^{176}Ir ε decay 1994Ki01,2005Wa25,1990Bo19

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

Parent: ^{176}Ir: E=0.0; $T_{1/2}$=8.7 s *5*; Q(ε)=8240 *30*; %ε+%β^+ decay=96.9 *6*

1994Ki01: ^{176}Ir activity produced by ^{149}Sm(^{31}P,4n) E=148 MeV. Measured Eγ, Iγ, $\gamma\gamma(\theta)$, Ice. Deduced conversion coefficients, angular correlation coefficients, γ-ray multipolarities and mixing ratios. Detectors: Compton-suppressed array of 6 germanium detectors, magnetic spectrometer (1994Ki01).

2005Wa25: ^{176}Ir activity produced by ^{146}Nd(^{36}Cl,5nγ) E=210 (effective 180 MeV); Detector: a coaxial HPGe(GMX), a planar HPGe(GLP), and a Segmented Clover detector; Measured: Eγ, $\gamma\gamma$ coin, $T_{1/2}$.

1990Bo19: ^{176}Ir activity produced by ^{141}Pr(^{40}Ar,5n) E=240 MeV. Measured α's: Eα, %α; γ rays: Eγ, Iγ, excitation functions. Detectors: semi for α's;Ge(Li) and Si(Li) for γ rays and x-rays, respectively.

^{176}Os Levels

E(level)†	J$^\pi$‡	Comments
0.0#	0+	
135.1# *7*	2+	J$^\pi$: 135γ E2 to 0+ state. Band member.
395.5# *8*	4+	J$^\pi$: 260.3γ E2 to 2+ state. Band member.
601.2@ *8*	0+	J$^\pi$: 466.1γ E2 to 2+ state. 601.3γ E0 to 0+ state. Band assignment.
742.2# *10*	6+	J$^\pi$: 346.9γ E2 to 4+ state. Band member.
742.4@ *8*	2+	J$^\pi$: 607.2γ E0+E2+M1 to 2+ state. Band member.
863.6& *7*	2+	J$^\pi$: 728.5γ E0+E2+M1 to 2+ state. 863.6γ E2 to 0+ state. Band assignment.
1025.5@ *8*	4+	J$^\pi$: 282.9γ E2 to 2+ state. 629.8γ E0+E2+M1 to 4+ state. Band member.
1037.7& *9*	3+	J$^\pi$: 642.2γ M1+E2 to 4+ state. 902.6γ M1+E2 to 2+ state.
1157.2# *11*	8+	J$^\pi$: 414.9γ E2 to 6+ state. Band member.
1223.9& *8*	4+	J$^\pi$: 828.4γ M1+E2 to 4+ state. 1088.8γ E2 to 2+ state.
1349.6a *9*	(3−)	J$^\pi$: 1214.6γ E1+M2 to 2+ state.
1409.5& *9*	5+	J$^\pi$: 667.2γ M1+E2 to 6+ state. 1014.0γ M1+E2 to 4+ state.
1431.8@ *9*	6+	J$^\pi$: 689.4γ E0+E2+M1 to 6+ state. 1036.4γ E2 to 4+ state.
1475.1a *10*	4−	J$^\pi$: 1079.8γ E1+M2 to 4+ state.
1516.5a *11*	5−	J$^\pi$: 773.9γ E1+M2 to 6+ state.
1708.0a *11*	6−	
1753.4a *11*	7−	
1929.6 *10*		
2103.3 *9*		
2138.5 *9*		

† Deduced by evaluator from a least squares fit to the γ-ray energies assuming ΔE=1 keV for all γ-rays.
‡ From multipolarity assignments and rotational band structure.
# K$^\pi$=0+ g.s. rotational band.
@ K$^\pi$=0+ β-vibrational band.
& K$^\pi$=2+ γ-vibrational band.
a K$^\pi$=(3−) band. Band members are adopted in Rotational band 1 and Rotational band 2.

^{176}Ir ε decay 1994Ki01,2005Wa25,1990Bo19 (continued)

$\gamma(^{176}Os)$

The decay-scheme normalization was not calculated because ε feeding to g.s. is unknown.

E_γ[†]	I_γ	E_i(level)	J^π_i	E_f	J^π_f	Mult.	δ[#]	α[&]	Comments
135.0	678 *20*	135.1	2^+	0.0	0^+	E2		1.37	α(K)= 0.455; α(L)= 0.686; α(M)= 0.172; α(N+..)= 0.0528 Mult.: from α(K)exp=0.66 *3* and α(L)exp=0.16 *1*. Eγ=134.9 *1*, Iγ=546 *27* (1990Bo19).
141.2	≈0.4	742.4	2^+	601.2	0^+				
233.0	1.0 *5*	1708.0	6^-	1475.1	4^-				
236.8	2.0 *8*	1753.4	7^-	1516.5	5^-				
260.3	1000 *30*	395.5	4^+	135.1	2^+	E2		0.143	α(K)= 0.0860; α(L)= 0.0427; α(M)= 0.0112; α(N+..)= 0.00264 Mult.: from α(K)exp=0.083 *4*, α(L)exp=0.044 *3*, and α(M)exp=0.0115 *8*. Eγ=259.7 *2*, Iγ=1000 *55* (1990Bo19).
282.9	19 *3*	1025.5	4^+	742.2	6^+	E2		0.110	α(K)= 0.0692; α(L)= 0.0310; α(M)= 0.00759; α(N+..)= 0.00177 Mult.: from α(K)exp=0.07 *2* for 282.9γ + 283.1γ.
283.1	10 *3*	1025.5	4^+	742.4	2^+				
312.0	2.4 *12*	1349.6	(3^-)	1037.7	3^+				
346.9[a]	600[a] *20*	742.2	6^+	395.5	4^+	E2		0.0594	α(K)= 0.0412; α(L)= 0.0146; α(M)= 0.00288; α(N+..)= 0.000740 Mult.: from α(K)exp=0.039 *5*, α(L)exp=0.0141 *8*, and α(M)exp=0.004 *1*. Eγ=346.7 *2*, Iγ=809 *44* (1990Bo19).
346.9[a]	19[a] *3*	742.4	2^+	395.5	4^+				
360.3	6 *2*	1223.9	4^+	863.6	2^+				
371.6	4 *1*	1409.5	5^+	1037.7	3^+				
406.3	36 *2*	1431.8	6^+	1025.5	4^+				Eγ=406.0 *5*, Iγ=60 *5*. 1990Bo19 placed this transition deexciting an 800.6-keV level.
414.9	59 *2*	1157.2	8^+	742.2	6^+	E2		0.0364	α(K)= 0.0266; α(L)= 0.00791; α(M)= 0.00145; α(N+..)= 0.000420 Mult.: from α(K)exp=0.028 *3*. Eγ=415.1 *3*, Iγ=77 *5* (1990Bo19).
437.4	5.4 *8*	1475.1	4^-	1037.7	3^+				
466.1	8.6 *14*	601.2	0^+	135.1	2^+	E2		0.0271	α(K)= 0.0202; α(L)= 0.00544; α(M)= 0.00112; α(N+..)= 0.000337 Mult.: from α(K)exp=0.019 *6*, A_2=+0.34 *16*, A_4=+1.08 *17*.
467.9	3.6 *10*	863.6	2^+	395.5	4^+				
481.6	4.4 *8*	1223.9	4^+	742.2	6^+				
485.9	2.8 *8*	1349.6	(3^-)	863.6	2^+				
596.4	6.4 *10*	1753.4	7^-	1157.2	8^+				
601.3		601.2	0^+	0.0	0^+	E0			Mult.: from K/L=5.9 *15*.

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^{176}Ir ε decay 1994Ki01,2005Wa25,1990Bo19 (continued)

γ(^{176}Os) (continued)

Eγ[†]	Iγ	Ei(level)	J^π_i	E_f	J^π_f	Mult.	δ[#]	α[&]	Comments
607.2	30 3	742.4	2+	135.1	2+	E0+E2+M1	−4.2 +5−6	0.139[@] 7	Mult.: from α(K)exp=0.114 7, α(L)exp=0.0173 18, α(M)exp=0.0072 10, A_2=+0.11 6, A_4=+0.27 7.
629.8	101 5	1025.5	4+	395.5	4+	E0+E2+M1	−2.8 +2−3	0.092[@] 5	Mult.: from α(K)exp=0.079 5, 0.0084 9, α(M)exp=0.0046 15; A_2=+0.001 6, A_4=+0.13 7.
642.2	4.4 6	1037.7	3+	395.5	4+	M1+E2	−2.9 +5−7	0.0152 15	α(K)= 0.012013; α(L)= 0.0023719 Mult.: from A_2=+0.27 14, A_4=−0.20 16.
667.2	10.4 14	1409.5	5+	742.2	6+	M1+E2	−2.4 +10−14	0.015 7	α(K)= 0.012 6; α(L)= 0.0022 9 Mult.: from A_2=+0.28 19, A_4=−0.25 23.
671.5[‡]		2103.3		1431.8	6+				
689.4	76 4	1431.8	6+	742.2	6+	E0+E2+M1	−2.0 +2−3	0.053[@] 8	Mult.: from α(K)exp=0.042 7, α(L)exp=0.0077 12, α(M)exp=0.0029 13; A_2=+0.01 6, A_4=+0.08 8.
706.5[‡]		2138.5		1431.8	6+				
728.5	40 3	863.6	2+	135.1	2+	E0+E2+M1	11 +0−5	0.018[@] 3	Mult.: from α(K)exp=0.0127 25, α(L)exp=0.0050 16; A_2=−0.00 4, A_4=+0.27 16.
773.9	30 2	1516.5	5−	742.2	6+	E1+M2	+0.13 +10−9	0.0041 19	α(K)= 0.003415; α(L)= 0.0005224 Mult.: from A_2=−0.25 12.
828.4	17.6 18	1223.9	4+	395.5	4+	M1+E2	+6 +0−4	0.0077 20	α(K)= 0.006117; α(L)= 0.0011625 Mult.: A_2=−0.18 11, A_4=+0.20 13.
863.6	25 3	863.6	2+	0.0	0+	E2		0.00676	α(K)= 0.00540; α(L)= 0.00102 Mult.: from α(K)exp=0.0063 9.
890.6	0.8 2	1025.5	4+	135.1	2+				
902.6	25 2	1037.7	3+	135.1	2+	M1+E2	−9 +3−5	0.0063 4	α(K)= 0.0050 4; α(L)= 0.00093 5 Mult.: from α(K)exp=0.0047 7; A_2=−0.26 8, A_4=−0.14 9.
965.4	7.8 14	1708.0	6−	742.2	6+				
1011.0	2.8 12	1753.4	7−	742.2	6+				
1014.0	11.8 8	1409.5	5+	395.5	4+	M1+E2	−22 +10−0	0.00486	α(K)= 0.00395; α(L)= 0.000685 Mult.: from A_2=−0.15 11, A_4=−0.08 13.
1036.4	30 4	1431.8	6+	395.5	4+	E2		0.00464	α(K)= 0.00379; α(L)= 0.000643 Mult.: from A_2=+0.07 16, A_4=+0.00 20.
1077.5[‡]		2103.3		1025.5	4+				
1079.8	21 2	1475.1	4−	395.5	4+	E1+M2	+0.1 +1−2	0.0019 6	α(K)= 0.0016 5; α(L)= 0.00023 7 Mult.: A_2=+0.15 22, A_4=+0.00 15.
1088.8	7.2 9	1223.9	4+	135.1	2+	E2		0.00422	α(K)= 0.00347; α(L)=

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^{176}Ir ε decay 1994Ki01,2005Wa25,1990Bo19 (continued)

γ(^{176}Os) (continued)

E_γ [†]	I_γ	E_i(level)	J^π_i	E_f	J^π_f	Mult.	δ [#]	Comments
								0.000559 Mult.: from α(K)exp=0.0033 *11*.
1112.8[‡]		2138.5		1025.5	4^+			
1214.6	12 *3*	1349.6	(3^-)	135.1	2^+	E1+M2	+0.3 *2*	Mult.: from α(K)exp=0.0016 *7*; A_2=+0.12 *15*, A_4=+0.01 *19*.
1361.5[‡]		2103.3		742.2	6^+			
1396.0[‡]		2138.5		742.2	6^+			
1534.2[‡]		1929.6		395.5	4^+			
1707.5[‡]		2103.3		395.5	4^+			
1743.5[‡]		2138.5		395.5	4^+			
1794.5[‡]		1929.6		135.1	2^+			

[†] From 1994Ki01 and 2005Wa25, except otherwise noted. The γ-ray energies in 1994Ki01 and 2005Wa25 are exactly the same.
[‡] From 2005Wa25.
[#] From 1994Ki01.
[@] Experimental value (Ice/Iγ).
[&] 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.
[a] Multiply placed with intensity suitably divided.

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Decay Scheme

Intensities: Relative $I_{(\gamma+ce)}$

@ Multiply placed: intensity suitably divided