^{185}Re(p,2nγ) 1973Ho09

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

Others: 1965Sa11 (E=12, 13, 14 MeV), 1973Ya05, 1974Ka19.
1974Ka19: E(p)=44 MeV; measured Eγ, Iγ for transitions from the J=2,4,6,8 members of the g.s. rotational band.
1973Ho09: E(p)=14 MeV; Ge(Li) detector; measured Eγ, Iγ.
1973Ya05: E(p)=14 MeV; Ge(Li) detector; measured Eγ, Iγ.
The level scheme is that of 1973Ho09 with the addition (by the evaluator) of levels At 1206, 1899, 1917, 1929, 1935, 1959, 1992, 2056, 2136, 2330 and 2400 to accommodate transitions which were unplaced by 1973Ho09 but for which the placements are known from Adopted Levels, Gammas.

^{184}Os Levels

E(level)†	Jπ@	E(level)†	Jπ@	E(level)†	Jπ@	E(level)†	Jπ@
0.0[a]	0+	1428.31[c] *14*	(5)+	1718.18[d] *13*	5−	1959.2‡ *4*	
119.81[a] *9*	2+	1445.75 *13*	(3,4)+	1832.79[d] *15*	(6−)	1991.46‡ *23*	
383.79[a] *12*	4+	1500.62[b] *16*	(3,4)+	1836.32 *15*		2055.94‡ *24*	
774.20[a] *13*	6+	1543.96[d] *13*	3−	1840.37 *14*		2135.7‡ *4*	
942.79#[c] *12*	2+	1613.21[c] *16*	(6+)	1877.59[b] *22*		2329.9‡ *3*	
1081.05[c] *12*	3+	1620.76[d] *13*	4−	1898.72‡ *23*		2399.11? *15*	
1205.6‡[b] *5*	2+&	1631.55 *13*	(5+)	1916.45‡ *22*		2446.79? *18*	5(+)
1225.06[c] *13*	4+	1697.8 *3*		1928.49‡ *19*			
1274.93[a] *20*	8+	1707.60 *15*	(4)−	1934.5‡ *3*			

† From least-squares fit to Eγ.
‡ Level introduced by evaluator to accommodate observed transition(S).
# Note that 1965Sa11 report the second 2+ level At 924 keV instead; reason for discrepancy unknown.
@ Values suggested by 1973Ho09.
& From Adopted Levels.
a Band(A): Kπ=0+ g.s. band.
b Band(B): quasi-β band.
c Band(C): Kπ=2+ γ band.
d Band(D): Kπ=3− band.

γ(^{184}Os)

Eγ†	Iγ†	Ei(level)	Jiπ	Ef	Jfπ	Comments
97.40 *20*	3.5 *11*	1718.18	5−	1620.76	4−	
119.79 *10*	481 *72*	119.81	2+	0.0	0+	other Iγ: 460 *37* (1973Ya05). Mult.: α(L)exp=0.44 *10* (1965Sa11); low for expected E2 transition, but ce peak area extraction May Be problematic because of self absorption.
174.32 *20*	1.5 *3*	1718.18	5−	1543.96	3−	Iγ: from Iγ/I(493γ+1334γ)=0.0196 *16* in Adopted Gammas.
185.76 *10*	9 *3*	1631.55	(5+)	1445.75	(3,4)+	
209.08 *20*	3.3 *13*	1840.37		1631.55	(5+)	placed from a different level with similar energy In Adopted Levels, Gammas.
212.02 *10*	16 *6*	1832.79	(6−)	1620.76	4−	
219.70 *20*	15 *5*	1840.37		1620.76	4−	

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^{185}Re(p,2nγ) 1973Ho09 (continued)

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

E_γ[†]	I_γ[†]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[‡]	α[a]	Comments
263.98 *10*	1000	383.79	4^+	119.81	2^+	E2	0.1349	other Iγ: 1000 *80* (1973Ya05). Mult.: from K/L=2.3 *2* (1965Sa11).
282.38 *20*	3.1 *9*	1225.06	4^+	942.79	2^+			
[x]308.0 *3*	7.5 *23*							
337.76 *20*	7.1 *21*	2055.94		1718.18	5^-			
[x]361.11 *25*	7.5 *26*							
364.72 *10*	17 *6*	1445.75	$(3,4)^+$	1081.05	3^+			
[x]368.03 *20*	6.2 *25*							
376.91 *20*	3.7 *11*	1877.59		1500.62	$(3,4)^+$			
390.36 *10*	382 *76*	774.20	6^+	383.79	4^+	E2	0.0432	other Iγ: 390 *31* (1973Ya05). Mult.: K/L=2.8 *8*, α(K)exp=0.032 *3* (1965Sa11).
404.51 *20*	5.9 *24*	1832.79	(6^-)	1428.31	$(5)^+$			
406.60 *15*	7 *3*	1631.55	(5^+)	1225.06	4^+			
411.95 *10*	11 *3*	1840.37		1428.31	$(5)^+$			
419.3 *4*	1.5[#] *7*	1500.62	$(3,4)^+$	1081.05	3^+			I_γ: from Iγ/I(1116.9γ)=0.070 *22* in Adopted Gammas and I(1117γ) here.
[x]420.53 *25*	<1.6[#]							I_γ: 0.5 *11* from Iγ=2.0 *8* for 419.3γ+420.53γ and I(419.3γ)=1.5 *7* deduced as indicated.
[x]427.0 *3*	1.7 *7*							
431.19[&] *20*	4.0 *12*	2329.9		1898.72				
[x]444.9 *3*	2.6 *10*							
[x]464.42 *20*	3.2 *10*							
493.11 *10*	57 *11*	1718.18	5^-	1225.06	4^+			
500.73 *15*	85 *21*	1274.93	8^+	774.20	6^+	E2	0.0227	other Iγ: 100 *20* (1973Ya05). Mult.: α(K)exp=0.018 *8* (1965Sa11).
502.95 *15*	32 *10*	1445.75	$(3,4)^+$	942.79	2^+			
539.69 *10*	69 *14*	1620.76	4^-	1081.05	3^+			
550.53 *20*	6.7 *20*	1631.55	(5^+)	1081.05	3^+			
601.16 *11*	48 *14*	1543.96	3^-	942.79	2^+			
606.41[b] *20*	<5	2446.79?	$5^{(+)}$	1840.37				
611.26 *11*	11 *4*	1836.32		1225.06	4^+			
613.82[b] *11*	<5	2446.79?	$5^{(+)}$	1832.79	(6^-)			
626.59 *11*	25 *6*	1707.60	$(4)^-$	1081.05	3^+			
653.98 *11*	5.7 *20*	1428.31	$(5)^+$	774.20	6^+			
684.3[&] *3*	3.0 *10*	1959.2		1274.93	8^+			
691.58 *20*	<3	2399.11?		1707.60	$(4)^-$			
697.26 *12*	19 *8*	1081.05	3^+	383.79	4^+			
726.1[&] *3*	12 *4*	1500.62	$(3,4)^+$	774.20	6^+			
778.25 *13*	<3	2399.11?		1620.76	4^-			
815.03[b] *14*	<3	2446.79?	$5^{(+)}$	1631.55	(5^+)			
822.97 *13*	133 *40*	942.79	2^+	119.81	2^+			other Iγ: 121 *10* (1973Ya05). Mult.: α(K)exp=0.0061 *19* (mult=E2) (1965Sa11) attributed by authors to transition between second and first 2^+ levels, but their Eγ=802.
826.05 *14*	<3	2446.79?	$5^{(+)}$	1620.76	4^-			
839.1 *3*	21[#] *8*	1613.21	(6^+)	774.20	6^+			I_γ: from I(1229γ) and Iγ/I(1229γ)=1.50 *10* in Adopted Gammas. I(839γ+841γ)=113 *40*.
841.33 *20*	92[#] *41*	1225.06	4^+	383.79	4^+			I_γ: from Iγ=113 *40* for the 839.1+841.33γ's and Iγ=21 *8* deduced as noted for the 839.1γ.

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^{185}Re(p,2nγ) 1973Ho09 (continued)

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

E_γ †	I_γ †	E_i(level)	J_i^π	E_f	J_f^π	Comments
						other Iγ: 124 *10* (1973Ya05), presumably for doublet.
942.87 *20*	96# *30*	942.79	2^+	0.0	0^+	I_γ: from Iγ=122 *30* for 942.87γ+944.14γ doublet and I(944γ)=26 *5*; see comment on I(944γ). other Iγ: 135 *11* (1973Ya05), presumably for a doublet. Mult.: α(K)exp=0.0050 *17* (mult=E2) (1965Sa11) attributed by authors to second 2^+ to g.s. transition, but their Eγ=924.
944.14 *20*	26# *5*	1718.18	5^-	774.20	6^+	I_γ: from I(493γ) and adopted I(944γ)/I(493γ)=0.46 *3* and Iγ=122 *30* for 942.87γ+944.14γ doublet; this implies I(943γ)=96 *30*.
953.45 *16*	<3	2399.11?		1445.75	$(3,4)^+$	
961.26 *15*	218 *45*	1081.05	3^+	119.81	2^+	other Iγ: 215 *17* (1973Ya05).
1044.55 *14*	96 *29*	1428.31	$(5)^+$	383.79	4^+	other Iγ: 137 *11* (1973Ya05).
1062.2 *3*	13# *5*	1445.75	$(3,4)^+$	383.79	4^+	I_γ: from Iγ/I(503γ)=0.41 *11* in Adopted Gammas and I(503γ) here. Iγ(1062.2 doublet)=44 *16*.
1062.2 *3*	37# *14*	1836.32		774.20	6^+	I_γ: from Iγ/I(1452γ)=2.33 *19* in Adopted Gammas and I(1453γ) here. Iγ(1062.2 doublet)=44 *16*.
1066.21 *14*	22 *9*	1840.37		774.20	6^+	
1085.8& *4*	16 *5*	1205.6	2^+	119.81	2^+	
1103.5 *3*	11.6# *27*	1877.59		774.20	6^+	I_γ: from Iγ/Iγ(376γ+1494γ)=1.40 *19* in Adopted Gammas. Iγ=92 *19* for the 1104γ+1105γ.
1105.28 *20*	80# *19*	1225.06	4^+	119.81	2^+	I_γ: from Iγ=92 *19* for the 1104γ+1105γ and Iγ=11.6 *27* deduced as noted for the 1103.5γ. other Iγ: 81 *6* (1973Ya05), presumably for doublet.
1116.91 *14*	22 *8*	1500.62	$(3,4)^+$	383.79	4^+	
1142.25& *17*	15 *5*	1916.45		774.20	6^+	
1154.31& *17*	18 *6*	1928.49		774.20	6^+	
1160.29 *17*	9 *3*	1543.96	3^-	383.79	4^+	
x1205.8 *3*	10@ *3*					
1217.2& *3*	3.8 *13*	1991.46		774.20	6^+	
1229.40 *12*	14 *5*	1613.21	(6^+)	383.79	4^+	
1236.93 *12*	18 *6*	1620.76	4^-	383.79	4^+	
1247.81 *12*	21 *8*	1631.55	(5^+)	383.79	4^+	
1314.1b *4*	9 *3*	1697.8		383.79	4^+	
1323.77 *25*	7.2# *20*	1707.60	$(4)^-$	383.79	4^+	I_γ: from Iγ/I(626γ)=0.29 *4* in Adopted Gammas. Iγ(1323.8γ+1325.7γ)=19 *7*.
1325.73 *25*	9# *3*	1445.75	$(3,4)^+$	119.81	2^+	I_γ: from Iγ/Iγ(502γ)=0.29 *3* in Adopted Gammas. I(1323.7γ+1325.7γ)=19 *7*.
1334.30 *12*	17 *7*	1718.18	5^-	383.79	4^+	
1361.5& *3*	21 *8*	2135.7		774.20	6^+	
1424.1 *3*	4.7 *19*	1543.96	3^-	119.81	2^+	
1452.50 *15*	16 *6*	1836.32		383.79	4^+	
x1457.89 *15*	28 *10*					
1493.74b *25*	4.6 *16*	1877.59		383.79	4^+	
1514.93& *20*	13 *4*	1898.72		383.79	4^+	
1544.6& *3*	10 *4*	1928.49		383.79	4^+	
1550.66& *25*	11 *4*	1934.5		383.79	4^+	
1578.17b *25*	18 *6*	1697.8		119.81	2^+	
1607.70& *25*	6.3 *22*	1991.46		383.79	4^+	
1625.95&b *20*	3.0	2399.11?		774.20	6^+	E_γ: fits placement poorly. a transition with this Eγ is

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^{185}Re(p,2nγ) 1973Ho09 (continued)

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

E_γ [†]	I_γ [†]	E_i(level)	J_i^π	E_f	J_f^π	Comments
						placed from a different level In Adopted Levels, Gammas, so evaluator concludes that its placement is incorrect here.
[x]1635.5 *3*	13 *5*					
1672.5 *3*	<3	2446.79?	$5^{(+)}$	774.20	6^+	
1697.8 *3*	12 *4*	1697.8		0.0	0^+	
[x]1746.2 *6*	6.7[@] *23*					
2063.0[b] *4*	<3	2446.79?	$5^{(+)}$	383.79	4^+	

[†] From 1973Ho09. Eγ data from 1973Ta05 are listed In the ^{187}Re(p,4nγ) data set and their Iγ data are given here In comments.
[‡] From ce data of 1965Sa11, except As noted. Electron and photon intensity scales normalized by evaluator so α(K)exp(264γ)=α(K)(E2 theory)(=0.0821).
[#] Intensity for doublet suitably divided.
[@] Composite peak, see 1973Ho09.
[&] Transition unplaced by 1973Ho09 but placed by evaluator consistent with Adopted Levels, Gammas.
[a] Total theoretical internal conversion coefficients, calculated using the BrIcc code (2008Ki07) with Frozen orbital approximation based on γ-ray energies, assigned multipolarities, and mixing ratios, unless otherwise specified.
[b] Placement of transition in the level scheme is uncertain.
[x] γ ray not placed in level scheme.

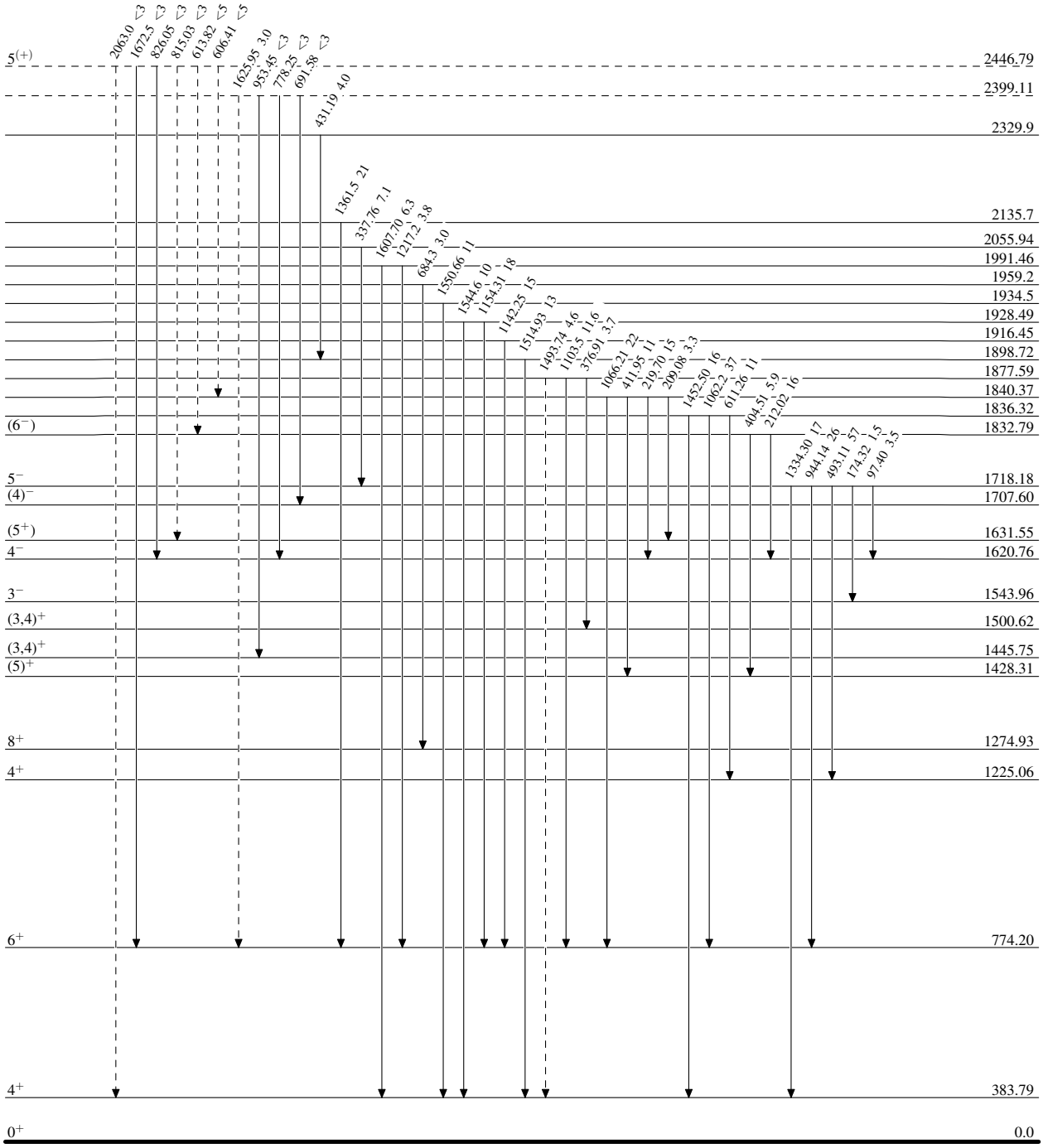
^{185}Re(p,2nγ) 1973Ho09

Level Scheme

Intensities: relative Iγ for E(p)=14 MeV.

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)

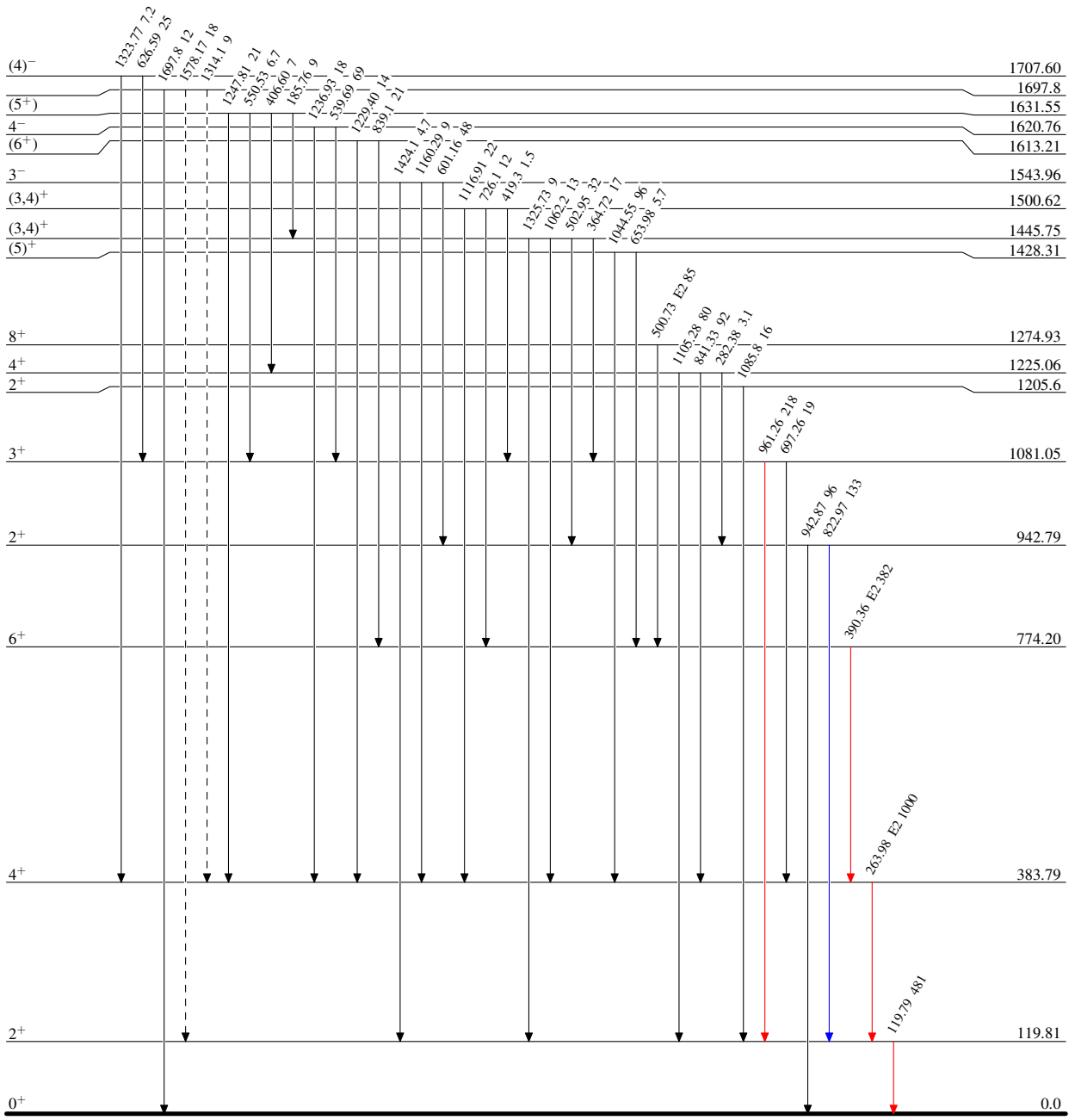


$^{184}_{76}Os_{108}$

^{185}Re(p,2nγ) 1973Ho09

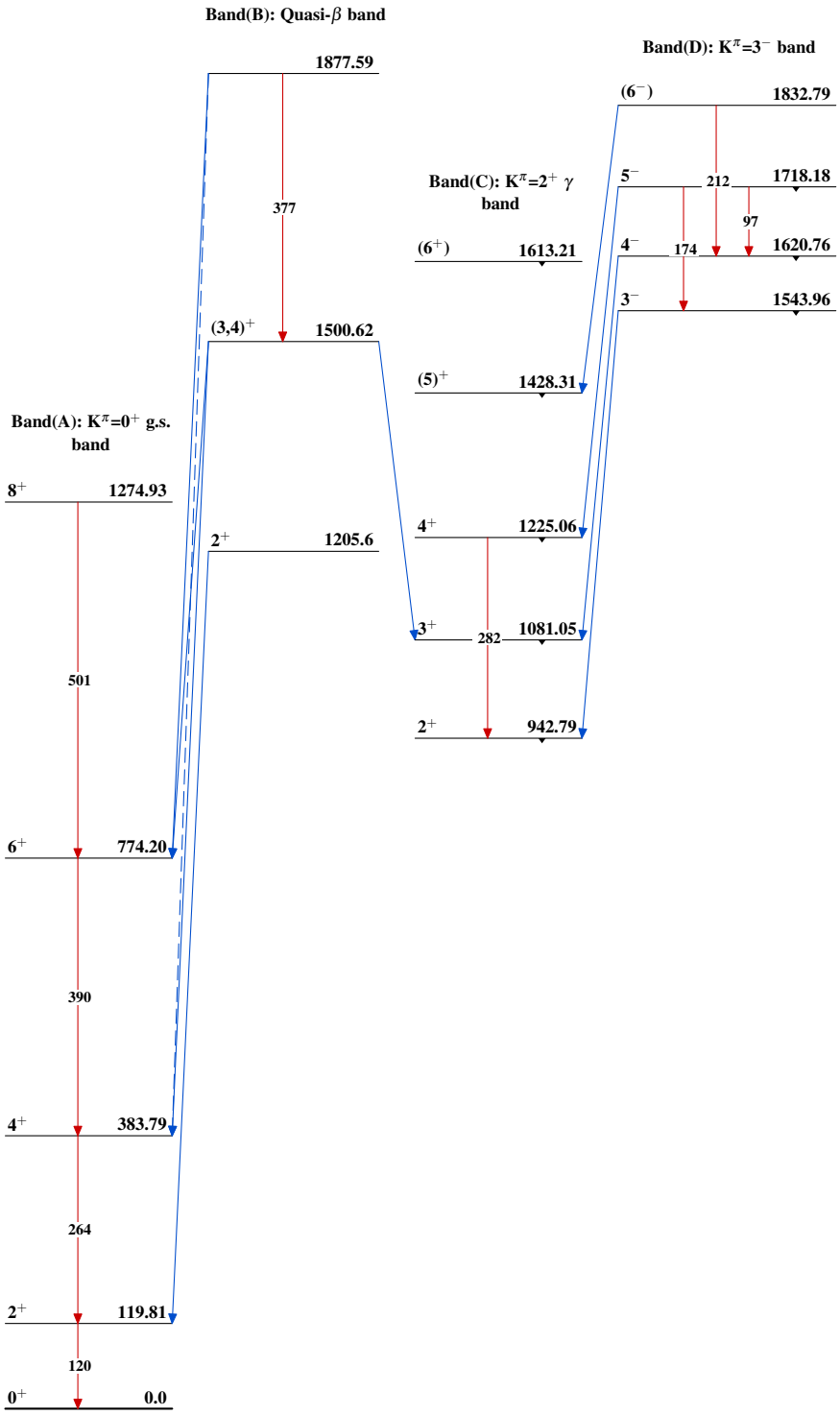
Level Scheme (continued)

Intensities: relative Iγ for E(p)=14 MeV.



$^{184}_{76}Os_{108}$

^{185}Re(p,2nγ) 1973Ho09



$^{184}_{76}Os_{108}$