.)=179 *7*
3073.2	(13^-)	444.8 *10*	100	2628.4	(11^-)	E2[&]	0.0283 *5*	B(E2)(W.u.)=155 *13*
3419.6	(14^+)	602.5 *10*	100	2817.1	12^+			
3445.9	(14^-)	478.5 *10*	100	2967.4	(12^-)	[&]		
3446.6	(16^+)	436.6 *5*	100	3010.0	(14^+)	E2[&]	0.0297	B(E2)(W.u.)=180 *21*
3576.6	(15^-)	503.4 *10*	100	3073.2	(13^-)	E2[&]	0.0206	B(E2)(W.u.)=210 *60*
4003.1	(16^+)	583.5 *10*	100	3419.6	(14^+)			
4011.6	(18^+)	565.0 *5*	100	3446.6	(16^+)	E2[&]	0.01559	B(E2)(W.u.)=180 *40*
4029.0	(16^-)	582.4 *10*	100	3445.9	(14^-)			
4130.4	(17^-)	553.8 *10*	100	3576.6	(15^-)	E2[&]	0.01635	B(E2)(W.u.)=240 *130*
4570.3	(18^+)	567.2 *10*	100	4003.1	(16^+)			
4587.8	(18^-)	558.8 *10*	100	4029.0	(16^-)			
4682.9	(20^+)	671.3 *10*	100	4011.6	(18^+)	(E2)	0.01047	
4702.8	(19^-)	572.4 *10*	100	4130.4	(17^-)	(E2)	0.01511	
5097.6	(20^-)	509.8 *10*	100	4587.8	(18^-)			
5174.1	(20^+)	603.8 *10*	100	4570.3	(18^+)			

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Adopted Levels, Gammas (continued)

γ(^{168}W) (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[‡]	E_f	J_f^π	Mult.[†]	α[a]
5287.7	(21$^-$)	584.9 *10*	100	4702.8	(19$^-$)	(E2)	0.01436
5437.2	(22$^+$)	754.3 *10*	100	4682.9	(20$^+$)	(E2)	0.00810
5658.2	(22$^-$)	560.6 *10*	100	5097.6	(20$^-$)		
5843	(22$^+$)	668.6 *10*	100	5174.1	(20$^+$)		
5914	(23$^-$)	626.3 *10*	100	5287.7	(21$^-$)	(E2)	0.01225
6245.8	(24$^+$)	808.6 *10*	100	5437.2	(22$^+$)	(E2)	0.00698
6308	(24$^-$)	650.0 *10*	100	5658.2	(22$^-$)		
6585	(24$^+$)	742.7 *10*	100	5843	(22$^+$)		
6607	(25$^-$)	692.9 *10*	100	5914	(23$^-$)	(E2)	0.00975
7057	(26$^-$)	748.9 *10*	100	6308	(24$^-$)		
7077	(26$^+$)	831.6 *10*	100	6245.8	(24$^+$)	[E2]	0.00658
7376	(27$^-$)	769.6 *10*	100	6607	(25$^-$)	(E2)	0.00776
7402?	(26$^+$)	817.0[b] *10*	100	6585	(24$^+$)		
7898	(28$^-$)	840.6 *10*	100	7057	(26$^-$)		
7920	(28$^+$)	842.5 *10*	100	7077	(26$^+$)		
8223	(29$^-$)	846.2 *10*	100	7376	(27$^-$)		
8788	(30$^+$)	867.7 *10*	100	7920	(28$^+$)		
8815	(30$^-$)	917.7 *10*	100	7898	(28$^-$)		
9137	(31$^-$)	914.5 *10*	100	8223	(29$^-$)	(Q)	
9696	(32$^+$)	908.6 *10*	100	8788	(30$^+$)		
9790	(32$^-$)	974.6 *10*	100	8815	(30$^-$)		
10108	(33$^-$)	971.2 *10*	100	9137	(31$^-$)		
10653	(34$^+$)	956.8 *10*	100	9696	(32$^+$)		
10813?	(34$^-$)	1023.0[b] *10*	100	9790	(32$^-$)		
11128	(35$^-$)	1019.3 *10*	100	10108	(33$^-$)		

† From (HI,xnγ), except as noted. Unless indicated otherwise, mult is based on measured γ(θ) and/or DCO ratio, with Δπ=(no) assigned to intraband transitions.

‡ Relative photon branching from each level; values are from (HI,xnγ), except as noted.

Weighted average from ^{168}Re ε decay and (HI,xnγ).

@ From ^{168}Re ε decay.

& Q from DCO ratio in (HI,xnγ); not M2 from RUL.

a 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.

b Placement of transition in the level scheme is uncertain.

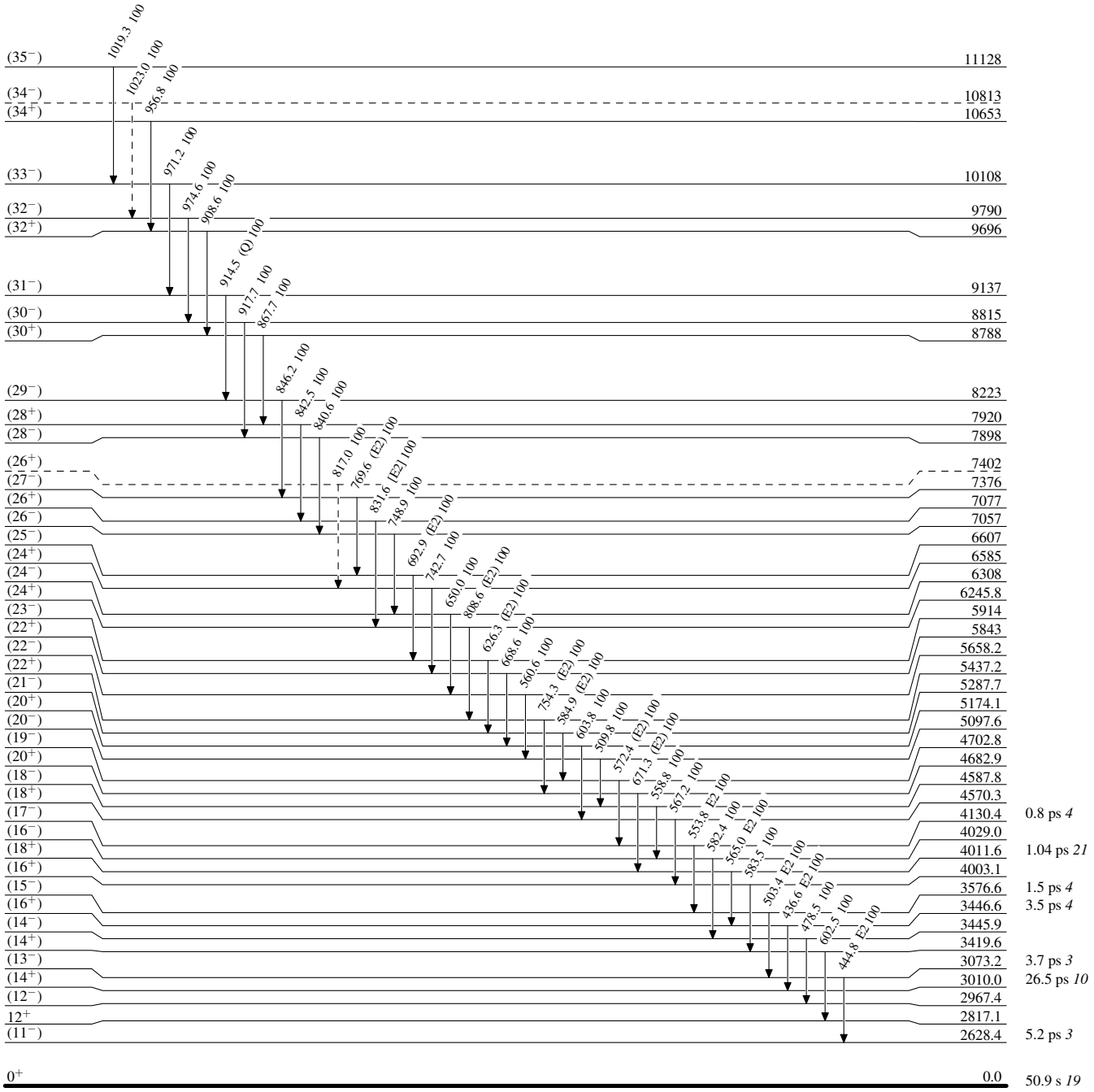
Adopted Levels, Gammas

Legend

Level Scheme

Intensities: Relative photon branching from each level

γ Decay (Uncertain)

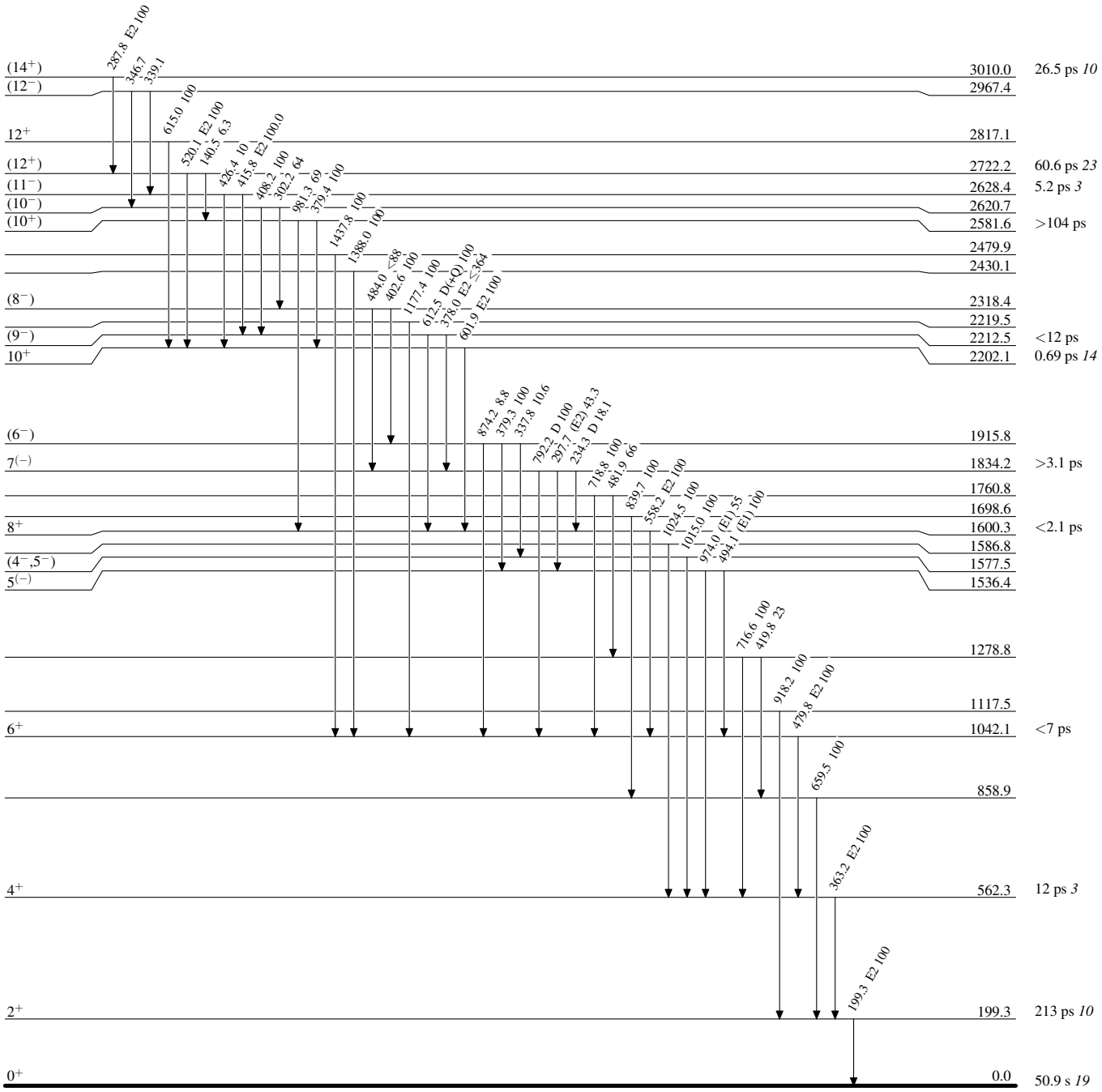


$^{168}_{74}W_{94}$

Adopted Levels, Gammas

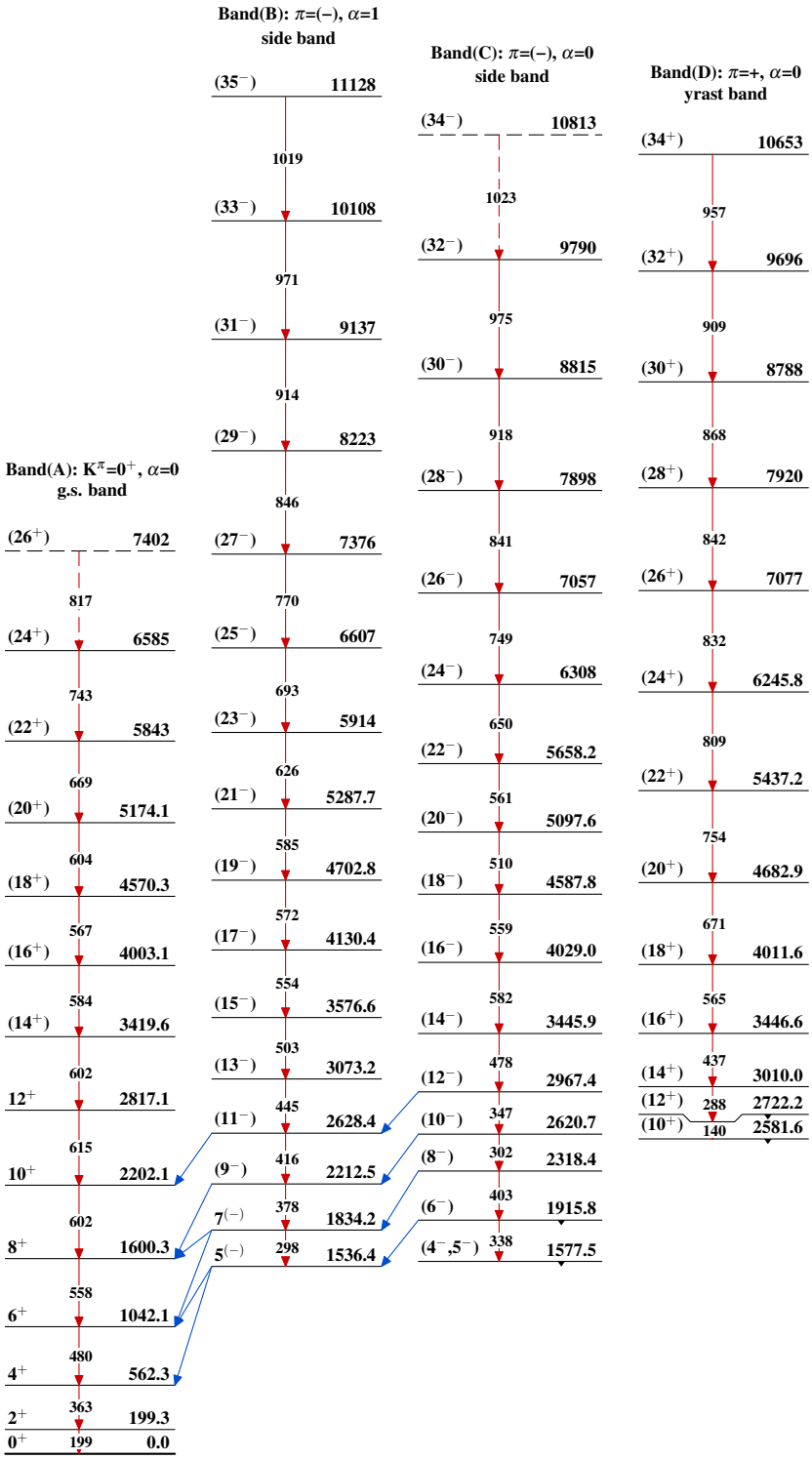
Level Scheme (continued)

Intensities: Relative photon branching from each level



$^{168}_{74}W_{94}$

Adopted Levels, Gammas



$^{168}_{74}W_{94}$