

$^{184}\text{W}(\text{n},\text{n}'\gamma)$ 1978Av04

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

Others: 1963Sm07.

1978Av04: Fast reactor neutrons, energy range not specified; 97.3% enriched ^{184}W target; measured photon spectrum At 90° ; deduced level populations and band structure.

 ^{184}W Levels

E(level) [†]	J ^π [‡]	E(level) [†]	J ^π [‡]	E(level) [†]	J ^π [‡]	E(level) [†]	J ^π [‡]
0.0 [@]	0 ⁺	1282.9? 3	(0 ⁻ ,1 ⁻ ,2 ⁻)	1537.4 ^d 11	(4 ⁺)	1809.4 7	(2 ⁺)
111.21 [@] 10	2 ⁺	1285.08 ^e 22	5 ⁻	1580.43 24	(6 ⁻)	1876.8 4	(2 ⁺)
364.04 [@] 20	4 ⁺	1294.91 ^{&} 23	(5 ⁺)	1613.9 4	(1 ⁺)	1894.3 4	[3 ⁺]
748.27 22	6 ⁺	1321.8 ^b 6	[0 ⁺]	1614.7 5	(0 ⁺)	1995.9 10	
903.30 ^{&} 13	2 ⁺	1345.36 ^a 14	(4)	1628.00 24	(2 ⁺) ^f	2035.7 12	(1 ⁺ ,2 ⁺)
1002.6 [#] 15	0 ⁺	1360.4 [#] 3	[4 ⁺]	1661.09? 22	4 ⁺	2056.6 14	(1 ⁻)
1005.98 ^{&} 13	3 ⁺	1386.41 ^c 15	2 ⁺	1677.6 ^d 6	(5 ⁺)	2060.3 10	(0 ⁺ ,2 ⁺)
1121.61 [#] 24	2 ⁺	1425.40 ^d 17	(3) ⁺	1683.4 5	4 ⁺	2097.7 16	(1 ⁺)
1130.08 ^a 14	(2 ⁻)	1430.8 ^b 4	2 ⁺	1713.7 4	(0 ⁺)	2126.34 24	(0 ⁺ ,2 ⁺)
1133.83 ^{&} 19	4 ⁺	1446.35 24	6 ⁻	1745.3 6	(5 ⁻ ,6)	2167.8 14	(1 ⁺)
1221.29 ^a 14	3 ⁻	1523.62 ^c 22	(3 ⁺)	1775.79 22	(2 ⁺)		

[†] From least-squares fit to E_γ , omitting the 384 γ , 642 γ , 903 γ calibration lines, and assigning 1 keV uncertainty to lines for which 1978Av04 did not assign an uncertainty.

[‡] Authors' suggested values, based on γ decay patterns and band structure.

Band(A): $K^\pi=0^+$ β band.

@ Band(B): $K^\pi=0^+$ g.s. band.

& Band(C): $K^\pi=2^+$ γ band.

^a Band(D): $K^\pi=2^-$ octupole band.

^b Band(E): $K=0$ band.

^c Band(F): $K^\pi=2^+$ band.

^d Band(G): $K^\pi=3^+$ band.

^e Band(H): $K^\pi=5^-$ band.

^f Differs from adopted value of (1)⁺.

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

E_γ [†]	I_γ [†]	$E_i(\text{level})$	J_i^π	E_f	J_f^π
111.21 10	86 15	111.21	2 ⁺	0.0	0 ⁺
^x 146.0 4	0.18 7				
161.27 ^a 10	<0.9	1282.9? (0 ⁻ ,1 ⁻ ,2 ⁻)		1121.61 2 ⁺	
161.27 10	<0.9	1446.35 6 ⁻		1285.08 5 ⁻	
203.5 ^a 5	0.32 8	1425.40 (3) ⁺		1221.29 3 ⁻	
^x 210.7 5	0.7 2				
215.21 10	<4.4	1221.29 3 ⁻		1005.98 3 ⁺	
215.21 10	<4.4	1345.36 (4)		1130.08 (2 ⁻)	
226.74 10	10.4 15	1130.08 (2 ⁻)		903.30 2 ⁺	
238.8 6	0.18 5	1360.4 [4 ⁺]		1121.61 2 ⁺	
252.850 [@]	28 5	364.04 4 ⁺		111.21 2 ⁺	

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$^{184}\text{W}(\text{n},\text{n}'\gamma)$ **1978Av04** (continued) $\gamma(^{184}\text{W})$ (continued)

$E_\gamma^\dagger$	$I_\gamma^\dagger$	$E_i(\text{level})$	J_i^π	E_f	J_f^π
295.35 10	<2.8	1425.40	(3) ⁺	1130.08	(2) ⁻
295.35 10	<2.8	1580.43	(6) ⁻	1285.08	5 ⁻
318.04 10	5.7 9	1221.29	3 ⁻	903.30	2 ⁺
339.45 10	1.9 6	1345.36	(4)	1005.98	3 ⁺
^x 352.0 5	0.17 5				
^x 359.4 3	0.48 9				
384.27 10	3.5 4	748.27	6 ⁺	364.04	4 ⁺
418.4 6	0.4 2	1321.8	[0 ⁺]	903.30	2 ⁺
460.2 5	0.20 8	1745.3	(5 ⁻ ,6)	1285.08	5 ⁻
526.8 4	0.13 4	1661.09?	4 ⁺	1133.83	4 ⁺
536.85 10	0.64 14	1285.08	5 ⁻	748.27	6 ⁺
607.9 4	0.37 9	1613.9	(1 ⁺)	1005.98	3 ⁺
^x 627.5 4	0.17 7				
641.91 @ 5	1.1 2	1005.98	3 ⁺	364.04	4 ⁺
^x 646.4 6	0.18 8				
655.5 3	<0.39	1661.09?	4 ⁺	1005.98	3 ⁺
655.5 3	<0.39	1876.8	(2 ⁺)	1221.29	3 ⁻
711.0 5	<1.0	1613.9	(1 ⁺)	903.30	2 ⁺
711.2 5	<1.0	1614.7	(0 ⁺)	903.30	2 ⁺
724.7 2	0.84 17	1628.00	(2 ⁺)	903.30	2 ⁺
757.6 3	1.2 2	1121.61	2 ⁺	364.04	4 ⁺
757.6 3	<1.4	1661.09?	4 ⁺	903.30	2 ⁺
763.6 6	0.38 15	1894.3	[3 ⁺]	1130.08	(2) ⁻
769.7 2	2.2 [‡] 6	1133.83	4 ⁺	364.04	4 ⁺
769.7 2	<0.9 [‡]	1775.79	(2 ⁺)	1005.98	3 ⁺
792.08 10	11.8 12	903.30	2 ⁺	111.21	2 ⁺
810.4 3	0.15 4	1713.7	(0 ⁺)	903.30	2 ⁺
891.4 15	1.8 10	1002.6	0 ⁺	111.21	2 ⁺
894.77 10	10.2 20	1005.98	3 ⁺	111.21	2 ⁺
903.28 @ 2	10	903.30	2 ⁺	0.0	0 ⁺
921.00 10	1.3 2	1285.08	5 ⁻	364.04	4 ⁺
930.87 10	0.97 19	1294.91	(5 ⁺)	364.04	4 ⁺
^x 938.9 8	0.09 3				
981.1 5	0.23 9	1345.36	(4)	364.04	4 ⁺
996.3 2	<0.9	1360.4	[4 ⁺]	364.04	4 ⁺
996.3 2	<0.9	2126.34	(0 ⁺ ,2 ⁺)	1130.08	(2) ⁻
1010.4 3	2.3 5	1121.61	2 ⁺	111.21	2 ⁺
1022.6 2	1.6 4	1133.83	4 ⁺	111.21	2 ⁺
1060.5 10	0.20 8	1425.40	(3) ⁺	364.04	4 ⁺
1110.4 3	0.6 2	1221.29	3 ⁻	111.21	2 ⁺
1121.4 10	0.5 2	1121.61	2 ⁺	0.0	0 ⁺
^x 1160.6 6	0.5 2				
1173.4 10	0.19 [#] 3	1285.08	5 ⁻	111.21	2 ⁺
1173.4 10	0.21 [#] 15	1537.4	(4 ⁺)	364.04	4 ⁺
1211.0 10	<0.03	1321.8	[0 ⁺]	111.21	2 ⁺
1249.8	<0.08	1360.4	[4 ⁺]	111.21	2 ⁺
^x 1260.6 5	0.44 7				
1275.2 2	0.97 9	1386.41	2 ⁺	111.21	2 ⁺
1313.6 5	<1.2	1425.40	(3) ⁺	111.21	2 ⁺
1313.6 5	<1.2	1677.6	(5 ⁺)	364.04	4 ⁺
1319.3 5	<1.2	1430.8	2 ⁺	111.21	2 ⁺
1319.6 5	<1.2	1683.4	4 ⁺	364.04	4 ⁺
1386.4 2	0.68 7	1386.41	2 ⁺	0.0	0 ⁺
1412.4 2	<0.93	1523.62	(3 ⁺)	111.21	2 ⁺

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$^{184}\text{W}(\text{n},\text{n}'\gamma)$ **1978Av04 (continued)** $\gamma(^{184}\text{W})$ (continued)

$E_\gamma^\dagger$	$I_\gamma^\dagger$	$E_i(\text{level})$	J_i^π	E_f	J_f^π	$E_\gamma^\dagger$	$I_\gamma^\dagger$	$E_i(\text{level})$	J_i^π	E_f	J_f^π
1412.4 5	<0.93	1775.79	(2 ⁺)	364.04	4 ⁺	1808.4 10	0.10 5	1809.4	(2 ⁺)	0.0	0 ⁺
1431.0 4	0.8 3	1430.8	2 ⁺	0.0	0 ⁺	1949.1 &	<0.57	2060.3	(0 ⁺ , 2 ⁺)	111.21	2 ⁺
^x 1475.7 8	0.15 8					1995.9	0.23 9	1995.9		0.0	0 ⁺
1501.8 9	0.09 4	1613.9	(1 ⁺)	111.21	2 ⁺	^x 2004.6 &	0.35 9				
1504.0 9	0.09 4	1614.7	(0 ⁺)	111.21	2 ⁺	2014.0 10	0.12 4	2126.34	(0 ⁺ , 2 ⁺)	111.21	2 ⁺
1530.5 8	0.06 3	1894.3	[3 ⁺]	364.04	4 ⁺	2035.7 12	0.12 5	2035.7	(1 ⁺ , 2 ⁺)	0.0	0 ⁺
1550.4 10	<0.05	1661.09?	4 ⁺	111.21	2 ⁺	2056.6 14	<0.25	2056.6	(1 ⁻)	0.0	0 ⁺
1571.5 8	0.18 9	1683.4	4 ⁺	111.21	2 ⁺	2056.6 14	<0.25	2167.8	(1 ⁺)	111.21	2 ⁺
1699.1 &	<0.16	1809.4	(2 ⁺)	111.21	2 ⁺	^x 2080.6 16	0.11 6				
1766.5 15	0.09 6	1876.8	(2 ⁺)	111.21	2 ⁺	^x 2087.5 16	0.16 8				
1783.6 6	0.14 4	1894.3	[3 ⁺]	111.21	2 ⁺	2097.7 16	0.18 9	2097.7	(1 ⁺)	0.0	0 ⁺

[†] From **1978Av04**, except As noted.

[‡] I(770 γ doublet)=2.3 5 (**1978Av04**). from I(1023 γ)=1.6 4 here and adopted I(769 γ)/I(1023 γ)=1.35 7, I(769 γ from 1134 level)=2.2 6 leaving 0.1 8 to deexcite the 1776 level.

[#] I(1173 γ doublet)=0.40 15 (**1978Av04**). from I(921 γ)=1.3 2 here and adopted I(1173 γ)/I(921 γ)=0.149 6, I(1173 γ from 1285 level)=0.19 3 leaving 0.21 15 to deexcite the 1538 level.

@ Transition used for energy calibration.

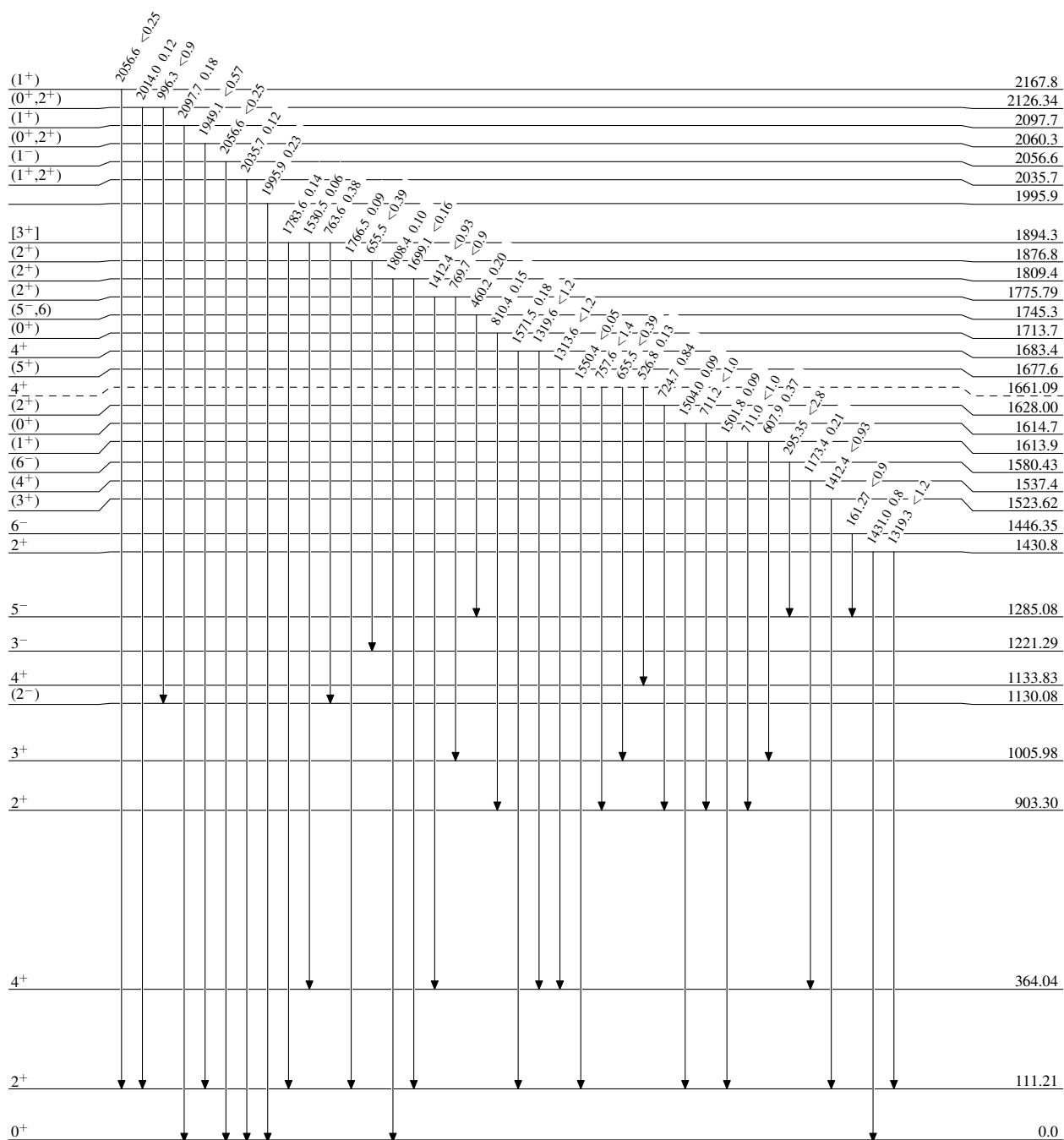
& Multiplet.

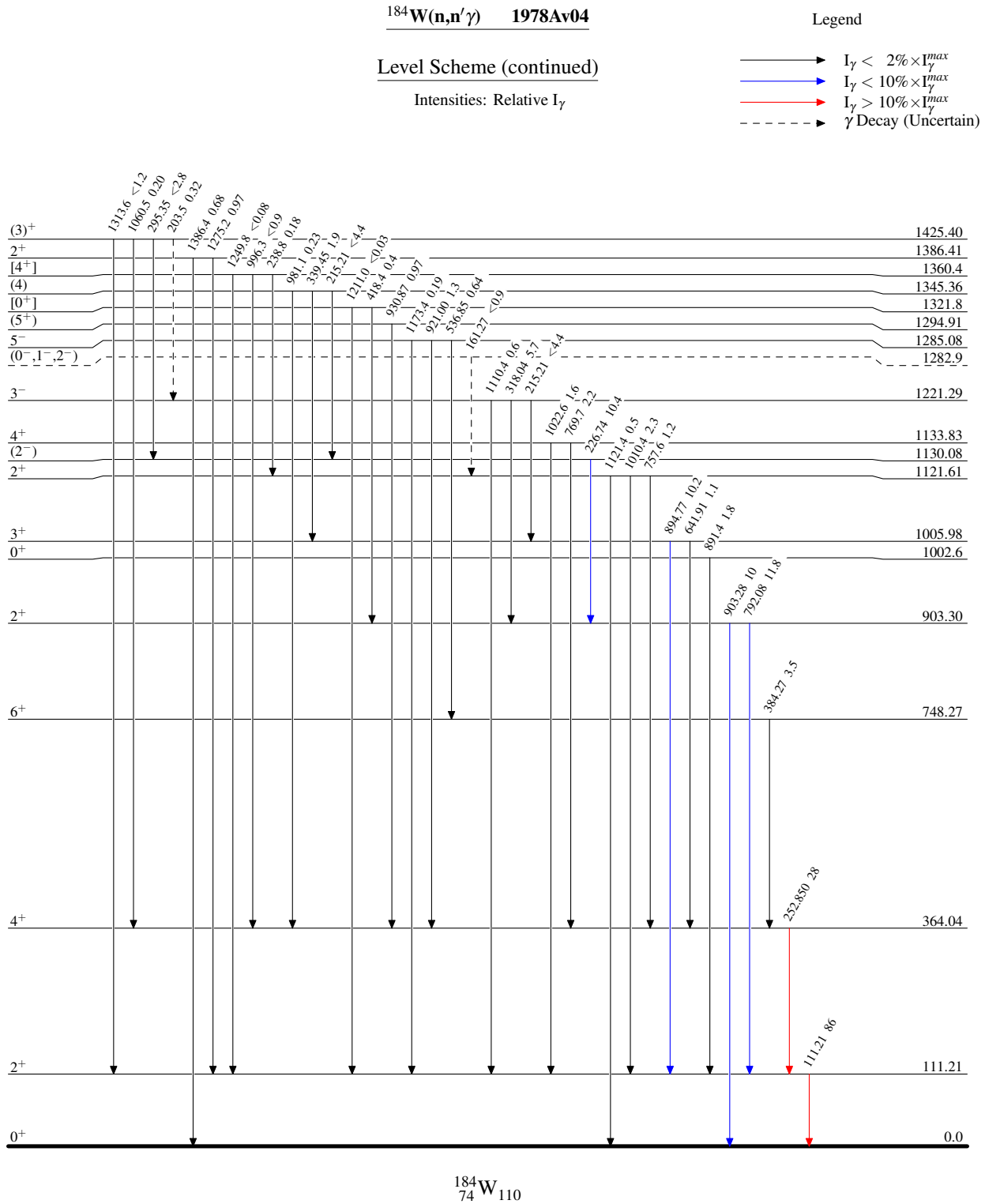
^a Placement of transition in the level scheme is uncertain.

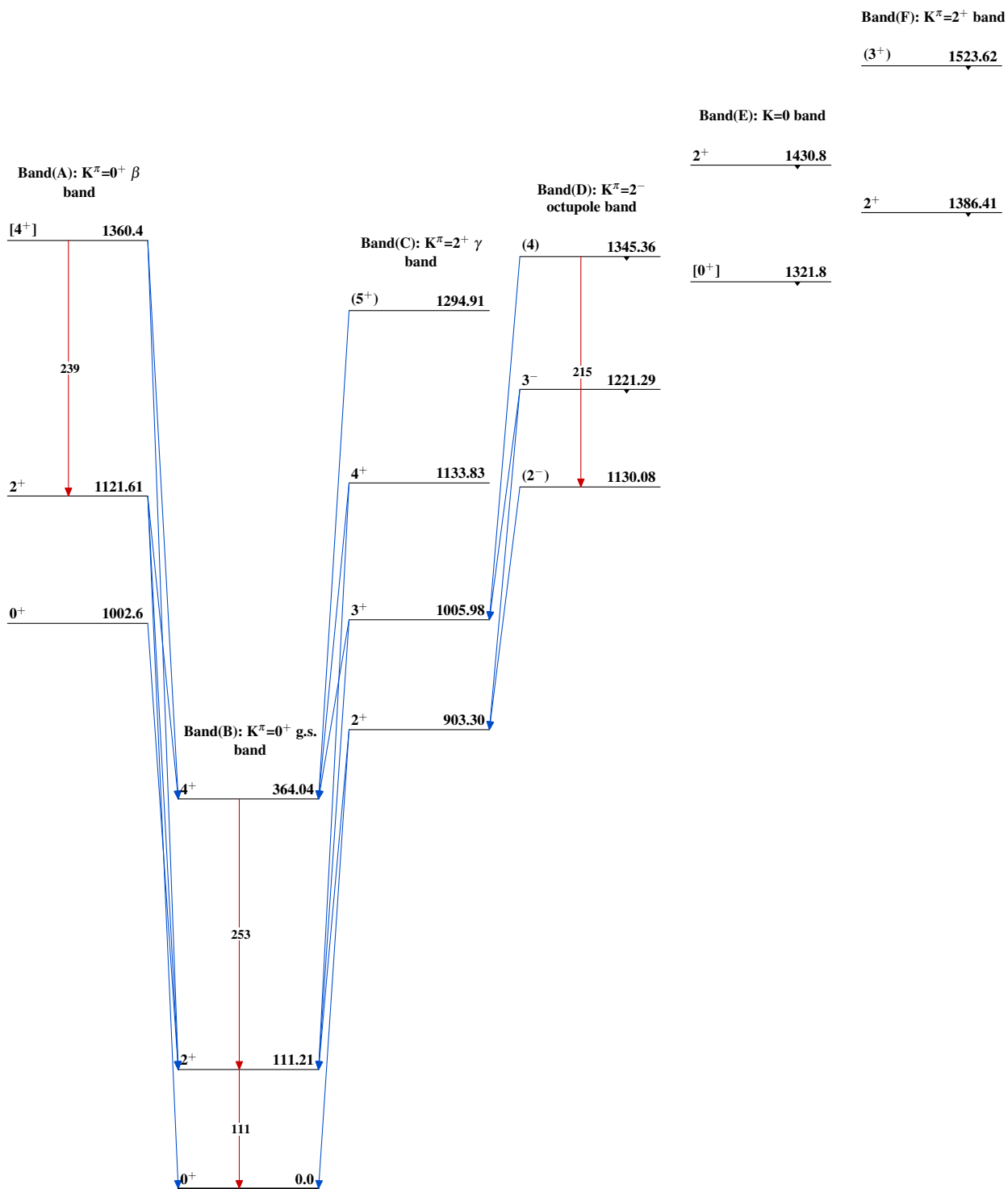
^x γ ray not placed in level scheme.

Intensities: Relative I_{γ}

Legend

 $^{184}_{74}\text{W}_{110}$



$^{184}\text{W}(\text{n},\text{n}'\gamma)$ 1978Av04

$^{184}\text{W}(\text{n},\text{n}'\gamma)$ 1978Av04 (continued)

Band(G): $\text{K}^{\pi}=3^{+}$ band

(5^{+}) 1677.6



(4^{+}) 1537.4



$(3)^{+}$ 1425.40



Band(H): $\text{K}^{\pi}=5^{-}$ band

5^{-} 1285.08

$^{184}_{74}\text{W}_{110}$