Adopted Levels, Gammas

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	C. M. Baglin[1], E. A. Mccutchan[2], S. Basunia[1]	NDS 153, 1 (2018)	1-Oct-2018

Q(β^-)=−8378 *27*; S(n)=10444 *20*; S(p)=4290 *30*; Q(α)=4140 *30* 2017Wa10
S(2n)=18540 *19*; S(2p)=6508 *31*; Q(εp)=137 31 (2017Wa10).

^{170}W Levels

Cross Reference (XREF) Flags

A	^{170}Re ε decay
B	^{174}Os α decay
C	Gd(^{20}Ne,xnγ), ^{122}Sn(^{52}Cr,4nγ)
D	^{186}W(n,17nγ)

E(level)[†]	J$^\pi$[‡]	$T_{1/2}$[#]	XREF	Comments
0.0[@]	0$^+$	2.42 min *4*	ABC	%ε+%β^+=100 %ε+%β^+: %α<1 from systematics of partial $T_{1/2}(\alpha)$ vs Q(α). $T_{1/2}$: from 1990Me12. Others: 4 min *1* (1971Na28); 2.4 min *1* (1987Es08), 2.47 min *10* (1990Me12), 2.8 min *1* (1992HeZV).
156.72[@] *13*	2$^+$	497 ps *10*	A C	J$^\pi$: E2 γ to 0$^+$.
462.33[@] *16*	4$^+$	19.6 ps *19*	A C	J$^\pi$: stretched E2 γ to 2$^+$; g.s. band member.
875.53[@] *18*	6$^+$	4.3 ps *3*	A CD	J$^\pi$: stretched E2 γ to 4$^+$; g.s. band member.
937.06[e] *16*	(2$^+$)		A	
952.50[d] *21*	(2$^+$)		A	
1073.57[e] *19*	(3$^+$)		A	
1153.03 *20*	(2$^+$,3,4$^+$)		A	J$^\pi$: 690.7γ to 4$^+$, 996.3γ to 2$^+$.
1202.18[d] *21*	4$^+$		A	J$^\pi$: E0+E2(+M1) 740γ to 4$^+$.
1220.00[e] *19*	(4$^+$)		A	J$^\pi$: 344.6γ to 6$^+$, 1063.2γ to 2$^+$.
1314.43[c] *20*	(3$^-$)		A	
1327.53[b] *24*	(2$^-$)		A	
1363.40[@] *22*	8$^+$	1.9 ps *5*	A CD	J$^\pi$: stretched E2 γ to 6$^+$; g.s. band member.
1492.55[b] *22*	(4$^-$)		A	
1517.27[c] *21*	5$^-$		A C	J$^\pi$: stretched E2 275γ from 7$^-$, 1055γ to 4$^+$.
1578.30[d] *23*	6$^+$		A	J$^\pi$: E0+E2(+M1) 703γ to 6$^+$.
1718.83 *22*	(4$^+$,5,6$^+$)		A	J$^\pi$: 843.4γ to 6$^+$, 1256.4γ to 4$^+$.
1791.71[c] *22*	7$^-$	30 ps *7*	A C	J$^\pi$: E1 916.0γ to 6$^+$; D 428.4γ to 8$^+$.
1811.0[b] *3*	(6$^-$)		A C	
1875.6 *3*			A	
1901.5[@] *3*	10$^+$	1.30 ps *24*	CD	J$^\pi$: stretched E2 γ to 8$^+$; g.s. band member.
1974.7 *3*			A	
2080.0 *3*			A	
2153.6[c] *3*	9$^-$	4.9 ps *10*	C	J$^\pi$: E1 790γ to 8$^+$; D 252γ to 10$^+$.
2203.5[b] *3*	(8$^-$)		C	
2344.8 *3*			A	
2442.8 *3*			A	
2464.3[@] *4*	12$^+$	1.11 ps *21*	CD	J$^\pi$: stretched E2 γ to 10$^+$; g.s. band member.
2481.1 *3*			A	
2551.8[a] *4*	(10$^-$)		C	
2552.8 *3*			A	
2577.5[c] *4*	11$^-$	3.0 ps *8*	C	J$^\pi$: stretched E2 424γ to 9$^-$, D 676γ to 10$^+$.

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Adopted Levels, Gammas (continued)

^{170}W Levels (continued)

E(level)[†]	Jπ[‡]	$T_{1/2}$[#]	XREF	Comments
2610.1[b] *5*	(10⁻)		C	
2650.3 *3*			A	
2898.4[a] *5*	(12⁻)	15 ps *3*	C	
2910.9[&] *4*	(14)⁺	3.6 ps *7*	C	Jπ: stretched E2 447γ to 12⁺.
3036.1[c] *5*	(13)⁻	2.0 ps *5*	C	Jπ: stretched E2 459γ to 11⁻.
3094.5[b] *6*	(12⁻)		C	
3118.0[@] *5*	14⁺		C	
3343.8[&] *5*	(16)⁺	2.6 ps *3*	C	Jπ: stretched E2 433γ to (14)⁺.
3354.6[a] *6*	(14⁻)		C	
3537.6[c] *6*	(15⁻)		C	
3652.3[b] *8*	(14⁻)		C	
3815.9[@] *6*	16⁺		C	
3874.0[&] *5*	(18)⁺	1.29 ps *24*	C	Jπ: stretched E2 530γ to (16)⁺.
3886.9[a] *7*	(16⁻)		C	
4094.7[c] *8*	(17⁻)		C	
4230.6[b] *9*	(16⁻)		C	
4460.4[a] *7*	(18⁻)		C	
4490.5[&] *8*	(20)⁺	0.37 ps *5*	C	Jπ: stretched E2 617γ to (18)⁺. $T_{1/2}$: from Doppler-broadened line shape and Doppler-shift recoil analyses in (^{52}Cr,4nγ).
4684.6[c] *10*	(19⁻)		C	
5056.8[a] *8*	(20⁻)		C	
5176.1[&] *9*	(22⁺)	0.17 ps *4*	C	$T_{1/2}$: from Doppler-broadened line shape analysis in (^{52}Cr,4nγ).
5276.3[c] *12*	(21⁻)		C	
5671.5[a] *10*	(22⁻)		C	
5894.7[c] *14*	(23⁻)		C	
5918.1[&] *9*	(24⁺)	0.26 ps *+6−4*	C	$T_{1/2}$: from Doppler-broadened line shape analysis in (^{52}Cr,4nγ).
6334.2[a] *10*	(24⁻)		C	
6587.7[c] *14*	(25⁻)		C	
6713.8[&] *10*	(26⁺)		C	
7086.2?[a] *15*	(26⁻)		C	
7359.3[c] *14*	(27⁻)		C	
7568.9[&] *10*	(28⁺)		C	
8202.3?[c] *17*	(29⁻)		C	
8487.8[&] *11*	(30⁺)		C	
9431.3[&] *12*	(32⁺)		C	
10390.0?[&] *16*	(34⁺)		C	
11369.6?[&] *19*	(36⁺)		C	

[†] From least-squares fit to adopted Eγ.
[‡] Based on γ(θ), γ linear polarization in (^{20}Ne,xnγ) and band structure, unless noted otherwise.
[#] From Doppler-shift recoil distance analysis in (^{52}Cr,4nγ) and/or (^{20}Ne,5nγ), except as noted.
[@] Band(A): g.s. band (1985Re06). And mult=E2 for 157.9γ J=2 to 0⁺.
[&] Band(B): (ν $i^2_{13/2}$), α=0 s band (1985Re06). two quasi-particle AB band, crossed by ((ν $i^2_{13/2}$)(π $i^2_{13/2}$)) band at ħω=0.45 MeV.
[a] Band(C): π=−, α=0 band (1985Re06). predominantly a two quasi-particle BF band for ħω ≥ 0.2 MeV, but possibly includes

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Adopted Levels, Gammas (continued)

^{170}W Levels (continued)

strong octupole vibration component at lower rotational frequencies (1985Re06).

[b] Band(D): π=−, α=0 band (1985Re06,2001Ki10). Probably predominantly (π 9/2[514])⊗(π 5/2[402]), for which $K^\pi=2^-$ is favored, but 2-quasineutron admixtures may also contribute. Also, a strong octupole vibration is present at low rotational frequencies, and Coriolis mixing of different K components of this vibration may render K a poor quantum number.

[c] Band(d): π=−, α=1 band (1985Re06,2001Ki10). Signature partner of π=−, α=0 band; see comments on that band.

[d] Band(E): $K^\pi=0^+$ β band (2001Ki10). Assignment supported by γ decay pattern, particularly the strong E0 component in the 740γ and 703γ to the 4^+ and 6^+ states, respectively, of the g.s. band. From systematics, the J=0 member is expected at≈750 keV, but it has not been observed yet.

[e] Band(F): $K^\pi=2^+$ γ band (2001Ki10). The energies of the J=2 and 4 members differ only by≈20 keV from their counterparts in the β band, so significant β band and γ band mixing is expected.

$\gamma(^{170}W)$

E_i(level)	J_i^π	E_γ	I_γ[†]	E_f	J_f^π	Mult.[‡]	δ	α[c]	Comments
156.72	2^+	156.73[#] *14*	100	0.0	0^+	E2		0.717	B(E2)(W.u.)=124 *3* Additional information 1.
462.33	4^+	305.65[#] *14*	100	156.72	2^+	E2		0.0804	B(E2)(W.u.)=179 *18* Additional information 2.
875.53	6^+	413.18[#] *14*	100	462.33	4^+	E2		0.0343	B(E2)(W.u.)=189 *14* Additional information 3.
937.06	(2^+)	780.6[@] *2*	8.0[@] *24*	156.72	2^+				
		936.8[@] *2*	100[@] *7*	0.0	0^+				
952.50	(2^+)	796.0[@] *2*	100[@]	156.72	2^+				
1073.57	(3^+)	611.3[@] *2*	23[@] *6*	462.33	4^+				
		916.7[@] *2*	100[@] *9*	156.72	2^+	(M1+E2)	≤+15		Mult.,δ: δ(D,Q)=+10 *+5−∞* from ε decay; $\Delta\pi$=(no) from level scheme.
1153.03	$(2^+,3,4^+)$	690.7[@] *2*	43[@] *11*	462.33	4^+				
		996.3[@] *2*	100[@] *22*	156.72	2^+				
1202.18	4^+	249.9[@] *2*	11[@] *4*	952.50	(2^+)	[E2]		0.1491	
		739.8[@] *2*	100[@] *11*	462.33	4^+	E0+E2(+M1)	≤+1.7	≈0.061	Mult.,δ: from α(K)exp and $\gamma(\theta)$ in ^{170}Re ε decay.
1220.00	(4^+)	344.6 *2*	31 *10*	875.53	6^+	[E2]		0.0567	
		757.6[@] *2*	100[@] *24*	462.33	4^+				
		1063.2[@] *2*	59[@] *17*	156.72	2^+				
1314.43	(3^-)	852.3[@] *2*	83[@] *26*	462.33	4^+				
		1157.5[@] *2*	100[@] *26*	156.72	2^+				
1327.53	(2^-)	1170.8[@] *2*	100[@]	156.72	2^+				
1363.40	8^+	487.95[#] *14*	100	875.53	6^+	E2		0.0223	B(E2)(W.u.)=190 *50* Additional information 4.
1492.55	(4^-)	418.9[@] *2*	25[@] *4*	1073.57	(3^+)				
		1030.3[@] *2*	100[@] *12*	462.33	4^+	(E1+M2)	−1.7 *+11−39*	0.017 *10*	Mult.,δ: D+Q from $\gamma(\theta)$ in ^{170}Re ε decay; $\Delta\pi$=yes from level scheme.
1517.27	5^-	641.7[@] *2*	100[@] *19*	875.53	6^+				
		1055.0[@] *2*	16[@] *6*	462.33	4^+				
1578.30	6^+	376.3[@] *2*	22[@] *4*	1202.18	4^+	[E2]		0.0443	
		702.6[@] *2*	100[@] *10*	875.53	6^+	E0+E2+M1	−1.7 *+8−25*	≈0.089	Mult.,δ: from α(K)exp and $\gamma(\theta)$ in ^{170}Re ε decay.
1718.83	$(4^+,5,6^+)$	843.4[@] *2*	41[@] *9*	875.53	6^+				
		1256.4[@] *2*	100[@] *9*	462.33	4^+				
1791.71	7^-	274.5 *3*	23 *7*	1517.27	5^-	E2[b]		0.1113	B(E2)(W.u.)=29 *13*

Adopted Levels, Gammas (continued)

$\gamma(^{170}W)$ (continued)

E_i(level)	J^π_i	E_γ	I_γ[†]	E_f	J^π_f	Mult.[‡]	α[c]	Comments
								I_γ: from (^{20}Ne,4nγ). Other: I(275γ)/I(916γ)=0.76 in (^{52}Cr,4nγ). Not observed in ε decay.
1791.71	7$^-$	428.40[#] *17*	48 *15*	1363.40	8$^+$	(E1)[&]		B(E1)(W.u.)=2.6×10^{-5} *12* Additional information 5. I_γ: from (^{20}Ne,4nγ). Other: I(428γ)/I(916γ)=0.76 in (^{52}Cr,4nγ), 2.5 *9* in ε decay.
		916.03[#] *17*	100 *27*	875.53	6$^+$	E1		B(E1)(W.u.)=5.5×10^{-6} *22* Additional information 6.
1811.0	(6$^-$)	935.45[#] *23*	100	875.53	6$^+$			Additional information 7.
1875.6		1413.3[@] *2*	100[@]	462.33	4$^+$			
1901.5	10$^+$	538.1 *2*	100	1363.40	8$^+$	E2	0.01753	B(E2)(W.u.)=170 *40*
1974.7		1099.2[@] *2*	100[@]	875.53	6$^+$			
2080.0		1204.5[@] *2*	100[@]	875.53	6$^+$			
2153.6	9$^-$	252.1 *3*	19 *6*	1901.5	10$^+$	(E1)[&]	0.0350	B(E1)(W.u.)=2.6×10^{-4} *11* I_γ: from (^{20}Ne,4nγ). Other: I(252γ)/I(362γ)=0.13 in (^{52}Cr,4nγ).
		361.8 *3*	100 *29*	1791.71	7$^-$	E2[b]	0.0494	B(E2)(W.u.)=160 *70*
		790.2 *3*	79 *21*	1363.40	8$^+$	E1		B(E1)(W.u.)=3.5×10^{-5} *14* I_γ: from (^{20}Ne,4nγ). Other: I(790γ)/I(362γ)=0.32 in (^{52}Cr,4nγ).
2203.5	(8$^-$)	392.6 *3*	100 *29*	1811.0	(6$^-$)	(E2)[a]	0.0394	
		840.1 *3*	100 *29*	1363.40	8$^+$			
2344.8		1469.3[@] *2*	100[@]	875.53	6$^+$			
2442.8		1567.3[@] *2*	100[@]	875.53	6$^+$			
2464.3	12$^+$	562.8 *2*	100	1901.5	10$^+$	E2	0.01573	B(E2)(W.u.)=160 *30*
2481.1		1605.6[@] *2*	100[@]	875.53	6$^+$			
2551.8	(10$^-$)	348.4 *3*	100 *29*	2203.5	(8$^-$)	(E2)[a]	0.0550	
		398.2 *3*	43 *14*	2153.6	9$^-$	(M1)[&]	0.1027	
2552.8		1677.3[@] *2*	100[@]	875.53	6$^+$			
2577.5	11$^-$	423.9 *3*	100 *31*	2153.6	9$^-$	E2[b]	0.0321	B(E2)(W.u.)=180 *90*
		676.0 *3*	31 *9*	1901.5	10$^+$	(E1)[&]		B(E1)(W.u.)=5×10^{-5} *3* I_γ: from (^{20}Ne,4nγ). Other: I(676γ)/I(424γ)=0.11 in (^{52}Cr,4nγ).
2610.1	(10$^-$)	406.6 *3*	100	2203.5	(8$^-$)			
2650.3		1774.8[@] *2*	100[@]	875.53	6$^+$			
2898.4	(12$^-$)	346.6 *3*	100	2551.8	(10$^-$)	E2[b]	0.0558	B(E2)(W.u.)=130 *30*
2910.9	(14)$^+$	446.6 *2*	100	2464.3	12$^+$	E2	0.0280	B(E2)(W.u.)=150 *30*
3036.1	(13)$^-$	458.6 *3*	100	2577.5	11$^-$	E2[b]	0.0261	B(E2)(W.u.)=240 *60*
3094.5	(12$^-$)	484.4 *3*	100	2610.1	(10$^-$)	(E2)[a]	0.0227	
3118.0	14$^+$	653.7 *3*	100	2464.3	12$^+$	(E2)[a]	0.01111	
3343.8	(16)$^+$	432.9 *2*	100	2910.9	(14)$^+$	E2	0.0303	B(E2)(W.u.)=250 *30*
3354.6	(14$^-$)	456.1 *3*	100	2898.4	(12$^-$)	(E2)[a]	0.0265	

$^{170}_{74}W_{96}$-5

$\gamma(^{170}W)$ (continued)

E_i(level)	J_i^π	E_γ	I_γ[†]	E_f	J_f^π	Mult.[‡]	α[c]	Comments
3537.6	(15⁻)	501.5 *3*	100	3036.1	(13)⁻	(E2)[a]	0.0208	
3652.3	(14⁻)	557.8 *6*	100	3094.5	(12⁻)			
3815.9	16⁺	697.9 *3*	100	3118.0	14⁺	(E2)[a]	0.00960	
3874.0	(18)⁺	530.2 *2*	100	3343.8	(16)⁺	E2	0.0182	B(E2)(W.u.)=180 *40*
3886.9	(16⁻)	532.3 *3*	100	3354.6	(14⁻)	(E2)[a]	0.0180	
4094.7	(17⁻)	557.1 *6*	100	3537.6	(15⁻)	(E2)[a]	0.01612	
4230.6	(16⁻)	578.3 *3*	100	3652.3	(14⁻)	(E2)[a]	0.01475	
4460.4	(18⁻)	573.5 *3*	100	3886.9	(16⁻)	(E2)[a]	0.01505	
4490.5	(20)⁺	616.5 *6*	100	3874.0	(18)⁺	E2	0.01271	B(E2)(W.u.)=300 *40*
4684.6	(19⁻)	589.9 *6*	100	4094.7	(17⁻)			
5056.8	(20⁻)	596.4 *3*	100	4460.4	(18⁻)	(E2)[a]	0.01372	
5176.1	(22⁺)	685.6 *3*	100	4490.5	(20)⁺	(E2)[a]	0.00999	B(E2)(W.u.)=390 *100*
5276.3	(21⁻)	591.7 *6*	100	4684.6	(19⁻)			
5671.5	(22⁻)	614.7 *6*	100	5056.8	(20⁻)			
5894.7	(23⁻)	618.4 *6*	100	5276.3	(21⁻)			
5918.1	(24⁺)	742.0 *3*	100	5176.1	(22⁺)	(E2)[a]		B(E2)(W.u.)=170 *40*
6334.2	(24⁻)	662.7 *3*	100	5671.5	(22⁻)	(E2)[a]	0.01078	
6587.7	(25⁻)	693.0 *3*	100	5894.7	(23⁻)	(E2)[a]		
6713.8	(26⁺)	795.7 *3*	100	5918.1	(24⁺)	(E2)[a]		
7086.2?	(26⁻)	752[d] *1*	100	6334.2	(24⁻)	(E2)[a]		
7359.3	(27⁻)	771.6 *3*	100	6587.7	(25⁻)	(E2)		Mult.: (Q) from $\gamma(\theta)$ in (^{20}Ne,xnγ); $\Delta\pi$=no from band structure.
7568.9	(28⁺)	855.1 *3*	100	6713.8	(26⁺)	(E2)[a]		
8202.3?	(29⁻)	843[d] *1*	100	7359.3	(27⁻)			
8487.8	(30⁺)	918.9 *3*	100	7568.9	(28⁺)	(E2)		Mult.: (Q) from $\gamma(\theta)$ in (^{20}Ne,xnγ); $\Delta\pi$=no from band structure.
9431.3	(32⁺)	943.5 *6*	100	8487.8	(30⁺)			
10390.0?	(34⁺)	958.7[d] *10*	100	9431.3	(32⁺)			
11369.6?	(36⁺)	979.6[d] *10*	100	10390.0?	(34⁺)			

† From (^{20}Ne,xnγ), except as noted. For several transitions, branching from (^{52}Cr,4nγ) differs significantly from adopted value, and these cases are noted in comments on the relevant transitions. Those values would, of course, lead to significantly different reduced transition probabilities.

‡ From $\gamma(\theta)$ and/or γ linear polarization in (^{20}Ne,xnγ), except as noted.

Weighted average of data from ^{170}Re ε decay and from (^{20}Ne,xnγ).

@ From ^{170}Re ε decay.

& From mult=D (from $\gamma(\theta)$ in (^{20}Ne,xnγ)), and adopted $\Delta\pi$.

a Q from $\gamma(\theta)$ in (^{20}Ne,xnγ); $\Delta\pi$=no from band structure.

b Q from $\gamma(\theta)$ in (^{20}Ne,xnγ); not M2 from RUL.

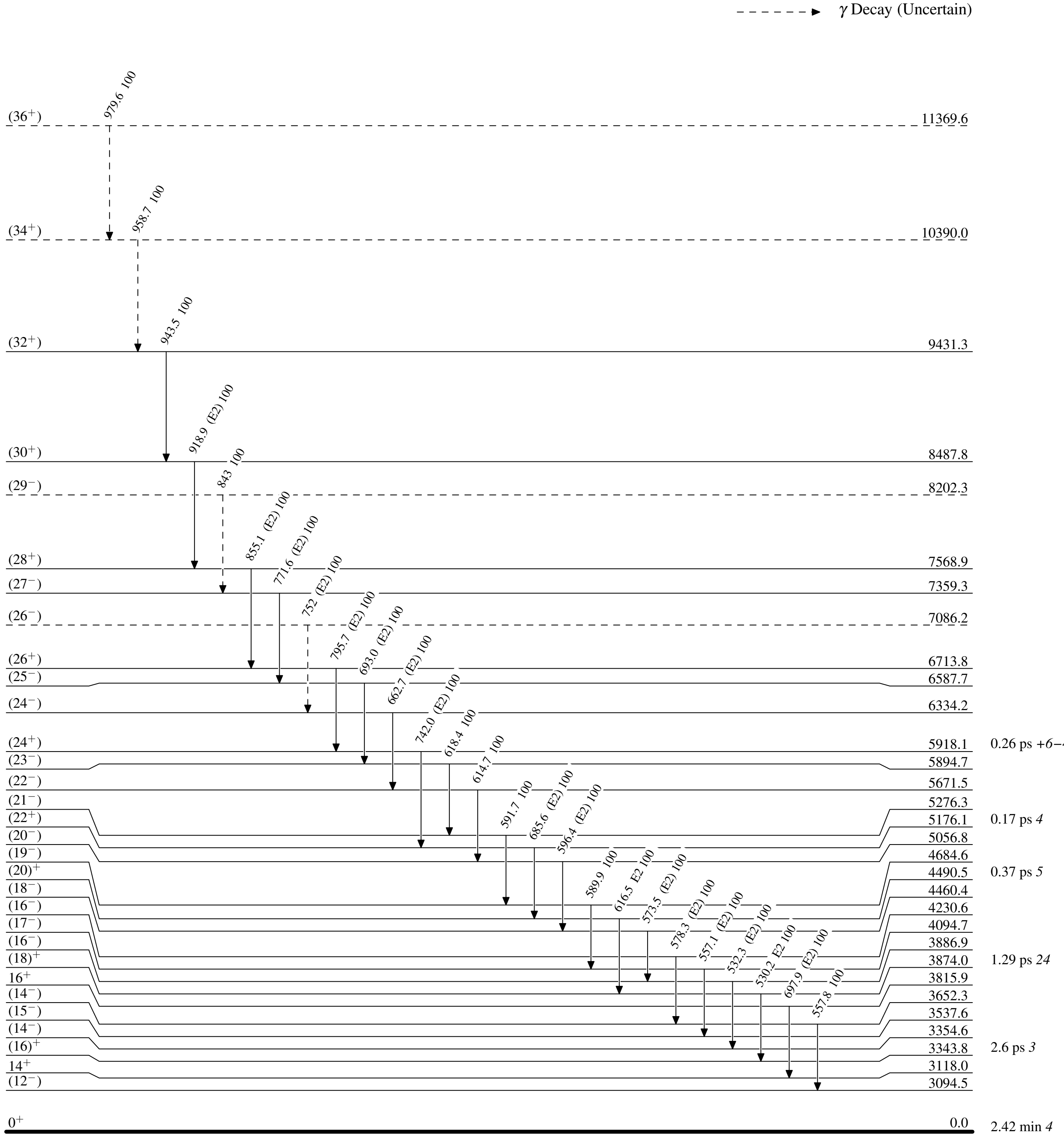
c Total theoretical internal conversion coefficients, calculated using the BrIcc code (2008Ki07) with Frozen orbital approximation based on γ-ray energies, assigned multipolarities, and mixing ratios, unless otherwise specified.

d Placement of transition in the level scheme is uncertain.

Adopted Levels, Gammas

Level Scheme

Intensities: Relative photon branching from each level

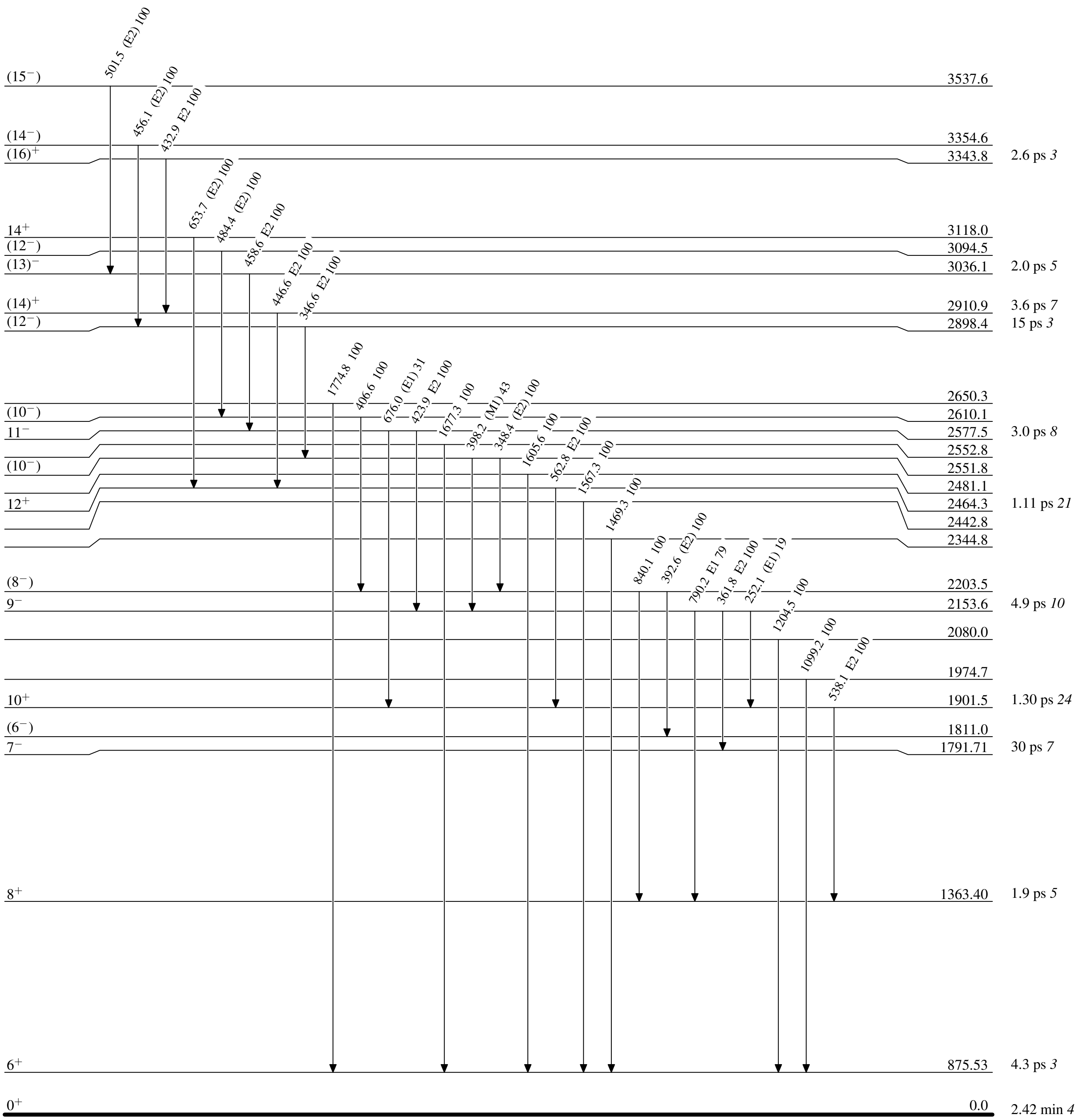


$^{170}_{74}W_{96}$

Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Relative photon branching from each level

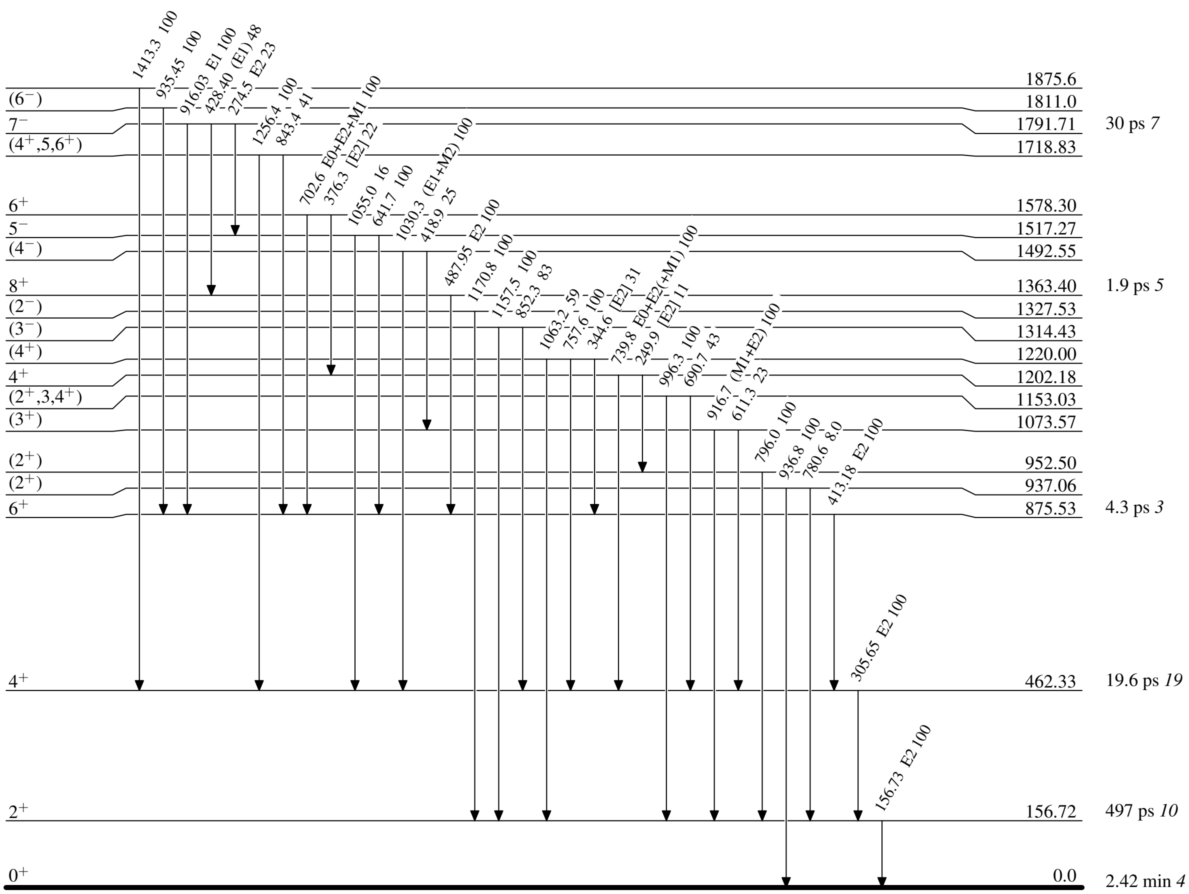


$^{170}_{74}W_{96}$

Adopted Levels, Gammas

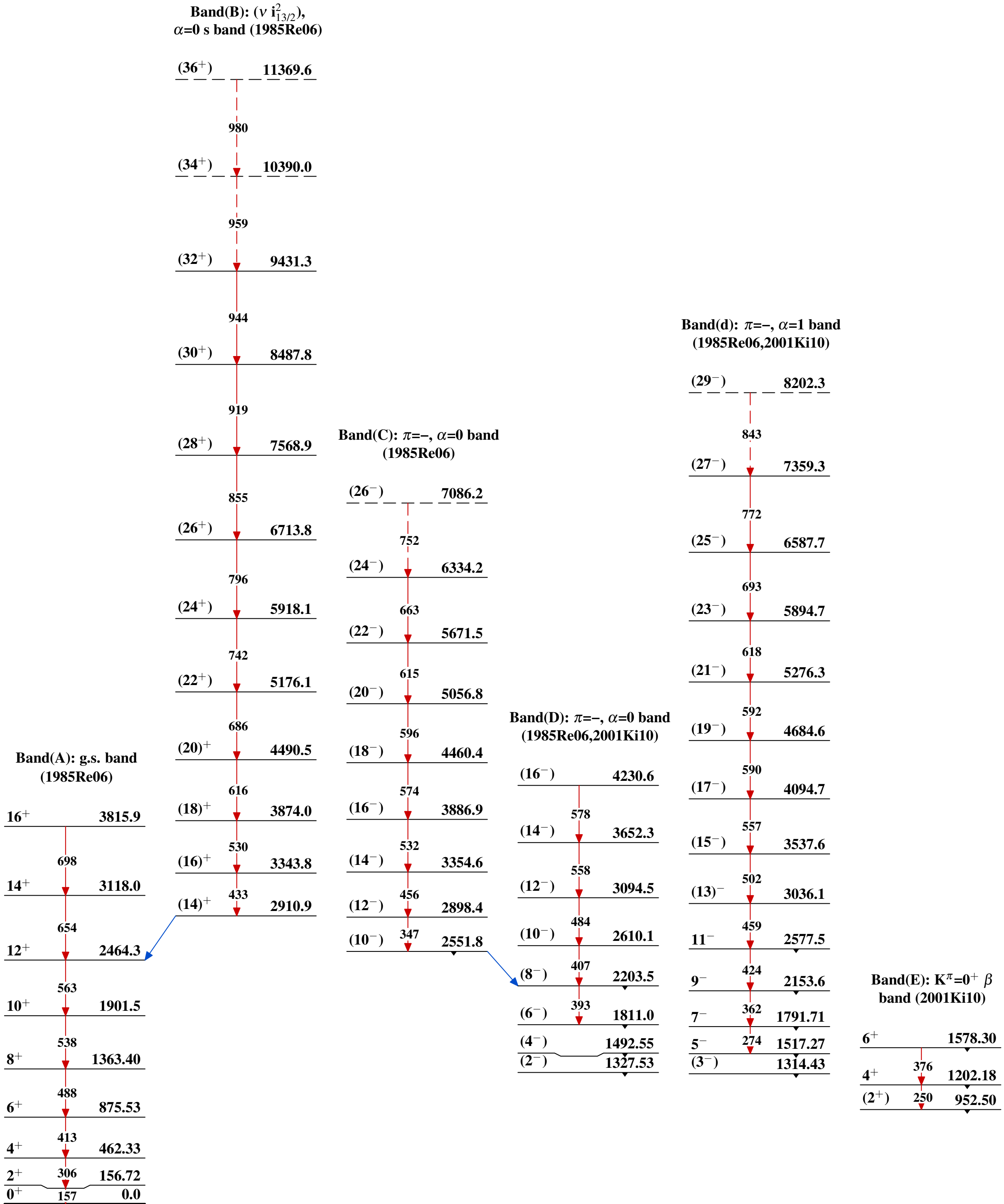
Level Scheme (continued)

Intensities: Relative photon branching from each level



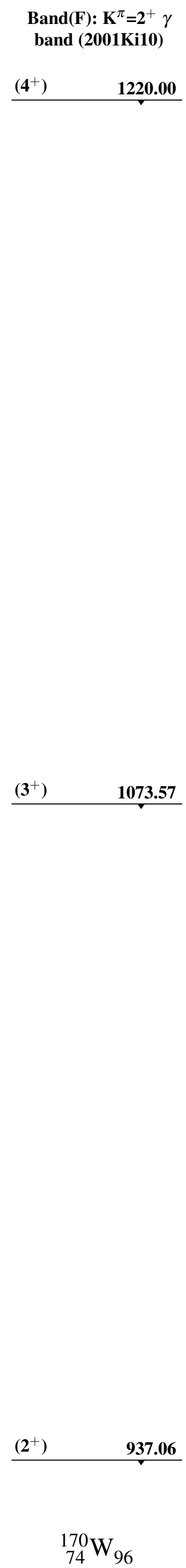
$^{170}_{74}W_{96}$

Adopted Levels, Gammas



$^{170}_{74}W_{96}$

Adopted Levels, Gammas (continued)



Adopted Levels, Gammas

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	M. S. Basunia	NDS 107,791 (2006)	15-Sep-2005

Q(β^-)=−5.58×10^3 *4*; S(n)=9.08×10^3 *4*; S(p)=5.52×10^3 *4*; Q(α)=3.34×10^3 *4* 2012Wa38

Note: Current evaluation has used the following Q record −5580 409080 405520 403340 40 2003Au03.

^{176}W Levels

Cross Reference (XREF) Flags

A	^{176}Re ε decay	E	^{154}Sm(^{26}Mg,4nγ)
B	^{150}Nd(^{30}Si,4nγ)	F	^{186}W(n,11nγ)
C	^{164}Dy(^{16}O,4nγ)	G	^{176}Hf(α,4nγ)
D	^{169}Tm(^{11}B,4nγ)		

E(level)[†]	J$^\pi$[‡]	T$_{1/2}$	XREF	Comments
0.0[a]	0$^+$	2.5 h *1*	ABCDE G	%ε=100 T$_{1/2}$: weighted average of 2.3 h *1* (1963Va20), 2.5 h *4* (1962Gr27), 2.5 h *5* (1963Ma48), and 2.7 h *1* (1963Ra14).
108.3[a] *7*	2$^+$		ABCDEFG	J$^\pi$: 108.5γ stretch E2 to 0$^+$ state. g.s. band member.
348.2[a] *8*	4$^+$		ABCDEFG	J$^\pi$: 239.9γ stretch E2 to 2$^+$ state. g.s. band member.
699.4[a] *8*	6$^+$		ABCDEFG	J$^\pi$: 351γ stretch E2 to 4$^+$ state. g.s. band member.
843.3[@] *13*	0$^+$		A	J$^\pi$: Supported by the γ-γ angular correlation of the 735 keV transition and consistent with the 0$^+$ to 2$^+$ state transition.
930.0[@] *10*	2$^+$		A	J$^\pi$: 582.0γ E2 to 4$^+$ state.
1040.2[i] *9*	2$^+$		A	J$^\pi$: 932.4γ E0+E2+M1 to 2$^+$ state.
1117.0[@] *9*	4$^+$		A	J$^\pi$: 768.7γ E0+E2+M1 to 4$^+$ state.
1127.7[c] *9*	(2$^-$)		A	J$^\pi$: 1019.9γ E1 to 2$^+$ state. K^π=(2$^-$) band assignment.
1139.7[a] *8*	8$^+$		BCDEFG	J$^\pi$: 440.55γ E2 to 6$^+$ state. g.s. band member.
1179.2[i] *10*	(3$^+$)		A	J$^\pi$: Band assignment.
1197.1[c] *9*	(3$^-$)		A	J$^\pi$: 849.1γ E1 to the 4$^+$ state at 349.3 keV level. Band assignment.
1302.0[c] *8*	(4$^-$)		ABC	J$^\pi$: Band assignment: configuration π1/2[541]⊗π7/2[404] in (^{30}Si,4nγ).
1321.3[i] *10*	(4$^+$)		A	J$^\pi$: Band assignment.
1396.2[@] *8*	6$^+$		AB	J$^\pi$: 697.0γ E0+E2+M1 to the 6$^+$ state at 698.3 keV level. Band assignment.
1400.7[c] *8*	(5$^-$)		ABC F	J$^\pi$: Band assignment.
1437.4 *13*			A	
1496.2 *10*			A	
1518.0[i] *11*	(5$^+$)		A	J$^\pi$: Band assignment.
1525.5 *13*			A	
1537.9 *13*			A	
1575.7[c] *8*	(6$^-$)		BC	J$^\pi$: Band assignment.
1585.2 *14*			A	
1586.7 *10*			A	
1589.7 *14*			A	
1594.0 *11*			A	
1648.5[a] *8*	10$^+$		BCDEFG	J$^\pi$: g.s. band member.
1657.3[g] *8*	6$^{(+)}$		ABC	J$^\pi$: Band assignment: configuration ν5/2[512]⊗ν7/2[514].
1659.9 *11*	(3,4,5)$^-$		A	J$^\pi$: 1311.8γ E1 to 4$^+$ state at 349.5 keV level.
1673.2[c] *8*	(7$^-$)		BC	
1682.5 *13*			A	
1685.4 *11*			A	
1700.2 *13*			A	
1708.5 *11*			A	

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Adopted Levels, Gammas (continued)

^{176}W Levels (continued)

E(level)[†]	J$^{\pi}$[‡]	XREF	Comments
1735.5 *14*		A	
1744.4 *14*		A	
1759.0[@] *8*	(8$^+$)	B	
1858.2[e] *8*	(7)	B	J$^{\pi}$: Band assignment, configuration Π9/2[514]⊗Π5/2[402].
1886.0 *10*		A	
1922.4 *13*		A	
1924.9[g] *8*	8$^{(+)}$	BC	J$^{\pi}$: Band assignment.
1925.4[c] *8*	(8$^-$)	BC	
1939.9[f] *8*	(7)	B	
1973.1[d] *8*	8$^{(-)}$	B	
1995.4[f] *8*		B	
2007.7[c] *8*	(9$^-$)	BC	
2149.9[e] *8*	(9)	B	
2160.7? *8*		B	
2189.7[@] *8*	(10$^+$)	B	
2206.3[a] *8*	12$^+$	BCDEF	J$^{\pi}$: g.s. band member.
2263.9+x		B	Additional information 1.
2264.8[g] *8*	10$^{(+)}$	B	J$^{\pi}$: Band assignment.
2308.1[c] *8*	(10$^-$)	BC	
2345.2[f] *9*	(9)	B	
2409.3[c] *8*	(11$^-$)	BC	
2414.3[d] *8*	10$^{(-)}$	B	
2466.0+x[h] *10*	(13)	B	
2524.7[e] *8*	(11)	B	
2624.3[&] *8*	12$^+$	B	
2652.3+x[h] *11*	(14)	B	
2708.7[g] *8*	12$^{(+)}$	B	J$^{\pi}$: Band assignment.
2753.8[c] *9*	(12$^-$)	BC	
2776.9[f] *9*	(11)	B	
2802.6[a] *8*	14$^+$	BCDEF	J$^{\pi}$: g.s. band member.
2830.6[@] *8*	(12$^+$)	B	
2862.7? *8*		B	
2870.6+x[h] *11*	(15)	B	
2881.5[c] *8*	(13$^-$)	BC	
2887.4[d] *8*	12$^{(-)}$	B	
2971.2[e] *8*	(13)	B	
3032.9[&] *8*	14$^+$	B	
3118.3+x[h] *11*	(16)	B	
3228.6? *8*		B	
3239.2[g] *9*	14$^{(+)}$	B	J$^{\pi}$: Band assignment.
3256.0 *8*		B	
3271.5[f] *10*	(13)	B	
3276.0[c] *9*	(14$^-$)	BC	
3302.3? *8*		B	
3393.3+x[h] *11*	(17)	B	
3399.5[d] *9*	14$^{(-)}$	B	
3421.8[c] *8*	(15$^-$)	BC	
3427.6[a] *8*	16$^+$	BCDE	J$^{\pi}$: g.s. band member.
3484.6[e] *8*	(15)	B	

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Adopted Levels, Gammas (continued)

^{176}W Levels (continued)

E(level)[†]	J^{π}[‡]	$T_{1/2}$	XREF	Comments
3493.7[&] *8*	16+		B	
3694.6+x[h] *12*	(18)		B	
3747.0[#] *8*	14+	41 ns *1*	B	μ=+6.65 *21*; Q=+5.99 *+66−82* J^{π}: K^{π}=14+ band assignment, possible configuration π7/2[404]⊗π9/2[514] ⊗ν7/2[633]⊗ν5/2[512]. $T_{1/2}$: From (^{16}O,4nγ) (2000Io03). Other value: 35 ns *10*, please see (^{30}Si,4nγ) dataset (1996Cr02). μ: From g factor=+0.475 *15*, observing γ precession in external magnetic field in (^{16}O,4nγ) (2000Io03). The diamagnetic and Knight shift corrections were not applied, as those were small (about 1%). Q: Observing the time-dependent quadrupole interaction pattern of the decay radiation from the isomer in (^{16}O,4nγ) (2002Io01). The isomer at 3747.0-keV (J^{π}=14+, K=14) decays with an unusual pattern to levels with K=0, bypassing available levels with intermediate values of K. This isomer has been interpreted as a four-quasiparticle state, and its decay explained in terms of triaxial-shape vibrations, referred as γ-tunneling (1996Cr02). A J^{π}=14+ isomer at 3312 keV in ^{174}Hf has a similar decay pattern (1995Gj01).
3817.2[f] *10*	(15)		B	
3845.9[c] *9*	(16−)		BC	
3952.8[d] *10*	16(−)		B	
3970.0[#] *8*	15+		B	
4002.5[&] *8*	18+		BC E	
4020.6+x[h] *12*	(19)		B	
4022.6[c] *8*	(17−)		BC	
4061.3[e] *8*	(17)		B	
4101.7 *8*			B	
4121.4[a] *9*	18+		B	J^{π}: g.s. band member.
4208.5[#] *8*	16+		B	
4368.4 *8*			B	
4417.9[f] *11*	(17)		B	
4453.5[c] *9*	(18−)		B	
4464.9[#] *8*	17+		B	J^{π}: g.s. band member.
4579.0 *8*			B	
4613.5[&] *8*	20+		BC E	
4670.8[c] *8*	(19−)		B	
4695.2[e] *8*	(19)		B	
4740.9[#] *8*	18+		B	
4839.6[a] *9*	20+		B	J^{π}: g.s. band member.
4894.7[b] *8*		≈10 ns	B	$T_{1/2}$: From ^{150}Nd(^{30}Si,4nγ) (1996Cr02).
5034.5[#] *8*	19+		B	
5083.2[c] *9*	(20−)		B	
5192.5[b] *8*			B	
5298.9[&] *9*	22+		BC E	
5343.2[#] *8*	20+		B	
5356.4[c] *9*	(21−)		B	
5369.9[e] *9*	(21)		B	
5506.2[b] *8*			B	
5607.0[a] *10*	22+		B	J^{π}: g.s. band member.

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Adopted Levels, Gammas (continued)

^{176}W Levels (continued)

E(level)[†]	Jπ[‡]	XREF	E(level)[†]	Jπ[‡]	XREF	E(level)[†]	Jπ[‡]	XREF
5665.8[#] 8	21+	B	6051.1[&] 9	24+	BC E	6709.1[#] 9	24+	B
5733.2[c] 10	(22−)	B	6186.1[b] 9		B	6858.8[&] 9	26+	B
5838.2[b] 8		B	6348.5[#] 9	23+	B	6921.7[b] 9		B
6000.5[#] 9	22+	B	6548.0[b] 9		B			

[†] Deduced by evaluator using a least-squares fit to adopted γ-ray energies.

[‡] J^π assignments are based on γ-ray multipolarities, deduced from angular distributions in ^{164}Dy(^{16}O,4nγ) (1978Dr04) and conversion electron data in ^{169}Tm(^{11}B,4nγ) (1965St03), on directional correlation from oriented states (DCO) ratios in ^{150}Nd(^{30}Si,4nγ) and on rotational structure (1996Cr02).

[#] Band(A): K$^\pi$=14$^+$ band: possible configuration π7/2[404]⊗π9/2[514]⊗ν7/2[633]⊗ν5/2[512].

[@] Band(B): K$^\pi$=(0^+_2) band: first excited state band, quasi β-vibrational band.

[&] Band(C): K$^\pi$=(0$^+$) band: Two rotation-aligned neutrons.

[a] Band(D): K$^\pi$=0$^+$ g.s. band.

[b] Band(E): rotational band: built on≈10 ns state.

[c] Band(F): K$^\pi$=(2$^-$) band: evaluator added levels of two K^π=(4$^-$) bands in high spin dataset [(^{30}Si,4nγ), 1996Cr02] with (2$^-$) band in ^{176}Re ε decay [2001Ki10] on the basis of observed common states 4$^{(-)}$ and 5$^{(-)}$ at 1303.3 keV and 1402.1 keV levels within this band in 2001Ki10.

[d] Band(G): K$^\pi$=(8$^-$) band: configuration π9/2[514]⊗π7/2[404].

[e] Band(H): K=7 band: configuration Π9/2[514]⊗Π5/2[402].

[f] Band(I): K=(7) band.

[g] Band(J): K$^\pi$=(6$^+$) band: configuration ν5/2[512]⊗ν7/2[514].

[h] Band(K): K=(13) band.

[i] Band(L): K$^\pi$=2$^+$ quasi γ-vibrational band.

$\gamma(^{176}W)$

E_i(level)	J^π_i	E_γ[†]	I_γ[†]	E_f	J^π_f	Mult.[@]	δ[a]	α[b]	Comments
108.3	2^+	108.5[#] *7*	100	0.0	0^+	E2		2.87	
348.2	4^+	239.95[#] *25*	100	108.3	2^+	E2		0.172	
699.4	6^+	351.00[#] *20*	100	348.2	4^+	E2		0.0542	
843.3	0^+	735.0	100 *11*	108.3	2^+				
		844.0[d]	1.7 *4*	0.0	0^+	E0[‡]			I_γ: K conversion electron intensity.
930.0	2^+	582.0[‡]	52[‡] *3*	348.2	4^+	E2		0.0147	
		822.2[‡]	100[‡] *4*	108.3	2^+	E0+E2+M1[‡]	−2.7		δ: uncertainty +0.4 −0.5.
1040.2	2^+	692.1[‡]	5.8[‡] *22*	348.2	4^+				
		932.4[‡]	100[‡] *5*	108.3	2^+	E0+E2+M1[‡]	+3.0		Mult.: from α(K)exp=0.0083 *16*. M1 is 11.1%. δ: uncertainty +1.0 −0.7.
		1041.6[‡d]	82[‡] *6*	0.0	0^+				
1117.0	4^+	186.5[‡]	2.2[‡] *4*	930.0	2^+				
		417.3[‡]	11.0[‡] *16*	699.4	6^+				
		768.7[‡]	100[‡] *4*	348.2	4^+	E0+E2+M1	−2.2		Mult.: from α(K)exp=0.066 *7*, α(L)exp=0.0122 *16*, α(M)exp=0.0033 *8* in ^{176}Re ε decay. M1 is 21%. δ: uncertainty +0.6 −1.2.
		1009.0[c‡]	52[c‡] *3*	108.3	2^+	E2			I_γ: 86 *20* in 1977Be72 (^{176}Re ε decay). Mult.: from α(K)exp=0.45 *10* in ^{176}Re ε decay.
		1117.0[‡d] *5*	80[‡] *20*	0.0	0^+				I_γ: From 1977Be72 (^{176}Re ε decay).
1127.7	(2^-)	87.1[‡]	5.4[‡] *13*	1040.2	2^+				
		1019.9[‡]	100[‡] *5*	108.3	2^+	E1			Mult.: From α(K)exp<0.001 in ^{176}Re ε decay.
1139.7	8^+	440.55[#] *15*	100	699.4	6^+	E2		0.0292	
1179.2	(3^+)	830.9[‡]	22.6[‡] *20*	348.2	4^+				
		1071.0[‡]	100[‡] *4*	108.3	2^+				Mult.: 1071γ E2 assignment from α(K)exp=0.0032 *7* in ^{176}Re ε decay is not consistent with the J^π assignment of the depopulating level.
1197.1	(3^-)	156.9[‡]	12.0[‡] *17*	1040.2	2^+				
		849.1[‡]	100[‡] *5*	348.2	4^+	E1			Mult.: from α(K)exp=0.0026 *8* in ^{176}Re ε decay.
1302.0	(4^-)	122.8[‡]	7.0[‡] *25*	1179.2	(3^+)				
		174.3[‡]	9.9[‡] *25*	1127.7	(2^-)				
		953.78[#] *16*	100[‡] *6*	348.2	4^+				
1321.3	(4^+)	973.0[‡]	100[‡] *5*	348.2	4^+	E2+M1[‡]	>30		
		1213.2[‡]	65[‡] *10*	108.3	2^+				
1396.2	6^+	697.0 *2*	100 *14*	699.4	6^+	E0+E2+M1[‡]			

$^{176}_{74}W_{102}$-5

$\gamma(^{176}W)$ (continued)

E_i(level)	J^π_i	E_γ [†]	I_γ [†]	E_f	J^π_f	Mult. [@]	Comments
1396.2	6^+	1047.0[d] *1*	43 *21*	348.2	4^+		
1400.7	(5^-)	203.9[‡]	9[‡] *4*	1197.1	(3^-)		
		701.41[‡#] *9*	100[‡] *11*	699.4	6^+		
		1052.3[‡]	36[‡] *7*	348.2	4^+		
1437.4		1329.1[‡]	100[‡]	108.3	2^+		
1496.2		368.5[‡]	66[‡] *12*	1127.7	(2^-)		
		1148.1[‡]	35[‡] *8*	348.2	4^+		
		1388.3[‡]	100[‡] *12*	108.3	2^+		
1518.0	(5^+)	818.4[‡]	40[‡] *5*	699.4	6^+		
		1169.8[‡]	100[‡] *9*	348.2	4^+		
1525.5		1417.3[‡]	100[‡]	108.3	2^+		
1537.9		1189.8[‡]	100[‡]	348.2	4^+		
1575.7	(6^-)	174.2 *3*	12 *2*	1400.7	(5^-)		
		274.00[#] *10*	60 *4*	1302.0	(4^-)		
		876.48[#] *16*	100 *40*	699.4	6^+		
1585.2		388.1[‡]	100[‡]	1197.1	(3^-)		
1586.7		1238.2[‡]	100[‡] *14*	348.2	4^+		
		1478.8[‡]	63[‡] *12*	108.3	2^+		
1589.7		659.6[‡]	100[‡]	930.0	2^+		
1594.0		292.1[‡]	54[‡] *11*	1302.0	(4^-)		
		397.2[‡]	100[‡] *22*	1197.1	(3^-)		
1648.5	10^+	508.60[#] *20*	100	1139.7	8^+		
1657.3	$6^{(+)}$	957.70[#] *20*	100	699.4	6^+		
1659.9	$(3,4,5)^-$	542.7[‡]	14[‡] *3*	1117.0	4^+		
		1311.8[‡]	100[‡] *6*	348.2	4^+	E1	Mult.: From α(K)exp=0.0012 *2* in ^{176}Re ε decay.
1673.2	(7^-)	272.5[#] *20*	23 *4*	1400.7	(5^-)		
		533.16[#] *12*	100 *15*	1139.7	8^+	(D)	
		973.6[#] *3*	85 *15*	699.4	6^+	D	
1682.5		1334.5[‡]	100[‡]	348.2	4^+		
1685.4		488.2[‡]	54[‡] *17*	1197.1	(3^-)		
		557.5[‡]	100[‡] *19*	1127.7	(2^-)		
1700.2		1352.2[‡]	100[‡]	348.2	4^+		
1708.5		1009.0[c‡]	100[c‡] *21*	699.4	6^+		

Adopted Levels, Gammas (continued)

$\gamma(^{176}$W) (continued)

E_i(level)	J^π_i	E_γ†	I_γ†	E_f	J^π_f	Mult.@	αb
1708.5		1360.2‡	29‡ *10*	348.2	4^+		
1735.5		695.1‡	100‡	1040.2	2^+		
1744.4		627.3‡	100‡	1117.0	4^+		
1759.0	(8^+)	363.0 *2*	36 *7*	1396.2	6^+		
		618.8 *2*	100 *29*	1139.7	8^+		
1858.2	(7)	717.4 *4*	100 *20*	1139.7	8^+		
		1159.5 *4*	60 *20*	699.4	6^+		
1886.0		1537.8‡	46‡ *18*	348.2	4^+		
		1777.9‡	100‡ *22*	108.3	2^+		
1922.4		1223.3‡	100‡	699.4	6^+		
1924.9	$8^{(+)}$	267.92# *16*	25 *3*	1657.3	$6^{(+)}$		
		1225.94# *12*	100 *19*	699.4	6^+	&	
1925.4	(8^-)	251.9 *3*	9.1 *18*	1673.2	(7^-)		
		348.90# *20*	100 *6*	1575.7	(6^-)		
		785.4# *1*	20.0 *18*	1139.7	8^+		
1939.9	(7)	1240.6 *3*	100	699.4	6^+		
1973.1	$8^{(-)}$	397.0 *3*	100	1575.7	(6^-)		
1995.4		1296.4 *3*	100	699.4	6^+		
2007.7	(9^-)	334.66# *12*	100 *6*	1673.2	(7^-)	E2	0.0621
		359.0 *3*	21 *3*	1648.5	10^+		
		867.86# *12*	88 *12*	1139.7	8^+	D	
2149.9	(9)	292.0 *1*	100 *8*	1858.2	(7)		
		1010.0 *3*	92 *8*	1139.7	8^+		
2160.7?		512.2 *3*	100	1648.5	10^+		
2189.7	(10^+)	430.8 *2*	90 *20*	1759.0	(8^+)		
		541.1 *1*	100 *20*	1648.5	10^+		
2206.3	12^+	557.86# *12*	100	1648.5	10^+	E2	0.0163
2264.8	$10^{(+)}$	339.8 *2*	100	1924.9	$8^{(+)}$		
2308.1	(10^-)	300.6 *3*	9.8 *24*	2007.7	(9^-)		
		382.88# *16*	100 *7*	1925.4	(8^-)	E2	0.0425
2345.2	(9)	350		1995.4			
		405.4 *3*	100	1939.9	(7)		
2409.3	(11^-)	401.68# *16*	100 *6*	2007.7	(9^-)	E2	0.0373
		760.96# *18*	29 *6*	1648.5	10^+		
2414.3	$10^{(-)}$	441.0 *3*	100 *22*	1973.1	$8^{(-)}$		
		489.0 *3*	61 *17*	1925.4	(8^-)		
2466.0+x	(13)	202.1	100	2263.9+x			

$^{176}_{74}$W$_{102}$-7

$\gamma(^{176}W)$ (continued)

E_i(level)	J^{π}_i	E_{γ}[†]	I_{γ}[†]	E_f	J^{π}_f	Mult.[@]	α[b]
2524.7	(11)	374.6 *1*	100	2149.9	(9)		
2624.3	12^+	418.0 *1*	87 *26*	2206.3	12^+		
		434.7 *1*	100 *9*	2189.7	(10^+)		
2652.3+x	(14)	186.3 *2*	100	2466.0+x	(13)		
2708.7	$12^{(+)}$	443.7 *1*	100	2264.8	$10^{(+)}$		
2753.8	(12^-)	445.6[#] *3*	100	2308.1	(10^-)		
2776.9	(11)	431.6 *3*	100	2345.2	(9)		
2802.6	14^+	595.96[#] *12*	100	2206.3	12^+	E2	0.0139
2830.6	(12^+)	624.0 *4*	100 *40*	2206.3	12^+		
		641.2 *2*	50 *20*	2189.7	(10^+)		
2862.7?		656.3 *2*	100	2206.3	12^+		
2870.6+x	(15)	218.0 *4*	100 *40*	2652.3+x	(14)		
		405.0[d] *3*	<20	2466.0+x	(13)		
2881.5	(13^-)	472.16[#] *12*	100	2409.3	(11^-)	E2	0.0244
2887.4	$12^{(-)}$	473.1 *3*	100 *19*	2414.3	$10^{(-)}$		
		579.1 *5*	25 *6*	2308.1	(10^-)		
2971.2	(13)	446.7 *1*	100	2524.7	(11)		
3032.9	14^+	230.7 *1*	36 *7*	2802.6	14^+		
		408.4 *1*	100 *7*	2624.3	12^+		
		826.6 *1*	29 *4*	2206.3	12^+		
3118.3+x	(16)	247.7 *2*	100 *33*	2870.6+x	(15)		
		466.5 *5*	33 *33*	2652.3+x	(14)		
3228.6?		1067.9 *3*	100	2160.7?			
3239.2	$14^{(+)}$	530.5 *2*	100	2708.7	$12^{(+)}$		
3256.0		632 *1*	33 *19*	2624.3	12^+		
		1049.8 *3*	100 *29*	2206.3	12^+		
3271.5	(13)	494.8 *3*	100	2776.9	(11)		
3276.0	(14^-)	522.22[#] *24*	100	2753.8	(12^-)		
3302.3?		1096.0 *1*	100	2206.3	12^+		
3393.3+x	(17)	275.0 *2*	100 *33*	3118.3+x	(16)		
		522.5 *5*	50 *33*	2870.6+x	(15)		
3399.5	$14^{(-)}$	512.2 *3*	100	2887.4	$12^{(-)}$		
3421.8	(15^-)	540.43[#] *9*	100	2881.5	(13^-)	E2	0.0176
3427.6	16^+	625.32[#] *9*	100	2802.6	14^+	E2	0.0125
3484.6	(15)	513.4 *1*	100	2971.2	(13)		
3493.7	16^+	460.9 *1*	100	3032.9	14^+		
3694.6+x	(18)	301.3 *3*	100	3393.3+x	(17)		
3747.0	14^+	445.0 *1*	31 *8*	3302.3?			
		490.9 *2*	50 *13*	3256.0			
		518.6 *3*	36 *8*	3228.6?			

γ(^{176}W) (continued)

E_i(level)	J^π_i	E_γ†	I_γ†	E_f	J^π_f	Mult.@	αb
3747.0	14+	714.1 *1*	100 *13*	3032.9	14+		
		884.5 *2*	31 *8*	2862.7?			
		916.8 *3*	39 *5*	2830.6	(12+)		
		945.0 *2*	19 *5*	2802.6	14+		
3817.2	(15)	545.7 *3*	100	3271.5	(13)		
3845.9	(16−)	569.87# *21*	100	3276.0	(14−)		
3952.8	16(−)	553.3 *3*	100	3399.5	14(−)		
3970.0	15+	222.8 *1*	100	3747.0	14+		
4002.5	18+	508.8	45 *13*	3493.7	16+		
		574.75# *12*	100 *15*	3427.6	16+		
4020.6+x	(19)	326.0 *4*	100	3694.6+x	(18)		
4022.6	(17−)	600.82# *9*	100	3421.8	(15−)	E2	0.0137
4061.3	(17)	576.7 *1*	100	3484.6	(15)		
4101.7		354.6 *1*	100	3747.0	14+		
4121.4	18+	628.0 *5*	59 *11*	3493.7	16+		
		693.7 *3*	100 *11*	3427.6	16+		
4208.5	16+	238.2 *1*	100 *22*	3970.0	15+		
		461.7 *2*	30 *6*	3747.0	14+		
4368.4		266.6 *1*	100	4101.7			
4417.9	(17)	600.7 *5*	100	3817.2	(15)		
4453.5	(18−)	607.7 *1*	100	3845.9	(16−)		
4464.9	17+	256.2 *1*	100 *17*	4208.5	16+		
		494.9 *1*	65 *8*	3970.0	15+		
4579.0		210.5 *1*	100	4368.4			
4613.5	20+	611.0 *1*	100	4002.5	18+		
4670.8	(19−)	648.0 *2*	100	4022.6	(17−)		
4695.2	(19)	633.9 *1*	100	4061.3	(17)		
4740.9	18+	275.9 *1*	100 *20*	4464.9	17+		
		532.5 *1*	92 *12*	4208.5	16+		
4839.6	20+	718.3 *3*	100	4121.4	18+		
4894.7		315.8 *1*	100	4579.0			
5034.5	19+	293.5 *1*	79 *26*	4740.9	18+		
		569.8 *2*	100 *13*	4464.9	17+		
5083.2	(20−)	629.7 *2*	100	4453.5	(18−)		
5192.5		297.8 *1*	100	4894.7			
5298.9	22+	685.5 *2*	100	4613.5	20+		
5343.2	20+	308.6 *1*	81 *27*	5034.5	19+		
		603.0 *2*	100 *16*	4740.9	18+		
5356.4	(21−)	685.7 *3*	100	4670.8	(19−)		
5369.9	(21)	674.7 *1*	100	4695.2	(19)		
5506.2		313.7 *1*	85 *19*	5192.5			

From ENSDF

$^{176}_{74}W_{102}$-9

$\gamma(^{176}\mathrm{W})$ (continued)

E_i(level)	J^π_i	E_γ[†]	I_γ[†]	E_f	J^π_f	E_i(level)	J^π_i	E_γ[†]	I_γ[†]	E_f	J^π_f
5506.2		612.0 *4*	100 *19*	4894.7		6186.1		347.6 *3*		5838.2	
5607.0	22^+	767.3 *4*	100	4839.6	20^+			680.2 *4*		5506.2	
5665.8	21^+	322.4 *2*		5343.2	20^+	6348.5	23^+	348.2 *2*		6000.5	22^+
		631.1 *2*	100	5034.5	19^+			682.0 *4*		5665.8	21^+
5733.2	(22^-)	650.0 *1*	100	5083.2	(20^-)	6548.0		362.1 *3*		6186.1	
5838.2		331.7 *1*	100 *19*	5506.2				709.5 *4*		5838.2	
		647.9 *4*	67 *15*	5192.5		6709.1	24^+	708.6 *4*	100	6000.5	22^+
6000.5	22^+	334.8 *4*	30 *11*	5665.8	21^+	6858.8	26^+	808.0 *1*	100	6051.1	24^+
		657.6 *3*	100 *23*	5343.2	20^+	6921.7		374.0 *3*		6548.0	
6051.1	24^+	752.1 *2*	100	5298.9	22^+			735.0 *5*		6186.1	

† From ^{150}Nd(^{30}Si,4nγ), unless otherwise specified.

‡ From ^{176}Re ε decay.

\# Weighted average of ^{150}Nd(^{30}Si,4nγ) and ^{164}Dy(^{16}O,4nγ).

@ From ^{16}O-$\gamma(\theta)$ in ^{164}Dy(^{16}O,4nγ), and ce data in ^{169}Tm(^{11}B,4nγ).

& Measured dipole multipolarity. Level scheme requires E2.

a From ^{176}Re ε decay.

b 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.

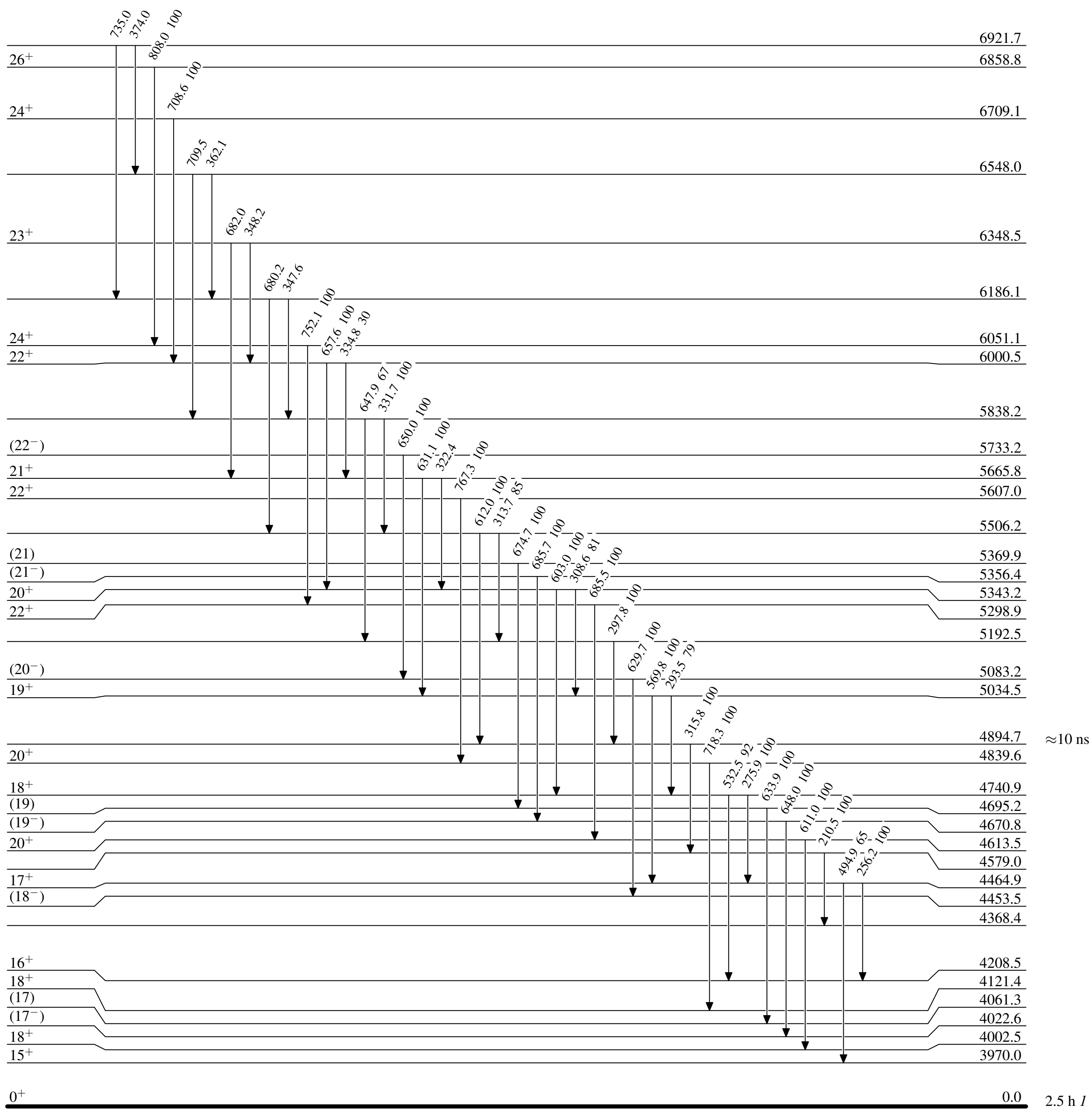
c Multiply placed with intensity suitably divided.

d Placement of transition in the level scheme is uncertain.

Adopted Levels, Gammas

Level Scheme

Intensities: Relative photon branching from each level

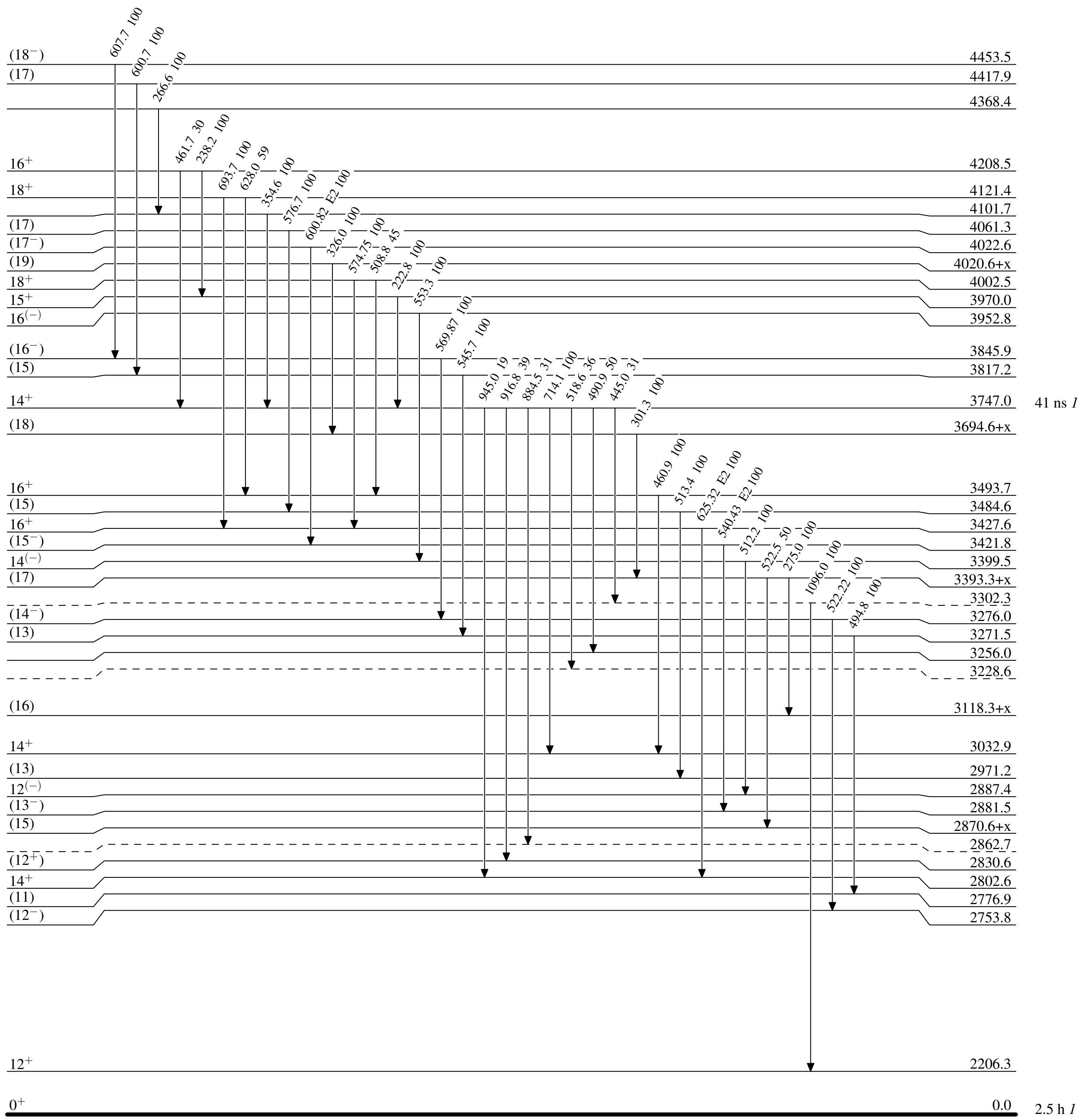


$^{176}_{74}W_{102}$

Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Relative photon branching from each level



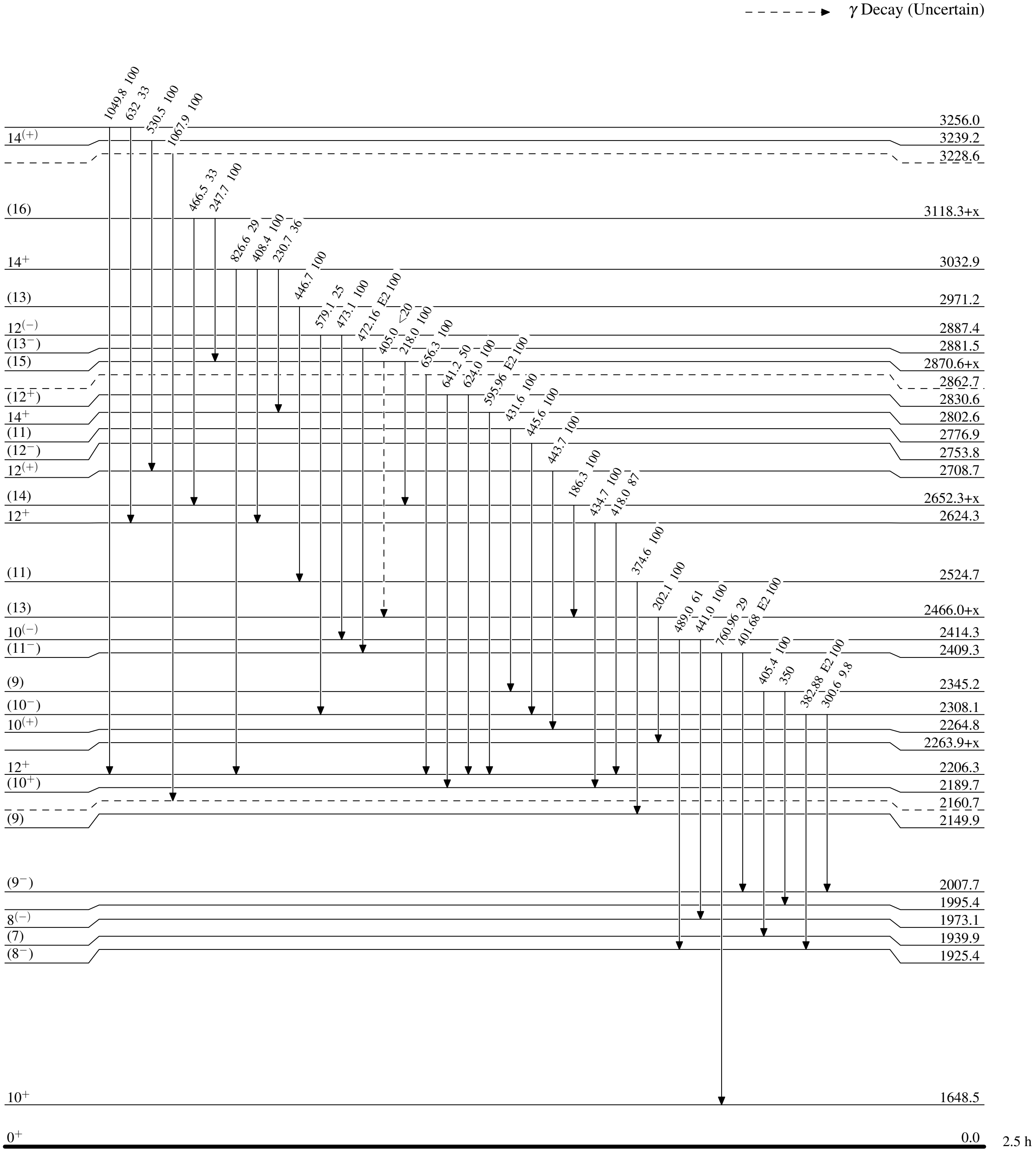
$^{176}_{74}W_{102}$

Adopted Levels, Gammas

Legend

Level Scheme (continued)

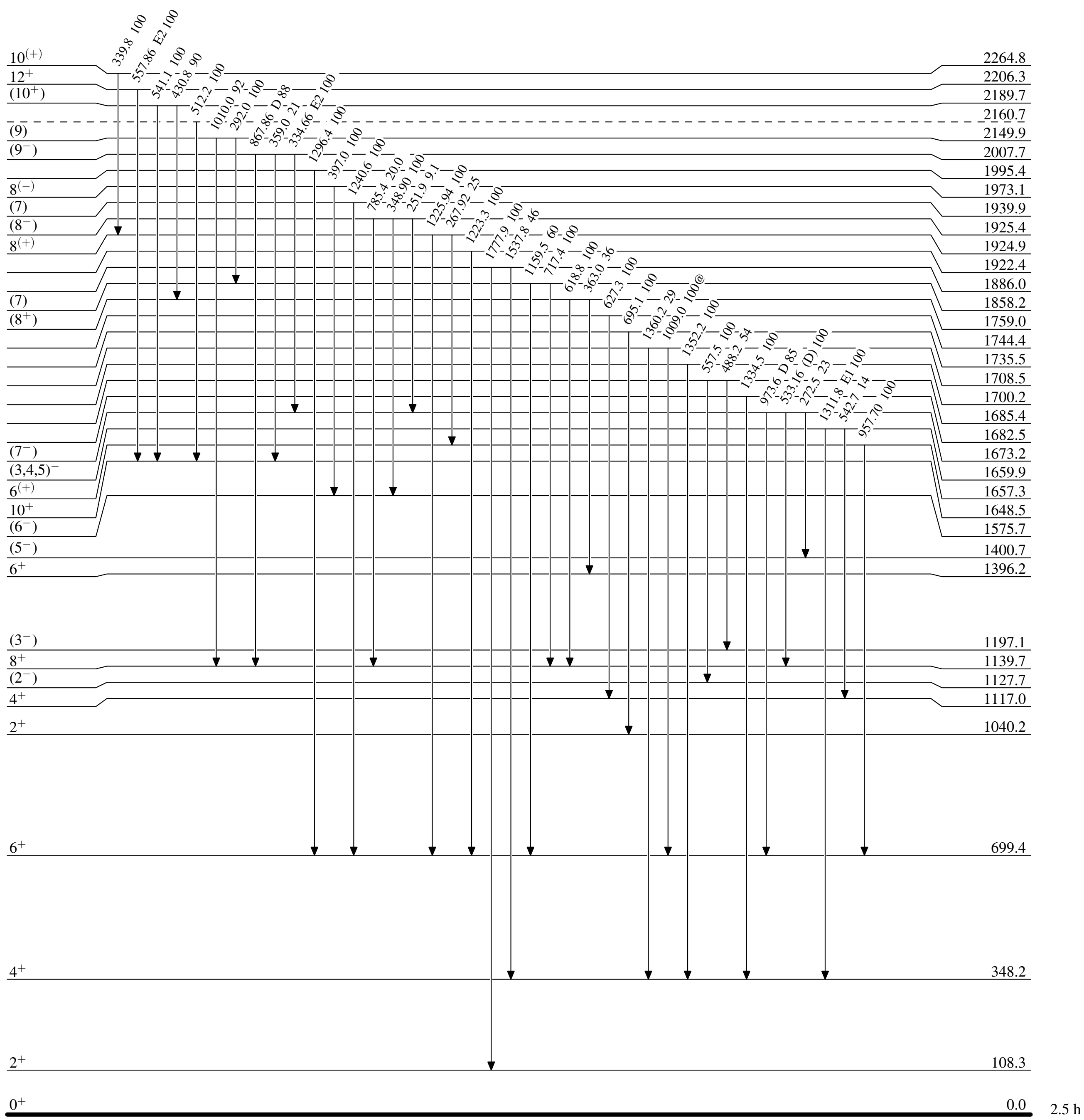
Intensities: Relative photon branching from each level



Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Relative photon branching from each level
@ Multiply placed: intensity suitably divided



$^{176}_{74}W_{102}$

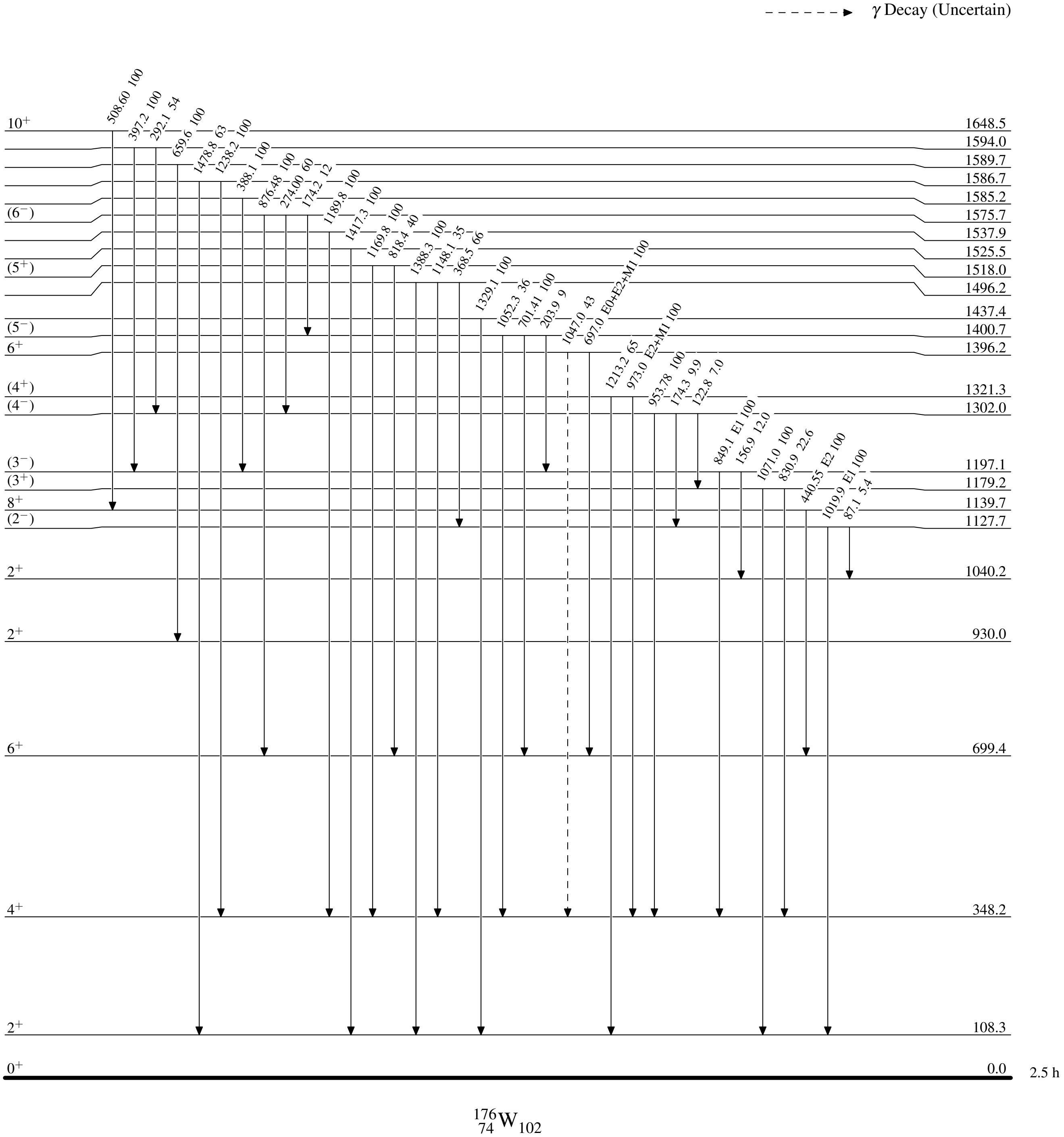
Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Relative photon branching from each level
@ Multiply placed: intensity suitably divided

Legend

γ Decay (Uncertain)

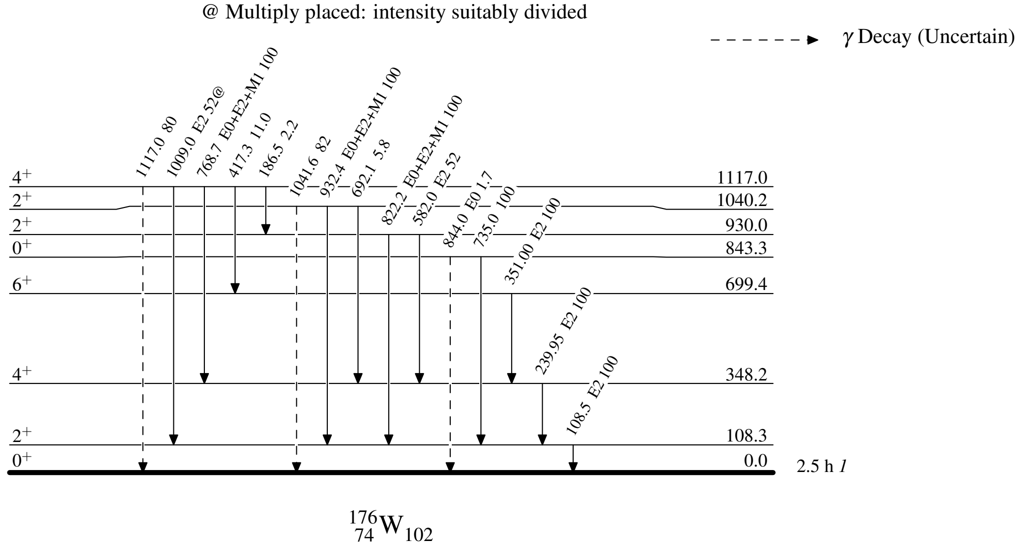


Adopted Levels, Gammas

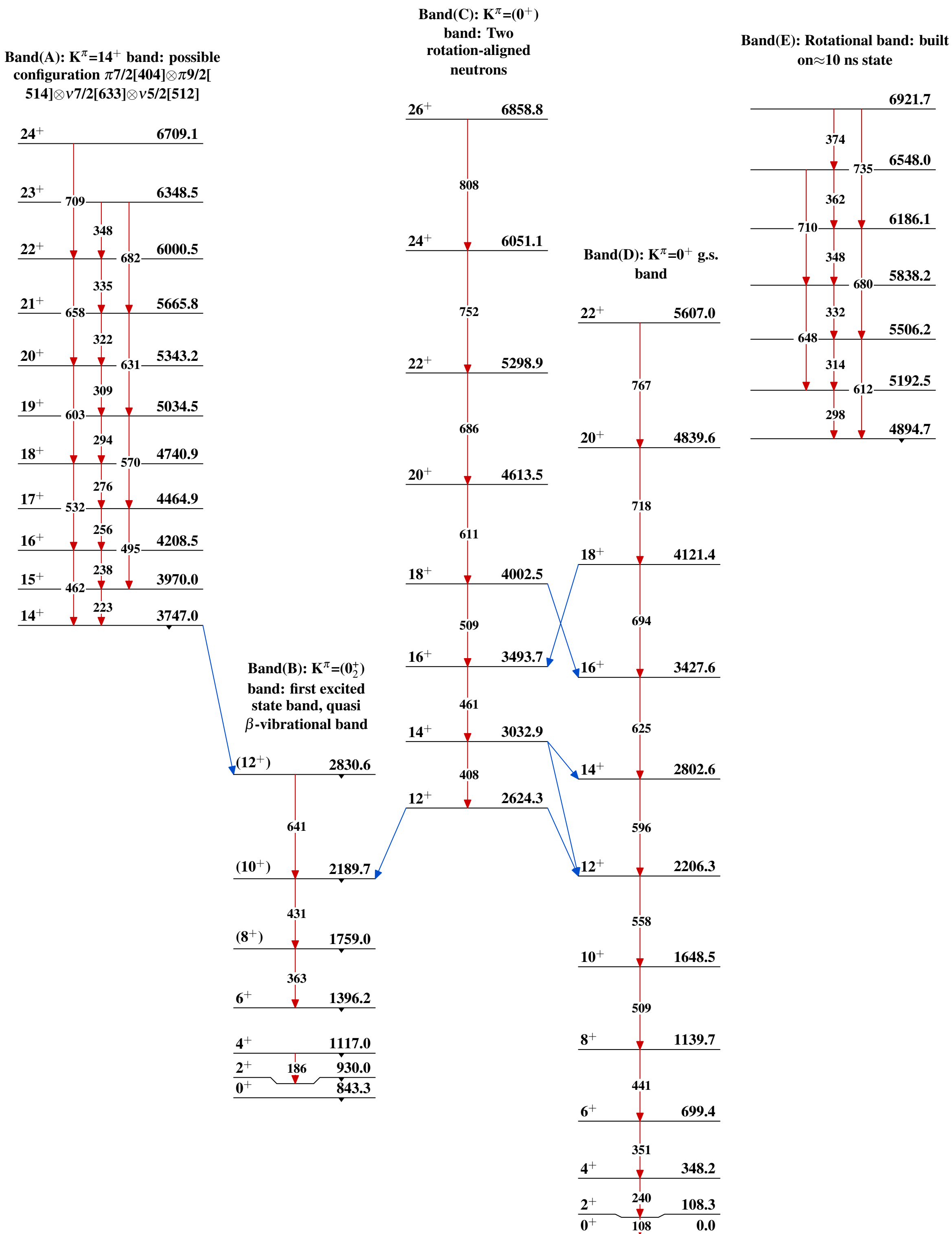
Level Scheme (continued)

Intensities: Relative photon branching from each level
@ Multiply placed: intensity suitably divided

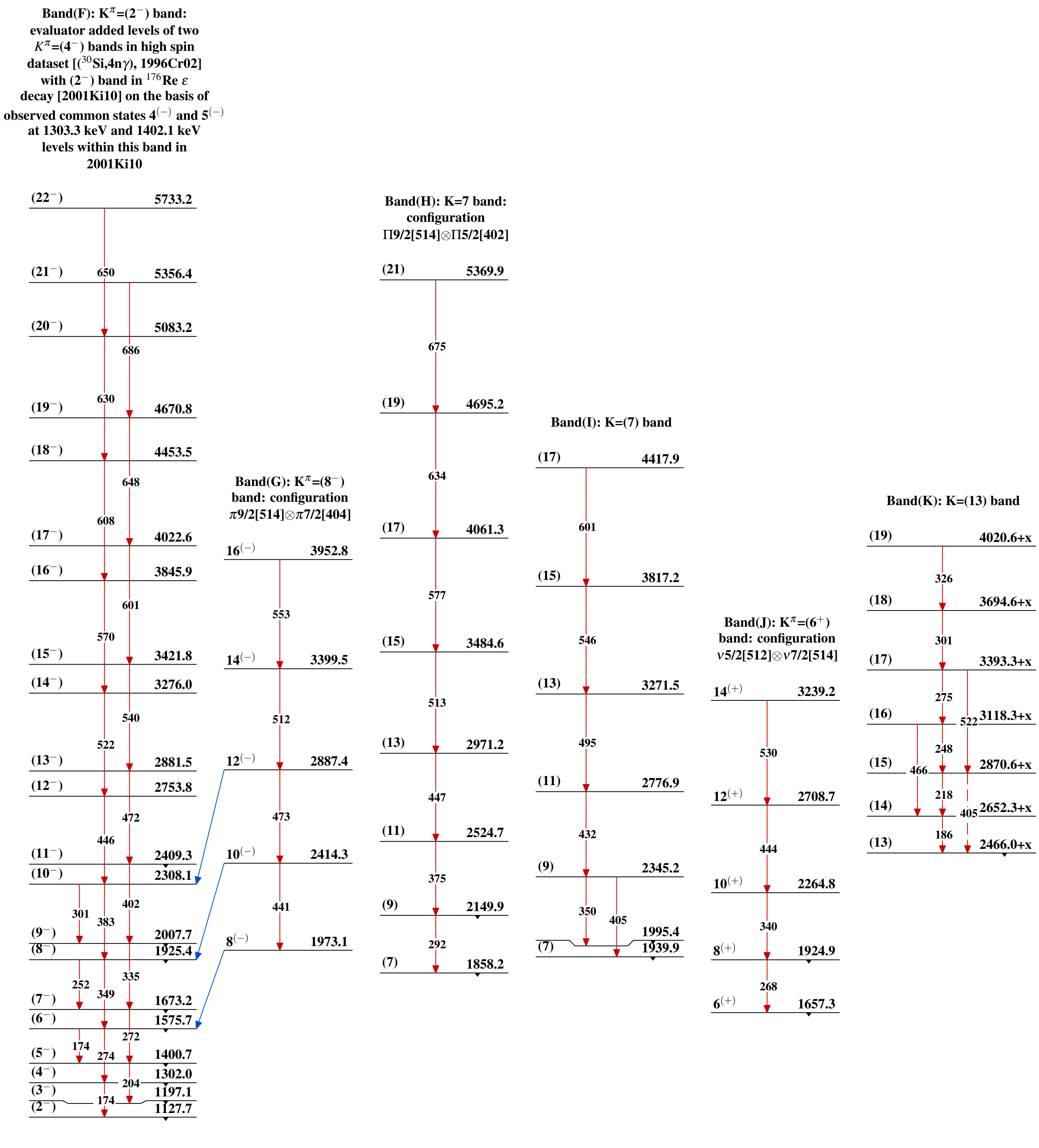
Legend



Adopted Levels, Gammas



Adopted Levels, Gammas (continued)



$^{176}_{74}W_{102}$

Adopted Levels, Gammas (continued)

Band(L): $K^{\pi}=2^{+}$ quasi γ-vibrational band

$^{176}_{74}W_{102}$

Adopted Levels, Gammas

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	E. Achterberg, O. A. Capurro, G. V. Marti	NDS 110,1473 (2009)	31-May-2008

Q(β^-)=−4.76×10^3 *4*; S(n)=8.78×10^3 *4*; S(p)=5981 *16*; Q(α)=3012 *16* 2012Wa38
Note: Current evaluation has used the following Q record −4760 308790 305981 153006 15 2003Au03.

^{178}W Levels

Cross Reference (XREF) Flags

A	^{178}Re ε decay	E	^{177}Hf(α,3nγ)
B	^{48}Ca(^{136}Xe,6nγ)	F	^{180}W(p,t)
C	^{164}Dy(^{18}O,4nγ)	G	^{181}Ta(p,4nγ)
D	^{170}Er(^{13}C,5nγ)		

E(level)†	J$^\pi$‡	T$_{1/2}$#	XREF	Comments
0.0@	0+	21.6 d *3*	ABCDEFG	%ε=100 T$_{1/2}$: weighted average of 21.5 d *5* (1950Wi67), 21.4 d *5* (1964Sa16), and 22.0 d *5* (1963Ra14). Other: 1956Bi73.
105.90@ *9*	2+		ABCDEFG	J$^\pi$: 106γ E2 to 0+.
342.74@ *10*	4+		ABCDEFG	J$^\pi$: 237γ E2 to 2+.
694.16@ *11*	6+		ABCDEFG	J$^\pi$: 352γ E2 to 4+.
997 *5*	0+		FG	J$^\pi$: L=0 in (p,t).
1044.60d *11*	2−		A DE G	J$^\pi$: 939γ E1 to 2+.
1082.44b *15*	2+		A FG	J$^\pi$: 977γ E0+M1+E2 to 2+.
1110.43c *20*	2+		A G	J$^\pi$: 1110γ E2 to 0+.
1120.13e *11*	3−		A DEFG	J$^\pi$: 778γ E1 to 4+.
1141.50@ *12*	8+		BCDE G	J$^\pi$: 448γ E2 to 6+.
1225.24d *11*	4−		A DE G	J$^\pi$: 883γ E1 to 4+.
1236.50c *15*	3+		A	
1275.09b *15*	4+		A FG	J$^\pi$: 933γ E0+M1+E2 to 4+.
1294.51& *15*	0+		A	
1344.62e *11*	5−		A DE G	J$^\pi$: 650γ (E1) to 6+, 1002γ (E1) to 4+.
1356 *5*	0+		F	J$^\pi$: L=0 in (p,t).
1380.14c *11*	4+		A DE G	J$^\pi$: 1274γ E2 to 2+.
1417.68& *14*	2+		A	J$^\pi$: 1417γ E2 to 0+.
1435 *5*			F	
1449.6 *4*	2+		A F	J$^\pi$: 1106, 1343, and 1449γ E2 to 4+, 2+, and 0+, respectively.
1508.62d *13*	6−		DE G	J$^\pi$: 284γ (E2) to (4)−, 164γ (E2,M1) to 5−.
1545.2 *4*	(3−)		A D	
1555.96b *13*	6+		A CDE G	J$^\pi$: 862γ E0+M1+E2 to 6+.
1572.41c *18*	5+		A	
1597.83& *17*	4+		A	J$^\pi$: 1492γ E2 to 2+.
1641.34 *18*	0+		A F	J$^\pi$: L=0 in (p,t).
1656.29e *12*	7−		DE G	J$^\pi$: 962γ E1 to 6+, 312γ E2 to 5−.
1664.94i *11*	6+	3.0 ns *4*	BCDE G	J$^\pi$: 285γ (E2) to 4+, 971γ (M1+E2) to 6+, 1322γ (E2) to 4+. T$_{1/2}$: From ^{181}Ta(p,4nγ) (3 ns *1* in (^{170}Er(^{13}C,5nγ)).
1665.35@ *12*	10+		BCDE G	J$^\pi$: 523γ E2 to 8+.
1703.67 *15*	4+		A	J$^\pi$: 1009γ E2 to 6+, 1361γ M1 to 4+.
1718.06 *15*	4+		A	
1728.40 *23*			A	

Continued on next page (footnotes at end of table)

Adopted Levels, Gammas (continued)

^{178}W Levels (continued)

E(level)[†]	J^{π}[‡]	$T_{1/2}$[#]	XREF	Comments
1738.70[k] *12*	7^-	9.6 ns *5*	BCDE G	J^{π}: 74γ E1 to 6^+. $T_{1/2}$: From ^{177}Hf(α,3nγ) (8 ns *1* in (^{170}Er(^{13}C,5nγ)).
1764.10[f] *14*	(5^-)		A D	
1827.41[l] *12*	8^-		BCDE	J^{π}: 88γ to 7^-.
1835.39[j] *13*	7^+		CDE G	J^{π}: 171γ (M1,E2) to 6^+.
1863.9 *4*	(4^+)		A	
1875.7 *6*			G	
1888.42[d] *17*	(8^-)		DE G	J^{π}: 380γ (E2) to 6^-.
1915.80[b] *13*	8^+		CDE G	J^{π}: 774γ E0+M1+E2 to 8^+.
1939.15 *23*			A	
1962.53 *23*			A	
1964.46[k] *12*	9^-		BCDE	J^{π}: 137γ (M1,E2) to 8^-, 226γ (E2) to 7^-.
1997.23 *17*			A	
2023.38[i] *13*	8^+		CDE G	
2030 *5*			F	
2041.81[e] *13*	9^-		DE G	J^{π}: 386γ (E2) to 7^-, 900γ (E1) to 8^+.
2043.7 *4*			G	
2054.14[g] *14*	(7)		D	
2060 *5*			F	
2076.17[f] *15*	(7^-)		D	
2078.27[h] *16*	8^-		D	
2091 *5*			F	
2116 *5*			F	
2121.05 *23*			A F	
2133.03[l] *13*	10^-		BCDE	J^{π}: 168γ (M1,E2) to 9^-, 306γ (E2) to 8^-.
2136.05 *14*	8^+		D	
2226.77[j] *13*	(9^+)		CDE G	J^{π}: 204γ (E2,M1) to 8^+, 392γ (E2) to 7^+.
2239.4 *6*			G	
2244.45[@] *13*	12^+		CDE G	J^{π}: 579γ (E2) to 10^+.
2322.62[h] *13*	9^-		D	
2327.51[k] *13*	11^-		BCDE	J^{π}: 195γ (M1,E2) to 10^-, 363γ (E2) to 9^-.
2339.74[b] *13*	10^+		CDE G	
2347.93[g] *13*	(9)		D	
2355.82[d] *20*	10^-		DE G	J^{π}: 468γ (E2) to (8^-).
2444.42[i] *13*	10^+		CDE	
2468.34[f] *14*	(9^-)		D	
2489.84[e] *14*	11^-		DE	J^{π}: 448γ (E2) to 9^-.
2546.07[l] *14*	12^-		CDE	J^{π}: 219γ (E2,M1) to 11^-, 413γ E2 to 10^-.
2577.56[h] *13*	10^-		D	
2671.79[j] *14*	11^+		CDE	
2682.79 *13*	10^+		D	J^{π}: 546γ E2 to 8^+.
2718.14[g] *14*	(11)		D	
2784.30[k] *15*	13^-		CDE	J^{π}: 457γ (E2) to 11^-.
2803.99[b] *13*	(12^+)		CDE	J^{π}: 464γ E2 to 10^+, 559γ M1(+E2) to 12^+.
2841.97[h] *17*	11^-		D	
2845.65[a] *16*	12^+		D	
2858.71[@] *15*	14^+		DE	J^{π}: 614γ E2 to 12^+.
2901.42[d] *22*	12^-		DE	J^{π}: 546γ (E2) to 10^-.
2911.62[i] *13*	12^+		D	

Continued on next page (footnotes at end of table)

Adopted Levels, Gammas (continued)

^{178}W Levels (continued)

E(level)[†]	Jπ[‡]	$T_{1/2}$[#]	XREF	Comments
2933.45[f] 17	(11⁻)		D	
2994.86[e] 17	13⁻		DE	
3044.19[l] 15	14⁻		CDE	
3053.81 13	11⁻	<2 ns	BCDE	Jπ: From γ-ray DCO ratios in ^{164}Dy(^{18}O,4nγ). Jπ: 921γ M1+E2 to 10⁻, 1090γ E2 to 9⁻. K^{π}=11⁻. Configuration=ν(1/2[521]5/2[512]7/2[514]9/2[624]).
3138.62[j] 17	13⁺		CDE	Jπ: 467γ (E2) to 11⁺.
3144.1 6			D	
3161.94[g] 17	(13)		D	
3209.25[a] 15	14⁺		D	
3235.34 12	12⁺	<1 ns	BCDE	Jπ: From γ-ray DCO ratios in ^{164}Dy(^{18}O,4nγ). Jπ: 552γ E2 to 10⁺, 991γ M1(+E2) to 12⁺. K^{π}=12⁺. Configuration=ν(1/2[521]7/2[633]7/2[514]9/2[624]) or ν(5/2[512]7/2[514])π(5/2[402]7/2[404]).
3282.20 16	(12⁻)		D	Probable band member of K^{π}=11⁻ band at 3053.
3301.2 4			A	
3317.40[k] 16	15⁻		DE	Jπ: 533γ (E2) to 13⁻.
3318.73[b] 15	(14⁺)		DE	Jπ: 460γ M1(+E2) to 14⁺.
3368.9 3	(2⁺)		A	
3383.3 5			A	
3385.35 18	(13⁺)		D	Probable band member of K^{π}=12⁺ band at 3235.
3420.39[i] 14	14⁺		D	
3455.57[f] 19	(13⁻)		D	
3459.75 19	(13⁻)		D	
3488.42[@] 16	16⁺		DE	Jπ: 630γ E2 to 14⁺.
3499.3 4			A	
3505.8 5			A	
3511.9 4	(2⁺)		A	
3514.82[d] 24	14⁻		D	
3515.0 5			A	
3525.53[m] 15	(13⁻)	<1 ns	BCDE	Jπ: a tentative Jπ=(14) has been proposed in ^{164}Dy(^{18}O,4nγ). Jπ: 290γ E1 to 12⁺.
3550.9 4			A	
3558.28[e] 19	15⁻		D	
3580.2 5			A	
3585.5 5			A	
3593.63 18	14⁻	3 ns 1	D	Jπ: 68γ (M1) to 13⁻. K^{π}=14⁻. Configuration=ν(5/2[512]7/2[514])π(7/2[404]9/2[514]).
3594.8 5			A	
3612.22[j] 19	15⁺		D	
3612.91[l] 18	16⁻		DE	
3634.4 5			A	
3654.93[o] 19	15⁺	30 ns 1	D	Jπ: 61γ (E1) to 14⁻.
3661.14[a] 15	16⁺		D	
3673.94[g] 20	(15)		D	
3686.63[n] 16	(14⁺)		D	
3689.21[m] 18	14⁻		D	Jπ: 164γ M1 to 13⁻.
3695.06 16			D	
3706.2 5			A	
3807.0 4			A	
3810.5 5			A	
3837.0[n] 6	(15⁺)		D	

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Adopted Levels, Gammas (continued)

^{178}W Levels (continued)

E(level)[†]	J^{π}[‡]	$T_{1/2}$[#]	XREF	Comments
3862.33[p] 22	16+		D	J^{π}: 207γ M1 to 15+.
3871.00[b] 16	16+		D	
3876.03 21	(15−)		D	Probable member of K^{π}=14− band at 3593.
3912.51[k] 19	17−		D	
3930.62[m] 19	15−		D	
4009.29[i] 17	16+		D	
4084.4[n] 6	(16+)		D	
4100.17[@] 17	18+		D	J^{π}: 612γ E2 to 16+.
4129.93[o] 23	17+		D	
4157.92[j] 20	17+		D	
4171.5[d] 6	16−		D	
4182.98[e] 22	17−		D	
4208.88[m] 19	16−		D	J^{π}: 278γ M1 to 15−, 520γ E2 to 14−.
4238.21[l] 21	18−		D	
4238.94[g] 23	(17)		D	
4248.20[a] 16	18+		D	J^{π}: 760γ E2 to 16+.
4368.8[n] 6	(17+)		D	
4429.73[p] 23	18+		D	
4498.31[b] 19	18+		D	
4516.28[m] 19	17−		D	
4555.92[k] 21	19−		D	
4663.39[i] 20	18+		D	
4678.7[n] 6	(18+)		D	
4711.83 20	(17+)		D	J^{π}: 1057γ E2 to 15+. Additional information 1.
4730.36[@] 20	20+		D	
4753.63[o] 24	19+		D	
4797.12[j] 23	19+		D	
4833.7[d] 8	(18−)		D	
4835.44[g] 25	(19)		D	
4863.88[e] 24	19−		D	
4879.72[q] 19	18−	<3 ns	D	J^{π}: 363γ M1 to 17−, 671γ E2 to 16−.
4905.71[l] 23	20−		D	
4941.84[a] 18	20+		D	
5006.7[n] 6	(19+)		D	
5063.22[r] 22	19−		D	J^{π}: 183γ M1 to 18−.
5096.83[p] 24	20+		D	
5188.31[b] 21	20+		D	
5234.12[k] 24	21−		D	
5269.84[q] 24	20−		D	
5313.7[s] 3	21−	64 ns 2	D	J^{π}: 44γ (M1) to 20−.
5428.96[@] 22	22+		D	
5455.74[o] 24	21+		D	
5460.8[g] 3	(21)		D	
5522.1[r] 3	21−		D	
5525.93[j] 25	21+		D	
5537.6[d] 13	(20−)		D	
5577.5[e] 3	(21−)		D	

Continued on next page (footnotes at end of table)

Adopted Levels, Gammas (continued)

^{178}W Levels (continued)

E(level)[†]	Jπ[‡]	$T_{1/2}$[#]	XREF	Comments
5603.21[l] 25	22⁻		D	
5627.1[u] 3	22⁻		D	
5675.2[t] 3	22⁻		D	
5688.75[a] 20	22⁺		D	
5814.2[q] 3	22⁻		D	
5827.22[p] 25	22⁺		D	
5906.61[b] 24	22⁺		D	
5939.9[k] 3	23⁻		D	
6000.6[v] 3	23⁻		D	
6052.9[s] 3	23⁻		D	
6136.8[g] 3	(23)		D	
6140.0[r] 3	23⁻		D	
6194.47[@] 25	24⁺		D	
6207.8[o] 3	23⁺		D	
6299.4[e] 6	(23⁻)		D	
6329.1[j] 6	23⁺		D	
6332.7[l] 3	24⁻		D	
6389.8[u] 3	24⁻		D	Jπ: 389γ M1+E2 to 23⁻, 763γ E2 to 22⁻.
6447.7[t] 4	24⁻		D	
6483.85[a] 23	24⁺		D	
6494.4[q] 3	24⁻		D	
6572.7[w] 3	25⁺	220 ns 10	D	Jπ: 183γ (E1) to 24⁻, 946γ (E3) to 22⁻.
6593.8[p] 3	24⁺		D	
6685.3[k] 3	25⁻		D	
6795.7[v] 3	25⁻		D	
6859.1[s] 5	25⁻		D	
6860.4[x] 3	26⁺		D	Jπ: 288γ M1 to 25⁺.
6872.9[r] 4	25⁻		D	
6886.5[g] 3	(25)		D	
6971.6[o] 4	(25⁺)		D	
6984.2 6	25⁺		D	
7006.0 5	25⁺		D	
7017.2[@] 3	(26⁺)		D	
7113.2[l] 3	26⁻		D	
7217.5[w] 4	27⁺		D	Jπ: 357γ M1 to 26⁺, 645γ E2 to 25⁺.
7218.6[u] 5	26⁻		D	
7272.4[q] 5	26⁻		D	
7288.2[t] 6	26⁻		D	
7330.2[a] 6	26⁺		D	
7337.0[p] 4	26⁺		D	
7392.2 4	26⁺		D	
7489.9[k] 3	27⁻		D	
7611.7[x] 4	28⁺		D	Jπ: 394γ M1 to 27⁺, 751γ E2 to 26⁺.
7657.6[v] 5	27⁻		D	
7690.1[r] 5	27⁻		D	
7709.4[o] 4	27⁺		D	
7719.3[g] 6	(27)		D	
7732.2[s] 8	27⁻		D	
7798.8 5	27⁺		D	

Continued on next page (footnotes at end of table)

Adopted Levels, Gammas (continued)

^{178}W Levels (continued)

E(level)[†]	J^{π}[‡]	$T_{1/2}$[#]	XREF	Comments
7897.5[@] 6	(28$^+$)		D	
7961.9[l] 3	(28$^-$)		D	
8034.6[w] 4	29$^+$		D	J^{π}: 423γ M1 to 28$^+$, 818γ E2 to 27$^+$.
8096.4[p] 4	28$^+$		D	
8111.6[u] 8	28$^-$		D	
8122.1[q] 8	28$^-$		D	
8148.4[y] 4	28$^{(-)}$	<5 ns	D	J^{π}: 931γ E1 to 27$^+$.
8189.1[t] 9	28$^-$		D	
8228.2 6	28$^+$		D	
8365.3[k] 6	(29$^-$)		D	
8476.0[z] 4	29$^{(-)}$		D	J^{π}: 327γ M1 to 28$^{(-)}$, 864γ E1 to 28$^+$.
8484.5[x] 5	30$^+$		D	J^{π}: 450γ M1 to 29$^+$, 873γ E2 to 28$^+$.
8499.7[o] 4	29$^+$		D	
8564.3[r] 9	29$^-$		D	
8578.6[v] 9	29$^-$		D	
8655.3[s] 10	29$^-$		D	
8665.6 7	29$^+$		D	
8800.3[3] 4	30$^+$	<1 ns	D	J^{π}: 324γ E1 to 29$^{(-)}$, 766γ M1 to 29$^+$, 1187γ E2 to 28$^+$.
8897.3[y] 4	30$^{(-)}$		D	J^{π}: 422γ M1 to 29$^{(-)}$, 749γ E2 to 28$^{(-)}$.
8905.6[1] 4	(29$^+$)	<1 ns	D	J^{π}: 757γ (E1) to 28$^{(-)}$.
8919.5[p] 4	30$^+$		D	
8957.9[w] 7	31$^+$		D	J^{π}: 474γ M1 to 30$^+$, 924γ E2 to 29$^+$.
9016.6[q] 10	30$^-$		D	
9051.6[u] 10	30$^-$		D	
9124.7[t] 12	30$^-$		D	
9342.7[2] 4	(30$^+$)		D	J^{π}: 437γ (M1) to (29$^+$).
9356.4[o] 4	31$^+$		D	
9359.5[4] 4	(31$^+$)		D	J^{π}: 559γ M1 to 30$^+$.
9360.9[z] 4	31$^-$		D	J^{π}: 464γ M1 to 30$^{(-)}$, 885γ E2 to 29$^{(-)}$.
9453.8[x] 8	32$^+$		D	J^{π}: 494γ M1 to 30$^+$.
9475.5[r] 11	31$^-$		D	
9532.6[v] 11	31$^-$		D	
9806.7[1] 4	(31$^+$)		D	J^{π}: 464γ (M1) to (30$^+$).
9810.6[p] 4	32$^+$		D	
9854.9[y] 5	32$^-$		D	J^{π}: 494γ M1 to 31$^-$, 958γ E2 to 30$^{(-)}$.
9931.9[3] 4	(32$^+$)		D	J^{π}: 572γ M1 to (31$^+$), 1132γ (E2) to 30$^+$.
9947.6[q] 12	32$^-$		D	
9971.9[w] 7	33$^+$		D	J^{π}: 518γ M1 to 32$^+$, 1014γ E2 to 31$^+$.
10280.3[o] 5	33$^+$		D	
10299.6[2] 5	(32$^+$)		D	J^{π}: 493γ (M1) to (31$^+$).
10378.8[z] 5	33$^-$		D	J^{π}: 524γ M1 to 32$^-$, 1018γ E2 to 31$^-$.
10509.2[x] 8	34$^+$		D	J^{π}: 537γ M1 to 33$^+$, 1055γ E2 to 32$^+$.
10514.6[v] 15	33$^-$		D	
10525.9[4] 4	(33$^+$)		D	J^{π}: 594γ M1 to (32$^+$), 1166γ (E2) to (31$^+$).
10766.4[p] 8	34$^+$		D	
10916.4[y] 5	34$^-$		D	J^{π}: 538γ M1 to 33$^-$, 1060γ E2 to 32$^-$.
11066.0[w] 8	35$^+$		D	J^{π}: 556γ M1 to 34$^+$, 1095γ E2 to 33$^+$.
11075.5[5] 5	(34$^+$)	<1 ns	D	J^{π}: 550γ (M1) to (33$^+$).
11265.4[o] 9	35$^+$		D	
11697.2[5] 5	(35$^+$)		D	J^{π}: 622γ (M1) to (34$^+$).

Continued on next page (footnotes at end of table)

Adopted Levels, Gammas (continued)

^{178}W Levels (continued)

E(level)[†]	J$^{\pi}$[‡]	XREF
11780.4[p] *10*	36^{+}	D
12306.4[o] *13*	37^{+}	D
12844.9[p] *15*	(38^{+})	D
13393.8[o] *17*	(39^{+})	D

† From a least-squares fit to adopted γ-ray energies.
‡ Assignments are based on rotational band structure, and on γ-ray multipolarities and decay patterns. Specific arguments are given with individual levels.
\# From ^{170}Er(^{13}C,5nγ), unless otherwise specified.
@ Band(A): K^{π}=0^{+}, Yrast band.
& Band(a): 2nd K^{π}=0^{+} band.
a Band(B): K^{π}=12^{+}, Yrare band.
b Band(C): β-vibrational band.
c Band(D): γ-vibrational band.
d Band(E): K^{π}=2^{-} band, α=0.
e Band(e): K^{π}=2^{-} band, α=1.
f Band(F): J^{π}=(3^{-}) band.
g Band(G): J=(7) band.
h Band(H): ΔJ=1 on 8^{-}.
i Band(I): K^{π}=6^{+}, α=0. Configuration=ν5/2[512]ν7/2[514].
j Band(i): K^{π}=6^{+}, α=1. Configuration=ν5/2[512]ν7/2[514].
k Band(j): K^{π}=7^{-}, α=0. Configuration=ν7/2[633]ν7/2[514].
l Band(J): K^{π}=7^{-}, α=1. Configuration=ν7/2[633]ν7/2[514].
m Band(K): K^{π}=13^{-}. Configuration=ν(7/2[633]7/2[514])π(5/2[402]7/2[404].
n Band(L): K^{π}=14^{+}. Configuration=ν(7/2[633]7/2[514])π(5/2[402]9/2[514].
o Band(m): K^{π}=15^{+}, α=0. Configuration=ν(7/2[633]7/2[514])π(7/2[404]9/2[514]).
p Band(M): K^{π}=15^{+}, α=1. Configuration=ν(7/2[633]7/2[514])π(7/2[404]9/2[514]).
q Band(N): K^{π}=18^{-}, α=0. Configuration=ν(7/2[633]7/2[514])π(1/2[541]5/2[402]7/2[404]9/2[514]).
r Band(n): K^{π}=18^{-}, α=1. Configuration=ν(7/2[633]7/2[514])π(1/2[541]5/2[402]7/2[404]9/2[514]).
s Band(o): K^{π}=21^{-}, α=0. Configuration=ν(5/2[512]7/2[633]7/2[514]9/2[624])π(5/2[402]9/2[514]).
t Band(O): K^{π}=21^{-}, α=1. Configuration=ν(5/2[512]7/2[633]7/2[514]9/2[624])π(5/2[402]9/2[514]).
u Band(P): K^{π}=22^{-}, α=0. Configuration=ν(5/2[512]7/2[633]7/2[514]9/2[624])π(7/2[404]9/2[514]).
v Band(p): K^{π}=22^{-}, α=1. Configuration=ν(5/2[512]7/2[633]7/2[514]9/2[624])π(7/2[404]9/2[514]).
w Band(q): K^{π}=25^{+}, α=0. Configuration=ν(5/2[512]7/2[633]7/2[514]9/2[624]) π(1/2[541]5/2[402]7/2[404]9/2[514]).
x Band(Q): K^{π}=25^{+}, α=1. Configuration=ν(5/2[512]7/2[633]7/2[514]9/2[624]) π(1/2[541]5/2[402]7/2[404]9/2[514]).
y Band(r): K^{π}=28^{-}, α=0. Configuration=ν(5/2[512]7/2[633]7/2[514]9/2[624]) π(1/2[541]7/2[404]9/2[514]11/2[505]).
z Band(R): K^{π}=28^{-}, α=1. Configuration=ν(5/2[512]7/2[633]7/2[514]9/2[624]) π(1/2[541]7/2[404]9/2[514]11/2[505]).
1 Band(S): K^{π}=(29^{+}) band, α=0. Configuration=ν(5/2[512]7/2[633]7/2[514]9/2[624]1/2[521]7/2[503]) π(1/2[541]5/2[402]7/2[404]9/2[514]).
2 Band(s): K^{π}=(29^{+}) band, α=1. Configuration=ν(5/2[512]7/2[633]7/2[514]9/2[624]1/2[521]7/2[503]) π(1/2[541]5/2[402]7/2[404]9/2[514]).
3 Band(t): K^{π}=30^{+} band, α=0. Configuration=ν(5/2[512]7/2[633]7/2[514]9/2[624]) π(5/2[402]7/2[404]9/2[514]11/2[505]).
4 Band(T): K^{π}=30^{+} band, α=1. Configuration=ν(5/2[512]7/2[633]7/2[514]9/2[624]) π(5/2[402]7/2[404]9/2[514]11/2[505]).
5 Band(U): K^{π}=(34^{+}) band. Configuration=ν(5/2[512]7/2[633]7/2[514]9/2[624]1/2[521]7/2[503]) π(5/2[402]7/2[404]9/2[514]11/2[505]).

Adopted Levels, Gammas (continued)

$\gamma(^{178}W)$

E_i(level)	J^π_i	E_γ†	I_γ†	E_f	J^π_f	Mult.#	δ	α@	$I_{(\gamma+ce)}$
105.90	2^+	105.8 1	100	0.0	0^+	E2		3.12	
342.74	4^+	236.7 1	100	105.90	2^+	E2		0.1772	
694.16	6^+	351.4 1	100	342.74	4^+	E2		0.0536	
1044.60	2^-	938.6 1	100	105.90	2^+	E1		0.00201	
1082.44	2^+	740.0‡ 6	10‡ 3	342.74	4^+				
		976.6‡ 5	100‡ 6	105.90	2^+	E0+M1+E2		0.007 3	
1110.43	2^+	767.7‡ 5	31‡ 7	342.74	4^+				
		1004.4‡ 6	32‡ 7	105.90	2^+				
		1110.8‡ 4	100‡ 5	0.0	0^+	E2		0.00366	
1120.13	3^-	75.5 1	28 14	1044.60	2^-				
		777.3 1	100 7	342.74	4^+	E1		0.00287	
		1014.5 5	10 3	105.90	2^+				
1141.50	8^+	447.4 1	100	694.16	6^+	E2		0.0278	
1225.24	4^-	105.2 1	35 9	1120.13	3^-				
		180.6 1	48 4	1044.60	2^-				
		882.4 1	100 4	342.74	4^+	E1		0.00225	
1236.50	3^+	893.6‡ 2	49‡ 5	342.74	4^+	E2		0.00566	
		1130.7‡ 2	100‡ 7	105.90	2^+	E2+M1	+6.9 +77−24	0.00361 11	
1275.09	4^+	192.5‡ 2	5.2‡ 12	1082.44	2^+	E2		0.351	
		580.8‡ 2	22‡ 4	694.16	6^+	E2		0.01460	
		932.7‡ 5	100‡ 6	342.74	4^+	E0+M1+E2		0.008 4	
		1169.5‡ 5	4.2‡ 9	105.90	2^+				
1294.51	0^+	1188.7‡ 2	100‡	105.90	2^+				
		1294.4‡ 2		0.0	0^+	E0			0.052 5
1344.62	5^-	119.2 5	15 5	1225.24	4^-				
		224.3 1	70 7	1120.13	3^-	(E2)		0.211	
		650.40 6	100 7	694.16	6^+	(E1)		0.00409	
		1001.9 1	44 4	342.74	4^+	(E1)		1.78×10^{-3}	
1380.14	4^+	686.1 1	50 8	694.16	6^+				
		1037.4 1	100 8	342.74	4^+	M1(+E2)		0.0065 24	
		1274.2 1	63 8	105.90	2^+	E2		0.00282	
1417.68	2^+	335.3‡ 2	8.6‡ 21	1082.44	2^+				
		1311.5‡ 2	100‡ 14	105.90	2^+	E0+M1+E2		0.0038 12	
		1417.9‡ 2	42‡ 7	0.0	0^+	E2		0.00233	
1449.6	2^+	1106.5‡ 6	52‡ 7	342.74	4^+	E2		0.00369	
		1342.5‡ 15	49‡ 10	105.90	2^+	E2		0.00256	

$\gamma(^{178}W)$ (continued)

E_i(level)	J^π_i	E_γ[†]	I_γ[†]	E_f	J^π_f	Mult.[#]	α[@]	Comments
1449.6	2^+	1450.0[‡] *5*	100[‡] *6*	0.0	0^+	E2	0.00225	
1508.62	6^-	163.8 *5*	10.8 *22*	1344.62	5^-	(E2,M1)	0.9 *3*	
		283.4 *1*	100 *8*	1225.24	4^-	(E2)	0.1009	
1545.2	(3^-)	500.3 *5*	100	1044.60	2^-			
1555.96	6^+	280.7[‡] *2*	33[‡] *8*	1275.09	4^+	E2	0.1039	
		861.9 *1*	100 *17*	694.16	6^+	E0+M1+E2	0.010 *4*	
1572.41	5^+	878.2[‡] *2*	35[‡] *6*	694.16	6^+			
		1229.7[‡] *2*	100[‡] *11*	342.74	4^+			
1597.83	4^+	1255.1[‡] *2*	100[‡] *9*	342.74	4^+	E0+M1+E2	0.0042 *14*	
		1491.9[‡] *2*	64[‡] *11*	105.90	2^+	E2	0.00214	
1641.34	0^+	521.2 *2*	100 *22*	1120.13	3^-			
		1298.6 *2*	28 *8*	342.74	4^+			
1656.29	7^-	311.7 *1*	100 *7*	1344.62	5^-	E2	0.0759	
		514.6 *1*	31.7 *24*	1141.50	8^+			
		962.1 *1*	46.3 *24*	694.16	6^+	E1	0.00192	
1664.94	6^+	284.9 *1*	9.2 *7*	1380.14	4^+	(E2)	0.0993	B(E2)(W.u.)=0.091 *14*
		970.7 *1*	60.5 *22*	694.16	6^+	(M1+E2)	0.008 *3*	
		1322.4 *1*	100 *3*	342.74	4^+	(E2)	0.00263	B(E2)(W.u.)=0.00046 *7*
1665.35	10^+	523.6 *1*	100	1141.50	8^+	E2	0.0187	
1703.67	4^+	1009.4 *2*	32 *4*	694.16	6^+	E2	0.00442	
		1361.0 *2*	73 *10*	342.74	4^+	M1	0.00455	
		1597.8 *2*	100 *9*	105.90	2^+			
1718.06	4^+	481.5 *2*	100 *15*	1236.50	3^+			
		607.7 *2*	47 *10*	1110.43	2^+			
		635.7 *2*	65 *15*	1082.44	2^+			
		1375.2 *2*	42 *8*	342.74	4^+			
1728.40		683.8 *2*	100	1044.60	2^-			
1738.70	7^-	73.6 *1*	100 *4*	1664.94	6^+	E1	0.816	B(E1)(W.u.)=2.95×10^{-5} *23*
		393.7 *1*	7.7 *8*	1344.62	5^-			
1764.10	(5^-)	218.6 *5*	17 *8*	1545.2	(3^-)			
		538.8 *1*	100 *8*	1225.24	4^-			
1827.41	8^-	88.3 *1*	100 *4*	1738.70	7^-			
		318.8 *1*	14 *1*	1508.62	6^-			
1835.39	7^+	170.5 *1*	100	1664.94	6^+	(M1,E2)	0.8 *3*	
1863.9	(4^+)	1169.5[‡] *5*	57[‡] *50*	694.16	6^+			
		1521.4[‡] *10*	57[‡] *30*	342.74	4^+			
		1758.2[‡] *6*	100[‡] *30*	105.90	2^+			
1875.7		137.0 *5*	100	1738.70	7^-			
1888.42	(8^-)	379.8 *1*	100	1508.62	6^-	(E2)	0.0432	

$\gamma(^{178}W)$ (continued)

E_i(level)	J_i^π	E_γ†	I_γ†	E_f	J_f^π	Mult.#	α@
1915.80	8^+	359.9 *1*	67 *5*	1555.96	6^+		
		774.1 *1*	100 *11*	1141.50	8^+	E0+M1+E2	0.013 *6*
1939.15		1596.4 *2*	100	342.74	4^+		
1962.53		842.4 *2*	100	1120.13	3^-		
1964.46	9^-	136.9 *1*	100 *7*	1827.41	8^-	(M1,E2)	1.6 *4*
		225.6 *1*	76 *4*	1738.70	7^-	(E2)	0.207
		307.9 *1*	17 *3*	1656.29	7^-		
		823.6 *1*	9 *3*	1141.50	8^+		
1997.23		1654.1 *2*	100 *14*	342.74	4^+		
		1891.7 *2*	30 *9*	105.90	2^+		
2023.38	8^+	187.8 *1*	56 *6*	1835.39	7^+		
		358.6 *1*	100 *6*	1664.94	6^+		
2041.81	9^-	385.6 *1*	100 *5*	1656.29	7^-	(E2)	0.0414
		900.1 *1*	36.6 *24*	1141.50	8^+	(E1)	0.00217
2043.7		305.0 *3*	100	1738.70	7^-		
2054.14	(7)	912.1 *5*	38 *13*	1141.50	8^+		
		1360.0 *1*	100 *13*	694.16	6^+		
2076.17	(7^-)	312.0 *1*	100 *10*	1764.10	(5^-)		
		1382.1 *5*	40 *7*	694.16	6^+		
2078.27	8^-	339.6 *1*	100	1738.70	7^-		
2121.05		1778.3 *2*	100	342.74	4^+		
2133.03	10^-	168.3 *1*	46.4 *21*	1964.46	9^-	(M1,E2)	0.8 *3*
		305.7 *1*	100 *4*	1827.41	8^-	(E2)	0.0804
2136.05	8^+	994.2 *1*	100 *17*	1141.50	8^+		
		1442.4 *5*	67 *17*	694.16	6^+		
2226.77	(9^+)	203.5 *1*	35.7 *24*	2023.38	8^+	(E2,M1)	0.46 *18*
		391.6 *1*	100 *7*	1835.39	7^+	(E2)	0.0397
2239.4		363.7 *3*	100	1875.7			
2244.45	12^+	578.9 *1*	100	1665.35	10^+	(E2)	0.01472
2322.62	9^-	245.0 *5*	25 *8*	2078.27	8^-		
		358.4 *1*	88 *13*	1964.46	9^-		
		494.9 *1*	100 *13*	1827.41	8^-		
2327.51	11^-	194.4 *1*	20.6 *9*	2133.03	10^-	(M1,E2)	0.53 *20*
		363.1 *1*	100 *4*	1964.46	9^-	(E2)	0.0489
2339.74	10^+	423.8 *1*	44 *6*	1915.80	8^+		
		674.7 *1*	100 *6*	1665.35	10^+		
2347.93	(9)	293.8 *1*	55 *7*	2054.14	(7)		
		1206.4 *1*	100 *9*	1141.50	8^+		
2355.82	10^-	467.4 *1*	100	1888.42	(8^-)	(E2)	0.0249
2444.42	10^+	217.5 *1*	25 *4*	2226.77	(9^+)		
		420.9 *1*	100 *4*	2023.38	8^+		
2468.34	(9^-)	392.1 *1*	100 *8*	2076.17	(7^-)		

$^{178}_{74}W_{104}$-10

$\gamma(^{178}W)$ (continued)

E_i(level)	J^π_i	E_γ †	I_γ †	E_f	J^π_f	Mult. #	α @	Comments
2468.34	(9⁻)	1326.9 *1*	54 *5*	1141.50	8⁺			
2489.84	11⁻	447.9 *1*	100 *3*	2041.81	9⁻	(E2)	0.0278	
		824.6 *1*	26.5 *21*	1665.35	10⁺			
2546.07	12⁻	218.5 *1*	16.8 *10*	2327.51	11⁻	(E2,M1)	0.38 *15*	
		412.9 *1*	100 *4*	2133.03	10⁻	E2	0.0344	
2577.56	10⁻	254.9 *1*	89 *11*	2322.62	9⁻			
		444.1 *5*	22 *11*	2133.03	10⁻			
		612.9 *1*	100 *22*	1964.46	9⁻			
2671.79	11⁺	228.2 *5*	13.9 *14*	2444.42	10⁺			I_γ: 100 *7* from ^{177}Hf(α,3nγ).
		445.5 *1*	100 *6*	2226.77	(9⁺)			I_γ: 73 *6* from ^{177}Hf(α,3nγ).
2682.79	10⁺	546.4 *1*	0.9 *2*	2136.05	8⁺	E2	0.01689	
		1016.9 *1*	100 *20*	1665.35	10⁺			
		1541.9 *1*	60 *10*	1141.50	8⁺			
2718.14	(11)	370.2 *1*	100 *7*	2347.93	(9)			
		1052.8 *1*	67 *7*	1665.35	10⁺			
2784.30	13⁻	238.2 *1*	10.7 *24*	2546.07	12⁻			I_γ: 100 *7* from ^{177}Hf(α,3nγ).
		456.8 *1*	100 *4*	2327.51	11⁻	(E2)	0.0264	I_γ: 76 *5* from ^{177}Hf(α,3nγ).
2803.99	(12⁺)	464.3 *1*	35 *6*	2339.74	10⁺	E2	0.0253	
		559.3 *1*	100 *9*	2244.45	12⁺	M1(+E2)	0.029 *14*	
2841.97	11⁻	264.4 *1*	100	2577.56	10⁻			
2845.65	12⁺	1180.3 *1*	100	1665.35	10⁺			
2858.71	14⁺	614.2 *1*	100	2244.45	12⁺	E2	0.01282	
2901.42	12⁻	545.6 *1*	100	2355.82	10⁻	(E2)	0.01695	
2911.62	12⁺	466.9 *1*	67 *13*	2444.42	10⁺			
		572.0 *1*	100 *22*	2339.74	10⁺			
		1246.3 *1*	89 *11*	1665.35	10⁺			
2933.45	(11⁻)	465.1 *1*	100	2468.34	(9⁻)			
2994.86	13⁻	505.0 *1*	100 *3*	2489.84	11⁻			
		750.6 *5*	15 *3*	2244.45	12⁺			
3044.19	14⁻	260.0 *1*	8.9 *25*	2784.30	13⁻			
		498.1 *1*	100 *4*	2546.07	12⁻			
3053.81	11⁻	211.6 *5*	7.0 *23*	2841.97	11⁻			
		269.1 *5*	9 *3*	2784.30	13⁻			
		476.0 *1*	27.9 *23*	2577.56	10⁻			
		507.6 *1*	26 *5*	2546.07	12⁻			
		563.9 *5*	9.8 *16*	2489.84	11⁻			
		726.6 *5*	7.0 *23*	2327.51	11⁻			
		920.8 *1*	79 *5*	2133.03	10⁻	M1+E2	0.009 *4*	
		1012.1 *5*	5.6 *14*	2041.81	9⁻			
		1089.6 *1*	100 *7*	1964.46	9⁻	E2	0.00380	B(E2)(W.u.)>0.0011
		1388.5 *5*	9 *5*	1665.35	10⁺			

$^{178}_{74}W_{104}$-11

Adopted Levels, Gammas (continued)

$\gamma(^{178}W)$ (continued)

E_i(level)	J^π_i	E_γ†	I_γ†	E_f	J^π_f	Mult.#	α@	Comments
3138.62	13^+	227.9 *5*	8.3 *17*	2911.62	12^+			
		466.7 *1*	100 *8*	2671.79	11^+	(E2)	0.0250	
3144.1		1478.7 *5*	100	1665.35	10^+			
3161.94	(13)	443.8 *1*	100	2718.14	(11)			
3209.25	14^+	363.8 *5*	27 *14*	2845.65	12^+			
		964.7 *1*	100 *9*	2244.45	12^+			
3235.34	12^+	181.4 *1*	100 *4*	3053.81	11^-	D		
		389.5 *5*	2.9 *6*	2845.65	12^+			
		430.8 *1*	6.8 *11*	2803.99	(12^+)			
		552.3 *1*	12.8 *23*	2682.79	10^+	E2	0.01646	B(E2)(W.u.)>0.015
		564.2 *1*	6.1 *16*	2671.79	11^+			
		689.1 *5*	1.7 *5*	2546.07	12^-			
		790.9 *1*	5.3 *15*	2444.42	10^+			
		907.8 *5*	1.7 *5*	2327.51	11^-			
		991.0 *1*	9.0 *15*	2244.45	12^+	M1(+E2)	0.007 *3*	
		1570.6 *1*	12.0 *15*	1664.94	6^+			
3282.20	(12^-)	228.4 *1*	100	3053.81	11^-			
3301.2		2957.6‡ *5*	100‡ *22*	342.74	4^+			
		3196.0‡ *5*	30‡ *9*	105.90	2^+			
3317.40	15^-	273.3 *1*	7.9 *20*	3044.19	14^-			
		533.0 *1*	100 *4*	2784.30	13^-	(E2)	0.0179	
3318.73	(14^+)	459.9 *1*	100 *9*	2858.71	14^+	M1(+E2)	0.048 *23*	
		515.0 *1*	100 *9*	2803.99	(12^+)			
3368.9	(2^+)	2247.8‡ *8*	44‡ *16*	1120.13	3^-			
		2287.0‡ *6*	67‡ *22*	1082.44	2^+			
		2324.6‡ *8*	44‡ *22*	1044.60	2^-			
		3025.0‡ *5*	100‡ *30*	342.74	4^+			
		3263.6‡ *6*	91‡ *31*	105.90	2^+			
		3369.5‡ *6*	36‡ *11*	0.0	0^+			
3383.3		3277.4‡ *6*	100‡ *36*	105.90	2^+			
		3383.3‡ *6*	33‡ *10*	0.0	0^+			
3385.35	(13^+)	103.4 *5*	75 *15*	3282.20	(12^-)			
		150.2 *5*	100 *15*	3235.34	12^+			
3420.39	14^+	508.6 *1*	95 *10*	2911.62	12^+			
		616.5 *1*	100 *10*	2803.99	(12^+)			
		1176.0 *1*	50 *5*	2244.45	12^+			
3455.57	(13^-)	522.1 *1*	100	2933.45	(11^-)			
3459.75	(13^-)	526.3 *1*	100	2933.45	(11^-)			
3488.42	16^+	629.6 *1*	100	2858.71	14^+	E2	0.01211	

$^{178}_{74}W_{104}$-12

Adopted Levels, Gammas (continued)

$\gamma(^{178}W)$ (continued)

E_i(level)	J^π_i	E_γ†	I_γ†	E_f	J^π_f	Mult.#	α@	Comments
3499.3		3156.8‡ *5*	100‡ *33*	342.74	4^+			
		3392.9‡ *6*	30‡ *10*	105.90	2^+			
3505.8		3399.4‡ *6*	100‡ *26*	105.90	2^+			
		3506.7‡ *8*	12‡ *6*	0.0	0^+			
3511.9	(2^+)	2287.0‡ *6*	33‡ *11*	1225.24	4^-			
		3168.6‡ *5*	100‡ *22*	342.74	4^+			
		3406.1‡ *6*	53‡ *13*	105.90	2^+			
		3512.0‡ *8*	11‡ *3*	0.0	0^+			
3514.82	14^-	613.4 *1*	100	2901.42	12^-			
3515.0		3172.2‡ *6*	100‡ *36*	342.74	4^+			
		3409.0‡ *8*	55‡ *18*	105.90	2^+			
3525.53	(13^-)	140.2 *1*	4.4 *5*	3385.35	(13^+)			
		290.2 *1*	100 *3*	3235.34	12^+	E1	0.0248	B(E1)(W.u.)>8.2×10^{-6} E_γ: From ^{164}Dy(^{18}O,4nγ), ^{177}Hf(α,3nγ).
3550.9		2324.6‡ *8*	21‡ *11*	1225.24	4^-			
		2468.0‡ *20*	21‡ *11*	1082.44	2^+			
		3208.5‡ *5*	78‡ *21*	342.74	4^+			
		3445.2‡ *6*	100‡ *11*	105.90	2^+			
3558.28	15^-	563.4 *1*	100 *3*	2994.86	13^-			
		699.9 *5*	10 *3*	2858.71	14^+			
3580.2		3237.6‡ *6*	100‡ *32*	342.74	4^+			
		3474.0‡ *8*	32‡ *10*	105.90	2^+			
3585.5		3242.9‡ *6*	100‡ *36*	342.74	4^+			
		3479.3‡ *8*	36‡ *11*	105.90	2^+			
3593.63	14^-	68.2 *1*	100	3525.53	(13^-)	(M1)	2.47	B(M1)(W.u.)=0.0067 *23*
3594.8		3251.6‡ *5*	100‡ *34*	342.74	4^+			
		3489.9‡ *8*	20‡ *5*	105.90	2^+			
3612.22	15^+	473.5 *1*	100	3138.62	13^+			
3612.91	16^-	295.6 *5*	2.7 *14*	3317.40	15^-			
		568.7 *1*	100 *4*	3044.19	14^-			
3634.4		2036.5‡ *8*	100‡ *33*	1597.83	4^+			
		3291.6‡ *6*	77‡ *27*	342.74	4^+			
		3528.7‡ *8*	70‡ *23*	105.90	2^+			
3654.93	15^+	61.4 *1*	100	3593.63	14^-	(E1)	0.265	B(E1)(W.u.)=2.43×10^{-5} *9*
3661.14	16^+	451.8 *1*	27 *5*	3209.25	14^+			

$^{178}_{74}W_{104}$-13

$\gamma(^{178}W)$ (continued)

E_i(level)	J^π_i	E_γ[†]	I_γ[†]	E_f	J^π_f	Mult.[#]	α[@]	Comments
3661.14	16^+	802.6 *1*	100 *9*	2858.71	14^+			
3673.94	(15)	512.0 *1*	100	3161.94	(13)			
3686.63	(14^+)	226.9 *5*	38 *5*	3459.75	(13^-)			
		230.8 *5*	50 *4*	3455.57	(13^-)			
		451.3 *1*	100 *13*	3235.34	12^+			
3689.21	14^-	163.6 *1*	100	3525.53	(13^-)	M1	1.170	
3695.06		1450.6 *1*	100	2244.45	12^+			
3706.2		3011.8[‡] *6*	75[‡] *25*	694.16	6^+			
		3363.6[‡] *6*	100[‡] *30*	342.74	4^+			
3807.0		3112.3[‡] *5*	100[‡] *33*	694.16	6^+			
		3464.9[‡] *6*	30[‡] *7*	342.74	4^+			
3810.5		3116.3[‡] *5*	100[‡] *33*	694.16	6^+			
		3467.7[‡] *8*	30[‡] *7*	342.74	4^+			
3837.0	(15^+)	150.4 *5*	100	3686.63	(14^+)			
3862.33	16^+	207.4 *1*	100	3654.93	15^+	M1	0.603	
3871.00	16^+	382.5 *1*	41 *5*	3488.42	16^+			
		552.4 *1*	100 *12*	3318.73	(14^+)			
3876.03	(15^-)	282.4 *1*	100	3593.63	14^-			
3912.51	17^-	595.1 *1*	100	3317.40	15^-			
3930.62	15^-	241.0 *1*	100 *3*	3689.21	14^-			
		405.0 *5*	3.3 *2*	3525.53	(13^-)			
4009.29	16^+	588.9 *1*	100 *6*	3420.39	14^+			
		1150.6 *5*	29 *5*	2858.71	14^+			
4084.4	(16^+)	247.4 *1*	100	3837.0	(15^+)			
4100.17	18^+	611.8 *1*	100	3488.42	16^+	E2	0.01293	
4129.93	17^+	267.5 *1*	100 *5*	3862.33	16^+			
		475.1 *5*	7 *4*	3654.93	15^+			
4157.92	17^+	288.5 *5*	39 *8*	3871.00	16^+			
		497.7 *5*	39 *9*	3661.14	16^+			
		545.6 *1*	100 *8*	3612.22	15^+			
4171.5	16^-	656.7 *5*	100	3514.82	14^-			
4182.98	17^-	624.7 *1*	100	3558.28	15^-			
4208.88	16^-	277.9 *1*	100 *4*	3930.62	15^-	M1	0.270	Mult.: A_2=−0.12 *10*, α(K)exp=0.244 *15*.
		520.0 *1*	21 *4*	3689.21	14^-	E2	0.0191	Mult.: α(K)exp=0.017 *5*.
4238.21	18^-	625.3 *1*	100	3612.91	16^-	E2	0.01230	Mult.: A_2=+0.52 *8*.
4238.94	(17)	565.0 *1*	100	3673.94	(15)			
4248.20	18^+	587.1 *1*	50 *4*	3661.14	16^+			
		759.7 *1*	100 *7*	3488.42	16^+	E2	0.00798	Mult.: A_2=+0.24 *20*.
4368.8	(17^+)	284.4 *1*	100	4084.4	(16^+)			
4429.73	18^+	299.7 *1*	100 *5*	4129.93	17^+	(M1,E2)	0.15 *7*	Mult.: A_2=+0.10 *4*, DCO=1.10 *4*.

$^{178}_{74}W_{104}$-14

$\gamma(^{178}W)$ (continued)

E_i(level)	J^π_i	E_γ[†]	I_γ[†]	E_f	J^π_f	Mult.[#]	α[@]	Comments
4429.73	18^+	567.5 *1*	16 *3*	3862.33	16^+	(E2)	0.01543	Mult.: DCO=0.92 *12*.
4498.31	18^+	398.4 *5*	1.9 *5*	4100.17	18^+			
		627.3 *1*	100 *13*	3871.00	16^+			
4516.28	17^-	307.3 *1*	100 *6*	4208.88	16^-			
		585.6 *1*	41 *3*	3930.62	15^-			
4555.92	19^-	643.4 *1*	100	3912.51	17^-	(E2)	0.01152	Mult.: A_2=+0.42 *12*.
4663.39	18^+	654.1 *1*	100	4009.29	16^+			
4678.7	(18^+)	309.9 *1*	100	4368.8	(17^+)			
4711.83	(17^+)	1057.0 *1*	100	3654.93	15^+	E2	0.00403	α(K)exp=0.0026 *9*.
4730.36	20^+	630.2 *1*	100	4100.17	18^+			
4753.63	19^+	323.9 *1*	100 *7*	4429.73	18^+	(M1,E2)	0.12 *6*	Mult.: DCO=1.15 *4*.
		623.7 *1*	21 *3*	4129.93	17^+	(E2)	0.01237	Mult.: DCO=1.26 *10*.
4797.12	19^+	639.2 *1*	100	4157.92	17^+			
4833.7	(18^-)	662.2 *5*	100	4171.5	16^-			
4835.44	(19)	596.5 *1*	100	4238.94	(17)			
4863.88	19^-	680.9 *1*	100	4182.98	17^-			
4879.72	18^-	168.0 *1*	23.5 *20*	4711.83	(17^+)	(E1)	0.0978	B(E1)(W.u.)>1.9×10^{-6} Mult.: A_2=−0.67.
		363.3 *1*	100 *8*	4516.28	17^-	M1	0.1310	B(M1)(W.u.)>8.1×10^{-5} Mult.: A_2=+0.28 *4*, α(K)exp=0.094 *9*.
		670.9 *1*	39.2 *20*	4208.88	16^-	E2	0.01048	B(E2)(W.u.)>0.0049 Mult.: α(K)exp=0.0094 *21*.
		966 *1*	5.9 *18*	3912.51	17^-			
		1266 *1*	3.9 *16*	3612.91	16^-			
4905.71	20^-	667.5 *1*	100	4238.21	18^-			
4941.84	20^+	693.6 *1*	100 *8*	4248.20	18^+			
		841.7 *1*	42 *4*	4100.17	18^+			
5006.7	(19^+)	328.0 *1*	100 *13*	4678.7	(18^+)			
		637.7 *5*	21 *6*	4368.8	(17^+)			
5063.22	19^-	183.5 *1*	100	4879.72	18^-	(M1)	0.848	Mult.: A_2=−0.13 *2*.
5096.83	20^+	343.1 *1*	100 *18*	4753.63	19^+	(M1,E2)	0.11 *5*	Mult.: DCO=1.11 *4*.
		667.1 *1*	27 *5*	4429.73	18^+	(E2)	0.01062	Mult.: DCO=1.10 *11*.
5188.31	20^+	690.0 *1*	100	4498.31	18^+			
5234.12	21^-	678.2 *1*	100	4555.92	19^-			
5269.84	20^-	206.6 *1*	100	5063.22	19^-	M1(+E2)	0.44 *17*	Mult.: A_2=+0.01 *7*.
5313.7	21^-	43.8 *1*	100 *11*	5269.84	20^-	(M1)	9.04 *14*	B(M1)(W.u.)=0.00039 *7*
		251.0 *5*	33 *11*	5063.22	19^-			
5428.96	22^+	698.6 *1*	100	4730.36	20^+			
5455.74	21^+	358.7 *1*	100 *5*	5096.83	20^+			Mult.: DCO=1.16 *5*.
		702.2 *1*	55 *10*	4753.63	19^+			Mult.: DCO=1.18 *7*.
5460.8	(21)	625.4 *1*	100	4835.44	(19)			

$^{178}_{74}W_{104}$-15

Adopted Levels, Gammas (continued)

γ(^{178}W) (continued)

E_i(level)	J^π_i	E_γ[†]	I_γ[†]	E_f	J^π_f	Mult.[#]	α[@]	Comments
5522.1	21^-	252.2 *1*	100 *5*	5269.84	20^-			Mult.: A_2=+0.03 *6*.
		458.8 *5*	20 *15*	5063.22	19^-			
5525.93	21^+	728.8 *1*	100	4797.12	19^+			
5537.6	(20^-)	704[&] *1*	100	4833.7	(18^-)			
5577.5	(21^-)	713.6 *1*	100	4863.88	19^-			
5603.21	22^-	697.5 *1*	100	4905.71	20^-			
5627.1	22^-	313.5 *1*	100	5313.7	21^-			
5675.2	22^-	361.5 *1*	100	5313.7	21^-			
5688.75	22^+	746.9 *1*	100 *13*	4941.84	20^+			
		958.6 *5*	12.5 *25*	4730.36	20^+			
5814.2	22^-	292.1 *1*	100 *6*	5522.1	21^-			
		544.9 *5*	28 *7*	5269.84	20^-			
5827.22	22^+	371.3 *1*	100 *7*	5455.74	21^+			Mult.: DCO=1.28 *6*.
		730.5 *1*	53 *7*	5096.83	20^+			Mult.: DCO=1.14 *7*.
5906.61	22^+	718.3 *1*	100	5188.31	20^+			
5939.9	23^-	705.8 *1*	100	5234.12	21^-			
6000.6	23^-	325.3 *1*	30.4 *22*	5675.2	22^-			
		373.3 *1*	100 *4*	5627.1	22^-			
		686.8 *5*	10.9 *22*	5313.7	21^-			
6052.9	23^-	377.7 *1*	100	5675.2	22^-			
6136.8	(23)	676.0 *1*	100	5460.8	(21)			
6140.0	23^-	325.8 *1*	100 *8*	5814.2	22^-			
		617.9 *5*	41 *7*	5522.1	21^-			
6194.47	24^+	765.5 *1*	100	5428.96	22^+			
6207.8	23^+	380.5 *1*	100 *11*	5827.22	22^+			
		752.1 *1*	89 *11*	5455.74	21^+			Mult.: DCO=1.16 *8*.
6299.4	(23^-)	721.9 *5*	100	5577.5	(21^-)			
6329.1	23^+	803.2 *5*	100	5525.93	21^+			
6332.7	24^-	729.5 *1*	100	5603.21	22^-			
6389.8	24^-	336.9 *1*	13 *6*	6052.9	23^-			
		389.1 *1*	100 *6*	6000.6	23^-	M1+E2	0.07 *4*	Mult.: A_2=+0.47 *15*, α(K)exp=0.058 *5*.
		762.9 *1*	44 *4*	5627.1	22^-	E2	0.00790	Mult.: α(K)exp=0.0081 *17*.
6447.7	24^-	394.8 *5*	100 *20*	6052.9	23^-			
		772.4 *5*	50 *25*	5675.2	22^-			
6483.85	24^+	795.1 *1*	100	5688.75	22^+			
6494.4	24^-	354.3 *1*	100 *10*	6140.0	23^-			
		680.7 *5*	30 *10*	5814.2	22^-			
6572.7	25^+	182.9 *1*	100 *3*	6389.8	24^-	(E1)	0.0787	B(E1)(W.u.)=1.44×10^{-7} *9* Mult.: A_2=−0.13 *2*.
		572[&] *1*	<1.0	6000.6	23^-			
		946 *1*	1.7 *7*	5627.1	22^-	(E3)	0.01144	B(E3)(W.u.)=0.07 *3*

From ENSDF

$^{178}_{74}W_{104}$-16

$\gamma(^{178}W)$ (continued)

E_i(level)	J^π_i	E_γ†	I_γ†	E_f	J^π_f	Mult.#	α@	Comments
6593.8	24+	386.0 *1*	100 *13*	6207.8	23+			
		767.0 *5*	63 *10*	5827.22	22+			Mult.: DCO=1.18 *10*.
6685.3	25−	745.4 *1*	100	5939.9	23−			
6795.7	25−	405.8 *1*	100 *15*	6389.8	24−			
		795.4 *5*	67 *17*	6000.6	23−			
6859.1	25−	411.3 *5*	100 *40*	6447.7	24−			
		806.2 *5*	50 *25*	6052.9	23−			
6860.4	26+	287.7 *1*	100	6572.7	25+	M1	0.246	Mult.: A_2=−1.15 *20*, DCO=0.17 *1*.
6872.9	25−	378.5 *1*	100 *9*	6494.4	24−			
		734.1 *5*	38 *13*	6140.0	23−			
6886.5	(25)	749.7 *1*	100	6136.8	(23)			
6971.6	(25+)	377.4 *5*	100 *20*	6593.8	24+			
		763.9 *5*	80 *20*	6207.8	23+			Mult.: DCO=1.13 *13*.
6984.2	25+	390.4 *5*	100	6593.8	24+			
7006.0	25+	411.7 *4*	62 *15*	6593.8	24+			
		799.7 *7*	100 *54*	6207.8	23+			
7017.2	(26+)	822.7 *1*	100	6194.47	24+			
7113.2	26−	780.5 *1*	100	6332.7	24−			
7217.5	27+	357.0 *1*	100 *6*	6860.4	26+	M1	0.1373	Mult.: A_2=+0.04 *20*, DCO=1.05 *3*.
		645.0 *5*	23.5 *24*	6572.7	25+	E2	0.01146	Mult.: DCO=1.21 *5*.
7218.6	26−	422.6 *5*	100 *20*	6795.7	25−			
		828.8 *5*	100 *25*	6389.8	24−			
7272.4	26−	399.1 *5*	100 *15*	6872.9	25−			
		778.5 *5*	25 *13*	6494.4	24−			
7288.2	26−	429.1 *5*	33 *20*	6859.1	25−			
		840.5 *5*	100 *33*	6447.7	24−			
7330.2	26+	846.3 *5*	100	6483.85	24+			
7337.0	26+	365.5 *1*	100 *4*	6971.6	(25+)			Mult.: DCO=1.15 *6*.
		743.0 *2*	50 *6*	6593.8	24+			Mult.: DCO=0.83 *13*.
7392.2	26+	386.0 *10*	22 *33*	7006.0	25+			
		420.3 *3*	100 *11*	6971.6	(25+)			
		799.9 *6*	83 *39*	6593.8	24+			
7489.9	27−	804.6 *1*	100	6685.3	25−			
7611.7	28+	394.0 *1*	100 *8*	7217.5	27+	M1	0.1056	Mult.: A_2=+0.49 *20*, DCO=1.52 *6*.
		751.3 *1*	75 *8*	6860.4	26+	E2	0.00817	Mult.: DCO=1.53 *17*.
7657.6	27−	438.7 *5*	33 *17*	7218.6	26−			
		862.2 *5*	100 *33*	6795.7	25−			
7690.1	27−	417.8 *5*	100 *25*	7272.4	26−			
		817.0 *5*	<50	6872.9	25−			
7709.4	27+	373.0 *1*	100 *12*	7337.0	26+			Mult.: DCO=1.15 *8*.
		737.5 *2*	69 *8*	6971.6	(25+)			

$^{178}_{74}W_{104}$-17

$\gamma(^{178}W)$ (continued)

E_i(level)	J^{π}_i	E_{γ}[†]	I_{γ}[†]	E_f	J^{π}_f	Mult.[#]	α[@]	Comments
7719.3	(27)	833.3[&] 5	100	6886.5	(25)			
7732.2	27^-	444		7288.2	26^-			
		873		6859.1	25^-			
7798.8	27^+	406.6 2	100	7392.2	26^+			
		793.1 14		7006.0	25^+			
7897.5	(28^+)	880.3 5	100	7017.2	(26^+)			
7961.9	(28^-)	848.7 1	100	7113.2	26^-			
8034.6	29^+	423.1 5	100 15	7611.7	28^+	M1	0.0875	Mult.: A_2=+0.42 26, DCO=2.16 16.
		817.8 5	100 20	7217.5	27^+	E2	0.00681	Mult.: DCO=1.03 14.
8096.4	28^+	387.5 1	100 9	7709.4	27^+			
		758.9 1	27 6	7337.0	26^+			
8111.6	28^-	454		7657.6	27^-			
		893		7218.6	26^-			
8122.1	28^-	432		7690.1	27^-			
		850		7272.4	26^-			
8148.4	$28^{(-)}$	930.9 1	100	7217.5	27^+	E1	0.00204	B(E1)(W.u.)>5.3×10^{-8} Mult.: A_2=−0.45 20, DCO=0.62 3.
8189.1	28^-	457		7732.2	27^-			
		901		7288.2	26^-			
8228.2	28^+	427.0[&] 2	43 14	7798.8	27^+			
		836.0 4	100 21	7392.2	26^+			
8365.3	(29^-)	875.4 5	100	7489.9	27^-			
8476.0	$29^{(-)}$	327.5 5	100 33	8148.4	$28^{(-)}$	M1	0.173	Mult.: DCO=0.20 5.
		864.4 1	93 7	7611.7	28^+	E1	0.00234	Mult.: DCO=0.68 13.
8484.5	30^+	450.0 5	33 17	8034.6	29^+	M1	0.0744	Mult.: A_2=+0.34 30.
		872.6 5	100 33	7611.7	28^+	E2	0.00595	Mult.: DCO=1.10 9.
8499.7	29^+	403.2 1	100 11	8096.4	28^+			
		791.1 4	84 16	7709.4	27^+			
8564.3	29^-	442		8122.1	28^-			
		874		7690.1	27^-			
8578.6	29^-	467		8111.6	28^-			
		921		7657.6	27^-			
8655.3	29^-	466		8189.1	28^-			
		923		7732.2	27^-			
8665.6	29^+	439.5[&] 4	100	8228.2	28^+			
8800.3	30^+	324.4 1	100 6	8476.0	$29^{(-)}$	E1	0.0190	B(E1)(W.u.)>4.6×10^{-6} Mult.: DCO=0.60 11.
		765.8 1	27 3	8034.6	29^+	M1	0.0189	B(M1)(W.u.)>9.8×10^{-6} Mult.: DCO=1.10 20.
		1187.3 4	5.9 6	7611.7	28^+	E2	0.00322	B(E2)(W.u.)>0.00018

$^{178}_{74}W_{104}$-18

$\gamma(^{178}W)$ (continued)

E_i(level)	J_i^π	E_γ†	I_γ†	E_f	J_f^π	Mult.#	α@	Comments
8897.3	$30^{(-)}$	421.8 *5*	100	8476.0	$29^{(-)}$	M1	0.0882	
		749		8148.4	$28^{(-)}$	E2	0.00822	E_γ: see $^{170}Er(^{13}C,5n\gamma)$.
8905.6	(29^+)	757.2 *2*	100	8148.4	$28^{(-)}$	(E1)	0.00302	B(E1)(W.u.)>4.9×10^{-7} Mult.: DCO=0.75 *24*.
8919.5	30^+	419.6 *6*		8499.7	29^+			
		823.4 *4*		8096.4	28^+			
8957.9	31^+	474 *1*	<50	8484.5	30^+	M1	0.0649	Mult.: A_2=+0.38 *34*.
		924 *1*	100 *50*	8034.6	29^+	E2	0.00529	
9016.6	30^-	452		8564.3	29^-			
		895		8122.1	28^-			
9051.6	30^-	473		8578.6	29^-			
		940		8111.6	28^-			
9124.7	30^-	469		8655.3	29^-			
		936		8189.1	28^-			
9342.7	(30^+)	437.0 *1*	100	8905.6	(29^+)	(M1)	0.0803	
9356.4	31^+	436.9 *2*	50 *9*	8919.5	30^+			
		856.7 *2*	100 *9*	8499.7	29^+			
9359.5	(31^+)	559.1 *1*	100	8800.3	30^+	M1	0.0423	Mult.: DCO=1.07 *17*.
9360.9	31^-	463.6 *2*	100 *27*	8897.3	$30^{(-)}$	M1	0.0688	
		884.8 *2*	53 *13*	8476.0	$29^{(-)}$	E2	0.00578	
9453.8	32^+	494 *1*	<50	8957.9	31^+	M1	0.0583	Mult.: DCO=1.12 *5*.
		968 *1*	<100	8484.5	30^+			
9475.5	31^-	459		9016.6	30^-			
		911		8564.3	29^-			
9532.6	31^-	481		9051.6	30^-			
		954		8578.6	29^-			
9806.7	(31^+)	464.0 *1*	100	9342.7	(30^+)	(M1)	0.0686	
9810.6	32^+	453.9 *3*	33 *7*	9356.4	31^+			
		891.2 *2*	100 *7*	8919.5	30^+			
9854.9	32^-	493.7 *8*		9360.9	31^-	M1	0.0584	
		957.6 *2*		8897.3	$30^{(-)}$	E2	0.00492	
9931.9	(32^+)	572.4 *1*	100 *9*	9359.5	(31^+)	M1	0.0398	Mult.: DCO=0.48 *10*.
		1132.0 *5*	8.2 *18*	8800.3	30^+	(E2)	0.00353	
9947.6	32^-	472		9475.5	31^-			
		931		9016.6	30^-			
9971.9	33^+	517.7 *3*	81 *19*	9453.8	32^+	M1	0.0516	
		1014.1 *1*	100 *13*	8957.9	31^+	E2	0.00438	
10280.3	33^+	469.5 *3*	63 *13*	9810.6	32^+			
		924.0 *3*	100 *13*	9356.4	31^+			
10299.6	(32^+)	492.9 *1*	100	9806.7	(31^+)	(M1)	0.0586	
10378.8	33^-	524.0 *2*		9854.9	32^-	M1	0.0500	

$^{178}_{74}W_{104}$-19

γ(^{178}W) (continued)

E_i(level)	J^π_i	E_γ †	I_γ †	E_f	J^π_f	Mult. #	α @	Comments
10378.8	33⁻	1017.7 *7*		9360.9	31⁻	E2	0.00435	
10509.2	34⁺	536.9 *3*	29 *12*	9971.9	33⁺	M1	0.0469	
		1055.5 *3*	100 *12*	9453.8	32⁺	E2	0.00405	
10514.6	33⁻	982		9532.6	31⁻			
10525.9	(33⁺)	594.1 *2*	100 *17*	9931.9	(32⁺)	M1	0.0361	Mult.: DCO=1.11 *5*.
		1166.1 *4*	32 *7*	9359.5	(31⁺)	(E2)	0.00333	
10766.4	34⁺	486		10280.3	33⁺			
		956		9810.6	32⁺			
10916.4	34⁻	537.6 *1*		10378.8	33⁻	M1	0.0468	
		1060.5 *7*		9854.9	32⁻	E2	0.00401	
11066.0	35⁺	556.5 *3*		10509.2	34⁺	M1	0.0428	
		1095.5 *7*	100	9971.9	33⁺	E2	0.00376	Mult.: DCO=1.28 *36*.
11075.5	(34⁺)	549.6 *1*	100	10525.9	(33⁺)	(M1)	0.0442	B(M1)(W.u.)>0.00013
		1144		9931.9	(32⁺)			
11265.4	35⁺	499		10766.4	34⁺			
		985		10280.3	33⁺			
11697.2	(35⁺)	621.7 *1*	100	11075.5	(34⁺)	(M1)	0.0321	
11780.4	36⁺	515		11265.4	35⁺			
		1014		10766.4	34⁺			
12306.4	37⁺	1041		11265.4	35⁺			
12844.9	(38⁺)	1065 &		11780.4	36⁺			
13393.8	(39⁺)	1088 &		12306.4	37⁺			

† From ^{170}Er(^{13}C,5nγ), unless otherwise stated.

‡ From ^{178}Re ε decay.

From γ-ray angular distribution coefficients in ^{170}Er(^{13}C,5nγ), ^{177}Hf(α,3nγ), and ^{181}Ta(p,4nγ); from conversion electron data in ^{178}Re ε decay and ^{181}Ta(p,4nγ); from γ-ray DCO ratios in ^{164}Dy(^{18}O,4nγ) and ^{170}Er(^{13}C,5nγ).

@ 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.

& Placement of transition in the level scheme is uncertain.

$^{178}_{74}$W$_{104}$-20

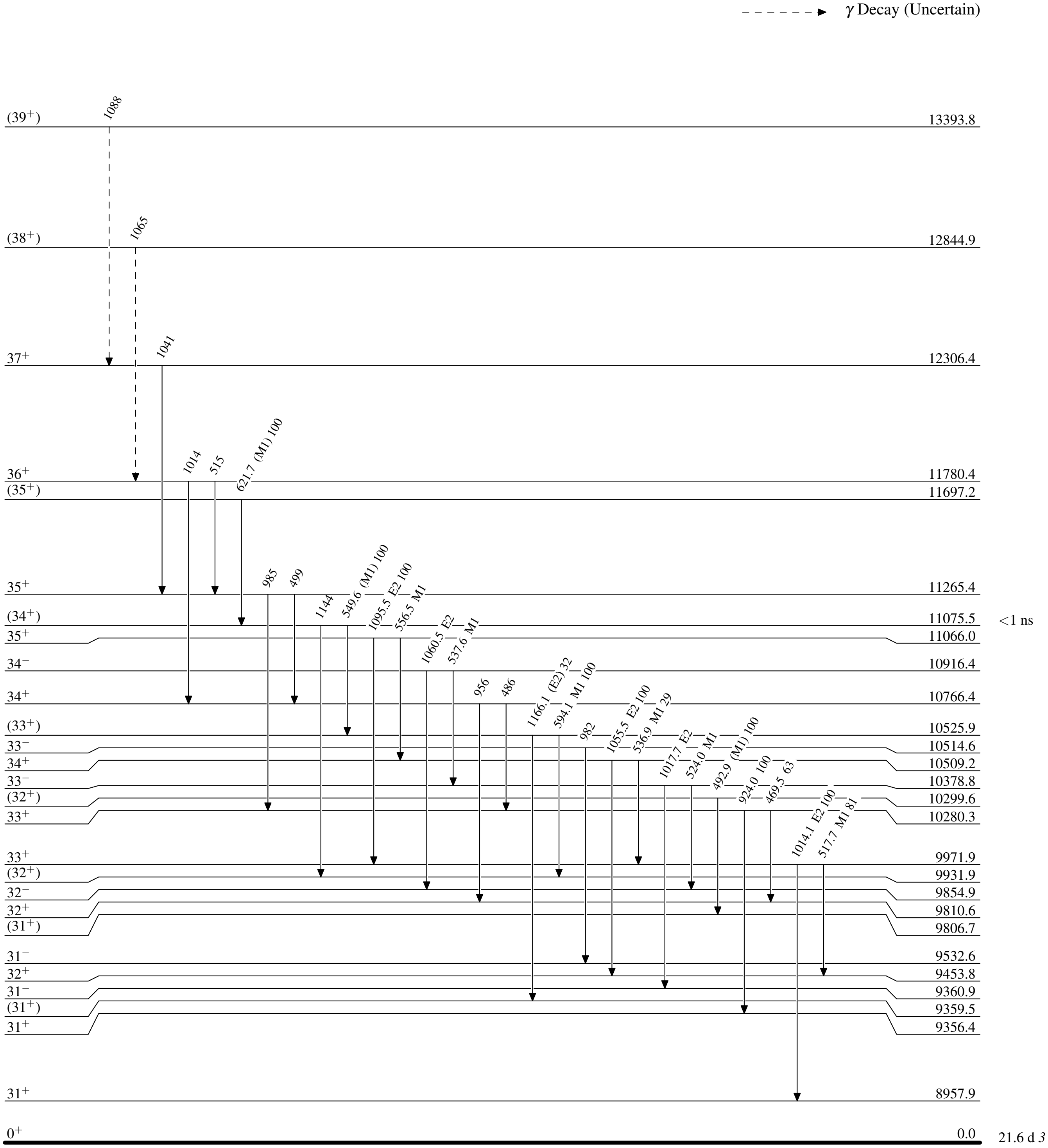
Adopted Levels, Gammas

Legend

Level Scheme

Intensities: Relative photon branching from each level

γ Decay (Uncertain)

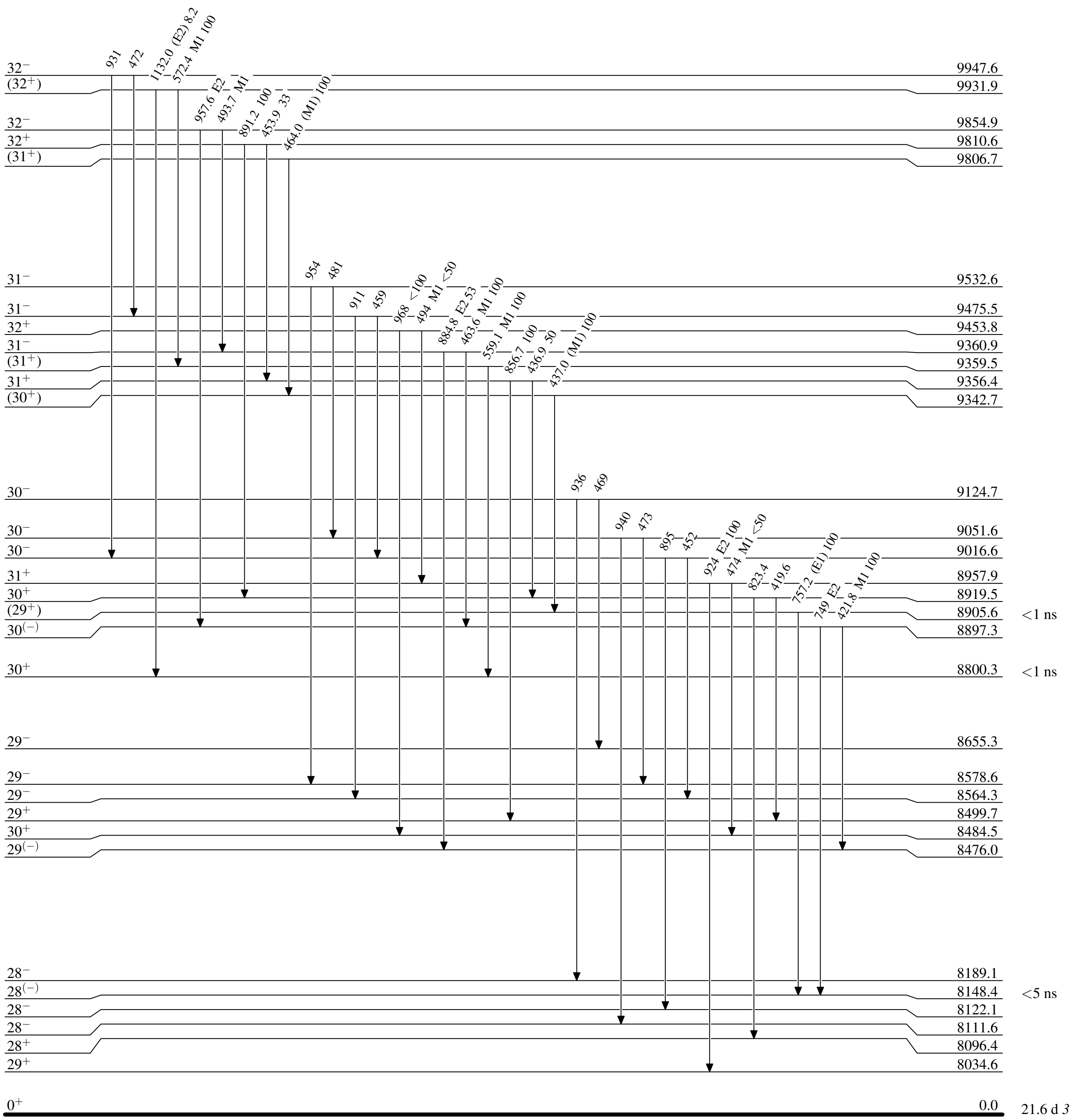


$^{178}_{74}W_{104}$

Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Relative photon branching from each level

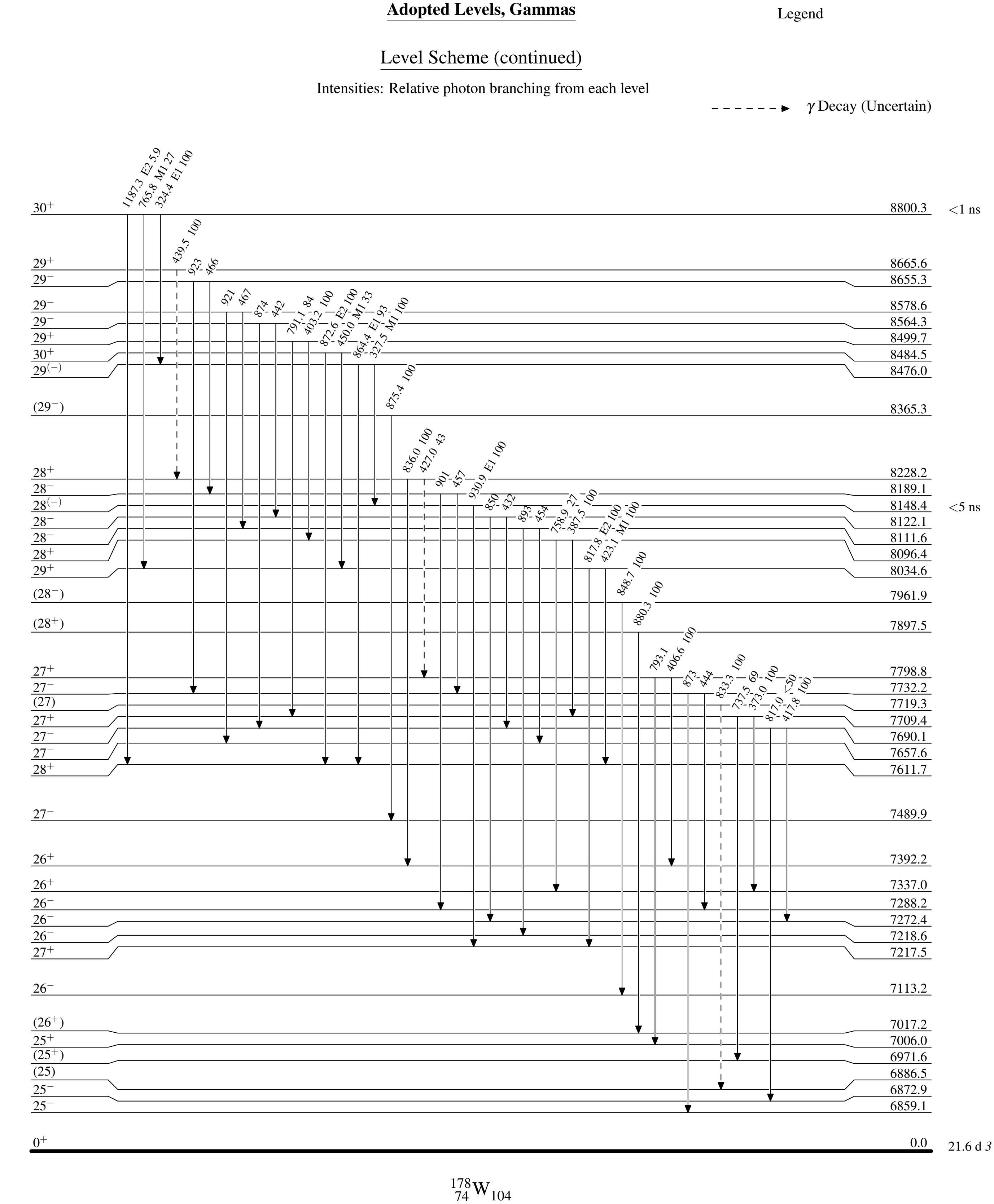


$^{178}_{74}W_{104}$

Adopted Levels, Gammas

Level Scheme (continued)

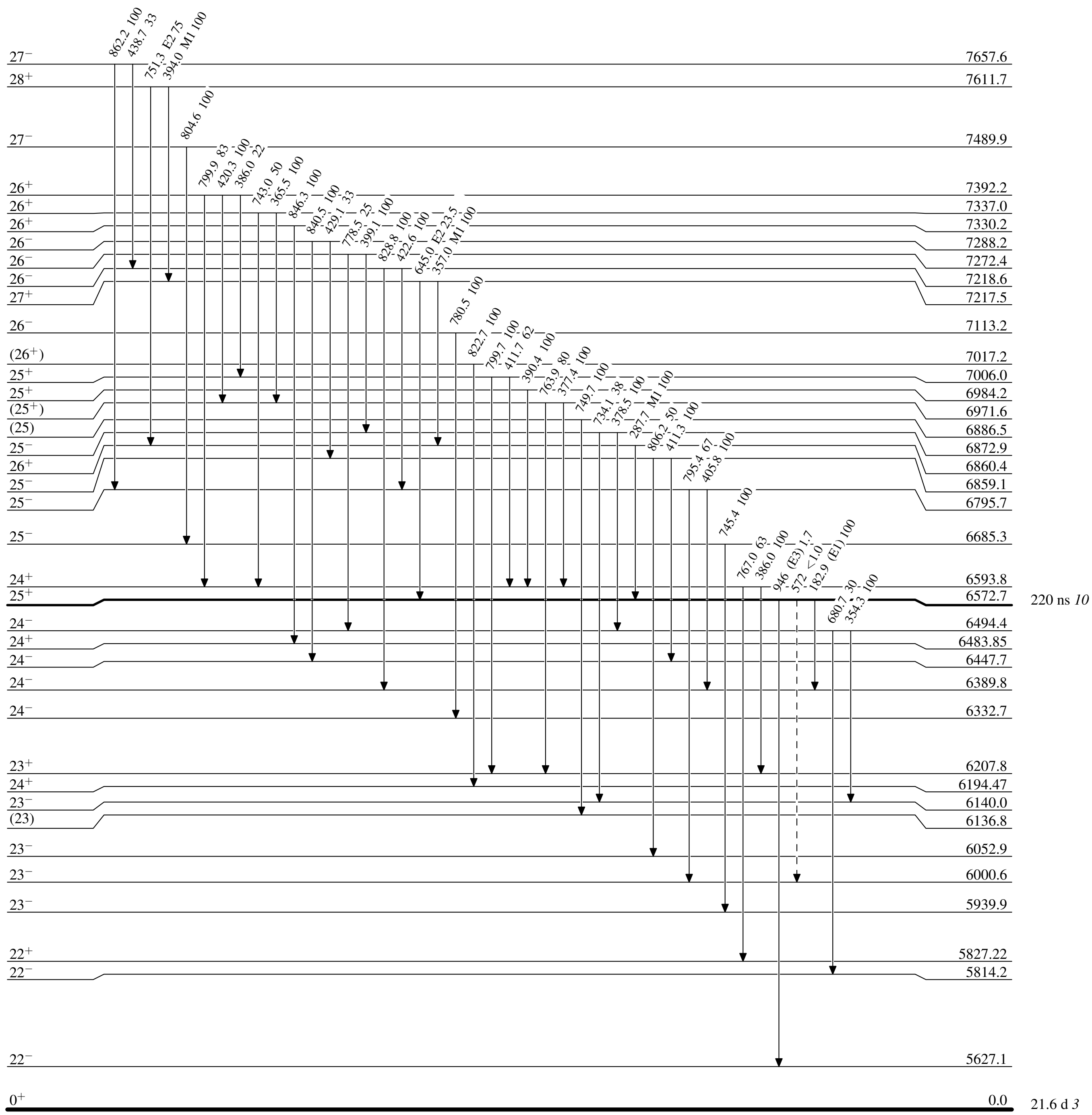
Intensities: Relative photon branching from each level



Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Relative photon branching from each level

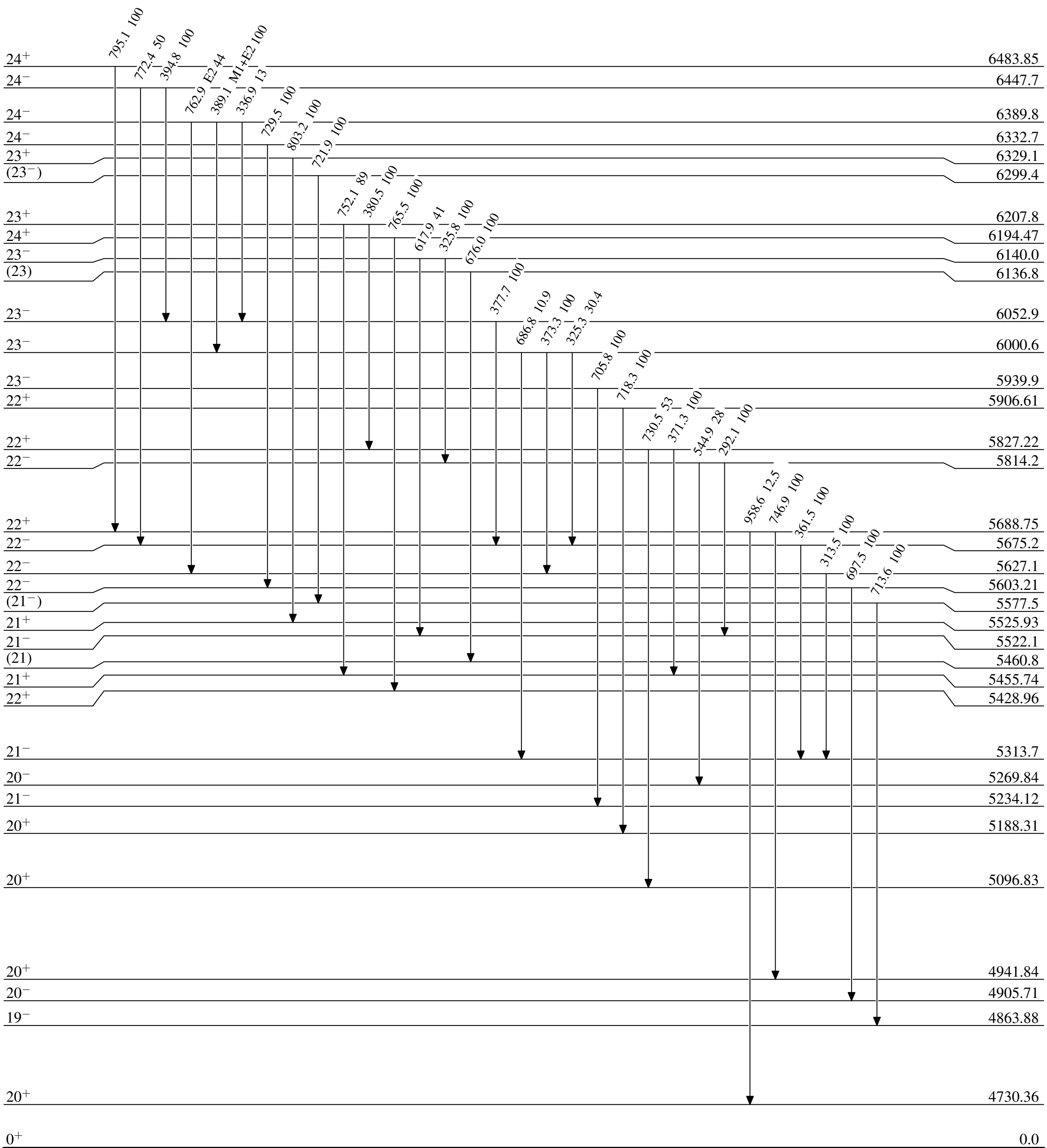


$^{178}_{74}W_{104}$

Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Relative photon branching from each level



$^{178}_{74}W_{104}$

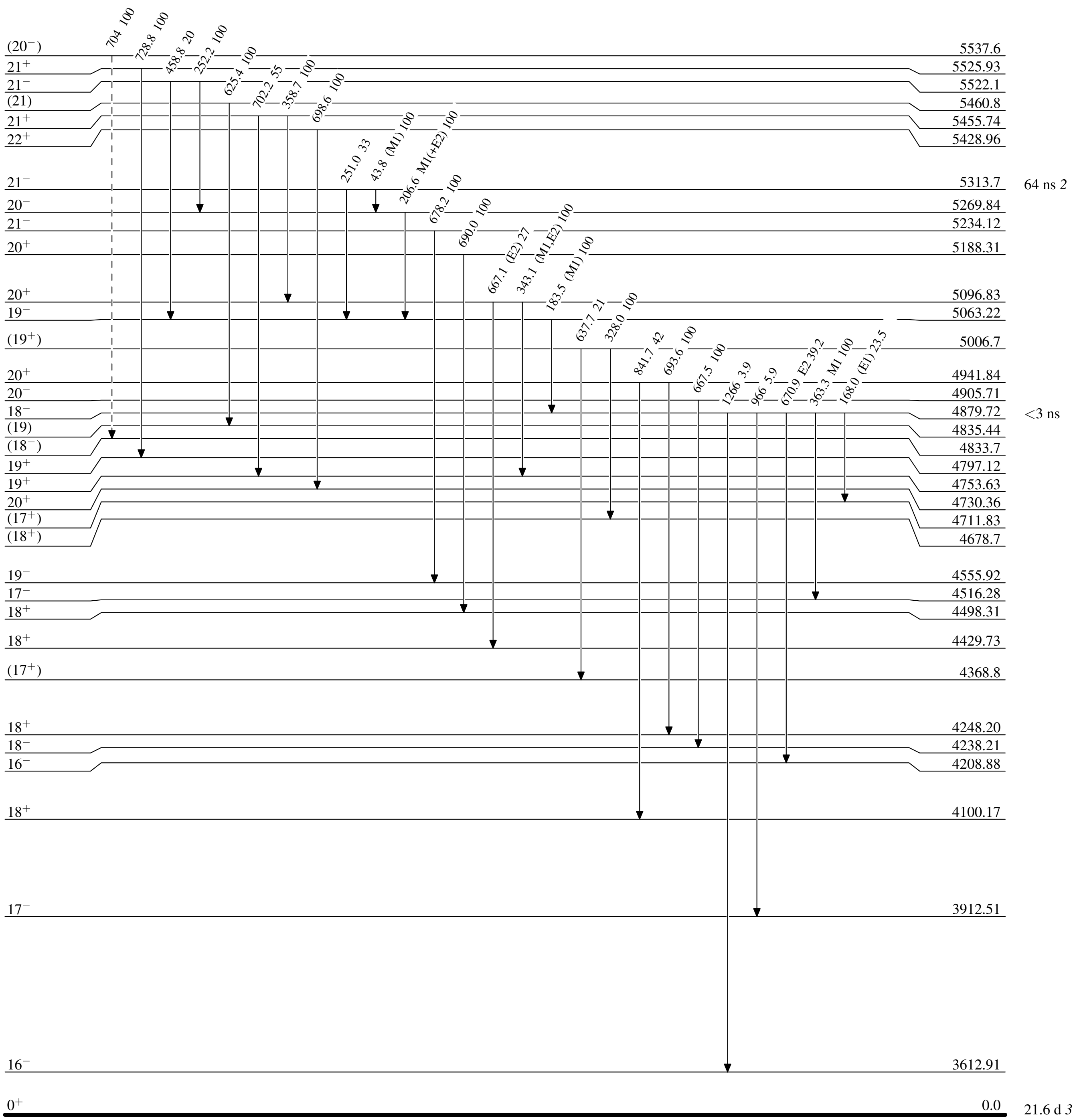
Adopted Levels, Gammas

Legend

Level Scheme (continued)

Intensities: Relative photon branching from each level

- - - - - -▶ γ Decay (Uncertain)

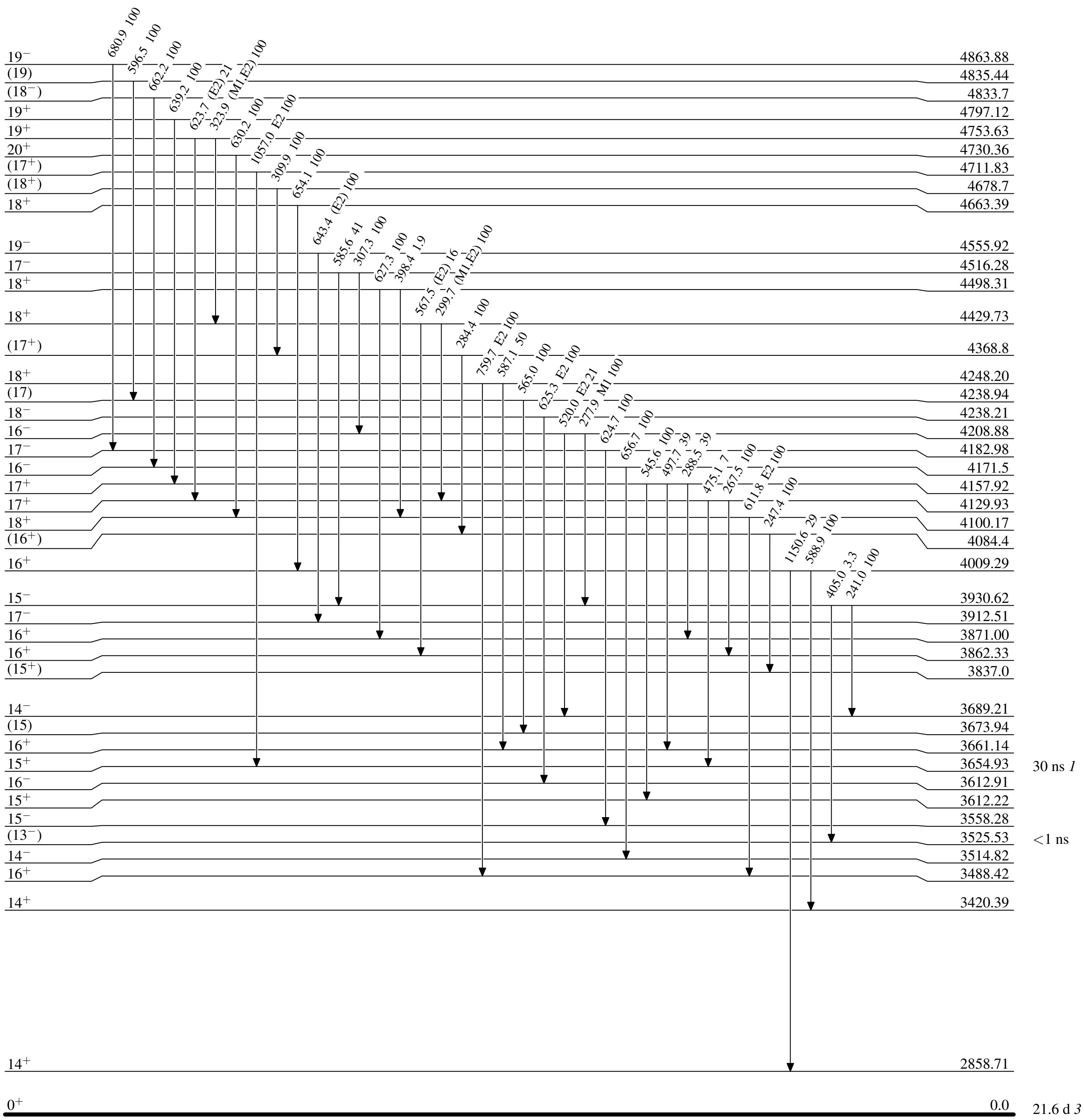


$^{178}_{74}W_{104}$

Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Relative photon branching from each level

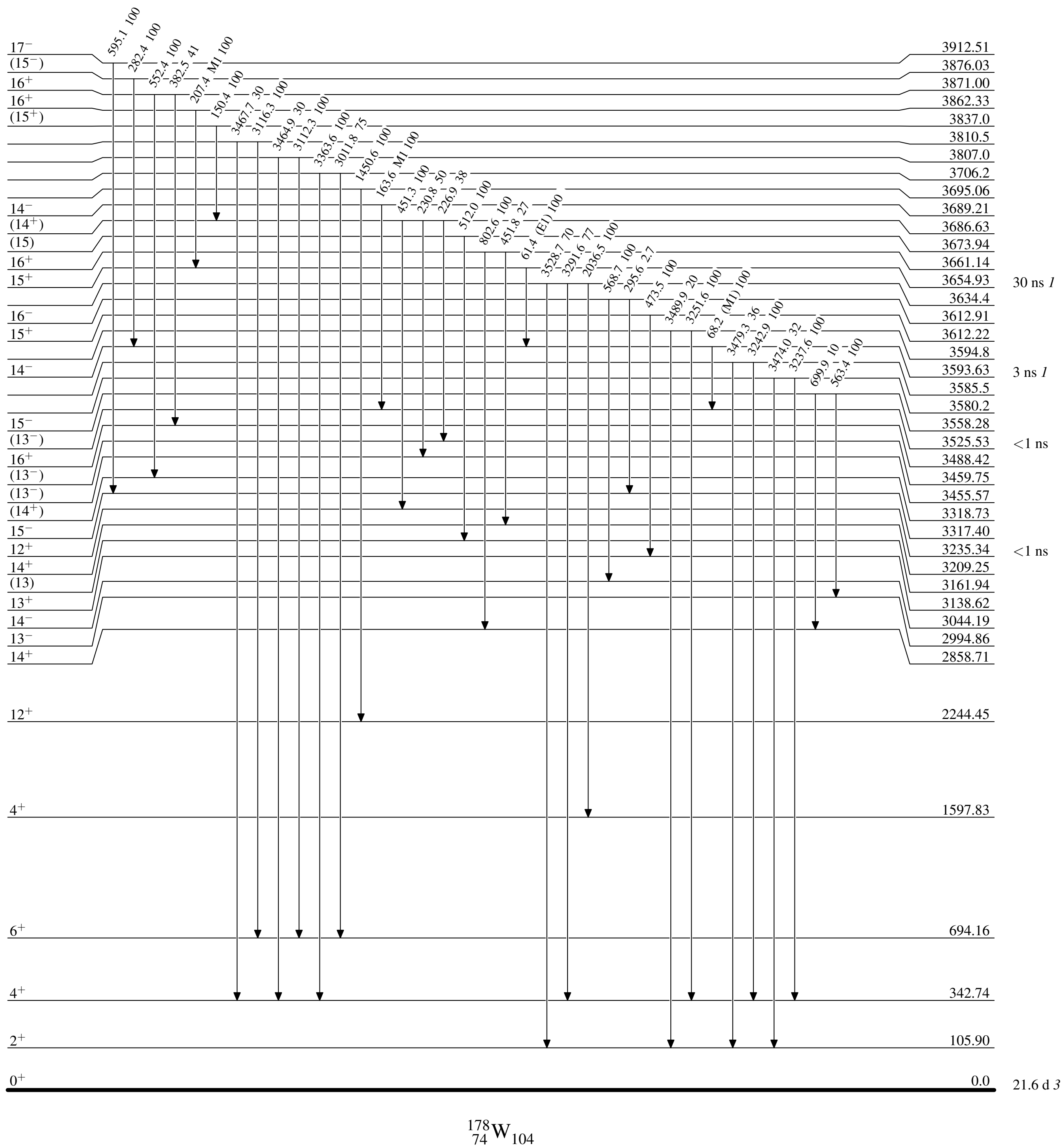


$^{178}_{74}W_{104}$

Adopted Levels, Gammas

Level Scheme (continued)

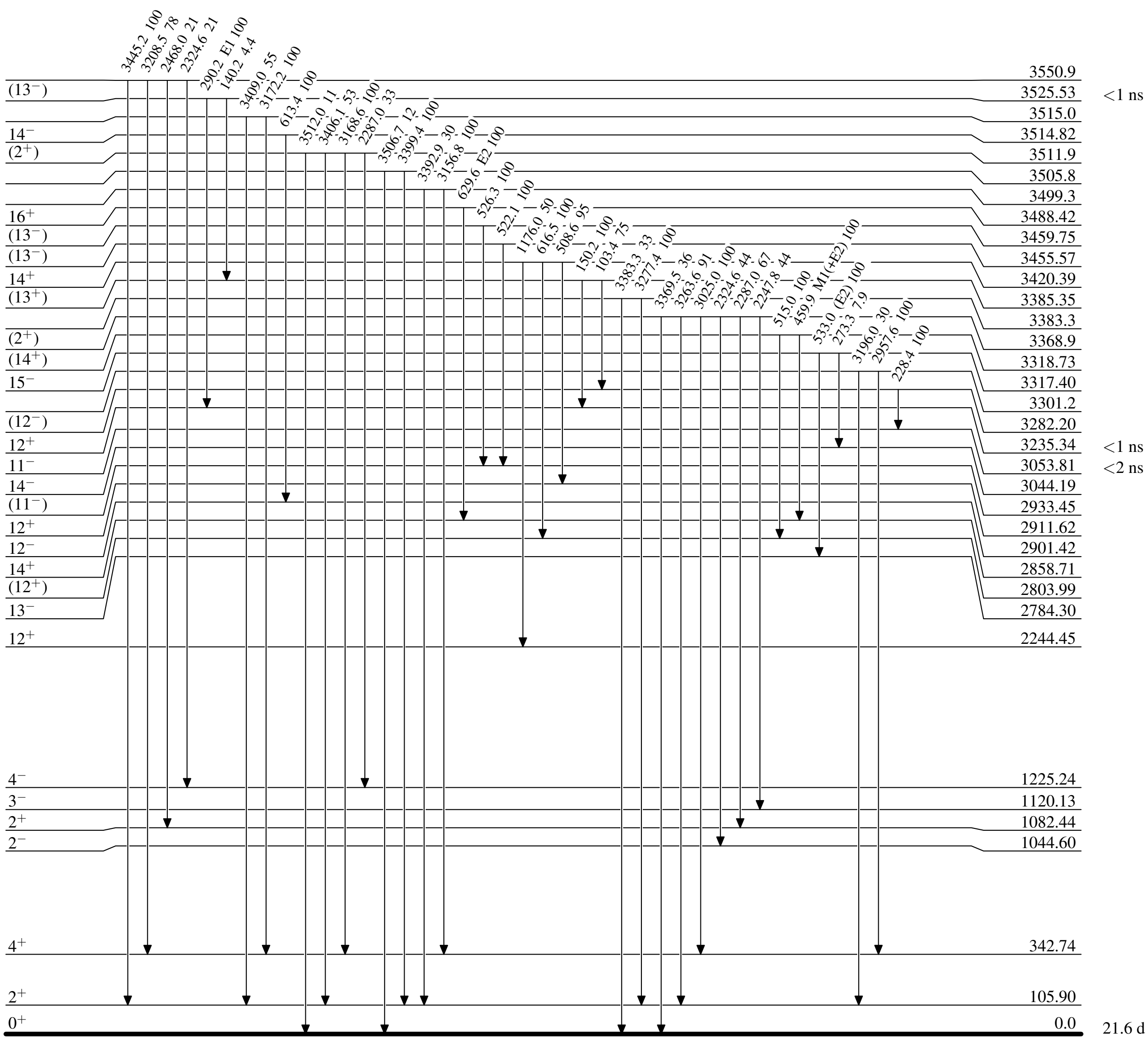
Intensities: Relative photon branching from each level



Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Relative photon branching from each level

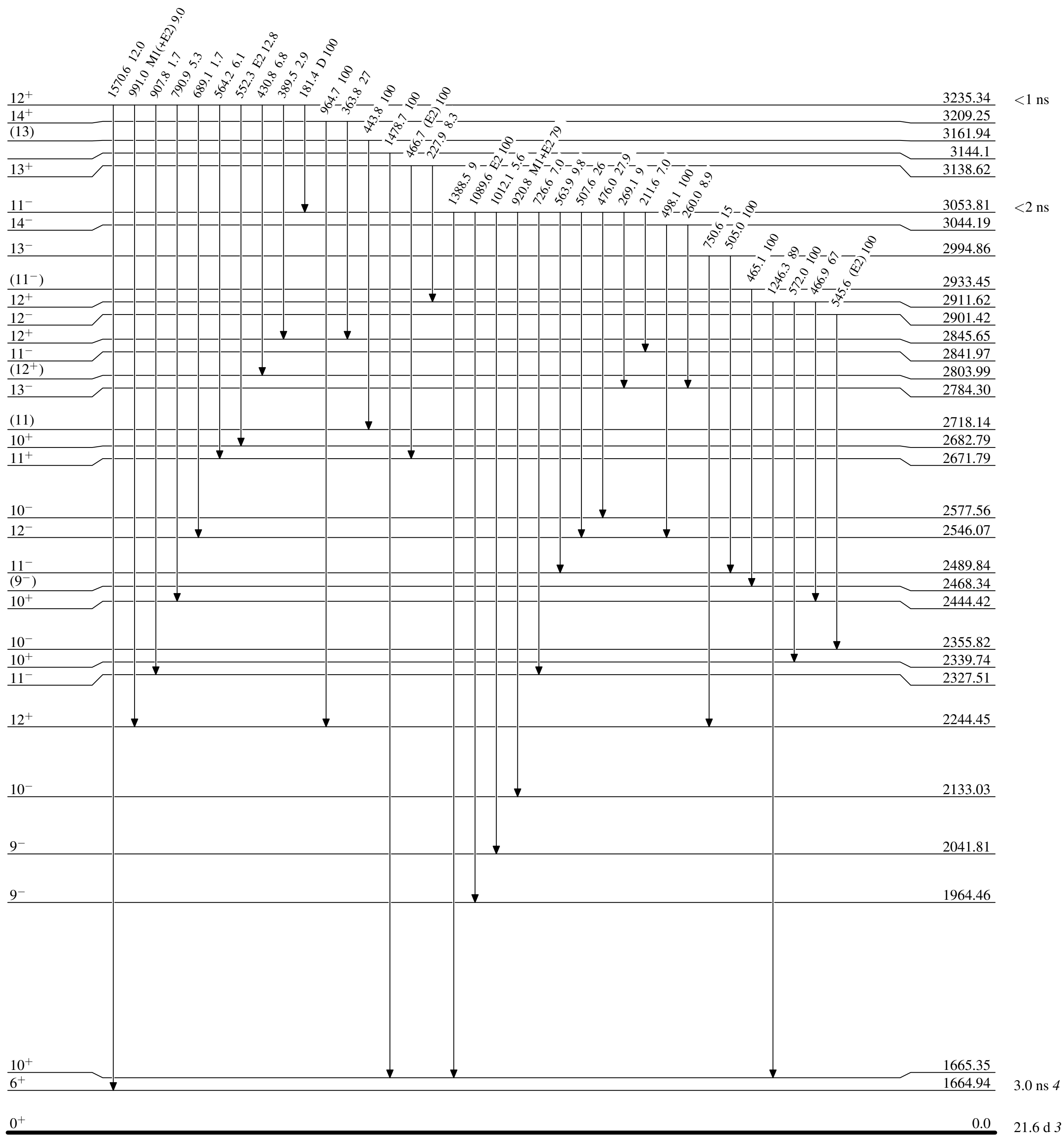


$^{178}_{74}W_{104}$

Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Relative photon branching from each level

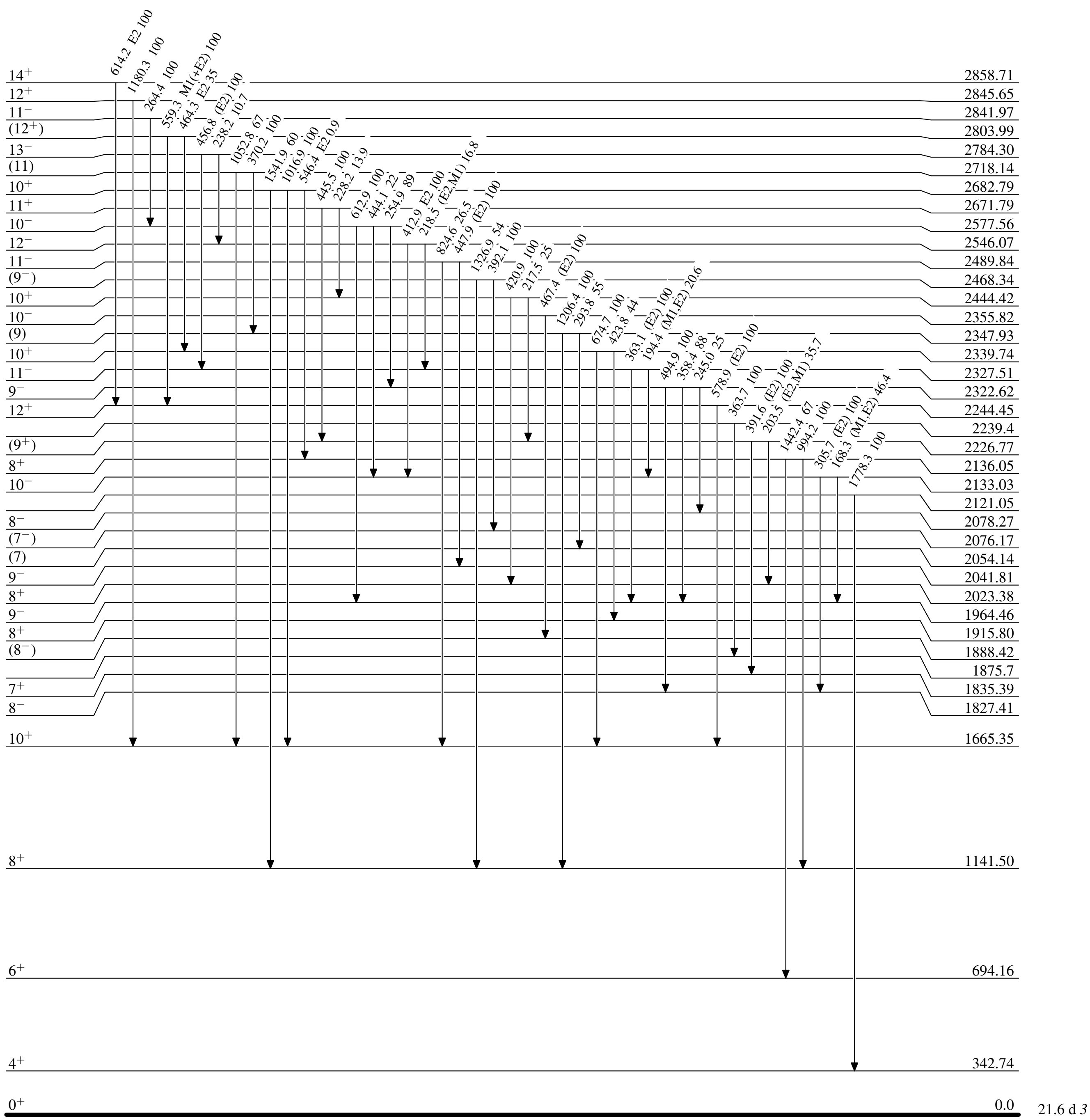


$^{178}_{74}W_{104}$

Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Relative photon branching from each level

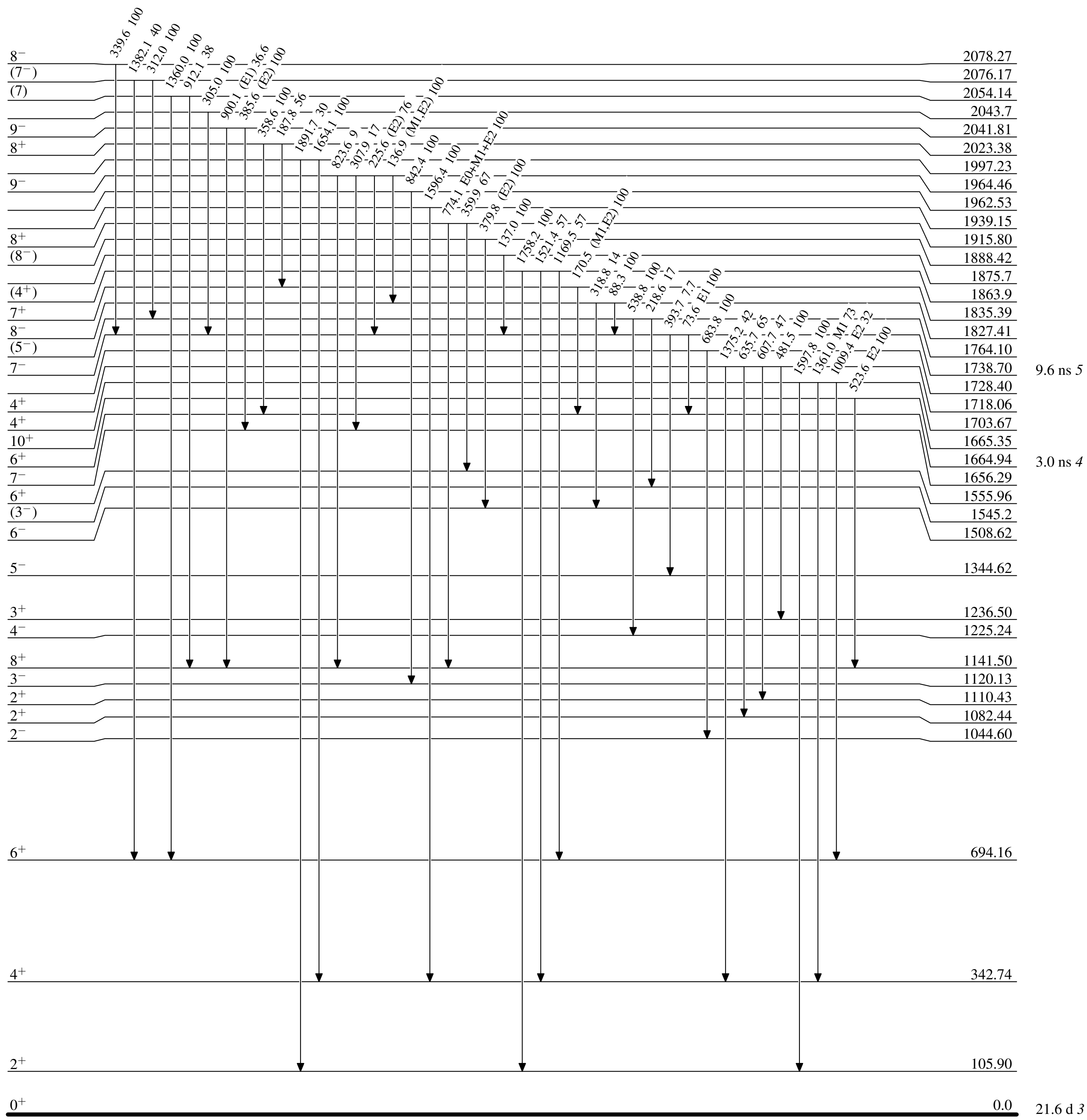


$^{178}_{74}W_{104}$

Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Relative photon branching from each level

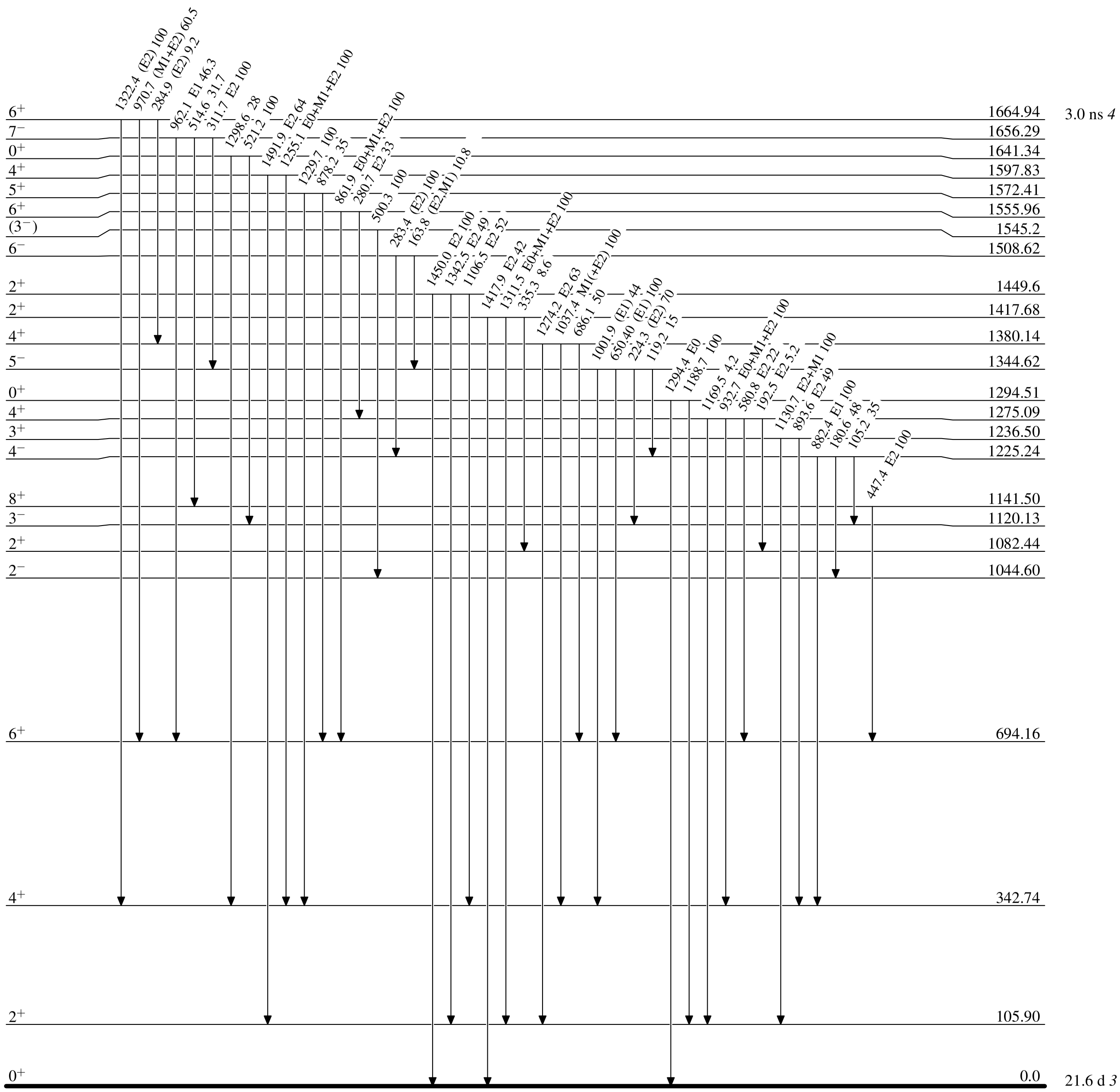


$^{178}_{74}W_{104}$

Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Relative photon branching from each level

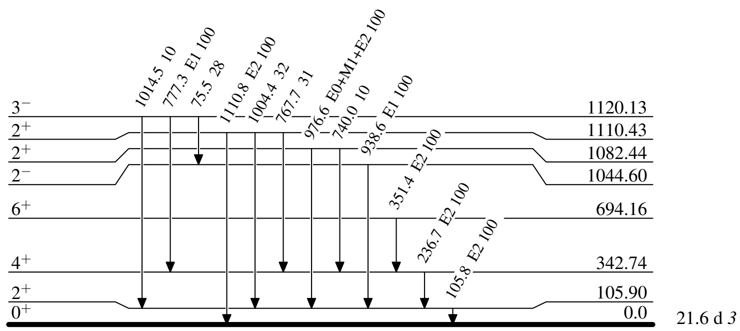


$^{178}_{74}W_{104}$

Adopted Levels, Gammas

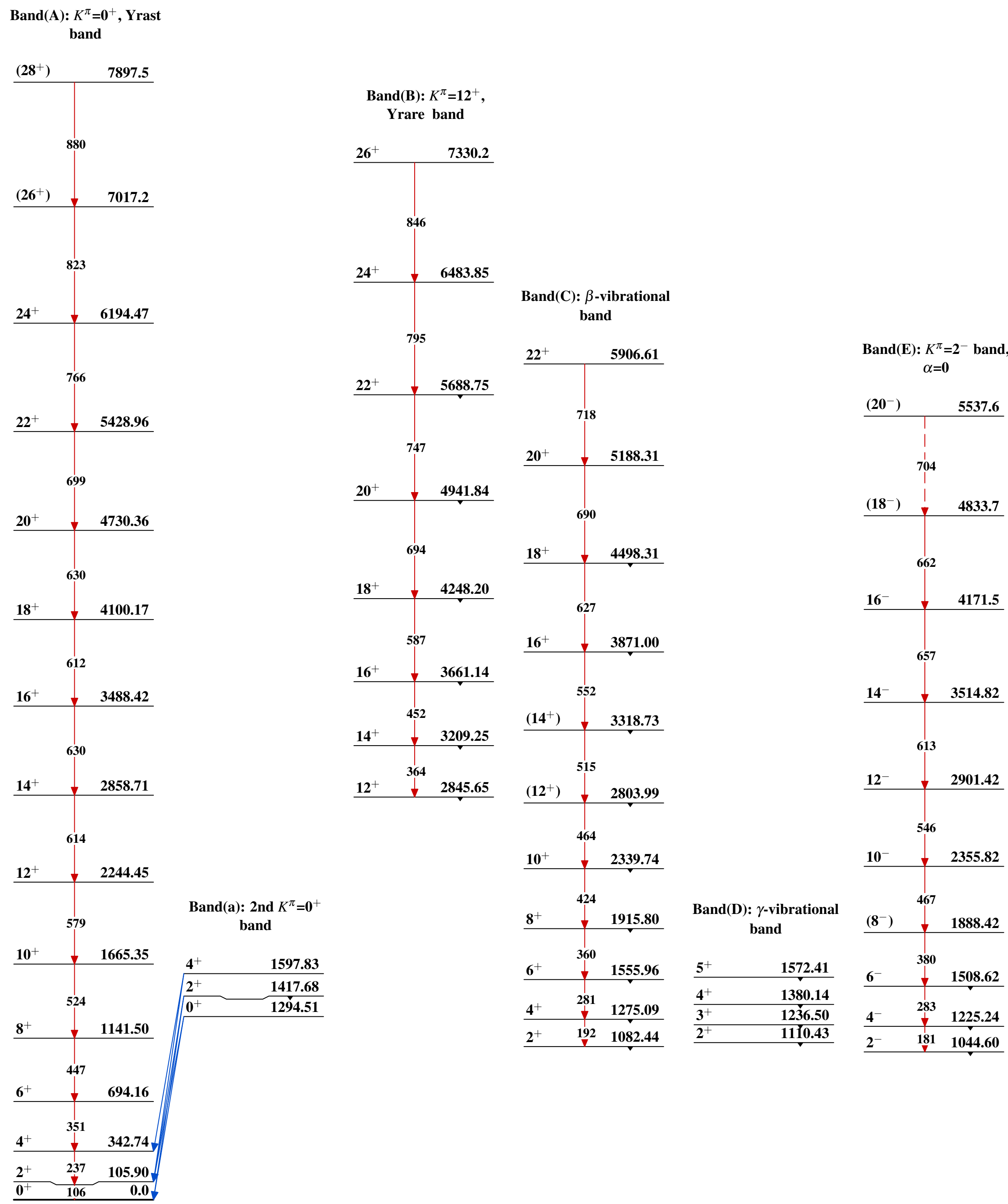
Level Scheme (continued)

Intensities: Relative photon branching from each level



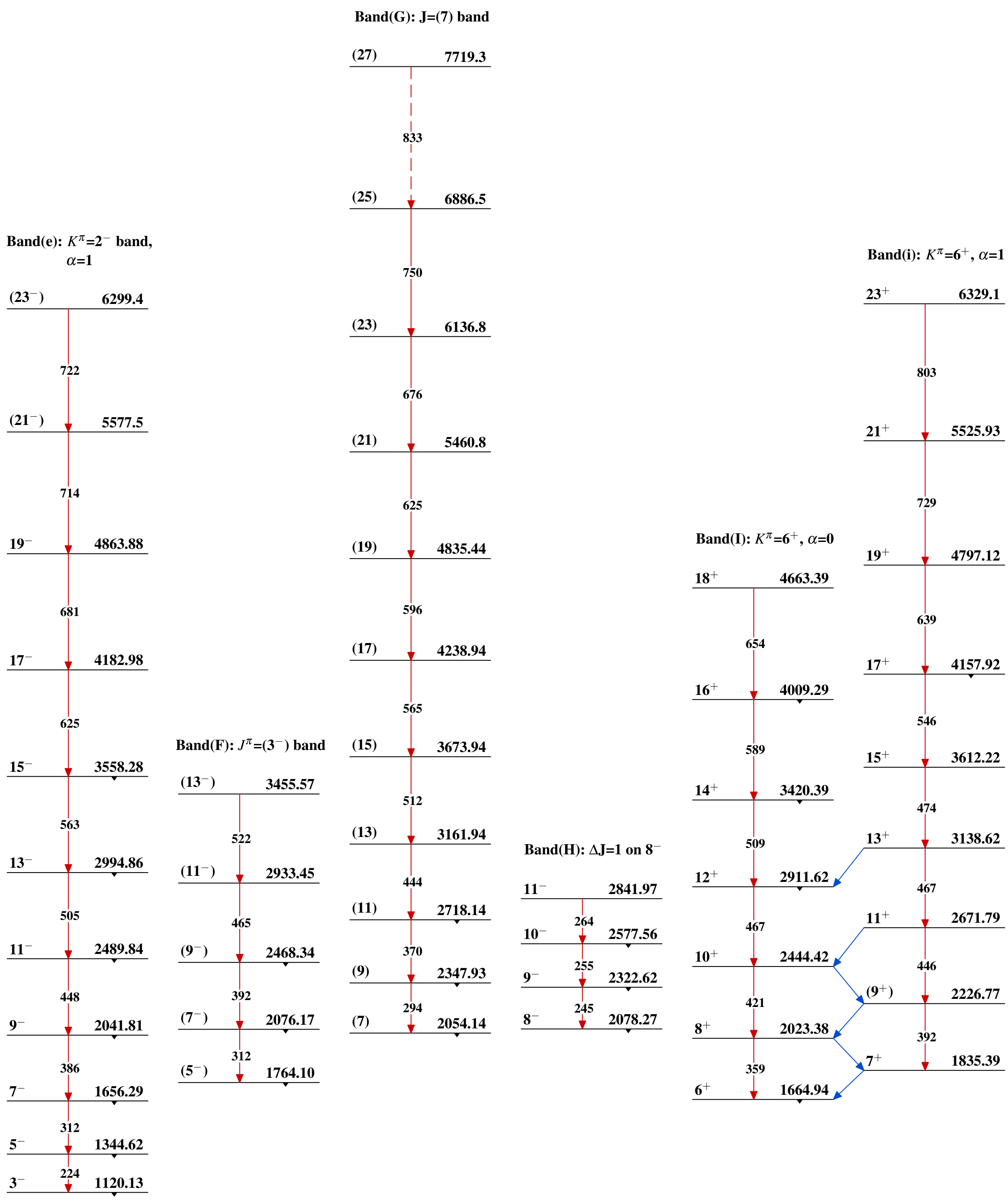
$^{178}_{74}W_{104}$

Adopted Levels, Gammas



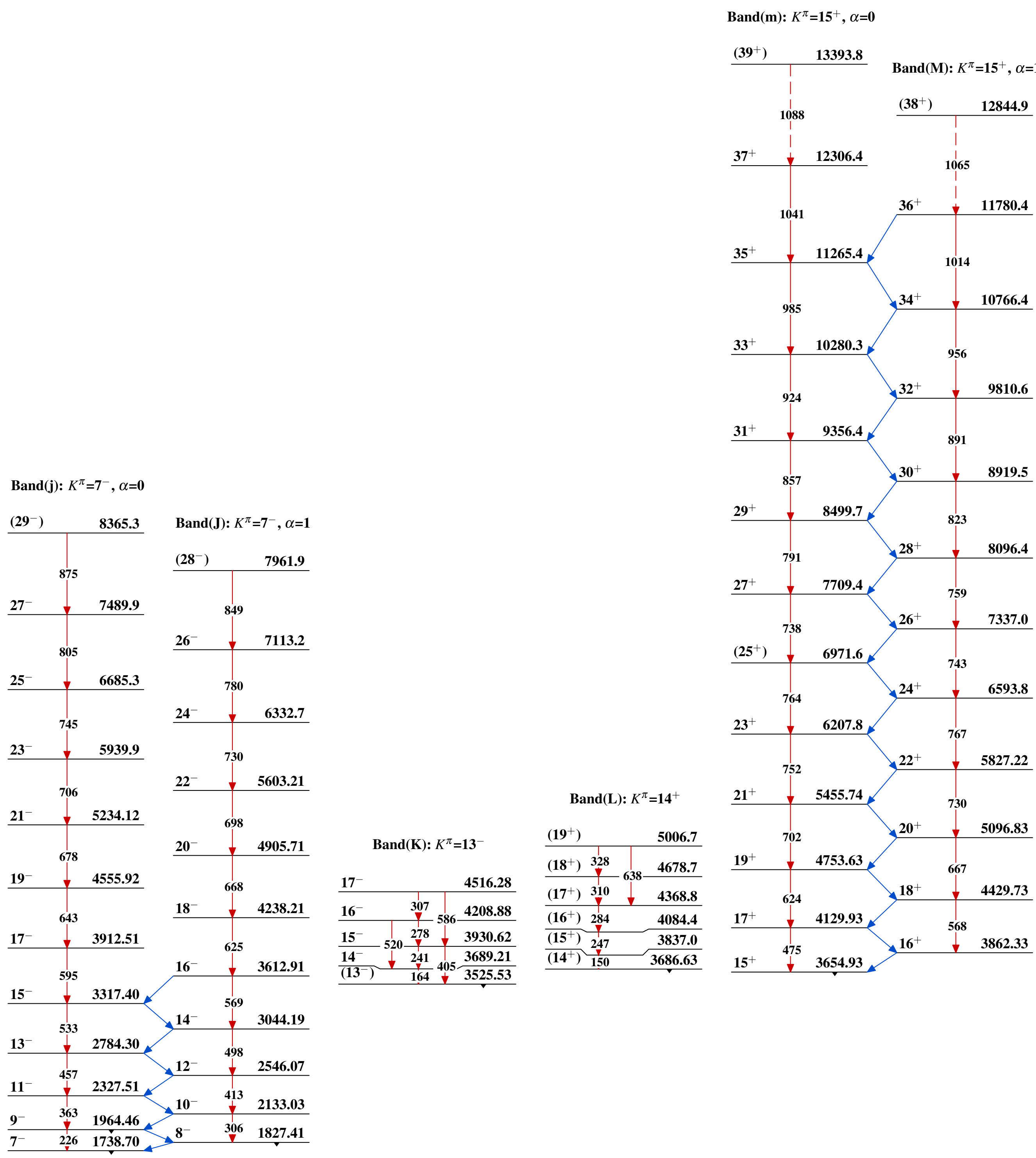
$^{178}_{74}W_{104}$

Adopted Levels, Gammas (continued)



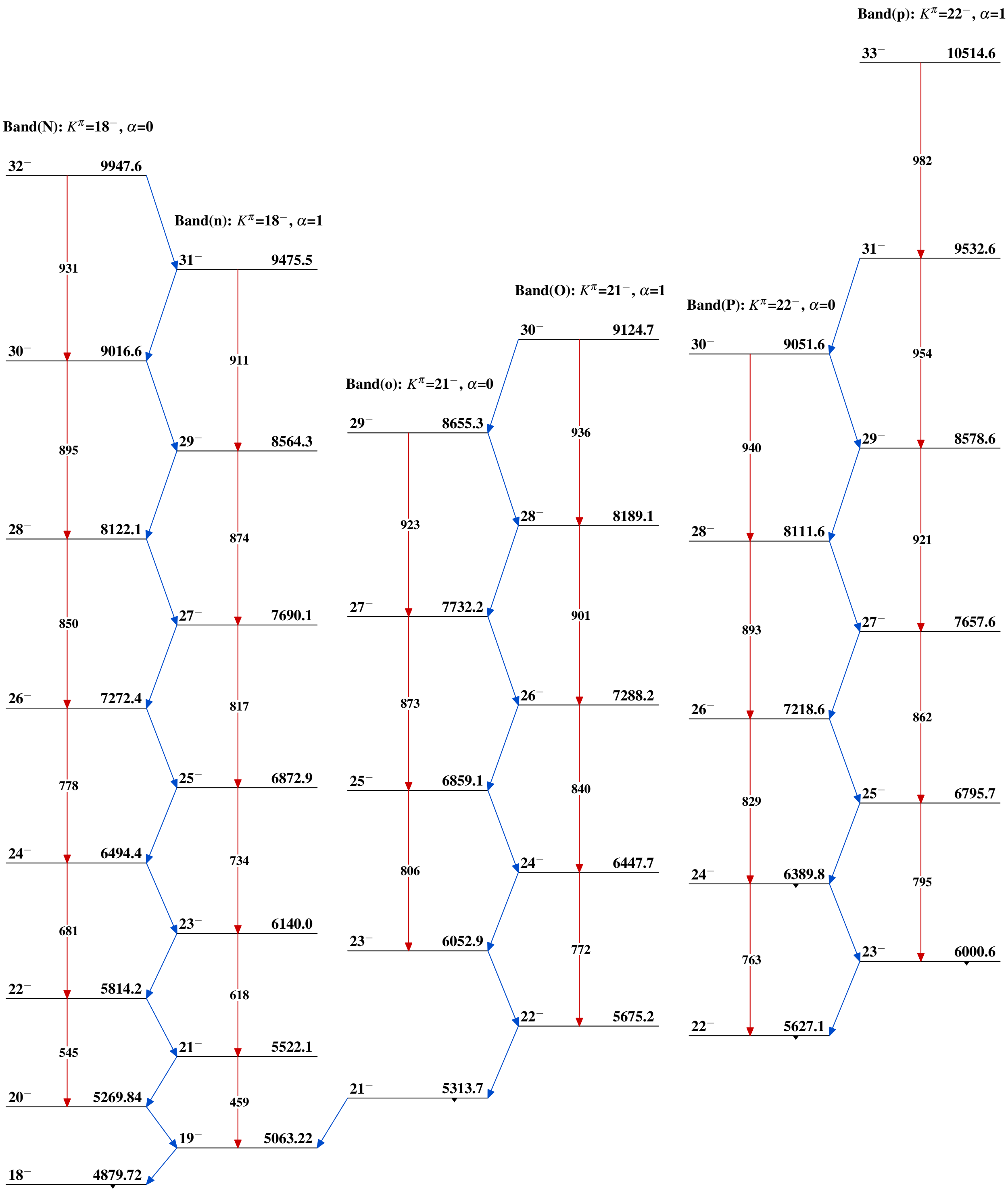
$^{178}_{74}W_{104}$

Adopted Levels, Gammas (continued)



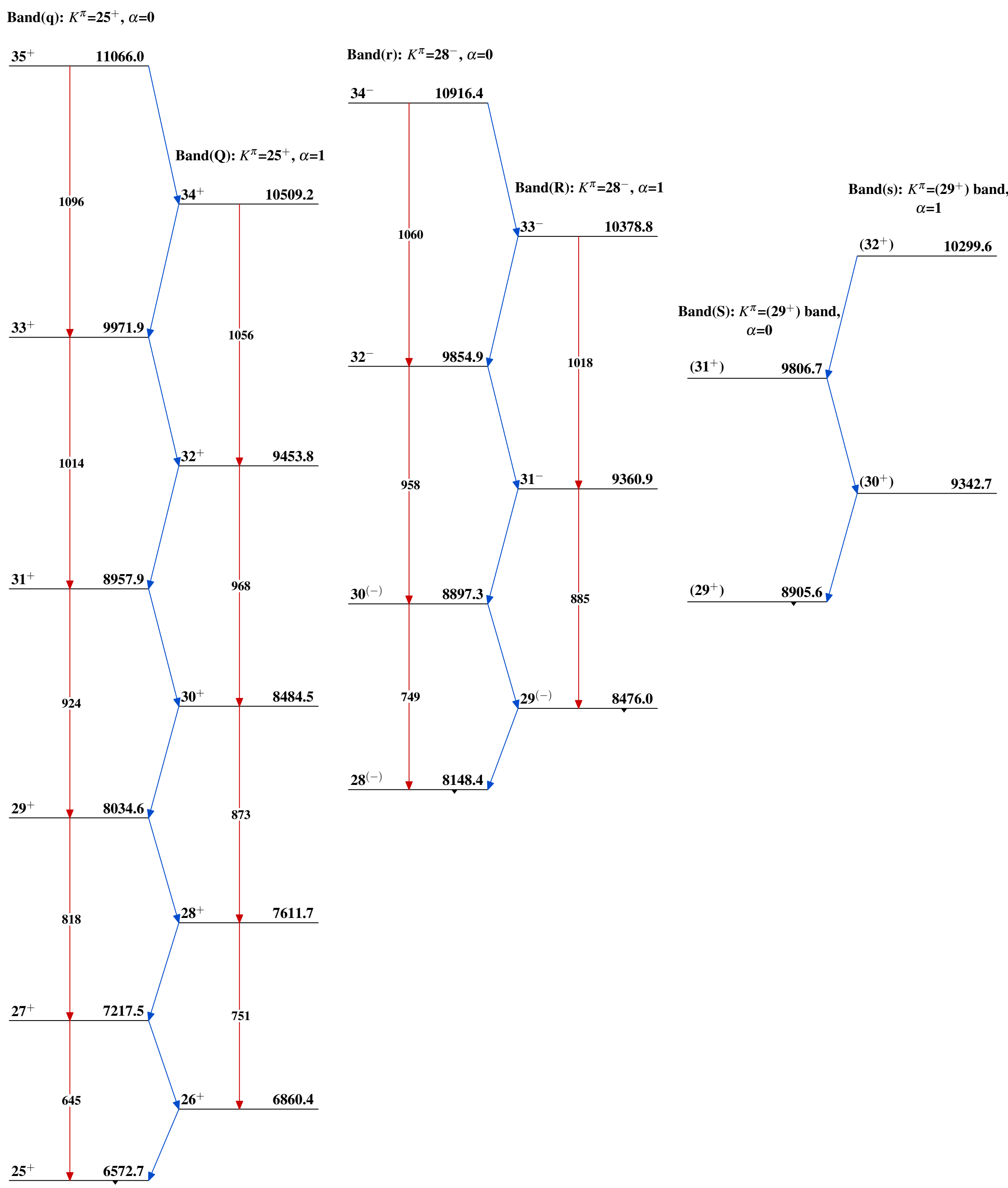
$^{178}_{74}W_{104}$

Adopted Levels, Gammas (continued)



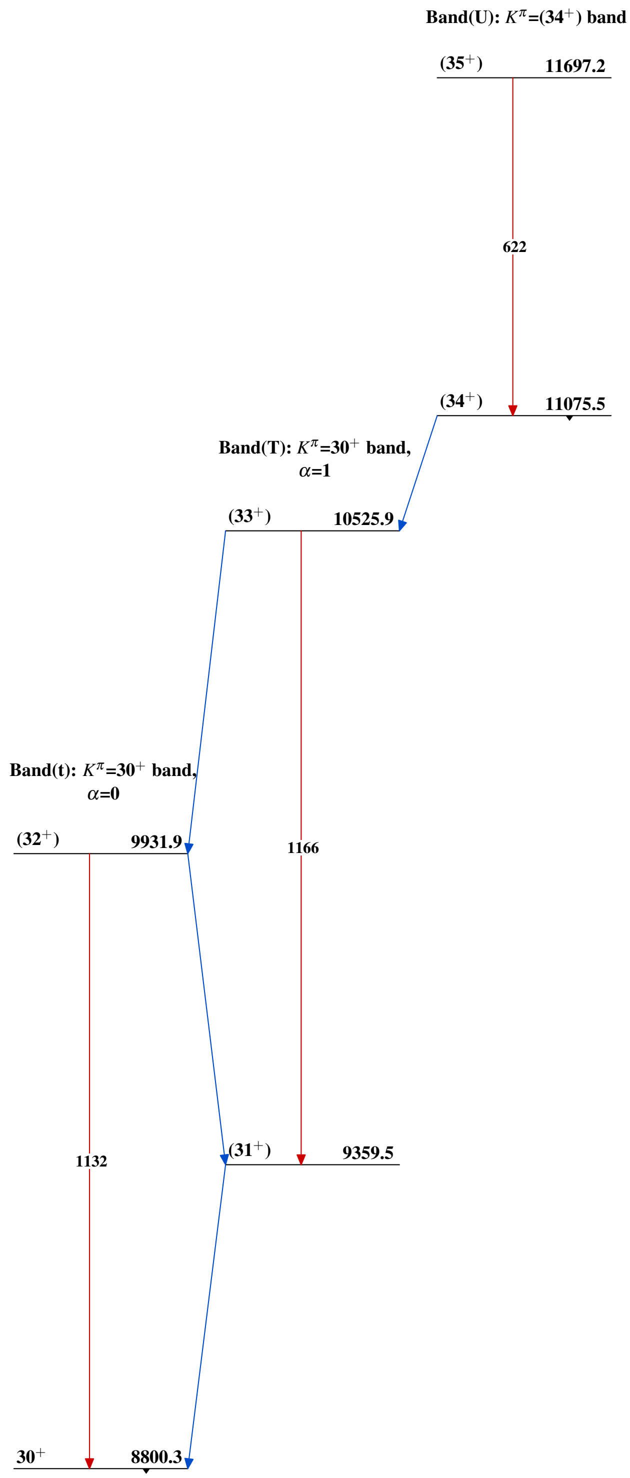
$^{178}_{74}W_{104}$

Adopted Levels, Gammas (continued)



$^{178}_{74}W_{104}$

Adopted Levels, Gammas (continued)



$^{178}_{74}W_{104}$

Adopted Levels, Gammas

		History	
Type	Author	Citation	Literature Cutoff Date
Full Evaluation	E. A. Mccutchan	NDS 126, 151 (2015)	1-Feb-2015

Q(β^-)=−3801 *21*; S(n)=8412 *15*; S(p)=6567.8 *5*; Q(α)=2515.0 *10* 2012Wa38
S(2n)=15372 *15*; S(2p)=11778.8 *3* (2012Wa38).
Q(2ε)=143.20 *27* from Penning Trap measurement (2012Dr01).
Other reactions:
2002Pf01: Be(^{208}Pb,Xγ), E=1 GeV/nucleon. Measured $T_{1/2}$ of 3265, 14$^-$ isomer.
1994Ji02: Atomic-beam laser spectroscopy, measured isotope shift relative to ^{182}W.
1980KoZK: ^{180}W(^{86}Kr,^{86}Kr′), measured yrast band energies up to 10$^+$ level.
1977Dr03: ^{181}Ta(d,3n), E=24 MeV. Measured delayed γ′s from 8$^-$ isomer.
1976Ha46: ^{182}W(^{12}C,^{14}C), E=70 MeV. Measured $\sigma(\theta)$ to 0$^+$ and 2$^+$ (103 keV) levels.
α: Additional information 1.

^{180}W Levels

Cross Reference (XREF) Flags

A	^{180}Ta β^- decay	E	^{176}Yb(^{9}Be,5nγ)	I	^{181}Ta(p,2nγ)
B	^{180}Re ε decay	F	Hf(α,xnγ)	J	^{182}W(p,t)
C	^{180}W IT decay (5.47 ms)	G	^{180}W(γ,γ'): Mossbauer	K	^{186}W(n,7nγ)
D	^{136}Xe(^{48}Ca,4nγ)	H	^{180}W(d,d′)		

E(level)[†]	J^π[‡]	$T_{1/2}$[#]	XREF	Comments
0.0[@]	0$^+$	1.8×10^{18} y *2*	ABCDEFGHIJK	%α=100 $T_{1/2}$: from 2004Co26. Others: 1.0×10^{18} y *+7−3* (2005Zd04) which supersedes the values from 2003Da05, 2003Bi13, 2002Bi16, and 1995Ge17, ≥2.7×10^{17} y (2003Ce01), >1.1×10^{15} y (1960Be13), >9×10^{14} y (1961Ma05). $T_{1/2}$: 2ε decay not observed. $T_{1/2}$(2ε0ν)≥1.3×10^{18} y, $T_{1/2}$(2ε2ν)≥6.6×10^{17} y (2011Be39,2009Be27) which supersedes the values from 2003Da09 and 2003Da24.
103.561[@] *16*	2$^+$	1.28 ns *5*	ABCDEFGHIJK	μ=0.509 *34* J^π: E2 103.6γ to 0$^+$. μ: from ^{180}W(γ,γ'):Mossbauer. Recalculated for consistency with standard (1973Zi03,1989Ra17). $T_{1/2}$: from ^{180}Ta β^- decay.
337.559[@] *24*	4$^+$		BCDEF HIJK	J^π: E2 234.0γ to 2$^+$.
688.46[@] *3*	6$^+$		CDEF HIJK	J^π: E2 350.9γ to 4$^+$.
1006.381[&] *19*	2$^-$	7.4 ns *4*	B EF I	J^π: E1+M2 903γ to 2$^+$, 669γ to 4$^+$, 1006γ to 0$^+$. $T_{1/2}$: from $\gamma\gamma$(t) in ^{180}Re ε decay. Other: ≈ 5.5 ns from centroid-shift analysis in ^{176}Yb(^{9}Be,5nγ).
1082.374[&] *20*	3$^-$		B EF HIJ	J^π: 76.0γ to 2$^-$, 744.8γ to 4$^+$; band assignment.
1117.31[a] *3*	2$^+$		B HIJ	J^π: 1014γ to 2$^+$, 1117γ to 0$^+$, L(p,t)=(2).
1138.47[@] *3*	8$^+$		CDEF I K	J^π: E2 450γ to 6$^+$; band assignment.
1184.893[&] *20*	4$^-$		B EF IJ	J^π: 102.5γ to 3$^-$, E2 178.5γ to 2$^-$, 847.4γ to 4$^+$; band assignment.
1232.67[a] *3*	3$^+$		B IJ	J^π: 895.3γ to 4$^+$, 1129.1γ to 2$^+$; band assignment.
1307.575[&] *23*	5$^-$		EF hI	XREF: h(1319). J^π: M1+E2 123γ to 4$^-$, E2 225.2γ to 3$^-$; band assignment.
1322.09 *19*	(2$^+$)		hIJ	XREF: h(1319). J^π: 984γ to 4$^+$, 1218.8 γ to 2$^+$, 1322γ to 0$^+$.

Continued on next page (footnotes at end of table)

Adopted Levels, Gammas (continued)

^{180}W Levels (continued)

E(level)[†]	J^{π}[‡]	$T_{1/2}$[#]	XREF	Comments
1360.51[a] *4*	4^+		IJ	J^{π}: (E2) 1257γ to 2^+, 1023γ to 4^+; band assignment.
1380.8 *3*	0^+		J	J^{π}: L(p,t)=0.
1461.82[&] *3*	6^-		EF I	J^{π}: E2 277γ to 4^-, 154γ to 5^-; band assignment.
1472.1 *4*	(0^+)		J	J^{π}: L(p,t)=(0).
1513.6 *4*	0^+		J	J^{π}: L(p,t)=0.
1529.05[d] *4*	8^-	5.47 ms *9*	CDEF I	J^{π}: E1 390.6γ to 8^+, $\gamma(\theta)$ in Hf(α,xnγ). $T_{1/2}$: weighted average of 5.24 ms *19* from Hf(α,xnγ) and 5.53 ms *10* from ^{181}Ta(p,2nγ). configuration=(ν7/2[514])(ν9/2[624]).
1535.63[a] *6*	5^+		I	J^{π}: 847γ to 6^+, 1198γ to 4^+, band assignment.
1568.17 *11*			I	
1587.27 *5*	2^+		B J	J^{π}: L(p,t)=2.
1624.23[&] *3*	7^-		EF I	J^{π}: E2 317γ to 5^-, 162γ to 6^-; band assignment.
1632.92 *5*	$(1^-,2)$		B h j	XREF: h(1637)j(1635). J^{π}: 550.5γ to 3^-, log *ft*=6.7 in ^{180}Re ε decay from $(1)^-$ parent.
1634.67 *4*	$(3,4^+)$		hIj	XREF: h(1637)j(1635). J^{π}: 450γ to 4^-, 517γ to 2^+, 1297γ to 4^+.
1639.80[b] *3*	(5^-)	19.2 ns *3*	EF I	J^{π}: 179γ to 6^-, 279γ to 4^+, 455γ to 4^-, 951γ to 6^+. $T_{1/2}$: from ^{181}Ta(p,2nγ). Other: 24 ns *7* from Hf(α,xnγ). configuration=(ν1/2[521])(ν9/2[624]).
1664.18[@] *4*	10^+		DEF I K	J^{π}: E2 526γ to 8^+; band assignment.
1689.4 *5*	0^+		h J	XREF: h(1692). J^{π}: L(p,t)=0.
1693.60 *15*			hI	XREF: h(1692).
1702.98[a] *8*	6^+		I	J^{π}: 1014γ to 6^+, 1365.5γ to 4^+; band assignment.
1725.59[d] *5*	9^-		DEF hIj	XREF: h(1737)j(1740). J^{π}: 196.5γ to 8^-; band assignment.
1729.85 *7*	$(4^+,5,6^+)$		hIj	XREF: h(1737)j(1740). J^{π}: 1041γ to 6^+, 1392γ to 4^+.
1764.42[b] *3*	(6^-)		EF I	J^{π}: 125γ to (5^-); band member.
1768.4 *5*	0^+		J	J^{π}: L(p,t)=0.
1784.96 *7*	$(4^+,5^+)$		I	J^{π}: 552γ to 3^+, 1096γ to 6^+.
1814.88 *12*	$(2^+,3)$		B H	J^{π}: 809γ to 2^-, 1477γ to 4^+, 1711γ to 2^+. Log *ft*=7.5 in ^{180}Re ε decay from $(1)^-$ parent favors $J^{\pi}=2^+$.
1830.85[&] *4*	8^-		EF hI	XREF: h(1824). J^{π}: E2 369γ to 6^-, 207γ to 7^-; band assignment.
1831.70 *3*	2^-		B h	XREF: h(1824). J^{π}: log *ft*=5.0 in ^{180}Re ε decay from $(1)^-$ parent, 599γ to 3^+.
1851.15 *6*			I	
1855.20 *16*			I	
1911.58[b] *4*	(7^-)		EF IJ	J^{π}: D+Q 147γ to (6^-), 272γ to (5^-); band assignment.
1918.13 *19*	$(4^+,5,6^+)$		I	J^{π}: 1230γ to 6^+, 1581γ to 4^+.
1926.44 *16*	$(6^+,7,8^+)$		I	J^{π}: 788γ to 8^+, 1238γ to 6^+.
1932.20[a] *11*	7^+		I	J^{π}: 794γ to 8^+, 12434γ to 6^+; band assignment.
1932.3 *6*	(0^+)		J	J^{π}: L(p,t)=(0).
1945.07[d] *6*	10^-		DEF IJ	J^{π}: E2 416γ to 8^-, M1 219.5γ to 9^-; band assignment.
1954.53 *15*			I	
2024.57[&] *8*	9^-		EF I	J^{π}: E2 400γ to 7^-; band assignment.
2036.7 *6*	0^+		J	J^{π}: L(p,t)=0.
2059.35 *12*			IJ	
2082.55[b] *6*	(8^-)		EF IJ	XREF: J(2095). J^{π}: E2 318γ to (6^-), M1+E2 171γ to (7^-); band assignment.

Continued on next page (footnotes at end of table)

Adopted Levels, Gammas (continued)

^{180}W Levels (continued)

E(level)[†]	Jπ[‡]	$T_{1/2}$[#]	XREF	Comments
2117.52 *12*			I	
2127.39 *9*			I	
2133.09[c] *9*	(8+)		E I	Jπ: 995γ to 8+; band head of Fermi-aligned $i^2_{13/2}$ band.
2164 *10*			J	
2176.80 *5*			B	
2181.6 *6*	0+		J	Jπ: L(p,t)=0.
2187.00[d] *11*	11−		DEF I	Jπ: E2 461γ to 9−, M1 242γ to 10−; band assignment.
2203 *10*			J	
2212 *6*			H J	E(level): from (d,d′). Other: 2212 *10* from (p,t).
2227.85 *9*			B	
2235.19[@] *11*	12+		DEF I K	Jπ: E2 571γ to 10+; band assignment.
2256.65? *6*			B j	XREF: j(2265).
2273.70[b] *7*	(9−)		EF Ij	XREF: j(2265). Jπ: E2 362γ to (7−), D 191.5γ to (8−); band assignment.
2274.0[c] *5*	(9+)		E	Jπ: 141γ to (8+); band assignment.
2284.00[&] *15*	10−		EF I	Jπ: E2 453γ to 8−; band assignment.
2293 *10*			J	
2326.8 *7*	0+		J	
2348 *6*			H J	E(level): from (d,d′). Other: 2356 *10* in (p,t).
2400 *10*			J	
2415.77 *4*	2−		B	Jπ: log *ft*=5.7 in ^{180}Re ε decay from (1)− parent, 1183γ to 3+.
2423.9[c] *4*	(10+)		E	Jπ: 150γ to (9+), 1285γ to 8+; band assignment.
2435.18 *3*	2−		B	Jπ: log *ft*=5.8 in ^{180}Re ε decay from (1)− parent, 1203γ to 3+.
2451.61[d] *13*	12−		DEF I	Jπ: E2 507γ to 10−; band assignment.
2494.5[b] *7*	(10−)		E	Jπ: 221γ to (9−), 412γ to (8−); band assignment.
2501.17[&] *13*	11−		EF I	Jπ: E2 477γ to 9−; band assignment.
2522.58 *7*			B	
2531.51 *9*			B	
2546.87 *9*			B	
2589.1[c] *5*	(11+)		E	Jπ: E2 315γ to (9+); band assignment.
2722.9[b] *10*	(11−)		E	Jπ: 449γ to (9−); band assignment.
2736.8[d] *4*	13−		DEF	Jπ: E2 549γ to 11−, M1 285γ to 12−; band assignment.
2763.6[c] *5*	(12+)		E	Jπ: E2 340γ to (10+), 175γ to (11+); band assignment.
2813.4[&] *10*	12−		EF	Jπ: E2 529γ to 10−; band assignment.
2822.9[@] *7*	14+		DEF	Jπ: E2 588γ to 12+; band assignment.
2884.12 *5*	2−		B	Jπ: log *ft*=5.6 in ^{180}Re ε decay from (1)− parent, 1651.5γ to 3+.
2910.02? *9*			B	
2966.2[c] *6*	(13+)		E	Jπ: E2 377γ to (11+), 202γ to (12+); band assignment.
3000.5[b] *12*	(12−)		E	Jπ: 506γ to (10−); band assignment.
3042.7[d] *4*	14−		DEF	Jπ: E2 591γ to 12−, M1 306γ to 13−; band assignment.
3047.5[&] *10*	13−		EF	Jπ: E2 546γ to 11−; band assignment.
3176.3[c] *6*	(14+)		E	Jπ: E2 413γ to (12+); band assignment.
3248.4[b] *14*	(13−)		E	Jπ: 526γ to (11−); band assignment.
3264.9 *3*	14−	2.3 μs *2*	DEF	Jπ: (M1) 222γ to 14−, 813γ to 12−. $T_{1/2}$: from 2.3 μs *2* in Be(^{208}Pb,X) (2002Pf01) and 2.3 μs *2* from Hf(α,xnγ). configuration=(ν7/2[514]ν9/2[624](π5/2[402]π7/2[404]).
3356.1 *8*			E	
3368.3[d] *7*	15−		E	Jπ: E2 632γ to 13−; band assignment.
3389.8 *7*	(15+)	8.6 ns *6*	DEF	Jπ: (E1) 125γ to 14−. $T_{1/2}$: other: ≈3.5 ns from centroid-shift analysis in ^{176}Yb(^{9}Be,5nγ). configuration=(ν7/2[514]ν9/2[624])(π5/2[402]π9/2[514]).

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Adopted Levels, Gammas (continued)

^{180}W Levels (continued)

E(level)†	Jπ‡	$T_{1/2}$#	XREF	Comments
3411.2[&] *14*	(14⁻)		EF	Jπ: 598γ to 12⁻; band assignment.
3412.7[@] *10*	16⁺		DEF	Jπ: E2 590γ to 14⁺, band assignment.
3421.8[c] *8*	(15⁺)		E	Jπ: E2 455γ to (13⁺), (M1+E2) 246γ to (14⁺); band assignment.
3515.2 *9*			D	
3529.1 *7*			E	
3547.9[g] *12*	(16⁺)	20.3 ns *6*	DEF	Jπ: (M1) 158γ to (15⁺). $T_{1/2}$: other: ≈4.2 ns from centroid-shift analysis in ^{176}Yb(^{9}Be,5nγ). configuration=(ν7/2[514]ν9/2[624])(π7/2[404]π9/2[514]).
3581.6 *8*			E	
3605.8 *9*			E	
3656.7[&] *14*	15⁻		E	Jπ: E2 609γ to 13⁻; band assignment.
3695.5[c] *8*	(16⁺)		E	Jπ: E2 519γ to (14⁺); band assignment.
3697.8 *7*			E	
3713.0[d] *8*	16⁻		E	Jπ: E2 671γ to 14⁻; band assignment.
3745.0 *9*			DE	
3831.5 *9*			D	
3845.4[b] *17*	(15⁻)		E	Jπ: 597γ to (13⁻); band assignment.
3888.2[g] *15*	(17⁺)		EF	Jπ: 340γ to (16⁺); band assignment.
3898.0[e] *8*	(16⁻)		E	Jπ: 250γ from (17⁻); band assignment.
3967.2[c] *10*	(17⁺)		E	Jπ: E2 545γ to (15⁺); band assignment.
4002.0 *12*			DE	
4017.4[@] *13*	(18⁺)		DEF	Jπ: (E2) 604.5γ to 16⁺; band assignment.
4066.2[&] *17*	(16⁻)		E	Jπ: 655γ to (14⁻); band assignment.
4074.9[d] *12*	(17⁻)		E	Jπ: 707γ to 15⁻; band assignment.
4147.8[e] *6*	(17⁻)		DE	Jπ: 435γ to 16⁻, 780γ to 15⁻.
4248.9[g] *15*	(18⁺)		EF	Jπ: 361γ to (17⁺), 701γ to (16⁺); band assignment.
4269.9 *11*			DE	
4320.4[&] *17*	(17⁻)		E	Jπ: 664γ to 15⁻; band assignment.
4339.4[c] *11*	(18⁺)		E	Jπ: E2 644γ to (16⁺); band assignment.
4416.7[e] *9*	(18⁻)		E	Jπ: 519γ to (16⁻); band assignment.
4455.9[d] *13*	(18⁻)		E	Jπ: 743γ to 16⁻; band assignment.
4525.7 *18*			E	
4554.2 *12*			DE	
4606.6[c] *14*	(19⁺)		E	Jπ: E2 639γ to (17⁺); band assignment.
4628.8[g] *16*	(19⁺)		EF	Jπ: 380γ to (18⁺), 741γ to (17⁺); band assignment.
4673.1[@] *14*	(20⁺)		DE	Jπ: E2 655.5γ to (18⁺); band assignment.
4711.4[h] *9*	(19⁻)		DE	Jπ: 295γ to (18⁻), 564γ to 17⁻.
4761.2[&] *20*	(18⁻)		E	Jπ: 695γ to (16⁻); band assignment.
4845.9?[d] *16*	(19⁻)		E	Jπ: 771γ to (17⁻); band assignment.
4852.9[h] *11*	(20⁻)		DE	Jπ: 142γ to (19⁻); band assignment.
4857.3 *12*			DE	
5024.8[g] *16*	(20⁺)		E	Jπ: 396γ to (19⁺), (E2) 776γ to (18⁺); band assignment.
5027.4?[&] *20*	(19⁻)		E	Jπ: 707γ to (17⁻); band assignment.
5029.7?[e] *13*	(20⁻)		E	Jπ: 613γ to (18⁻); band assignment.
5095.3[c] *15*	(20⁺)		E	Jπ: E2 756γ to (18⁺); band assignment.
5128.7[h] *12*	(21⁻)		DE	Jπ: 276γ to (20⁻); band assignment.
5178.5 *12*			DE	
5339.8[c] *17*	(21⁺)		E	Jπ: E2 733γ to (19⁺).
5402.2[@] *14*	(22⁺)		DE	Jπ: 729γ to (20⁺); band assignment.
5434.8[g] *17*	(21⁺)		E	Jπ: 410γ to (20⁺), 806γ to (19⁺); band assignment.

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Adopted Levels, Gammas (continued)

^{180}W Levels (continued)

E(level)[†]	Jπ[‡]	$T_{1/2}$[#]	XREF	Comments
5454.2[h] 12	(22⁻)		DE	Jπ: 326γ to (21⁻), 601γ to (20⁻); band assignment.
5518.8 13			DE	
5745.4?[&] 22	(21⁻)		E	Jπ: 718γ to (19⁻); band assignment.
5815.8[h] 12	(23⁻)		DE	Jπ: 362γ to (22⁻), 687γ to (21⁻); band assignment.
5859.3[g] 17	(22⁺)		E	Jπ: 424γ to (21⁺), 835γ to (20⁺); band assignment.
5877.5 12	(22⁻)		DE	Jπ: 359γ to (21⁻), 699γ to (20⁻); band assignment.
5975.4 12	(23⁻)	<0.7 ns	DE	Jπ: 521γ to (22⁻), 847γ to (21⁻). $T_{1/2}$: from centroid-shift analysis in ^{176}Yb(^{9}Be,5nγ).
6115.2 12	(23⁻)	≈1.4 ns	DE	Jπ: 661γ to (22⁻), 986γ to (21⁻). $T_{1/2}$: from centroid-shift analysis in ^{176}Yb(^{9}Be,5nγ).
6162.8?[c] 20	(23⁺)		E	Jπ: 823γ to (21⁺); band assignment.
6207.9[h] 13	(24⁻)		E	Jπ: 392γ to (23⁻), 735.5γ to (22⁻); band assignment.
6211.9[@] 14	(24⁺)		DE	Jπ: 809.5γ to (22⁺); band assignment.
6292.6?[g] 18	(23⁺)		E	Jπ: 433γ to (22⁺), 858γ to (21⁺); band assignment.
6304.2[f] 13	(24⁺)	<0.7 ns	DE	Jπ: 189γ to (23⁻). $T_{1/2}$: from centroid-shift analysis in ^{176}Yb(^{9}Be,5nγ).
6626.6[h] 14	(25⁻)		E	Jπ: 418.5γ to (24⁻), 811γ to (23⁻); band assignment.
6734.1[f] 15	(25⁺)		DE	Jπ: 430γ to (24⁺); band assignment.
7070.2[h] 15	(26⁻)		E	Jπ: 444γ to (25⁻), 862γ to (24⁻); band assignment.
7101.4[@] 17	(26⁺)		E	Jπ: 889.5γ to (24⁺); band assignment.
7177.4[f] 15	(26⁺)		DE	Jπ: 443γ to (25⁺), 873γ to (24⁺); band assignment.
7634.1[f] 16	(27⁺)		D	Jπ: 456γ to (26⁺), 900γ to (25⁺); band assignment.
8067.4?[@] 20	(28⁺)		E	Jπ: 966γ to (26⁺); band assignment.

† From a least-squares fit to Eγ, by evaluator, for levels connected by γ-rays. The remaining level energies are from the indicated dataset.
‡ Assignments are based mainly on band structures and on γ-ray multipolarities and decay patterns. Additional arguments are included in the comments.
# From beam-γ(t) in Hf(α,xnγ), except where noted.
@ Band(A): g.s. band.
& Band(B): $K^{\pi}=2^-$ octupole rotational band.
a Band(C): $K^{\pi}=2^+$ γ vibrational band.
b Band(D): $K^{\pi}=(5^-)$ rotational band.
c Band(E): $K^{\pi}=(8^+)$ band. Interpreted as a Fermi-aligned $i^2_{13/2}$, t-band.
d Band(F): $K^{\pi}=8^-$ rotational band.
e Band(G): $K^{\pi}=16^-$ band.
f Band(H): K=(24⁺) band.
g Band(I): $K^{\pi}=(16^+)$ band.
h Band(J): $K^{\pi}=(19^-)$ band.

$\gamma(^{180}W)$

E_i(level)	J^π_i	E_γ†	I_γ†	E_f	J^π_f	Mult.‡	δ	α	Comments
103.561	2^+	103.568 *18*	100	0.0	0^+	E2		3.40	α(K)=0.827 *12*; α(L)=1.95 *3*; α(M)=0.492 *7*; α(N)=0.1159 *17*; α(O)=0.01587 *23* α(P)=6.54×10^{-5} *10* B(E2)(W.u.)=140 *6* Mult.: from ce ratios in ^{180}Re ε decay.
337.559	4^+	233.99 *3*	100	103.561	2^+	E2		0.184	α(K)=0.1106 *16*; α(L)=0.0558 *8*; α(M)=0.01379 *20*; α(N)=0.00327 *5*; α(O)=0.000466 *7* α(P)=9.03×10^{-6} *13* Mult.: from ce(K)/ce(L) in Hf(α,xnγ) and ^{181}Ta(p,2nγ).
688.46	6^+	350.898 *7*	100	337.559	4^+	E2		0.0538	α(K)=0.0380 *6*; α(L)=0.01212 *17*; α(M)=0.00293 *5*; α(N)=0.000697 *10*; α(O)=0.0001028 *15* α(P)=3.34×10^{-6} *5* Mult.: from ce(K)/ce(L) in Hf(α,xnγ) and ^{181}Ta(p,2nγ).
1006.381	2^-	668.84 *10*	0.45 *3*	337.559	4^+	[M2]		0.0736	α(K)=0.0599 *9*; α(L)=0.01053 *15*; α(M)=0.00243 *4*; α(N)=0.000588 *9*; α(O)=9.55×10^{-5} *14* α(P)=6.62×10^{-6} *10* B(M2)(W.u.)=0.0044 *4* I_γ: from ^{180}Re ε decay. Other: 1.14 from ^{181}Ta(p,2nγ).
		902.814 *13*	100 *3*	103.561	2^+	E1+M2	−0.31 *5*	0.0048 *8*	α(K)=0.0039 *7*; α(L)=0.00062 *12*; α(M)=0.00014 *3*; α(N)=3.4×10^{-5} *7*; α(O)=5.5×10^{-6} *10* α(P)=3.9×10^{-7} *7* B(E1)(W.u.)=3.5×10^{-8} *3*; B(M2)(W.u.)=0.019 *6* Mult.,δ: from γγ(θ) and ce data in ^{180}Re ε decay. δ: Other: −0.16 *7* from ^{181}Ta(p,2nγ).
		1006.34 *6*	0.547 *21*	0.0	0^+	[M2]		0.0236	α(K)=0.0195 *3*; α(L)=0.00321 *5*; α(M)=0.000736 *11*; α(N)=0.0001776 *25*; α(O)=2.89×10^{-5} *4* α(P)=2.05×10^{-6} *3* B(M2)(W.u.)=0.00069 *5* I_γ: from ^{180}Re ε decay. Other: 0.91 from ^{181}Ta(p,2nγ).
1082.374	3^-	75.987 *10*	68 *3*	1006.381	2^-				I_γ: from ^{180}Re ε decay. Other: 57 from ^{181}Ta(p,2nγ).
		744.79 *3*	100 *7*	337.559	4^+				
1117.31	2^+	1013.71 *8*	100 *4*	103.561	2^+				
		1117.27 *4*	84 *3*	0.0	0^+				
1138.47	8^+	450.018 *20*	100	688.46	6^+	E2		0.0274	α(K)=0.0206 *3*; α(L)=0.00527 *8*; α(M)=0.001257 *18*; α(N)=0.000300 *5*; α(O)=4.52×10^{-5} *7* α(P)=1.86×10^{-6} *3* Mult.: from α(K)exp and ce(K)/ce(L) in Hf(α,xnγ) and ^{181}Ta(p,2nγ).
1184.893	4^-	102.513 *10*	22	1082.374	3^-				
		178.516 *10*	100 *10*	1006.381	2^-	E2#		0.454	α(K)=0.229 *4*; α(L)=0.1712 *24*; α(M)=0.0427 *6*; α(N)=0.01010 *15*;

$^{180}_{74}W_{106}$-6

$\gamma(^{180}W)$ (continued)

E_i(level)	J^π_i	E_γ[†]	I_γ[†]	E_f	J^π_f	Mult.[‡]	α	Comments
								α(O)=0.001415 *20* α(P)=1.771×10^{-5} *25*
1184.893	4$^-$	847.35 *4*	39 *13*	337.559	4$^+$			I_γ: from ^{180}Re ε decay. Other: 25 from ^{181}Ta(p,2nγ).
		1081.52 *12*	7.0	103.561	2$^+$			
1232.67	3$^+$	895.26 *10*	16	337.559	4$^+$			
		1129.12 *4*	100	103.561	2$^+$			
1307.575	5$^-$	122.688 *20*	24.4 *17*	1184.893	4$^-$	M1+E2	2.2 *5*	α(K)=1.4 *8*; α(L)=0.6 *3*; α(M)=0.15 *8*; α(N)=0.036 *17*; α(O)=0.0052 *21*; α(P)=0.00013 *9* I_γ: from Hf(α,xnγ). Other: 25 *3* from ^{176}Yb(^{9}Be,5nγ), 9.3 from ^{181}Ta(p,2nγ). Mult.: D+Q from $\gamma(\theta)$ in ^{176}Yb(^{9}Be,5nγ), $\Delta\pi$=no from level scheme.
		225.189 *20*	100 *6*	1082.374	3$^-$	E2[#]	0.208	α(K)=0.1226 *18*; α(L)=0.0651 *10*; α(M)=0.01612 *23*; α(N)=0.00382 *6*; α(O)=0.000543 *8* α(P)=9.94×10^{-6} *14*
		619.24 *22*	4.0	688.46	6$^+$			
		969.83 *18*	6.0	337.559	4$^+$			
1322.09	(2$^+$)	984.2 *3*	60	337.559	4$^+$			
		1218.8 *3*	100	103.561	2$^+$			
		1322.2 *4*	60	0.0	0$^+$			
1360.51	4$^+$	1022.92 *6*	100	337.559	4$^+$			
		1257.16 *9*	59	103.561	2$^+$	(E2)[@]	0.00289	α(K)=0.00239 *4*; α(L)=0.000378 *6*; α(M)=8.61×10^{-5} *12*; α(N)=2.07×10^{-5} *3*; α(O)=3.33×10^{-6} *5* α(P)=2.21×10^{-7} *3*
1461.82	6$^-$	154.23 *4*	2.3 *8*	1307.575	5$^-$			I_γ: from ^{176}Yb(^{9}Be,5nγ). Other: 4.5 from ^{181}Ta(p,2nγ).
		276.941 *20*	100 *8*	1184.893	4$^-$	E2	0.1083	α(K)=0.0704 *10*; α(L)=0.0289 *4*; α(M)=0.00708 *10*; α(N)=0.001679 *24*; α(O)=0.000242 *4* α(P)=5.95×10^{-6} *9*
1529.05	8$^-$	67		1461.82	6$^-$			E_γ: observed only in ^{176}Yb(^{9}Be,5nγ).
		390.581 *15*	100	1138.47	8$^+$	E1	0.01230	α(K)=0.01030 *15*; α(L)=0.001554 *22*; α(M)=0.000351 *5*; α(N)=8.40×10^{-5} *12* α(O)=1.341×10^{-5} *19*; α(P)=8.66×10^{-7} *13* B(E1)(W.u.)<6.43×10^{-13} *11* Mult.: from α(K)exp in Hf(α,xnγ) and ^{181}Ta(p,2nγ).
1535.63	5$^+$	847.0	12.0	688.46	6$^+$			
		1198.07 *6*	100	337.559	4$^+$			
1568.17		879.6[b] *3*	50	688.46	6$^+$			
		1230.62 *11*	100	337.559	4$^+$			
1587.27	2$^+$	580.8 *1*	100 *17*	1006.381	2$^-$			
		1483.69 *6*	92 *8*	103.561	2$^+$			
		1587.2 *3*	16 *3*	0.0	0$^+$			
1624.23	7$^-$	162.43 *5*	2.9	1461.82	6$^-$			
		316.63 *3*	100	1307.575	5$^-$	E2	0.0724	α(K)=0.0495 *7*; α(L)=0.01751 *25*; α(M)=0.00426 *6*; α(N)=0.001012 *15*; α(O)=0.0001479 *21* α(P)=4.28×10^{-6} *6*

$^{180}_{74}W_{106}$-7

γ(^{180}W) (continued)

E_i(level)	J^π_i	E_γ†	I_γ†	E_f	J^π_f	Mult.‡	α	Comments
1632.92	(1⁻,2)	550.52 *6*	100 *8*	1082.374	3⁻			
		626.7 *2*	35 *13*	1006.381	2⁻			
		1529.30 *11*	47 *3*	103.561	2⁺			
1634.67	(3,4⁺)	401.84 *12*	69	1232.67	3⁺			
		450.0 *5*	27	1184.893	4⁻			
		517.37 *4*	100	1117.31	2⁺			
		552.0 *3*	15	1082.374	3⁻			
		1297.4 *3*	19	337.559	4⁺			
1639.80	(5⁻)	179.1	8.3	1461.82	6⁻			
		279.31 *4*	33	1360.51	4⁺			
		332.24 *3*	100 *8*	1307.575	5⁻			
		454.88 *3*	112 *9*	1184.893	4⁻			I_γ: weighted average of 115 *8* from Hf(α,xnγ) and 86 *23* from ^{176}Yb(^{9}Be,5nγ). Other: 73 from ^{181}Ta(p,2nγ).
		951.25 *12*	10	688.46	6⁺			
1664.18	10⁺	525.71 *3*	100	1138.47	8⁺	E2	0.0185	α(K)=0.01429 *20*; α(L)=0.00327 *5*; α(M)=0.000773 *11*; α(N)=0.000185 *3*; α(O)=2.82×10^{-5} *4* α(P)=1.309×10^{-6} *19*
1693.60		1356.04 *15*	100	337.559	4⁺			
1702.98	6⁺	1014.49 *10*	100	688.46	6⁺			
		1365.46 *13*	47	337.559	4⁺			
1725.59	9⁻	196.54 *3*	100	1529.05	8⁻	M1+E2	0.51 *19*	α(K)=0.38 *21*; α(L)=0.103 *12*; α(M)=0.025 *4*; α(N)=0.0059 *9*; α(O)=0.00088 *7* α(P)=3.6×10^{-5} *23* Mult.: D+Q from $\gamma(\theta)$ in ^{176}Yb(^{9}Be,5nγ), $\Delta\pi$= no from assumed band structure.
1729.85	(4⁺,5,6⁺)	1041.40 *7*	100	688.46	6⁺			
		1392.22 *16*	42	337.559	4⁺			
1764.42	(6⁻)	124.63 *2*	100	1639.80	(5⁻)			
1784.96	(4⁺,5⁺)	424.50 *8*	100	1360.51	4⁺			
		552.4 *2*	50	1232.67	3⁺			
		1096.3 *2*	38	688.46	6⁺			
		1447.2 *2*	88	337.559	4⁺			
1814.88	(2⁺,3)	808.9 *3*	100 *19*	1006.381	2⁻			
		1477.3 *3*	44 *16*	337.559	4⁺			
		1711.3 *2*	81 *13*	103.561	2⁺			
1830.85	8⁻	206.7 *7*	1.9 *9*	1624.23	7⁻			I_γ: from ^{176}Yb(^{9}Be,5nγ). Other: 3.1 from ^{181}Ta(p,2nγ).
		369.02 *3*	100 *6*	1461.82	6⁻	E2	0.0467	α(K)=0.0334 *5*; α(L)=0.01017 *15*; α(M)=0.00245 *4*; α(N)=0.000584 *9*; α(O)=8.64×10^{-5} *13* α(P)=2.96×10^{-6} *5*
1831.70	2⁻	599.0 *2*	1.50 *19*	1232.67	3⁺			
		714.43 *7*	2.82 *19*	1117.31	2⁺			
		749.34 *5*	11.3 *4*	1082.374	3⁻			
		825.36 *5*	100 *3*	1006.381	2⁻	M1	0.01564	α(K)=0.01308 *19*; α(L)=0.00198 *3*; α(M)=0.000449 *7*; α(N)=0.0001080 *16*

$^{180}_{74}$W$_{106}$-8

$\gamma(^{180}W)$ (continued)

E_i(level)	J^π_i	E_γ†	I_γ†	E_f	J^π_f	Mult.‡	α	Comments
								α(O)=1.768×10^{-5} *25*; α(P)=1.282×10^{-6} *18* Mult.: from α(K)exp in ^{180}Re ε decay.
1831.70	2$^-$	1727.8 *1*	0.57 *7*	103.561	2$^+$			
1851.15		211.35 *5*	100	1639.80	(5$^-$)			
1855.20		1166.74 *16*	100	688.46	6$^+$			
1911.58	(7$^-$)	147.16 *2*	100 *8*	1764.42	(6$^-$)	M1+E2	1.2 *4*	α(K)=0.8 *5*; α(L)=0.30 *10*; α(M)=0.07 *3*; α(N)=0.017 *6*; α(O)=0.0026 *7*; α(P)=8.E−5 *6* Mult.: D+Q from $\gamma(\theta)$ in ^{176}Yb(^{9}Be,5nγ), $\Delta\pi$= no from assumed band structure.
		271.75 *5*	98 *6*	1639.80	(5$^-$)			
1918.13	(4$^+$,5,6$^+$)	1229.6 *2*	100	688.46	6$^+$			
		1581.2 *6*	60	337.559	4$^+$			
1926.44	(6$^+$,7,8$^+$)	788.0 *3*	14	1138.47	8$^+$			
		1237.96 *18*	100	688.46	6$^+$			
1932.20	7$^+$	794	13	1138.47	8$^+$			
		1243.73 *11*	100	688.46	6$^+$			
1945.07	10$^-$	219.49 *4*	102 *8*	1725.59	9$^-$	M1	0.515	α(K)=0.428 *6*; α(L)=0.0674 *10*; α(M)=0.01533 *22*; α(N)=0.00369 *6*; α(O)=0.000603 *9* α(P)=4.30×10^{-5} *6* I_γ: weighted average of 89 *5* from Hf(α,xnγ) and 107 *3* from ^{176}Yb(^{9}Be,5nγ). Others: 100 *20* in ^{136}Xe(^{48}Ca,4nγ) and 220 in ^{181}Ta(p,2nγ). Mult.: D from $\gamma(\theta)$ in Hf(α,xnγ), $\Delta\pi$=no from level scheme.
		415.94 *10*	100 *5*	1529.05	8$^-$	E2	0.0337	α(K)=0.0249 *4*; α(L)=0.00680 *10*; α(M)=0.001629 *23*; α(N)=0.000388 *6*; α(O)=5.81×10^{-5} *9* α(P)=2.23×10^{-6} *4*
1954.53		319.74[b] *17*	100	1634.67	(3,4$^+$)			
		1266.2 *3*	63	688.46	6$^+$			
		1617.6 *5*	25	337.559	4$^+$			
2024.57	9$^-$	194.0	1.3 *7*	1830.85	8$^-$			
		400.26 *8*	100 *4*	1624.23	7$^-$	E2	0.0374	α(K)=0.0273 *4*; α(L)=0.00772 *11*; α(M)=0.00185 *3*; α(N)=0.000441 *7*; α(O)=6.58×10^{-5} *10* α(P)=2.44×10^{-6} *4*
		886.6 *2*	16	1138.47	8$^+$			
2059.35		329.5 *1*	100	1729.85	(4$^+$,5,6$^+$)			
2082.55	(8$^-$)	170.95 *5*	23 *5*	1911.58	(7$^-$)	M1+E2	0.8 *3*	α(K)=0.6 *3*; α(L)=0.17 *4*; α(M)=0.041 *11*; α(N)=0.0098 *24*; α(O)=0.00146 *25*; α(P)=5.E−5 *4* Mult.: D+Q from $\gamma(\theta)$ in ^{176}Yb(^{9}Be,5nγ), $\Delta\pi$= no from assumed band structure. I_γ: from ^{176}Yb(^{9}Be,5nγ). Others: 145 *10* from Hg(α,xnγ) and 63 from ^{181}Ta(p,2nγ).
		318.24 *11*	100 *24*	1764.42	(6$^-$)	E2	0.0714	α(K)=0.0489 *7*; α(L)=0.01719 *25*; α(M)=0.00418 *6*; α(N)=0.000993

$\gamma(^{180}W)$ (continued)

E_i(level)	J^π_i	E_γ†	I_γ†	E_f	J^π_f	Mult.‡	α	Comments
								14; α(O)=0.0001452 *21* α(P)=4.23×10^{-6} *6* I_γ: from Hg(α,xnγ). Other: 160 from ^{181}Ta(p,2nγ).
2117.52		979.05 *12*	100	1138.47	8$^+$			
2127.39		988.92 *8*	100	1138.47	8$^+$			
2133.09	(8$^+$)	603.4[b]		1529.05	8$^-$			
		994.62 *8*		1138.47	8$^+$			
2176.80		1059.42 *6*	100 *5*	1117.31	2$^+$			
		2073.5 *2*	20 *3*	103.561	2$^+$			
		2176.9 *1*	28 *3*	0.0	0$^+$			
2187.00	11$^-$	241.91 *14*	74 *9*	1945.07	10$^-$	M1	0.394	α(K)=0.328 *5*; α(L)=0.0515 *8*; α(M)=0.01171 *17*; α(N)=0.00282 *4*; α(O)=0.000460 *7* α(P)=3.28×10^{-5} *5* I_γ: weighted average of 79.7 *24* from ^{176}Yb(^{9}Be,5nγ) and 60 *4* from Hf(α,xnγ). Other: 170 from ^{181}Ta(p,2nγ). Mult.: D from $\gamma(\theta)$ in Hf(α,xnγ), $\Delta\pi$=no from level scheme.
		461.43 *13*	100 *6*	1725.59	9$^-$	E2	0.0257	α(K)=0.0194 *3*; α(L)=0.00487 *7*; α(M)=0.001160 *17*; α(N)=0.000276 *4*; α(O)=4.18×10^{-5} *6* α(P)=1.757×10^{-6} *25*
2227.85		995.14 *9*	100 *10*	1232.67	3$^+$			
		1110.7 *2*	78 *9*	1117.31	2$^+$			
		1145.4 *4*	14 *8*	1082.374	3$^-$			
2235.19	12$^+$	571.0 *1*	100	1664.18	10$^+$	E2	0.01520	α(K)=0.01186 *17*; α(L)=0.00257 *4*; α(M)=0.000605 *9*; α(N)=0.0001445 *21*; α(O)=2.22×10^{-5} *4* α(P)=1.091×10^{-6} *16*
2256.65?		1250.22[a] *6*	<65[a]	1006.381	2$^-$			
		2153.24 *11*	100 *6*	103.561	2$^+$			
2273.70	(9$^-$)	191.5 *3*	37 *11*	2082.55	(8$^-$)	M1	0.752	α(K)=0.625 *10*; α(L)=0.0986 *15*; α(M)=0.0225 *4*; α(N)=0.00541 *8*; α(O)=0.000882 *13* α(P)=6.29×10^{-5} *10* Mult.: D from $\gamma(\theta)$ in Hf(α,xnγ), $\Delta\pi$=no from level scheme. I_γ: from ^{176}Yb(^{9}Be,5nγ). Others: 25 from ^{181}Ta(p,2nγ), 104 *14* from Hf(α,xnγ).
		362.10 *6*	100 *22*	1911.58	(7$^-$)	E2	0.0493	α(K)=0.0351 *5*; α(L)=0.01086 *16*; α(M)=0.00262 *4*; α(N)=0.000624 *9*; α(O)=9.22×10^{-5} *13* α(P)=3.10×10^{-6} *5*
2274.0	(9$^+$)	141.2	100 *8*	2133.09	(8$^+$)	(M1+E2)	1.4 *4*	α(K)=0.9 *6*; α(L)=0.35 *13*; α(M)=0.09 *4*; α(N)=0.021 *8*; α(O)=0.0030 *10*; α(P)=9.E−5 *6* Mult.: D+Q from $\gamma(\theta)$ in ^{176}Yb(^{9}Be,5nγ), $\Delta\pi$=no from level scheme.
		548.7	16 *8*	1725.59	9$^-$			
2284.00	10$^-$	453.15 *14*	100	1830.85	8$^-$	E2	0.0269	α(K)=0.0202 *3*; α(L)=0.00515 *8*; α(M)=0.001229 *18*; α(N)=0.000293 *5*;

γ(^{180}W) (continued)

E_i(level)	J^{π}_i	E_{γ}[†]	I_{γ}[†]	E_f	J^{π}_f	Mult.[‡]	α	Comments
								α(O)=4.42×10^{-5} *7* α(P)=1.83×10^{-6} *3*
2415.77	2$^-$	782.6 *2*	5.8 *19*	1632.92	(1$^-$,2)			
		828.5[b] *2*	8 *4*	1587.27	2$^+$			
		1183.11 *7*	24.0 *19*	1232.67	3$^+$			
		1298.44 *5*	74.0 *19*	1117.31	2$^+$			
		1333.4 *2*	11.6 *12*	1082.374	3$^-$			
		1409.40 *5*	100 *4*	1006.381	2$^-$			
		2312.1 *2*	3.9 *8*	103.561	2$^+$			
2423.9	(10$^+$)	150.0	47 *6*	2274.0	(9$^+$)	(M1+E2)	1.2 *4*	α(K)=0.8 *5*; α(L)=0.28 *9*; α(M)=0.068 *24*; α(N)=0.016 *6*; α(O)=0.0024 *7*; α(P)=8.E−5 *5* Mult.: D+Q from $\gamma(\theta)$ in ^{176}Yb(^{9}Be,5nγ), $\Delta\pi$=no from level scheme.
		698.2	23 *3*	1725.59	9$^-$			
		759.7	100 *6*	1664.18	10$^+$			
		1285.2	70 *12*	1138.47	8$^+$			
2435.18	2$^-$	847.8[a] *1*	<13[a]	1587.27	2$^+$			
		1202.6 *1*	28.7 *23*	1232.67	3$^+$			
		1250.22[a] *6*	<23[a]	1184.893	4$^-$			
		1317.85 *6*	63 *3*	1117.31	2$^+$			
		1352.80 *5*	100 *7*	1082.374	3$^-$			
		1428.8 *1*	13 *3*	1006.381	2$^-$			
		2331.87 *11*	30.3 *16*	103.561	2$^+$			
2451.61	12$^-$	264.7 *6*	46 *3*	2187.00	11$^-$		0.22 *10*	I_{γ}: from Hf(α,xnγ). Other: ≤110 from ^{181}Ta(p,2nγ).
		506.56 *12*	100 *5*	1945.07	10$^-$	E2	0.0203	α(K)=0.01556 *22*; α(L)=0.00365 *6*; α(M)=0.000866 *13*; α(N)=0.000207 *3*; α(O)=3.15×10^{-5} *5* α(P)=1.422×10^{-6} *20*
2494.5	(10$^-$)	221.0	11 *4*	2273.70	(9$^-$)			
		411.8	100 *21*	2082.55	(8$^-$)			
2501.17	11$^-$	476.6 *1*	100	2024.57	9$^-$	E2[#]	0.0237	α(K)=0.0179 *3*; α(L)=0.00440 *7*; α(M)=0.001047 *15*; α(N)=0.000250 *4*; α(O)=3.78×10^{-5} *6* α(P)=1.632×10^{-6} *23*
2522.58		935.2 *2*	52 *13*	1587.27	2$^+$			
		1290.0 *1*	62 *9*	1232.67	3$^+$			
		1405.2 *1*	100 *10*	1117.31	2$^+$			
		1516.0 *5*	75 *14*	1006.381	2$^-$			
2531.51		699.7[b] *2*	100 *30*	1831.70	2$^-$			
		1449.2 *2*	18 *6*	1082.374	3$^-$			
		1525.14 *11*	84 *5*	1006.381	2$^-$			
2546.87		1314.2 *1*	36 *9*	1232.67	3$^+$			
		1429.5 *2*	100 *18*	1117.31	2$^+$			
2589.1	(11$^+$)	165.1	100 *5*	2423.9	(10$^+$)	(M1+E2)	0.9 *3*	α(K)=0.6 *4*; α(L)=0.19 *5*; α(M)=0.047 *13*; α(N)=0.011 *3*; α(O)=0.0017 *4*;

$^{180}_{74}$W$_{106}$-11

$\gamma(^{180}W)$ (continued)

E_i(level)	J^π_i	E_γ†	I_γ†	E_f	J^π_f	Mult.‡	α	Comments
								α(P)=6.E−5 *4* Mult.: D+Q from $\gamma(\theta)$ in ^{176}Yb(^{9}Be,5nγ), $\Delta\pi$=no from level scheme.
2589.1	(11$^+$)	315.4	15 *5*	2274.0	(9$^+$)	E2#	0.0733	α(K)=0.0500 *7*; α(L)=0.01776 *25*; α(M)=0.00432 *6*; α(N)=0.001027 *15*; α(O)=0.0001500 *21* α(P)=4.32×10^{-6} *6*
		643.5	12 *5*	1945.07	10$^-$			
2722.9	(11$^-$)	449.2	100	2273.70	(9$^-$)			
2736.8	13$^-$	285.3	17 *3*	2451.61	12$^-$	M1	0.251	α(K)=0.209 *3*; α(L)=0.0327 *5*; α(M)=0.00743 *11*; α(N)=0.00179 *3*; α(O)=0.000292 *4* α(P)=2.09×10^{-5} *3* Mult.: D from $\gamma(\theta)$ in Hf(α,xnγ), $\Delta\pi$=no from level scheme.
		549.1	100 *2*	2187.00	11$^-$	E2	0.01669	α(K)=0.01295 *19*; α(L)=0.00288 *4*; α(M)=0.000679 *10*; α(N)=0.0001621 *23* α(O)=2.49×10^{-5} *4*; α(P)=1.189×10^{-6} *17*
2763.6	(12$^+$)	174.5	9.0 *17*	2589.1	(11$^+$)	M1+E2	0.73 *25*	α(K)=0.5 *3*; α(L)=0.16 *3*; α(M)=0.038 *9*; α(N)=0.0091 *21*; α(O)=0.00135 *21*; α(P)=5.E−5 *4* Mult.: D+Q from $\gamma(\theta)$ in ^{176}Yb(^{9}Be,5nγ), $\Delta\pi$=no from level scheme.
		339.6	17 *3*	2423.9	(10$^+$)	E2#	0.0591	α(K)=0.0413 *6*; α(L)=0.01360 *19*; α(M)=0.00330 *5*; α(N)=0.000784 *11*; α(O)=0.0001152 *17* α(P)=3.61×10^{-6} *5*
		528.3	100 *7*	2235.19	12$^+$			
		1099.6	40 *10*	1664.18	10$^+$	(E2)#	0.00373	α(K)=0.00308 *5*; α(L)=0.000504 *7*; α(M)=0.0001152 *17*; α(N)=2.76×10^{-5} *4*; α(O)=4.43×10^{-6} *7* α(P)=2.86×10^{-7} *4*
2813.4	12$^-$	529.4	100	2284.00	10$^-$	E2	0.0182	α(K)=0.01406 *20*; α(L)=0.00320 *5*; α(M)=0.000757 *11*; α(N)=0.000181 *3*; α(O)=2.76×10^{-5} *4* α(P)=1.289×10^{-6} *18*
2822.9	14$^+$	587.6	100	2235.19	12$^+$	E2	0.01421	α(K)=0.01113 *16*; α(L)=0.00237 *4*; α(M)=0.000557 *8*; α(N)=0.0001331 *19*; α(O)=2.05×10^{-5} *3* α(P)=1.025×10^{-6} *15*
2884.12	2$^-$	1069.4 *2*	15 *3*	1814.88	(2$^+$,3)			
		1651.45 *11*	31.6 *22*	1232.67	3$^+$			
		1766.74 *11*	41 *4*	1117.31	2$^+$			
		1801.75 *11*	65 *4*	1082.374	3$^-$			
		1877.70 *10*	100 *4*	1006.381	2$^-$			
		2780.6 *2*	6.2 *9*	103.561	2$^+$			
2910.02?		1678.0 *3*	72 *19*	1232.67	3$^+$			
		1792.3 *3*	59 *16*	1117.31	2$^+$			
		1903.6 *1*	100 *13*	1006.381	2$^-$			
2966.2	(13$^+$)	202.4	27 *4*	2763.6	(12$^+$)	(M1+E2)	0.47 *18*	α(K)=0.35 *19*; α(L)=0.093 *9*; α(M)=0.022 *3*; α(N)=0.0053 *7*; α(O)=0.00080 *5*; α(P)=3.3×10^{-5} *21* Mult.: D+Q from $\gamma(\theta)$ in ^{176}Yb(^{9}Be,5nγ), $\Delta\pi$=no from level scheme.
		376.9	100 *5*	2589.1	(11$^+$)	E2#	0.0441	α(K)=0.0317 *5*; α(L)=0.00946 *14*; α(M)=0.00228 *4*; α(N)=0.000542 *8*;

$^{180}_{74}W_{106}$-12

$\gamma(^{180}W)$ (continued)

E_i(level)	J^{π}_i	E_{γ} †	I_{γ} †	E_f	J^{π}_f	Mult. ‡	α	Comments
								α(O)=8.05×10^{-5} *12* α(P)=2.82×10^{-6} *4*
3000.5	(12$^-$)	506.0	100	2494.5	(10$^-$)			
3042.7	14$^-$	306.1	18.7 *16*	2736.8	13$^-$	M1	0.208	α(K)=0.1727 *25*; α(L)=0.0270 *4*; α(M)=0.00613 *9*; α(N)=0.001477 *21*; α(O)=0.000241 *4* α(P)=1.725×10^{-5} *25* Mult.: D from $\gamma(\theta)$ in Hf(α,xnγ), $\Delta\pi$=no from level scheme.
		591.2	100 *5*	2451.61	12$^-$	E2	0.01401	α(K)=0.01098 *16*; α(L)=0.00233 *4*; α(M)=0.000547 *8*; α(N)=0.0001308 *19*; α(O)=2.02×10^{-5} *3* α(P)=1.012×10^{-6} *15*
3047.5	13$^-$	546.3	100	2501.17	11$^-$	E2	0.01690	α(K)=0.01310 *19*; α(L)=0.00292 *4*; α(M)=0.000689 *10*; α(N)=0.0001645 *23* α(O)=2.52×10^{-5} *4*; α(P)=1.202×10^{-6} *17*
3176.3	(14$^+$)	353.3 b		2822.9	14$^+$			
		413.0	40 *6*	2763.6	(12$^+$)	E2 #	0.0344	α(K)=0.0253 *4*; α(L)=0.00696 *10*; α(M)=0.001668 *24*; α(N)=0.000397 *6*; α(O)=5.94×10^{-5} *9* α(P)=2.27×10^{-6} *4*
		940.9	100 *5*	2235.19	12$^+$	E2 #	0.00510	α(K)=0.00417 *6*; α(L)=0.000715 *10*; α(M)=0.0001643 *23*; α(N)=3.94×10^{-5} *6*; α(O)=6.27×10^{-6} *9* α(P)=3.87×10^{-7} *6*
3248.4	(13$^-$)	525.5	100	2722.9	(11$^-$)			
3264.9	14$^-$	222.3 *3*	82 *4*	3042.7	14$^-$	(M1)	0.497	α(K)=0.413 *6*; α(L)=0.0651 *10*; α(M)=0.01480 *22*; α(N)=0.00357 *6*; α(O)=0.000582 *9* α(P)=4.15×10^{-5} *6* B(M1)(W.u.)=2.31×10^{-7} *25* Mult.: from α(exp) in Hf(α,xnγ).
		298.4		2966.2	(13$^+$)	[E1]	0.0232	α(K)=0.0193 *3*; α(L)=0.00298 *5*; α(M)=0.000674 *10*; α(N)=0.0001610 *23*; α(O)=2.55×10^{-5} *4* α(P)=1.588×10^{-6} *23*
		528.0 *3*	100 *6*	2736.8	13$^-$			
		813.4 *3*	87 *4*	2451.61	12$^-$	[E2]	0.00689	α(K)=0.00558 *8*; α(L)=0.001010 *15*; α(M)=0.000234 *4*; α(N)=5.60×10^{-5} *8*; α(O)=8.83×10^{-6} *13* α(P)=5.19×10^{-7} *8* B(E2)(W.u.)=3.2×10^{-6} *4*
3356.1		91.3	100	3264.9	14$^-$	D+Q #		
3368.3	15$^-$	325.6	100.0 *23*	3042.7	14$^-$			
		631.7	26.0 *17*	2736.8	13$^-$	E2 #	0.01201	α(K)=0.00949 *14*; α(L)=0.00194 *3*; α(M)=0.000454 *7*; α(N)=0.0001085 *16* α(O)=1.683×10^{-5} *24*; α(P)=8.77×10^{-7} *13*
3389.8	(15$^+$)	125.0	100	3264.9	14$^-$	(E1)	0.210	α(K)=0.1728 *25*; α(L)=0.0291 *4*; α(M)=0.00663 *10*; α(N)=0.001571 *22*; α(O)=0.000240 *4* α(P)=1.271×10^{-5} *18*

$^{180}_{74}W_{106}$-13

γ(^{180}W) (continued)

E_i(level)	J^π_i	E_γ †	I_γ †	E_f	J^π_f	Mult. ‡	α	Comments
								B(E1)(W.u.)=1.04×10^{-5} *8* Mult.: from α(exp) in Hf(α,xnγ).
3411.2	(14$^-$)	597.8	100	2813.4	12$^-$			
3412.7	16$^+$	589.6	100	2822.9	14$^+$	E2	0.01410	α(K)=0.01104 *16*; α(L)=0.00235 *4*; α(M)=0.000552 *8*; α(N)=0.0001318 *19*; α(O)=2.03×10^{-5} *3* α(P)=1.018×10^{-6} *15*
3421.8	(15$^+$)	245.7	6 *3*	3176.3	(14$^+$)	(M1+E2)	0.27 *11*	α(K)=0.21 *11*; α(L)=0.0476 *18*; α(M)=0.01127 *17*; α(N)=0.00269 *4*; α(O)=0.00041 *3* α(P)=2.0×10^{-5} *12* Mult.: D+Q from $\gamma(\theta)$ in ^{176}Yb(^{9}Be,5nγ), $\Delta\pi$=no from level scheme.
		455.4	100 *11*	2966.2	(13$^+$)	E2 #	0.0266	α(K)=0.0200 *3*; α(L)=0.00507 *8*; α(M)=0.001210 *17*; α(N)=0.000288 *4*; α(O)=4.35×10^{-5} *6* α(P)=1.81×10^{-6} *3*
3515.2		250	100	3264.9	14$^-$			
3529.1		173.2		3356.1		D+Q		
		264		3264.9	14$^-$			
3547.9	(16$^+$)	158.1	100	3389.8	(15$^+$)	(M1)	1.288	α(K)=1.069 *15*; α(L)=0.1693 *24*; α(M)=0.0385 *6*; α(N)=0.00928 *13*; α(O)=0.001514 *22* α(P)=0.0001078 *15* B(M1)(W.u.)=0.000120 *5*
3581.6		316.7 &	100	3264.9	14$^-$			
3605.8		216.0	100	3389.8	(15$^+$)			
3656.7	15$^-$	609.2	100	3047.5	13$^-$	E2 #	0.01306	α(K)=0.01028 *15*; α(L)=0.00214 *3*; α(M)=0.000503 *7*; α(N)=0.0001201 *17*; α(O)=1.86×10^{-5} *3* α(P)=9.48×10^{-7} *14*
3695.5	(16$^+$)	519.0	100 *20*	3176.3	(14$^+$)	E2 #	0.0191	α(K)=0.01472 *21*; α(L)=0.00340 *5*; α(M)=0.000804 *12*; α(N)=0.000192 *3*; α(O)=2.93×10^{-5} *4* α(P)=1.347×10^{-6} *19*
		872.8	97 *20*	2822.9	14$^+$			
3697.8		168.6	21 *4*	3529.1				
		308.0	12 *5*	3389.8	(15$^+$)			
		433.0	100 *20*	3264.9	14$^-$			
3713.0	16$^-$	670.5	100	3042.7	14$^-$	E2 #	0.01050	α(K)=0.00835 *12*; α(L)=0.001652 *24*; α(M)=0.000386 *6*; α(N)=9.22×10^{-5} *13* α(O)=1.436×10^{-5} *21*; α(P)=7.73×10^{-7} *11*
3745.0		139.1	34 *3*	3605.8				
		355.3	100 *8*	3389.8	(15$^+$)			
3831.5		316 &	100	3515.2				
3845.4	(15$^-$)	597.0	100	3248.4	(13$^-$)			
3888.2	(17$^+$)	340.4	100	3547.9	(16$^+$)	M1+E2		Mult.: D+Q from $\gamma(\theta)$ in Hf(α,xnγ), $\Delta\pi$=no from level scheme.
3898.0	(16$^-$)	316.7 &	100	3581.6				
3967.2	(17$^+$)	271.7 b		3695.5	(16$^+$)	(M1+E2)	0.20 *9*	α(K)=0.16 *9*; α(L)=0.034 *4*; α(M)=0.0081 *5*; α(N)=0.00193 *13*; α(O)=0.00030 *4*

From ENSDF

$^{180}_{74}$W$_{106}$-14

γ(^{180}W) (continued)

E_i(level)	J^π_i	E_γ†	I_γ†	E_f	J^π_f	Mult.‡	α	Comments
								α(P)=1.5×10^{-5} *9* Mult.: (D+Q) from $\gamma(\theta)$ in ^{176}Yb(^{9}Be,5nγ), $\Delta\pi$=no from level scheme.
3967.2	(17$^+$)	545.4		3421.8	(15$^+$)	(E2)#	0.01696	α(K)=0.01315 *19*; α(L)=0.00293 *5*; α(M)=0.000692 *10*; α(N)=0.0001653 *24* α(O)=2.53×10^{-5} *4*; α(P)=1.207×10^{-6} *17*
4002.0		257.1	100	3745.0				
4017.4	(18$^+$)	604.5	100	3412.7	16$^+$	(E2)#	0.01330	α(K)=0.01045 *15*; α(L)=0.00219 *3*; α(M)=0.000514 *8*; α(N)=0.0001228 *18*; α(O)=1.90×10^{-5} *3* α(P)=9.64×10^{-7} *14*
4066.2	(16$^-$)	655.0	100	3411.2	(14$^-$)			
4074.9	(17$^-$)	706.6	100	3368.3	15$^-$			
4147.8	(17$^-$)	249.9	41 *25*	3898.0	(16$^-$)			
		316		3831.5				
		435		3713.0	16$^-$			
		450.0	100 *10*	3697.8				
		542^b		3605.8				
		565.9	29 *9*	3581.6				
		779.7	7.4 *8*	3368.3	15$^-$			
4248.9	(18$^+$)	360.9	100 *6*	3888.2	(17$^+$)	M1+E2		Mult.: D+Q from $\gamma(\theta)$ in Hf(α,xnγ), $\Delta\pi$=no from level scheme.
		700.9	19 *5*	3547.9	(16$^+$)			
4269.9		267.7	100 *13*	4002.0				
		524.9	40 *6*	3745.0				
4320.4	(17$^-$)	663.7	100	3656.7	15$^-$			
4339.4	(18$^+$)	643.9		3695.5	(16$^+$)	E2#	0.01150	α(K)=0.00911 *13*; α(L)=0.00184 *3*; α(M)=0.000431 *6*; α(N)=0.0001030 *15* α(O)=1.599×10^{-5} *23*; α(P)=8.42×10^{-7} *12*
		926.8^b		3412.7	16$^+$			
4416.7	(18$^-$)	518.9	100 *21*	3898.0	(16$^-$)			
		703.6	41 *5*	3713.0	16$^-$			
4455.9	(18$^-$)	742.9	100	3713.0	16$^-$			
4525.7		276.8	100	4248.9	(18$^+$)			
4554.2		284.3	100 *30*	4269.9				
		552.5	13 *4*	4002.0				
4606.6	(19$^+$)	639.4	100	3967.2	(17$^+$)	E2#	0.01169	α(K)=0.00925 *13*; α(L)=0.00188 *3*; α(M)=0.000439 *7*; α(N)=0.0001050 *15* α(O)=1.629×10^{-5} *23*; α(P)=8.55×10^{-7} *12*
4628.8	(19$^+$)	379.8	100 *10*	4248.9	(18$^+$)			
		740.5	73 *7*	3888.2	(17$^+$)			
4673.1	(20$^+$)	655.5	100	4017.4	(18$^+$)	E2#	0.01104	α(K)=0.00877 *13*; α(L)=0.001755 *25*; α(M)=0.000410 *6*; α(N)=9.81×10^{-5} *14* α(O)=1.525×10^{-5} *22*; α(P)=8.11×10^{-7} *12*
4711.4	(19$^-$)	294.8	19 *3*	4416.7	(18$^-$)			
		563.6	100 *9*	4147.8	(17$^-$)			
4761.2	(18$^-$)	695.0	100	4066.2	(16$^-$)			
4845.9?	(19$^-$)	771.0^b	100	4074.9	(17$^-$)			

$\gamma(^{180}W)$ (continued)

E_i(level)	J^π_i	E_γ†	I_γ†	E_f	J^π_f	Mult.‡	α	Comments
4852.9	(20−)	141.6	100	4711.4	(19−)			
4857.3		303.2	100 *17*	4554.2				
		587.3	30 *12*	4269.9				
5024.8	(20+)	396.3	100 *10*	4628.8	(19+)			
		776.0	78 *17*	4248.9	(18+)	(E2)#	0.00762	α(K)=0.00615 *9*; α(L)=0.001135 *16*; α(M)=0.000263 *4*; α(N)=6.30×10^{-5} *9*; α(O)=9.90×10^{-6} *14* α(P)=5.71×10^{-7} *8*
5027.4?	(19−)	707.0[b]	100	4320.4	(17−)			
5029.7?	(20−)	613[b]	100	4416.7	(18−)			
5095.3	(20+)	755.9	100	4339.4	(18+)	E2#	0.00806	α(K)=0.00649 *9*; α(L)=0.001212 *17*; α(M)=0.000281 *4*; α(N)=6.73×10^{-5} *10* α(O)=1.057×10^{-5} *15*; α(P)=6.02×10^{-7} *9*
5128.7	(21−)	276.0	100	4852.9	(20−)			
5178.5		321.3	100 *17*	4857.3				
		624.3	30 *13*	4554.2				
5339.8	(21+)	733.2	100	4606.6	(19+)	E2#	0.00861	α(K)=0.00692 *10*; α(L)=0.001309 *19*; α(M)=0.000304 *5*; α(N)=7.28×10^{-5} *11* α(O)=1.141×10^{-5} *16*; α(P)=6.41×10^{-7} *9*
5402.2	(22+)	728.9	100	4673.1	(20+)			
5434.8	(21+)	409.9	100 *13*	5024.8	(20+)			
		805.6	87 *24*	4628.8	(19+)			
5454.2	(22−)	325.5	100 *9*	5128.7	(21−)			
		601.4	21 *4*	4852.9	(20−)			
5518.8		340.5	100 *8*	5178.5				
		661.4	7.8 *25*	4857.3				
5745.4?	(21−)	718[b]	100	5027.4?	(19−)			
5815.8	(23−)	361.5	100 *10*	5454.2	(22−)			
		687.0	37 *5*	5128.7	(21−)			
5859.3	(22+)	423.9		5434.8	(21+)			
		835[b]		5024.8	(20+)			
5877.5	(22−)	358.8	100 *17*	5518.8				
		699.1	72 *11*	5178.5				
5975.4	(23−)	159.7		5815.8	(23−)			
		521[b]		5454.2	(22−)			E_γ: observed only in ^{136}Xe(^{48}Ca,4nγ).
		846.8		5128.7	(21−)			
6115.2	(23−)	237.7		5877.5	(22−)			
		299.1		5815.8	(23−)			
		661.2		5454.2	(22−)			
		986.4		5128.7	(21−)			
6162.8?	(23+)	823.0[b]	100	5339.8	(21+)			
6207.9	(24−)	392.0		5815.8	(23−)			
		753.5		5454.2	(22−)			
6211.9	(24+)	809.5	100	5402.2	(22+)			

Adopted Levels, Gammas (continued)

$\gamma(^{180}W)$ (continued)

E_i(level)	J^π_i	E_γ†	I_γ†	E_f	J^π_f
6292.6?	(23^+)	433[b]		5859.3	(22^+)
		858[b]		5434.8	(21^+)
6304.2	(24^+)	(92)		6211.9	(24^+)
		189.1		6115.2	(23^-)
		328.9		5975.4	(23^-)
6626.6	(25^-)	418.5		6207.9	(24^-)
		811.1		5815.8	(23^-)
6734.1	(25^+)	430.0	100	6304.2	(24^+)
7070.2	(26^-)	443.6		6626.6	(25^-)
		862.3		6207.9	(24^-)
7101.4	(26^+)	889.5	100	6211.9	(24^+)
7177.4	(26^+)	443.0		6734.1	(25^+)
		873.1		6304.2	(24^+)
7634.1	(27^+)	456.3		7177.4	(26^+)
		900.4		6734.1	(25^+)
8067.4?	(28^+)	966[b]	100	7101.4	(26^+)

† Weighted average of all available data, except where noted.

‡ From $\gamma(\theta)$ and $\gamma\gamma(\theta)$ in Hf(α,xnγ), except where noted.

From $\gamma(\theta)$ in ^{176}Yb(^{9}Be,5nγ). Stretched Q transitions are assumed to be E2 in character.

@ From p$\gamma(\theta)$ in ^{181}Ta(p,2nγ). Stretched Q transitions are assumed to be E2 in character.

& Multiply placed.

[a] Multiply placed with undivided intensity.

[b] Placement of transition in the level scheme is uncertain.

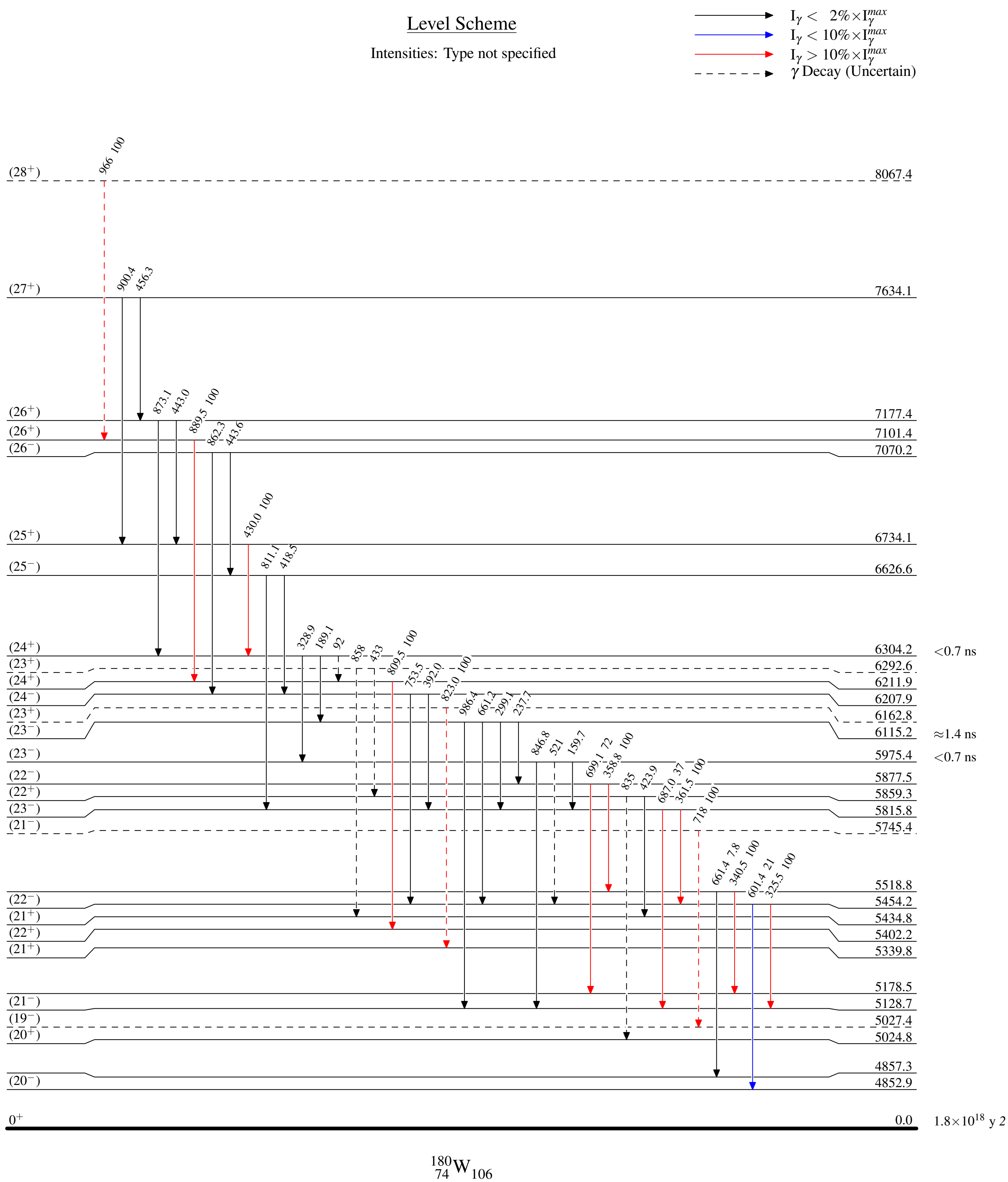
From ENSDF

$^{180}_{74}W_{106}$-17

Adopted Levels, Gammas

Level Scheme

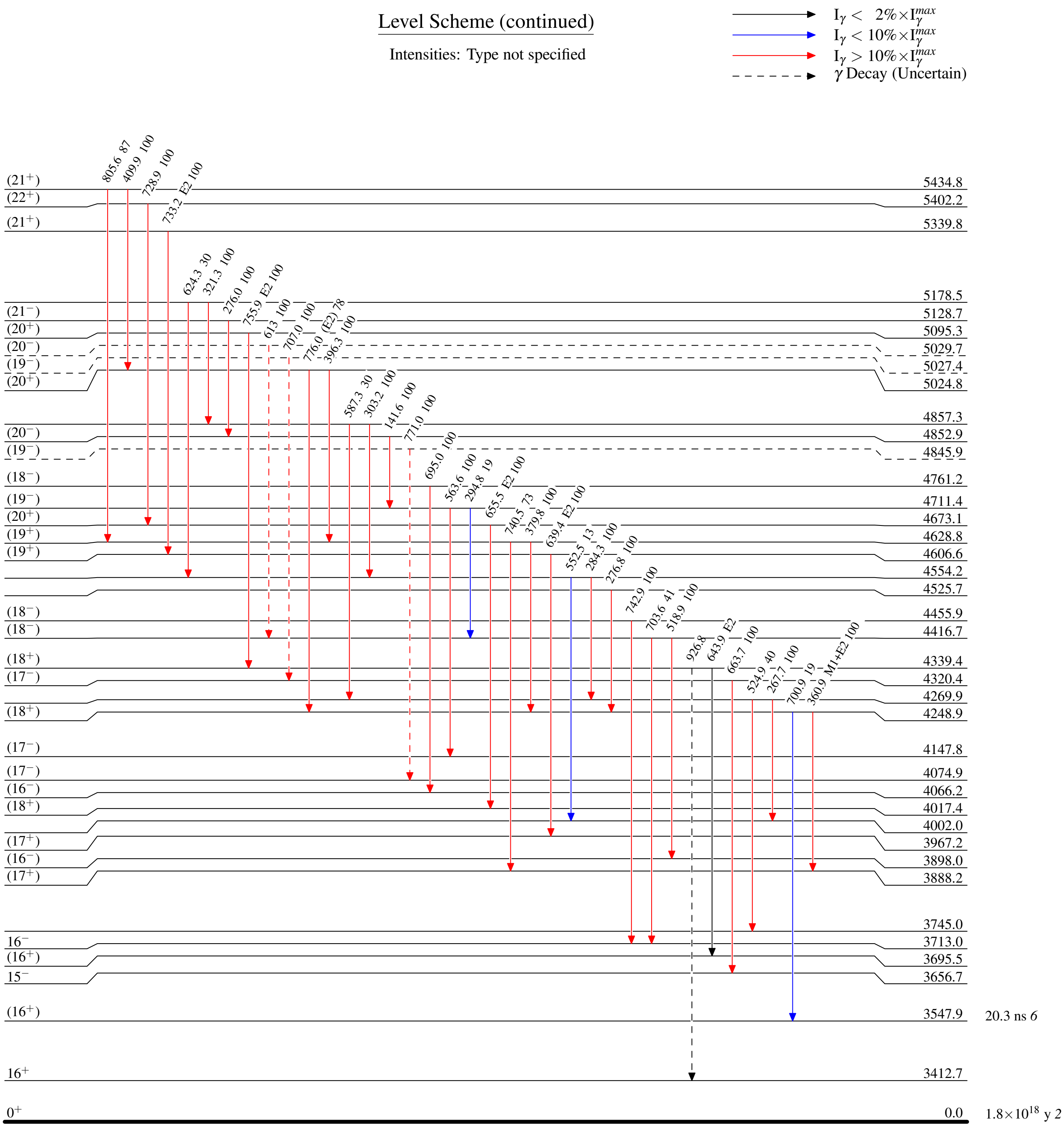
Intensities: Type not specified



Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Type not specified

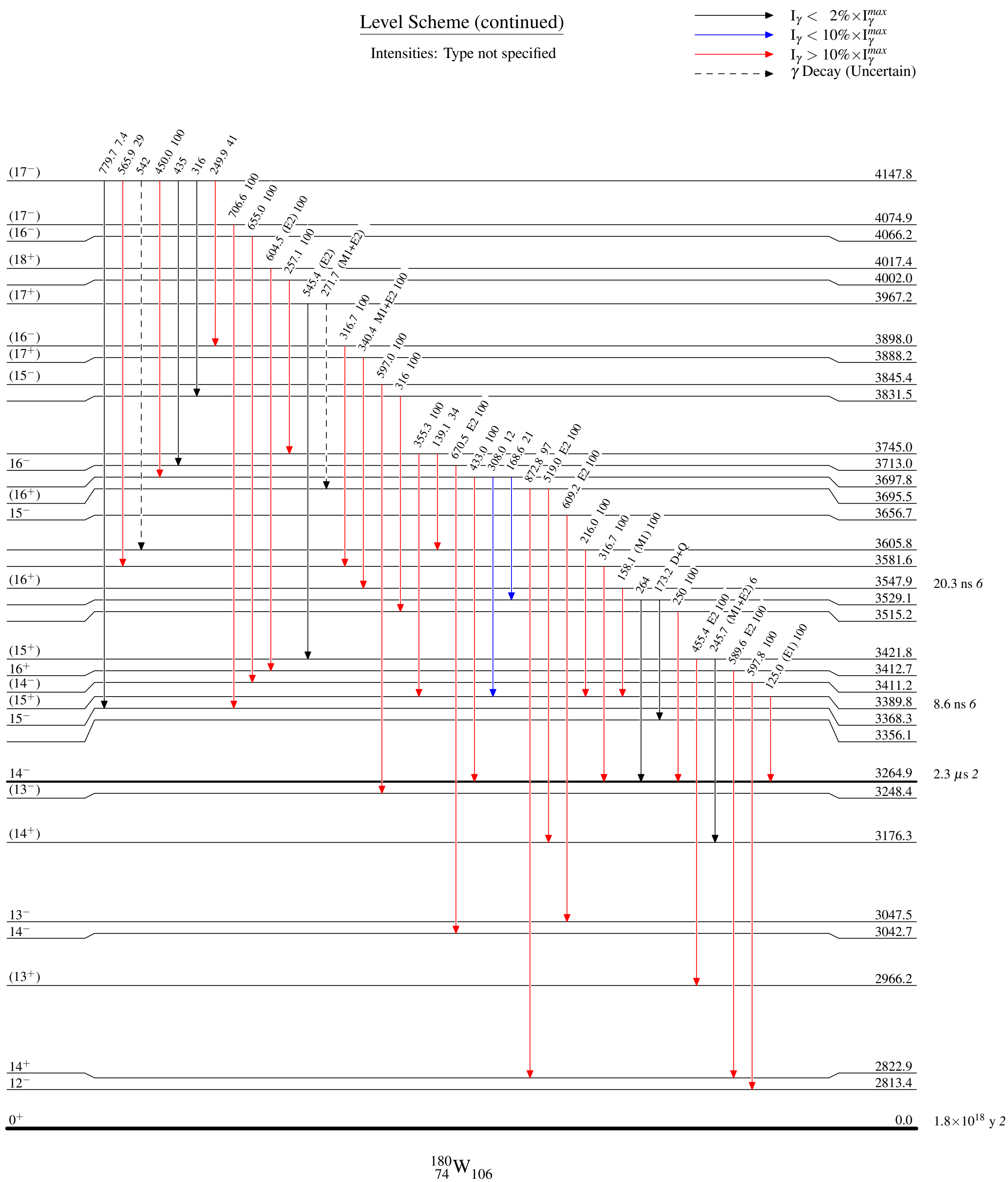


$^{180}_{74}W_{106}$

Adopted Levels, Gammas

Level Scheme (continued)

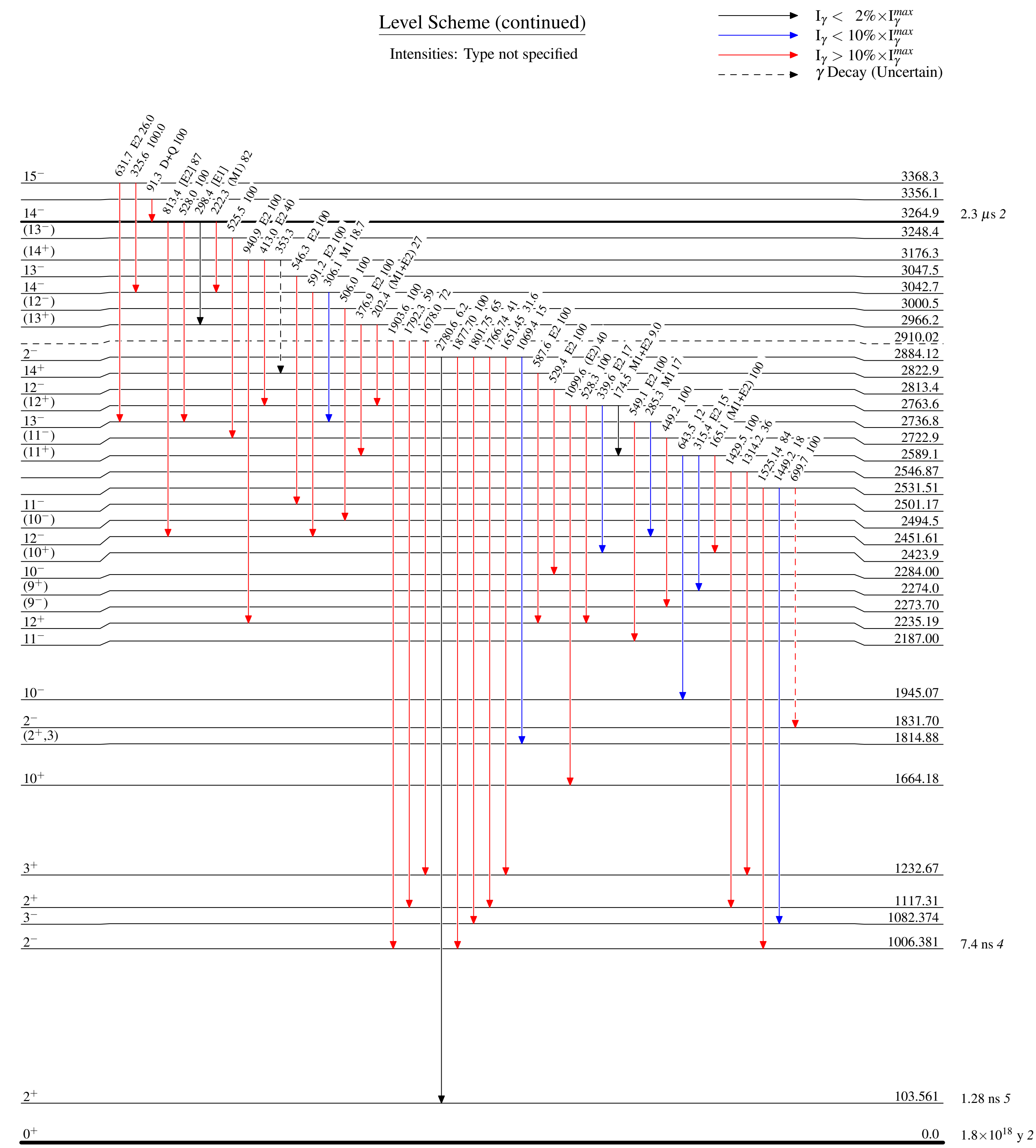
Intensities: Type not specified



Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Type not specified



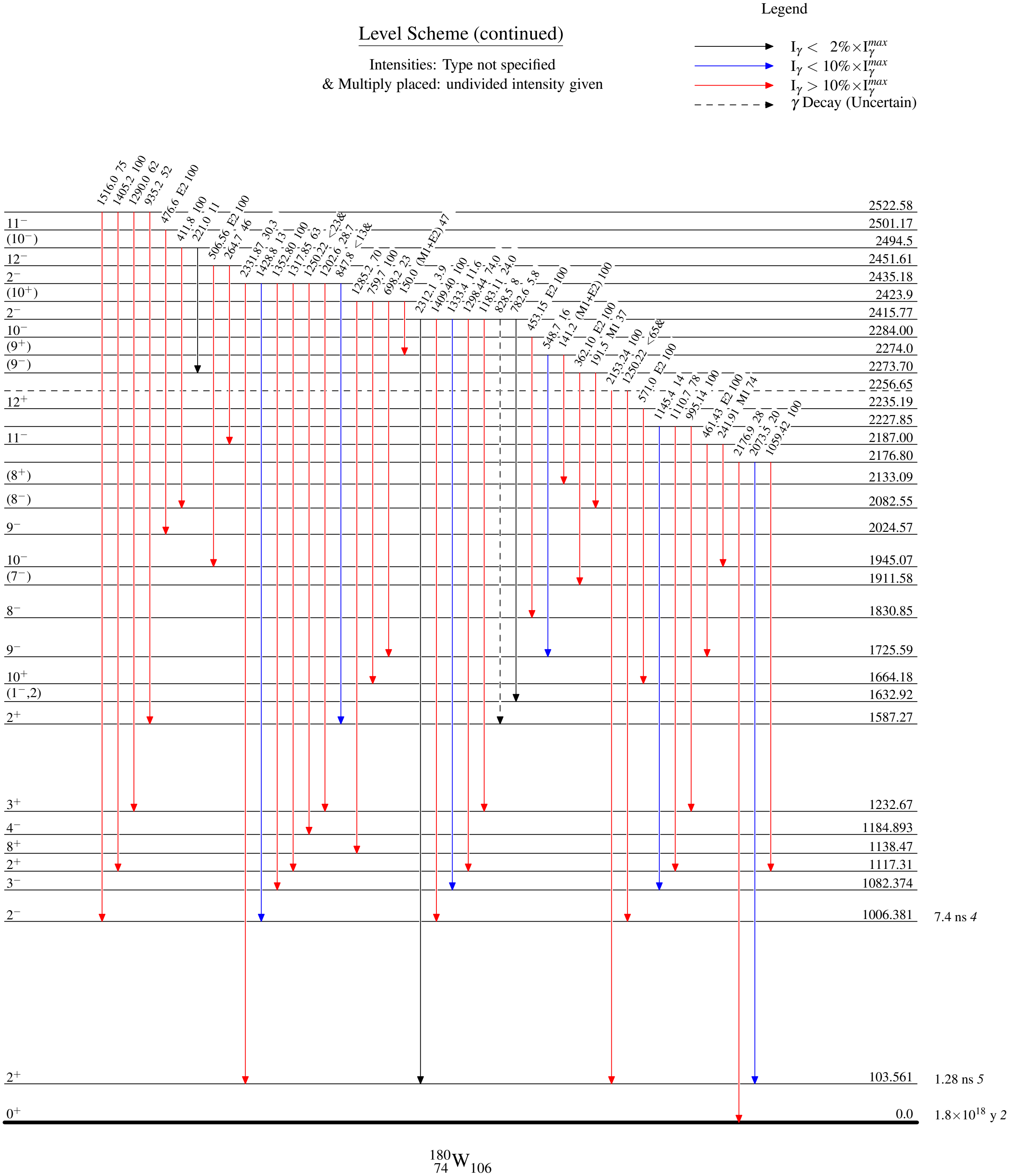
$^{180}_{74}W_{106}$

Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Type not specified

& Multiply placed: undivided intensity given



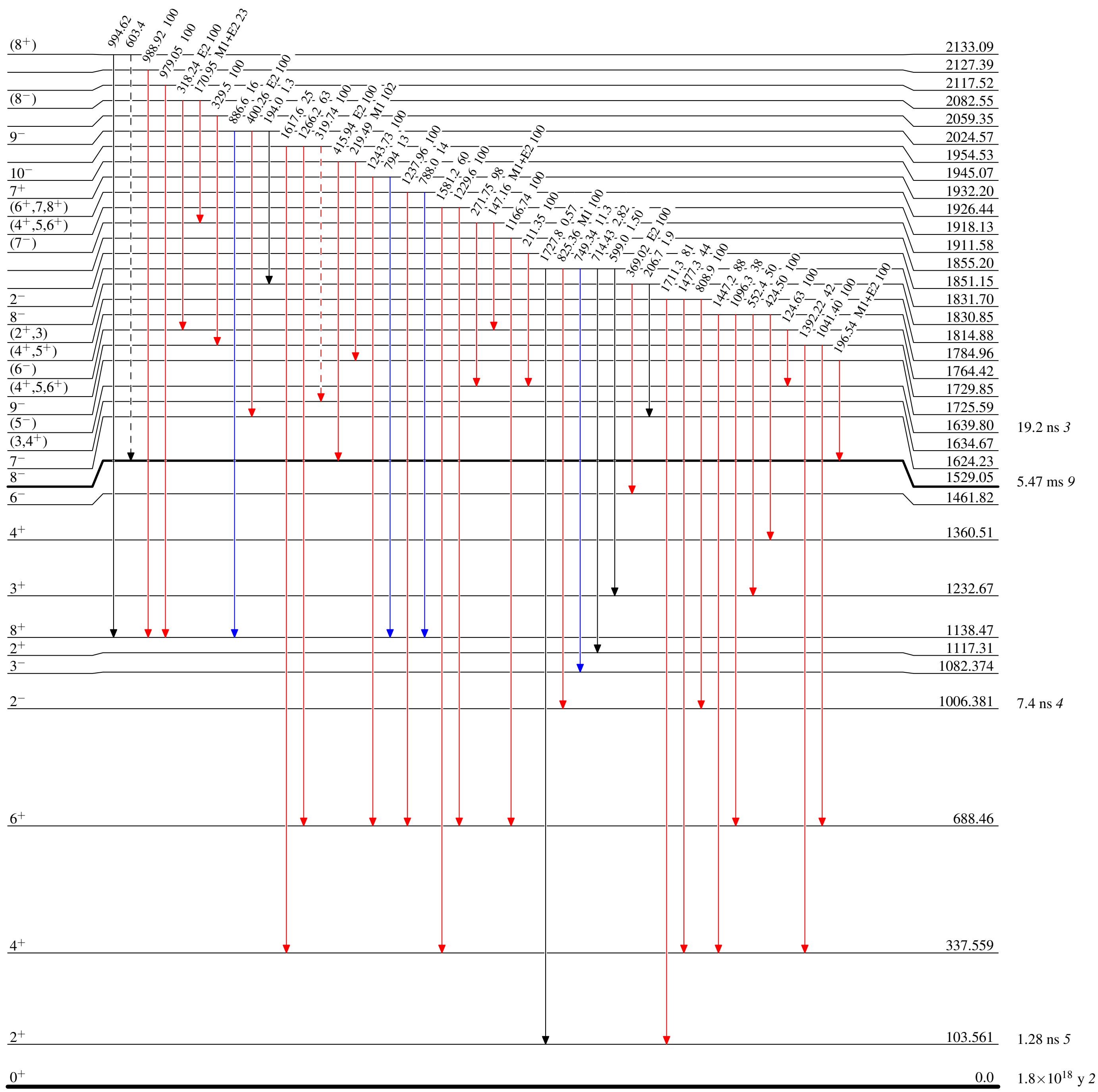
Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Type not specified
& Multiply placed: undivided intensity given

Legend

$I_\gamma < 2\% \times I_\gamma^{max}$
$I_\gamma < 10\% \times I_\gamma^{max}$
$I_\gamma > 10\% \times I_\gamma^{max}$
γ Decay (Uncertain)



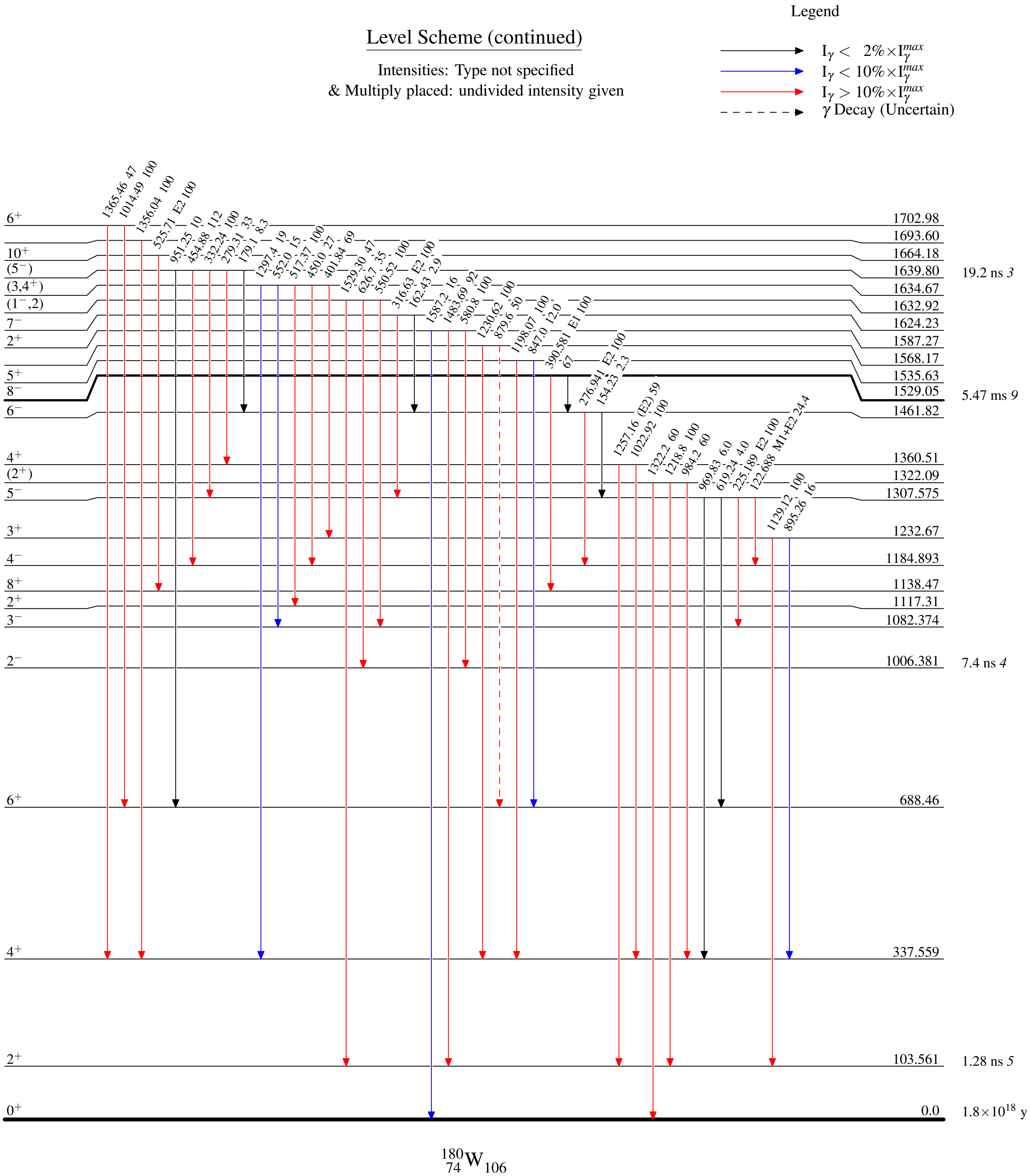
$^{180}_{74}W_{106}$

Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Type not specified

& Multiply placed: undivided intensity given

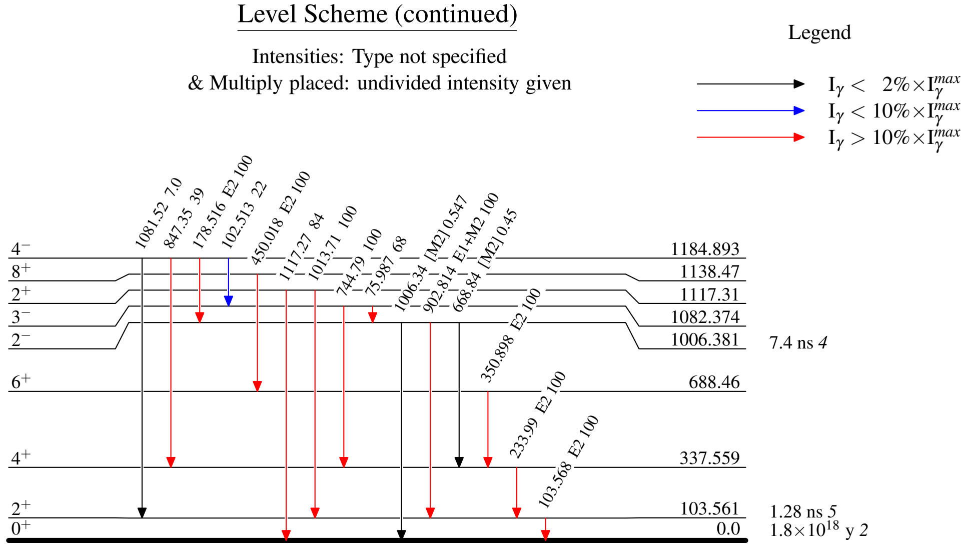


Adopted Levels, Gammas

Level Scheme (continued)

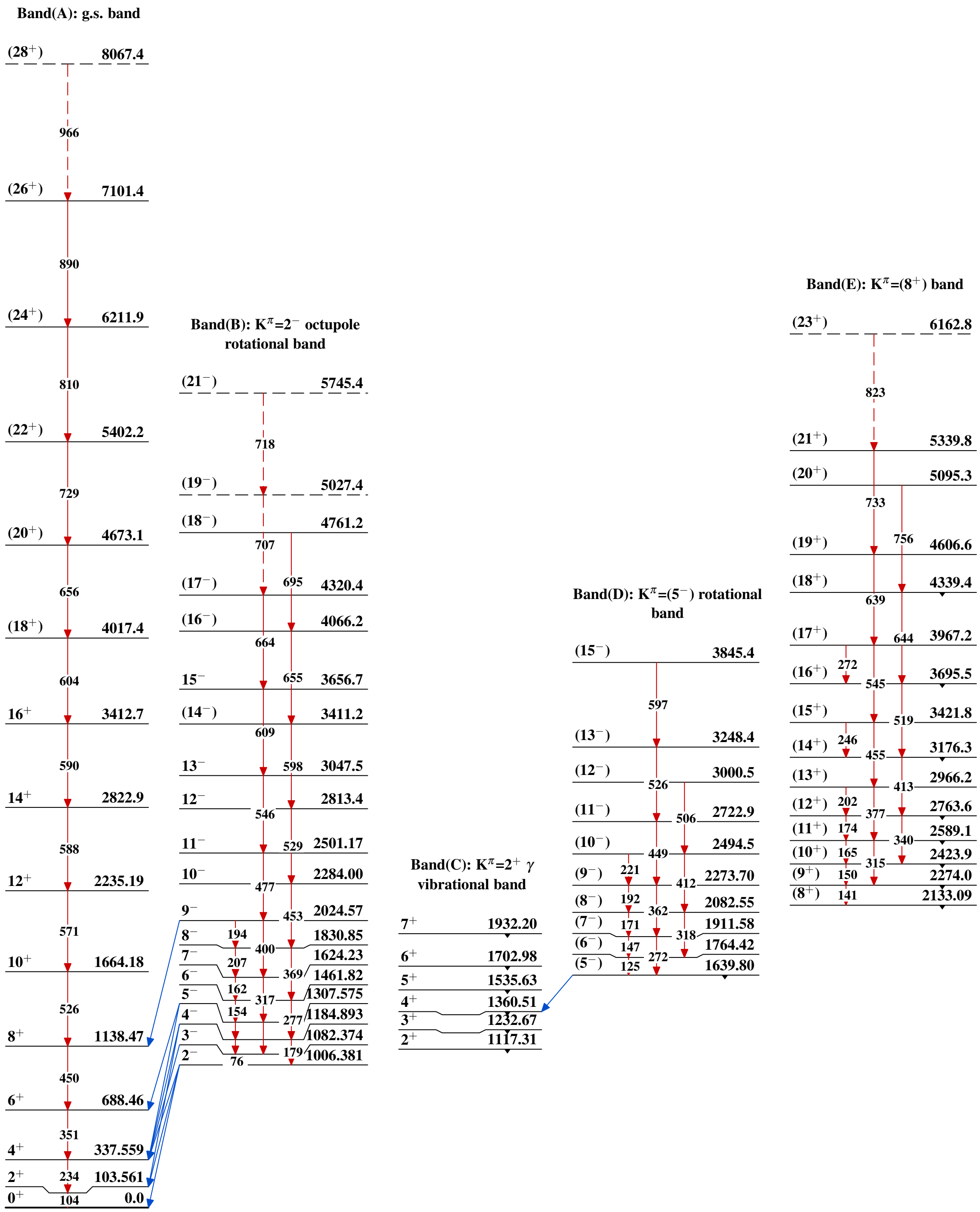
Intensities: Type not specified

& Multiply placed: undivided intensity given



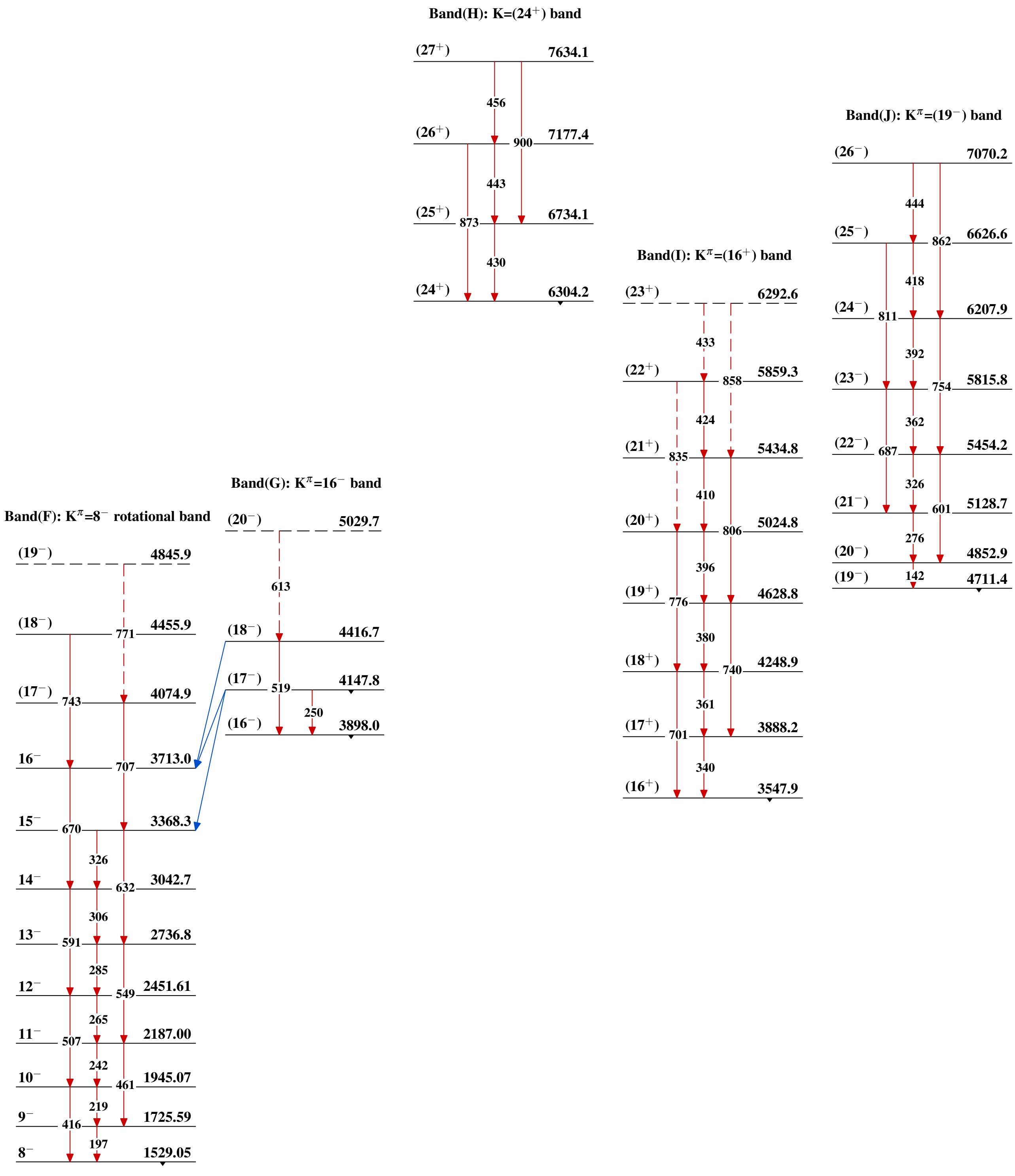
$^{180}_{74}W_{106}$

Adopted Levels, Gammas



$^{180}_{74}W_{106}$

Adopted Levels, Gammas (continued)



$^{180}_{74}W_{106}$

Adopted Levels, Gammas

Type	Author	History Citation	Literature Cutoff Date
Full Evaluation	Balraj Singh	NDS 130, 21 (2015)	15-Jul-2015

Q(β^-)=−280×10^1 *10*; S(n)=8066 *5*; S(p)=7095.1 *17*; Q(α)=1765.0 *19* 2012Wa38
S(2n)=14751.8 *20*, S(2p)=13043.9 *10* (2012Wa38).
First identification of ^{182}W isotope by Aston: Nature 126, 913 (1930).
Other reactions:
^{9}Be(^{208}Pb,X) E=1 GeV/nucleon: 2002Pf01: Measured fragment yield, (fragment)γ coin, deduced isomer (at 2230 keV) half-life and isomer production ratio of 10% *2*.
Additional information 1.
Mass measurements: 2012Li52, 1977Sh04, 1970Mc03, 1961De21, 1960Bh02.
Structure calculations (levels, moments, transition probabilities, high-K isomers, etc.): 2013Zh43, 2012Bu01, 2012Ze02, 2012Zh23, 2011Er04, 2008Sa21, 2003Jo10, 1998Sh01, 1996Na08, 1996Na12, 1994Be21, 1994Mo07, 1993Be25, 1991Gr14, 1990Ch50, 1990Ve01, 1989Sa19, 1989Ta06. Only selected references are given here, consult NSR database at www.nndc.bnl.gov website for more detailed bibliography for theoretical studies on ^{182}W nuclide.

^{182}W Levels

Details of the measurements of Half-life (in ns) of the 100.1, 2$^+$ state:
1. Deduced from B(E2) values in Coulomb excitation: 1.44 *7* (1961Ha21), 1.26 *11* (1963Gr04), 1.340 *30* (1968St13), 1.368 *29* (1973Be40, earlier value from the same lab is 1.31 *15*, 1958Mc02), 1.15 *12* (1989Ku04), 1.53 *7* (1991Wu05, earlier value is 1.41 *9* in 1989Wu04).
2. Delayed coincidence method in Coulomb excitation: 1.366 *14* (1961Ke07), 1.43 *4* (1962Bi05, earlier value from the same group is 1.55 *14*,1959Bi10).
3. Pulsed beam: (p,p′γ): 1.372 *14* (1964Sc21).
4. Deduced from B(E2) in Muonic atom: 1.343 *40* (1970Hi03).
5. Deduced from B(E2) in (e,e′): 1.391 *21* (1987PeZV,1988PeZW).
6. Delayed coincidence in ^{182}Ta β^- decay: 1.27 *10* (1955Su64,1954Su10), 1.55 *11* (1963Ba24), 1.26 *4* (1963Fo02), 1.41 *6* (1963Ko02), 1.47 *9* (1964Ro19), 1.4 *1* (1964Be36), 1.39 *3* (1965Do02), 1.37 *3* (1965Me08), 1.45 *4* (1966Bl08), 1.35 *7* (1966Fu03), 1.43 *5* (1966Ra04), 1.48 *3* (1970Ab14), 1.380 *20* (1971Ho14), 1.55 *5* (1973GrXX), 1.380 *30* (1983El02),

Cross Reference (XREF) Flags

A	^{182}Ta β^- decay (114.74 d)	H	^{180}Hf(α,2nγ)	O	^{182}W(p,p′),(pol p,p′),(α,α')
B	Muonic atom	I	^{180}W(t,p)	P	^{182}W(d,d′)
C	^{182}Re ε decay (64.2 h)	J	^{182}W(γ,γ):Mossbauer	Q	Coulomb excitation
D	^{182}Re ε decay (14.14 h)	K	^{182}W(γ,γ')	R	^{183}W(d,t)
E	^{186}Os α decay	L	^{182}W(e,e′)	S	^{183}W(^{3}He,α)
F	^{176}Yb(^{9}Be,3nγ)	M	^{182}W(n,n′γ)	T	^{184}W(p,t)
G	^{176}Yb(^{13}C,α3nγ)	N	^{182}W(n,n′)	U	^{186}W(n,5nγ)

E(level)[†]	J$^\pi$[‡]	$T_{1/2}$	XREF	Comments
0.0[&]	0$^+$	stable	ABCDEFGHIJKLMNOPQR TU	$T_{1/2}$: $T_{1/2}$(α decay) measured limits: ≥7.7×10^{21} y (2004Co26) with 90% confidence limit. Others: ≥1.7×10^{20} y (2003Da05,2003Bi13,1997Ge15, 1995Ge17), ≥2.5×10^{19} y (2003Ce01), 1960Be13. (<r^2>)$^{1/2}$(rms charge radius)=5.3559 fm *17* (2013An02,evaluation). Δ<r^2>(^{182}W−^{180}W)=0.068 fm^2 *4* (1994Ji02). Δ<r^2>(^{183}W−^{182}W)=0.052 fm^2 *3* (1994Ji02). Δ<r^2>(^{184}W−^{182}W)=0.099 fm^2 *5* (1994Ji02).

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Adopted Levels, Gammas (continued)

^{182}W Levels (continued)

E(level)[†]	J^{π}[‡]	$T_{1/2}$	XREF	Comments
100.10598[&] *7*	2^+	1.381 ns *10*	ABCD FGHIJKLMNOPQRSTU	μ=+0.521 *16* (1968Pe06,2014StZZ) Q=−2.13 *35* (1977RuZV,2014StZZ,2013StZZ) B(E2)↑=4.17 *6* μ: Mossbauer effect (1968Pe06). Other: +0.528 *12* (CEAD,1972Ca12). Q: reorientation method in Coul. Ex. (1977RuZV). B(E2) from Coul. Ex. $T_{1/2}$: from several weighted averaging methods (weighted average, limitation of statistical weights method (LWM), normalized residuals method (NRM) and Rajeval′s technique (RT)) using 26 independent measurements (from 1954 to 1991) of lifetimes from Coulomb excitation, delayed coincidence methods, pulsed beam, (e,e′) and muonic atom. The value of χ^2 is ≈2.1 for different methods as compared to critical χ^2 of 1.7. All the values used in the averaging procedure are listed above in the header comments of this table 2001Ra27 evaluation (of 27 measurements from 1954 to 1988) gives nearly the same adopted B(E2)(↑)=4.20 *8* and mean lifetime (τ)=1990 ps *20* ($T_{1/2}$=1.379 ns *14*). J^{π}: E2 γ to 0^+.
329.4268[&] *6*	4^+	62 ps *3*	A CD FGHI LMNOPQRSTU	μ=+0.88 *17* (1972Be94,2014StZZ) B(E4)=0.077 *16* (1987PeZV) from (e,e′). μ: IPAC (1972Be94). $T_{1/2}$: from RDM in Coul. ex. J^{π}: ΔJ=2, E2 γ to 2^+.
680.42[&] *5*	6^+	8.2 ps *9*	A C FGH LMNOPQR TU	B(E6)=0.012 *5* (1987PeZV) from (e,e′). $T_{1/2}$: from RDM in Coul. ex. J^{π}: stretched E2 γ to 4^+.
1135.82[a] *10*	0^+		A I MN P R T	J^{π}: L(p,t)=0. Also L(t,p)=0 and E0 transition to 0^+.
1144.32[&] *12*	8^+	2.01 ps *17*	FGH LM Q U	B(E8)=0.00029 *17* (1987PeZV) from (e,e′). $T_{1/2}$: from RDM in Coulomb excitation. J^{π}: ΔJ=2, E2 γ to 6^+; band assignment.
1221.4001[b] *10*	2^+	0.434 ps *11*	A CD HI MNOPQR T	J^{π}: E2 γ to 0^+. $T_{1/2}$: from B(E2) in Coulomb excitation. B(E2)(IS)(↑)=0.146 *11* ((pol p,p′) 1987Ic04). This gives B(E2)(W.u.)=4.8 *4* compared to 3.4 from Coul. ex.
1257.4121[a] *11*	2^+	1.71 ps *13*	A CD HI MN PQR T	J^{π}: E2 γ to 0^+. $T_{1/2}$: from B(E2) in Coulomb excitation and adopted branching ratios.
1289.1498[c] *10*	2^-	1.12 ns *4*	A CD GH M QR	μ=+1.74 *24* (1973Se14,2014StZZ) μ: IPAC (1973Se14). J^{π}: M2 γ to 0^+. $T_{1/2}$: from (β)(ce)(t) and $\beta\gamma$(t) in ^{182}Ta β^- decay. Weighted averaging method (normalized residuals) used.
1331.1153[b] *10*	3^+	<0.6 ns	A CD H MN QRS	XREF: N(1309). J^{π}: M1+E2 γs to 2^+ and 4^+. $T_{1/2}$: from $\gamma\gamma$(t) in ^{182}Ta β^- decay.
1373.8301[c] *10*	3^-	78 ps *10*	A CD GH MNOPQ T	μ=0.96 *27* (1972He10,2014StZZ) XREF: N(1357). μ: IPAC (1972He10). Other: 2.21 *34* (IPAC,1973Se14). J^{π}: E3 γ to 0^+. $T_{1/2}$: from (ce)(ce)(t) in ^{182}Ta β^- decay.
1442.835[b] *9*	4^+	0.32 ps *3*	A CD HI MNOPQR T	J^{π}: M1+E2 γ to 4^+; E2 γ to 2^+; (E1) γ from 5^-; band

Continued on next page (footnotes at end of table)

Adopted Levels, Gammas (continued)

^{182}W Levels (continued)

E(level)[†]	J^{π}[‡]	$T_{1/2}$	XREF	Comments
				assignment. $T_{1/2}$: from B(E2) in Coul. ex. B(E4)(IS)(↑)=0.0122 *25* ((pol p,p′) 1987Ic04) which gives B(E4)(W.u.)=2.0 *4*.
1487.5018[c] *10*	4^-	<49 ps	A CD GH MN	XREF: N(1492). J^{π}: M2+E3 γ to 2^+; M1+E2 γ from 5^-. $T_{1/2}$: from (ce)(ce)(t) in ^{182}Ta β^- decay.
1510.22[a] *4*	4^+		A C H M R	J^{π}: E2 γ to 2^+; E2+M1 γ to 4^+; γ from 5^-.
1553.2240[g] *10*	4^-	1.27 ns *4*	A CD GH MN R	$T_{1/2}$: from $\gamma\gamma$(t) in ^{182}Ta β^- decay. J^{π}: M2+E3 γ to 2^+; M1+E2 γ from 5^-.
1621.284[c] *21*	5^-		C GH Mn p t	J^{π}: M1 γ from 6^-; E1 γ to 4^+.
1623.51[b] *4*	$(5)^+$		C H Mn pQR t	J^{π}: E1 γ from 6^-; band assignment.
1660.383[g] *21*	5^-		C GH MN P R T	XREF: N(1678). J^{π}: E1+M2 γ to 4^+; M1+E2 γ to 5^-; M1 γ from 6^-.
1711.99[&] *14*	10^+	0.76 ps *7*	FGH Q U	$T_{1/2}$: from RDM in Coulomb excitation. J^{π}: ΔJ=2, E2 γ to 8^+; band assignment.
1756.75[h] *4*	6^+		C GH MN	XREF: N(1745). J^{π}: log *ft*=7.4 from 7^+, E2 γ to 4^+.
1765.53 *12*			M P T	
1768.943[g] *23*	6^-		C GH M RS	J^{π}: E1+M2 γ to 6^+; E2 γs to 4^-; band assignment.
1769.5?[b] *7*	(6^+)		Q	E(level): level is suspect since the two γ rays at 1089 and 1440 are associated with the decay of 1769, $(6)^-$ level. J^{π}: γ to 6^+; possible band assignment.
1809.64[i] *7*	5^-		C GH n R t	XREF: n(1792). J^{π}: M1 γ to 4^-; M1 γ from 6^-.
1810.85[c] *4*	$(6)^-$		C GH n t	XREF: n(1792). J^{π}: log *ft*=8.7 from 7^+; M1+E2 γ to 5^-; band assignment.
1813.4 *3*			Mn r t	XREF: n(1792).
1829.53[j] *3*	6^-		C GH RST	J^{π}: log *ft*=7.4 from 7^+; E2 γ to 4^-.
1833.1? *6*			M	
1855.98 *5*	(2^+)		D Mn p r t	XREF: M(1856.2). J^{π}: γs to 0^+ and 4^+.
1856.9 *5*	1		Mn p r t	XREF: M(1856.9). J^{π}: γs to 0^+ and 2^+; $\gamma(\theta)$ in (n,n′γ).
1871.17 *15*	1^-		D M	J^{π}: E1 γ to 0^+.
1887.84 *21*			M P T	
1917.05[g] *5*	7^-		C GH RS	XREF: R(1916). J^{π}: ΔJ=2, E2 γ to 5^-; γ to $(6)^-$; band assignment.
1918.6 *4*	(2^+ to 4^+)		MN R	XREF: R(1923). J^{π}: γ to 2^+; not 0 or 1 from $\gamma(\theta)$ in (n,n′γ).
1959.35 *16*	(2^+)		M P R T	XREF: T(1961). J^{π}: ΔJ=(2) γ to 4^+; γ to 0^+.
1960.30[j] *3*	$(7)^-$		C GH	J^{π}: log *ft*=7.1 from 7^+; ΔJ=2, E2 γs to 5^-.
1960.78[i] *7*	6^-		C G M RS	J^{π}: M1 γ to 5^-; log *ft*=8.0 from 7^+; possible band assignment.
1971.05[h] *7*	$(7)^+$		C GH R	XREF: R(1966). J^{π}: log *ft*=8.2 from 7^+; M1+E2 γ to 6^+; band assignment.
1978.36[k] *4*	$(7)^-$		C GH	J^{π}: log *ft*=7.0 from 7^+; M1+E2 γ to $(6)^-$; band assignment.
1981.82 *25*			MN R	XREF: R(1985).

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Adopted Levels, Gammas (continued)

^{182}W Levels (continued)

E(level)[†]	J^{π}[‡]	$T_{1/2}$	XREF	Comments
1993.68[c] 10	(7⁻)		GH	J^{π}: ΔJ=2 γ to 5⁻; band assignment.
2016.8 8	(2,3,4)⁺		M R	J^{π}: L(d,t)=1,3 from 1/2⁻; possible γs to 2⁺ and 4⁺. E(level): 2023 7 level in (d,t) is probably not 2023.57, 3⁻ level.
2023.57 3	3⁻		D Mn	J^{π}: M1+E2 γs to 2⁻ and 4⁻.
2057.39 5	1⁺		D Mn R	J^{π}: ΔJ=1 γ to 0⁺; L(d,t)=1,3 from 1/2⁻ target.
2071			R	
2087.43[g] 7	8⁻		GH	J^{π}: ΔJ=2 γ to (6⁻); band assignment.
2094 10			R T	
2109.96 20	(2⁻,3⁻)		D Mn R t	XREF: t(2117). J^{π}: (E2) γ to 4⁻; (E1+M2) γ to 2⁺.
2114.35[j] 5	(8)⁻		C GH	J^{π}: E2 γ to (6)⁻; log *ft*=8.2 from 7⁺; band assignment.
2116.4 3			D Mn t	XREF: t(2117). J^{π}: 0⁺ to 4⁺ from γ to 2⁺.
2120.25[l] 7	(8⁻)		C GH	J^{π}: (M1) γ to (7)⁻; probable bandhead of a 2-qp band.
2131.3[i] 3	(7⁻)		GH RS	J^{π}: γ to (6)⁻; possible band assignment.
2143.0 10			M p R t	
2147.95 17	(3⁻)		D Mn p R t	J^{π}: (E1) γ to 4⁺; (E1+M2) γ to 2⁺.
2173.5 3	(0⁺ to 4⁺)		D Mn P R t	XREF: t(2175). J^{π}: γ to 2⁺. If 2174γ to 0⁺ exists, then J^{π}=1,2⁺.
2180.4[b] 8	(8⁺)		Q	J^{π}: γs to 8⁺ and 6⁺; band assignment.
2184.04 4	(2⁻,3⁻)		D Mn p t	XREF: t(2175). J^{π}: (M1) γs to 2⁻ and 3⁻.
2204.54[k] 6	(8)⁻		C GH	J^{π}: M1+E2 γ to (7)⁻, log *ft*=7.5 from 7⁺.
2207.21 16	(3⁻)		D Mn p R t	J^{π}: (E3) γ to 0⁺ and (E1+M2) γ to 4⁺.
2209.07 17	3⁻		D Mn p R t	XREF: R(2217). J^{π}: E1 γ to 4⁺, log *ft*=8.3 from 2⁺.
2212.50[h] 11	(8⁺)		GH	J^{π}: ΔJ=1 γ to (7)⁺; band assignment.
2225.35[c] 11	(8⁻)		GH	J^{π}: ΔJ=2 γ to (6)⁻, band assignment.
2230.65[d] 14	(10⁺)	1.3 μs 1	FGH	%IT=100 J^{π}: (M1) γ to 10⁺; γ to 8⁺; probable bandhead of a 2-qp band. $T_{1/2}$: from γ(t); average of 1.2 μs 1 in ^{9}Be(^{208}Pb,X) and 1.4 μs 1 in (α,2nγ).
2240.83 15	(3⁺)		D MN R T	J^{π}: (M1) γs to 2⁺ and 4⁺.
2273.87[g] 8	9⁻		GH	J^{π}: ΔJ=2 γ to (7)⁻; γ to (8⁻); band assignment.
2274.63 4	(3)⁻		D Mn R t	XREF: R(2270). J^{π}: E1 γ to 2⁺; (M1) γ to 4⁻.
2283.5 6	1		Mn R t	XREF: R(2284). J^{π}: 2283γ(θ) in (n,n′γ).
2301.56[j] 8	(9⁻)		G	J^{π}: γs to (7)⁻ and (8)⁻; band assignment.
2316.1 22	(1,2⁺)		D n T	XREF: T(2311). J^{π}: γ to 0⁺.
2323.85[i] 21	(8⁻)		GH	J^{π}: γ to (7)⁻; possible band assignment.
2327.91[l] 10	(9⁻)		H	J^{π}: ΔJ=1, (M1+E2) γ to (8⁻); band assignment.
2328			P	
2331 10			P R T	
2334.26 21			H	J^{π}: (7,8,9) from γ to (7)⁻.
2360 8			R T	
2372.59[&] 17	12⁺	0.38 ps 2	FGH Q U	J^{π}: ΔJ=2, E2 γ to 10⁺; band assignment. $T_{1/2}$: from B(E2) in Coulomb excitation from 10⁺ level.
2376			R	
2382.1 7	1	7.9[#] fs 11	K N R	J^{π}: from γγ(θ).

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Adopted Levels, Gammas (continued)

^{182}W Levels (continued)

E(level)[†]	Jπ[‡]	$T_{1/2}$	XREF	Comments
				B(M1)(↑)=0.46 *6*. B(E1)(↑)=5.0×10^{-5} *7*.
2395 *8*			R	
2427 *8*			R	E(level): multiplet.
2445.98[c] *15*	(9^-)		GH	Jπ: ΔJ=2 γ to (7^-), band assignment.
2452.7 *20*			R	
2455.74[k] *12*	(9^-)		GH	Jπ: ΔJ=1 γ to $(8)^-$; γ to $(7)^-$; band assignment.
2474.1 *7*	1[@]	15[#] fs *2*	K N R	Jπ: from γγ(θ). B(M1)(↑)=0.31 *5*. B(E1)(↑)=3.5×10^{-5} *5*.
2479.83[h] *13*	(9^+)		GH	Jπ: ΔJ=1 γ to (8^+); γ to $(7)^+$; band assignment.
2486.89[g] *10*	10^-		GH	Jπ: ΔJ=2 γ to (8^-); γ to (9^-); band assignment.
2492 *8*			R	
2492.78[d] *17*	(11^+)		FGH	Jπ: ΔJ=1 γ to (10^+); band assignment.
2507.48[j] *9*	(10^-)		G	Jπ: γs to $(8)^-$ and (9^-); band assignment.
2520 *10*	0^+		n T	Jπ: L(p,t)=0.
2552 *10*	0^+		n T	Jπ: L(p,t)=0.
2563.94[l] *12*	(10^-)		GH	Jπ: γ to (9^-); band assignment.
2610 *10*			N P T	XREF: T(2625).
2689 *10*			T	
2710.93[g] *11*	11^-		GH	Jπ: ΔJ=2 γ to (9^-); γ to (10^-); band assignment.
2725 *10*	0^+		N P T	XREF: N(2690). Jπ: L(p,t)=0.
2730.84[k] *16*	(10^-)		GH	Jπ: ΔJ=1 γ to (9^-); band assignment.
2739.15[c] *15*	(10^-)		GH	Jπ: ΔJ=2 γ to (8^-); band assignment.
2741.66[j] *12*	(11^-)		G	Jπ: ΔJ=2 γ to (9^-); band assignment.
2769.27[h] *16*	(10^+)		GH	Jπ: ΔJ=1 γ to (11^+); γ to (10^+); band assignment.
2775 *10*			N T	
2775.65[d] *18*	(12^+)		FGH	Jπ: ΔJ=2 γ to (10^+); ΔJ=1 γ to (11^+); band assignment.
2815 *10*			T	
2823.93[l] *16*	(11^-)		GH	Jπ: ΔJ=1 γ to (10^-); γ to (9^-); band assignment.
2884.1 *7*	1[@]	16[#] fs *2*	K	Jπ: from γγ(θ). B(M1)(↑)=0.22 *3*. B(E1)(↑)=2.4×10^{-5} *3*.
2892.1 *7*	(1)	27[#] fs *17*	K	Jπ: from γγ(θ). B(M1)(↑)=0.07 *4*. B(E1)(↑)=0.8×10^{-5} *5*.
2941.0 *20*	($1,2^+$)		K	Jπ: γ to 0^+.
2972.49[g] *13*	12^-		G	Jπ: ΔJ=2 γ to (10^-); γ to (11^-); band assignment.
2980.58[c] *18*	(11^-)		GH	Jπ: ΔJ=2 γ to (9^-); band assignment.
2981.33[j] *12*	(12^-)		G	Jπ: γ to (10^-); band assignment.
2996.1 *7*	1	6.7[#] fs *13*	K	Jπ: from γγ(θ). Possible K=(0) assigned by 1993He15. B(M1)(↑)=0.25 *5*. B(E1)(↑)=2.7×10^{-5} *5*.
3027.94[k] *19*	(11^-)		GH	Jπ: ΔJ=(1) γ to (10^-); γ to (9^-); band assignment.
3078.25[d] *19*	(13^+)		FGH	Jπ: ΔJ=1 γ to (12^+); ΔJ=2 γ to (11^+); band assignment.
3080.1 *7*	1[@]	17[#] fs *3*	K	Jπ: from γγ(θ). B(M1)(↑)=0.15 *3*. B(E1)(↑)=1.6×10^{-5} *3*.
3106.72[l] *18*	(12^-)		GH	Jπ: ΔJ=(1) γ to (11^-); γ to (10^-); band assignment.
3112.89[&] *20*	14^+	0.24 ps *4*	FGH Q	Jπ: ΔJ=2, (E2) γ to 12^+; band assignment. $T_{1/2}$: from B(E2) in Coul. ex. from 12^+.
3163.1 *7*	1[@]	10.3[#] fs *14*	K	Jπ: from γγ(θ). B(M1)(↑)=0.24 *3*. B(E1)(↑)=2.6×10^{-5} *4*.
3198.1 *7*	($1,2^+$)[@]	16[#] fs *3*	K	Jπ: (γ,γ′) excitation from 0^+. B(M1)(↑)=0.14 *3*. B(E1)(↑)=1.5×10^{-5} *3*.

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Adopted Levels, Gammas (continued)

^{182}W Levels (continued)

E(level)[†]	J^{π}[‡]	$T_{1/2}$	XREF	Comments
3224.53[g] 15	13⁻		G	J^{π}: ΔJ=2 γ to (11⁻); band assignment.
3269.56[j] 16	(13⁻)		G	J^{π}: ΔJ=2 γ to (11⁻); band assignment.
3319.7[c] 5	(12⁻)		G	J^{π}: γ to (10⁻); band assignment.
3343.05[k] 21	(12⁻)		G	J^{π}: ΔJ=(1) γ to (11⁻); γ to (10⁻); band assignment.
3365.1 7	1[@]	11.1[#] fs 23	K	J^{π}: from γγ(θ). B(M1)(↑)=0.17 4. B(E1)(↑)=1.9×10^{-5} 4.
3398.35[d] 19	(14⁺)		FGH	J^{π}: ΔJ=2 γ to (12⁺); ΔJ=1 γ to (13⁺); band assignment.
3410.54[l] 20	(13⁻)		G	J^{π}: γs to (11⁻) and (12⁻); band assignment.
3415.92[o] 19	(12)		G	J^{π}: ΔJ=1 γ to (11⁺); band assignment.
3422.1 7	(1,2⁺)[@]	10.3[#] fs 20	K	J^{π}: (γ,γ′) excitation from 0⁺. B(M1)(↑)=0.19 3. B(E1)(↑)=2.1×10^{-5} 4.
3518.04[j] 15	(14⁻)		G	J^{π}: γ to (12⁻); band assignment.
3549.99[g] 17	14⁻		G	J^{π}: ΔJ=2 γ to (12⁻); band assignment.
3567.8[c] 4	(13⁻)		G	J^{π}: ΔJ=(2) γ to (11⁻); band assignment.
3601.1 7	1[@]	6.2[#] fs 12	K	J^{π}: from γγ(θ). B(M1)(↑)=0.23 4. B(E1)(↑)=2.5×10^{-5} 5.
3640.0 20	(1,2⁺)		K	J^{π}: γ to 0⁺.
3677.15[o] 21	(13)		G	J^{π}: γ to (12⁺); band assignment.
3727.1 15	(1,2⁺)		K	J^{π}: γ to 0⁺.
3733.85[l] 23	(14⁻)		G	J^{π}: γs to (12⁻) and (13⁻); band assignment.
3736.40[d] 20	(15⁺)		FGH	J^{π}: γs to (13⁺) and (14⁺); band assignment.
3754.89[m] 21	(15⁺)	37 ns 2	FG	J^{π}: ΔJ=2, (E2) γ to (13⁺); ΔJ=1 γ to (14⁺); bandhead of configuration=((ν 9/2⁺[624])(ν 7/2⁻[503])8⁻)+((π 9/2⁻[514])(π 5/2⁺[402])7⁻). Other possible configuration from coupling of K^{π}=10⁺ neutrons to K^{π}=5⁺ protons: π9/2[514]+π1/2[541] is less likely. $T_{1/2}$: from γγ(t) in (^{13}C,α3nγ). Other: 54 ns 10 in (^{9}Be,3nγ).
3807.63[g] 18	15⁻		G	J^{π}: ΔJ=2 γ to (13⁻); band assignment.
3880.06[j] 19	(15⁻)		G	J^{π}: ΔJ=2 γ to (13⁻); band assignment.
3882.0 20	(1,2⁺)		K	J^{π}: γ to 0⁺.
3893.69[e] 23	(16⁺)	≤7 ns	FG	J^{π}: (M1) γ to (15⁺); probable bandhead of a 4-qp band. $T_{1/2}$: from γγ(t) in (^{9}Be,3nγ).
3910.09[&] 22	16⁺	0.14 ps 3	FG Q	$T_{1/2}$: from B(E2) in Coul. ex. from 14⁺. J^{π}: ΔJ=2, E2 γ to 14⁺; band assignment.
3920.0 20	1		K	J^{π}: from γγ(θ).
3966.25[o] 23	(14)		G	J^{π}: γs to (12) and (13); band assignment.
4040.6[f] 3	(17⁻)	20 ns 1	FG	J^{π}: (E1) γ to (16⁺); probable bandhead of a 4-qp band. $T_{1/2}$: from γγ(t) in (^{13}C,α3nγ). Other: 17 ns 7 in (^{9}Be,3nγ).
4074.8[l] 3	(15⁻)		G	J^{π}: γs to (13⁻) and (14⁻); band assignment.
4078.89[m] 23	(16⁺)		G	J^{π}: γ to (15⁺); band assignment.
4081.5[d] 3	(16⁺)		G	J^{π}: γs to (14⁺) and (15⁺); band assignment.
4116.9[j] 3	(16⁻)		G	J^{π}: γ to (14⁻); band assignment.
4197.1[c] 4	(15⁻)		G	J^{π}: γs to (13⁻); band assignment.
4211.1[g] 3	16⁻		G	J^{π}: ΔJ=2 γ to (14⁻); band assignment.
4218.1 5	(17⁺)		F	J^{π}: γ to (16⁺).
4280.2[o] 3	(15)		G	J^{π}: γs to (13) and (14); band assignment.
4293.1[e] 3	(17⁺)		G	J^{π}: γ to (16⁺); band assignment.
4421.5[f] 3	(18⁻)		FG	J^{π}: γ to (17⁻); band assignment.
4430.5[m] 3	(17⁺)		G	J^{π}: γs to (15⁺) and (16⁺); band assignment.

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Adopted Levels, Gammas (continued)

^{182}W Levels (continued)

E(level)[†]	J^{π}[‡]	$T_{1/2}$	XREF	Comments
4453.3[d] *8*	(17$^+$)		G	J^{π}: γs to (15$^+$) and (16$^+$); band assignment.
4456.2[g] *3*	17$^-$		G	J^{π}: ΔJ=2 γ to (15$^-$); band assignment.
4569.7 *6*	(18$^+$)		F	J^{π}: γs to (16$^+$) and (17$^+$); band assignment.
4570.9[j] *4*	(17$^-$)		G	J^{π}: γ to (15$^-$); band assignment.
4690.89[&] *25*	18$^+$		G	J^{π}: ΔJ=2 γ to 16$^+$; band assignment.
4711.9[e] *3*	(18$^+$)		G	J^{π}: γs to (16$^+$) and (17$^+$); band assignment.
4748.0 *10*	(18$^+$)	0.088 ps *+22−17*	F Q	E(level): this level also seems connected with g.s. band. $T_{1/2}$: from B(E2) in Coul. ex. J^{π}: γ to (16$^+$); Coulomb excited.
4779.6[j] *4*	(18$^-$)		G	J^{π}: γ to (16$^-$); band assignment.
4780.4[n] *4*	(18)		FG	J^{π}: γ to (17$^-$); possible configuration=((ν 9/2$^+$[624])(ν 11/2$^+$[615])10$^+$)+ ((π 9/2$^-$[514])(π 7/2$^+$[404]))8$^-$.
4804.9[m] *3*	(18$^+$)		G	J^{π}: γs to (16$^+$) and (17$^+$); band assignment.
4820.1[f] *3*	(19$^-$)		FG	J^{π}: γs to (17$^-$) and (18$^-$); band assignment.
4847.4[d] *8*	(18$^+$)		G	J^{π}: γ to 16$^+$; band assignment.
4954.8[g] *11*	18$^-$		G	J^{π}: γ to (16$^-$); band assignment.
5148.6[e] *5*	(19$^+$)		G	J^{π}: γs to (17$^+$) and (18$^+$); band assignment.
5170.8 *4*	19$^-$		G P	J^{π}: γ to (17$^-$); band assignment.
5191.8[n] *4*	(19)		G	J^{π}: γ to (18); band assignment.
5199.6[m] *4*	(19$^+$)		G	J^{π}: γ to (18$^+$); band assignment.
5225.4[d] *13*	(19$^+$)		G	J^{π}: γ to (17$^+$); band assignment.
5235.8[f] *4*	(20$^-$)		FG	J^{π}: γs to (18$^-$) and (19$^-$); band assignment.
5338.6[j] *11*	(19$^-$)		G	J^{π}: γ to (17$^-$); band assignment.
5428.6[&] *4*	20$^+$		G	J^{π}: γ to 18$^+$; band assignment.
5618.6[n] *4*	(20)		G	J^{π}: γs to (18) and (19); band assignment.
5666.9[f] *8*	(21$^-$)		G	J^{π}: γs to (19$^-$) and (20$^-$); band assignment.

† From least-squares fit to Eγ data; normalized χ^2=0.68.

‡ For high-spin (J>6) states, ascending spins are assumed with the rise in excitation energy, as expected from yrast type of population of levels in in-beam, heavy-ion γ-ray studies. The transitions involving ΔJ=2 from angular distributions are generally treated as E2 from RUL and those with ΔJ=1 and significant D+Q admixtures as M1+E2.

Deduced from $\Gamma_{\gamma 0}$ and branching ratio given by 1993He15.

@ K=1 assigned by 1993He15 from comparison of reduced transition probabilities with Alaga′s rules.

& Band(A): K^{π}=0$^+$, g.s. band. Backbending at $\hbar\omega\approx$0.38 MeV.

[a] Band(B): K^{π}=0$^+$ band. 2001Ga02, in analysis of β vibration and second 0$^+$ states, suggest that excited 0$^+$ band in ^{182}W is not a β-vibration.

[b] Band(C): K^{π}=2$^+$, γ band.

[c] Band(D): K^{π}=2$^-$, octupole band.

[d] Band(E): K^{π}=10$^+$,ν9/2[624]$\otimes\nu$11/2[615]. (g_K-g_R)=0.34 *4* (1994Re03), g_K(exp)=−0.15 *2*.

[e] Band(F): K^{π}=(16$^+$),4−qp band. ν^2(8$^-$): ν9/2[624]$\otimes\nu$7/2[503]; π^2(8$^-$): π9/2[514]$\otimes\pi$7/2[404]. (g_K-g_R)=0.21 *19* (1994Re03), g_K(exp)=+0.36 *6*. Configuration=(ν9/2$^+$[624])(ν11/2$^+$[615])10$^+$)+(π7/2$^+$[404]) (π5/2$^+$[402])6$^+$ is also proposed by 1994Re03. For K^{π}=8$^-$ neutron configuration, 7/2[514] orbital is excluded by the comparison of experimental g_K and corresponding theoretical value.

[f] Band(G): K^{π}=(17$^-$),4−qp band. ν^2(10$^+$):ν9/2[624]$\otimes\nu$11/2[615]; π^2(7$^-$):π9/2[514]$\otimes\pi$5/2[402]. (g_K-g_R)=0.30 *7*, 0.18 *7* (1994Re03), g_K(exp)=+0.46 *3*.

[g] Band(H): K^{π}=4$^-$,ν9/2[624]$\otimes\nu$1/2[510]. g_K(exp)=+0.05 *4*.

[h] Band(I): K^{π}=6$^+$,π5/2[402]$\otimes\pi$7/2[404]. g_K(exp)=+1.11 *5*.

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Adopted Levels, Gammas (continued)

^{182}W Levels (continued)

[i] Band(J): $K^{\pi}=5^{-}$,ν9/2[624]$\otimes\nu$1/2[510].
[j] Band(K): $K^{\pi}=6^{-}$,ν9/2[624]$\otimes\nu$3/2[512]. g_K(exp)=+0.01 *1*.
[k] Band(L): $K^{\pi}=7^{-}$,π9/2[514]$\otimes\pi$5/2[402]. g_K(exp)=+1.17 *7*.
[l] Band(M): $K^{\pi}=8^{-}$,ν9/2[624]$\otimes\nu$7/2[503]. g_K(exp)=−0.21 *5* excludes 7/2[514] neutron orbital when compared with theoretical value.
[m] Band(N): $K^{\pi}=15^{+}$,4−qp band. $\nu^2(8^-)$: ν9/2[624]$\otimes\nu$7/2[503]; $\pi^2(7^-)$: π9/2[514]$\otimes\pi$5/2[402]. g_K(exp)=+0.52 *4*. For $K^{\pi}=8^{-}$ neutron configuration, 7/2[514] orbital is excluded by the comparison of experimental g_K and corresponding theoretical value.
[n] Band(O): $K^{\pi}=18^{-}$,$\nu^2_{(10^+)}\otimes\pi^2_{(8^-)}$. $\nu^2(10^+)$:ν9/2[624]$\otimes\nu$11/2[615]; $\pi^2(8^-)$:π9/2[514]$\otimes\pi$7/2[404]. g_K(exp)≈+0.32.
[o] Band(P): K=(12) band.

Adopted Levels, Gammas (continued)

$\gamma(^{182}$W)

q_K(E0/E2)=ratios of K-conversion intensities of E0 and E2 transitions.

E_i(level)	J^π_i	E_γ[†]	I_γ[†]	E_f	J^π_f	Mult.[‡]	δ[‡]	α[@]	$I_{(\gamma+ce)}$	Comments
100.10598	2^+	100.10595[#] *7*	100	0.0	0^+	E2		3.89		B(E2)(W.u.)=136.1 *18* α(K)=0.878 *13*; α(L)=2.28 *4*; α(M)=0.576 *8* α(N)=0.1358 *19*; α(O)=0.0186 *3*; α(P)=7.08×10^{-5} *10*
329.4268	4^+	229.3207[#] *6*	100	100.10598	2^+	E2		0.196		B(E2)(W.u.)=196 *10* α(K)=0.1167 *17*; α(L)=0.0605 *9*; α(M)=0.01497 *21* α(N)=0.00354 *5*; α(O)=0.000505 *7*; α(P)=9.50×10^{-6} *14*
680.42	6^+	351.02 *6*	100	329.4268	4^+	E2		0.0538		B(E2)(W.u.)=201 *22* α(K)=0.0380 *6*; α(L)=0.01210 *17*; α(M)=0.00293 *5* α(N)=0.000696 *10*; α(O)=0.0001027 *15*; α(P)=3.34×10^{-6} *5*
1135.82	0^+	1035.65 *12*	100 *33*	100.10598	2^+	[E2]		0.00420		α(K)=0.00346 *5*; α(L)=0.000575 *8*; α(M)=0.0001317 *19* α(N)=3.16×10^{-5} *5*; α(O)=5.05×10^{-6} *7*; α(P)=3.21×10^{-7} *5*
		1135.9 *2*		0.0	0^+	E0			0.84 *21*	q^2_K(E0/E2)=1.8 *7*, X(E0/E2)=0.09 *4* (2005Ki02 evaluation).
1144.32	8^+	463.9 *1*	100	680.42	6^+	E2		0.0254		B(E2)(W.u.)=209 *18* α(K)=0.0191 *3*; α(L)=0.00479 *7*; α(M)=0.001140 *16* α(N)=0.000272 *4*; α(O)=4.11×10^{-5} *6*; α(P)=1.735×10^{-6} *25*
1221.4001	2^+	891.77 *10*	0.163 *7*	329.4268	4^+	E2		0.00569		B(E2)(W.u.)=0.0346 *18* α(K)=0.00464 *7*; α(L)=0.000810 *12*; α(M)=0.000187 *3* α(N)=4.47×10^{-5} *7*; α(O)=7.09×10^{-6} *10*; α(P)=4.31×10^{-7} *6*
		1121.290 *3*	100.0	100.10598	2^+	E2+M1+E0	+30 *+6−4*			B(E2)(W.u.)=6.74 *17* Mult.: E0 component suggested by ce data in ^{182}Ta β^- (1990Ka35) and q_K(E0/E2)=0.19 *6* (1975We22). δ: 17 *+4−3* (1990Ka35).
		1221.395 *3*	77.27 *22*	0.0	0^+	E2		0.00305		B(E2)(W.u.)=3.40 *9* α(K)=0.00252 *4*; α(L)=0.000402 *6*; α(M)=9.15×10^{-5} *13*

$\gamma(^{182}W)$ (continued)

E_i(level)	J_i^π	E_γ†	I_γ†	E_f	J_f^π	Mult.‡	δ‡	α@	Comments
									α(N)=2.20×10^{-5} *3*; α(O)=3.53×10^{-6} *5*; α(P)=2.34×10^{-7} *4*; α(IPF)=6.75×10^{-6} *10*
1257.4121	2$^+$	(121.5 *2*)	0.16 *4*	1135.82	0$^+$	[E2]		1.83	B(E2)(W.u.)=1.8×10^2 *5* α(K)=0.596 *9*; α(L)=0.936 *15*; α(M)=0.236 *4* α(N)=0.0556 *9*; α(O)=0.00765 *13*; α(P)=4.50×10^{-5} *7* E_γ: B(E2)(W.u.)=200 *60* is considered as large and improbable by the evaluators in view of relatively small B(E2)(W.u.) for other transitions from the 1257 level. Thus the presence of this transition is treated as questionable.
		928.00 *3*	40.5 *6*	329.4268	4$^+$	E2		0.00524	B(E2)(W.u.)=1.73 *15* α(K)=0.00429 *6*; α(L)=0.000738 *11*; α(M)=0.0001698 *24* α(N)=4.07×10^{-5} *6*; α(O)=6.47×10^{-6} *9*; α(P)=3.98×10^{-7} *6* δ(M3/E2)=+0.04 *14* ($\gamma\gamma(\theta)$ in ^{182}Ta β^-, 1992Ch26).
		1157.3 *1*	42 *6*	100.10598	2$^+$	E2+M1+E0	−9 *+3−6*	0.0092 *5*	B(E2)(W.u.)=0.59 *10* E_γ: from ^{182}Re decay (64.0 h). In β^- decay, 1157+1158 doublet is not well resolved; with average energy of the doublet at 1157.510 *15*, it deviates from level-energy difference by 0.2 keV in β^- decay dataset. I_γ: unweighted average of 48.6 *23* (β^- decay) and 35 *4* in ε decay (64 h). Other: 72 *5* in Coul. ex. is high by ≈70%. Values from (α,2nγ) and (n,n′γ) cannot be used as these studies did not account for 1157 being a doublet with the second component from 1487 level. Mult.: E0 component is estimated as 0.5% *1* by the evaluators from comparison of γ-ray intensities and K-shell electron conversion data in 1976He18. α: based on 0.5% *1* E0 component and δ(E2/M1)=−9 *+3−6*.
		1257.407 *3*	100.00 *28*	0.0	0$^+$	E2		0.00289	B(E2)(W.u.)=0.93 *8* α(K)=0.00239 *4*; α(L)=0.000378 *6*; α(M)=8.60×10^{-5} *12* α(N)=2.06×10^{-5} *3*; α(O)=3.33×10^{-6} *5*; α(P)=2.21×10^{-7} *3*; α(IPF)=1.119×10^{-5} *16*
1289.1498	2$^-$	31.7377 *5*	5.30 *13*	1257.4121	2$^+$	E1		1.628	B(E1)(W.u.)=7.1×10^{-5} *4* α(L)=1.259 *18*; α(M)=0.293 *4* α(N)=0.0675 *10*; α(O)=0.00910 *13*; α(P)=0.000305 *5* I_γ: all branchings relative to 1189γ, since efficiency problems at low energies such as 67.7 keV can be problematic. Branching for 31.7γ is from β^- decay. Other: 2.8 *6* from ε decay is low by a factor of ≈2.
		67.74970# *10*	260.4 *21*	1221.4001	2$^+$	E1		0.202	B(E1)(W.u.)=0.000360 *14* α(L)=0.1563 *22*; α(M)=0.0358 *5* α(N)=0.00840 *12*; α(O)=0.001234 *18*; α(P)=5.51×10^{-5} *8*

$^{182}_{74}W_{108}$-10

$\gamma(^{182}W)$ (continued)

E_i(level)	J^π_i	E_γ[†]	I_γ[†]	E_f	J^π_f	Mult.[‡]	δ[‡]	α[@]	Comments
									Mult.,δ: RUL(M2)=1 implies δ<0.002, thus pure E1 is assigned. Experimental limit: δ<0.02.
1289.1498	2^-	959.73 *3*	2.120 *24*	329.4268	4^+	E3+M2	−5.5 *+19−10*	0.0116 *7*	B(M2)(W.u.)=0.00016 *11*; B(E3)(W.u.)=3.44 *16* α(K)=0.0090 *6*; α(L)=0.00196 *8*; α(M)=0.000463 *17* α(N)=0.000111 *4*; α(O)=1.73×10^{-5} *7*; α(P)=9.3×10^{-7} *6* δ: other: −4.6 *+36*−Inf ($\gamma\gamma(\theta)$ in ^{182}Ta β^-, 1992Ch26).
		1189.040 *3*	100.00 *24*	100.10598	2^+	E1+M2+E3		0.0047 *3*	δ(M2/E1)=+0.48 *3*; δ(E3/E1)=−0.67 *5* B(E1)(W.u.)=1.58×10^{-8} *13*; B(M2)(W.u.)=0.012 *2*; B(E3)(W.u.)=10.6 *13* δ: from weighted averages of δ(M2/E1)=+0.44 *6*, δ(E3/E1)=−0.69 *10* (1983Ri05); δ(M2/E1)=+0.49 *3*, δ(E3/E1)=−0.64 *5* (1972Kr05); δ(M2/E1)=0.49 *3*, δ(E3/E1)=0.72 *7* (1972He10). Mult.,α: 59% *4* E1, 14% *1* M2 and 27% *3* E3. Conversion coefficient deduced for this admixture from BrIcc code.
		1289.145 *3*	8.32 *4*	0.0	0^+	M2		0.01231	B(M2)(W.u.)=0.00460 *17* α(K)=0.01019 *15*; α(L)=0.001630 *23*; α(M)=0.000372 *6* α(N)=8.98×10^{-5} *13*; α(O)=1.466×10^{-5} *21*; α(P)=1.047×10^{-6} *15*; α(IPF)=5.96×10^{-6} *9*
1331.1153	3^+	1001.700 *18*	17.95 *21*	329.4268	4^+	E2+M1	−8.9 *+18−21*	0.00455 *8*	B(M1)(W.u.)>4.1×10^{-8}; B(E2)(W.u.)>0.0023 α(K)=0.00374 *6*; α(L)=0.000627 *10*; α(M)=0.0001438 *23* α(N)=3.45×10^{-5} *6*; α(O)=5.51×10^{-6} *9*; α(P)=3.48×10^{-7} *6* δ: other: −8.2 *+22−42* ($\gamma\gamma(\theta)$ in ^{182}Ta β^-, 1992Ch26).
		1231.004 *3*	100.00 *24*	100.10598	2^+	E2+M1	−33 *+6−9*	0.00301	B(M1)(W.u.)>9.7×10^{-9}; B(E2)(W.u.)>0.0046 α(K)=0.00249 *4*; α(L)=0.000395 *6*; α(M)=9.01×10^{-5} *13* α(N)=2.16×10^{-5} *3*; α(O)=3.48×10^{-6} *5*; α(P)=2.31×10^{-7} *4*; α(IPF)=7.86×10^{-6} *11* δ: others: +11 *+6−3* ($\gamma\gamma(\theta)$ in ^{182}Ta β^-, 1992Ch26); −60 *+20−100* (1972Kr05).
1373.8301	3^-	42.7148 *4*	3.82 *8*	1331.1153	3^+	E1		0.720	B(E1)(W.u.)=0.00028 *4* α(L)=0.557 *8*; α(M)=0.1286 *18* α(N)=0.0299 *5*; α(O)=0.00419 *6*; α(P)=0.0001586 *23*
		84.6802[#] *3*	37.82 *25*	1289.1498	2^-	M1+E2	+0.326 *11*	7.66	B(M1)(W.u.)=0.034 *5*; B(E2)(W.u.)=2.1×10^{2} *3* α(K)=5.84 *9*; α(L)=1.40 *3*; α(M)=0.331 *8*

$^{182}_{74}W_{108}$-11

$\gamma(^{182}W)$ (continued)

E_i(level)	J_i^π	E_γ†	I_γ†	E_f	J_f^π	Mult.‡	δ‡	α@	Comments
									α(N)=0.0790 *18*; α(O)=0.0121 *3*; α(P)=0.000593 *9* δ: weighted average of +0.32 *3* (1983Ri05), +0.30 *2* (1980Sp01), +0.31 *5* (1975Qu01), +0.30 *2* (1972Kr05), 0.352 *3* (1972He10,ce data, uncertainty increased to 0.02 in averaging procedure), 0.40 *7* (1971Ga37,ce data), 0.346 *7* (1967Ni03, ce data, uncertainty increased to 0.02 in averaging procedure). Values with sign are from $\gamma(\theta)$ or $\gamma\gamma(\theta)$ data.
1373.8301	3⁻	116.4179# *6*	6.33 *5*	1257.4121	2⁺	E1		0.253	B(E1)(W.u.)=2.3×10^{-5} *3* α(K)=0.207 *3*; α(L)=0.0353 *5*; α(M)=0.00805 *12* α(N)=0.00191 *3*; α(O)=0.000290 *4*; α(P)=1.510×10^{-5} *22*
		152.42991# *26*	100.0 *5*	1221.4001	2⁺	E1		0.1258	B(E1)(W.u.)=0.000162 *21* α(K)=0.1038 *15*; α(L)=0.01703 *24*; α(M)=0.00387 *6* α(N)=0.000919 *13*; α(O)=0.0001421 *20*; α(P)=7.85×10^{-6} *11* δ: −0.22 *11* (1992Ch26), −0.023 *4* (1983Ri05), 0.035 *53* (1980Sp01 in ^{182}Re decay); +0.014 *13* (1975Qu01); all from $\gamma(\theta)$ or $\gamma\gamma(\theta)$. Subshell ratios in ce data (1967Ni03) give pure E1 consistent with RUL(M2)=1 suggests δ<0.006, thus the evaluators assign pure E1.
		1044.42 *5*	3.41 *6*	329.4268	4⁺	E1+M2(+E3)	0.46 *9*	0.0051 *12*	B(E1)(W.u.)=1.42×10^{-8} *21*; B(M2)(W.u.)=(0.013 *5*) α(K)=0.0042 *10*; α(L)=0.00067 *16*; α(M)=0.00015 *4* α(N)=3.7×10^{-5} *9*; α(O)=6.0×10^{-6} *14*; α(P)=4.2×10^{-7} *10* δ(M2/E1)=+0.4 *3*, δ(E3/E1)=−0.3 *2* (1972Kr05).
		1273.719 *3*	9.40 *5*	100.10598	2⁺	E1+M2+E3		0.0029 *5*	δ(M2/E1)=+0.36 *10*; δ(E3/E1)=−0.28 *12* B(E1)(W.u.)=1.37×10^{-8} *20*; B(M2)(W.u.)≈8×10^{-4}; B(E3)(W.u.)=9 *2* Mult.,α: 81% *5* E1, 12% *4* M2 and 7% *2* E3. Conversion coefficient deduced for this admixture from BrIcc code. Mult.,δ: from $\gamma(\theta)$ and lin pol data of 1983Ri05, agrees with ce data of 1992Ch26.
		1373.824 *3*	3.17 *3*	0.0	0⁺	E3		0.00496	B(E3)(W.u.)=5.8 *8* α(K)=0.00400 *6*; α(L)=0.000728 *11*; α(M)=0.0001685 *24* α(N)=4.05×10^{-5} *6*; α(O)=6.44×10^{-6} *9*; α(P)=3.97×10^{-7} *6*; α(IPF)=1.252×10^{-5} *18*
1442.835	4⁺	1113.410 *18*	100.0 *14*	329.4268	4⁺	E2+M1(+E0)	+5.6 *+13−10*	0.00376 *8*	B(E2)(W.u.)=10.3 *10* Mult.,δ: from ce data in ^{182}Ta β^-, 1990Ka35

$^{182}_{74}W_{108}$-12

Adopted Levels, Gammas (continued)

$\gamma(^{182}W)$ (continued)

E_i(level)	J_i^π	E_γ†	I_γ†	E_f	J_f^π	Mult.‡	δ‡	α@	Comments
									suggest M1+E2(+E0) with δ(E2/M1)=20 *13*. δ(E2/M1)=+1.1 *2* from $\gamma\gamma(\theta)$ in ^{182}Ta β^- (1992Ch26). E0 component is suggested by 1975We22 with q_K(E0/E2)=0.41 *9*.
1442.835	4^+	1342.730 *15*	57.7 *3*	100.10598	2^+	E2		0.00256	B(E2)(W.u.)=2.41 *23* α(K)=0.00211 *3*; α(L)=0.000329 *5*; α(M)=7.49×10^{-5} *11* α(N)=1.80×10^{-5} *3*; α(O)=2.90×10^{-6} *4*; α(P)=1.95×10^{-7} *3*; α(IPF)=2.56×10^{-5} *4* I_γ: 93 *7* in (α,2nγ) is high by ≈60%. δ(M3/E2)=−0.11 *+4−20* from $\gamma(\theta)$ in ^{182}Ta β^- decay is inconsistent with RUL(M3)=10, which suggests that δ should be near zero. α(K)exp in ^{182}Re ε decay is consistent with δ(M3/E2)=0 assigned by the evaluators.
1487.5018	4^-	44.66& *11*	1.12 *22*	1442.835	4^+	[E1]		0.637 *10*	B(E1)(W.u.)>0.00011 α(L)=0.493 *8*; α(M)=0.1136 *18* α(N)=0.0264 *5*; α(O)=0.00373 *6*; α(P)=0.0001436 *22*
		113.67170# *22*	70.0 *3*	1373.8301	3^-	M1+E2	+0.36 *1*	3.18	B(M1)(W.u.)>0.038; B(E2)(W.u.)>1.5×10^2 α(K)=2.49 *4*; α(L)=0.530 *9*; α(M)=0.1242 *22* α(N)=0.0297 *5*; α(O)=0.00462 *8*; α(P)=0.000250 *4* I_γ: 122 *10* in (α,2nγ) is high by ≈75%.
		156.3864# *3*	100.0 *4*	1331.1153	3^+	E1		0.1177	B(E1)(W.u.)>0.00023 α(K)=0.0972 *14*; α(L)=0.01590 *23*; α(M)=0.00362 *5* α(N)=0.000858 *12*; α(O)=0.0001328 *19*; α(P)=7.38×10^{-6} *11* δ(M2/E1)=−0.053 *4* (1983Ri05,$\gamma(\theta)$ and lin pol); −0.08 *5* (1992Ch26, $\gamma\gamma(\theta)$); +0.06 *+3−6* (1981Ka22,$\gamma\gamma(\theta)$). But RUL=1 for M2 implies δ<0.005, thus the evaluators assign E1. δ(M2/E1)=−0.08 *5* ($\gamma\gamma(\theta)$ and ce in ^{182}Ta β^-, 1992Ch26).
		198.35187# *29*	54.84 *21*	1289.1498	2^-	E2		0.317	B(E2)(W.u.)>68 α(K)=0.1725 *25*; α(L)=0.1097 *16*; α(M)=0.0273 *4* α(N)=0.00646 *9*; α(O)=0.000910 *13*; α(P)=1.364×10^{-5} *19* δ(M3/E2)=+0.067 *10* from $\gamma(\theta)$ in ^{182}Ta β^-, but RUL(M3)=10 suggests δ(M3/E2) should be near zero. The evaluators assign pure E2.
		1158.1 *2*	10.8 *13*	329.4268	4^+	E1		1.38×10^{-3}	B(E1)(W.u.)>6.1×10^{-8} α(K)=0.001159 *17*; α(L)=0.0001632 *23*; α(M)=3.66×10^{-5} *6*

Adopted Levels, Gammas (continued)

$\gamma(^{182}W)$ (continued)

E_i(level)	J^π_i	E_γ[†]	I_γ[†]	E_f	J^π_f	Mult.[‡]	δ[‡]	α[@]	Comments
									α(N)=8.79×10^{-6} *13*; α(O)=1.432×10^{-6} *20*; α(P)=1.021×10^{-7} *15*; α(IPF)=7.59×10^{-6} *12* δ(M2/E1)=−0.01 +*2*−*1* ($\gamma\gamma(\theta)$ in ^{182}Ta β^-, 1992Ch26). I_γ: from ^{182}Re decay (64.0 h).
1487.5018	4$^-$	1387.390 *3*	2.73 *4*	100.10598	2$^+$	E3+M2	2.6 *4*	0.00554 *24*	B(M2)(W.u.)>0.0020; B(E3)(W.u.)>5.9 α(K)=0.00450 *21*; α(L)=0.00079 *3*; α(M)=0.000183 *7* α(N)=4.39×10^{-5} *16*; α(O)=7.0×10^{-6} *3*; α(P)=4.50×10^{-7} *21*; α(IPF)=1.426×10^{-5} *22*
1510.22	4$^+$	830.1 *4*	17 *3*	680.42	6$^+$				E_γ,I_γ: weighted averages taken of data from β^-, ε and (n,n′γ) for all three γ rays from the 1510 level.
		1180.80 *11*	100 *3*	329.4268	4$^+$	E2+M1	−2.8 *10*	0.0036 *4*	α(K)=0.0030 *4*; α(L)=0.00047 *5*; α(M)=0.000108 *11* α(N)=2.59×10^{-5} *25*; α(O)=4.2×10^{-6} *5*; α(P)=2.8×10^{-7} *4*; α(IPF)=3.11×10^{-6} *16*
		1410.13 *5*	45.8 *10*	100.10598	2$^+$	E2		0.00235	α(K)=0.00193 *3*; α(L)=0.000298 *5*; α(M)=6.76×10^{-5} *10* α(N)=1.624×10^{-5} *23*; α(O)=2.62×10^{-6} *4*; α(P)=1.783×10^{-7} *25*; α(IPF)=4.20×10^{-5} *6*
1553.2240	4$^-$	65.72215[#] *15*	39.8 *4*	1487.5018	4$^-$	M1+E2	0.093 *6*	2.91 *5*	B(M1)(W.u.)=0.00624 *24*; B(E2)(W.u.)=5.2 *7* α(L)=2.25 *4*; α(M)=0.517 *9* α(N)=0.1242 *20*; α(O)=0.0200 *3*; α(P)=0.001340 *19*
		110.393 *12*	1.42 *4*	1442.835	4$^+$	[E1]		0.290	B(E1)(W.u.)=4.53×10^{-7} *20* α(K)=0.238 *4*; α(L)=0.0408 *6*; α(M)=0.00931 *13* α(N)=0.00220 *3*; α(O)=0.000335 *5*; α(P)=1.717×10^{-5} *24*
		179.39381[#] *25*	41.22 *19*	1373.8301	3$^-$	M1+E2	+1.3 *2*	0.62 *4*	B(M1)(W.u.)=0.000119 *24*; B(E2)(W.u.)=2.6 *4* α(K)=0.42 *5*; α(L)=0.149 *5*; α(M)=0.0363 *13* α(N)=0.0086 *3*; α(O)=0.00126 *4*; α(P)=3.9×10^{-5} *5* I_γ: 35.5 *21* from ε decay is quite in agreement. δ: unweighted average of +2.2 *2* (1992Ch26), +2.1 +*3*−*2* (1983Ri05), +1.3 *5* (1980Sp01), +0.9 *4* (1975Qu01), +0.92 +*13*−*7* (1972Kr05), +0.90m +40-23 (1972He10), 0.7 *1* (1967Ni03). Weighted average is 1.0 *2* but with reduced χ^2=10. Except for 1967Ni03, all other methods are $\gamma(\theta)$ on oriented nuclei or $\gamma\gamma(\theta)$.
		222.1085[#] *3*	100.0 *3*	1331.1153	3$^+$	E1		0.0480	B(E1)(W.u.)=3.92×10^{-6} *13* α(K)=0.0399 *6*; α(L)=0.00630 *9*; α(M)=0.001429 *20* α(N)=0.000340 *5*; α(O)=5.34×10^{-5} *8*; α(P)=3.17×10^{-6} *5* δ: +0.007 *5* (1972Kr05), +0.027 *7* (1992Ch26), −0.12 *18* (1975Qu01), pure E1 from subshell data (1967Ni01), as also suggested by RUL for M2.
		264.0740[#] *3*	47.74 *19*	1289.1498	2$^-$	E2		0.1254	B(E2)(W.u.)=0.700 *23* α(K)=0.0799 *12*; α(L)=0.0347 *5*; α(M)=0.00852 *12* α(N)=0.00202 *3*; α(O)=0.000291 *4*; α(P)=6.69×10^{-6} *10*

γ(^{182}W) (continued)

E_i(level)	J^π_i	E_γ†	I_γ†	E_f	J^π_f	Mult.‡	δ‡	α@	Comments
1553.2240	4−	1223.73 *11*	3.1 *4*	329.4268	4+	E1+M2(+E3)	−0.15 *+10−25*	0.0016 *15*	B(E1)(W.u.)=7.1×10^{-10} *10*; B(M2)(W.u.)=(5.E−5 *+7−5*) α(K)=0.0013 *13*; α(L)=1.9×10^{-4} *20*; α(M)=4.2×10^{-5} *46* α(N)=1.0×10^{-5} *11*; α(O)=1.6×10^{-6} *18*; α(P)=1.2×10^{-7} *13*; α(IPF)=2.7×10^{-5} *3* E_γ: weighted average from β^- and ε decay. Mult.,δ: from ce data of 1976He18 and $\gamma\gamma(\theta)$ data of of 1992Ch26 in ^{182}Ta β^-. E3 admixture cannot be ruled out.
		1453.120 *6*	0.405 *14*	100.10598	2+	E3(+M2)	>2.3	0.0048 *4*	B(E3)(W.u.)=0.017 *2* α(K)=0.0039 *4*; α(L)=0.00068 *5*; α(M)=0.000156 *11* α(N)=3.76×10^{-5} *25*; α(O)=6.0×10^{-6} *4*; α(P)=3.9×10^{-7} *4*; α(IPF)=2.29×10^{-5} *4* I_γ: other: 27 *3* in (α,2nγ) is much higher, most likely an impurity or incorrect assignment.
1621.284	5−	111.07 *5*	4.1 *3*	1510.22	4+				
		133.80 *5*	49 *3*	1487.5018	4−	M1+E2	+0.39 *+4−3*	1.96 *4*	α(K)=1.55 *4*; α(L)=0.316 *10*; α(M)=0.0739 *24* α(N)=0.0177 *6*; α(O)=0.00277 *8*; α(P)=0.000155 *4*
		178.47 *5*	45 *3*	1442.835	4+	E1		0.0838	α(K)=0.0693 *10*; α(L)=0.01118 *16*; α(M)=0.00254 *4* α(N)=0.000604 *9*; α(O)=9.39×10^{-5} *14*; α(P)=5.36×10^{-6} *8*
		247.46 *5*	100 *7*	1373.8301	3−	E2		0.1538	α(K)=0.0951 *14*; α(L)=0.0447 *7*; α(M)=0.01101 *16* α(N)=0.00261 *4*; α(O)=0.000374 *6*; α(P)=7.86×10^{-6} *11*
		1291.8 *4*	4.6 *5*	329.4268	4+	E1+M2	0.4 *2*	0.0027 *14*	α(K)=0.0022 *12*; α(L)=3.4×10^{-4} *19*; α(M)=7.7×10^{-5} *44* α(N)=1.9×10^{-5} *11*; α(O)=3.0×10^{-6} *17*; α(P)=2.2×10^{-7} *13*; α(IPF)=5.0×10^{-5} *7*
		1521.3 *4*	1.89 *20*	100.10598	2+	(E3)		0.00402	α(K)=0.00325 *5*; α(L)=0.000568 *8*; α(M)=0.0001309 *19* α(N)=3.15×10^{-5} *5*; α(O)=5.03×10^{-6} *7*; α(P)=3.20×10^{-7} *5*; α(IPF)=3.37×10^{-5} *5*
1623.51	(5)+	943.1 *3*	14.0 *22*	680.42	6+	E2		0.00507	α(K)=0.00415 *6*; α(L)=0.000711 *10*; α(M)=0.0001634 *23* α(N)=3.92×10^{-5} *6*; α(O)=6.23×10^{-6} *9*; α(P)=3.86×10^{-7} *6* I_γ: 35 *5* in (n,n′γ) is discrepant.
		1294.0 *3*	100.0 *19*	329.4268	4+	E2(+M1)	>30	0.00274	α(K)=0.00226 *4*; α(L)=0.000356 *5*; α(M)=8.10×10^{-5} *12*

From ENSDF

$^{182}_{74}$W$_{108}$-15

$\gamma(^{182}W)$ (continued)

E_i(level)	J^π_i	E_γ †	I_γ †	E_f	J^π_f	Mult. ‡	δ ‡	α @	Comments
									α(N)=1.94×10^{-5} *3*; α(O)=3.13×10^{-6} *5*; α(P)=2.10×10^{-7} *3*; α(IPF)=1.654×10^{-5} *24*
1660.383	5$^-$	39.1 *1*	3.7 *7*	1621.284	5$^-$	M1+E2	0.061 *7*	13.6 *4*	α(L)=10.53 *25*; α(M)=2.42 *6* α(N)=0.581 *15*; α(O)=0.0933 *21*; α(P)=0.00618 *10*
		107.13 *5*	20.1 *15*	1553.2240	4$^-$	M1+E2	−0.8 *2*	3.54 *13*	α(K)=2.3 *4*; α(L)=0.96 *15*; α(M)=0.24 *4* α(N)=0.056 *9*; α(O)=0.0081 *12*; α(P)=0.00022 *4* I_γ: 55 *4* in (α,2nγ) is discrepant.
		150.25& *5*	7.3 *7*	1510.22	4$^+$	(E1)		0.1305	α(K)=0.1077 *16*; α(L)=0.01770 *25*; α(M)=0.00403 *6* α(N)=0.000956 *14*; α(O)=0.0001476 *21*; α(P)=8.13×10^{-6} *12* I_γ: 51 *10* in (α,2nγ) is discrepant.
		172.87 *5*	51 *3*	1487.5018	4$^-$	M1+E2	+0.26 *1*	0.971	α(K)=0.795 *12*; α(L)=0.1356 *20*; α(M)=0.0312 *5* α(N)=0.00749 *11*; α(O)=0.001205 *17*; α(P)=7.97×10^{-5} *12* I_γ: 137 *14* in (α,2nγ) is discrepant.
		217.55 *5*	46 *3*	1442.835	4$^+$	(E1)		0.0506	α(K)=0.0420 *6*; α(L)=0.00664 *10*; α(M)=0.001508 *22* α(N)=0.000359 *5*; α(O)=5.63×10^{-5} *8*; α(P)=3.33×10^{-6} *5* I_γ: 93 *7* in (α,2nγ) is discrepant.
		286.56 *5*	100 *7*	1373.8301	3$^-$	E2		0.0976	α(K)=0.0643 *9*; α(L)=0.0254 *4*; α(M)=0.00621 *9* α(N)=0.001472 *21*; α(O)=0.000213 *3*; α(P)=5.47×10^{-6} *8*
		1330.9 *2*	5.3 *5*	329.4268	4$^+$	E1+M2	0.5 *2*	0.0032 *14*	α(K)=0.0026 *11*; α(L)=4.0×10^{-4} *18*; α(M)=9.1×10^{-5} *41* α(N)=2.19×10^{-5} *98*; α(O)=3.6×10^{-6} *16*; α(P)=2.6×10^{-7} *12*; α(IPF)=6.3×10^{-5} *9*
		1560.4 *4*	1.02 *11*	100.10598	2$^+$	(E3)		0.00382	α(K)=0.00309 *5*; α(L)=0.000534 *8*; α(M)=0.0001231 *18* α(N)=2.96×10^{-5} *5*; α(O)=4.74×10^{-6} *7*; α(P)=3.03×10^{-7} *5*; α(IPF)=4.10×10^{-5} *6*
1711.99	10$^+$	567.5 *1*	100	1144.32	8$^+$	E2		0.01543	B(E2)(W.u.)=203 *19* α(K)=0.01202 *17*; α(L)=0.00262 *4*; α(M)=0.000616 *9* α(N)=0.0001472 *21*; α(O)=2.26×10^{-5} *4*; α(P)=1.106×10^{-6} *16*
1756.75	6$^+$	313.94 *12*	7.5 *5*	1442.835	4$^+$	E2		0.0743	α(K)=0.0506 *8*; α(L)=0.0181 *3*; α(M)=0.00440 *7* α(N)=0.001045 *15*; α(O)=0.0001525 *22*; α(P)=4.37×10^{-6} *7*
		1076.4 *1*	100 *3*	680.42	6$^+$	E2+M1	+2.56 *+9−8*	0.00444	α(K)=0.00368 *6*; α(L)=0.000592 *9*; α(M)=0.0001351 *21* α(N)=3.24×10^{-5} *5*; α(O)=5.22×10^{-6} *8*; α(P)=3.45×10^{-7} *6* Mult.: no E0 admixture was found in γ(ce)(θ) and ce data of 1975We22.
		1427.2 *1*	92.1 *17*	329.4268	4$^+$	E2		0.00231	α(K)=0.00188 *3*; α(L)=0.000291 *4*; α(M)=6.60×10^{-5} *10* α(N)=1.584×10^{-5} *23*; α(O)=2.56×10^{-6} *4*; α(P)=1.744×10^{-7} *25*; α(IPF)=4.67×10^{-5} *7*
1765.53		434.3 *2*	48 *12*	1331.1153	3$^+$				
		544.20 *15*	100 *15*	1221.4001	2$^+$				
1768.943	6$^-$	108.58 *5*	12.6 *25*	1660.383	5$^-$	M1+E2	−0.6 *2*	3.50 *13*	α(K)=2.5 *3*; α(L)=0.78 *14*; α(M)=0.19 *4* α(N)=0.045 *9*; α(O)=0.0066 *11*; α(P)=0.00025 *4* I_γ: 78 *6* in (α,2nγ) is discrepant.
		145.43 *5*	11.8 *9*	1623.51	(5)$^+$	(E1)		0.1420	α(K)=0.1171 *17*; α(L)=0.0193 *3*; α(M)=0.00440 *7* α(N)=0.001043 *15*; α(O)=0.0001608 *23*; α(P)=8.80×10^{-6} *13* I_γ: 45 *10* in (α,2nγ) is discrepant.

$^{182}_{74}W_{108}$-16

$\gamma(^{182}W)$ (continued)

E_i(level)	J_i^π	E_γ†	I_γ†	E_f	J_f^π	Mult.‡	δ‡	α@	Comments
		147.71 *5*	16.2 *14*	1621.284	5^-	M1+E2	+0.8 *2*	1.30 *9*	α(K)=0.94 *12*; α(L)=0.277 *24*; α(M)=0.067 *7* α(N)=0.0159 *15*; α(O)=0.00237 *18*; α(P)=9.1×10^{-5} *13* I_γ: 49 *10* in (α,2nγ) is discrepant.
		215.72 *5*	12.3 *24*	1553.2240	4^-	(E2)		0.240	α(K)=0.1376 *20*; α(L)=0.0776 *11*; α(M)=0.0192 *3*

$^{182}_{74}W_{108}$-17

$\gamma(^{182}W)$ (continued)

E_i(level)	J^π_i	E_γ[†]	I_γ[†]	E_f	J^π_f	Mult.[‡]	δ[‡]	α[@]	Comments
									α(N)=0.00455 *7*; α(O)=0.000645 *9*; α(P)=1.106×10^{-5} *16* I_γ: 65 *6* in (α,2nγ) is discrepant.
1768.943	6$^-$	281.43 *5*	100 *7*	1487.5018	4$^-$	E2		0.1031	α(K)=0.0675 *10*; α(L)=0.0272 *4*; α(M)=0.00665 *10* α(N)=0.001578 *23*; α(O)=0.000228 *4*; α(P)=5.72×10^{-6} *8*
		1088.5 *3*	3.5 *4*	680.42	6$^+$	E1+M2	0.4 *2*	0.0040 *23*	α(K)=0.0033 *19*; α(L)=5.1×10^{-4} *31*; α(M)=1.17×10^{-4} *70* α(N)=2.8×10^{-5} *17*; α(O)=4.6×10^{-6} *28*; α(P)=3.3×10^{-7} *20*
		1439.3 *3*	2.81 *18*	329.4268	4$^+$	(M2)		0.00930	α(K)=0.00770 *11*; α(L)=0.001217 *17*; α(M)=0.000277 *4* α(N)=6.69×10^{-5} *10*; α(O)=1.093×10^{-5} *16*; α(P)=7.84×10^{-7} *11*; α(IPF)=2.33×10^{-5} *4* Mult.: E1+M2 from α(K)exp but ΔJ^π requires M2.
1769.5?	(6$^+$)	1089.0		680.42	6$^+$				
		1440.1		329.4268	4$^+$				
1809.64	5$^-$	188.54[&] *5*	1.38 *14*	1621.284	5$^-$				
		256.42 *11*	100 *8*	1553.2240	4$^-$	M1+E2	+0.037 *+6−7*	0.336	α(K)=0.279 *4*; α(L)=0.0438 *7*; α(M)=0.00997 *14* α(N)=0.00240 *4*; α(O)=0.000392 *6*; α(P)=2.80×10^{-5} *4*
1810.85	(6)$^-$	42.0		1768.943	6$^-$				
		187.34 *5*	18.4 *18*	1623.51	(5)$^+$	E1+M2	+0.25 *+27−20*	0.33 *66*	α(K)=0.25 *50*; α(L)=0.06 *13*; α(M)=0.014 *30* α(N)=0.0033 *73*; α(O)=5.E−4 *12*; α(P)=3.3×10^{-5} *74*
		189.60 *7*	21.8 *18*	1621.284	5$^-$	M1+E2	+0.31 *+15−12*	0.74 *4*	α(K)=0.60 *4*; α(L)=0.104 *3*; α(M)=0.0240 *10* α(N)=0.00576 *22*; α(O)=0.000924 *21*; α(P)=6.0×10^{-5} *5*
		323.33 *10*	100 *7*	1487.5018	4$^-$	E2		0.0681	α(K)=0.0469 *7*; α(L)=0.01623 *23*; α(M)=0.00395 *6* α(N)=0.000937 *14*; α(O)=0.0001372 *20*; α(P)=4.07×10^{-6} *6*
1813.4		524.2 *3*	100	1289.1498	2$^-$				
1829.53	6$^-$	19.85 *10*	0.32 *11*	1809.64	5$^-$	M1+E2	0.07 *2*	1.3×10^2 *3*	α(L)=102 *20*; α(M)=24 *5* α(N)=5.7 *12*; α(O)=0.88 *15*; α(P)=0.0461 *10*
		60.65 *10*	0.91 *23*	1768.943	6$^-$				
		169.15 *10*	100 *7*	1660.383	5$^-$	M1+E2	+0.094 *6*	1.060	α(K)=0.879 *13*; α(L)=0.1405 *20*; α(M)=0.0320 *5* α(N)=0.00771 *11*; α(O)=0.001256 *18*; α(P)=8.85×10^{-5} *13*
		206.00 *5*	4.5 *5*	1623.51	(5)$^+$	E1		0.0581	α(K)=0.0482 *7*; α(L)=0.00766 *11*; α(M)=0.001739 *25* α(N)=0.000414 *6*; α(O)=6.48×10^{-5} *9*; α(P)=3.80×10^{-6} *6*
		208.26 *5*	5.5 *5*	1621.284	5$^-$	M1+E2	−1.0 *5*	0.43 *10*	α(K)=0.32 *11*; α(L)=0.084 *4*; α(M)=0.0200 *14* α(N)=0.0048 *3*; α(O)=0.000721 *18*; α(P)=3.1×10^{-5} *12*
		276.31 *5*	77 *5*	1553.2240	4$^-$	E2		0.1090	α(K)=0.0708 *10*; α(L)=0.0291 *4*; α(M)=0.00714 *10*

$^{182}_{74}W_{108}$-18

$\gamma(^{182}W)$ (continued)

E_i(level)	J^π_i	E_γ†	I_γ†	E_f	J^π_f	Mult.‡	α@	Comments
								α(N)=0.001693 24; α(O)=0.000245 4; α(P)=5.98×10^{-6} 9
1829.53	6^-	342.03 10	9.3 7	1487.5018	4^-	E2	0.0579	α(K)=0.0406 6; α(L)=0.01326 19; α(M)=0.00321 5 α(N)=0.000764 11; α(O)=0.0001124 16; α(P)=3.55×10^{-6} 5 I_γ: 43 4 in (α,2nγ) is discrepant.
1833.1?		1733.0& 6	100	100.10598	2^+			
1855.98	(2^+)	598.56 5	100 11	1257.4121	2^+			
		1527.0& 10	10 5	329.4268	4^+			E_γ: from (n,n′γ) only.
		1756.0 2	15 3	100.10598	2^+			I_γ: 167 40 in (n,n′γ) is discrepant.
		1857.3 2	8.0 6	0.0	0^+	(E2)	1.59×10^{-3}	α(K)=0.001162 17; α(L)=0.0001723 25; α(M)=3.89×10^{-5} 6 α(N)=9.35×10^{-6} 13; α(O)=1.522×10^{-6} 22; α(P)=1.073×10^{-7} 15; α(IPF)=0.000210 3 E_γ: from ^{182}Re decay only, poor fit; γ not used in the level-scheme fitting procedure. Level-energy difference=1856.1.
1856.9	1	1757.0 6	35 12	100.10598	2^+			
		1856.7 6	100 23	0.0	0^+			
1871.17	1^-	1543 2	≈5	329.4268	4^+	[E3]	0.00391	α(K)=0.00316 5; α(L)=0.000549 8; α(M)=0.0001265 19 α(N)=3.04×10^{-5} 5; α(O)=4.86×10^{-6} 7; α(P)=3.11×10^{-7} 5; α(IPF)=3.77×10^{-5} 7
		1771.0 2	100 10	100.10598	2^+	E1	1.04×10^{-3}	α(K)=0.000562 8; α(L)=7.77×10^{-5} 11; α(M)=1.740×10^{-5} 25 α(N)=4.18×10^{-6} 6; α(O)=6.84×10^{-7} 10; α(P)=4.98×10^{-8} 7; α(IPF)=0.000383 6
		1871.2 2	90 7	0.0	0^+	E1	1.06×10^{-3}	α(K)=0.000513 8; α(L)=7.09×10^{-5} 10; α(M)=1.587×10^{-5} 23 α(N)=3.81×10^{-6} 6; α(O)=6.24×10^{-7} 9; α(P)=4.55×10^{-8} 7; α(IPF)=0.000457 7
1887.84		556.7 3	83 25	1331.1153	3^+			
		666.4 4	46 17	1221.4001	2^+			
		1558.5 4	100 25	329.4268	4^+			
1917.05	7^-	106.3 1	8 2	1810.85	$(6)^-$			
		148.2 1	10 2	1768.943	6^-			
		160.20& 5		1756.75	6^+			E_γ: from ^{182}Re decay only. This γ is considered as suspect by the evaluators since its intensity of 116 7 relative to 100 for 295.7γ is much too high to have missed detection in in-beam γ-ray study.
		256.5 1	28 4	1660.383	5^-	Q		
		295.63 10	100 14	1621.284	5^-	E2	0.0888	α(K)=0.0592 9; α(L)=0.0226 4; α(M)=0.00551 8 α(N)=0.001308 19; α(O)=0.000190 3; α(P)=5.06×10^{-6} 8
1918.6	$(2^+ \text{ to } 4^+)$	1818.5 4	100	100.10598	2^+			
1959.35	(2^+)	449.8 3	21 10	1510.22	4^+	(Q)		
		627.5 4	50 14	1331.1153	3^+			
		1629.8 2	100 14	329.4268	4^+			
		1859.1 8	71 24	100.10598	2^+			
		1959.2& 10	14 5	0.0	0^+			

$^{182}_{74}W_{108}$-19

$\gamma(^{182}W)$ (continued)

E_i(level)	J^π_i	E_γ†	I_γ†	E_f	J^π_f	Mult.‡	δ‡	α@	Comments
1960.30	(7)$^-$	130.81 *5*	100 *7*	1829.53	6$^-$	M1+E2	−0.51 +*6*−*8*	2.03 *6*	α(K)=1.55 *8*; α(L)=0.369 *21*; α(M)=0.087 *6* α(N)=0.0208 *13*; α(O)=0.00319 *16*; α(P)=0.000154 *8*
		149.45 *5*	12.1 *10*	1810.85	(6)$^-$	M1+E2	−0.15 +*15*−*18*	1.50 *6*	α(K)=1.23 *7*; α(L)=0.202 *14*; α(M)=0.046 *4* α(N)=0.0111 *9*; α(O)=0.00180 *10*; α(P)=0.000124 *8*
		191.39 *5*	90 *7*	1768.943	6$^-$	M1+E2	−0.23 +*6*−*8*	0.734 *18*	α(K)=0.604 *19*; α(L)=0.1002 *18*; α(M)=0.0230 *5* α(N)=0.00552 *11*; α(O)=0.000892 *14*; α(P)=6.05×10^{-5} *20*
		203.55 *5*	6.6 *7*	1756.75	6$^+$	(E1)		0.0599	α(K)=0.0497 *7*; α(L)=0.00790 *11*; α(M)=0.00179 *3* α(N)=0.000427 *6*; α(O)=6.68×10^{-5} *10*; α(P)=3.91×10^{-6} *6* From γ(θ) in ^{182}Re ε decay, 1980Sp01 give δ(Q/D)=−17 +*10*−*24* or +0.06 +*9*−*4*; favoring the former value from δ based on ce data of 1971Ga37. But 1971Ga37 assigned tentative E2 from their ce data. δ(M2/E1)=−17 +*10*−*24* is inconsistent with RUL(M2)=1 for $T_{1/2}$(1960.30 level)<1 ns or so. The evaluators assign tentative E1. I_γ: 52 *4* in (α,2nγ) is discrepant.
		299.90 *10*	20 *3*	1660.383	5$^-$	E2		0.0851	α(K)=0.0570 *8*; α(L)=0.0214 *3*; α(M)=0.00522 *8* α(N)=0.001239 *18*; α(O)=0.000180 *3*; α(P)=4.89×10^{-6} *7* I_γ: 61 *6* in (α,2nγ) is discrepant.
		339.04 *10*	72 *10*	1621.284	5$^-$	E2		0.0594	α(K)=0.0415 *6*; α(L)=0.01368 *20*; α(M)=0.00332 *5* α(N)=0.000789 *11*; α(O)=0.0001159 *17*; α(P)=3.63×10^{-6} *5*
1960.78	6$^-$	151.15 *5*	26 *3*	1809.64	5$^-$	M1+E2	0.8 *3*	1.21 *13*	α(K)=0.88 *17*; α(L)=0.25 *3*; α(M)=0.061 *9* α(N)=0.0146 *20*; α(O)=0.00218 *23*; α(P)=8.5×10^{-5} *19*
		300.36 *10*	100 *23*	1660.383	5$^-$	M1+E2	+0.048 *26*	0.218	α(K)=0.181 *3*; α(L)=0.0284 *4*; α(M)=0.00646 *9* α(N)=0.001555 *22*; α(O)=0.000254 *4*; α(P)=1.81×10^{-5} *3*
		1279.8& *3*	3.6 *5*	680.42	6$^+$				
		1631.4& *5*	0.74 *14*	329.4268	4$^+$	M2+E3	≈2.5	≈0.00396	α(K)≈0.00321; α(L)≈0.000536; α(M)≈0.0001230 α(N)≈2.96×10^{-5}; α(O)≈4.77×10^{-6}; α(P)≈3.17×10^{-7}; α(IPF)≈5.70×10^{-5}
1971.05	(7)$^+$	214.31 *5*	100	1756.75	6$^+$	M1+E2	+0.25 +*8*−*7*	0.532 *15*	α(K)=0.439 *14*; α(L)=0.0725 *11*; α(M)=0.0166 *3* α(N)=0.00399 *7*; α(O)=0.000645 *9*; α(P)=4.39×10^{-5} *15*
1978.36	(7)$^-$	18.05 *10*	1.9 *5*	1960.30	(7)$^-$	M1+E2	0.016 *5*	128 *4*	α(L)=99 *3*; α(M)=22.7 *7* α(N)=5.45 *16*; α(O)=0.883 *24*; α(P)=0.0612 *14*
		148.86 *5*	27.2 *20*	1829.53	6$^-$	M1+E2	+0.28 +*8*−*6*	1.48 *4*	α(K)=1.20 *5*; α(L)=0.214 *8*; α(M)=0.0493 *22* α(N)=0.0118 *5*; α(O)=0.00189 *6*; α(P)=0.000121 *5*
		209.40 *5*	7.6 *8*	1768.943	6$^-$	M1+E2	−0.28 +*23*−*15*	0.56 *3*	α(K)=0.46 *3*; α(L)=0.0776 *15*; α(M)=0.0178 *5* α(N)=0.00428 *10*; α(O)=0.000690 *11*; α(P)=4.6×10^{-5} *4* I_γ: 33 *3* in (α,2nγ) is discrepant.
		221.59 *6*	100 *8*	1756.75	6$^+$	E1		0.0483	α(K)=0.0401 *6*; α(L)=0.00633 *9*; α(M)=0.001438 *21* α(N)=0.000342 *5*; α(O)=5.37×10^{-5} *8*; α(P)=3.19×10^{-6} *5*
		357.04 *10*	8.4 *8*	1621.284	5$^-$	E2		0.0513	α(K)=0.0364 *5*; α(L)=0.01140 *16*; α(M)=0.00276 *4* α(N)=0.000656 *10*; α(O)=9.68×10^{-5} *14*; α(P)=3.20×10^{-6} *5*
1981.82		650.7 *3*	59 *18*	1331.1153	3$^+$				

$^{182}_{74}W_{108}$-20

$\gamma(^{182}W)$ (continued)

E_i(level)	J^π_i	E_γ†	I_γ†	E_f	J^π_f	Mult.‡	δ‡	α@	Comments
1981.82		723.8 7	26 9	1257.4121	2^+				
		1653.1 8	82 24	329.4268	4^+				
		1881.8 8	100 18	100.10598	2^+				
1993.68	(7^-)	182.8 5	<11	1810.85	$(6)^-$				
		372.4 1	100 17	1621.284	5^-	Q			
2016.8	$(2,3,4)^+$	1688.3& 10	100 33	329.4268	4^+				
		1915.3& 12	100 33	100.10598	2^+				
2023.57	3^-	470.26 5	100 5	1553.2240	4^-	M1+E2	0.6 1	0.055 3	α(K)=0.0455 25; α(L)=0.0075 3; α(M)=0.00171 6 α(N)=0.000412 15; α(O)=6.6×10^{-5} 3; α(P)=4.5×10^{-6} 3
		536.04 5	10.3 16	1487.5018	4^-	M1+E2	0.7 2	0.037 4	α(K)=0.031 4; α(L)=0.0051 4; α(M)=0.00116 9 α(N)=0.000279 21; α(O)=4.5×10^{-5} 4; α(P)=3.0×10^{-6} 4
		649.73 5	16.8 24	1373.8301	3^-	M1+E2	0.8 2	0.0219 23	α(K)=0.0181 19; α(L)=0.00293 24; α(M)=0.00067 6 α(N)=0.000161 13; α(O)=2.60×10^{-5} 22; α(P)=1.76×10^{-6} 20
		734.53 5	18.7 22	1289.1498	2^-	M1+E2	1.0 3	0.0148 22	α(K)=0.0122 19; α(L)=0.00199 24; α(M)=0.00045 6 α(N)=0.000109 13; α(O)=1.76×10^{-5} 22; α(P)=1.18×10^{-6} 19
2057.39	1^+	800 1	16 4	1257.4121	2^+				
		835.98 5	50 5	1221.4001	2^+	(M1+E2)	≈0.8	≈0.01177	α(K)≈0.00979; α(L)≈0.001538; α(M)≈0.000350 α(N)≈8.42×10^{-5}; α(O)≈1.366×10^{-5}; α(P)≈9.48×10^{-7}
		1957.4 2	49 3	100.10598	2^+	(M1+E2)	1.0 +6−4	0.00186 17	α(K)=0.00131 13; α(L)=0.000193 18; α(M)=4.4×10^{-5} 4 α(N)=1.05×10^{-5} 10; α(O)=1.72×10^{-6} 17; α(P)=1.24×10^{-7} 13; α(IPF)=0.000303 23
		2057.4 3	100 8	0.0	0^+	D			
2087.43	8^-	170.4 1	20 4	1917.05	7^-				
		318.5 1	100 15	1768.943	6^-	Q		0.0716	
2109.96	$(2^-,3^-)$	556.7 3	100 28	1553.2240	4^-	(E2)		0.01615	α(K)=0.01255 18; α(L)=0.00276 4; α(M)=0.000652 10 α(N)=0.0001556 22; α(O)=2.39×10^{-5} 4; α(P)=1.154×10^{-6} 17
		2010.1 3	86 12	100.10598	2^+	(E1+M2)	0.9 +7−4	0.00250 85	α(K)=0.00176 80; α(L)=2.7×10^{-4} 13; α(M)=6.0×10^{-5} 28 α(N)=1.45×10^{-5} 68; α(O)=2.4×10^{-6} 11; α(P)=1.73×10^{-7} 81; α(IPF)=3.9×10^{-4} 10
		2109.3 5	<235	0.0	0^+	[M2,E3]		0.00303 80	α(K)=0.00235 66; α(L)=3.64×10^{-4} 95; α(M)=8.3×10^{-5} 22 α(N)=1.99×10^{-5} 52; α(O)=3.25×10^{-6} 86; α(P)=2.31×10^{-7} 68; α(IPF)=0.000211 16
2114.35	$(8)^-$	154.10 5	58 13	1960.30	$(7)^-$	M1+E2	0.6 3	1.22 12	α(K)=0.93 15; α(L)=0.22 3; α(M)=0.052 8 α(N)=0.0124 17; α(O)=0.00190 19; α(P)=9.2×10^{-5} 17
		197.4 2	23 7	1917.05	7^-				
		285.1 10	46 8	1829.53	6^-				
		345.29 15	100 15	1768.943	6^-	E2		0.0564	α(K)=0.0396 6; α(L)=0.01283 18; α(M)=0.00311 5

$^{182}_{74}W_{108}$-21

γ(^{182}W) (continued)

E_i(level)	J^{π}_i	E_{γ} †	I_{γ} †	E_f	J^{π}_f	Mult.‡	δ‡	α@	Comments
									α(N)=0.000739 *11*; α(O)=0.0001087 *16*; α(P)=3.47×10^{-6} *5*
2116.4		2016.3 *3*	100	100.10598	2$^+$				
2120.25	(8$^-$)	160.1 *1*	100 *18*	1960.30	(7)$^-$	(M1)		1.243	α(K)=1.032 *15*; α(L)=0.1633 *23*; α(M)=0.0372 *6* α(N)=0.00896 *13*; α(O)=0.001461 *21*; α(P)=0.0001040 *15*
		290.5 *1*	35 *6*	1829.53	6$^-$				
2131.3	(7$^-$)	362.4 *3*	100	1768.943	6$^-$				
2143.0		1813.6& *10*	100	329.4268	4$^+$				
2147.95	(3$^-$)	817.0 *10*	12 *4*	1331.1153	3$^+$				E_{γ}: from (n,n′γ) only.
		1818.7 *2*	92 *8*	329.4268	4$^+$	(E1)		1.05×10^{-3}	α(K)=0.000538 *8*; α(L)=7.44×10^{-5} *11*; α(M)=1.664×10^{-5} *24* α(N)=4.00×10^{-6} *6*; α(O)=6.54×10^{-7} *10*; α(P)=4.77×10^{-8} *7*; α(IPF)=0.000418 *6* I_{γ}: 222 *33* in (n,n′γ) is discrepant.
		2047.4 *3*	100 *8*	100.10598	2$^+$	(E1+M2)	1.0 *+10−5*	0.00258 *89*	α(K)=0.00183 *84*; α(L)=2.8×10^{-4} *13*; α(M)=6.3×10^{-5} *30* α(N)=1.51×10^{-5} *72*; α(O)=2.5×10^{-6} *12*; α(P)=1.80×10^{-7} *85*; α(IPF)=3.9×10^{-4} *12*
		2148& *3*	24 *5*	0.0	0$^+$	[E3]		0.00218	α(K)=0.001633 *24*; α(L)=0.000259 *4*; α(M)=5.90×10^{-5} *9* α(N)=1.419×10^{-5} *21*; α(O)=2.30×10^{-6} *4*; α(P)=1.573×10^{-7} *23*; α(IPF)=0.000209 *3*
2173.5	(0$^+$ to 4$^+$)	952.3 *6*	42 *12*	1221.4001	2$^+$				
		2073.3 *3*	100 *23*	100.10598	2$^+$				
		2174&	<23	0.0	0$^+$				E_{γ}: from (n,n′γ) only.
2180.4	(8$^+$)	1036.0		1144.32	8$^+$				
		1500.0		680.42	6$^+$				
2184.04	(2$^-$,3$^-$)	810.24 *5*	18.2 *21*	1373.8301	3$^-$	(M1)		0.01639	α(K)=0.01371 *20*; α(L)=0.00208 *3*; α(M)=0.000470 *7* α(N)=0.0001132 *16*; α(O)=1.85×10^{-5} *3*; α(P)=1.343×10^{-6} *19*
		894.85 *5*	100 *8*	1289.1498	2$^-$	(M1)		0.01276	α(K)=0.01068 *15*; α(L)=0.001613 *23*; α(M)=0.000365 *6* α(N)=8.79×10^{-5} *13*; α(O)=1.440×10^{-5} *21*; α(P)=1.045×10^{-6} *15*
		2084.0 *3*	3.1 *3*	100.10598	2$^+$				
2204.54	(8)$^-$	226.19 *5*	100	1978.36	(7)$^-$	M1+E2	+0.15 *2*	0.468	α(K)=0.388 *6*; α(L)=0.0620 *9*; α(M)=0.01414 *20* α(N)=0.00341 *5*; α(O)=0.000554 *8*; α(P)=3.89×10^{-5} *6*

$^{182}_{74}$W$_{108}$-22

Adopted Levels, Gammas (continued)

γ(^{182}W) (continued)

E_i(level)	J^π_i	E_γ†	I_γ†	E_f	J^π_f	Mult.‡	δ‡	α@	Comments
2207.21	(3⁻)	1877.6 2	58 18	329.4268	4⁺	(E1+M2)	−0.28 6	0.00134 12	α(K)=0.00076 11; α(L)=0.000110 17; α(M)=2.5×10^{-5} 4 α(N)=6.0×10^{-6} 10; α(O)=9.7×10^{-7} 16; α(P)=7.1×10^{-8} 11; α(IPF)=0.000438 12
		2106.8 5	<250	100.10598	2⁺				
		2207.7 3	100 9	0.0	0⁺	(E3)		0.00209	α(K)=0.001548 22; α(L)=0.000244 4; α(M)=5.56×10^{-5} 8 α(N)=1.336×10^{-5} 19; α(O)=2.17×10^{-6} 3; α(P)=1.488×10^{-7} 21; α(IPF)=0.000229 4
2209.07	3⁻	835.9 6	33 11	1373.8301	3⁻				E_γ: from (n,n′γ) only.
		1879.6 2	21 6	329.4268	4⁺	E1		1.06×10^{-3}	α(K)=0.000509 8; α(L)=7.04×10^{-5} 10; α(M)=1.575×10^{-5} 22 α(N)=3.78×10^{-6} 6; α(O)=6.19×10^{-7} 9; α(P)=4.52×10^{-8} 7; α(IPF)=0.000463 7
		2108.9 4	100 17	100.10598	2⁺				
		2208.8 6	78 17	0.0	0⁺	[E3]		0.00209	α(K)=0.001546 22; α(L)=0.000244 4; α(M)=5.55×10^{-5} 8 α(N)=1.335×10^{-5} 19; α(O)=2.16×10^{-6} 3; α(P)=1.487×10^{-7} 21; α(IPF)=0.000230 4 E_γ: from (n,n′γ) only.
2212.50	(8⁺)	241.5 1	100 15	1971.05	(7)⁺	D+Q			
		454.9 4	15 5	1756.75	6⁺				
2225.35	(8⁻)	414.5 1	100	1810.85	(6)⁻	Q			
2230.65	(10⁺)	518.5 1	100 13	1711.99	10⁺	(M1)		0.0514	B(M1)(W.u.)=7.0×10^{-8} 13 α(K)=0.0429 6; α(L)=0.00659 10; α(M)=0.001495 21 α(N)=0.000360 5; α(O)=5.89×10^{-5} 9; α(P)=4.24×10^{-6} 6
		1086.5 1	69 7	1144.32	8⁺	[E2]		0.00382	B(E2)(W.u.)=1.9×10^{-6} 3 α(K)=0.00315 5; α(L)=0.000517 8; α(M)=0.0001183 17 α(N)=2.84×10^{-5} 4; α(O)=4.54×10^{-6} 7; α(P)=2.93×10^{-7} 4 I_γ: 116 13 in (α,2nγ) is discrepant.
2240.83	(3⁺)	1911.8 2	100 17	329.4268	4⁺	(M1)		0.00230	α(K)=0.001659 24; α(L)=0.000245 4; α(M)=5.52×10^{-5} 8 α(N)=1.330×10^{-5} 19; α(O)=2.18×10^{-6} 3; α(P)=1.602×10^{-7} 23; α(IPF)=0.000322 5
		2140.3 2	87 15	100.10598	2⁺	(M1)		0.00197	α(K)=0.001265 18; α(L)=0.000186 3; α(M)=4.19×10^{-5} 6 α(N)=1.010×10^{-5} 15; α(O)=1.658×10^{-6} 24; α(P)=1.219×10^{-7} 17; α(IPF)=0.000464 7
2273.87	9⁻	186.5 1	16.7 19	2087.43	8⁻				
		356.8 1	100 15	1917.05	7⁻	Q			

$^{182}_{74}W_{108}$-23

$\gamma(^{182}W)$ (continued)

E_i(level)	J^π_i	E_γ†	I_γ†	E_f	J^π_f	Mult.‡	δ‡	α@	Comments
2274.63	(3)⁻	787.11 *5*	86 *16*	1487.5018	4⁻	(M1)		0.01763	α(K)=0.01474 *21*; α(L)=0.00224 *4*; α(M)=0.000506 *7* α(N)=0.0001219 *17*; α(O)=2.00×10⁻⁵ *3*; α(P)=1.446×10⁻⁶ *21* I_γ: 15 *8* in (n,n′γ) is discrepant.
		900.80 *5*	100 *17*	1373.8301	3⁻	(M1+E2)	≈0.5	≈0.01116	α(K)≈0.00932; α(L)≈0.001427; α(M)≈0.000324 α(N)≈7.79×10⁻⁵; α(O)≈1.271×10⁻⁵; α(P)≈9.06×10⁻⁷
		2175.2 *3*	13.2 *19*	100.10598	2⁺	E1		1.14×10⁻³	α(K)=0.000402 *6*; α(L)=5.53×10⁻⁵ *8*; α(M)=1.238×10⁻⁵ *18* α(N)=2.97×10⁻⁶ *5*; α(O)=4.87×10⁻⁷ *7*; α(P)=3.57×10⁻⁸ *5*; α(IPF)=0.000671 *10*
2283.5	1	909.7 *6*	64 *29*	1373.8301	3⁻				
		2283.5 *10*	100 *29*	0.0	0⁺				
2301.56	(9⁻)	181.3 *10*	18 *9*	2120.25	(8⁻)				
		187.6 *3*	36 *9*	2114.35	(8)⁻				
		214.2 *10*	<27	2087.43	8⁻				
		341.3 *1*	109 *46*	1960.30	(7)⁻				
		384.4 *1*	100 *18*	1917.05	7⁻				
2316.1	(1,2⁺)	2216 *3*	≈275	100.10598	2⁺				
		2316 *3*	100 *20*	0.0	0⁺				
2323.85	(8⁻)	406.8 *2*	100	1917.05	7⁻				
2327.91	(9⁻)	207.4 *2*	73 *15*	2120.25	(8⁻)	(M1+E2)		0.44 *17*	α(K)=0.33 *18*; α(L)=0.085 *7*; α(M)=0.0203 *24* α(N)=0.0048 *6*; α(O)=0.00073 *3*; α(P)=3.1×10⁻⁵ *19*
		213.6 *1*	100 *16*	2114.35	(8)⁻				
2334.26		355.9 *2*	100	1978.36	(7)⁻				
2372.59	12⁺	660.6 *1*	100	1711.99	10⁺	E2		0.01085	B(E2)(W.u.)=191 *10* α(K)=0.00862 *12*; α(L)=0.001719 *24*; α(M)=0.000401 *6* α(N)=9.60×10⁻⁵ *14*; α(O)=1.494×10⁻⁵ *21*; α(P)=7.98×10⁻⁷ *12*
2382.1	1	2282 *1*	142 *20*	100.10598	2⁺				
		2382 *1*	100	0.0	0⁺				
2445.98	(9⁻)	452.3 *1*	100	1993.68	(7⁻)	Q			
2455.74	(9⁻)	251.2 *1*	100 *14*	2204.54	(8)⁻	(D+Q)			
		477.1 *10*	<7	1978.36	(7)⁻				
2474.1	1	2374 *1*	66 *14*	100.10598	2⁺				
		2474 *1*	100	0.0	0⁺				
2479.83	(9⁺)	267.3 *1*	100 *18*	2212.50	(8⁺)	D+Q			
		508.8 *2*	29 *6*	1971.05	(7)⁺				
2486.89	10⁻	213.0 *1*	25 *3*	2273.87	9⁻				
		399.5 *2*	100 *19*	2087.43	8⁻	Q			
2492.78	(11⁺)	262.1 *1*	100	2230.65	(10⁺)	D+Q			
2507.48	(10⁻)	205.8 *2*	30 *10*	2301.56	(9⁻)				
		233.8 *10*	<20	2273.87	9⁻				
		387.1 *2*	120 *60*	2120.25	(8⁻)				
		393.4 *2*	60 *10*	2114.35	(8)⁻				

$^{182}_{74}W_{108}$-24

$\gamma(^{182}W)$ (continued)

E_i(level)	J^π_i	E_γ[†]	I_γ[†]	E_f	J^π_f	Mult.[‡]	α[@]	Comments
2507.48	(10^-)	420.0 *1*	100 *20*	2087.43	8^-			
2563.94	(10^-)	236.0 *1*	100 *16*	2327.91	(9^-)			
		443.8 *2*	<8	2120.25	(8^-)			
2710.93	11^-	224.0 *1*	24 *3*	2486.89	10^-			
		437.1 *1*	100 *18*	2273.87	9^-	Q		
2730.84	(10^-)	275.1 *1*	100 *14*	2455.74	(9^-)	(D+Q)		
		526.2 *10*	<14	2204.54	$(8)^-$			
2739.15	(10^-)	513.8 *1*	100	2225.35	(8^-)	Q		
2741.66	(11^-)	440.1 *1*	100 *18*	2301.56	(9^-)	Q		
		467.7 *5*	35 *6*	2273.87	9^-			
2769.27	(10^+)	289.4 *1*	100	2479.83	(9^+)	D+Q		
		557.6 *5*	39 *4*	2212.50	(8^+)			
2775.65	(12^+)	282.8 *1*	100	2492.78	(11^+)	D+Q		
		545.1 *2*	18 *3*	2230.65	(10^+)	Q		
2823.93	(11^-)	260.0 *1*	100	2563.94	(10^-)	D+Q		
		496.0 *5*	48 *5*	2327.91	(9^-)			
2884.1	1	2784 *1*	40 *11*	100.10598	2^+			
		2884 *1*	100	0.0	0^+			
2892.1	(1)	2792 *1*	150 *90*	100.10598	2^+			
		2892 *1*	100	0.0	0^+			
2941.0	($1,2^+$)	2941 *2*	100	0.0	0^+			
2972.49	12^-	261.6 *2*	20 *5*	2710.93	11^-			
		485.6 *1*	100 *20*	2486.89	10^-	Q		
2980.58	(11^-)	534.6 *1*	100	2445.98	(9^-)	Q		
2981.33	(12^-)	473.8 *1*	100 *19*	2507.48	(10^-)			
		494.6 *2*	38 *6*	2486.89	10^-			
2996.1	1	2896 *1*	168 *35*	100.10598	2^+			
		2996 *1*	100	0.0	0^+			
3027.94	(11^-)	297.1 *1*	100	2730.84	(10^-)	(D+Q)		
		575.2 *20*	24 *11*	2455.74	(9^-)			
3078.25	(13^+)	302.5 *1*	100	2775.65	(12^+)	D+Q		$I\gamma(586\gamma)/I\gamma(302)$=1.6 *7* in ($\alpha$,2n$\gamma$).
		585.8 *2*	47 *9*	2492.78	(11^+)	Q		
3080.1	1	2980 *1*	61 *18*	100.10598	2^+			
		3080 *1*	100	0.0	0^+			
3106.72	(12^-)	282.8 *1*	100	2823.93	(11^-)	(D+Q)		
		542.5 *5*	53 *6*	2563.94	(10^-)			
3112.89	14^+	740.3 *1*	100	2372.59	12^+	(E2)	0.00843	B(E2)(W.u.)=1.7×10^2 *3* α(K)=0.00678 *10*; α(L)=0.001277 *18*; α(M)=0.000297 *5* α(N)=7.10×10^{-5} *10*; α(O)=1.114×10^{-5} *16*; α(P)=6.29×10^{-7} *9*
3163.1	1	3063 *1*	54 *12*	100.10598	2^+			
		3163 *1*	100	0.0	0^+			

From ENSDF

γ(^{182}W) (continued)

E_i(level)	J^π_i	E_γ[†]	I_γ[†]	E_f	J^π_f	Mult.[‡]	α[@]	Comments
3198.1	(1,2$^+$)	3098 *1*	59 *21*	100.10598	2$^+$			
		3198 *1*	100	0.0	0$^+$			If E2, B(E2)(W.u.)=0.67×10^{-5} *16*.
3224.53	13$^-$	513.6 *1*	100	2710.93	11$^-$	Q		
3269.56	(13$^-$)	527.9 *1*	100	2741.66	(11$^-$)	Q		
3319.7	(12$^-$)	580.6 *4*	100	2739.15	(10$^-$)			
3343.05	(12$^-$)	315.1 *1*	100 *14*	3027.94	(11$^-$)	(D+Q)		
		612.6 *10*	43 *29*	2730.84	(10$^-$)			
3365.1	1	3265 *1*	63 *17*	100.10598	2$^+$			
		3365 *1*	100	0.0	0$^+$			
3398.35	(14$^+$)	320.0 *1*	100	3078.25	(13$^+$)	D+Q		
		622.7 *1*	61 *18*	2775.65	(12$^+$)	Q		
3410.54	(13$^-$)	303.8 *1*	100 *13*	3106.72	(12$^-$)			
		586.8 *5*	88 *13*	2823.93	(11$^-$)			
3415.92	(12)	923.1 *1*	100	2492.78	(11$^+$)	D+Q		
3422.1	(1,2$^+$)	3322 *1*	53 *15*	100.10598	2$^+$			
		3422 *1*	100	0.0	0$^+$			If E2, B(E2)(W.u.)=0.76×10^{-5} *17*.
3518.04	(14$^-$)	536.7 *1*	100 *20*	2981.33	(12$^-$)			
		545.7 *5*	40 *10*	2972.49	12$^-$			
3549.99	14$^-$	568.6[&] *10*	<22	2981.33	(12$^-$)			
		577.5 *1*	100 *22*	2972.49	12$^-$	Q		
3567.8	(13$^-$)	587.2 *3*	100	2980.58	(11$^-$)	(Q)		
3601.1	1	3501 *1*	77 *19*	100.10598	2$^+$			
		3601 *1*	100	0.0	0$^+$			
3640.0	(1,2$^+$)	3640 *2*		0.0	0$^+$			
3677.15	(13)	261.2 *1*	100 *14*	3415.92	(12)			
		901.8 *3*	21 *7*	2775.65	(12$^+$)			
3727.1	(1,2$^+$)	3627 *2*		100.10598	2$^+$			
		3727 *2*		0.0	0$^+$			
3733.85	(14$^-$)	323.3 *1*	71 *10*	3410.54	(13$^-$)			
		627.4 *5*	100 *14*	3106.72	(12$^-$)			
3736.40	(15$^+$)	338.0 *1*	100	3398.35	(14$^+$)			
		658.2 *1*	94 *20*	3078.25	(13$^+$)			
3754.89	(15$^+$)	(19)	≈0.2	3736.40	(15$^+$)	[M1]	107.1	B(M1)(W.u.)≈9.8×10^{-7} α(L)=82.8 *12*; α(M)=18.9 *3* α(N)=4.56 *7*; α(O)=0.741 *11*; α(P)=0.0526 *8* I_γ: from $\gamma\gamma$ data, I(γ+ce) branching is ≈10%.
		356.5 *1*	100 *17*	3398.35	(14$^+$)	(M1+E2)	0.095 *44*	B(M1)(W.u.)=13.0×10^{-6} *23* α(K)=0.076 *40*; α(L)=0.015 *4*; α(M)=0.0034 *7* α(N)=0.00082 *16*; α(O)=0.00013 *4*; α(P)=7.3×10^{-6} *42*
		676.8 *2*	57 *13*	3078.25	(13$^+$)	(E2)	0.01028	B(E2)(W.u.)=0.00053 *15* α(K)=0.00819 *12*; α(L)=0.001612 *23*; α(M)=0.000376 *6* α(N)=8.99×10^{-5} *13*; α(O)=1.402×10^{-5} *20*; α(P)=7.58×10^{-7} *11*
3807.63	15$^-$	583.1 *1*	100	3224.53	13$^-$	Q		

Adopted Levels, Gammas (continued)

$\gamma(^{182}W)$ (continued)

E_i(level)	J^π_i	E_γ†	I_γ†	E_f	J^π_f	Mult.‡	α@	Comments
3880.06	(15^-)	610.5 *1*	100	3269.56	(13^-)	Q		
3882.0	$(1,2^+)$	3782& *2*		100.10598	2^+			
		3882 *2*		0.0	0^+			
3893.69	(16^+)	138.8 *1*	100	3754.89	(15^+)	(M1)	1.86	B(M1)(W.u.)>0.00041 α(K)=1.545 *22*; α(L)=0.245 *4*; α(M)=0.0558 *8* α(N)=0.01344 *19*; α(O)=0.00219 *4*; α(P)=0.0001559 *22*
3910.09	16^+	797.2 *1*	100	3112.89	14^+	E2	0.00719	B(E2)(W.u.)=2.0×10^2 *5* α(K)=0.00582 *9*; α(L)=0.001061 *15*; α(M)=0.000246 *4* α(N)=5.88×10^{-5} *9*; α(O)=9.27×10^{-6} *13*; α(P)=5.40×10^{-7} *8*
3920.0	1	3920 *2*	100	0.0	0^+			
3966.25	(14)	289.1 *1*	100 *50*	3677.15	(13)			
		550.3 *10*	25 *13*	3415.92	(12)			
4040.6	(17^-)	146.9 *1*	100	3893.69	(16^+)	(E1)	0.1384	B(E1)(W.u.)=2.92×10^{-6} *15* α(K)=0.1141 *16*; α(L)=0.0188 *3*; α(M)=0.00428 *6* α(N)=0.001015 *15*; α(O)=0.0001566 *23*; α(P)=8.59×10^{-6} *13*
4074.8	(15^-)	340.9 *2*	75 *25*	3733.85	(14^-)			
		664.2 *5*	100 *25*	3410.54	(13^-)			
4078.89	(16^+)	324.0 *1*	100	3754.89	(15^+)			
4081.5	(16^+)	345.1 *2*	60 *20*	3736.40	(15^+)			
		683.2 *3*	100 *40*	3398.35	(14^+)			
4116.9	(16^-)	598.9 *2*	100	3518.04	(14^-)			
4197.1	(15^-)	629.3 *2*	100	3567.8	(13^-)			
4211.1	16^-	661.1 *2*	100	3549.99	14^-	Q		
4218.1	(17^+)	324.4 *5*	100	3893.69	(16^+)			
4280.2	(15)	314.0 *1*	100 *67*	3966.25	(14)			
		603.1 *10*	33 *17*	3677.15	(13)			
4293.1	(17^+)	399.4 *1*	100	3893.69	(16^+)			
4421.5	(18^-)	380.9 *1*	100	4040.6	(17^-)			
4430.5	(17^+)	351.6 *1*	100 *18*	4078.89	(16^+)			
		675.5 *11*	18 *9*	3754.89	(15^+)			
4453.3	(17^+)	371.3 *10*	<33	4081.5	(16^+)			
		717.3 *10*	100 *33*	3736.40	(15^+)			
4456.2	17^-	648.6 *2*	100	3807.63	15^-	Q		
4569.7	(18^+)	351.6 *5*	100 *32*	4218.1	(17^+)			
		676.1 *7*	24 *8*	3893.69	(16^+)			
4570.9	(17^-)	690.8 *3*	100	3880.06	(15^-)			
4690.89	18^+	780.8 *1*	100	3910.09	16^+	Q		
4711.9	(18^+)	418.8 *1*	100 *18*	4293.1	(17^+)			
		818.1 *6*	64 *27*	3893.69	(16^+)			
4748.0	(18^+)	837.9 *9*	100	3910.09	16^+	[E2]	0.00648	B(E2)(W.u.)=2.5×10^2 +5−7 α(K)=0.00526 *8*; α(L)=0.000940 *14*; α(M)=0.000217 *3* α(N)=5.20×10^{-5} *8*; α(O)=8.22×10^{-6} *12*; α(P)=4.88×10^{-7} *7*
4779.6	(18^-)	662.7 *2*	100	4116.9	(16^-)			

$^{182}_{74}W_{108}$-27

Adopted Levels, Gammas (continued)

γ(^{182}W) (continued)

E_i(level)	J^π_i	E_γ†	I_γ†	E_f	J^π_f
4780.4	(18)	739.8 *2*	100	4040.6	(17⁻)
4804.9	(18⁺)	374.5 *2*	100 *25*	4430.5	(17⁺)
		725.7 *5*	50 *25*	4078.89	(16⁺)
4820.1	(19⁻)	398.5 *1*	100	4421.5	(18⁻)
		779.9 *3*	24 *11*	4040.6	(17⁻)
4847.4	(18⁺)	765.9 *10*	100 *33*	4081.5	(16⁺)
		937.3 *10*	67 *33*	3910.09	16⁺
4954.8	18⁻	743.7 *10*	100	4211.1	16⁻
5148.6	(19⁺)	436.6 *9*	100 *25*	4711.9	(18⁺)
		855.5 *4*	<50	4293.1	(17⁺)
5170.8	19⁻	714.6 *3*	100	4456.2	17⁻
5191.8	(19)	411.4 *2*	100	4780.4	(18)
5199.6	(19⁺)	394.7 *2*	100	4804.9	(18⁺)
5225.4	(19⁺)	772.1 *10*	100	4453.3	(17⁺)
5235.8	(20⁻)	415.6 *2*	100 *25*	4820.1	(19⁻)
		814.8 *4*	75 *25*	4421.5	(18⁻)
5338.6	(19⁻)	767.7 *10*	100	4570.9	(17⁻)
5428.6	20⁺	737.7 *2*	100	4690.89	18⁺
5618.6	(20)	426.7 *2*	100	5191.8	(19)
		838.4 *5*	50	4780.4	(18)
5666.9	(21⁻)	431.2 *10*	100	5235.8	(20⁻)
		846.7 *10*	100	4820.1	(19⁻)

† The adopted values represent weighted averages from different studies. The intensities are known with high precision in ^{182}Ta β^- decay, thus values from this decay are preferred when available. In cases where large discrepancies are found, those values were not considered in deducing averages. In (α,2nγ), many such cases are noted where the relative branching ratios are discrepant, generally being much higher than in other studies. For gammas from high-spin levels above 2500 keV, gamma-ray energies and intensities are almost entirely from ^{176}Yb(^{13}C,α3nγ) dataset since this dataset provides the most complete set of values.

‡ From ce and angular distribution/correlation studies in ^{182}Ta decay, ^{182}Re decay and in-beam γ-ray studies.

From evaluation by 2000He14.

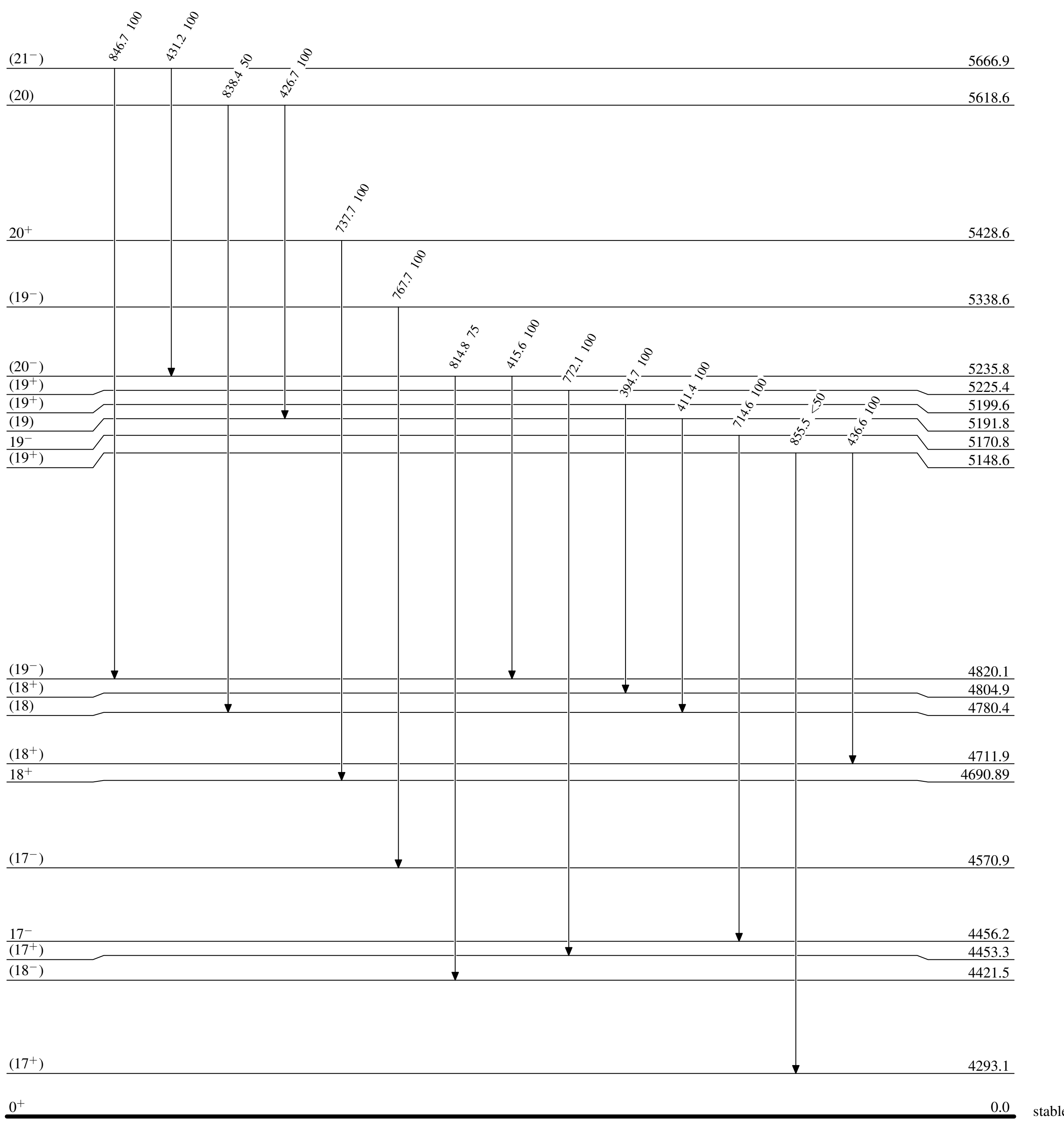
@ Theoretical values from BrIcc v2.3b (16-Dec-2014) 2008Ki07, “Frozen Orbitals” approximation. If mixing ratio δ is not given, it was assumed as 1.0 for E2/M1 and E3/M2 and 0.10 for others.

& Placement of transition in the level scheme is uncertain.

Adopted Levels, Gammas

Level Scheme

Intensities: Relative photon branching from each level



$^{182}_{74}W_{108}$

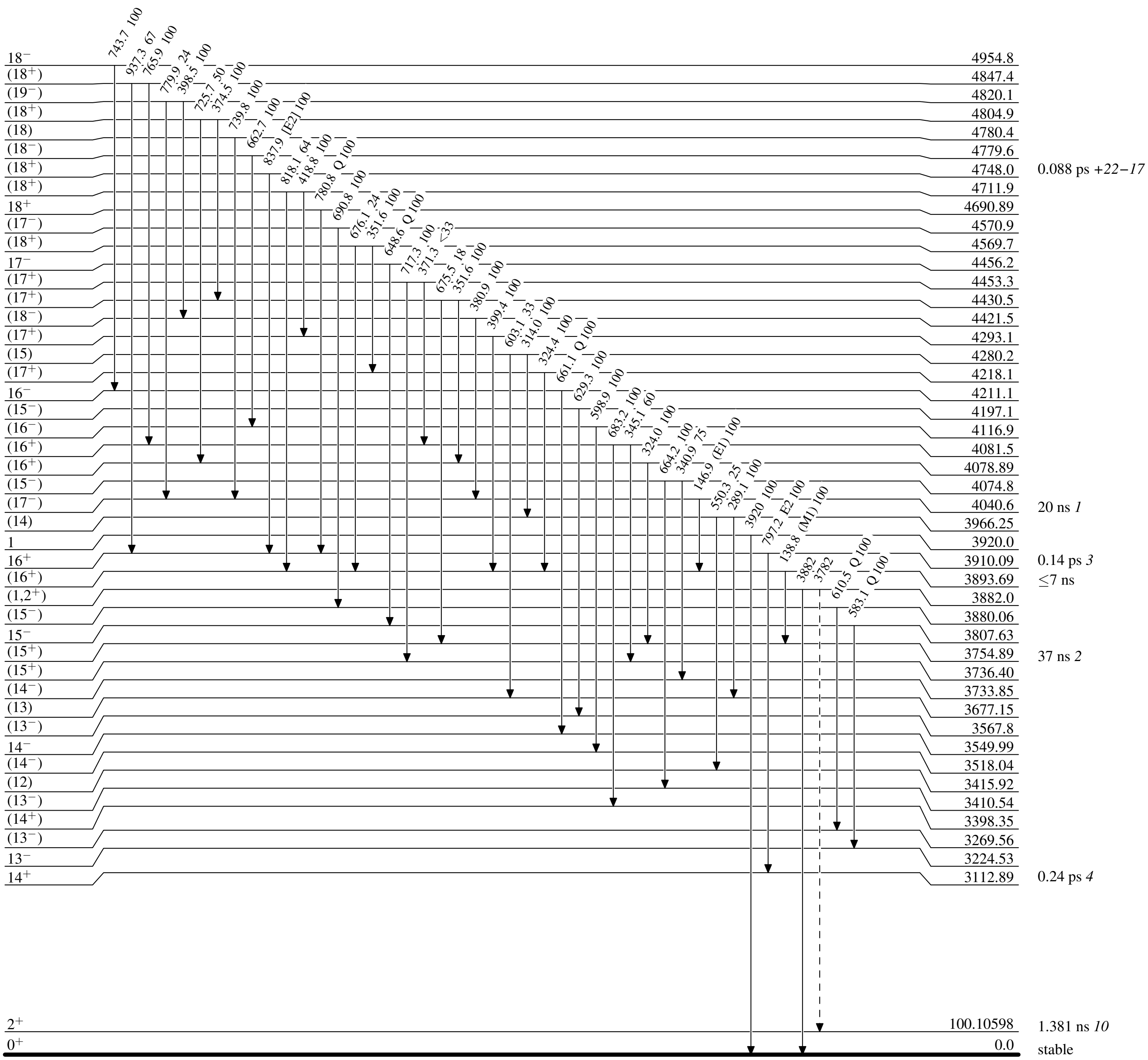
Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Relative photon branching from each level

Legend

γ Decay (Uncertain)



$^{182}_{74}W_{108}$

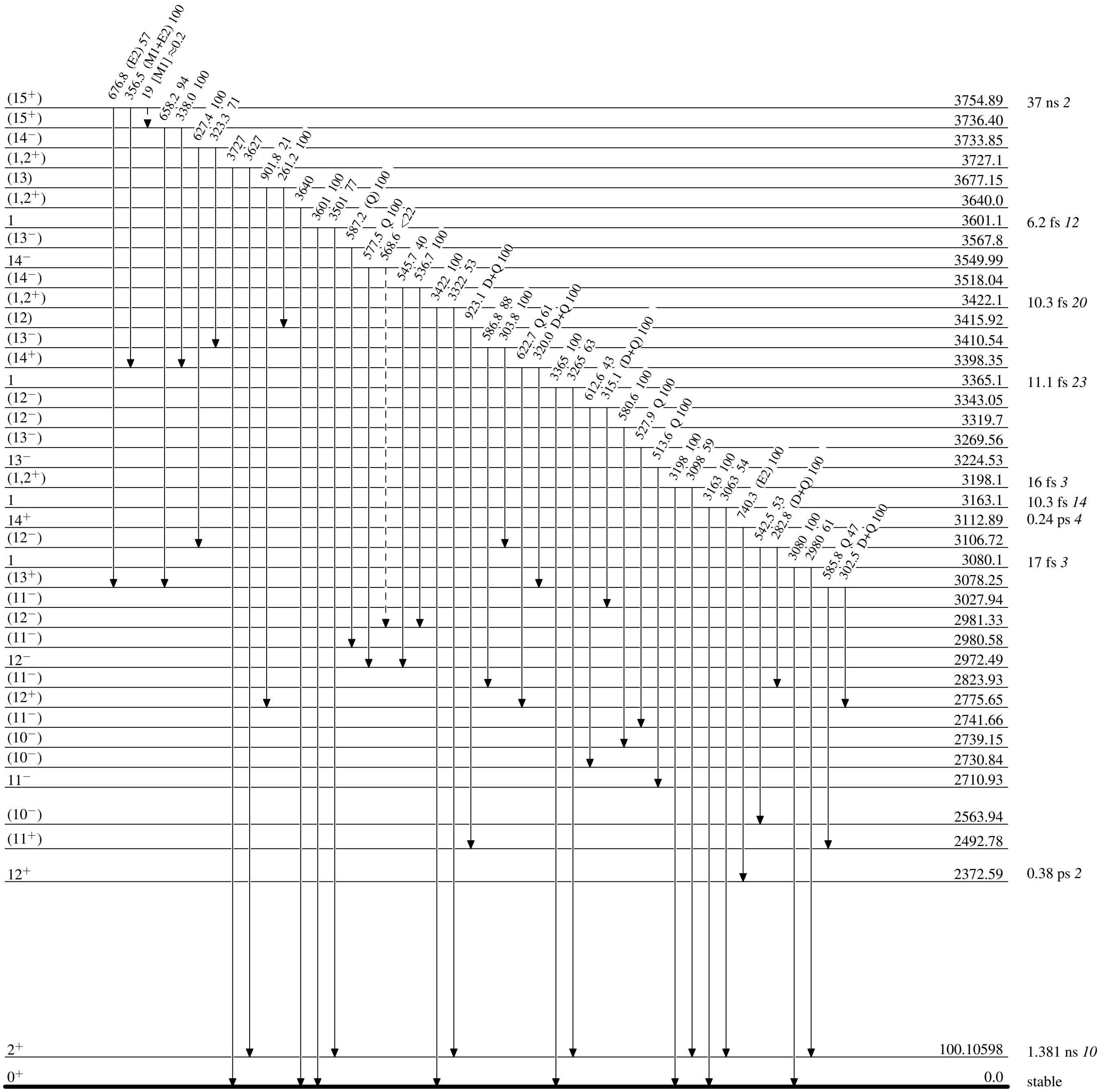
Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Relative photon branching from each level

Legend

γ Decay (Uncertain)

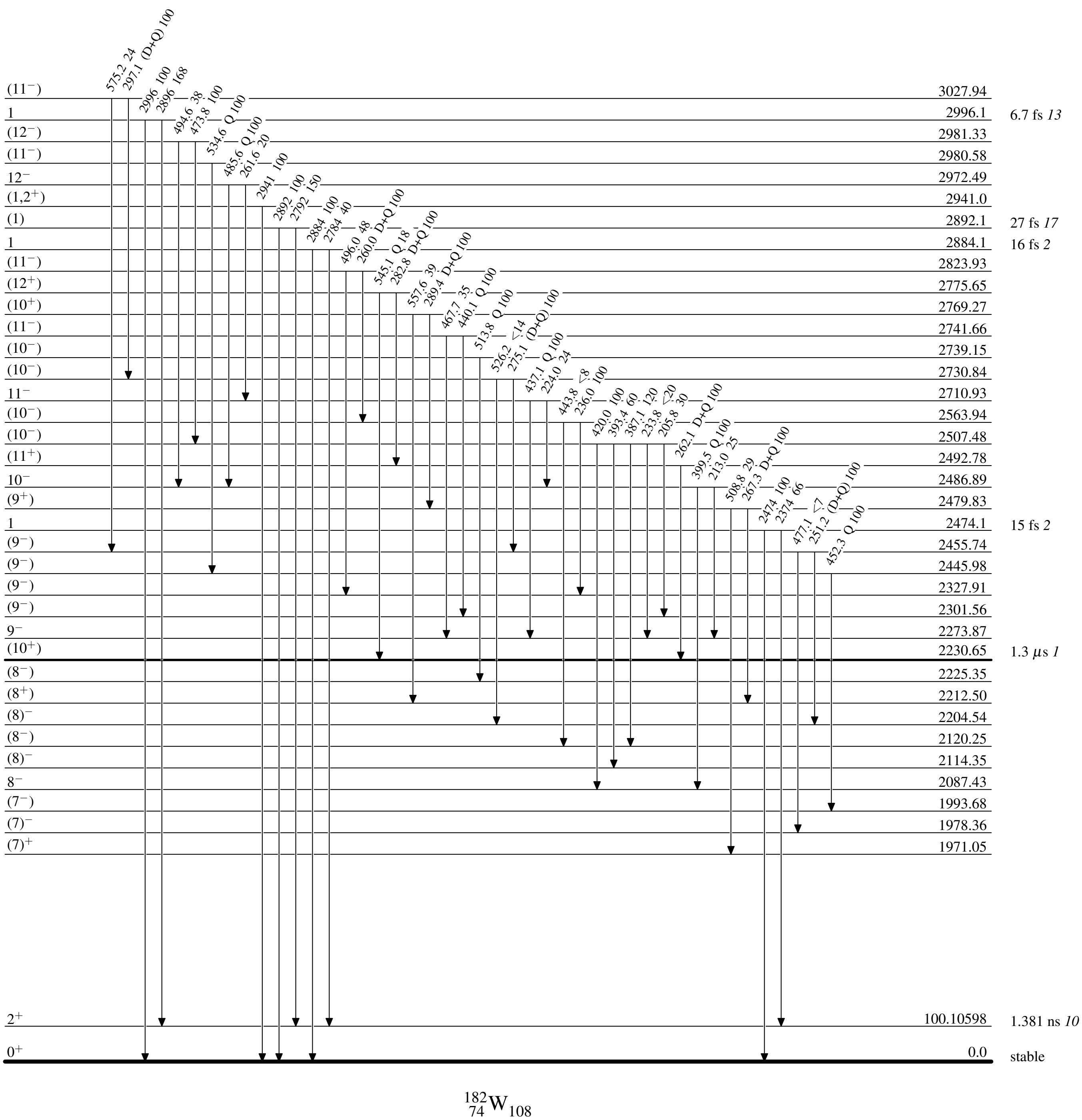


$^{182}_{74}W_{108}$

Adopted Levels, Gammas

Level Scheme (continued)

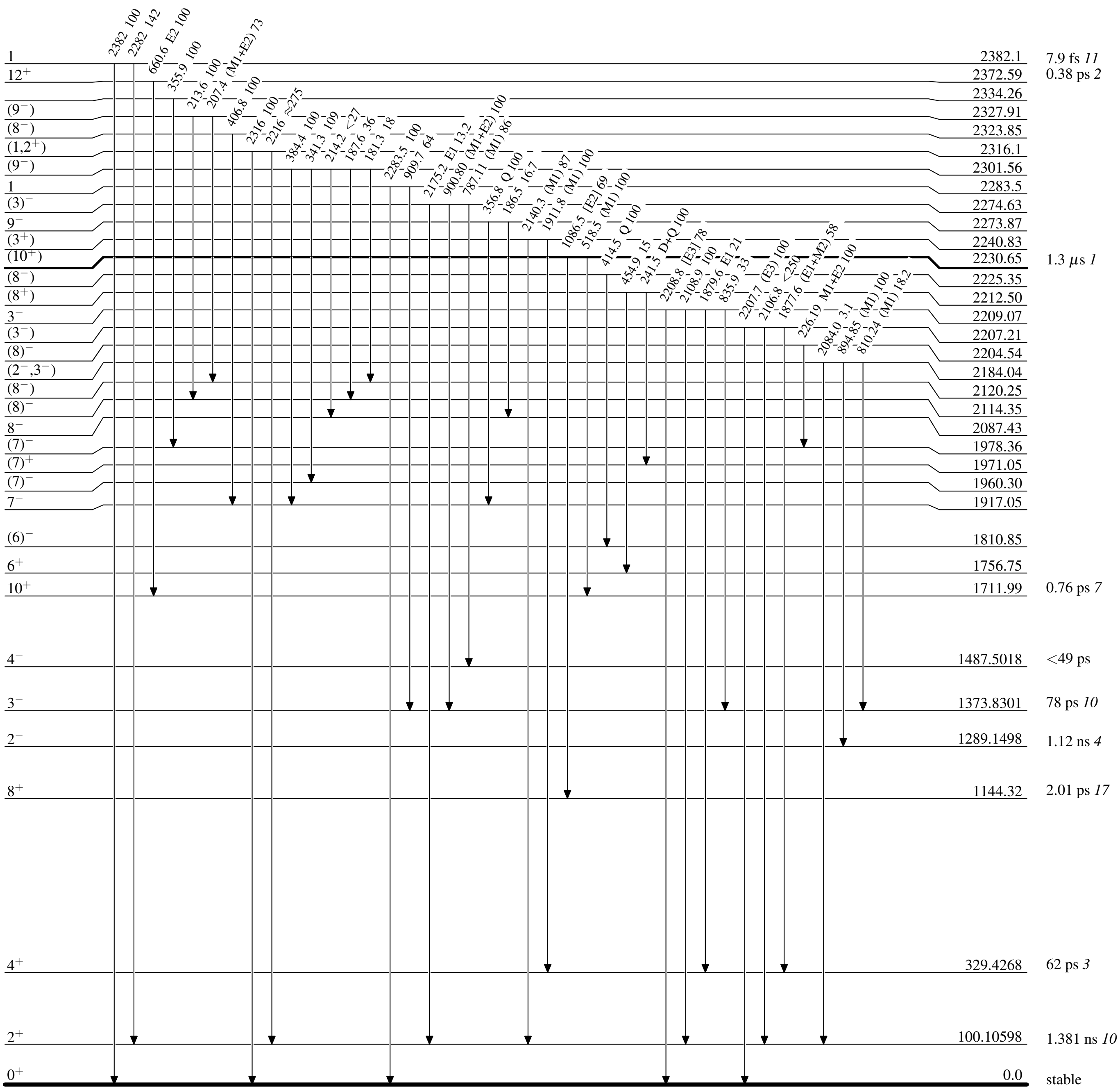
Intensities: Relative photon branching from each level



Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Relative photon branching from each level



$^{182}_{74}W_{108}$

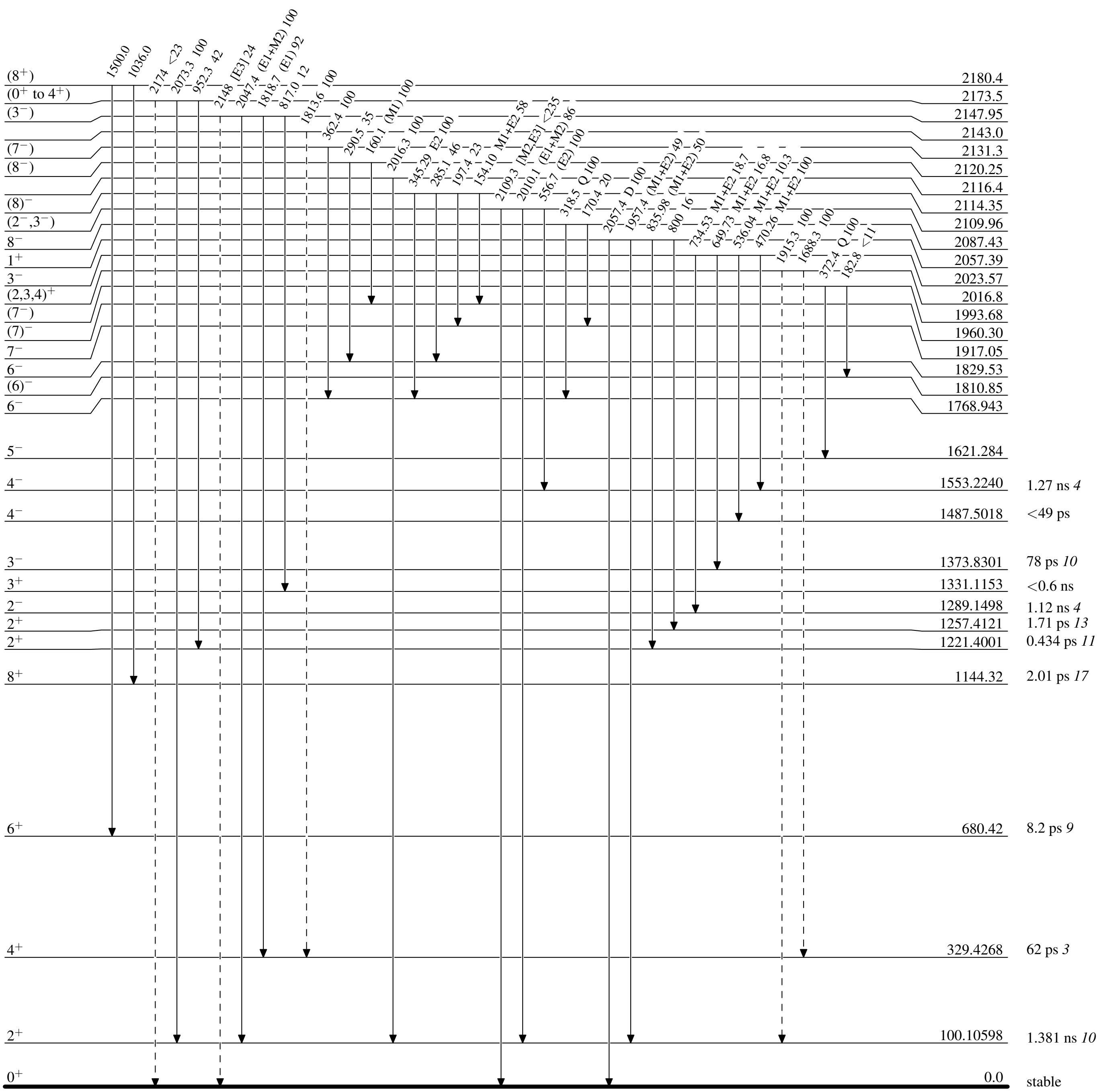
Adopted Levels, Gammas

Legend

Level Scheme (continued)

Intensities: Relative photon branching from each level

γ Decay (Uncertain)



$^{182}_{74}W_{108}$

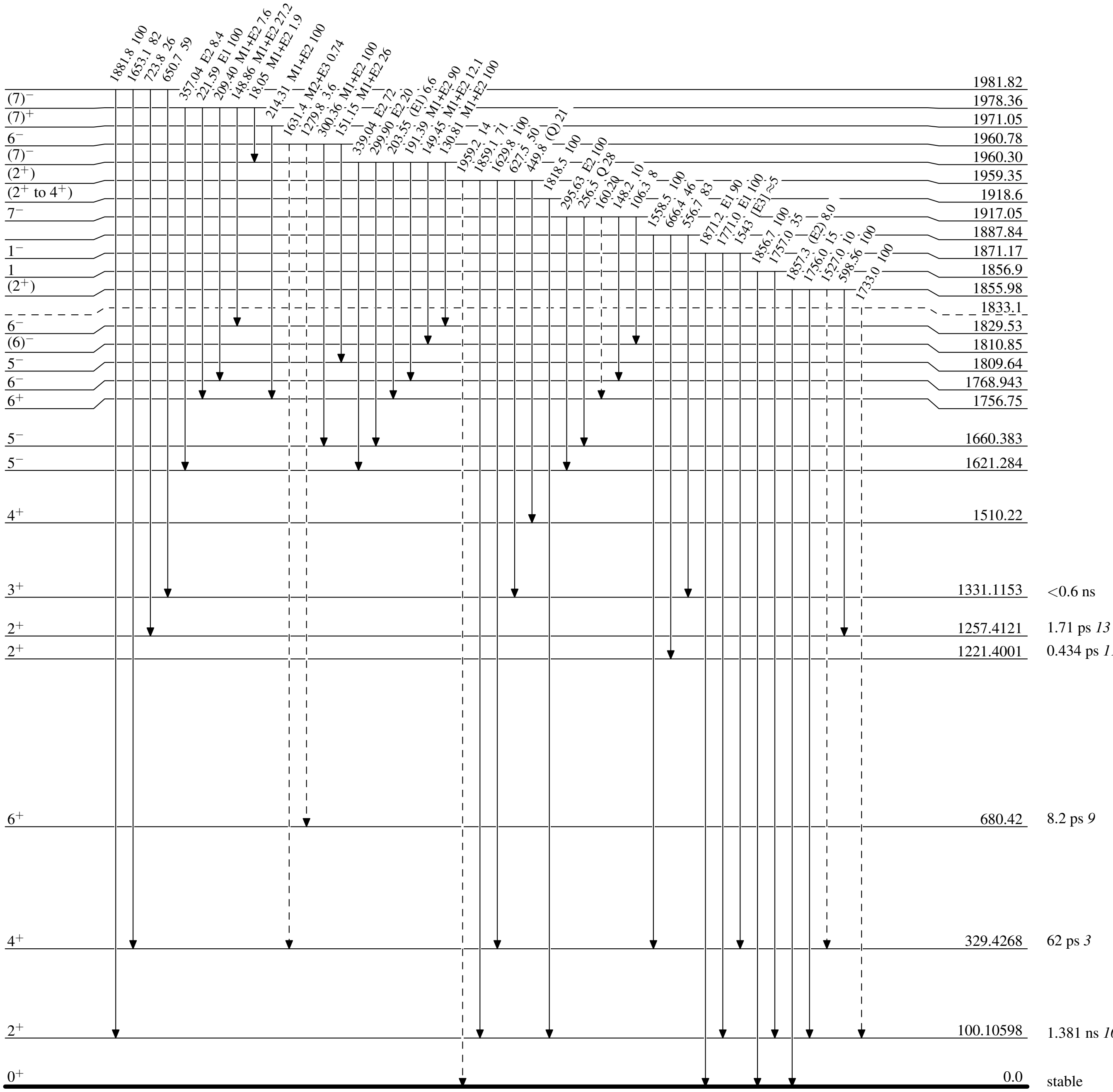
Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Relative photon branching from each level

Legend

γ Decay (Uncertain)

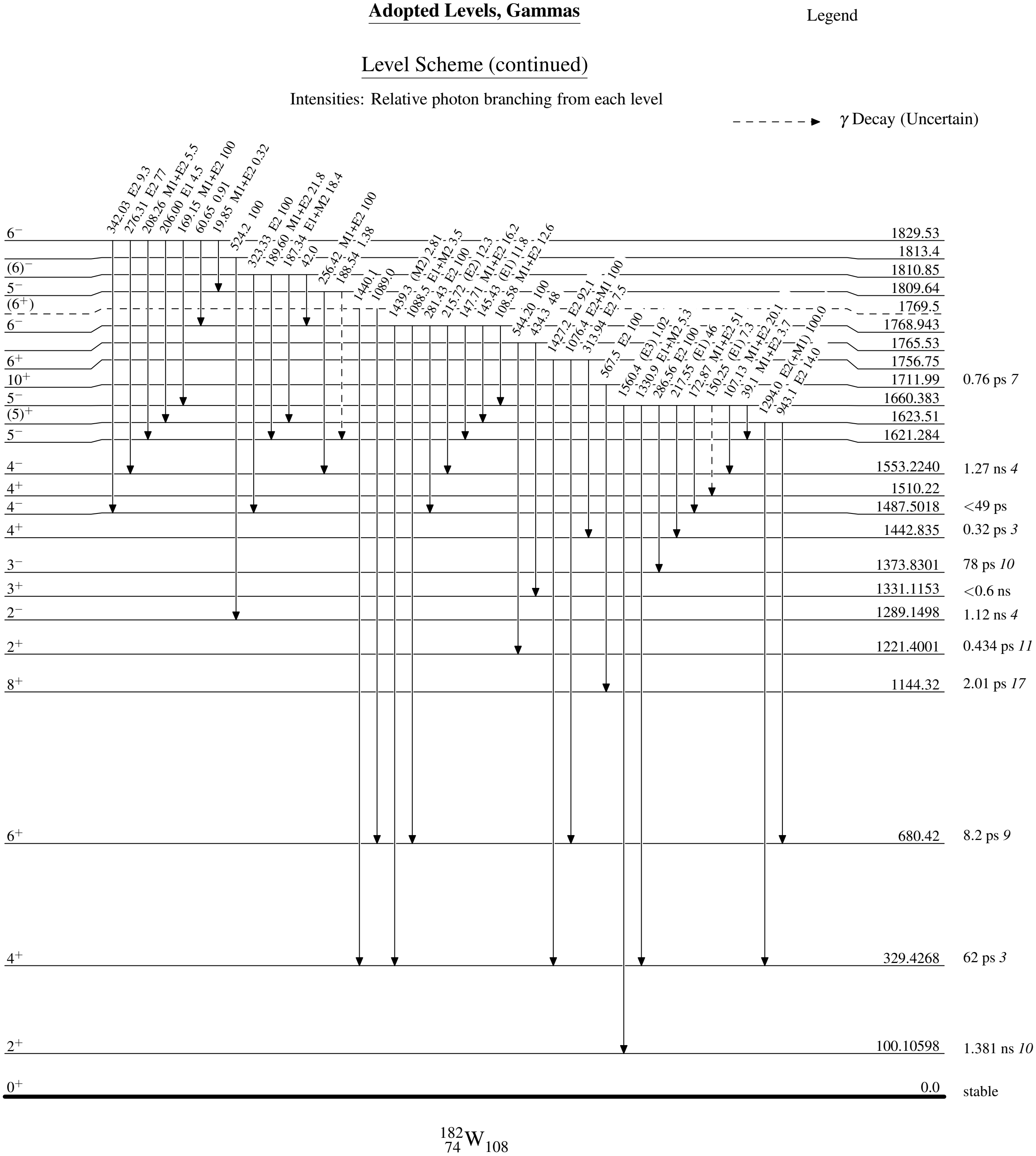


$^{182}_{74}W_{108}$

Adopted Levels, Gammas

Level Scheme (continued)

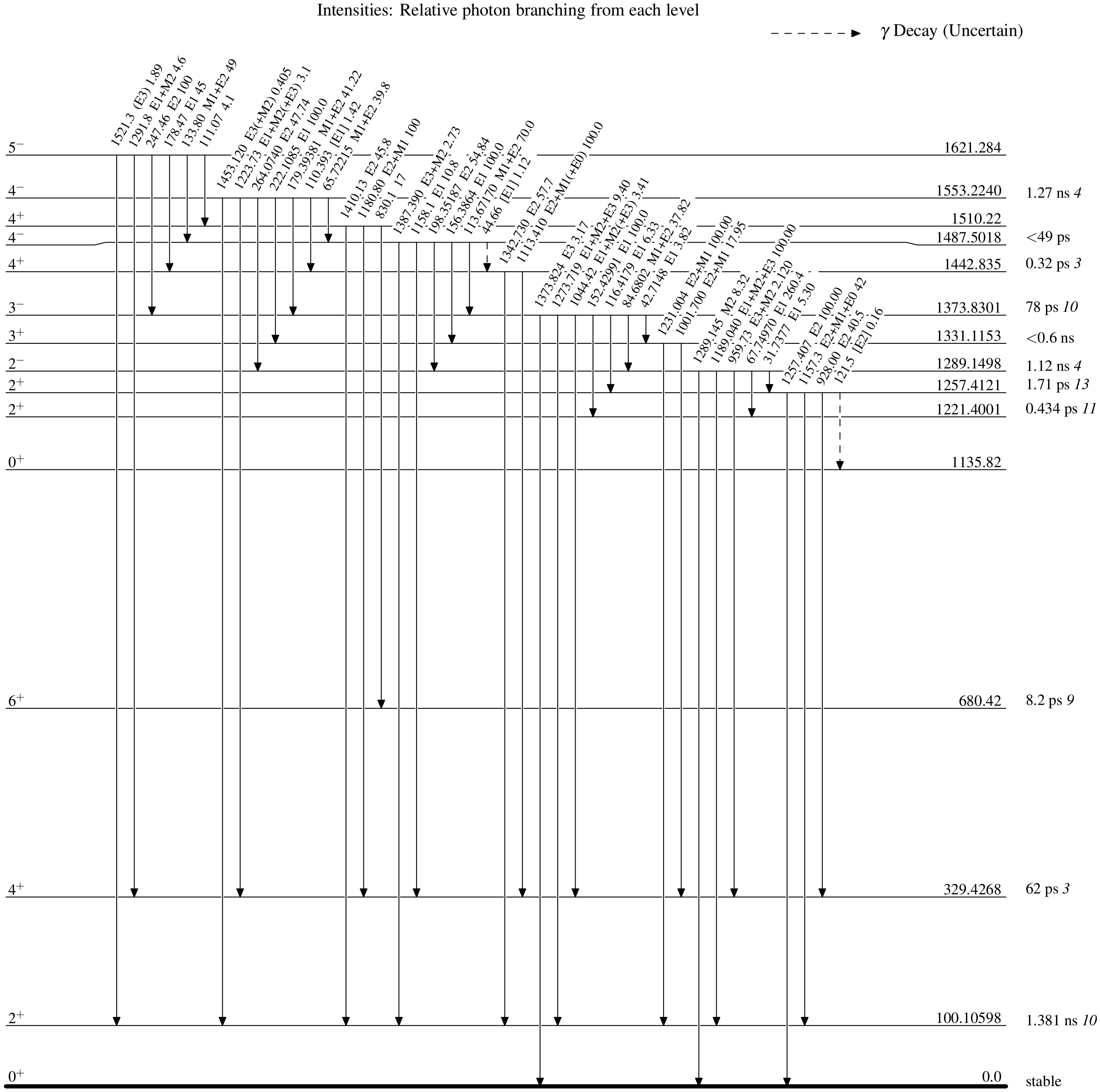
Intensities: Relative photon branching from each level



Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Relative photon branching from each level

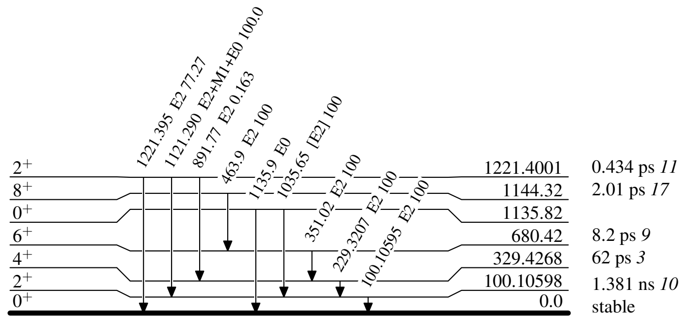


$^{182}_{74}W_{108}$

Adopted Levels, Gammas

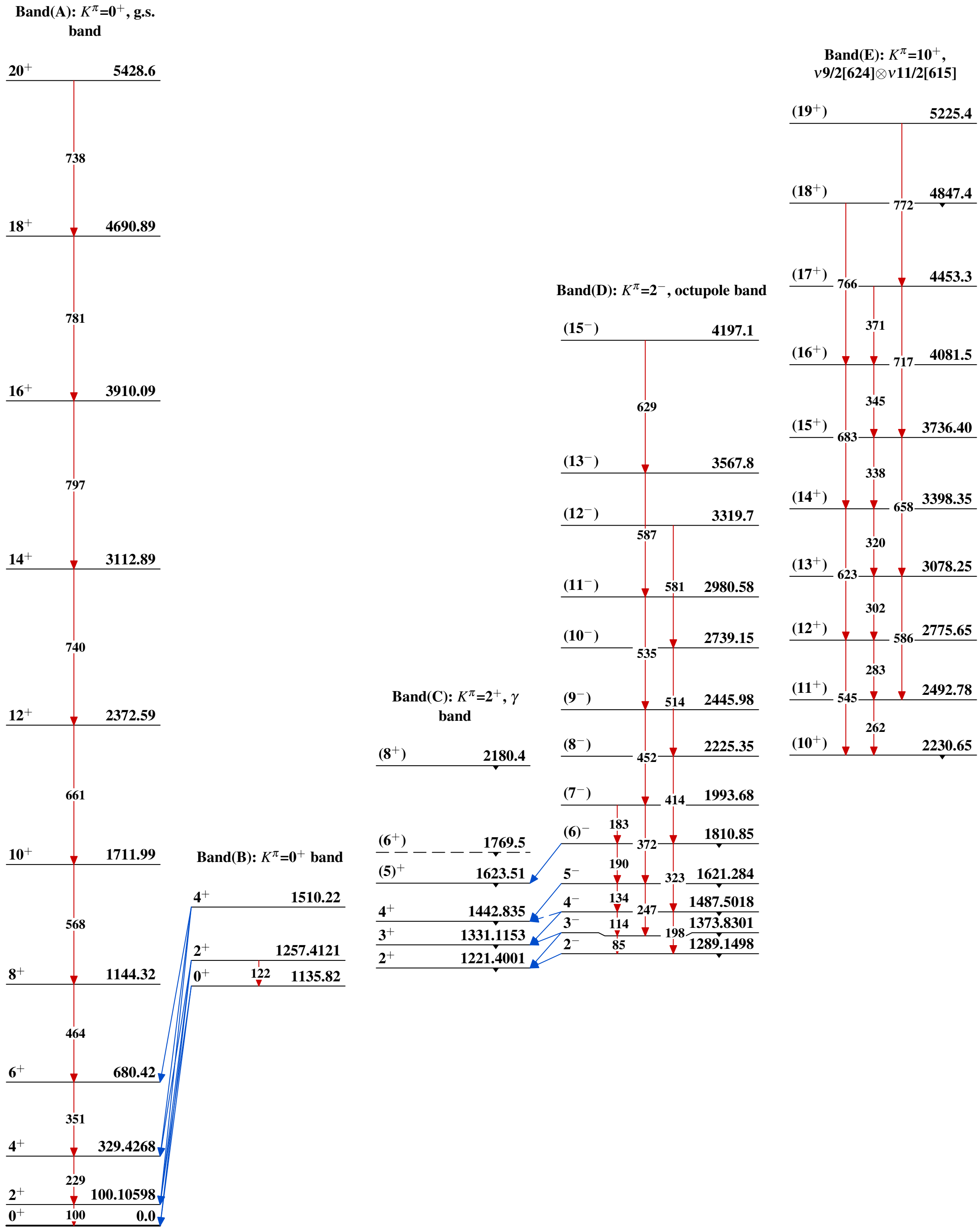
Level Scheme (continued)

Intensities: Relative photon branching from each level



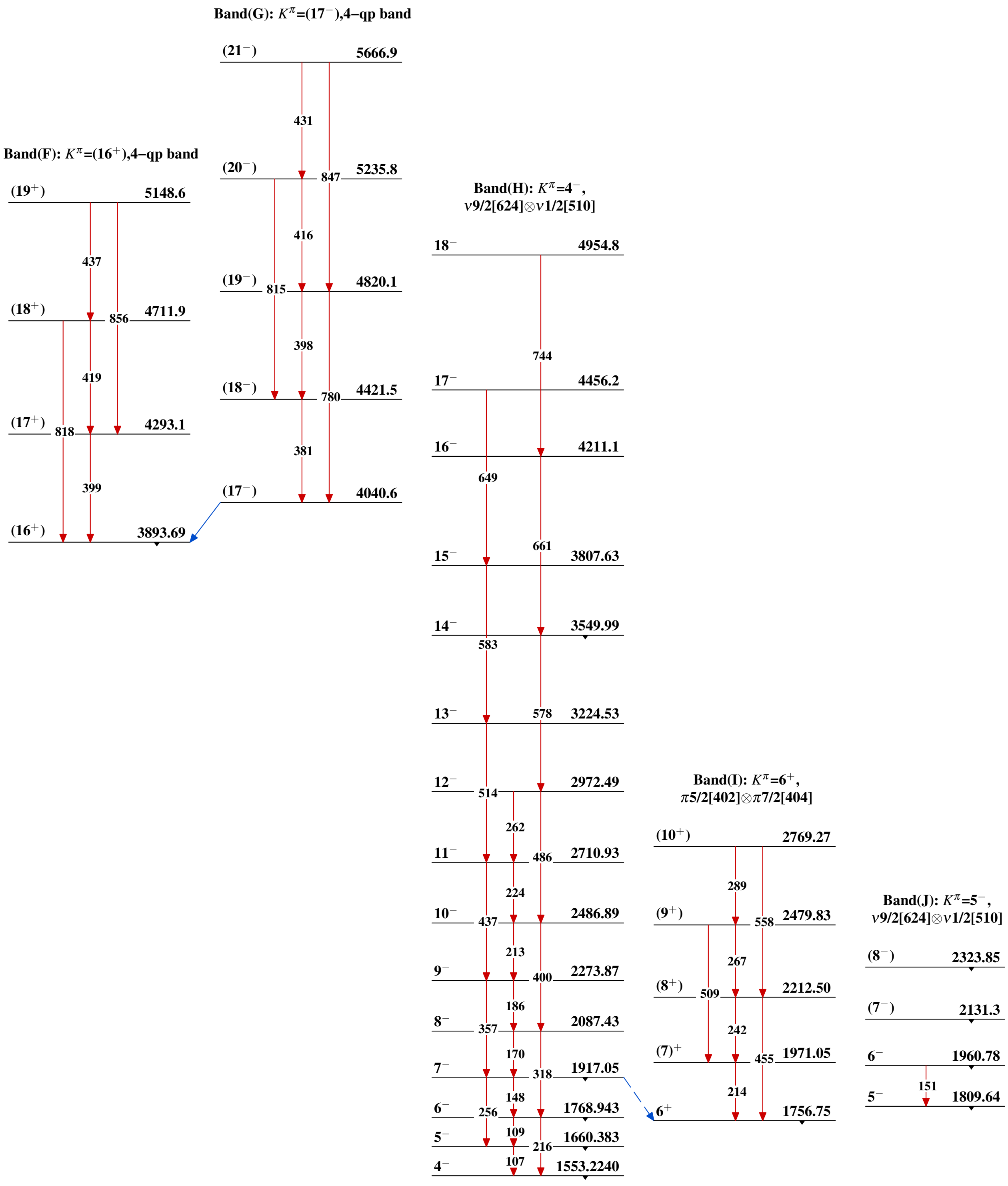
$^{182}_{74}W_{108}$

Adopted Levels, Gammas



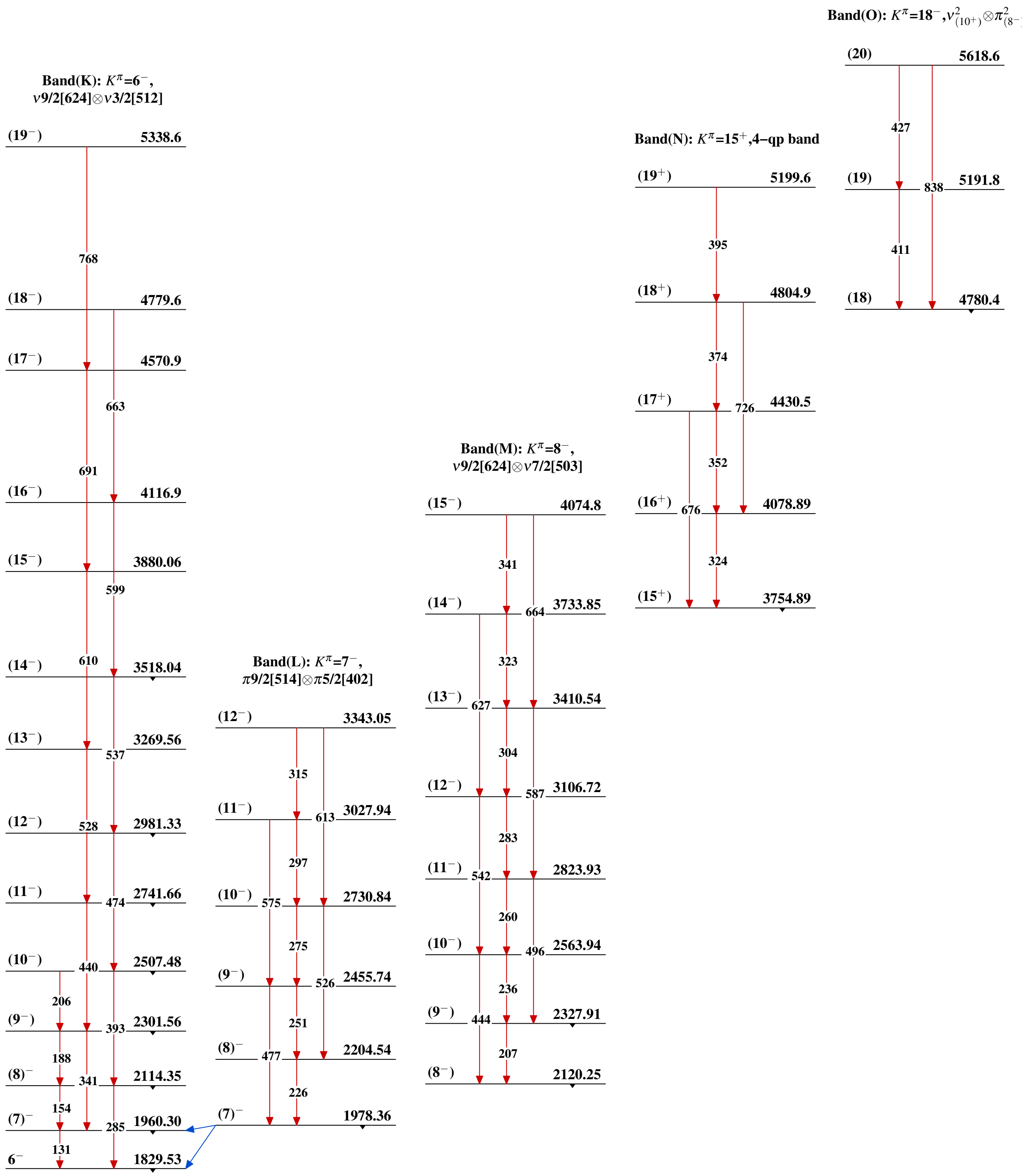
$^{182}_{74}W_{108}$

Adopted Levels, Gammas (continued)



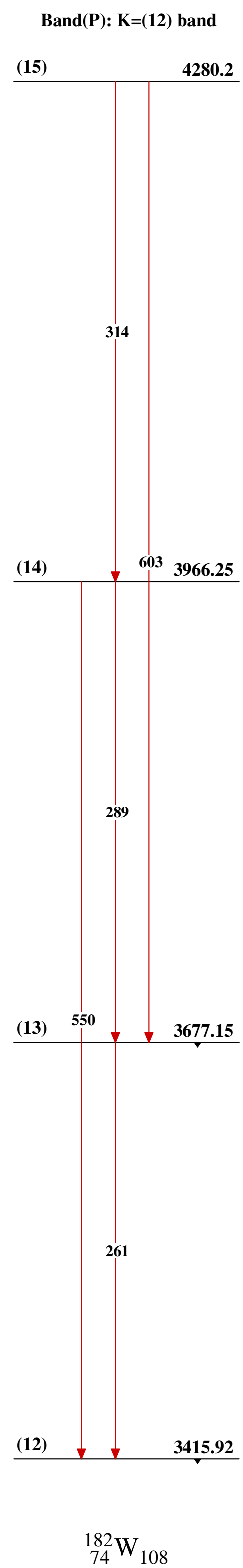
$^{182}_{74}W_{108}$

Adopted Levels, Gammas (continued)



$^{182}_{74}W_{108}$

Adopted Levels, Gammas (continued)



Adopted Levels, Gammas

Type	Author	History Citation	Literature Cutoff Date
Full Evaluation	Coral M. Baglin	NDS 111,275 (2010)	1-Oct-2009

Q(β^-)=−1483 *5*; S(n)=7411.66 *25*; S(p)=7700.4 *18*; Q(α)=1649.3 *20* 2012Wa38
Note: Current evaluation has used the following Q record −1481 4 *7411*.6026 *7700.2 17* 1657.0 *20* 2003Au03,2009AuZZ.
Q(α): From 2009AuZZ; 1656.2 *22* in 2003Au03.
Other Reactions:

^{184}W(e,e) (1973Ka44): E=42, 60, 65 MeV; deduced charge distribution parameters.
For isotope shift and/or hfs data see, for example, 1985Bo33, 1988Au04 1994Ji02, 1994Ji07, 1995Au08.

^{184}W Levels

Cross Reference (XREF) Flags

A	^{184}Ta β^- decay	J	^{184}W(d,d′)	S	Muonic atom
B	^{184}Re ε decay (35.4 d)	K	Coulomb excitation	T	^{198}Pt(^{136}Xe,Xγ)
C	^{184}Re ε decay (169 d)	L	^{186}W(p,t)	U	^{183}W(n,γ) E=thermal: $\gamma\gamma$ coin
D	^{183}W(n,γ) E=thermal	M	^{183}W(d,p)	V	^{183}W(n,γ) E=res
E	^{183}W(n,γ) E=7.6 eV	N	^{182}W(t,p)	W	^{184}W(α,α')
F	^{183}W(n,γ) E=2 keV	O	^{184}W(γ,γ')	X	^{186}W(N,3nγ)
G	^{183}W(n,γ) E=300 eV	P	^{184}W(γ,γ):Mossbauer	Y	^{184}W(γ,X)
H	^{184}W(n,n′)	Q	^{184}W(p,p),(p,p′),(pol p,p′)	Z	^{184}W(^{12}C,^{12}C′), (^{18}O,^{18}O′)
I	^{184}W(n,n′γ)	R	^{186}W(^{12}C,^{14}C)		

E(level)[†]	J$^\pi$	T$_{1/2}$	XREF	Comments
0.0[e]	0+[f]	stable	ABCDEFGHIJKLMNOPQ STUVW Z	Δ<r^2>(^{186}W,^{184}W)=0.085 *4*, Δ<r^2>(^{184}W,^{182}W)=0.099 *5* (1994Ji02). Δ<r^2>(^{186}W,^{184}W)=0.084 *7* (1988Au04). <r^2>$^{1/2}$(charge)=5.3670 *17* (2004An14). J$^\pi$: L(p,t)=0. T$_{1/2}$: α decay searched for but not observed. T$_{1/2}$≥8.9×10^{21} y (2004Co26), T$_{1/2}$≥1.8×10^{20} y (2003Da05), T$_{1/2}$≥2.9×10^{19} y (2003Ce01), T$_{1/2}$≥4.0×10^{18} y (1997Ge15), all at 90% confidence level. Others: T$_{1/2}$>2×10^{17} y (1960Be13), T$_{1/2}$>3×10^{17} y (1961Gr37).
111.2174[e] *4*	2+[f]	1.251 ns *12*	ABCDEFGHIJKLMNOPQ STUVWX Z	μ=+0.578 *14* (1984Al06) Q=−1.87 *20* (1977RuZV) μ: from g=+0.289 *7* (1984Al06; IPAC); corrected for Knight shift and diamagnetism. Other: +0.576 *14* (1972Ca12; Coulomb excitation integral perturbed angular distribution). Other g-factor data: 1961Ha21, 1962Go17. Q: From Coulomb excitation reorientation. Other data: Q/Q(^{182}W)=0.938 *15* (1968Pe06), 0.930 *16* (1969Ch23), 0.965 *8* (1971Ob02). Isomer shift δ<r^2>/<r^2> =+0.19×10^{-4} *12* (1971HaWV), ≈+0.13×10^{-4} (1971WaYS). δ<r^2>/δ<r^2>(^{182}W)=−0.8 *7* (1971HaWV), −0.81 *22* (1971WaYS). J$^\pi$: E2 111γ to 0$^+$ g.s.. T$_{1/2}$: from ^{184}Re ε decay (35.4 d) (1984Al06). Other values: 1.23 ns *4* (from B(E2)), 1.24 ns *3*, 1.28 ns *2*,

Continued on next page (footnotes at end of table)

Adopted Levels, Gammas (continued)

^{184}W Levels (continued)

E(level)[†]	J$^\pi$	T$_{1/2}$	XREF	Comments
				1.22 ns *9*, all from Coulomb excitation), 1.19 ns *4* (muonic atom), 1.29 ns *12* (Mossbauer). The weighted average of all these data is 1.253 ns *14*.
364.069[e] *8*	4$^+$[f]	46.3[b] ps *+25−13*	ABCDE HIJKLMN Q TU WX Z	μ=+1.17 *9* μ: from g=+0.293 *23* (1984Al06; IPAC). Other: 1970BlZT. J$^\pi$: E4 excitation from 0$^+$. Other T$_{1/2}$: 40 ps *5* from RDM in Coulomb excitation.
748.320[e] *12*	6$^+$[f]	5.75[b] ps *18*	A CDE HIJKL N Q T WX	μ=+1.79 *26* μ: from g=+0.299 *43* (1984Al06; IPAC). Other:+1.85 *20* (1985St18; transient field) if g(364 level)=+0.293 *23*. J$^\pi$: E2 to 4$^+$, band assignment. Other T$_{1/2}$: 5.2 ps *6* from RDM in Coulomb excitation.
903.307[g] *9*	2$^+$[h]	1.80[b] ps *4*	ABCDEFGHIJKLMN Q UVW	μ=+0.25 *8* (1985St18) Q=+0.1 *+4−3* (1977Ob02,1977Ob01) From g/g(364 level)=0.42 *14* if g(364 level)=0.293 *23*. Method: transient field. Q: from Coulomb-excitation reorientation. J$^\pi$: E2 539γ to 0$^+$. Other T$_{1/2}$: 2.3 ps *3* from RDM in Coulomb excitation.
1002.49[d] *4*	0$^+$		DEFGHIJ L N Q UV	J$^\pi$: L=0 in (p,t) and (t,p). Other E: 1003.3 *4* in (p,t).
1005.971[g] *10*	3$^+$[h]		ABCDEF I K U	J$^\pi$: M1+E2 894γ to 2$^+$ 111; M1+E2 642γ to 4$^+$ 364.
1121.440[d] *14*	2$^+$	56 ps *7*	B DEFGHIJKLMN UVW	J$^\pi$: E2 757γ to 0$^+$. T$_{1/2}$: from B(E2)↑=0.00052 *6* in Coulomb excitation and adopted γ properties. However, B(E2) and B(E2)(W.u.) values given in Coulomb excitation for 1121γ are inconsistent by a factor of ≈2.
1130.045[i] *9*	(2)$^-$		ABCDEFG I	J$^\pi$: E1+M2+E3 227γ to 2$^+$ 903; reduced Iγ for M1 primary γ from 0$^-$,1$^-$ in (n,γ) E=300 eV favors 0$^-$,2$^-$; (E1) 124γ to 3$^+$ 1005.
1133.850[g] *10*	4$^+$[h]	2.30[b] ps *17*	ABCDE HIJKLM Q T	J$^\pi$: E2 230γ to 2$^+$ 903; γ band member. Other T$_{1/2}$: 2.6 ps *3* from RDM in Coulomb excitation.
1221.308[i] *8*	3$^-$	45[b] ps *5*	A CDE GHIJKL N W	J$^\pi$: E1+M2 1110γ to 2$^+$ 111; E1 857γ to 4$^+$ 364.
1252.2[e] *7*	8$^+$[f]	1.49[b] ps *3*	K T X	μ=+2.9 *6* (1985St18) μ: from g/g(364 level)=1.22 *24* if g(364 level)=0.293 *23*; transient field. J$^\pi$: E2 504γ to 6$^+$, band assignment. Other T$_{1/2}$: 1.37 ps *17* from RDM in Coulomb excitation.
1282.71 *10*	(1,2)$^-$		G IJ	J$^\pi$: M1 primary γ from 0$^-$,1$^-$ in (n,γ) E=300 eV. Possible γ to 2$^+$.
1284.997[n] *8*	5$^-$	8.33 μs *18*	A CDE IJ	T$_{1/2}$: from (216γ)(200<E(γ)<1000)(t) (1969Gl04) in ε decay (169 d). Other T$_{1/2}$:

Continued on next page (footnotes at end of table)

Adopted Levels, Gammas (continued)

^{184}W Levels (continued)

E(level)[†]	J^π	$T_{1/2}$	XREF	Comments
				7.70 μs *3* (1969FaZY) and 8.0 μs *4* (1969Mo07) from delayed coin in ^{184}Ta β^- decay. J^π: E1+M2+E3 921γ to 4^+ 364; E1+M2+E3 537γ to 6^+ 748.
1294.94[g] *10*	5^+[ah]		A D I K MN	
1322.152[k] *22*	$(0)^+$		DEFGHIJ V	XREF: V(1310). J^π: E1 primary γ from $0^-,1^-$ in (n,γ) E=300 eV; band assignment.
1345.37[i] *3*	(4^-)[a]		A DE I	
1360.38[d] *19*	(4^+)[a]		hIJ M	J^π: 239γ to 2^+ 1122; 996γ to 4^+ 364.
1386.296[l] *13*	2^+	1.08[b] ps *10*	B DEFGhIJK M UV	J^π: E2 1386γ to 0^+ g.s..
1425.003[m] *16*	$(3)^+$		AB DE hI M	J^π: E1 295γ to 2^- 1330; E2 1061γ to 4^+ 364; band assignment.
1431.02[k] *5*	2^+	>5[b] ps	B DEFGhIJK UV	J^π: E2 1431γ to 0^+ g.s..
1446.266[p] *13*	6^-		A C hI M	J^π: M1 from 7^-, M1 to 5^-.
1476.9[g] *5*	6^+[ah]	1.82 ps *9*	JK MN T	J^π: E2 225γ to 8^+ 1252; E2 343γ to 4^+ 1134. $T_{1/2}$: from B(E2) in Coulomb excitation. Other: 2.0 ps *4* from DSA in Coulomb excitation (1991Wu05).
1492[i] *4*	(5^-)[a]		J	
1501.545[o] *13*	7^-	2.35 ns *10*	A C	$T_{1/2}$: from (K x ray)(216γ)(t) (1969Gl04) in ^{184}Re ε decay (169 d). J^π: E2 217γ to 5^-, log *ft*=7.8 from $8^{(+)}$.
1523.27[l] *8*	(3^+)[a]		DE hI M	
1536.66[m] *16*	(4^+)[a]		A D hIJ MN	
1570.2 *3*	(2^+)		DE	J^π: γ's to 0^+,$(3)^+$.
1581.46 *9*	(6^-)		A I M	J^π: L(d,p)>3 for $1/2^+$ target; band assignment.
1613.512 *20*	(1^+)		D FG I UV	J^π: strong 608γ to 3^+ 1006 inconsistent with J=0 so level differs from the 0^+ 1614.3 *5* level excited in (p,t); 1502γ to 2^+ 111; primary γ to 1613 level from 0^- in (n,γ) E=res; 1975Ca23 argue that levels at 1614 and 1615 are 1^+ and 0^+, respectively, on the basis of more intense feeding of the 1614 level in (n,γ) E=7.6 eV.
1614.3 *5*	0^+		g I L	J^π: L(p,t)=0 for E=1614.3 *5* level. Consistent with J^π=$0^+,2^+$ recommended for a 1613.9 *7* level fed by E1 primary γ from $0^-,1^-$ in (n,γ) E=300 eV.
1614.90 *6*	$(1,2)^+$		DE g I Uv	J^π: E1 primary γ's from $0^-,1^-$ in (n,γ) E=300 eV, with $0^+,2^+$ favored for a 1613.9 *7* level and 1^+ for a 1615.46 *23* level; 1504γ to 2^+ 111; possible 1615γ to 0^+ g.s. in (n,γ) E=thermal: $\gamma\gamma$ coin inconsistent with J=0.
1627.71 *3*	$(1)^+$		DEFG M UV	J^π: E1 primary γ from $0^-,1^-$ in (n,γ) E=300 eV with reduced Iγ that favors 1^+; 724γ to 2^+ 903.
1637[n] *4*	(7^-)[a]		M	
1661.09 *19*			hI V	XREF: V(1651). J^π: 527γ to 4^+ 1134.
1676.42[m] *12*	(5^+)		A hI M	J^π: 1312γ to 4^+ 364; 382γ to (5^+) 1295; 331γ to (4^-) 1345; band assignment suggested in (n,n$'\gamma$).
1683.4 *5*			I	J^π: gammas to 2^+ and 4^+.
1699.04 *4*	$(5)^+$		A M	J^π: E1 414γ to 5^- 1285, 274γ to $(3)^+$ 1425, 253γ to 6^- 1446. Possible configuration: (ν 7/2[503])+(ν 3/2[512]) (1984Bu37).

Continued on next page (footnotes at end of table)

Adopted Levels, Gammas (continued)

^{184}W Levels (continued)

E(level)[†]	J^π	$T_{1/2}$	XREF	Comments
1713.47 *10*	$(0)^+$		D FG I U	J^π: E1 primary γ from $0^-,1^-$ in (n,γ) E=300 eV with reduced Iγ that favors $0^+,2^+$. 0^+ proposed by 1975Ca23 on the basis of (n,γ) population systematics.
1722 *4*	(1^+)		M V	J^π,E(level): primary γ to 1722 level from 0^- resonance in (n,γ) E=res. Presumed to feed this level instead of the $(0)^+$ 1713.
1746.03 *4*	$(6)^+$		A I	J^π: E1 461γ to 5^- 1285, γ to 7^- 1502. Possible configuration: (π 5/2[402])+(π 7/2[404]) (1984Bu37).
1755 *3*	(4^+)		J MN	E(level): weighted average of 1756 *5* from (d,d′), 1754 *5* from (d,p) and 1755 *5* from (t,p). J^π: L(d,p)=3; assigned by 1973Kl06 as K=4 bandhead based on comparison of experimental and theoretical cross sections.
1774.5 *5*	0^+		L	J^π: L(p,t)=0.
1775.34 *3*	$(2)^+$		DEFG I M	J^π: E1 primary γ from $0^-,1^-$ in (n,γ) E=300 eV; 1412γ to 4^+ 364.
1795.8 *5*	0^+		LM v	XREF: v(1803). E(level): from (p,t). E=1796 *5* for composite peak in (d,p). J^π: L(p,t)=0.
1808.27 *6*	(2^+)		DEFG I MN Uv	XREF: v(1803). J^π: 1809γ to 0^+ g.s.; 1445γ to 4^+ 364. (M1) primary γ from $0^-,1^-$ in (n,γ) E=300 eV for E=1808.7 *5* level is inconsistent with this and may indicate the existence of a separate close-lying level.
1846.6? *15*			E	
1860.8[e] *9*	10^+[f]	0.570[b] ps *+24−31*	K N	J^π: E2 to 8^+, band assignment. $T_{1/2}$: other $T_{1/2}$: 0.66 ps *9* from DSA (1991Wu05) in Coulomb excitation.
1876.71 *9*	$(2)^+$		D FG I U	J^π: 1877γ to 0^+ g.s.; 655γ to 3^- 1221; E1 primary γ from $0^-,1^-$ in (n,γ) E=300 eV.
1894.3 *4*	$(2^+,3)$		IJ M	XREF: M(1901). J^π: 764γ to 2^- 1130; 1531γ to 4^+ 364; 1784γ to 2^+ 111.
1921 *5*			M	
1925.4[g] *7*	8^+[h]		K T	J^π: E2 intraband 449γ to 6^+ 1477; E2 Coulomb excitation from 10^+ 1861.
1995.4 *3*	$1^{(-)}$		D FG I O U	J^π: D 1995γ to 0^+ g.s.; (M1) contaminated primary γ from $0^-,1^-$ in (n,γ) E=300 eV.
2012.94 *10*	$(2)^+$		D FG U	J^π: 1007γ to 3^+ 1006; 883γ to 2^- 1130; E1 primary γ from $0^-,1^-$ in (n,γ) E=300 eV with reduced Iγ that favors $0^+,2^+$.
2029.83 *6*	$(5^-,6,7^-)$		A M	XREF: M(2022). J^π: γ to 7^-, log *ft*=8.2 from (5^-).
2031.3 *4*	0^+		D FG L U	J^π: L(p,t)=0 for 2030.7 *6* level; E1 primary γ from $0^-,1^-$ in (n,γ) E=300 eV.
2035.56 *18*	$1^+,2^+$		D FG I U	J^π: E1 primary γ from $0^-,1^-$ in (n,γ) E=300 eV; strong γ to 0^+.
2044 *6*			M v	XREF: v(2050). E(level): from (d,p).
2056.41 *17*	$(1)^-$	26[&] fs *5*	D G I O Uv	XREF: v(2050).

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Adopted Levels, Gammas (continued)

^{184}W Levels (continued)

E(level)†	J^π	$T_{1/2}$	XREF	Comments
				J^π: M1 primary γ from 0^-,1^- in (n,γ) E=300 eV; 2056γ to 0^+ g.s.. K=(0) based on branching in (γ,γ').
2060.8 *3*			DEF I m UV	J^π: 636γ to $(3)^+$ 1425; 1950γ to 2^+ 111, so J^π=(1^+,2,3,4^+). If this is the level fed by primary γ from 0^- in (n,γ) E=res, J^π=(1^+) would Be favored.
2063.4 *3*	$(0,2)^+$		G m	J^π: E1 primary γ from 0^-,1^- in (n,γ) E=300 eV with reduced Iγ that favors J=0,2.
2074.0 *6*	$(0,2)^-$		G N	J^π: M1 primary γ from 0^-,1^- in (n,γ) E=300 eV with reduced Iγ that favors J=(0,2).
2084.8 *5*	$(0,2)^-$		G	J^π: M1 primary γ from 0^-,1^- in (n,γ) E=300 eV with reduced Iγ that favors J=0,2.
2089.5 *5*	$(1)^-$		D G	J^π: M1 primary γ from 0^-,1^- in (n,γ) E=300 eV with reduced Iγ that favors J=1.
2097.7 *3*	$(1)^+$	31& fs *4*	D FG I O UV	XREF: V(2090). J^π: E1 primary γ from 0^-,1^- in (n,γ) E=300 eV with reduced Iγ that favors J=1; 2098γ to 0^+ g.s.; probably primary γ from 0^- in (n,γ) E=res.
2104.20 *8*	$(2)^+$		D FG M U	J^π: E1 primary γ from 0^-,1^- in (n,γ) E=300 eV with reduced Iγ that favors J=0,2; 782γ to $(0)^+$ 1322; 1098γ to 3^+ 1006.
2111.2 *6*	0^+		g L	E(level): from (p,t). J^π: L(p,t)=0.
2112.49 *18*			D Fg	J^π: 982γ to $(2)^-$ 1130, so J≤(4).
2124.6 *7*	$(1,2^+)$		g m Uv	J^π: 1121γ to 0^+ 1002; 1222γ to 2^+ 903. See also comment on 2126 level.
2126.07 *5*			DEFg IJ m Uv	J^π: 996γ to 2^- 1130; 2015γ to 2^+ 1113. An E1 primary γ from 0^-,1^- in (n,γ) E=300 eV with reduced Iγ that favors J=0,2 populates 2126 and/or 2125 level..
2168.19 *5*	$(1)^+$		DEFG I M UV	J^π: 2168γ to 0^+ g.s.; 743γ to $(3)^+$ 1425; E1 primary γ from 0^-,1^- in (n,γ) E=300 eV; primary γ from 0^- in (n,γ) E=res.
2182 *5*	(0^+)		N	J^π: L=(0) in (t,p).
2194.7 *10*			F	
2221.77 *22*	(≤4)		D fg mn V	J^π: 447γ to 2^+ 111, so J≤(4). E1 primary γ from 0^-,1^- in (n,γ) E=300 eV may feed 2222 and/or 2223 levels. In (n,γ) E=res, primary γ from 0^- possibly feeds this level; if so, J^π=(1^+) is favored.
2222.8 *5*	$(2^+,3,4^+)$		Efg mn	J^π: 1859γ to 4^+ 364; possible 1320γ to 2^+ 903. E1 primary γ from 0^-,1^- in (n,γ) E=300 eV may feed 2222 and/or 2223 levels; its reduced intensity favors J^π=0^+,2^+.
2228.30? *7*	$(2^-,3,4^-)$		D	J^π: 883γ to $(4)^-$ 1345; 1098γ to 2^- 1130.
2246.3 *3*	$(2)^+$		DEFG M UV	J^π: 2245γ to 0^+ g.s.; E1 primary γ from 0^-,1^- in (n,γ) E=300 eV with reduced Iγ that favors J=0,2. However, if primary γ from 0^- in (n,γ) E=res feeds this level, J^π=1^+ would Be preferred.
2294.61 *7*	$(2)^+$		D FG M Uv	XREF: v(2293). J^π: 2295γ to 0^+ g.s.; 2184γ to 2^+ 111; E1 primary γ from 0^-,1^- in (n,γ) E=300 eV with reduced Iγ that favors J=0,2.
2309.6 *7*	0^+		L v	XREF: v(2293). E(level): from (p,t). J^π: L(p,t)=0.
2320.4‡ *3*	$(1^-,2^-)$		D G m U	J^π: 1417γ to 2^+ 930; (M1) primary γ from 0^-,1^- in

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Adopted Levels, Gammas (continued)

^{184}W Levels (continued)

E(level)[†]	Jπ	$T_{1/2}$	XREF	Comments
				(n,γ) E=300 eV.
2328.7? *5*	(1,2$^+$)		E m	Jπ: γ to 0$^+$.
2349.9[‡] *5*			m U	
2352.2 *2*	(1)$^-$		D FG m	Jπ: M1 primary γ from 0$^-$,1$^-$ in (n,γ) E=300 eV.
2370.1 *3*	(1)$^+$		D FG M UV	Jπ: E1 primary from 0$^-$,1$^-$ in (n,γ) E=300 eV.
2389.14 *12*	(4$^-$,5,6$^-$)		A D m	Jπ: gammas to 4$^-$ and 6$^-$.
2390.3[‡] *2*	(1)$^+$		G m Uv	XREF: v(2400). Jπ: E1 primary γ from 0$^-$,1$^-$ in (n,γ) E=300 eV has reduced intensity that favors J^π=1$^+$.
2392.3 *3*			F m v	XREF: v(2400).
2395.8[‡] *4*	(1)$^+$		D G J m Uv	XREF: v(2400). Jπ: E1 primary γ from 0$^-$,1$^-$ in (n,γ) E=300 eV.
2401.8 *6*			F m	
2404.2[‡] *3*	0$^+$		D G L U	Jπ: L(p,t)=0 for E=2404.7 *7* level. Consistent with E1 primary from 0$^-$,1$^-$ in (n,γ) E=300 eV with reduced intensity that favors J^π=0$^+$,2$^+$.
2421.5 *7*	(0$^+$)		F J MN	Jπ: L=(0) in (t,p).
2429.6 *11*			D V	XREF: V(2420). Jπ: if this is the level populated by primary γ from 0$^-$ in (n,γ) E=res, J^π=1$^+$ is favored.
2439.8[‡] *2*			D F M U	
2458.4[‡] *2*	1[@]	62[&] fs *12*	D F O U	
2468.9 *7*	(0$^+$)		L V	E(level): from (p,t). Jπ: L(p,t)=(0).
2471.7[g] *12*	10+[h]	0.82[b] ps *+15−4*	K	
2479.3[j] *9*	(8$^-$,9,10$^+$)		T	Jπ: γ's to 8$^+$ levels but not to 6$^+$ levels; calculated energies for possible two quasiparticle configurations at roughly this energy have J^π=8$^-$ or 9$^-$ or 10$^+$, the latter, ν^2 11/2[615]+9/2[624] configuration, being the closest (2004Wh02).
2485.3 *12*			D F	XREF: D(2486.7)F(2484.3). E(level): weighted average from (n,γ) E=thermal and (n,γ) E=2 keV.
2492.67 *10*	(4$^-$,5,6)		A F M	Jπ: log *ft*=7.4 from (5$^-$), γ to 6$^-$.
2509.4[‡] *2*			D F Uv	XREF: v(2513).
2512.7 *7*	0$^+$		L v	XREF: v(2513). E(level): from (p,t). Jπ: L(p,t)=0.
2518.9 *3*			D F M v	XREF: v(2513).
2520.7[‡] *3*			U	
2532.4 *6*			F M	
2546.1 *7*	1[@]	65[&] fs *15*	O	K=1 based on branching in (γ,γ′) (1993He15).
2555.0[‡] *2*			D F J U	
2557.0[e] *14*	12+[f]	0.265[b] ps *+21−24*	K	
2567.9 *7*	(0$^+$)		L	Jπ: L(p,t)=(0).

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Adopted Levels, Gammas (continued)

^{184}W Levels (continued)

E(level)[†]	J^π	$T_{1/2}$	XREF	Comments
2573.4[‡] 3			D F m U	
2582.0 23			F m	
2592.5 6			D F M	
2613.3[‡] 3			D F U	
2618.8[‡] 3			D F U	
2630.7 7			D F M	
2649.0[‡] 3			D Uv	XREF: v(2653).
2652.1 5			F J v	XREF: v(2653).
2655.8[‡] 4			Uv	XREF: v(2653).
2675.5 7			F J M V	XREF: V(2688). J^π: primary γ from 1^- resonance in (n,γ) E=res.
2694.4[‡] 3	1[@]		F O Uv	XREF: F(2693.4)v(2688).
2704.5 9			F	
2706.7[‡] 4			D U	
2713	≤3		V	J^π,E(level): primary γ from 0^-,1^- resonance in (n,γ) E=res.
2719.8[‡] 2			D F U	
2732.5[‡] 6			D U	XREF: D(2730.3).
2739.3[cj] 14			T	
2757.6[‡] 2			D Uv	XREF: v(2763).
2763.2[‡] 2	1[@]	28[&] fs 6	D O Uv	XREF: D(2764.0)v(2763).
2767.6[‡] 6			F Uv	XREF: v(2763).
2798.2[‡] 4			D Uv	XREF: v(2803).
2802.7[‡] 1			D J v	XREF: v(2803).
2813 1			O	
2815.0[‡] 2			D F U	
2825.1[‡] 3	0^+		L U	J^π: L(p,t)=0 for 2826.4 7 level. 2714γ to 2^+ 111.
2836.9[‡] 4			U	
2845.4 11			F J	
2849.2? 8			D	
2853.6 6			F	
2855.6? 10			D j	XREF: j(2863).
2870.5[‡] 2	(0^+)		D j L U	XREF: j(2863). J^π: L(p,t)=(0) for 2871.3 7 level; consistent with 1967γ to 2^+ 903.
2892.1[‡] 2	1[@]	31[&] fs 6	F O U	Other E: 2893 1 from (γ,γ'). K=1 based on branching in (γ,γ').
2902.0 8			D	
2905.8[‡] 7			U	
2919.5[‡] 2			D F U	
2927.7 7	(0^+)		L	J^π: L(p,t)=(0).
2939.6 7	(0^+)		F L	E(level): from (p,t). Other E: 2937.8 14 from (n,γ) E=2 keV. J^π: L(p,t)=(0).
2946.8[‡] 4			U	
2948.7 5			F	
2951.0[‡] 5	1[@]	33[&] fs 6	D O U	K=1 based on branching in (γ,γ').
2968.7[‡] 2	(1^+)		D F UV	XREF: V(2960). J^π: primary γ from 0^- resonance in (n,γ) E=res.
2981.4	5		d F v	XREF: v(2986). E(level): from (n,γ) E=2 keV.

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Adopted Levels, Gammas (continued)

^{184}W Levels (continued)

E(level)[†]	J$^{\pi}$	T$_{1/2}$	XREF	Comments
2983.6[‡] *4*			d Uv	XREF: v(2986). J$^{\pi}$: primary γ from 0^- resonance in (n,γ) E=res favors $J^{\pi}=1^+$ for 2982 and/or 2984 level.
3004.1 *11*			D	
3017.1[‡] *1*			D U	
3022.9[‡] *3*			U	
3026.8 *5*			D F	E(level): weighted average from (n,γ) E=thermal and (n,γ) E=2 keV.
3029.0[‡] *1*			U	
3037.1[‡] *6*	(1^+)		D UV	XREF: D(3035.5). J$^{\pi}$: primary γ from 0^- resonance in (n,γ) E=res.
3053.4[‡] *2*			U	
3060.3[c,j] *17*			T	
3068.5[‡] *3*			D f U	XREF: f(3070.1).
3071.2[‡] *3*	1[@]		f O U	XREF: f(3070.1).
3084.0 *10*	1[@]		F O	
3088 *1*	1[@]		O	
3104.2[‡] *3*			D F U	
3108.8?[g] *16*	(12^+)[h]	0.35[b] ps *+14−3*	K	
3112.1 *8*			D	
3124 *1*	1[@]		O	
3133 *1*	1[@]		O	
3134.6[‡] *5*			D F U	
3136.8[‡] *4*			U	
3164.1[‡] *8*			U	
3166.2[‡] *8*			U	
3169.1[‡] *2*			D U	
3177.9[‡] *5*			U	
3183.8[‡] *1*			D F U	
3187.1[‡] *3*			U	
3193.3[‡] *3*			D U	
3201.8[‡] *6*			D G UV	XREF: D(3200.3).
3215.5 *7*			F	
3220.6 *9*			D	
3224.6[‡] *7*			U	
3226.3[‡] *5*			D F U	
3233.7[‡] *8*			U	
3244.6 *8*			D	
3248.8[‡] *3*			D F U	XREF: D(3251.1).
3262.6 *8*			F v	XREF: v(3264).
3264.0[‡] *5*			D Uv	XREF: v(3264).
3266.4[‡] *5*			Uv	
3288.3[‡] *6*			U	
3290.0[‡] *4*			D F U	
3293.5[‡] *6*			U	
3304.3[‡] *4*			U	

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Adopted Levels, Gammas (continued)

^{184}W Levels (continued)

E(level)[†]	J^π	$T_{1/2}$	XREF	Comments
3307.4[‡] *5*			D U	
3314.4 *6*			F	
3316.6 *9*			D	
3318.5[‡] *4*			U	
3319.9[e] *17*	14^+[f]	0.140[b] ps *+25−10*	K	
3329.2[‡] *3*			D U	
3341.4[‡] *5*			U	
3345.1[‡] *2*			U	
3349.1[‡] *6*			U	
3352.6[‡] *6*			D U	
3364.7 *20*			D	
3369.9 *9*			D F	XREF: D(3371.5).
3372.9[‡] *5*			U	
3377.5[‡] *3*			D U	
3384.3[‡] *6*			D U	XREF: D(3386.1). Other E: 3386.1 *7* from (n,γ) E=thermal.
3392.0[‡] *9*			F U	
3399.9 *7*			F	
3413.7[‡] *5*			U	
3420.8 *9*			F	
3422.4[‡] *4*		16[&] fs *10*	O U	$T_{1/2}$: if J=1.
3427.2[‡] *4*			D U	XREF: D(3428.5).
3441.3[cj] *20*			T	
3442.3 *10*			F	
3448.2[‡] *3*			D U	
3455.6 *7*			D F U	XREF: D(3454.3).
3466.2[‡] *6*	1[@]	5.0[&] fs *12*	F O U	
3473.3[‡] *5*			U	
3488.2[‡] *4*			D U	
3500.7[‡] *4*			D U	
3507.1 *7*	(1)	12[&] fs *4*	F O	XREF: F(3507.9). J^π: (D) γ to 0^+ g.s.. K=(1) based on branching (1993He15).
3516.2[‡] *6*			D U	XREF: D(3517.8).
3522.5[‡] *4*			U	
3546.9 *6*			D	
3571.1 *7*	(1)	4.1[&] fs *17*	D O	E(level): from (γ,γ'). J^π: (D) γ to 0^+ g.s.. K=(0) based on branching (1993He15).
3618.1[‡] *5*			D U	
3633.1 *7*	1[@]	4.7[&] fs *17*	O	K=1 based on branching (1993He15).
3634.7[‡] *3*			D U	
3649.2[‡] *4*			d U	XREF: d(3652). E(level): may Be the same level as seen at E=3633 *1* in (γ,γ'), but γ branching differs.
3654.2[‡] *3*			d U	XREF: d(3652).
3670.3[‡] *5*			U	

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Adopted Levels, Gammas (continued)

^{184}W Levels (continued)

E(level)[†]	J$^{\pi}$	T$_{1/2}$	XREF	Comments
3682.1 *7*	(1)	8[&] fs *5*	O	J$^{\pi}$: (D) γ to 0^{+} g.s.. K=(1) based on branching (1993He15).
3684.5[‡] *4*			F U	E(level): may Be the same level as seen at E=3682 *1* in (γ,γ'), but γ branching differs.
3686.3 *6*			D	
3703.2 *7*			D	
3706.6[‡] *5*			U	
3715.3[c] *22*			T	
3715.6[‡] *4*			D U	
3743.9 *6*			D	
3770.6 *5*			D	
3782.3 *7*			D	
3807.0 *5*			D	
3863.2 *25*	(14^{-},15,17^{-})	188 ns *38*	T	T$_{1/2}$: from ^{198}Pt(^{136}Xe,Xγ) (2004Wh02). J$^{\pi}$: probable 4-quasiparticle isomer; candidate configurations with calculated energies near this energy have J$^{\pi}$=14^{-} or 15 or 17^{-} (2004Wh02).
3882.8 *11*			D	
3930.2 *13*			D	
3962.4[‡] *2*			D U	
3971.9 *6*			D	
4061.6 *6*			D	
4116.9[e] *20*	16^{+}[f]	0.125[b] ps *+32−13*	K	
4278.8[‡] *3*			U	
6543.5[‡] *2*			U	
6556.1 *10*			O	
6580.8[‡] *2*			U	
6622.7[‡] *4*			U	
6760.1 *10*	1^{+}[#]		O	
11.90×10^{3} *17*		2.90 MeV *17*	Y	E(level),T$_{1/2}$: component of E1 GDR; total GDR Γ=6.8 *2* MeV; from (γ,X).
14.80×10^{3} *22*		4.70 MeV *22*	Y	E(level),T$_{1/2}$: component of E1 GDR; total GDR Γ=6.8 *2* MeV; from (γ,X).

[†] From least-squares fit to adopted Eγ, except as noted, whenever γ's are observed; from weighted average of values in reaction dataset(s) otherwise.
[‡] From (n,γ) E=thermal: $\gamma\gamma$ coin.
[#] M1 γ to 0^{+}.
[@] D γ to 0^{+} g.s..
[&] Deduced from measured $\Gamma^{2}_{\gamma0}/\Gamma$ in (γ,γ')and adopted $\Gamma_{\gamma1}/\Gamma_{\gamma0}$, assuming $\Gamma=\Gamma_{\gamma1}+\Gamma_{\gamma0}$. Thus, deduced T$_{1/2}$ will Be an upper limit if branches exist to levels other than the g.s. and the 111-keV level.
[a] From band assignment and arguments given.
[b] From measured B(E2) in Coulomb excitation.
[c] Energy may differ from value shown because it depends on unestablished order of γ cascade above the 2480 level in

Continued on next page (footnotes at end of table)

Adopted Levels, Gammas (continued)

^{184}W Levels (continued)

(^{136}Xe,Xγ) (2004Wh02).

[d] Band(A): K$^{\pi}$=0^{+} β band. Band parameters: A=23.9, B=−296 (J=0,2,4,6 levels).

[e] Band(B): K$^{\pi}$=0^{+} ground state band. Band parameters: A=18.5, B=−17 (J=2,4,6 levels).

[f] Definite J^{π} is assigned to members of g.s. band based on smooth progression of level spacings and independently established J^{π} for g.s. and E2 multipolarity for J=2 to 0 transition.

[g] Band(C): K$^{\pi}$=2^{+} γ band. Band parameters: A=17.7, B=−63 (J=2,3,4 levels).

[h] Definite J^{π} is assigned to J≤10 members of γ band based on smooth progression of level spacings and independently established J^{π} for 2^{+} member (903 keV) and E2 multipolarity for J=4 to 2, 230γ.

[i] Band(D): K$^{\pi}$=2^{-} octupole band.

[j] Band(E): sequence based on 2479 (8^{-},9,10^{+}) level.

[k] Band(F): K=0 band.

[l] Band(G): K$^{\pi}$=2^{+} (ν 3/2[512])+(ν 1/2[510]) band.

[m] Band(H): K$^{\pi}$=3^{+} (ν 7/2[503])-(ν 1/2[510]) band.

[n] Band(I): K$^{\pi}$=5^{-} (ν 11/2[615])-(ν 1/2[510]) band.

[o] Band(J): K$^{\pi}$=7^{-} (ν 11/2[615])+(ν 3/2[512]) band.

[p] Band(K): K$^{\pi}$=6^{-} (ν 11/2[615])+(ν 1/2[510]) band.

Adopted Levels, Gammas (continued)

$\gamma(^{184}W)$

E_i(level)	J^π_i	E_γ[†]	I_γ[†]	E_f	J^π_f	Mult.[‡]	δ[‡]	α[c]	Comments
111.2174	2^+	111.2174[&] *4*	100[&]	0.0	0^+	E2		2.57	B(E2)(W.u.)=119.8 *17* Additional information 1.
364.069	4^+	252.845[@] *10*	100[@]	111.2174	2^+	E2		0.1437	B(E2)(W.u.)=166 *+5−9*
748.320	6^+	384.250[@] *12*	100[@]	364.069	4^+	E2		0.0418	B(E2)(W.u.)=181 *6*
903.307	2^+	539.220 *25*	0.83 *3*	364.069	4^+	E2		0.01744	B(E2)(W.u.)=0.459 *20* E_γ: from ε decay. I_γ: weighted average of 0.80 *4* in ε decay (169 d), 0.86 *4* in ε decay (35.4 d), 0.77 *10* in β^- decay. Other $I\gamma$: 1.3 *3* in (n,γ) E=thermal; 2.2 *2* for possibly contaminated γ in Coulomb excitation.
		792.067 *22*	98.5 *11*	111.2174	2^+	M1+E2	−16.8 *5*	0.00733	B(M1)(W.u.)=4.3×10^{-5} *3*; B(E2)(W.u.)=7.94 *21* E_γ: from ε decay. I_γ: weighted average of 98.9 *22* in ε decay (169 d), 98.9 *16* in ε decay (35.4 d), 97.1 *24* in β^- decay. Weighted average from ε decay. Other δ: −19 *+6−21* and −18 *+4−2* from Coulomb excitation.
		903.282 *19*	100.0 *11*	0.0	0^+	E2		0.00554 *8*	B(E2)(W.u.)=4.19 *11* E_γ: from ε decay. I_γ: weighted average from β^- decay, ε decay (169 d) and ε decay (35.4 d).
1002.49	0^+	891.27 *4*	100	111.2174	2^+	[E2]		0.00575	
1005.971	3^+	641.915 *20*	12.40 *18*	364.069	4^+	M1+E2	−8.5 *8*	0.01183 *18*	E_γ: from ε decay (35.4 d). I_γ: weighted average of 12.1 *5* in (n,γ) E=thermal, 10.8 *20* in (n,n′γ), 12.42 *22* in ε decay (35.4 d), 12.4 *26* in (n,γ) E=7.6 eV, 12.5 *4* in ε decay (169 d).
		894.760 *19*	100.0 *14*	111.2174	2^+	M1+E2	−13.2 *9*	0.00569 *8*	E_γ: from ε decay (35.4 d).
1121.440	2^+	757.328 *24*	70 *4*	364.069	4^+	E2		0.00803	B(E2)(W.u.)=0.22 *3* E_γ: weighted average from ε decay and (n,γ) E=thermal. I_γ: weighted average of 76 *4* in (n,γ) E=thermal, 52 *9* in (n,n′γ), 67 *5* in ε decay (35.4 d), 66 *14* in (n,γ) E=7.6 eV. B(E2)(W.u.): See comment on $T_{1/2}$(1121 level).
		1010.245 *21*	100 *4*	111.2174	2^+	M1+E2+E0		0.0139 *10*	E_γ: weighted average from ε decay and (n,γ) E=thermal. δ(M1,E2)=+2.3 *6*. ρ^2(E0)=0.0026 *5* (1999Wo07). α: estimate based on α(K)exp.
		1121.422 *24*	38.0 *20*	0.0	0^+	E2		0.00359	B(E2)(W.u.)=0.0166 *23* E_γ: weighted average from ε decay and (n,γ) E=thermal. I_γ: weighted average of 38.8 *28* in (n,γ) E=thermal, 22 *9* in

$^{184}_{74}W_{110}$-12

$\gamma(^{184}W)$ (continued)

E_i(level)	J^{π}_i	E_{γ}[†]	I_{γ}[†]	E_f	J^{π}_f	Mult.[‡]	δ[‡]	α[c]	Comments
									(n,n′γ), 38.5 *28* in ε decay (35.4 d), 40 *9* in (n,γ) E=7.6 eV. B(E2)(W.u.): See comment on $T_{1/2}$(1121 level).
1130.045	(2)$^-$	124.067 *12*	9.0 *7*	1005.971	3$^+$	(E1)		0.214	E_{γ}: weighted average of 124.071 *15* in (n,γ) E=thermal and 124.060 *20* in ε decay. I_{γ}: weighted average of 9.7 *10* in (n,γ) E=thermal, 10.1 *5* in ε decay (169 d), 9.8 *19* in ε decay (35.4 d), 7.6 *5* in β^- decay.
		226.746 *8*	100.0 *21*	903.307	2$^+$	E1+M2+E3		0.059 *5*	E_{γ}: weighted average of 226.743 *12* in (n,γ) E=thermal and 226.748 *10* in ε decay. Mult.: δ(M2,E1)=0.0 *4*, δ(E3,E1)=+0.10 *3* from ε decay.
		1018.83 *9*	5.6 *3*	111.2174	2$^+$	(E1)			I_{γ}: weighted average of 4.9 *5* in (n,γ) E=thermal, 6.4 *7* in ε decay (169 d), 6.3 *12* in ε decay (35.4 d), 5.7 *5* in β^- decay, 5.5 *11* in (n,γ) E=7.6 eV. E_{γ}: weighted average of 1018.75 *9* in β^- decay, 1018.93 *5* in ε decay and 1018.63 *8* in (n,γ) E=thermal.
1133.850	4$^+$	127.67 *10*	0.25 *10*	1005.971	3$^+$	E2(+M1)	>2.8	1.57 *6*	B(M1)(W.u.)<0.0010; B(E2)(W.u.)>86 E_{γ}: from ε decay. I_{γ}: based on ce(L2) data in ε decay; photons not observed.
		230.45[@] *6*	2.2[@] *3*	903.307	2$^+$	E2		0.193	B(E2)(W.u.)=75 *12*
		385.5	<0.83	748.320	6$^+$	[E2]		0.0414	B(E2)(W.u.)=1.1 *11* E_{γ}: from level energy difference. I_{γ}: based on ce(K) data in ε decay; photons not observed.
		769.778 *17*	100 *3*	364.069	4$^+$	M1+E2	−6.3 *+20−32*	0.0080 *4*	B(M1)(W.u.)=0.00029 *18*; B(E2)(W.u.)=8.0 *7* E_{γ}: from ε decay. Other δ: −12 *+5−20* from Coulomb excitation.
		1022.63 *3*	74 *3*	111.2174	2$^+$	E2		0.00431 *6*	B(E2)(W.u.)=1.46 *13* E_{γ}: from ε decay. I_{γ}: weighted average of 70 *5* in β^- decay and 77 *4* in ε decay (35.4 d).
1221.308	3$^-$	87.452 *10*	4.15 *19*	1133.850	4$^+$	E1		0.529	B(E1)(W.u.)=0.000142 *18* E_{γ}: from ε decay (169 d). I_{γ}: weighted average of 4.1 *6* in β^- decay and 4.15 *20* in ε decay (169 d).
		91.270 *10*	4.35 *24*	1130.045	(2)$^-$	M1+E2	0.62 *4*	6.03	B(M1)(W.u.)=0.0099 *13*; B(E2)(W.u.)=190 *30* E_{γ}: from ε decay (169 d). I_{γ}: weighted average of 4.54 *28* in β^- decay, 4.42 *20* in ε decay (169 d) and 3.3 *5* in (n,γ) E=thermal.
		215.326 *12*	48.9 *13*	1005.971	3$^+$	E1		0.0519	B(E1)(W.u.)=0.000112 *13* E_{γ}: from ε decay (169 d).

γ(^{184}W) (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[†]	E_f	J_f^π	Mult.[‡]	δ[‡]	α[c]	Comments
									I_γ: weighted average of 52 *4* in (n,γ) E=thermal, 48.3 *14* in ε decay (169 d), 50 *5* in β^- decay, 59 *24* in (n,γ) E=7.6 eV.
1221.308	3^-	318.008 *10*	100.0 *12*	903.307	2^+	E1+M2	−0.020 *10*	0.0202 *5*	B(E1)(W.u.)=7.1×10^{-5} *8* E_γ: from ε decay (169 d). δ: from $\gamma(\theta$,H,t) in ε decay; however, note that δ<0.017 if B(M2)(W.u.)<1 as required by RUL.
		857.23 *3*	2.84 *7*	364.069	4^+	E1		0.00238 *4*	B(E1)(W.u.)=1.03×10^{-7} *12* E_γ: from ε decay (169 d). I_γ: weighted average of 2.93 *19* in β^- decay and 2.82 *8* in ε decay (169 d).
		1110.08 *3*	9.88 *25*	111.2174	2^+	E1+M2	+0.08 *3*	0.00159 *10*	B(E1)(W.u.)=1.64×10^{-7} *19*; B(M2)(W.u.)=0.004 *3* E_γ: from ε decay (169 d). I_γ: weighted average of 9.0 *12* in (n,γ) E=thermal, 10.1 *5* in ε decay (169 d), 9.8 *3* in β^- decay, 10.5 *35* in (n,n′γ), 15 *3* in (n,γ) E=7.6 eV.
		1221.29 *4*	0.36 *3*	0.0	0^+	(E3)		0.00639 *9*	B(E3)(W.u.)=5.9 *9* E_γ: from ε decay (169 d). I_γ: weighted average of 0.41 *6* in β^- decay and 0.35 *3* in ε decay (169 d). B(E3)↓: From measured B(E3)↑=0.082 *6* in Coulomb excitation.
1252.2	8^+	503.6	100	748.320	6^+	E2		0.0206	B(E2)(W.u.)=185 *5* Mult.,E_γ: from Coulomb excitation.
1282.71	$(1,2)^-$	161.27[ae] *10*	100[a]	1121.440	2^+				
1284.997	5^-	63.6890 *14*	5.47 *25*	1221.308	3^-	E2		25.7	B(E2)(W.u.)=0.0188 *11* E_γ: from ε decay (169 d). I_γ: from β^- decay.
		151.134 *20*	0.57 *5*	1133.850	4^+	[E1]		0.1286	B(E1)(W.u.)=1.37×10^{-11} *13* E_γ: from ε decay (169 d). I_γ: weighted average of 0.50 *9* in β^- decay and 0.60 *6* in ε decay (169 d).
		(279.0)	<0.010	1005.971	3^+	[M2]		1.111	B(M2)(W.u.)=1.1×10^{-6} *+12−11* I_γ: from ε decay (169 d).
		381.82 *14*	0.69 *6*	903.307	2^+	[E3]		0.1579	B(E3)(W.u.)=0.139 *13* E_γ: from ε decay (169 d). I_γ: weighted average of 0.65 *7* in β^- decay and 0.77 *10* in ε decay (169 d).
		536.674 *15*	40.4 *6*	748.320	6^+	E1+M2+E3		0.0068 *1*	E_γ: from ε decay (169 d). I_γ: weighted average of 29 *7* in (n,γ) E=thermal, 40.6 *6* in ε decay (169 d), 39.9 *14* in β^- decay, 49 *11* in

$^{184}_{74}W_{110}$-14

$\gamma(^{184}W)$ (continued)

E_i(level)	J^π_i	E_γ[†]	I_γ[†]	E_f	J^π_f	Mult.[‡]	δ[‡]	α[c]	Comments
									(n,n′γ). δ: δ(M2,E1)=+0.070 *6*, δ(E3,E1)=−0.025 *4*, λ=−2.1 *2*.
1284.997	5⁻	920.933[@] *21*	100.0[@] *14*	364.069	4⁺	E1+M2+E3		0.0030 *2*	Mult.: δ(M2,E1)=−0.14 *4*, δ(E3,E1)=−0.19 *3*.
		1173.77 *3*	14.9 *6*	111.2174	2⁺	(E3)		0.00698 *10*	B(E3)(W.u.)=0.00116 *6* Eγ: from ε decay (169 d). Iγ: weighted average of 14.9 *8* in ε decay (169 d), 14.9 *11* in β⁻ decay, 15 *4* in (n,n′γ).
1294.94	5⁺	930.87[a] *10*	100[a]	364.069	4⁺				Other Eγ: 932.2 in Coulomb excitation, 930.00 *25* in (n,γ) E=thermal, 930.9 *5* in β⁻ decay.
1322.152	(0)⁺	418.847 *20*	100 *50*	903.307	2⁺	[E2]		0.0331	Iγ: from (n,n′γ).
		1211.0[a] *10*	<7.5[a]	111.2174	2⁺				
1345.37	(4⁻)	211.63 *5*	27 *7*	1133.850	4⁺	[E1]		0.0542	
		215.21[a] *10*	<232[a]	1130.045	(2)⁻				
		339.34 *4*	100 *20*	1005.971	3⁺	[E1]		0.0170 *3*	
		981.1 *5*	15 *5*	364.069	4⁺				Eγ: from (n,n′γ). Iγ: weighted average of 12 *5* in (n,n′γ), 23 *8* in β⁻ decay.
1360.38	(4⁺)	238.8[a] *6*	100[a] *28*	1121.440	2⁺				
		996.3[a] *2*	<500[a]	364.069	4⁺				
		1249.8[a] *10*	<44[a]	111.2174	2⁺				
1386.296	2⁺	380.34 *4*	3.9 *10*	1005.971	3⁺	M1+E2	1.3 *+23−6*	0.070 *22*	B(M1)(W.u.)=0.003 *+6−3*; B(E2)(W.u.)=13 *+18−13* Eγ: from ε decay (35.4 d). Other Iγ: 4.2 *11* in ε decay (35.4 d).
		482.92 *3*	15.8 *18*	903.307	2⁺	M1+E2		0.042 *20*	Iγ: weighted average of 13.9 *28* in (n,γ) E=7.6 eV, 11.8 *25* in Coulomb excitation, 15.4 *28* in ε decay (35.4 d), 19.5 *20* in (n,γ) E=thermal. Mult.: small E0 component suggested in ε decay.
		1275.11[&] *3*	100[&] *5*	111.2174	2⁺	M1+E2	≥+3		B(M1)(W.u.)<0.00054; B(E2)(W.u.)>0.98 δ,Mult.: δ(M1,E2):−0.42 *4* or >18, <−50 from γ(θ,H,t) (1973Kr01), 1.2 *+10−5* from α(K)exp if no E0 in ε decay (35.4 d), but 1974Mc08 suggest the possible presence of an E0 component; δ=+6 *+6−3* from γ(θ) in Coulomb excitation (1971Mi08), where this larger solution is considered the more likely. The evaluator adopts δ≥+3.
		1386.302 *17*	81 *3*	0.0	0⁺	E2		0.00242 *4*	B(E2)(W.u.)=0.66 *7* Iγ: weighted average of 83 *17* in (n,γ) E=7.6 eV, 70 *7* in (n,n′γ), 86 *4* in ε decay (35.4 d), 80 *4* in (n,γ) E=thermal. Other Iγ: 84 in Coulomb excitation.

Adopted Levels, Gammas (continued)

$\gamma(^{184}W)$ (continued)

E_i(level)	J^π_i	E_γ[†]	I_γ[†]	E_f	J^π_f	Mult.[‡]	δ[‡]	α[c]	Comments
1425.003	$(3)^+$	203.56 *10*	13.1 *24*	1221.308	3^-	[E1]		0.0599	Other Iγ: 16 *8* in (n,γ) E=7.6 eV, 6 *3* in β^- decay, 11 *3* in (n,n′γ).
		294.962 *15*	100 *5*	1130.045	$(2)^-$	E1		0.0238	
		1060.85 *15*	11.4 *15*	364.069	4^+	E2		0.00401 *6*	Iγ: weighted average of 13 *3* in (n,γ) E=7.6 eV, 15 *4* in β^- decay, 11.9 *23* in ε decay (35.4 d), 7 *3* in (n,n′γ). Other: 36 *4* in (n,γ) E=thermal.
		1313.79 *4*	58 *6*	111.2174	2^+	E2		0.00266 *4*	Eγ: from ε decay (35.4 d). Iγ: weighted average of 57 *11* in (n,γ) E=7.6 eV, 69 *10* in β^- decay, 51 *4* in ε decay (35.4 d), 74 *7* in (n,γ) E=thermal. Other Iγ: <43 in (n,n′γ).
1431.02	2^+	424.36[e] *15*	8.3 *19*	1005.971	3^+				
		1319.84 *6*	100 *6*	111.2174	2^+	M1+E2+E0			
		1430.97 *6*	79 *6*	0.0	0^+	E2		0.00230 *4*	B(E2)(W.u.)<0.13
1446.266	6^-	161.269[@] *15*	100[@]	1284.997	5^-	M1+E2	0.53 *7*	1.09 *3*	
1476.9	6^+	224.7		1252.2	8^+	E2		0.210	B(E2)(W.u.)=2.5 *+18−4* B(E2)(W.u.): From measured B(E2)↑=0.0119 *+85−21* in Coulomb excitation. Eγ: from Coulomb excitation.
		343.1		1133.850	4^+	E2		0.0574	B(E2)(W.u.)=179 *+8−10* Eγ: from Coulomb excitation. B(E2)(W.u.): From measured B(E2)↑=1.60 *+7−9* in Coulomb excitation.
		728.6		748.320	6^+	M1+E2	−4 *+1−15*	0.0095 *8*	B(E2)(W.u.)=10.5 *5* Eγ: from Coulomb excitation. B(E2)(W.u.): From measured B(E2)↑=0.065 *3* in Coulomb excitation. Mult.,δ: from Coulomb excitation.
		1112.9		364.069	4^+	E2		0.00364 *6*	B(E2)(W.u.)=1.13 *7* Eγ: from Coulomb excitation. B(E2)(W.u.): From measured B(E2)↑=0.0101 *+5−6* in Coulomb excitation.
1501.545	7^-	55.2790[@] *8*	24.5[@] *25*	1446.266	6^-	M1+E2	0.051 *17*	4.68 *12*	B(M1)(W.u.)=0.0052 *7*; B(E2)(W.u.)=1.8 *13*
		216.547[@] *12*	100.0[@] *21*	1284.997	5^-	E2		0.237	B(E2)(W.u.)=3.09 *23*
1523.27	(3^+)	1412.05 *8*	100	111.2174	2^+				
1536.66	(4^+)	112[e]		1425.003	$(3)^+$				Eγ: from β^- decay.
		191.0[#] *5*	12[#] *5*	1345.37	(4^-)	[E1]		0.0704 *11*	
		315.4[#] *4*	100[#] *24*	1221.308	3^-				
		1172.1[#] *5*	83[#] *24*	364.069	4^+				
		1425.54[#] *20*	56[#] *5*	111.2174	2^+				Other Iγ: 77 *19* from (n,γ) E=thermal.
1570.2	(2^+)	145.6[e] *8*	2.6×10^2 *13*	1425.003	$(3)^+$				Eγ,Iγ: from (n,γ) E=7.6 eV. γ should have been seen

From ENSDF

$^{184}_{74}W_{110}$-16

$\gamma(^{184}W)$ (continued)

E_i(level)	J^π_i	E_γ[†]	I_γ[†]	E_f	J^π_f	Mult.[‡]	α[c]	Comments
								in (n,γ) E=thermal also, but was not, rendering this placement questionable.
1570.2	(2⁺)	1570.19 *25*	100 *40*	0.0	0⁺			I_γ: from (n,γ) E=7.6 eV.
1581.46	(6⁻)	296.46[#] *10*	100[#]	1284.997	5⁻			
1613.512	(1⁺)	607.620 *25*	100 *6*	1005.971	3⁺			
		710.08 *3*	94 *10*	903.307	2⁺			
		1502.35 *8*	24 *12*	111.2174	2⁺			
1614.90	(1,2)⁺	711.58 *6*	100 *10*	903.307	2⁺			
		1503.74 *15*	54 *14*	111.2174	2⁺			Other Iγ: 77 *18* from (n,γ) E=7.6 eV; 61 from (n,γ) E=thermal: γγ coin.
		1614.6[b]	3.9[b] *14*	0.0	0⁺			E_γ: γ reported only in (n,γ) E=thermal: γγ coin.
1627.71	(1)⁺	241.46 *6*	4.9 *10*	1386.296	2⁺	[M1]	0.396	
		724.39 *3*	100 *5*	903.307	2⁺			
1661.09		526.8[a] *4*	100[a] *31*	1133.850	4⁺			
		655.5[a] *3*	<300[a]	1005.971	3⁺			
		757.6[a] *3*	<1000[a]	903.307	2⁺			
		1550.4[a] *10*	<38[a]	111.2174	2⁺			
1676.42	(5⁺)	331.06[#] *12*	74[#] *17*	1345.37	(4⁻)			
		381.6[#] *5*	100[#] *52*	1294.94	5⁺			
		1312.2[#] *4*	61[#] *17*	364.069	4⁺			
1683.4		1319.6[a] *5*	<670[a]	364.069	4⁺			
		1571.5[a] *8*	100[a] *50*	111.2174	2⁺			
1699.04	(5)⁺	≈162[#]	2.3[#] *10*	1536.66	(4⁺)	[M1]	1.202	I_γ: possibly overestimated; see comment on this γ in β^- decay data set.
		≈253[#]	6.8[#] *20*	1446.266	6⁻	[E1]	0.0347	
		274.07[#] *7*	0.60[#] *6*	1425.003	(3)⁺	[E2]	0.1118	
		354.0[#] *2*	0.20[#] *8*	1345.37	(4⁻)	[E1]	0.01544	
		414.01[#] *5*	100[#]	1284.997	5⁻	E1	0.01078	Mult.: from ^{184}Ta β^- decay.
		1334.9 *3*	0.07 *2*	364.069	4⁺			
1713.47	(0)⁺	810.16 *10*	100	903.307	2⁺			
1746.03	(6)⁺	244.44[#] *6*	33[#] *4*	1501.545	7⁻	[E1]	0.0378	
		299.79[#] *9*	4.4[#] *5*	1446.266	6⁻	[E1]	0.0229	
		461.06[#] *5*	100[#] *3*	1284.997	5⁻	E1	0.00848 *12*	Mult.: from ^{184}Ta β^- decay.
1775.34	(2)⁺	769.44 *3*	51 *24*	1005.971	3⁺			Other Iγ: 109 *47* from (n,γ) E=7.6 eV.
		871.56 *8*	100 *21*	903.307	2⁺			
		1412.4[e] *5*		364.069	4⁺			Eγ and placement from (n,n′γ) for doubly-placed γ.
1808.27	(2⁺)	586.94[e] *7*	44 *4*	1221.308	3⁻			
		678.17 *6*	100 *9*	1130.045	(2)⁻			

$^{184}_{74}W_{110}$-17

Adopted Levels, Gammas (continued)

$\gamma(^{184}W)$ (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[†]	E_f	J_f^π	Mult.[‡]	δ[‡]	α[c]	Comments
1808.27	(2^+)	802.53 *20*	41 *9*	1005.971	3^+				Other Iγ: 26 *6* from (n,γ) E=7.6 eV.
		1444.5 *3*	79 *21*	364.069	4^+				
		1697.5 *3*	91 *15*	111.2174	2^+				
		1808.5 *4*	68 *15*	0.0	0^+				
1860.8	10^+	608.6	100	1252.2	8^+	E2		0.01309	B(E2)(W.u.)=189 *+11−8* E_γ,Mult.: from Coulomb excitation.
1876.71	$(2)^+$	655.38 *12*	26 *5*	1221.308	3^-				
		746.59 *15*	47 *11*	1130.045	$(2)^-$				
		1765.6 *4*	100 *29*	111.2174	2^+				
		1877.3 *4*	92 *18*	0.0	0^+				
1894.3	$(2^+,3)$	763.6[a] *6*	100[a] *39*	1130.045	$(2)^-$				
		1530.5[a] *8*	16[a] *8*	364.069	4^+				
		1783.6[a] *6*	37[a] *11*	111.2174	2^+				
1925.4	8^+	64.6		1860.8	10^+	E2		24.0	B(E2)(W.u.)=2.2 *+22−13* B(E2)(W.u.): From measured B(E2)↑=0.011 *+11−7* in Coulomb excitation. E_γ: from level energy difference.
		448.7		1476.9	6^+	E2		0.0276	B(E2)(W.u.)=221 *+14−9* E_γ: from Coulomb excitation. B(E2)(W.u.): From measured B(E2)↑=1.79 *+11−7* in Coulomb excitation.
		673		1252.2	8^+	M1+E2	−2.3 *+42−4*	0.0129 *10*	B(E2)(W.u.)=11.0 *+8−26* E_γ: from ^{198}Pt(^{136}Xe,Xγ). B(E2)(W.u.): From measured B(E2)↑=0.069 *+5−16* in Coulomb excitation. Mult.,δ: from Coulomb excitation.
		1177.3		748.320	6^+	E2		0.00327 *5*	B(E2)(W.u.)=0.63 *+6−11* E_γ: from Coulomb excitation. B(E2)(W.u.): From measured B(E2)↑=0.0052 *+5−9* in Coulomb excitation.
1995.4	$1^{(-)}$	1995.35 *25*	100	0.0	0^+	D			Mult.: from γ anisotropy in (γ,γ′).
2012.94	$(2)^+$	882.75[d] *15*	<185[d]	1130.045	$(2)^-$				
		1007.03[d] *12*	<235[d]	1005.971	3^+				
		1901.9 *3*	100 *31*	111.2174	2^+				
2029.83	$(5^-,6,7^-)$	528.28[#] *6*	100[#]	1501.545	7^-				
2031.3	0^+	1920.1 *4*	100	111.2174	2^+				
2035.56	$1^+,2^+$	1132.36 *20*	17 *3*	903.307	2^+				
		2035.1 *4*	100 *20*	0.0	0^+				
2056.41	$(1)^-$	1945.3 *3*	100 *15*	111.2174	2^+	[E1]			B(E1)(W.u.)=0.00062 *16* I_γ: from (γ,γ′).
		2056.34 *20*	76	0.0	0^+	[E1]			B(E1)(W.u.)=0.00040 *9* I_γ: from (γ,γ′).

$^{184}_{74}W_{110}$-18

γ(^{184}W) (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[†]	E_f	J_f^π	Mult.[‡]	Comments
2060.8		635.92[e] *8*	27 *4*	1425.003	(3)$^+$		Other Iγ: 8.6 *21* from (n,γ) E=7.6 eV.
		1949.60 *25*	100 *15*	111.2174	2$^+$		
2097.7	(1)$^+$	1986.6 *4*	81 *17*	111.2174	2$^+$		
		2097.6 *4*	100 *14*	0.0	0$^+$	[M1]	B(M1)(W.u.)=0.043 *10*
2104.20	(2)$^+$	782.2[d] *3*	26[d] *9*	1322.152	(0)$^+$		
		982.44[d] *18*	41[d] *9*	1121.440	2$^+$		
		1098.28[d] *8*	100[d] *9*	1005.971	3$^+$		
2112.49		982.44[d] *18*	100[d]	1130.045	(2)$^-$		
2124.6	(1,2$^+$)	1121.4	47 *18*	1002.49	0$^+$		
		1222.0	100 *9*	903.307	2$^+$		
2126.07		996.06 *5*	52 *5*	1130.045	(2)$^-$		Other Iγ: 66 *13* in (n,γ) E=7.6 eV.
		1004.47 *8*	44 *5*	1121.440	2$^+$		Other Iγ: 41 *8* in (n,γ) E=7.6 eV.
		2015.32 *20*	100 *10*	111.2174	2$^+$		Other Iγ: 100 *41* in (n,γ) E=7.6 eV.
2168.19	(1)$^+$	743.19 *4*	66 *14*	1425.003	(3)$^+$		I$_\gamma$: from (n,γ) E=7.6 eV.
		782.2[de] *3*	<28[d]	1386.296	2$^+$		I$_\gamma$: if I(1046γ)=34.
		846.21 *25*	34 *10*	1322.152	(0)$^+$		I$_\gamma$: if I(1046γ)=34.
		1046.4 *3*	34 *8*	1121.440	2$^+$		I$_\gamma$: from (n,γ) E=7.6 eV.
		≈1264.7	20 *4*	903.307	2$^+$		E$_\gamma$,I$_\gamma$: from (n,γ) E=7.6 eV. Other Iγ: 14 *7* from (n,γ) E=thermal; 29 *11* from (n,γ) E=thermal: $\gamma\gamma$ coin.
		2056.5 *5*	100 *4*	111.2174	2$^+$		E$_\gamma$,I$_\gamma$: from (n,γ) E=7.6 eV.
		2168.0 *5*	10 *4*	0.0	0$^+$		E$_\gamma$,I$_\gamma$: from (n,γ) E=7.6 eV. Other Iγ: 62 *10* from (n,γ) E=thermal: $\gamma\gamma$ coin.
2221.77	(≤4)	446.64 *25*	21 *6*	1775.34	(2)$^+$		
		2110.0 *4*	100 *26*	111.2174	2$^+$		
2222.8	(2$^+$,3,4$^+$)	≈1319.5[e]		903.307	2$^+$		E$_\gamma$: from ^{183}W(n,γ) 7.6 eV; doubly-placed γ.
		1858.7 *5*		364.069	4$^+$		E$_\gamma$: from ^{183}W(n,γ) 7.6 eV.
2228.30?	(2$^-$,3,4$^-$)	882.75[d] *15*	60[d] *12*	1345.37	(4$^-$)		
		1007.03[d] *12*	82[d] *9*	1221.308	3$^-$		
		1098.28[d] *8*	100[d] *10*	1130.045	(2)$^-$		
2246.3	(2)$^+$	2135.1 *3*	100 *41*	111.2174	2$^+$		I$_\gamma$: from (n,γ) E=7.6 eV.
		≈2245	38 *16*	0.0	0$^+$		E$_\gamma$,I$_\gamma$: from (n,γ) E=7.6 eV.
2294.61	(2)$^+$	1173.1[b]	8.4[b] *16*	1121.440	2$^+$		
		1391.23 *8*	46 *5*	903.307	2$^+$		
		2183.62 *15*	100 *15*	111.2174	2$^+$		
		2294.5[b]	4.9[b] *22*	0.0	0$^+$		
2320.4	(1$^-$,2$^-$)	1417.1[b]	100[b]	903.307	2$^+$		
2328.7?	(1,2$^+$)	2328.7 *5*	100	0.0	0$^+$		
2349.9		2349.9[b]	100[b]	0.0	0$^+$		
2370.1	(1)$^+$	2258.6 *4*	100 *26*	111.2174	2$^+$		

Adopted Levels, Gammas (continued)

$\gamma(^{184}W)$ (continued)

E_i(level)	J^π_i	E_γ[†]	I_γ[†]	E_f	J^π_f	Mult.[‡]	α[c]	Comments
2370.1	(1)+	2370.4 4	93 14	0.0	0+			
2389.14	(4−,5,6−)	359.2[#] 3	22[#] 6	2029.83	(5−,6,7−)			
		807.68[#] 10	100[#] 12	1581.46	(6−)			
		942.9[#] 4	21[#] 4	1446.266	6−			
		1043.1[#] 8	≈1.5[#]	1345.37	(4−)			
		1093.8[#] 10	4[#] 3	1294.94	5+			
		1104.4[#] 3	9[#] 4	1284.997	5−			
2390.3	(1)+	2279.1[b]	27[b] 9	111.2174	2+			
		2390.3[b]	100[b] 16	0.0	0+			
2395.8	(1)+	782.2[de] 3	<14[d]	1613.512	(1+)			
		1274.3[b]	20.6[b] 18	1121.440	2+			
		2031.7[b]	16[b] 3	364.069	4+			
		2284.2 4	100 6	111.2174	2+			I_γ: from (n,γ) E=thermal: $\gamma\gamma$ coin.
		2395.9 5	48 4	0.0	0+			I_γ: from (n,γ) E=thermal: $\gamma\gamma$ coin. Other: 37 14 in (n,γ) E=thermal.
2404.2	0+	1500.9[b]	100[b] 13	903.307	2+			
		2292.9[b]	49[b] 12	111.2174	2+			
2439.8		2328.6[b]	100[b]	111.2174	2+			
2458.4	1	2347.1[b]	19[b] 4	111.2174	2+			
		2458.4[b]	100[b] 9	0.0	0+	D		Mult.: from anisotropy in (γ,γ').
2471.7	10+	546.3	100	1925.4	8+	[E2]	0.0169	B(E2)(W.u.)=224 +12−41 E_γ: from Coulomb excitation.
2479.3	(8−,9,10+)	554		1925.4	8+			E_γ: from ^{198}Pt(^{136}Xe,Xγ).
		1227		1252.2	8+			E_γ: from ^{198}Pt(^{136}Xe,Xγ).
2492.67	(4−,5,6)	1046.4[#] 6	15[#] 5	1446.266	6−			
		1207.67[#] 10	100[#] 10	1284.997	5−			
2509.4		1606.1[b]	22[b] 7	903.307	2+			
		2398.1[b]	100[b] 13	111.2174	2+			
2520.7		2409.5[b]	100[b]	111.2174	2+			
2546.1	1	2435	44 11	111.2174	2+			E_γ,I_γ: from (γ,γ').
		2546 1	100	0.0	0+	D		E_γ,I_γ,Mult.: from (γ,γ').
2555.0		2443.8[b]	100[b]	111.2174	2+			
2557.0	12+	696.2	100	1860.8	10+	E2	0.00965 14	B(E2)(W.u.)=208 +19−17 E_γ,Mult.: from Coulomb excitation. B(E2)(W.u.): From measured B(E2)↑=1.54 +14−12 in Coulomb excitation.

From ENSDF

$^{184}_{74}W_{110}$-20

$\gamma(^{184}W)$ (continued)

E_i(level)	J^π_i	E_γ[†]	I_γ[†]	E_f	J^π_f	Mult.[‡]	Comments
2573.4		2462.2[b]	100[b]	111.2174	2^+		
2613.3		1710.0[b]	100[b] *26*	903.307	2^+		
		2502.1[b]	54[b] *21*	111.2174	2^+		
2618.8		2618.8[b]	100[b]	0.0	0^+		
2630.7		2519.4[b]	34[b] *9*	111.2174	2^+		
		2630.7[b]	100[b] *17*	0.0	0^+		
2649.0		2537.8[b]	100[b]	111.2174	2^+		
2655.8		2544.5[b]	39[b] *16*	111.2174	2^+		
		2655.8[b]	100[b] *26*	0.0	0^+		
2694.4	1	2694.4[b]	100[b]	0.0	0^+	D	Other Eγ: 2693 *1* from (γ,γ'). Mult.: from γ anisotropy in (γ,γ').
2706.7		1803.4[b]	100[b] *14*	903.307	2^+		
		2595.5[b]	32[b] *11*	111.2174	2^+		
		2706.7[b]	26[b] *13*	0.0	0^+		
2719.8		1816.5[b]	100[b]	903.307	2^+		
2732.5		2621.3[b]	100[b]	111.2174	2^+		
2739.3		260		2479.3	$(8^-,9,10^+)$		E_γ: from $^{198}Pt(^{136}Xe,X\gamma)$.
2757.6		2646.4[b]	100[b]	111.2174	2^+		
2763.2	1	2397.1[b]	20[b] *5*	364.069	4^+		
		2651.9[b]	82[b] *12*	111.2174	2^+		
		2763.2[b]	100[b] *12*	0.0	0^+	D	Mult.: from γ anisotropy in (γ,γ').
2767.6		2656.3[b]	100[b] *16*	111.2174	2^+		
		2767.6[b]	25[b] *9*	0.0	0^+		
2798.2		2798.2[b]	100[b]	0.0	0^+		
2802.7		2691.5[b]	100[b]	111.2174	2^+		
2813		2813 *1*	100	0.0	0^+		E_γ: from (γ,γ').
2815.0		2450.9[b]	25[b] *5*	364.069	4^+		
		2703.7[b]	100[b] *10*	111.2174	2^+		
2825.1	0^+	1921.8[b]	63[b] *25*	903.307	2^+		
		2713.9[b]	100[b] *28*	111.2174	2^+		
2836.9		2725.7[b]	100[b]	111.2174	2^+		
2870.5	(0^+)	1967.2[b]	100[b]	903.307	2^+		
2892.1	1	2780.9	35 *12*	111.2174	2^+		E_γ: from (n,γ) E=thermal: $\gamma\gamma$ coin. I_γ: from (γ,γ'). Other: 25 *13* from (n,γ) E=thermal: $\gamma\gamma$ coin.

$^{184}_{74}W_{110}$-21

Adopted Levels, Gammas (continued)

$\gamma(^{184}W)$ (continued)

E_i(level)	J^π_i	E_γ [†]	I_γ [†]	E_f	J^π_f	Mult. [‡]	α [c]	Comments
2892.1	1	2892.1	100	0.0	0^+	D		E_γ: from (n,γ) E=thermal: $\gamma\gamma$ coin. I_γ: from (γ,γ'). Mult.: from γ anisotropy in (γ,γ').
2905.8		2000.8[b]	100[b] *25*	903.307	2^+			
		2905.8[b]	49[b] *25*	0.0	0^+			
2919.5		2808.3[b]	100[b]	111.2174	2^+			
2946.8		2043.5[b]	100[b] *47*	903.307	2^+			
		2835.5[b]	91[b] *47*	111.2174	2^+			
2951.0	1	2839.7	56 *11*	111.2174	2^+			E_γ: from (n,γ) E=thermal: $\gamma\gamma$ coin. I_γ: from (γ,γ'). Other: 34 *21* from (n,γ) E=thermal: $\gamma\gamma$ coin.
		2951.0	100	0.0	0^+	D		E_γ: from (n,γ) E=thermal: $\gamma\gamma$ coin. I_γ: from (γ,γ'). Mult.: from γ anisotropy in (γ,γ').
2968.7	(1^+)	2857.4[b]	33[b] *7*	111.2174	2^+			
		2968.7[b]	100[b] *24*	0.0	0^+			
2983.6		2983.6[b]	100[b]	0.0	0^+			
3017.1		3017.1[b]	100[b]	0.0	0^+			
3022.9		2911.6[b]	71[b] *29*	111.2174	2^+			
		3022.9[b]	100[b] *20*	0.0	0^+			
3029.0		2917.8[b]	100[b]	111.2174	2^+			
3037.1	(1^+)	1915.7[b]	100[b] *22*	1121.440	2^+			
		2925.9[b]	78[b] *24*	111.2174	2^+			
		3037.1[b]	90[b] *31*	0.0	0^+			
3053.4		2942.2[b]	100[b]	111.2174	2^+			
3060.3		321		2739.3				E_γ: from ^{198}Pt(^{136}Xe,Xγ).
		581[e]		2479.3	$(8^-,9,10^+)$			E_γ: from ^{198}Pt(^{136}Xe,Xγ).
3068.5		2957.3[b]	100[b]	111.2174	2^+			
3071.2	1	3071.2[b]	100[b]	0.0	0^+	D		Mult.: from γ anisotropy in (γ,γ').
3084.0	1	3084 *1*	100	0.0	0^+	D		E_γ,I_γ: from (γ,γ'). Mult.: from γ anisotropy in (γ,γ').
3088	1	3088 *1*	100	0.0	0^+	D		E_γ,I_γ: from (γ,γ'). Mult.: from γ anisotropy in (γ,γ').
3104.2		2200.9[b]	42[b] *7*	903.307	2^+			
		2992.9[b]	28[b] *7*	111.2174	2^+			
		3104.2[b]	100[b] *12*	0.0	0^+			
3108.8?	(12^+)	637.1[e]	100	2471.7	10^+	[E2]	0.01178	B(E2)(W.u.)=245 *+21−97*

$^{184}_{74}W_{110}$-22

$\gamma(^{184}W)$ (continued)

E_i(level)	J^π_i	E_γ [†]	I_γ [†]	E_f	J^π_f	Mult. [‡]	α [c]	Comments
								E_γ: from Coulomb excitation. B(E2)(W.u.): From measured B(E2)↑=1.79 +*15*−*71* in Coulomb excitation.
3124	1	3124 *1*	100	0.0	0^+	D		E_γ,I_γ: from (γ,γ'). Mult.: from γ anisotropy in (γ,γ').
3133	1	3133 *1*	100	0.0	0^+	D		Mult.,E_γ: from γ anisotropy in (γ,γ').
3134.6		2231.3[b]	100[b]	903.307	2^+			
3136.8		3136.8[b]	100[b]	0.0	0^+			
3164.1		3052.9[b]	78[b] *32*	111.2174	2^+			
		3164.1[b]	100[b] *28*	0.0	0^+			
3166.2		3055.0[b]	100[b]	111.2174	2^+			
3169.1		3057.9[b]	100[b]	111.2174	2^+			
3177.9		3177.9[b]	100[b]	0.0	0^+			
3183.8		3072.6[b]	100[b]	111.2174	2^+			
3187.1		3075.9[b]	100[b]	111.2174	2^+			
3193.3		3082.1[b]	100[b]	111.2174	2^+			
3201.8		3090.6[b]	100[b]	111.2174	2^+			
3224.6		3113.4[b]	100[b]	111.2174	2^+			
3226.3		2323.0[b]	100[b]	903.307	2^+			
3233.7		2330.4[b]	78[b] *40*	903.307	2^+			
		3122.4[b]	100[b] *36*	111.2174	2^+			
3248.8		3137.6[b]	100[b]	111.2174	2^+			
3264.0		3264.0[b]	100[b]	0.0	0^+			
3266.4		3155.2[b]	100[b]	111.2174	2^+			
3288.3		2385.0[b]	100[b]	903.307	2^+			
3290.0		3290.0[b]	100[b]	0.0	0^+			
3293.5		3293.5[b]	100[b]	0.0	0^+			
3304.3		2401.4[b]	100[b]	903.307	2^+			
3307.4		3196.2[b]	100[b]	111.2174	2^+			
3318.5		3207.3[b]	100[b]	111.2174	2^+			
3319.9	14^+	762.9	100	2557.0	12^+	[E2]	0.0079	B(E2)(W.u.)=250 +*18*−*44* E_γ: from Coulomb excitation. B(E2)(W.u.): From measured B(E2)↑=1.80 +*13*−*32* in Coulomb excitation.
3329.2		3218.0[b]	100[b]	111.2174	2^+			
3341.4		3230.2[b]	100[b]	111.2174	2^+			

$^{184}_{74}W_{110}$-23

$\gamma(^{184}W)$ (continued)

E_i(level)	J^π_i	E_γ[†]	I_γ[†]	E_f	J^π_f	Mult.[‡]	Comments
3345.1		2223.7[b]	100[b]	1121.440	2^+		
3349.1		3237.9[b]	100[b]	111.2174	2^+		
3352.6		3241.4[b]	68[b] *23*	111.2174	2^+		
		3352.6[b]	100[b] *29*	0.0	0^+		
3372.9		3261.7[b]	100[b]	111.2174	2^+		
3377.5		3266.3[b]	100[b]	111.2174	2^+		
3384.3		3273.1[b]	100[b]	111.2174	2^+		
3392.0		3280.8[b]	84[b] *38*	111.2174	2^+		
		3392.0[b]	100[b] *46*	0.0	0^+		
3413.7		3302.5[b]	100[b]	111.2174	2^+		
3422.4		3311.2[b]	100[b]	111.2174	2^+		
		3422.4	81 *28*	0.0	0^+		E_γ: from (n,γ) E=thermal: $\gamma\gamma$ coin. I_γ: weighted average of 71 *39* from (n,γ) E=thermal: $\gamma\gamma$ coin, 91 *41* from (γ,γ').
3427.2		3316.0[b]	100[b]	111.2174	2^+		
3441.3		381		3060.3			E_γ: from ^{198}Pt(^{136}Xe,Xγ).
		702[e]		2739.3			E_γ: from ^{198}Pt(^{136}Xe,Xγ).
3448.2		3337.0[b]	100[b]	111.2174	2^+		
3455.6		3344.4[b]	100[b] *36*	111.2174	2^+		
		3455.6[b]	98[b] *38*	0.0	0^+		
3466.2	1	3355	100	111.2174	2^+		E_γ: from level energy difference.
		3466.2[b]	76[b] *13*	0.0	0^+	D	Other Eγ: 3464 *1* in (γ,γ'). I_γ: from (γ,γ').
3473.3		3362.1[b]	94[b] *42*	111.2174	2^+		
		3473.3[b]	100[b] *45*	0.0	0^+		
3488.2		3377.0[b]	100[b]	111.2174	2^+		
3500.7		3389.5[b]	98[b] *33*	111.2174	2^+		
		3500.7[b]	100[b] *38*	0.0	0^+		
3507.1	(1)	3396	70 *20*	111.2174	2^+		I_γ: from (γ,γ').
		3507 *1*	100	0.0	0^+	(D)	Mult.: from γ anisotropy in (γ,γ').
3516.2		3405.0[b]	100[b]	111.2174	2^+		
3522.5		3411.3[b]	100[b]	111.2174	2^+		
3571.1	(1)	3460	100	111.2174	2^+		
		3571 *1*	56 *12*	0.0	0^+	(D)	I_γ: from (γ,γ'). Mult.: from γ anisotropy in (γ,γ').
3618.1		3618.1[b]	100[b]	0.0	0^+		

$^{184}_{74}W_{110}$-24

Adopted Levels, Gammas (continued)

$\gamma(^{184}W)$ (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[†]	E_f	J_f^π	Mult.[‡]	α[c]	Comments
3633.1	1	3522	45 *12*	111.2174	2^+			I_γ: from (γ,γ').
		3633 *1*	100	0.0	0^+	D		Mult.: from γ anisotropy in (γ,γ').
3634.7		3523.5[b]	100[b] *24*	111.2174	2^+			
		3634.7[b]	80[b] *24*	0.0	0^+			
3649.2		3538.0[b]	100[b]	111.2174	2^+			
3654.2		3543.0[b]	100[b]	111.2174	2^+			
3670.3		3559.1[b]	100[b]	111.2174	2^+			
3682.1	(1)	3571	46 *14*	111.2174	2^+			E_γ,I_γ: from (γ,γ').
		3682 *1*	100	0.0	0^+	(D)		E_γ,I_γ: from (γ,γ'). Mult.: from γ anisotropy in (γ,γ').
3684.5		3573.3[b]	100[b]	111.2174	2^+			
3706.6		3595.4[b]	100[b]	111.2174	2^+			
3715.3		274	100	3441.3				E_γ: from $^{198}Pt(^{136}Xe,X\gamma)$ (2004Wh02.
3715.6		3604.4[b]	100[b]	111.2174	2^+			
3863.2	$(14^-,15,17^-)$	148	100	3715.3		(M1)	1.552	B(M1)(W.u.)=1.4×10^{-5} *3* E_γ: from $^{198}Pt(^{136}Xe,X\gamma)$. Mult.: α(exp)=4.3 *24* in $(^{136}Xe,X\gamma)$ favors M1, but uncertainty is large and authors do not rule out E2 and E1 which are within 2σ of deduced α(exp).
3962.4		3851.2[b]	37[b] *13*	111.2174	2^+			
		3962.4[b]	100[b] *20*	0.0	0^+			
4116.9	16^+	797.0	100	3319.9	14^+	[E2]	0.00720 *10*	B(E2)(W.u.)=225 *+23−58* E_γ: from Coulomb excitation. B(E2)(W.u.): From measured B(E2)↑=1.59 *+16−41* in Coulomb excitation.
4278.8		4167.5[b]	51[b] *18*	111.2174	2^+			
		4278.8[b]	100[b] *25*	0.0	0^+			
6543.5		6543.5[b]	100[b]	0.0	0^+			
6556.1		5433	28 *17*	1121.440	2^+			E_γ,I_γ: from (γ,γ').
		6444	64 *32*	111.2174	2^+			E_γ,I_γ: from (γ,γ').
		6555	100	0.0	0^+			E_γ,I_γ: from (γ,γ').
6580.8		6580.8[b]	100[b]	0.0	0^+			
6622.7		6511.5[b]	100[b]	111.2174	2^+			
6760.1	1^+	6648	71 *25*	111.2174	2^+			E_γ,I_γ: from (γ,γ').
		6760	100	0.0	0^+	M1		E_γ,I_γ,Mult.: from (γ,γ').

[†] From (n,γ) E=thermal, except as noted.

$^{184}_{74}W_{110}$-25

Adopted Levels, Gammas (continued)

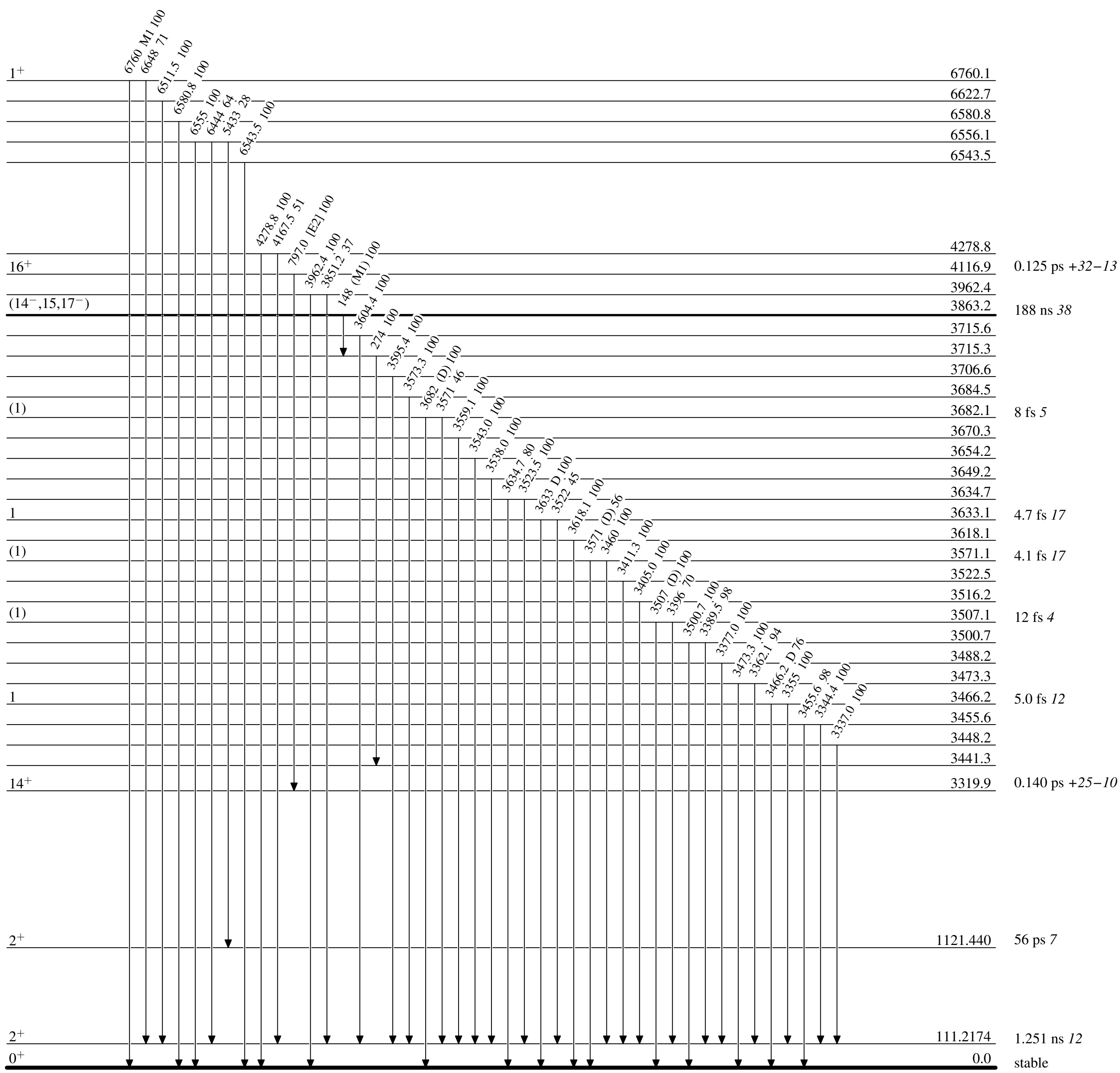
$\gamma(^{184}W)$ (continued)

‡ From ^{184}Re ε decay, except as noted.
# From β^- decay.
@ From ε decay (169 d).
& From ε decay (35.4 d).
[a] From (n,n′γ).
[b] From (n,γ) E=thermal: $\gamma\gamma$ coin.
[c] 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.
[d] Multiply placed with undivided intensity.
[e] Placement of transition in the level scheme is uncertain.

Adopted Levels, Gammas

Level Scheme

Intensities: Relative photon branching from each level



$^{184}_{74}W_{110}$

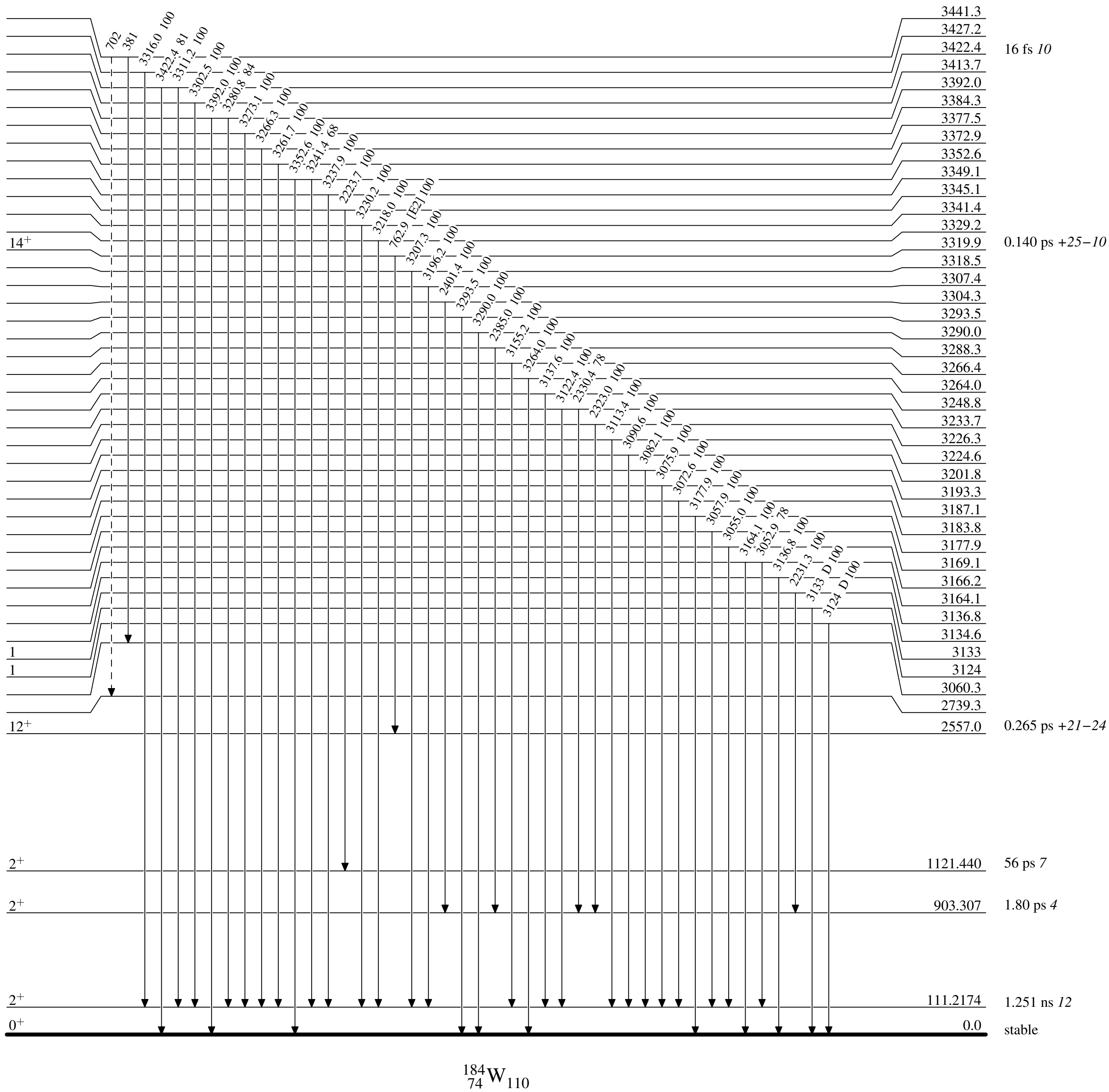
Adopted Levels, Gammas

Legend

Level Scheme (continued)

Intensities: Relative photon branching from each level

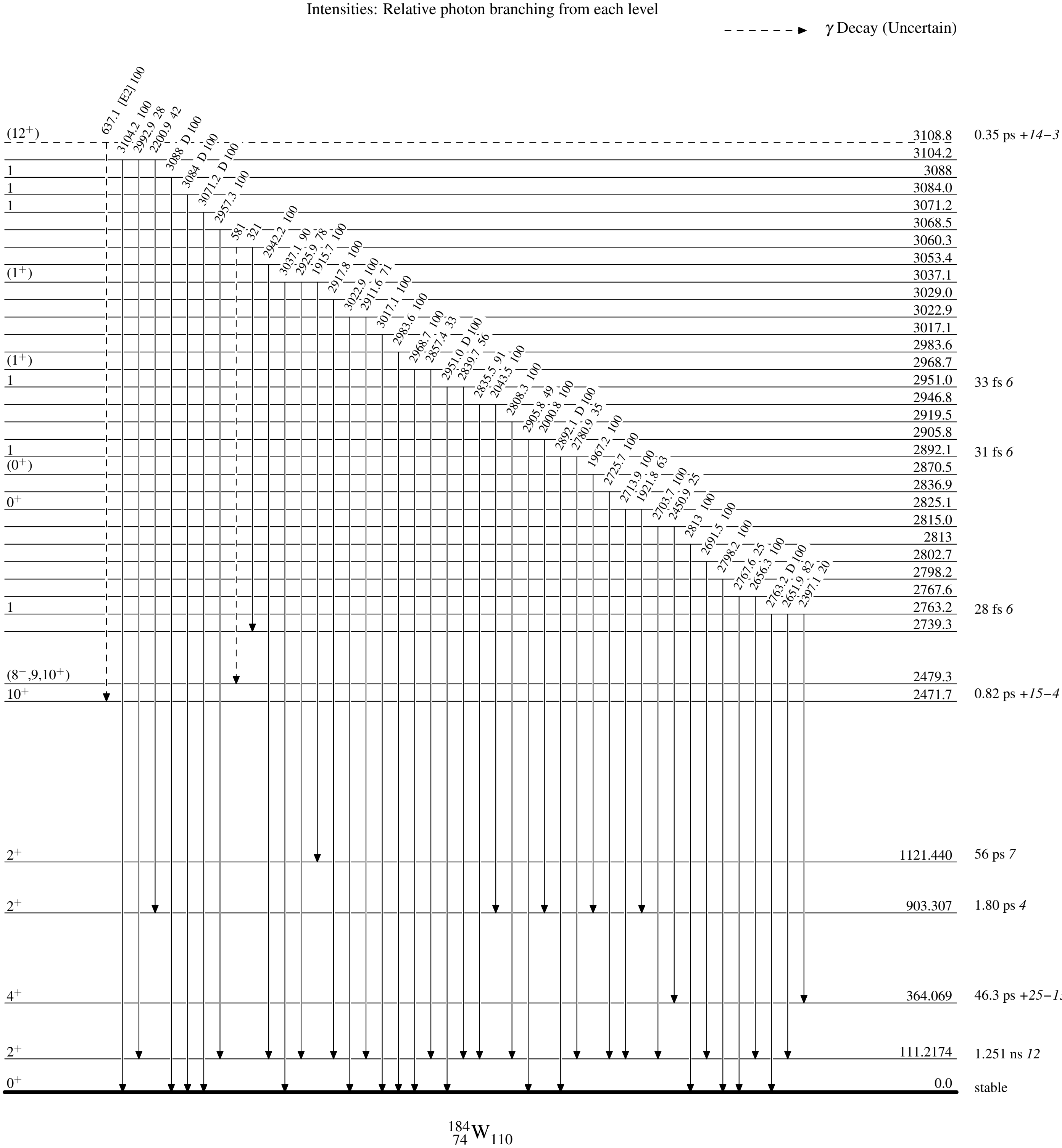
γ Decay (Uncertain)



Adopted Levels, Gammas

Level Scheme (continued)

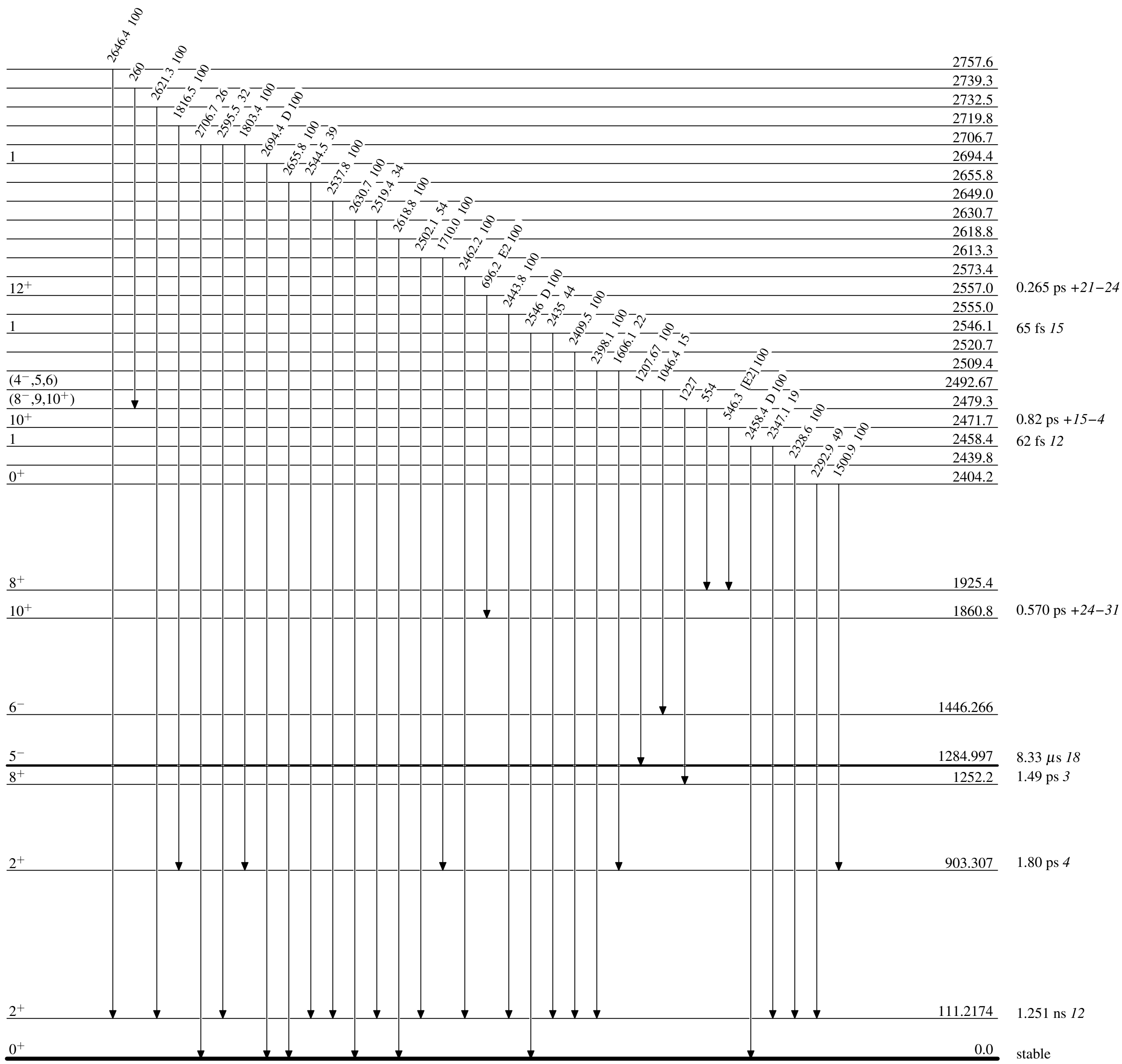
Intensities: Relative photon branching from each level



Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Relative photon branching from each level



$^{184}_{74}W_{110}$

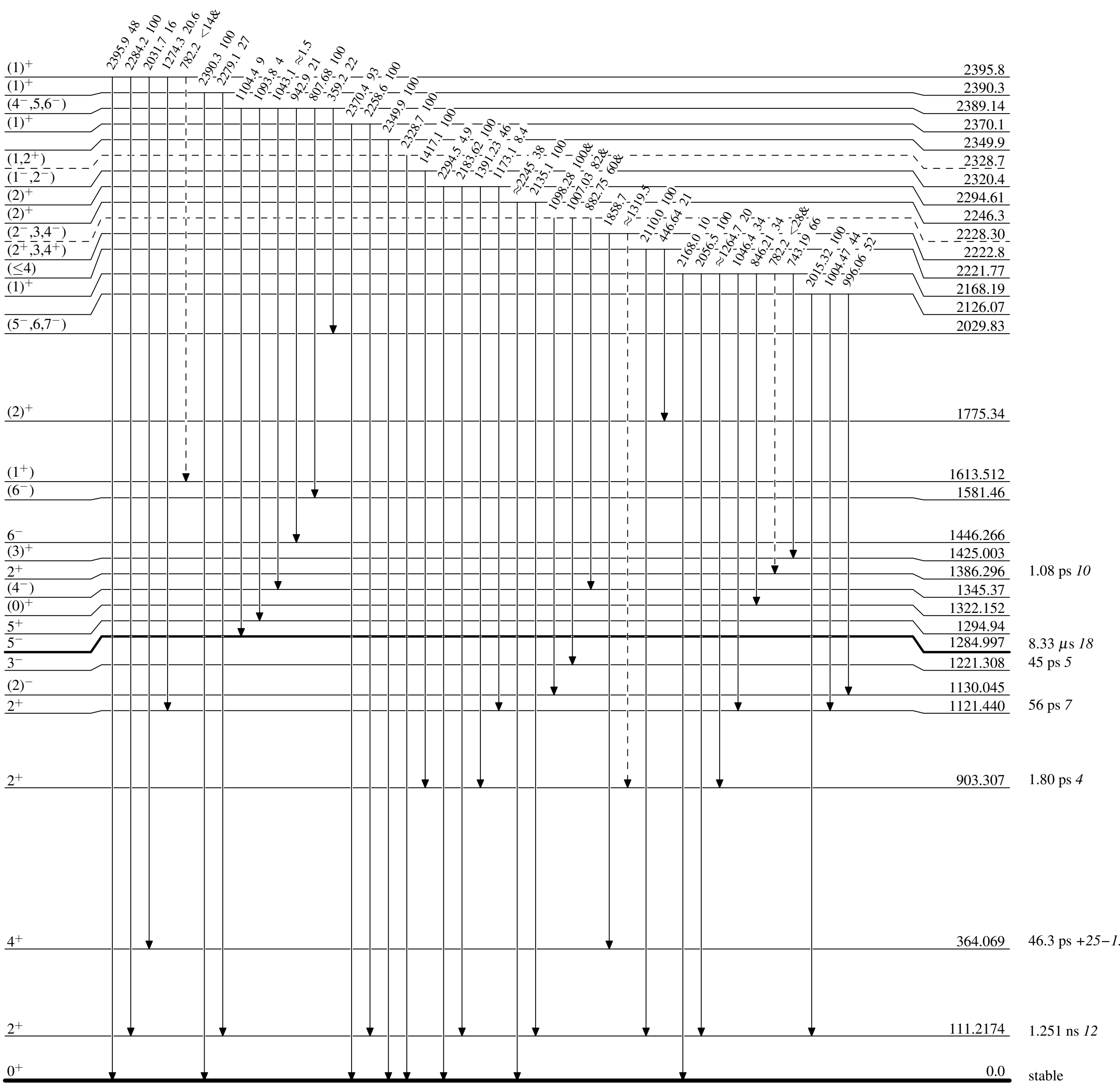
Adopted Levels, Gammas

Legend

Level Scheme (continued)

Intensities: Relative photon branching from each level
& Multiply placed: undivided intensity given

γ Decay (Uncertain)

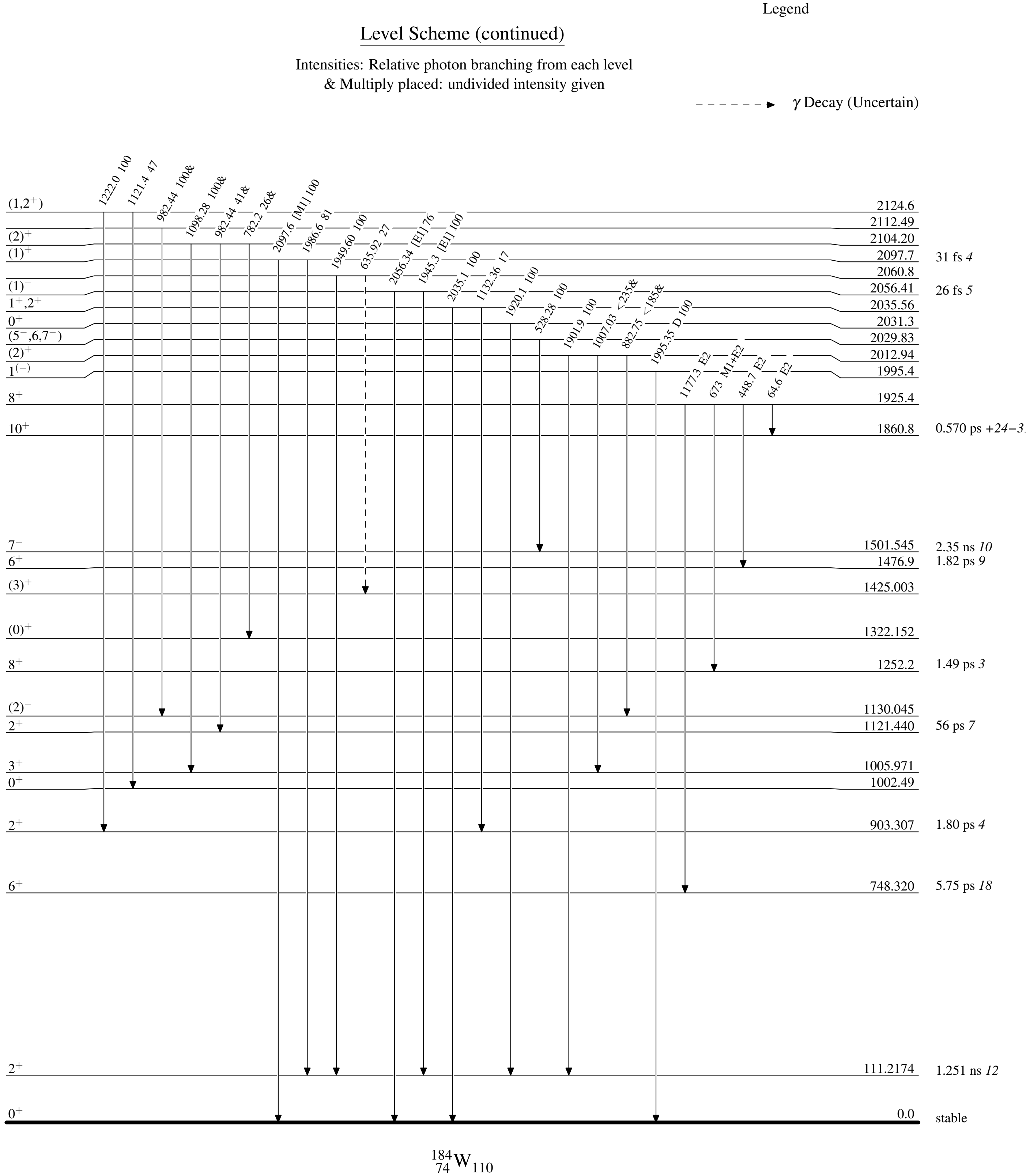


$^{184}_{74}W_{110}$

Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Relative photon branching from each level
& Multiply placed: undivided intensity given



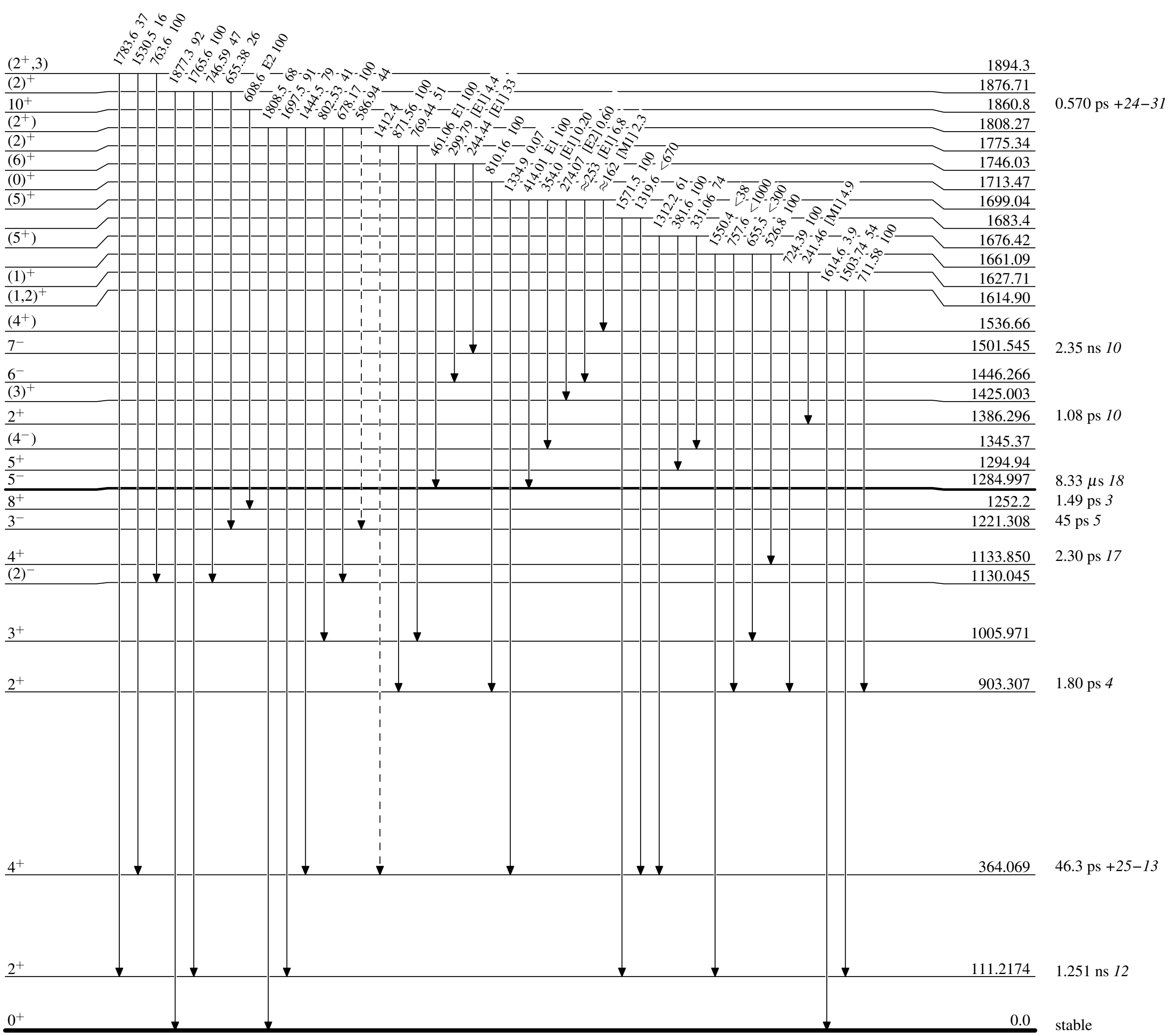
Adopted Levels, Gammas

Legend

Level Scheme (continued)

Intensities: Relative photon branching from each level
& Multiply placed: undivided intensity given

- - - - - - ► γ Decay (Uncertain)



$^{184}_{74}W_{110}$

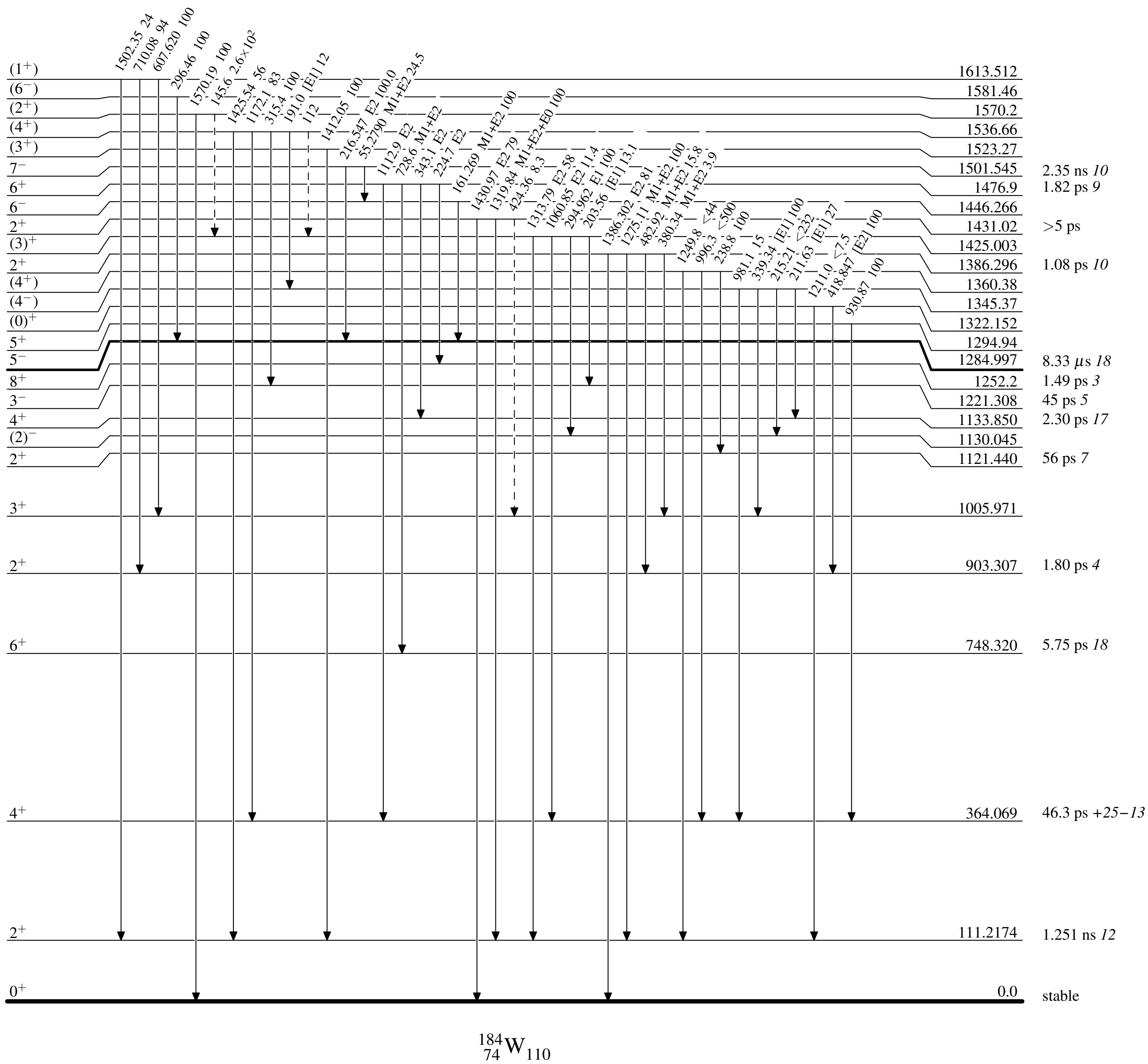
Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Relative photon branching from each level
& Multiply placed: undivided intensity given

Legend

γ Decay (Uncertain)

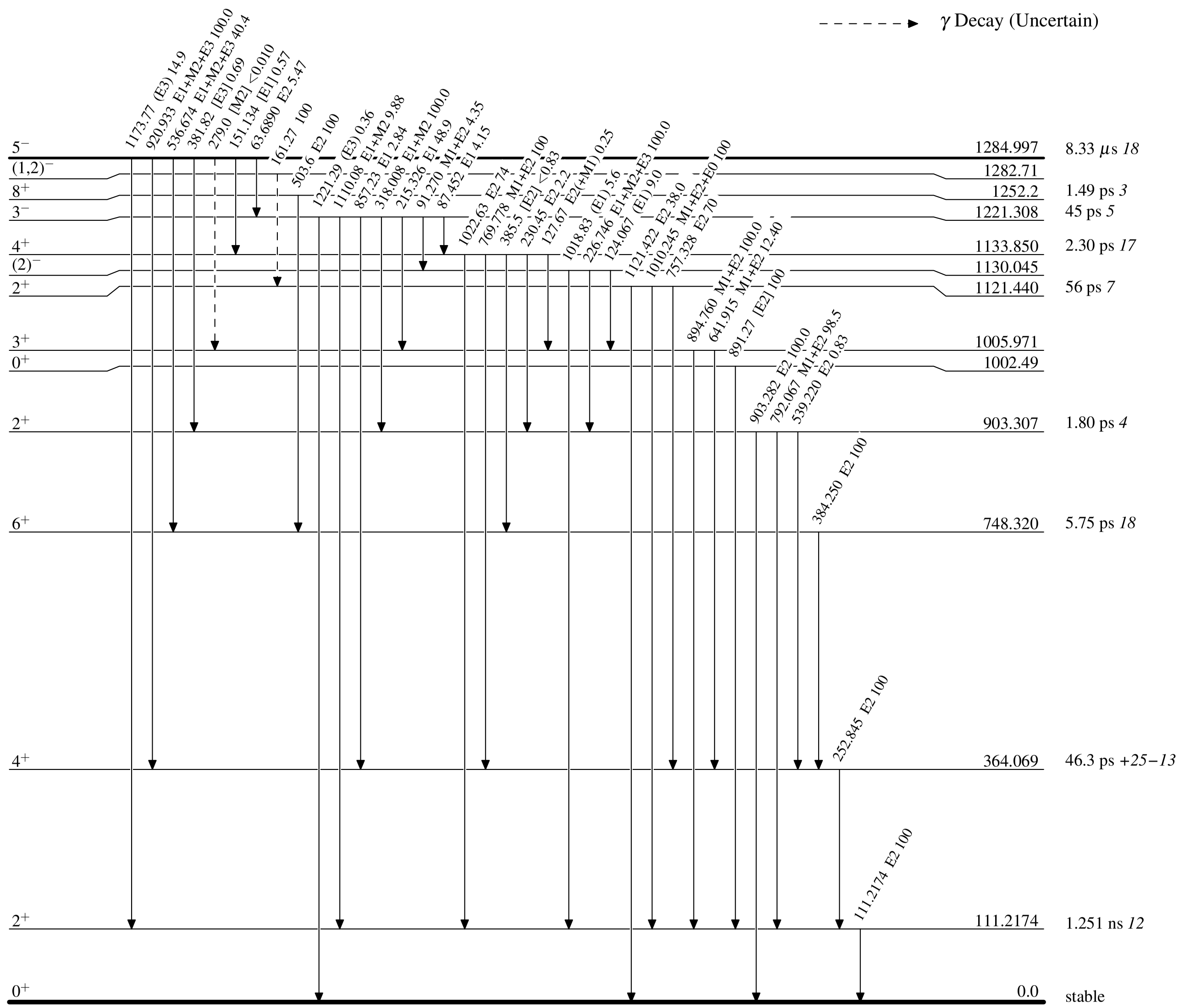


Adopted Levels, Gammas

Level Scheme (continued)

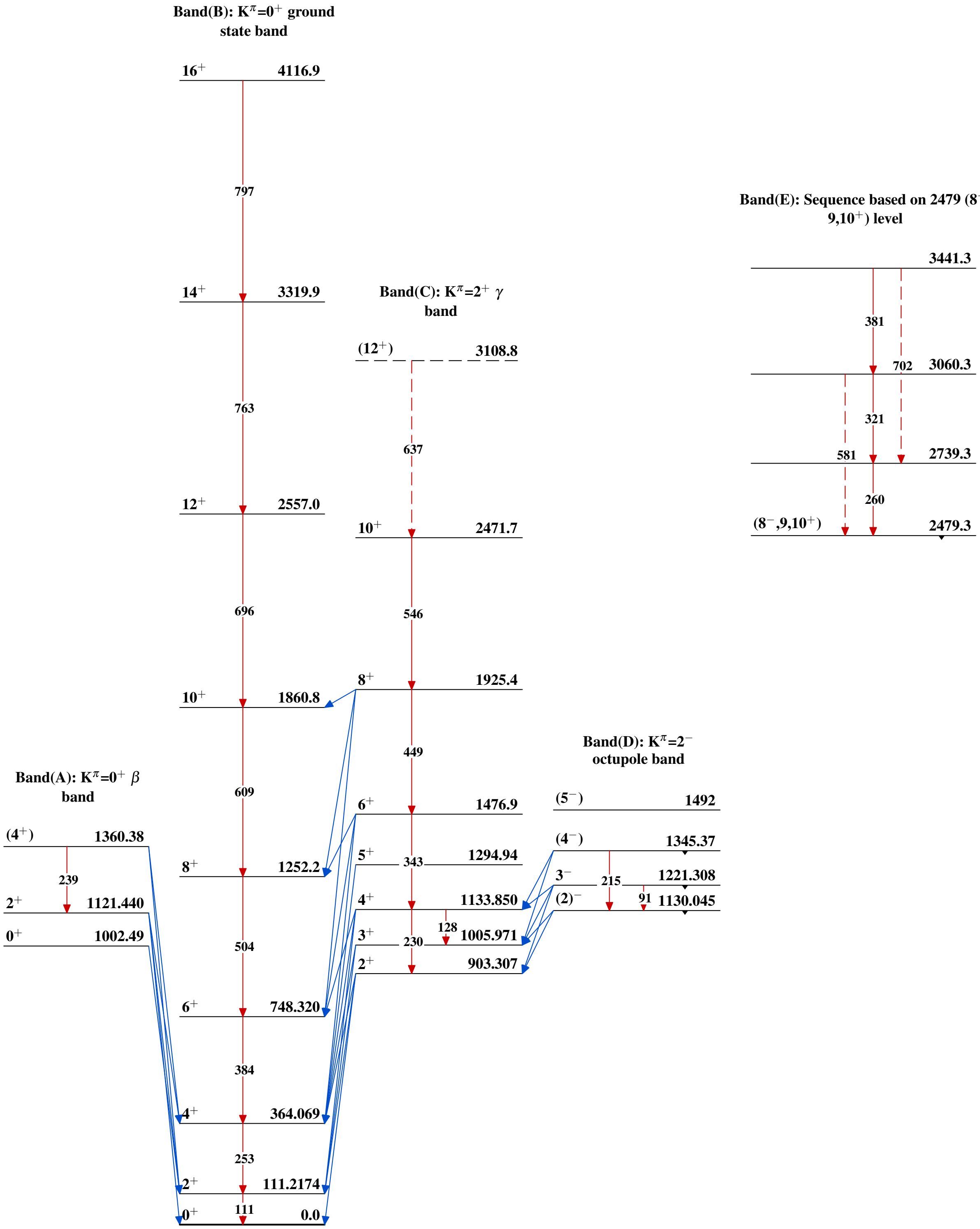
Intensities: Relative photon branching from each level
& Multiply placed: undivided intensity given

Legend



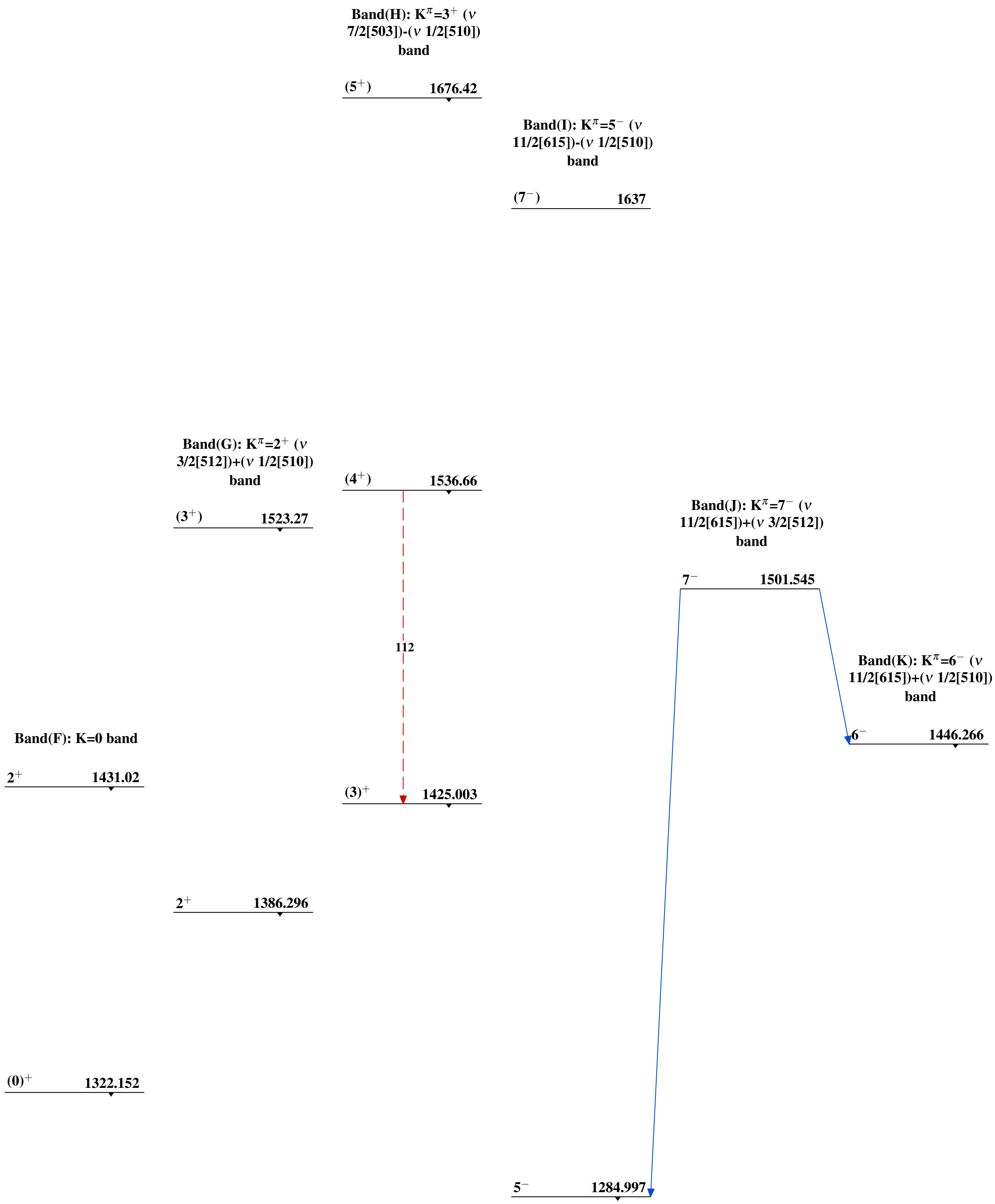
$^{184}_{74}W_{110}$

Adopted Levels, Gammas



$^{184}_{74}W_{110}$

Adopted Levels, Gammas (continued)



$^{184}_{74}W_{110}$

Adopted Levels, Gammas

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	J. C. Batchelder and A. M. Hurst, M. S. Basunia	NDS 183, 1 (2022)	1-Mar-2022

Q(β^-)=−581.3 *12*; S(n)=7192.0 *12*; S(p)=8403 *14*; Q(α)=1116 *6* 2021Wa16

Other Reactions:

Isotope shift data: see, e.g., 1988Au04, 1994Ji02, 1995Au08.

^{186}W Levels

Cross Reference (XREF) Flags

A	^{186}Ta β^- decay	E	^{186}W(n,n′γ)	I	^{186}W(^{136}Xe,^{136}Xe′γ)
B	^{186}Re ε decay (3.7185 d)	F	Coulomb excitation	J	^{186}W(^{238}U,^{238}U′γ): delayed γ′s
C	^{186}W(γ,γ′)	G	^{186}W(d,d′), (p,p′), (α,α′)		
D	^{186}W(n,n′)	H	^{184}W(t,p)		

E(level)[†]	J$^\pi$	T$_{1/2}$	XREF	Comments
0.0[&]	0$^+$	stable[@]	ABCDEFGHIJ	Δ<r^2>(^{186}W−^{184}W)=0.085 fm^2 *4* (1994Ji02).
122.632[&] *15*	2$^+$	1.040 ns *10*	ABCDEFGHIJ	μ=+0.621 *17* Q=−1.6 *3* μ: from Mossbauer and recoil into gas or vacuum (2020StZV, based on data of 1976St23). Other: 0.62 *3* from g-factor ratio in Coulomb excitation (1991St04). Q: from Coulomb excitation reorientation (2021StZZ, from 1977RuZV). Other data: Q/Q(2$^+$ ^{182}W)=0.882 *17* (1968Pe06), 0.908 *24* (1969Ch23), 0.906 *18* (1971Ob02). Q<0 (1973Kl08). T$_{1/2}$: Weighted ave. of 1.036 ns *10* (1975Ka11 – ^{186}Ta β^- decay), 1.08 ns *3* from B(E2)=3.42 *5* (see Coulomb Exci. dataset), 1.12 ns *7* (p,p′γ) (1959Bi10), and 1.01 ns *4* (α,α′γ) (1962Bi05) – considered following the systematics of B(E2) 2$^+$ → 0$^+$ values of neighboring even-even W isotopes (see 2016Pr01). Others: 1.30 ns *21* (1967As03), 1.116 ns *21* pulsed beam (1967Ku07); 1.38 ns *12* (1970Me09, Mossbauer); 1.39 ns *12* (1971Ob02, Mossbauer); ≥1.15 ns *6* (1972Hi14, Mossbauer) – all are listed in Coul. Exci. dataset. J$^\pi$: direct E2 Coulomb excitation from 0$^+$.
396.551[&] *18*	4$^+$	36.4 ps *25*	A DEFGHIJ	μ=+1.28 *10*; Q=−2.6 *13* B(E4)↑=0.14 *+15−10* μ: from transient field integral PAC (2020StZV – from 1985St07); relative to ^{186}W(123 keV level). Q: from Coulomb excitation reorientation (2021StZZ – from 1970McZQ). B(E4)↑: from Coulomb excitation. T$_{1/2}$: from B(E2)=1.63 *11* in Coulomb excitation. Other: 38 ps *3* (1986Bi13 – Coul. Exci. J$^\pi$: stretched E2 274γ to 2$^+$; Coulomb excited member of g.s. band.
737.960[a] *20*	2$^+$	4.78 ps *16*	A CDEFGHIJ	μ=+0.39 *8* Q=+1.3 *3* μ: from transient field integral PAC (2020StZV, from 1985St07); relative to ^{186}W(123 keV level). Q: from Coulomb excitation reorientation (2021StZZ, from 1977Ob02). Other: 1.3 *3* (2014StZZ from revised value of 1.2 *3* (1977Mc11). Opposite signs in 2016St14 compared to those in 1977Ob02 and 1977Mc11. 0.7 *4* (1970McZQ). T$_{1/2}$: from B(E2)=0.140 *4* in Coulomb excitation.

Continued on next page (footnotes at end of table)

Adopted Levels, Gammas (continued)

^{186}W Levels (continued)

E(level)[†]	J^{π}	$T_{1/2}$	XREF	Comments
				J^{π}: direct E2 Coulomb excitation from 0^+.
809.26[&] *3*	6^+	4.0 ps *3*	A EFGHIJ	μ=+1.9 *4* μ: from transient field integral PAC (2020StZV, from 1985St07); relative to ^{186}W(123 keV level). $T_{1/2}$: from B(E2)=1.70 *12* in Coulomb excitation. J^{π}: E2 412γ to 4^+ 396; Coulomb excited member of g.s. band.
862.286[b] *21*	3^+		A DEF IJ	J^{π}: E1 183γ from 3^- 1045; D+Q gammas to 2^+ and 4^+.
883.597[e] *25*	(0^+)		A EFG I	J^{π}: from $\sigma(90°)/\sigma(125°)$ in (d,d′).
952.745[c] *24*	$(2)^-$	0.193 ns *15*	A DEF IJ	J^{π}: E1 215γ to 2^+ 738; M1+E2 92.7γ from 3^- 1045. $T_{1/2}$: from ^{186}Ta β^- decay (1975Ka11).
1006.734[a] *20*	4^+		A EFG IJ	J^{π}: stretched E2 884γ to 2^+; D+Q 610γ to 4^+. 2^+ is favored by σ ratio in (d,d′), however.
1014.97[‡] *10*	$(2^+,3,4^+)$		A	J^{π}: gammas to 2^+ and 4^+.
1030.234[e] *16*	2^+		A dEFG I	XREF: d(1035). J^{π}: E2 1030γ to g.s.; (M1+E2) 908γ to 2^+; Q 634γ to 4^+. 4^+ from $\sigma(90°)/\sigma(125°)$ in (d,d′); However, note that in (d,d′), β^- decay and one (n,n′γ) study, this level has been designated as the 4^+ member of the γ band.
1045.401[d] *20*	3^-		A dEFGHIJ	B(E3)↑=0.101 *8* XREF: d(1035). J^{π}: direct E3 Coulomb excitation from 0^+.
1150[f] *2*	(0^+)		G	J^{π}: from σ ratio in (d,d′).
1171.63[c] *4*	$(4)^-$		A E IJ	J^{π}: 218.93γ Q to $(2)^-$; D(+Q) 309γ to 3^+; band assignment.
1197.30[b] *3*	5^+		EF I	J^{π}: Q γ to 3^+; largely quadrupole D+Q 801γ to 4^+; band assignment in multiple Coulomb excitation.
1279.19[‡] *23*	(1,2,3)		A	J^{π}: gammas to 2^+ and 2^-.
1285.419[f] *21*	2^+	4.0 ps *4*	A EFG	J^{π}: direct E2 Coulomb excitation from 0^+. $T_{1/2}$: from B(E2) and branching in Coulomb excitation.
1298.93[e] *3*	4^+		A E G I	J^{π}: D+Q 902γ to 4^+; stretched E2 1176γ to 2^+. 1973Gu02 report (^{186}Ta β-decay) a 1298 keV γ-ray from this level. The placement is not consistent with the assigned $J^{\pi}=4^+$ and not adopted. Reported peak may be due to summing.
1322.137[d] *25*	5^-		E g IJ	J^{π}: 276.72γ Q to 3^-; band assignment.
1322.41 *19*	(2^+)		A g	J^{π}: 1322γ to 0^+; 460γ to 3^+; possible 316γ to 4^+ 1006 level.
1349.0[&] *4*	8^+	1.08 ps *7*	EF I	$T_{1/2}$: from B(E2) in Coulomb excitation. J^{π}: E2 to 6^+; Coulomb excited member of g.s. band.
1398.08[a] *4*	6^+		EFG IJ	J^{π}: stretched Q gammas to 4^+; 589γ to 6^+.
1453.449? *23*			E	J^{π}: gammas to 2^+ and 3^+, so $J^{\pi}=(1^+,2,3,4^+)$. 2^+ favored by 1988GoZC in (n,n′γ).
1458.38? *4*			E	J^{π}: gammas to 2^+, so $J^{\pi}=(0^+,1,2,3,4^+)$. 3^+ favored by 1988GoZC in (n,n′γ).
1463.42 *15*	$(2^+,3^+)$	<0.1 ns	A	J^{π}: gammas to 3^-; (E1) 511γ to 2^- 953 level. $T_{1/2}$: from ^{186}Ta β^- decay (1975Ka11). Presumed to differ from 1463.8 level in (n,n′γ) based on γ branching.
1463.77 *3*	$(2^-,3^-,4^-)$		E	J^{π}: (M1+E2) 418γ to 3^-; possible γ to (4^-). presumed to differ from 1463.4 level in β^- decay based on γ branching.
1514.64[c] *25*	$(6)^-$		I	J^{π}: 343γ to $(4)^-$, band assignment.
1517.2[g] *6*	(7^-)	18 μs *1*	J	J^{π}: gammas to 6^+ and (5^-); proposed as bandhead for $K^{\pi}=7^-$ configuration based on $T_{1/2}$ and model calculation of level energy (1998Wh02). $T_{1/2}$: from (^{238}U,^{238}U′γ): delayed γ's.

Continued on next page (footnotes at end of table)

Adopted Levels, Gammas (continued)

^{186}W Levels (continued)

E(level)[†]	J^π	$T_{1/2}$	XREF	Comments
1521.32 3	(4^+)		A E G	J^π: stretched Q 783γ to 2^+; γ to 4^+.
1532.32 3	$2^{(+)},3^{(+)}$		E	J^π: (M1+E2) 1409.7γ to 2^+; D gammas to 2^- and 3^-.
1563.37 3	1		E	J^π: D 1563γ to 0^+; D+Q 1440.75γ to 2^+.
1607.52 5	$(2^+,3,4^+)$		E gh	J^π: gammas to 4^+ and 2^+.
1608.07 10	$(2^+,3)$		A gh	J^π: gammas to 2^+ and 2^- and 4^+.
1628.27 5	$(3^-,5^-)$		E g	J^π: significantly mixed (M1+E2) 457γ to 4^-; possibly stretched Q γ to 3^-. E(level): see comment on 1628.4 level.
1628.40 18	$(2^+,3,4^+)$		A g	J^π: gammas to 2^+ and 4^+. E(level): assumed to differ from 1628.3 level excited in (n,n′γ) because three gammas which deexcite this level in β^- decay are absent in (n,n′γ).
1642.46 5	(3,4)		E GH	XREF: E(?). J^π: D+Q gammas to 3^+ and 4^+, γ to 4^+.
1652.76[b] 19	7^+		I	
1661.39 17	$(2^-,3^-)$	4.92 ns 10	A	$T_{1/2}$: from ^{186}Ta β^- decay (1975Ka11). J^π: 339γ to (2^+) 1322 level; 800γ to 3^+ 862 level; E1 γ to $(2^+,3^+)$ 1463 level.
1672.4[e] 3	6^+		I	
1678 5			G	
1709.74 3	3		E	J^π: D(+Q) gammas to 2^+ and 4^+.
1713.5[d] 4	(7^-)		I	J^π: 391.4γ to 5^-, band assignment.
1722 4			GH	
1737.5[g] 10	(8^-)		J	J^π: γ to (7^-); band assignment.
1829.4 4	$(2^+,3,4^+)$		A	J^π: 1093γ to 2^+; 823γ to 4^+ 1006 level.
1903.95[a] 22	8^+		F I	J^π: band assignment in multiple Coulomb excitation.
1979.0[c] 5	$(8)^-$		I	J^π: 464γ to $(6)^-$, band assignment.
1993 4			GH	
2001.9[&] 5	10^+	0.49 ps +14−5	FG I	$T_{1/2}$: from B(E2) in Coulomb excitation. J^π: E2 to 8^+; Coulomb excited member of g.s. band.
2059 4			GH	
2116 5			H	
2117.8[h] 10	(9^-)		J	J^π: gammas to (8^-) and (7^-); band assignment.
2142.7[e] 5	8^+		I	
2166.5 7			A	1429γ to 2^+ 738; 1213γ to $(2)^-$ 952 level.
2212.0[d] 6	(9^-)		I	J^π: 498.5γ to (7^-), band assignment.
2220.1[b] 4	9^+		I	
2270.5 5			A GH	
2285.8[h] 15	(10^-)		J	J^π: γ to (9^-); band assignment.
2339 4			GH	
2378 9			G	
2511.0[a] 4	10^+		F I	J^π: 607.1 Q to 8^+, band assignment.
2522.8[h] 17	(11^-)		J	J^π: γ to (10^-); band assignment.
2555.8[c] 7	$(10)^-$		I	J^π: 576.8γ to $(8)^-$, band assignment.
2556.8 7	1[#]		C	
2588 10			G	
2672.8? 20			J	J^π: (11^+) in (^{238}U,^{238}U′γ).
2707.1[e] 7	10^+		I	
2750.4[&] 7	(12^+)	0.20 ps +6−2	F I	$T_{1/2}$: from B(E2) in Coulomb excitation. J^π: band assignment in multiple Coulomb excitation.
2806.5[d] 7	(11^-)		I	J^π: 594.5γ to (9^-), band assignment.
2837.8[h] 17	(12^-)		J	J^π: gammas to (11^-) and (10^-); band assignment.

Continued on next page (footnotes at end of table)

Adopted Levels, Gammas (continued)

^{186}W Levels (continued)

E(level)[†]	J^π	$T_{1/2}$	XREF	Comments
2863.8 *7*	1[#]		C	
2887.3[b] *6*	11$^+$		I	
3035.8 *7*	1[#]		C	
3055.8 *7*	(1)[#]		C	
3067.8 *7*	(1)[#]		C	
3143.8 *20*			J	J^π: (13$^+$) in (^{238}U,^{238}U$'\gamma$).
3171.8 *7*	1[#]		C	
3188.2[a] *5*	12$^+$		F I	J^π: band assignment in multiple Coulomb excitation.
3237.8[c] *8*	(12)$^-$		I	J^π: 682.0γ to (10)$^-$, band assignment.
3317.8 *7*	1[#]		C	
3362.8 *21*			J	J^π: (14$^+$) in (^{238}U,^{238}U$'\gamma$).
3363.8 *7*	1[#]		C	
3371.2[e] *8*	12$^+$		I	
3378.8 *7*	1[#]		C	
3393.8 *7*	1[#]		C	
3428.0 *10*	1[#]		C	
3477.0 *10*	1[#]		C	
3483.3[d] *8*	(13$^-$)		I	J^π: 676.8γ to (11$^-$), band assignment.
3533.8 *22*			J	J^π: (14$^+$) in (^{238}U,^{238}U$'\gamma$).
3542.8 *21*	(16$^+$)	7.5 s *+48−35*	J	E(level): Other: 3560 *59* – from measured mass difference between isomer and ground state in 2012Re19. J^π: possible configuration: (π 5/2[402])+(π 9/2[514])+(ν 7/2[503])+(ν 11/2[615]) (1998Wh02). $T_{1/2}$: From 2012Re19 – ^{9}Be(^{197}Au,x). Other: 3 ms < $T_{1/2}$ < 30 s (1998Wh02).
3561.9[&] *8*	(14$^+$)	0.183 ps *20*	F I	$T_{1/2}$: from B(E2) in Coulomb excitation. J^π: band assignment in multiple Coulomb excitation.
3913.3[a] *7*	14$^+$		I	
6417.3 *6*	1$^-$	0.0075 eV *9*	C	J^π: E1 6417γ to 0$^+$ g.s. $T_{1/2}$: from (γ,γ').

† From least-squares adjustment of adopted Eγ, allowing ΔE=1 keV for Eγ values to which authors did not assign an uncertainty.

‡ Existence of level is inconsistent with (n,n$'\gamma$) because the strongest gammas deexciting it were either absent or differently placed in an (n,n$'\gamma$) study which was expected to excite all levels below E≈1200 for which J=1 to 4 (1978Av05). This level has been proposed in β^- decay alone.

From γ correlations in (γ,γ').

@ From search for double β decay: 2ν2β- decay to g.s. of ^{186}Os: ≥2.3(2.8)×10^{19} y at 90%(68%) confidence limit (C.L.) (2009Be27,2010Be41,2011Be39), ≥2.6(4.1)×10^{18} y at 90%(68%) C.L. (2003Da09), ≥3.7(5.3)×10^{18} y at 90%(68%) C.L. (2003Da24), ≥1.4(2.5)×10^{18} y at 90%(68%) C.L. (2005Da47); 2ν2β- decay to 1st excited state at 137 of ^{186}Os: ≥1.8(3.6)×10^{20} y at 90%(68%) C.L. (2009Be27,2010Be41,2011Be39), ≥1.0(1.3)×10^{19} y at 90%(68%) C.L. (2003Da09,2003Da24); 0ν2β- decay to g.s. of ^{186}Os: ≥2.1(4.2)×10^{20} y at 90%(68%) C.L. (2009Be27,2010Be41), ≥1.0×10^{21} y (2011Be39), ≥1.1(1.6)×10^{21} y at 90%(68%) C.L. (2003Da09), ≥1.1(2.1)×10^{21} y at 90%(68%) C.L. (2003Da24), ≥1.1(1.7)×10^{19} y at 90%(68%) C.L. (2005Da47), ≥2.7×10^{20} y (1995Ge14); 0ν2β- decay to 1st excited state at 137 of ^{186}Os: ≥2.1(4.2)×10^{20} y at 90%(68%) C.L. (2009Be27,2010Be41), ≥9.0×10^{20} y (2011Be39), ≥1.1(1.6)×10^{21} y at 90%(68%) C.L. (2003Da09), ≥1.1(2.0)×10^{21} y at 90%(68%) C.L. (2003Da24), ≥2.4×10^{20} y (1995Ge14); 0ν2β- M1 decay to g.s. of ^{186}Os: ≥5.8(6.8)×10^{19} y at 90%(68%) C.L. (2009Be27,2010Be41,2011Be39), ≥1.2(1.4)×10^{20} y at 90%(68%) C.L. (2003Da09,2003Da24); 0ν2β- M2 decay to g.s. of ^{186}Os: ≥1.1×10^{19} y (2011Be39); 0ν2β- bM decay to g.s. of ^{186}Os:

Continued on next page (footnotes at end of table)

Adopted Levels, Gammas (continued)

^{186}W Levels (continued)

$\geq 1.1\times10^{19}$ y (2011Be39); From search for α decay: $\geq 2.82\times10^{21}$ y (2004Co26), $\geq 1.7\times10^{20}$ y (2003Da05,2003Bi13), $\geq 2.7\times10^{19}$ y (2003Ce01), $\geq 6.5\times10^{18}$ y (1995Ge17,1997Ge15), each at 90% C.L., $\geq 2.3\times10^{17}$ y (1960Be13). Other: $>6\times10^{15}$ y (from specific activity, 1952Ri01).

[&] Band(A): $K^\pi=0^+$ g.s. band (1989Ku04). Rotational parameters: A=20.3, B=−0.03.

[a] Band(B): $K^\pi=2^+$: α=0. γ band (1989Ku04). Rotational parameters: A=20, B=−0.03. The 1006 level is adopted as the J=4 member here, contrary to some earlier designations of the 1030 level (now assigned 2^+) as that member.

[b] Band(b): $K=2^+$ band: α=1. γ band (2021Pr11).

[c] Band(C): Possible $K^\pi=2^-$ band: α=0. Octupole band (2021Pr11). Rotational parameters: A=15, B=0.02.

[d] Band(c): $K=2^-$ band: α=1. Octupole band (2021Pr11).

[e] Band(D): Possible K=0 β band (1988GoZC). Rotational parameters: A=26, B=−0.03.

[f] Band(E): Possible $K^\pi=0^+$ band (1988GoZC). Rotational parameter: A=22.6.

[g] Band(F): $K^\pi=7^-$, (π 9/2[514])+(π 5/2[402]) (1998Wh02). Rotational parameter: A=13.8. An alternative (ν 3/2[512])+(ν 11/2[615]) configuration cannot be excluded (1998Wh02), but its calculated energy is somewhat high.

[h] Band(G): π=(−), high-K band (1998Wh02). Rotational parameters: A=6.2, B=−0.05.

Adopted Levels, Gammas (continued)

$\gamma(^{186}\mathrm{W})$

E_i(level)	J^π_i	E_γ[†]	I_γ[†]	E_f	J^π_f	Mult.[f]	δ[f]	α[h]	Comments
122.632	2^+	122.64[#] *2*	100	0.0	0^+	E2		1.767	B(E2)(W.u.)=112.4 *15* α(K)=0.584 *9*; α(L)=0.897 *13*; α(M)=0.226 *4* α(N)=0.0533 *8*; α(O)=0.00734 *11*; α(P)=4.40×10^{-5} *7* E_γ: Other $E\gamma$: 122.3 *1* from β^- decay. Mult.: from subshell ratios in ε decay.
396.551	4^+	273.93[#] *5*	100	122.632	2^+	E2		0.1120	B(E2)(W.u.)=144 *+11−10* α(K)=0.0725 *11*; α(L)=0.0301 *5*; α(M)=0.00738 *11* α(N)=0.001751 *25*; α(O)=0.000253 *4*; α(P)=6.11×10^{-6} *9*
737.960	2^+	341.0 *10*	≈0.9	396.551	4^+	[E2]		0.0584 *10*	α(K)=0.0409 *7*; α(L)=0.01341 *24*; α(M)=0.00325 *6* α(N)=0.000772 *14*; α(O)=0.0001136 *20*; α(P)=3.58×10^{-6} *6* B(E2)(W.u.)=1.9 *+12−10* Absent in (n,n′γ).
		615.31[#] *2*	94[a] *3*	122.632	2^+	M1+E2[g]	−11 *+3−4*	0.01293 *24*	B(M1)(W.u.)=8×10^{-5} *+8−4*; B(E2)(W.u.)=10.1 *7* α(K)=0.01020 *19*; α(L)=0.00210 *4*; α(M)=0.000492 *8* α(N)=0.0001177 *19*; α(O)=1.82×10^{-5} *3*; α(P)=9.43×10^{-7} *19* Mult.,δ: from Coulomb excitation. Other δ: −4.1 *5* from (n,n′γ).
		737.97[#] *8*	100[#] *2*	0.0	0^+	E2		0.00849	B(E2)(W.u.)=4.35 *+28−26* α(K)=0.00682 *10*; α(L)=0.001288 *18*; α(M)=0.000299 *5* α(N)=7.16×10^{-5} *10*; α(O)=1.123×10^{-5} *16*; α(P)=6.33×10^{-7} *9*
809.26	6^+	412.69[#] *2*	100	396.551	4^+	E2		0.0344	B(E2)(W.u.)=181 *+15−13* α(K)=0.0253 *4*; α(L)=0.00697 *10*; α(M)=0.001672 *24* α(N)=0.000398 *6*; α(O)=5.96×10^{-5} *9*; α(P)=2.27×10^{-6} *4* E_γ: Other $E\gamma$: 412.0 *2* in β^- decay.
862.286	3^+	465.70[#] *2*	9.0[#] *7*	396.551	4^+	D+Q[g]	−4.0 *5*		
		739.73[#] *8*	100.0[#] *23*	122.632	2^+	D+Q[g]	−7 *2*	0.0087 *3*	
883.597	(0^+)	760.96[#] *2*	100	122.632	2^+				E_γ: Other $E\gamma$: 759.4 *5* in β^- decay.
952.745	$(2)^-$	91.0 *5*	4.4 *18*	862.286	3^+	(E1)		0.478 *10*	B(E1)(W.u.)=5.5×10^{-5} *+32−26* α(K)=0.388 *8*; α(L)=0.0694 *15*; α(M)=0.0158 *4* α(N)=0.00374 *8*; α(O)=0.000561 *12*; α(P)=2.73×10^{-5} *6* Mult.: from intensity balance at the 952 level in ^{186}Ta β^- decay.
		214.75[#] *4*	100 *4*	737.960	2^+	E1		0.0523	B(E1)(W.u.)=9.4×10^{-5} *+11−10* α(K)=0.0434 *6*; α(L)=0.00687 *10*; α(M)=0.001560 *22* α(N)=0.000371 *6*; α(O)=5.82×10^{-5} *9*; α(P)=3.44×10^{-6} *5* Mult.: from α(K)exp, α(L)exp in ^{186}Ta β^- decay.
		830.11[#] *3*	3.3[#] *3*	122.632	2^+	(E1+M2)	+0.23 *10*	0.0044 *18*	B(E1)(W.u.)=5.1×10^{-8} *+15−13*; B(M2)(W.u.)=0.018 *+26−13* α(K)=0.0037 *15*; α(L)=0.0006 *3*; α(M)=0.00013 *6* α(N)=3.1×10^{-5} *14*; α(O)=5.1×10^{-6} *23*; α(P)=3.5×10^{-7} *16* I_γ: =3.5 *6* in β^- decay, but 830γ may include a sum γ contribution there. Mult.: D+Q from $\gamma(\theta)$ in (n,n′γ); $\Delta\pi$ from decay scheme.

$^{186}_{74}\mathrm{W}_{112}$-6

γ(^{186}W) (continued)

E_i(level)	J^π_i	E_γ[†]	I_γ[†]	E_f	J^π_f	Mult.[f]	δ[f]	α[h]	Comments
1006.734	4$^+$	144.5[b] 3	0.7[b] 1	862.286	3$^+$				
		268.85[#] 5	14.4[#] 10	737.960	2$^+$	Q			I_γ: Other: 24 9 from β^- decay.
		610.22[#] 2	100.0[#] 26	396.551	4$^+$	D+Q[g]	−1.21 10		
		884.08[#] 2	74[#] 6	122.632	2$^+$	E2		0.00579	α(K)=0.00472 7; α(L)=0.000827 12; α(M)=0.000191 3 α(N)=4.57×10^{-5} 7; α(O)=7.24×10^{-6} 11; α(P)=4.38×10^{-7} 7 Other Iγ: <12 from Coulomb excitation; 57 7 from β^- decay.
1014.97	(2$^+$,3,4$^+$)	277.0 1	100 20	737.960	2$^+$				E_γ: A γ with similar energy is placed between the 1322.1 and 1045 levels in (n,n′γ).
		618.3 3	40 20	396.551	4$^+$				E_γ: Absent in (n,n′γ).
		893.0 10	60 8	122.632	2$^+$				E_γ: Absent in (n,n′γ).
1030.234	2$^+$	146.6[b] 3	<3[b]	883.597	(0$^+$)				
		292.4[b] 6	14.4[b] 9	737.960	2$^+$				E_γ: Other: 292.97 multiply placed in (n,n′γ). I_γ: Other: 10.9 9 for triplet in (n,n′γ). Other: <400 for doublet in ^{186}Ta β^- decay.
		633.70[#] 2	61[#] 7	396.551	4$^+$	Q			E_γ: Other: 635.0 5 in β^- decay.
		907.58[#] 2	100[#] 9	122.632	2$^+$	(M1+E2)[g]	+7.1 3	0.00562	α(K)=0.00459 7; α(L)=0.000792 12; α(M)=0.000182 3 α(N)=4.37×10^{-5} 7; α(O)=6.95×10^{-6} 10; α(P)=4.28×10^{-7} 6 Mult.: D+Q from $\gamma(\theta)$ in (n,n′γ); δ implausibly large for $\Delta\pi$=yes.
		1030.23[#] 2	85[#] 7	0.0	0$^+$	E2		0.00425	α(K)=0.00349 5; α(L)=0.000582 9; α(M)=0.0001333 19 α(N)=3.20×10^{-5} 5; α(O)=5.11×10^{-6} 8; α(P)=3.24×10^{-7} 5 Absent in β^- decay.
1045.401	3$^-$	92.7 3	14.5 26	952.745	(2)$^-$	M1+E2	1.3 5	5.52 18	α(K)=2.4 10; α(L)=2.3 6; α(M)=0.58 16 α(N)=0.14 4; α(O)=0.019 5; α(P)=0.00024 10 Mult.,δ: from Coulomb excitation.
		183.08[#] 2	31 5	862.286	3$^+$	E1		0.0785	α(K)=0.0650 9; α(L)=0.01045 15; α(M)=0.00237 4 α(N)=0.000564 8; α(O)=8.79×10^{-5} 13; α(P)=5.04×10^{-6} 7 I_γ: Other: 48 3 in (n,n′γ). Mult.: from Coulomb excitation. δ(D+Q)=+0.02 2 from (n,n′γ).
		307.51[#] 6	100 5	737.960	2$^+$	E1		0.0216	α(K)=0.0180 3; α(L)=0.00276 4; α(M)=0.000626 9 α(N)=0.0001494 21; α(O)=2.37×10^{-5} 4; α(P)=1.482×10^{-6} 21 Mult.: from Coulomb excitation. δ(D+Q)=+0.02 3 from (n,n′γ). I_γ: other: 100 15 in (n,n′γ).
		649.5 5	≈0.3	396.551	4$^+$				E_γ: A comparable and more precise 650.25 11 γ unplaced in (n,n′γ). If considered, yields significant difference of the χ^2 compared to that of the χ^2 critical in the least squares fit.

$^{186}_{74}$W$_{112}$-7

Adopted Levels, Gammas (continued)

$\gamma(^{186}W)$ (continued)

E_i(level)	J^{π}_i	E_{γ}[†]	I_{γ}[†]	E_f	J^{π}_f	Mult.[f]	δ[f]	α[h]	Comments
1045.401	3^-	922.77[#] 2	12.5[#] 13	122.632	2^+				I_{γ}: other: 11.9 26 (^{186}Ta β^- decay).
		(1045)		0.0	0^+	[E3]			Mult.: 1045 level directly populated by E3 Coulomb excitation.
1171.63	$(4)^-$	126.31[#] 20	8.3[#] 12	1045.401	3^-				
		164.77[#] 7	15.9[#] 12	1006.734	4^+				
		218.93[#] 6	41[#] 3	952.745	$(2)^-$	Q			
		309.38[#] 8	100[#] 4	862.286	3^+	D(+Q)	+0.02 2		
1197.30	5^+	190.6[b] 3	<1[b]	1006.734	4^+				
		335.04[#] 5	22.7[#] 17	862.286	3^+	Q			
		388.17[#] 13	6.7[#] 7	809.26	6^+				
		800.74[#] 2	100[#] 10	396.551	4^+	D+Q	−8.0 8		
1279.19	(1,2,3)	327.2 5	100 33	952.745	$(2)^-$				Absent in (n,n′γ).
		541.4 5	≈33	737.960	2^+				Absent in (n,n′γ).
1285.419	2^+	401.56[#] 17	5.8[#] 8	883.597	(0^+)	[E2]			B(E2)(W.u.)=5.2 +10−9
		547.41[#] 3	40[#] 3	737.960	2^+	D+Q			E_{γ}: Other: 546.3 5 in β^- decay. I_{γ}: Other: <24 in Coulomb excitation; ≈200 for poorly established 546.3γ in ^{186}Ta β^- decay (if the total I(547γ) is placed from this level).
		1162.81[#] 2	95[#] 9	122.632	2^+	M1+E2[g]	+6 1	0.00344 7	B(M1)(W.u.)=3.7×10^{-5} +29−15; B(E2)(W.u.)=0.40 +10−8 α(K)=0.00284 6; α(L)=0.000457 8; α(M)=0.0001042 18 α(N)=2.50×10^{-5} 5; α(O)=4.02×10^{-6} 7; α(P)=2.64×10^{-7} 5; α(IPF)=1.88×10^{-6} 3 Mult.: from Coulomb excitation. δ: +13 +70−6 in Coulomb excitation, −0.25 5 or +6 1 in (n,n′γ). Other Iγ: 96 20 or 128 10 in Coulomb excitation.
		1285.40[#] 5	100[#] 10	0.0	0^+	E2		0.00277	B(E2)(W.u.)=0.26 +6−5 α(K)=0.00229 4; α(L)=0.000361 5; α(M)=8.21×10^{-5} 12 α(N)=1.97×10^{-5} 3; α(O)=3.18×10^{-6} 5; α(P)=2.12×10^{-7} 3; α(IPF)=1.520×10^{-5} 22
1298.93	4^+	268.5[b] 4	72[b] 3	1030.234	2^+				
		292.2[b] 6	7.1[b] 6	1006.734	4^+				E_{γ},I_{γ}: Other: 292.97 and <44, respectively (n,n′γ).
		902.40[#] 3	51[#] 5	396.551	4^+	D+Q[g]	+1.7 2		
		1176.27[#] 3	100[#] 10	122.632	2^+	E2		0.00327	α(K)=0.00271 4; α(L)=0.000435 6; α(M)=9.93×10^{-5} 14 α(N)=2.38×10^{-5} 4; α(O)=3.83×10^{-6} 6; α(P)=2.51×10^{-7} 4; α(IPF)=2.66×10^{-6} 4
1322.137	5^-	150.5[b] 3	9.9[b] 4	1171.63	$(4)^-$				E_{γ}: Other: 150 (^{238}U,^{238}U′γ), absent in (n,n′γ).
		276.72[#] 2	100[#] 6	1045.401	3^-	Q			

$^{186}_{74}W_{112}$-8

Adopted Levels, Gammas (continued)

$\gamma(^{186}W)$ (continued)

E_i(level)	J^π_i	E_γ[†]	I_γ[†]	E_f	J^π_f	Mult.[f]	δ[f]	α[h]	Comments
1322.137	5^-	315.44[#] *3*	50[#] *4*	1006.734	4^+	D(+Q)	−0.1 *3*	0.190 *16*	α(K)=0.158 *15*; α(L)=0.0248 *10*; α(M)=0.00564 *19* α(N)=0.00136 *5*; α(O)=0.000222 *10*; α(P)=1.58×10^{-5} *15*
1322.41	(2^+)	315.6 *2*	100 *17*	1006.734	4^+	[E2]		0.0731	α(K)=0.0499 *7*; α(L)=0.0177 *3*; α(M)=0.00431 *7* α(N)=0.001025 *15*; α(O)=0.0001496 *22*; α(P)=4.32×10^{-6} *6* I_γ: see comment on 315.44γ from 1322.1 level.
		440.0[&] *10*	53 *10*	883.597	(0^+)				
		460.0[j] *5*	≈17	862.286	3^+				Absent in (n,n′γ).
		1199.5[&] *10*	≈17	122.632	2^+				
		1322.0 *15*	≈20	0.0	0^+				Absent in (n,n′γ).
1349.0	8^+	540.0[a]	100	809.26	6^+	E2		0.01738	B(E2)(W.u.)=178 *+13−12* α(K)=0.01344 *19*; α(L)=0.00302 *5*; α(M)=0.000713 *10* α(N)=0.0001703 *24*; α(O)=2.61×10^{-5} *4*; α(P)=1.234×10^{-6} *18* Mult.: From Coulomb excitation.
1398.08	6^+	200.7[b] *3*	5.2[b] *2*	1197.30	5^+				
		391.46[#] *5*	100[#] *8*	1006.734	4^+	Q			
		588.70[#] *5*	54[#] *9*	809.26	6^+				
		1001.55[#] *6*	45[#] *4*	396.551	4^+	Q			
1453.449?		423.16[#j] *9*	11.5[#] *10*	1030.234	2^+				
		591.18[#j] *3*	31[#] *3*	862.286	3^+				
		715.45[#j] *3*	100[#] *9*	737.960	2^+				
		1330.84[#j] *3*	43[#] *5*	122.632	2^+				
1458.38?		720.42[#j] *9*	11.9[#] *16*	737.960	2^+				
		1335.74[#j] *3*	100[#] *11*	122.632	2^+				
1463.42	$(2^+,3^+)$	184.2 *3*	1.3 *7*	1279.19	(1,2,3)	[D,E2]		0.5 *4*	Absent in (n,n′γ).
		417.7 *2*	33 *3*	1045.401	3^-				γ in (n,n′γ) with similar Eγ (but inappropriate multipolarity for this placement) is placed from 1463.8 level.
		448.0 *11*	1.3 *7*	1014.97	$(2^+,3,4^+)$				Absent in (n,n′γ).
		457.0 *11*	5.7 *7*	1006.734	4^+				γ in (n,n′γ) with similar energy is placed from 1628 level.
		510.6 *5*	100 *7*	952.745	$(2)^-$	(E1)		0.00679	α(K)=0.00570 *8*; α(L)=0.000843 *12*; α(M)=0.000190 *3* α(N)=4.55×10^{-5} *7*; α(O)=7.32×10^{-6} *11*; α(P)=4.88×10^{-7} *7* Mult.: from α(K)exp in ^{186}Ta β^- decay. Absent in (n,n′γ).
		601.0 *5*	1.3 *7*	862.286	3^+				Absent in (n,n′γ).
		726.0 *5*	2.7[d] *7*	737.960	2^+				Absent in (n,n′γ).

γ(^{186}W) (continued)

E_i(level)	J^π_i	E_γ[†]	I_γ[†]	E_f	J^π_f	Mult.[f]	δ[f]	α[h]	Comments
1463.77	(2⁻,3⁻,4⁻)	292.97[i#]	<35[#]	1171.63	(4)⁻				
		418.37[#] *2*	100[#] *7*	1045.401	3⁻	(M1+E2)	−4.7 *3*	0.0357 *6*	α(K)=0.0267 *5*; α(L)=0.00688 *10*; α(M)=0.001643 *24* α(N)=0.000391 *6*; α(O)=5.90×10^{-5} *9*; α(P)=2.43×10^{-6} *5* Mult.: D+Q from $\gamma(\theta)$ in (n,n′γ); δ implausibly large for $\Delta\pi$=yes.
1514.64	(6)⁻	192.5[b] *3*	<5[b]	1322.137	5⁻				
		343.0[b] *4*	100[b]	1171.63	(4)⁻				
1517.2	(7⁻)	119[‡]		1398.08	6⁺				
		195[‡]	[e]	1322.137	5⁻	[E2]		0.336	α(K)=0.181 *3*; α(L)=0.1178 *17*; α(M)=0.0293 *5* α(N)=0.00694 *10*; α(O)=0.000977 *14*; α(P)=1.423×10^{-5} *20* E_γ: possibly the unplaced 195.36 *5* transition of (n,n′γ).
		708[‡]		809.26	6⁺				E_γ: possibly the unplaced 708.67 *8* transition of (n,n′γ); I(709γ):I(195γ)=0.25 *8*:1.00 *10* in (n,n′γ).
1521.32	(4⁺)	488.0 *15*		1030.234	2⁺				E_γ: Placed by 1973Gu02 from 1520 level. A comparable 486.93 *4* γ in (n,n′γ) is placed from a 1532 level.
		567.2 *3*		952.745	(2)⁻				E_γ: Placement from 1973Gu02 (^{186}Ta β- decay). A comparable and more precise 567.10 *2* γ is unplaced in (n,n′γ). If considered, yields significant difference of the χ^2 compared to that of the χ^2 critical in the least squares fit.
		659.05[#] *5*	44[#] *4*	862.286	3⁺				
		783.34[#] *3*	100[#] *13*	737.960	2⁺	Q			
		1124.53[#] *16*	17.9[#] *18*	396.551	4⁺				
		1399.26[#] *13*	≈0.8	122.632	2⁺				E_γ: Other: 1398 *1* and placement from 1973Gu02 (^{186}Ta β- decay). Unplaced in (n,n′γ).
1532.32	2$^{(+)}$,3$^{(+)}$	486.93[#] *4*	33[#] *3*	1045.401	3⁻	D(+Q)	+0.04 *6*		
		579.57[#] *2*	100[#] *10*	952.745	(2)⁻	D(+Q)	+0.01 *2*		
		1409.71[#] *4*	68[#] *6*	122.632	2⁺	(M1+E2)	+8.5 *8*	0.00238	α(K)=0.00195 *3*; α(L)=0.000301 *5*; α(M)=6.83×10^{-5} *10* α(N)=1.641×10^{-5} *24*; α(O)=2.65×10^{-6} *4*; α(P)=1.81×10^{-7} *3*; α(IPF)=4.22×10^{-5} *6* Mult.: D+Q from $\gamma(\theta)$ in (n,n′γ); δ implausibly large for $\Delta\pi$=yes.
1563.37	1	1440.75[#] *3*	100[#] *9*	122.632	2⁺	D+Q			δ: +0.05 *4* or −4.1 *6* from (n,n′γ).
		1563.34[#] *4*	69[#] *7*	0.0	0⁺	D			
1607.52	(2⁺,3,4⁺)	561.96[#] *13*	13.4[#] *21*	1045.401	3⁻				
		1210.98[#] *4*	100[#] *9*	396.551	4⁺	Q(+D)			δ=+0.10 *5* or 1/δ=−0.01 *5* from (n,n′γ).
		1484.62[#]	<65[#]	122.632	2⁺				E_γ,I_γ: for multiplet in (n,n′γ).
1608.07	(2⁺,3)	309.2 *1*	100 *11*	1298.93	4⁺				
		654.9 *5*	67 *22*	952.745	(2)⁻				

$^{186}_{74}$W$_{112}$-10

$\gamma(^{186}W)$ (continued)

E_i(level)	J^π_i	E_γ[†]	I_γ[†]	E_f	J^π_f	Mult.[f]	δ[f]	α[h]	Comments
1608.07	$(2^+,3)$	745.0 10	≈11	862.286	3^+				
		869.5 5	≈11	737.960	2^+				
		1210.0[c] 15	≈11[c]	396.551	4^+				
		1485.0[c] 15	≈11[c]	122.632	2^+				
1628.27	$(3^-,5^-)$	456.63[#] 4	100[#] 9	1171.63	$(4)^-$	(M1+E2)	−8 1	0.0271 5	α(K)=0.0205 4; α(L)=0.00510 8; α(M)=0.001213 18 α(N)=0.000289 5; α(O)=4.38×10^{-5} 7; α(P)=1.86×10^{-6} 4 Mult.: D+Q from $\gamma(\theta)$ in (n,n′γ); δ implausibly large for E1+M2.
		582.84[#] 6	76[#] 7	1045.401	3^-	Q			
		621.71[#] 10	43[#] 4	1006.734	4^+				
1628.40	$(2^+,3,4^+)$	583.2 2	100 14	1045.401	3^-				Line with similar Eγ is placed from 1628.3 level in (n,n′γ).
		596.5 5	≈23	1030.234	2^+				Absent in (n,n′γ).
		622.0 5		1006.734	4^+				Line with similar Eγ is placed from 1628.3 level in (n,n′γ).
		1231.0 15	≈14	396.551	4^+				Absent in (n,n′γ).
		1507.0[j] 15		122.632	2^+				Absent in (n,n′γ).
1642.46	(3,4)	780.08[#] 8	100[#] 14	862.286	3^+	D+Q	+0.25 2		
		1245.92[#] 5	96[#] 9	396.551	4^+	D+Q	+0.40 10		
		1520.2[#] 2	21[#] 4	122.632	2^+				
1652.76	7^+	254.6[b] 3	<1[b]	1398.08	6^+				
		455.6[b] 4	100[b]	1197.30	5^+	Q[b]			
		843.4[b] 4	49.4[b] 23	809.26	6^+	D[b]			
1661.39	$(2^-,3^-)$	197.9 1	100	1463.42	$(2^+,3^+)$	E1		0.0643	B(E1)(W.u.)=4.71×10^{-6} +20−19 α(K)=0.0533 8; α(L)=0.00851 12; α(M)=0.00193 3 α(N)=0.000460 7; α(O)=7.18×10^{-5} 11; α(P)=4.18×10^{-6} 6 Mult.: from α(K)exp, α(L)exp in ^{186}Ta β^- decay.
		338.5 10	1.0 5	1322.41	(2^+)				
		383.2 5	1.0 5	1279.19	(1,2,3)				
		646.6 10	≈0.3	1014.97	$(2^+,3,4^+)$				
		709.0 10	2.0[d] 5	952.745	$(2)^-$				
		799.8 5	4.8 5	862.286	3^+				
1672.4	6^+	373.6[b] 4	100[b]	1298.93	4^+				
		1275.7[b] 4	66[b] 3	396.551	4^+				
1709.74	3	1313.16[#] 3	87[#] 8	396.551	4^+	D(+Q)	−0.02 3		
		1587.15[#] 4	100[#] 10	122.632	2^+	D(+Q)	−0.01 2		
1713.5	(7^-)	391.4 4	100	1322.137	5^-				

Adopted Levels, Gammas (continued)

$\gamma(^{186}W)$ (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[†]	E_f	J_f^π	Mult.[f]	α[h]	Comments
1737.5	(8^-)	220[‡]		1517.2	(7^-)			
1829.4	$(2^+,3,4^+)$	814.0 *5*	≈50[d]	1014.97	$(2^+,3,4^+)$			
		823.0 *5*	≈50	1006.734	4^+			
		1092.5 *10*	≈100	737.960	2^+			
1903.95	8^+	251.2 *3*	<1	1652.76	7^+			
		506.1 *4*	100	1398.08	6^+	Q		E_γ: Other: 509 *5* (Coulomb excitation).
		554.9 *4*	6.6 *2*	1349.0	8^+	D		E_γ: Other: 559 *5* (Coulomb excitation).
		1094.5 *4*	5.0 *2*	809.26	6^+	Q		
1979.0	$(8)^-$	464.4 *4*	100	1514.64	$(6)^-$			
2001.9	10^+	653.2[a]	100	1349.0	8^+	E2	0.01113	B(E2)(W.u.)=152 *+18−34* α(K)=0.00883 *13*; α(L)=0.001771 *25*; α(M)=0.000414 *6* α(N)=9.90×10^{-5} *14*; α(O)=1.539×10^{-5} *22*; α(P)=8.17×10^{-7} *12* Mult.: from Coulomb excitation.
2117.8	(9^-)	380[‡]	[e]	1737.5	(8^-)			
		601[‡]		1517.2	(7^-)			
2142.7	8^+	470.3[b] *4*	100[b]	1672.4	6^+			
2166.5		703.0 *10*	≈100	1463.42	$(2^+,3^+)$			
		1213.0 *15*	≈40	952.745	$(2)^-$			
		1429 *1*	≈50	737.960	2^+			
2212.0	(9^-)	498.5[b] *4*	100[b]	1713.5	(7^-)			
2220.1	9^+	567.3[b] *4*	100[b]	1652.76	7^+	Q[b]		
		871.2[b] *4*	15[b] *4*	1349.0	8^+			
2270.5		442.0 *10*	100 *19*	1829.4	$(2^+,3,4^+)$			
		641.6 *10*	≈44	1628.40	$(2^+,3,4^+)$			
		947.5 *10*	≈31	1322.41	(2^+)			
		1238.0 *15*	≈25	1030.234	2^+			
		1319.0 *15*	≈31	952.745	$(2)^-$			
		1409 *1*	≈63	862.286	3^+			
2285.8	(10^-)	168[‡]		2117.8	(9^-)			
2511.0	10^+	509.1[b] *4*	14.1[b] *18*	2001.9	10^+	D[b]		
		607.1[b] *4*	100[b]	1903.95	8^+	Q[b]		E_γ: Other: 608 *5* (Coulomb excitation).
		1161.9[b] *4*	<4[b]	1349.0	8^+			
2522.8	(11^-)	237[‡]		2285.8	(10^-)			
2555.8	$(10)^-$	576.8[b] *4*	100[b]	1979.0	$(8)^-$			
2556.8	1	2434[@]	37[@] *9*	122.632	2^+			
		2557[@] *1*	100[@]	0.0	0^+			
2672.8?		387[‡][j]		2285.8	(10^-)			
2707.1	10^+	564.4[b] *4*	100[b]	2142.7	8^+			
2750.4	(12^+)	748.5 *4*	100	2001.9	10^+	E2		B(E2)(W.u.)=191 *+22−45*

$^{186}_{74}W_{112}$-12

$\gamma(^{186}W)$ (continued)

E_i(level)	J^π_i	E_γ †	I_γ †	E_f	J^π_f	Comments
						E_γ: Other: 748.5 (Coulomb excitation). Mult.: Q in (^{136}Xe,^{136}Xe$'\gamma$) and RUL.
2806.5	(11⁻)	594.5[b] *4*	100[b]	2212.0	(9⁻)	
2837.8	(12⁻)	165‡		2672.8?		
		315‡		2522.8	(11⁻)	
		552‡	[e]	2285.8	(10⁻)	
2863.8	1	2741@	102@ *22*	122.632	2⁺	
		2864@ *1*	100@	0.0	0⁺	
2887.3	11⁺	667.2[b] *4*	100[b]	2220.1	9⁺	
3035.8	1	2913@	65@ *24*	122.632	2⁺	
		3036@ *1*	100@	0.0	0⁺	
3055.8	(1)	2933@	100@ *24*	122.632	2⁺	
		3056@ *1*	54@	0.0	0⁺	
3067.8	(1)	2945@	100@ *43*	122.632	2⁺	
		3068@ *1*	83@	0.0	0⁺	
3143.8		306‡		2837.8	(12⁻)	
3171.8	1	3049@	57@ *10*	122.632	2⁺	
		3172@ *1*	100@	0.0	0⁺	
3188.2	12⁺	677.1[b] *4*	100[b]	2511.0	10⁺	E_γ: Other: 677 *5* (Coul. excitation).
		1186.3[b] *4*	<20[b]	2001.9	10⁺	
3237.8	(12)⁻	682.0[b] *4*	100[b]	2555.8	(10)⁻	
3317.8	1	3195@	100@ *20*	122.632	2⁺	
		3318@ *1*	79@	0.0	0⁺	
3362.8		219‡		3143.8		
3363.8	1	3241@	100@ *18*	122.632	2⁺	
		3364@ *1*	60@	0.0	0⁺	
3371.2	12⁺	664.1[b] *4*	100[b]	2707.1	10⁺	
3378.8	1	3256@	47@ *8*	122.632	2⁺	
		3379@ *1*	100@	0.0	0⁺	
3393.8	1	3271@	55@ *24*	122.632	2⁺	
		3394@ *1*	100@	0.0	0⁺	
3428.0	1	3428 *1*		0.0	0⁺	E_γ: from (γ,γ').
3477.0	1	3477 *1*		0.0	0⁺	E_γ: from (γ,γ').
3483.3	(13⁻)	676.8[b] *4*	100[b]	2806.5	(11⁻)	
3533.8		390‡		3143.8		

$^{186}_{74}W_{112}$-13

Adopted Levels, Gammas (continued)

$\gamma(^{186}\mathrm{W})$ (continued)

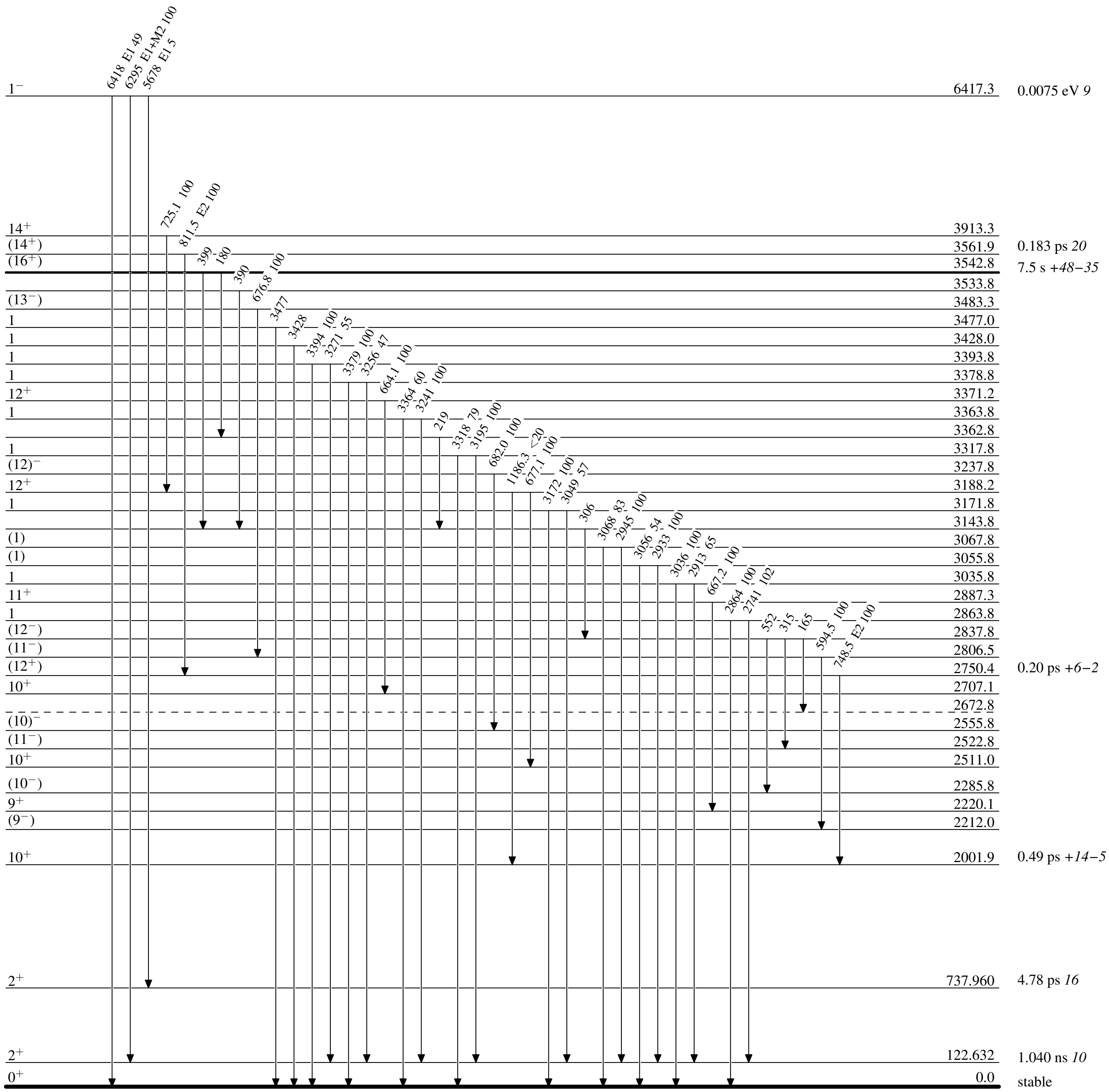
E_i(level)	J^π_i	E_γ[†]	I_γ[†]	E_f	J^π_f	Mult.[f]	δ[f]	Comments
3542.8	(16^+)	180[‡]		3362.8				
		399[‡]	[e]	3143.8				
3561.9	(14^+)	811.5[b] *4*	100[b]	2750.4	(12^+)	E2[b]		B(E2)(W.u.)=139 *+18−14* E_γ: Other: 811.5 (Coul. Excitation) R. Mult.: Q in (^{136}Xe,^{136}Xe′γ) and RUL.
3913.3	14^+	725.1[b] *4*	100[b]	3188.2	12^+			
6417.3	1^-	5678[@]	5[@] *3*	737.960	2^+	E1		B(E1)(W.u.)=6.0×10^{-7} *36*
		6295[@]	100[@] *19*	122.632	2^+	E1+M2	−0.095 *23*	B(E1)(W.u.)=8.80×10^{-6} *11*; B(M2)(W.u.)=0.009 *5* Mult.,δ: from $\gamma(\theta)$ and linear polarization in (γ,γ').
		6418[@]	49[@]	0.0	0^+	E1		B(E1)(W.u.)=4.1×10^{-6} *5* Mult.: from $\gamma(\theta)$ and linear polarization in (γ,γ').

[†] From ^{186}Ta β^- decay, unless noted otherwise.
[‡] From (^{238}U,^{238}U′γ); uncertainty unstated by authors.
[#] From (n,n′γ).
[@] From (γ,γ').
[&] An unplaced γ of similar energy exists in (n,n′γ), but Eγ does not fit this placement.
[a] From Coulomb excitation.
[b] From (^{136}Xe,^{136}Xe′γ).
[c] The 1210.98 *4* and 1484.62 gammas with I(1211γ):I(1485γ)=0.97 *9*:0.57 *6* reported in (n,n′γ) are assumed by the evaluators to differ from the 1210.0 *15* and 1485.0 *15* gammas seen in ^{186}Ta β^- decay; the 745.0 and 869.5 gammas of comparable strength and the relatively strong 654.9γ, placed from the same level as the 1210γ and 1485γ in decay, are absent in (n,n′γ).
[d] Iγ may be overestimated; possible sum-γ contribution.
[e] Based on line widths in level scheme drawing (fig. 3 of 1998Wh02), this is the strongest γ deexciting the parent level.
[f] From (n,n′γ), unless noted otherwise.
[g] For a theoretical estimate of δ for this transition, see 1996Na08 and/or 1994Mo07. Note that 1994Mo07 indicate that the 884γ is the [third 2^+]-level to [first 2^+]-level transition; however, the 907.6γ constitutes that transition, as adopted here and assumed by 1996Na08.
[h] Additional information 1.
[i] Multiply placed.
[j] Placement of transition in the level scheme is uncertain.

Adopted Levels, Gammas

Level Scheme

Intensities: Relative photon branching from each level



$^{186}_{74}W_{112}$

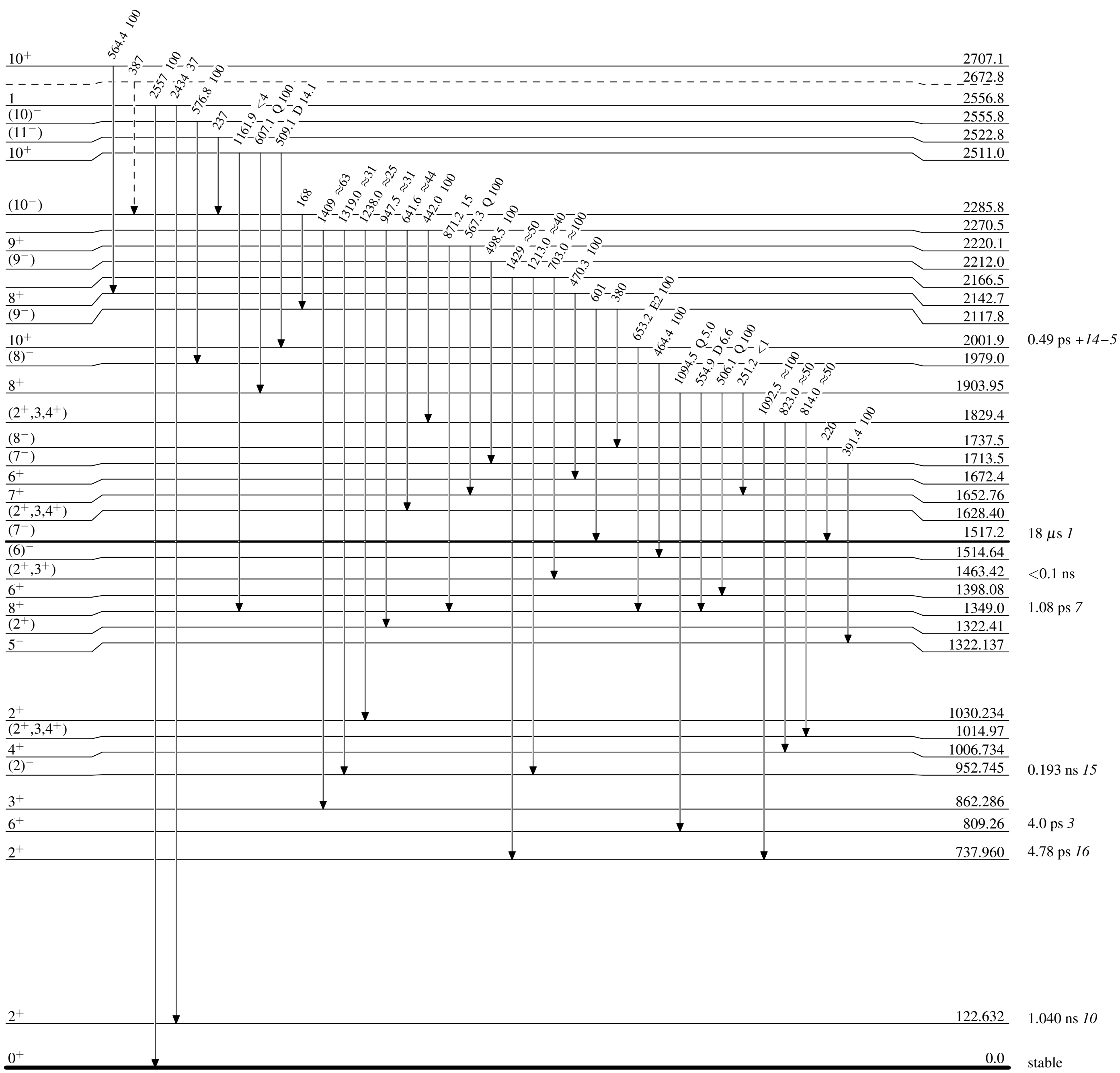
Adopted Levels, Gammas

Legend

Level Scheme (continued)

Intensities: Relative photon branching from each level

γ Decay (Uncertain)



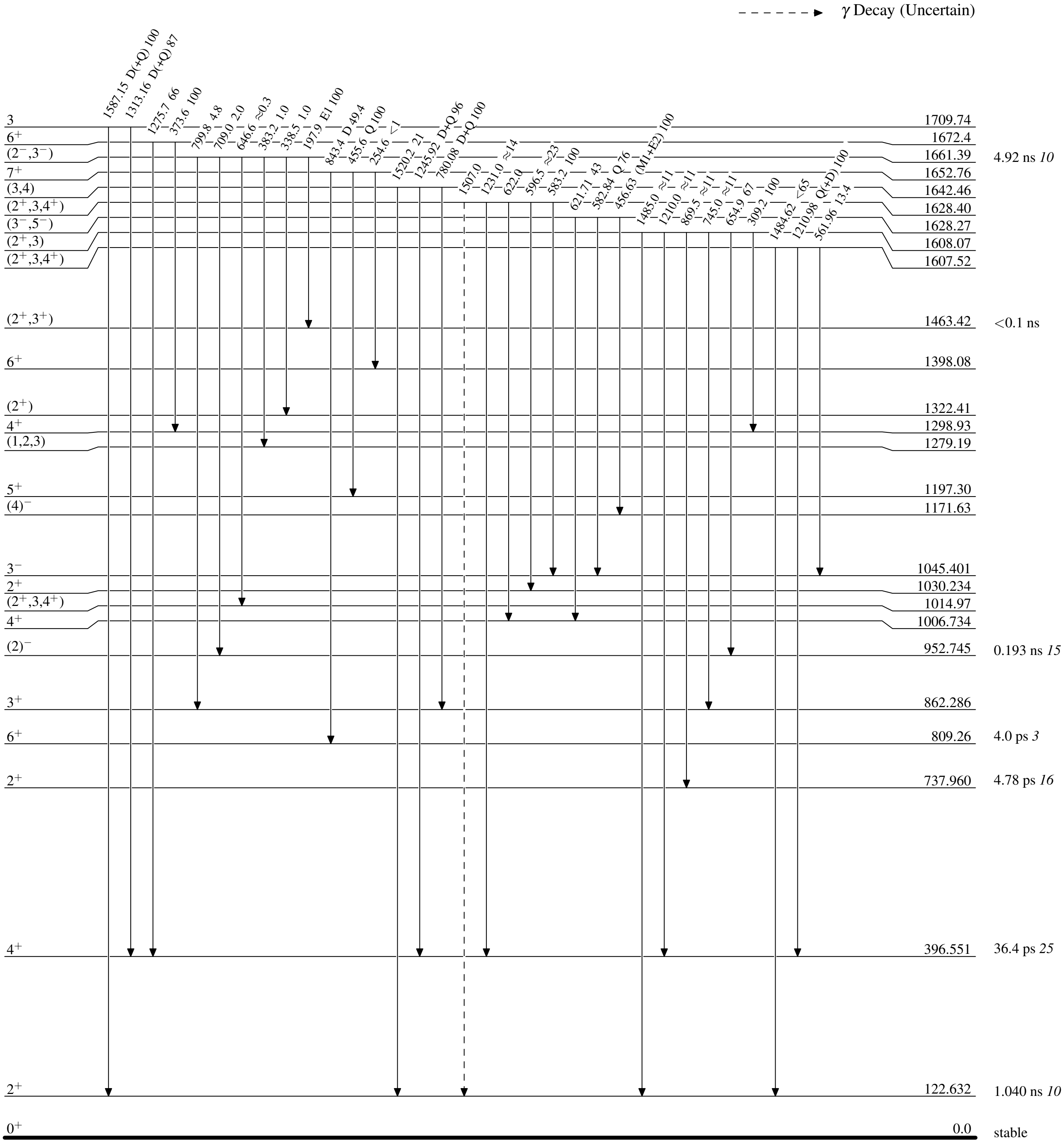
$^{186}_{74}W_{112}$

Adopted Levels, Gammas

Legend

Level Scheme (continued)

Intensities: Relative photon branching from each level

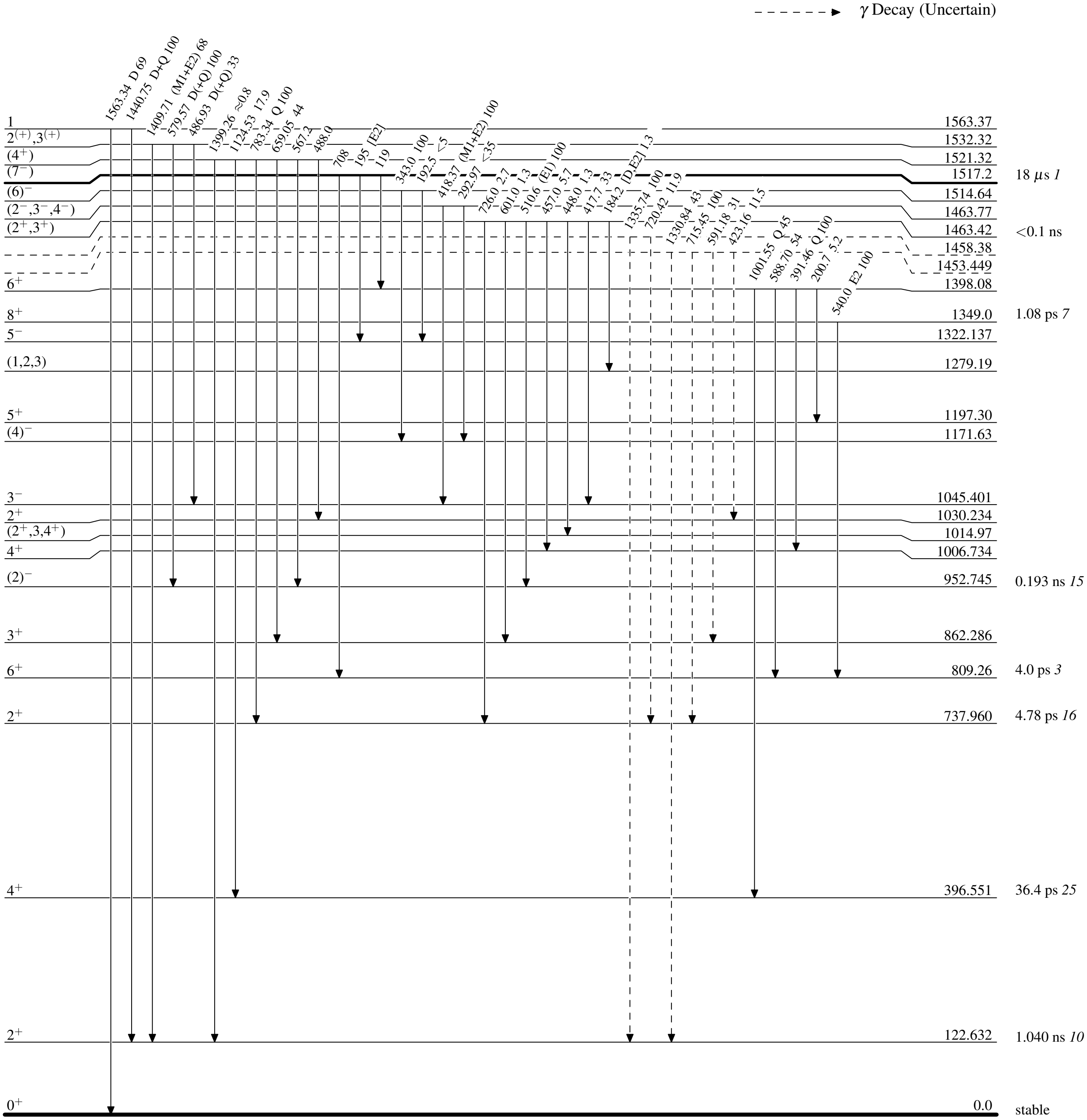


$^{186}_{74}W_{112}$

Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Relative photon branching from each level

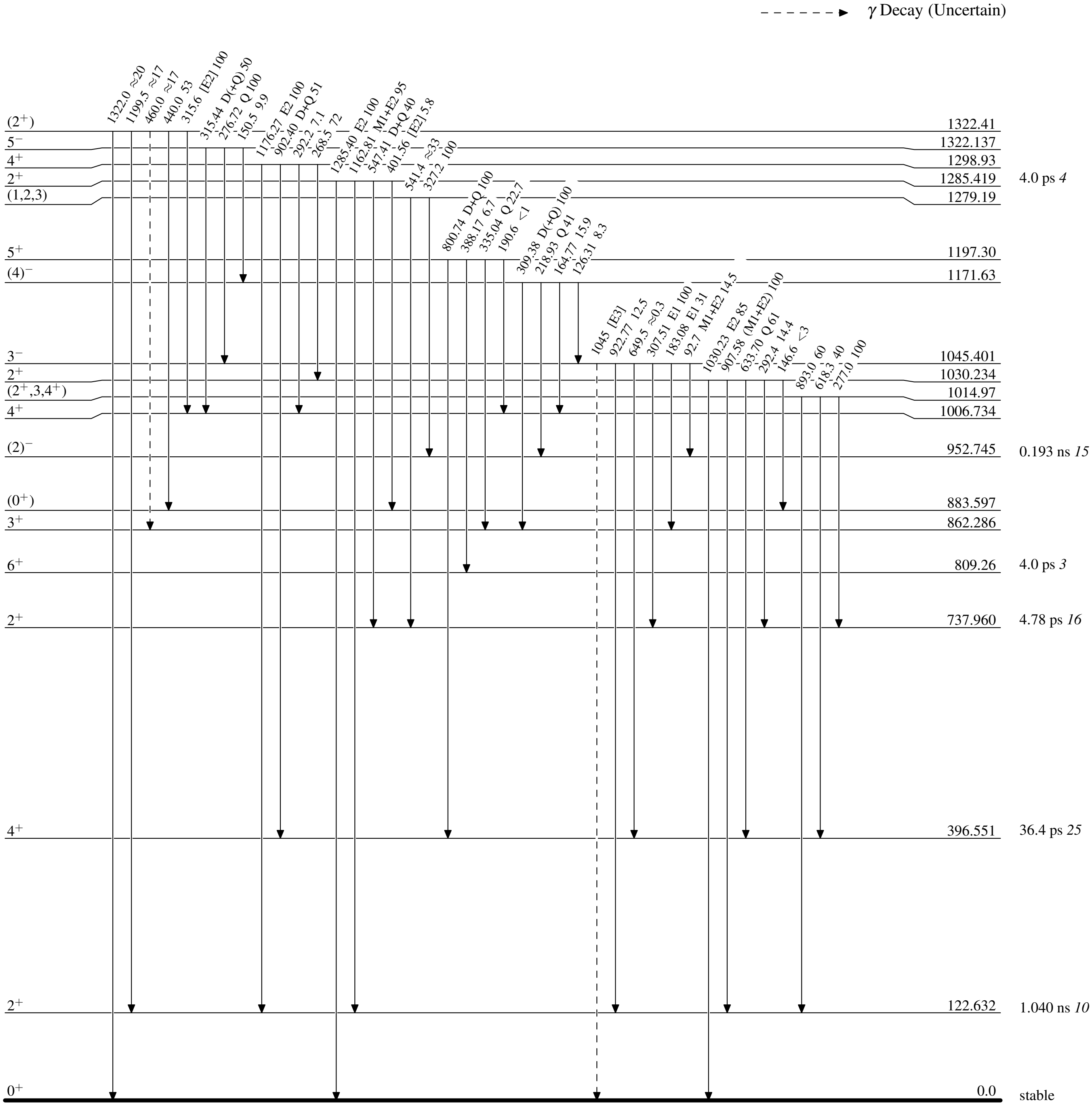


$^{186}_{74}W_{112}$

Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Relative photon branching from each level

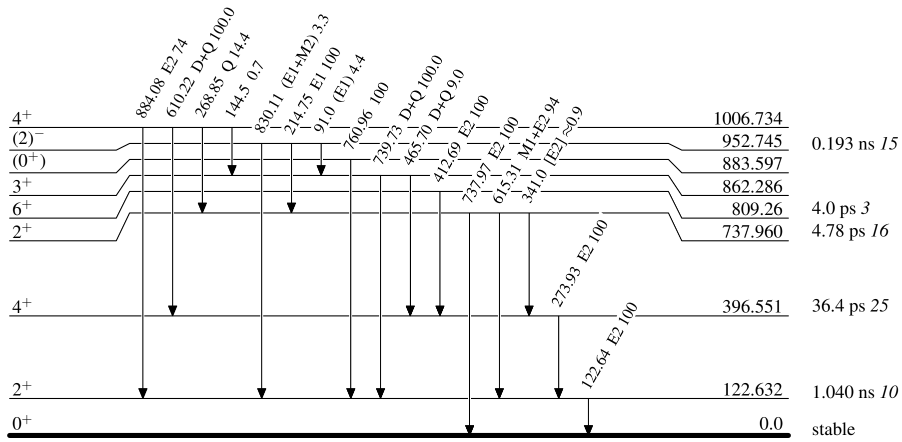


$^{186}_{74}W_{112}$

Adopted Levels, Gammas

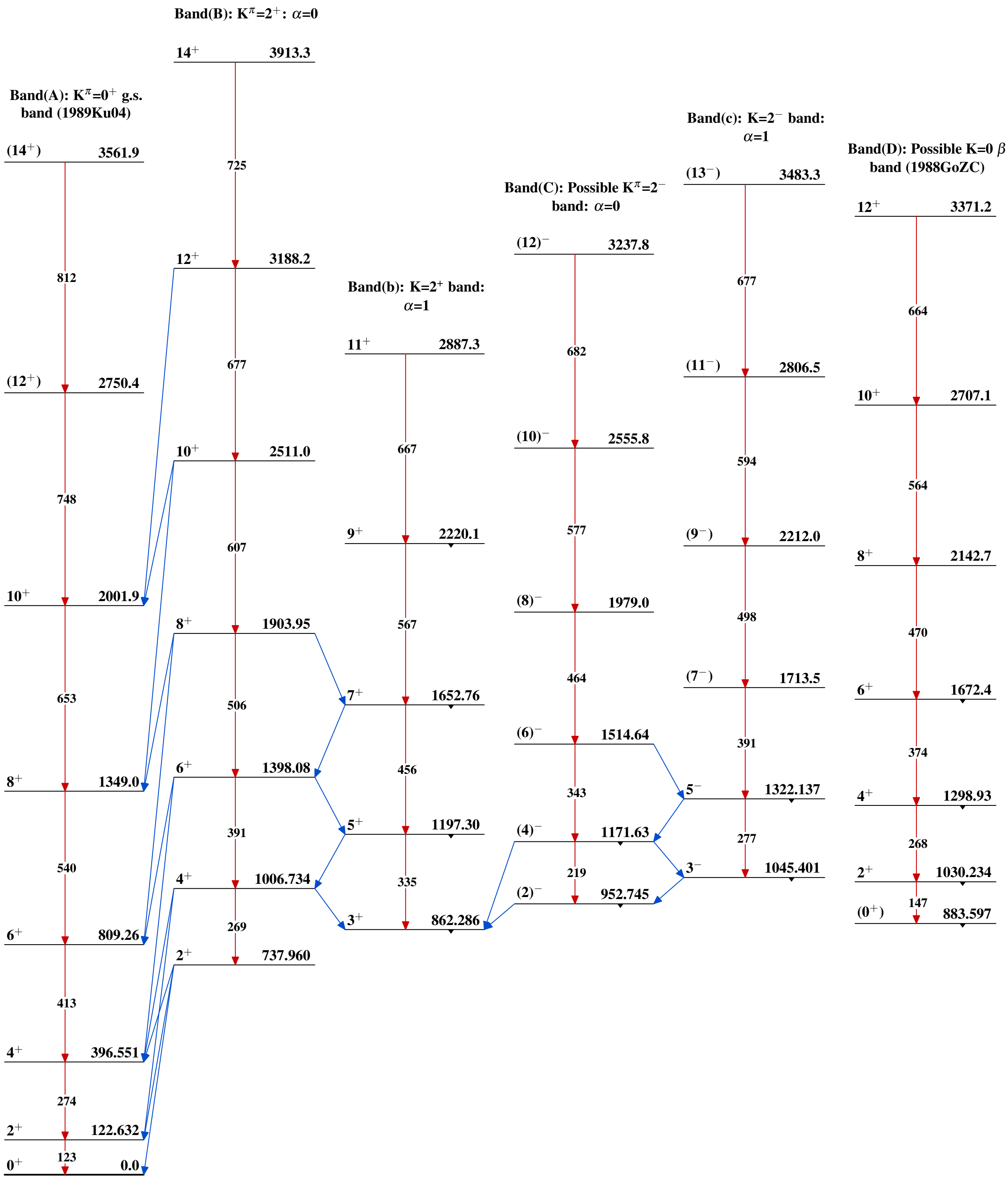
Level Scheme (continued)

Intensities: Relative photon branching from each level



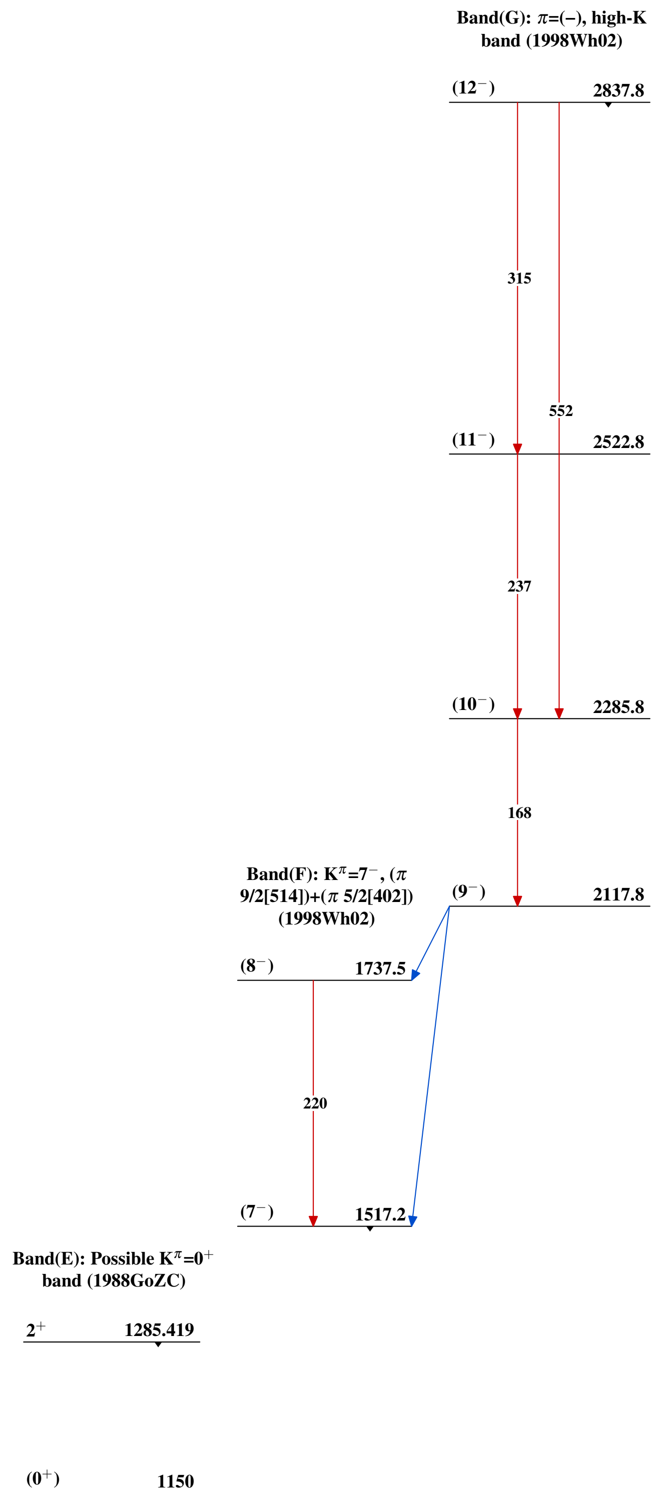
$^{186}_{74}W_{112}$

Adopted Levels, Gammas



$^{186}_{74}W_{112}$

Adopted Levels, Gammas (continued)



$^{186}_{74}W_{112}$

Adopted Levels, Gammas

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	F. G. Kondev, S. Juutinen, D. J. Hartley	NDS 150, 1 (2018)	1-Feb-2018

Q(β^-)=349 *3*; S(n)=6835 *3*; S(p)=9061 *56*; Q(α)=407 *40* 2017Wa10
Additional information 1.

^{188}W Levels

Cross Reference (XREF) Flags

A	^{188}Ta β^- decay	D	^{192}Os(^{82}Se,Xγ)
B	^{186}W(t,p)	E	^{186}W(^{136}Xe,Xγ)
C	^{186}W(^{18}O,^{16}Oγ)	F	^{186}W(^{7}Li,αpγ)

E(level)†	J$^\pi$	T$_{1/2}$	XREF	Comments
0#	0$^+$	69.78 d *12*	ABCDEF	%β^-=100 T$_{1/2}$: From 2014Un01, supersedes previously reported 69.77 d *5* (2012Fi12) and 69.78 d *5* (2002Zi01,2002Un02) by the same group. Others: 69.5 d *7* (2002Po17), 69.4 d *5* (1962Ro16) and 65 d *5* (1951Li07).
143.16# *8*	2$^+$	0.87 ns *12*	ABCDEF	J$^\pi$: 142.9γ E2 to 0$^+$. T$_{1/2}$: From 143γ-250γ-750γ(t) in LaBr$_3$:Ce detectors, using a $\gamma\gamma$(t) gated by the 296γ, 432γ and 485γ in the HPGe detectors (2013Ma66) in ^{186}W(^{7}Li,αpγ).
439.49# *13*	4$^+$		ABCDEF	XREF: B(442). J$^\pi$: 296.2γ E2 to 2$^+$; band assignment.
628.14@ *8*	2$^+$		BC F	XREF: B(630). J$^\pi$: 628.4γ (E2) to 0$^+$; 484.7γ (M1+E2) to 2$^+$; systematics of K^π=2$^+$ γ-vibrational bands in neighboring nuclei; band assignment.
780‡ *2*			B	
854.13 *21*	(0$^+$,2,4$^+$)		C F	J$^\pi$: 711γ D (ΔJ=0) or E2 to 2$^+$; non observation of a γ-ray transition to 0$^+$.
871.10# *16*	6$^+$		A CDEF	J$^\pi$: 431.6γ E2 to 4$^+$; band assignment.
886‡ *10*	(0$^+$)		B	J$^\pi$: L(t,p)=(0).
939.23@ *21*	4$^+$		C	J$^\pi$: 796.5γ E2 to 2$^+$, 499.7γ to 4$^+$; band assignment.
979.37& *13*	2$^{(-)}$		C EF	J$^\pi$: 351.2γ (E1), ΔJ=0 to 2$^+$; systematics of octupole bands in neighboring nuclei; absence of γ ray to 0$^+$ would argue against J=1; band assignment.
1070.7& *4*	3$^{(-)}$		BC E	XREF: B(1073). J$^\pi$: 928.0γ (E1) to 2$^+$, 91γ to 2$^{(-)}$, 630.2γ to 4$^+$; band assignment.
1193.77& *16*	4$^{(-)}$		C E	J$^\pi$: 214.4γ E2 to 2$^{(-)}$; band assignment.
1228.9 *5*	2$^+$,3,4$^+$		BC	XREF: B(1233). J$^\pi$: 600.6γ to 2$^+$, 788.8γ to 4$^+$.
1341.7& *5*	5$^{(-)}$		A C E	J$^\pi$: 903γ (E1) to 4$^+$, 271.6γ to 3$^{(-)}$, 469.4γ to 6$^+$; band assignment.
1425.15# *25*	8$^+$		C E	J$^\pi$: 554.0γ E2 to 6$^+$; band assignment.
1437‡ *5*			B	
1473‡ *10*			B	
1533.77& *19*	6$^{(-)}$		C E	J$^\pi$: 340.0γ (E2) to 4$^{(-)}$; band assignment.
1538.2 *4*	(5$^+$)		C	J$^\pi$: 344.3γ to 4$^{(-)}$, 1099.0γ to 4$^+$ and 667.5γ to 6$^+$. The absence of transitions to 2$^+$ and 3$^-$ levels would argue against J=4 and 5$^-$. configuration: ν1/2[510]$\otimes\nu$9/2[505] (K^π=5$^+$) proposed in 2006Sh23. The assignment is tentative.
1544‡ *5*			B	
1721‡ *5*			B	

Continued on next page (footnotes at end of table)

Adopted Levels, Gammas (continued)

^{188}W Levels (continued)

E(level)[†]	J^π	$T_{1/2}$	XREF	Comments
1728.7[&] *5*	$7^{(-)}$		E	J^π: 387γ to $5^{(-)}$ and 303γ to 8^+; band assignment.
1742.7 *5*	$7^{(-)}$		A E	J^π: 401γ to $5^{(-)}$ and 317γ to 8^+ allow for $J^\pi=6^+$ or 7^-. An apparent mixing with the $7^{(-)}$ level at 1729.8 keV is consistent with $7^{(-)}$ for this level (2010La16). configuration: ν3/2[512]⊗ν11/2[615] ($K^\pi=7^-$) proposed in 2010La16. The assignment is tentative.
1816[‡] *10*			B	E(level): possible doublet.
1897[‡] *5*			B	
1915[‡] *5*			B	
1926.7[a] *8*	8^-	109.5 ns *35*	A E	J^π: 184γ M1 to $7^{(-)}$; systematics of similar isomers in neighboring nuclei. $T_{1/2}$: From sum of 144, 297 and 432γ(t) in 2010La16. configuration: π7/2[404]⊗π9/2[514] ($K^\pi=8^-$) proposed in 2010La16. The assignment is supported by the measured g_K-g_R=0.76 *4*, where Q_0=6.5 eb, which is in good agreement with the expected value of 0.70 from the Nilsson model and by assuming g_R=0.3.
1960[‡] *10*	(0^+)		B	J^π: L(t,p)=(0).
1994[‡] *10*			B	
2028[‡] *5*			B	
2104[‡] *5*			B	
2175[‡] *5*			B	
2264[‡] *5*			B	
2274.4[a] *12*	(9^-)		E	J^π: 348γ to 8^-; band assignment.
2314[‡] *5*			B	
2394[‡] *5*			B	
2427[‡] *10*			B	E(level): possible doublet.
2665.9[a] *12*	(10^-)		E	J^π: 392γ to (9^-), 739γ to 8^-; band assignment.
3086.7[a] *13*	(11^-)		E	J^π: 421γ to (10^-), 812γ to (9^-); band assignment.

† From a least-squares fit to Eγ′s, unless otherwise stated.
‡ From ^{186}W(t,p).
# Band(A): $K^\pi=0^+$, g.s. band.
@ Band(B): $K^\pi=2^+$, γ-vibrational band.
& Band(C): $K^\pi=2^-$, octupole band.
a Band(D): $K^\pi=8^-$, π7/2[404]⊗π9/2[514] band.

γ(^{188}W)

E_i(level)	J_i^π	E_γ[†]	I_γ[†]	E_f	J_f^π	Mult.[†]	α[#]	Comments
143.16	2^+	142.9 *1*	100	0	0^+	E2	1.001	α(K)=0.406 *6*; α(L)=0.451 *7*; α(M)=0.1134 *17* α(N)=0.0268 *4*; α(O)=0.00371 *6*; α(P)=3.05×10^{-5} *5* B(E2)(W.u.)=85 *12* Mult.: R(asym)=1.13 *3* (2006Sh23).
439.49	4^+	296.3 *1*	100	143.16	2^+	E2	0.0882	α(K)=0.0589 *9*; α(L)=0.0224 *4*; α(M)=0.00546 *8* α(N)=0.001297 *19*; α(O)=0.000188 *3*; α(P)=5.04×10^{-6} *7* Mult.: R(asym)=1.67 *3* (2006Sh23).
628.14	2^+	484.7 *1*	84 *12*	143.16	2^+	(M1+E2)	0.042 *20*	α(K)=0.034 *17*; α(L)=0.0060 *19*; α(M)=0.0014 *4* α(N)=0.00033 *10*; α(O)=5.3×10^{-5} *18*; α(P)=3.3×10^{-6}

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Adopted Levels, Gammas (continued)

$\gamma(^{188}W)$ (continued)

E_i(level)	J_i^π	E_γ†	I_γ†	E_f	J_f^π	Mult.†	α#	Comments
								18 Mult.: R(asym)=0.70 *3* (2006Sh23).
628.14	2^+	628.4 *1*	100 *28*	0	0^+	(E2)	0.01216	α(K)=0.00960 *14*; α(L)=0.00197 *3*; α(M)=0.000461 *7* α(N)=0.0001101 *16*; α(O)=1.707×10^{-5} *24*; α(P)=8.87×10^{-7} *13* Mult.: R(asym)=1.00 *5* (2006Sh23).
854.13	$(0^+,2,4^+)$	711.0 *2*	100	143.16	2^+	D,E2		Mult.: R(asym)=1.00 *4* (2006Sh23), suggests D (ΔJ=0) or E2 transition.
871.10	6^+	431.6 *1*	100	439.49	4^+	E2	0.0306	α(K)=0.0227 *4*; α(L)=0.00602 *9*; α(M)=0.001441 *21* α(N)=0.000343 *5*; α(O)=5.15×10^{-5} *8*; α(P)=2.05×10^{-6} *3* Mult.: R(asym)=1.91 *8* (2006Sh23).
939.23	4^+	311.3 *5*	43 *14*	628.14	2^+			
		499.7 *2*	100 *14*	439.49	4^+			
		796.5 *10*	57 *28*	143.16	2^+	E2	0.00721	α(K)=0.00583 *9*; α(L)=0.001064 *16*; α(M)=0.000246 *4* α(N)=5.90×10^{-5} *9*; α(O)=9.29×10^{-6} *14*; α(P)=5.41×10^{-7} *8* Mult.: R(asym)=1.73 *12* (2006Sh23).
979.37	$2^{(-)}$	351.2 *1*	100	628.14	2^+	(E1)	0.01573	α(K)=0.01315 *19*; α(L)=0.00200 *3*; α(M)=0.000453 *7* α(N)=0.0001081 *16*; α(O)=1.722×10^{-5} *25*; α(P)=1.096×10^{-6} *16* Mult.: R(asym)=1.21 *8*; ΔJ=0 transition (2006Sh23) and the adopted level scheme.
		838‡ *1*		143.16	2^+			
1070.7	$3^{(-)}$	91 *1*	<14	979.37	$2^{(-)}$			
		442.5 *10*	43 *14*	628.14	2^+			
		630.2 *10*	29 *14*	439.49	4^+			
		928.0 *5*	100 *28*	143.16	2^+	(E1)	0.00205	α(K)=0.001733 *25*; α(L)=0.000247 *4*; α(M)=5.54×10^{-5} *8* α(N)=1.330×10^{-5} *19*; α(O)=2.16×10^{-6} *3*; α(P)=1.519×10^{-7} *22* Mult.: R(asym)=0.64 *3* (2006Sh23) and the adopted level scheme.
1193.77	$4^{(-)}$	214.4 *1*	100	979.37	$2^{(-)}$	E2	0.245	α(K)=0.1399 *20*; α(L)=0.0795 *12*; α(M)=0.0197 *3* α(N)=0.00467 *7*; α(O)=0.000662 *10*; α(P)=1.123×10^{-5} *16* Mult.: R(asym)=1.27 *18* (2006Sh23).
1228.9	$2^+,3,4^+$	375.0 *5*	100 *20*	854.13	$(0^+,2,4^+)$			
		600.6 *10*	40 *20*	628.14	2^+			
		788.8 *10*	≈20	439.49	4^+			
1341.7	$5^{(-)}$	148‡ *1*		1193.77	$4^{(-)}$			
		271.6 *10*	67 *33*	1070.7	$3^{(-)}$			
		469.4 *10*	67 *33*	871.10	6^+			
		903.0 *10*	100 *33*	439.49	4^+	(E1)	0.00216	α(K)=0.00182 *3*; α(L)=0.000260 *4*; α(M)=5.84×10^{-5} *9* α(N)=1.401×10^{-5} *20*; α(O)=2.28×10^{-6} *4*; α(P)=1.597×10^{-7} *23* Mult.: R(asym)=0.81 *5* (2006Sh23) and the adopted level scheme.

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Adopted Levels, Gammas (continued)

$\gamma(^{188}W)$ (continued)

E_i(level)	J_i^π	E_γ†	I_γ†	E_f	J_f^π	Mult.†	α#	Comments
1425.15	8^+	554.0 *2*	100	871.10	6^+	E2	0.01634	α(K)=0.01269 *18*; α(L)=0.00280 *4*; α(M)=0.000661 *10* α(N)=0.0001579 *23*; α(O)=2.42×10^{-5} *4*; α(P)=1.166×10^{-6} *17* Mult.: R(asym)=2.05 *20* (2006Sh23).
1533.77	$6^{(-)}$	340.0 *1*	100 *25*	1193.77	$4^{(-)}$	(E2)	0.0589	α(K)=0.0412 *6*; α(L)=0.01355 *19*; α(M)=0.00328 *5* α(N)=0.000781 *11*; α(O)=0.0001148 *17*; α(P)=3.60×10^{-6} *5* Mult.: R(asym)=1.03 *11*.
		662.5 *10*	≈25	871.10	6^+			
1538.2	(5^+)	344.3 *4*	67 *33*	1193.77	$4^{(-)}$			
		599.3 *10*	67 *33*	939.23	4^+			
		667.5 *10*	≈33	871.10	6^+			
		1099.0 *10*	100 *33*	439.49	4^+			
1728.7	$7^{(-)}$	195‡ *1*		1533.77	$6^{(-)}$			
		303‡ *1*		1425.15	8^+			
		387‡ *1*		1341.7	$5^{(-)}$			
		858‡ *1*		871.10	6^+			
1742.7	$7^{(-)}$	(14‡)		1728.7	$7^{(-)}$			E_γ: Not observed but inferred from coincidence relationships (2010La16).
		209‡ *1*		1533.77	$6^{(-)}$			
		317‡ *1*		1425.15	8^+			
		401‡ *1*		1341.7	$5^{(-)}$			E_γ: Also seen in ^{188}Ta β- decay, but not placed in the level scheme.
		872‡ *1*		871.10	6^+			
1926.7	8^-	184‡ *1*	100 *2*	1742.7	$7^{(-)}$	M1	0.841 *18*	α(K)=0.699 *15*; α(L)=0.1103 *23*; α(M)=0.0251 *6* α(N)=0.00605 *13*; α(O)=0.000987 *21*; α(P)=7.03×10^{-5} *15* B(M1)(W.u.)=1.72×10^{-5} *7* E_γ: Also seen in ^{188}Ta β- decay, but not placed in the level scheme. I_γ: From $^{186}W(^{136}Xe,X\gamma)$. Mult.: From α_T(exp)=0.77 6 in 2010La16.
		198‡ *1*	1.9 *7*	1728.7	$7^{(-)}$	[M1]	0.686 *14*	α(K)=0.570 *12*; α(L)=0.0898 *18*; α(M)=0.0204 *4* α(N)=0.00492 *10*; α(O)=0.000804 *16*; α(P)=5.73×10^{-5} *12* B(M1)(W.u.)=2.6×10^{-7} *10* I_γ: From $^{186}W(^{136}Xe,X\gamma)$.
2274.4	(9^-)	348‡ *1*		1926.7	8^-			
2665.9	(10^-)	392‡ *1*		2274.4	(9^-)			
		739‡ *1*		1926.7	8^-			
3086.7	(11^-)	421‡ *1*		2665.9	(10^-)			
		812‡ *1*		2274.4	(9^-)			

† From $^{186}W(^{18}O,^{16}O\gamma)$, unless otherwise stated. Mult. are based on R(asym)=Iγ(in reaction plane)/Iγ(out of reaction plane), measured in 2006Sh23, and the corresponding band assignments. R(asym)>1 is expected for ΔJ=2, quadrupole or ΔJ=0, dipole and R(asym)<1 for ΔJ=1, dipole. For in-band transitions D=M1 and Q=E2 was assumed.
‡ From $^{186}W(^{136}Xe,X\gamma)$ (2010La16). E_γ uncertainty was assigned by the evaluator.

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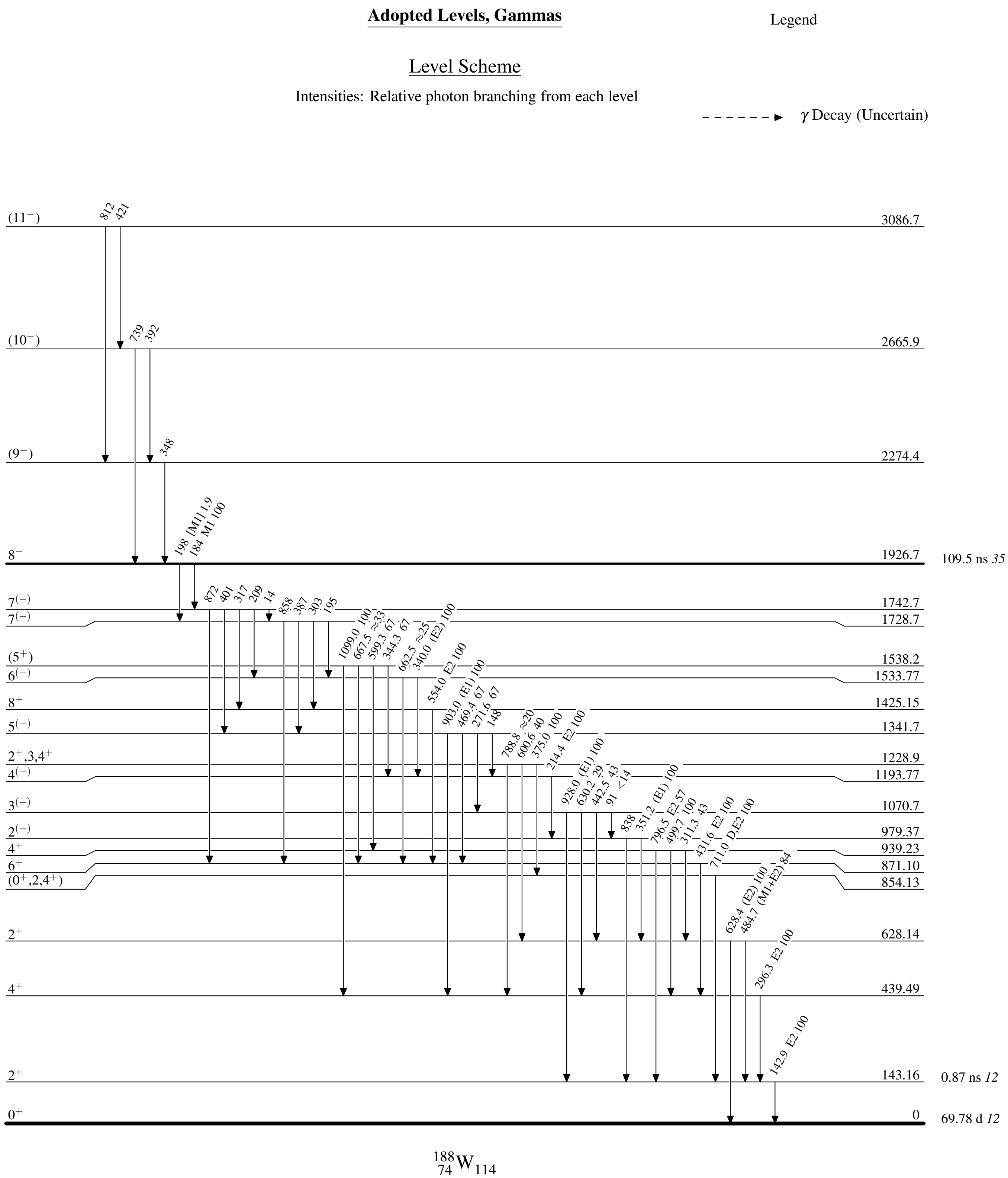
Adopted Levels, Gammas (continued)

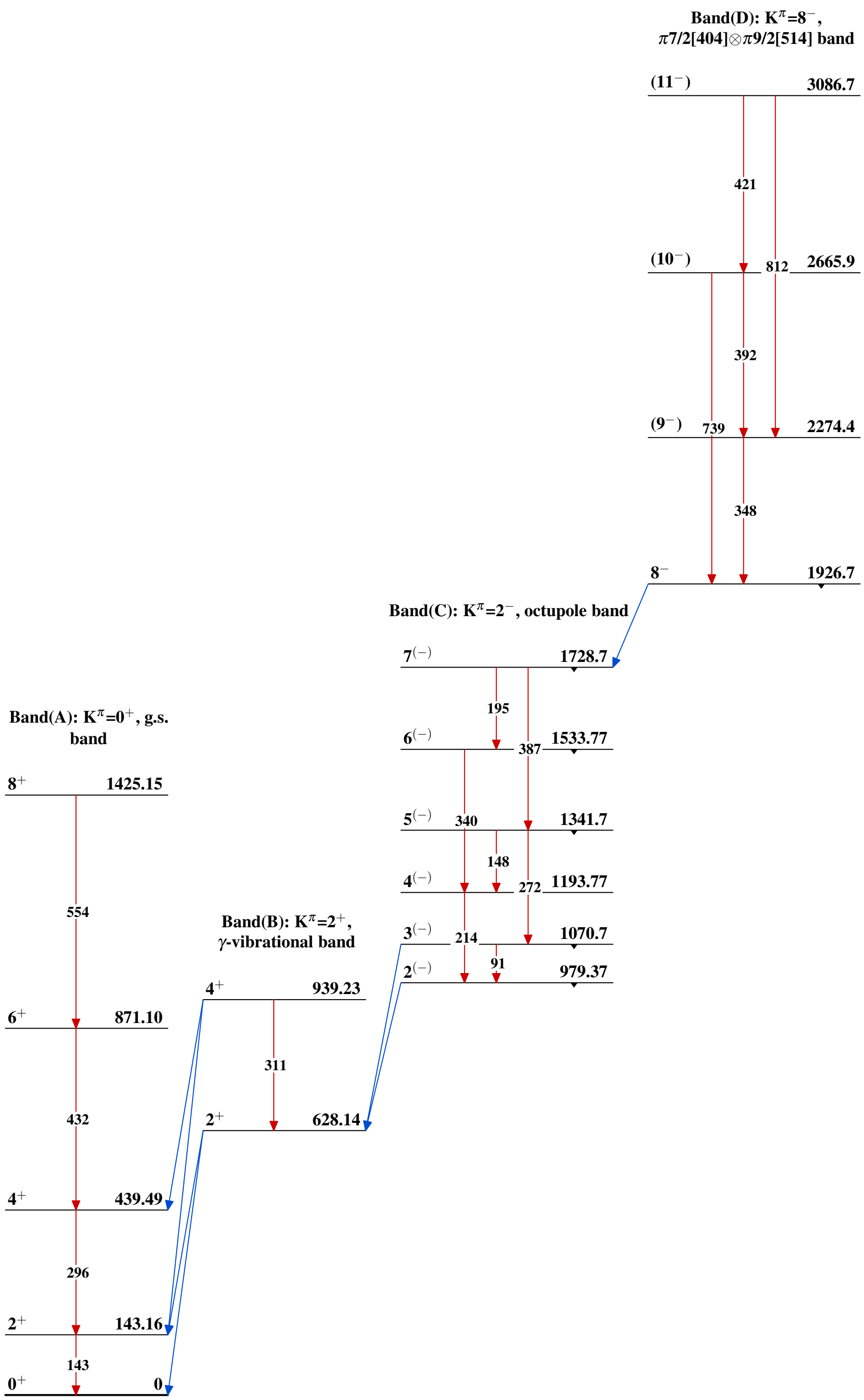
$\gamma(^{188}W)$ (continued)

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.

Adopted Levels, Gammas



Adopted Levels, Gammas



$^{188}_{74}W_{114}$