(HI,xnγ) 1991Dr06,1995Ba51,2002OdZZ

Type	Author	History Citation	Literature Cutoff Date
Full Evaluation	F. G. Kondev	NDS 159, 1 (2019)	30-Aug-2019

1991Dr06: Produced using the ^{150}Sm(^{31}P,4nγ) reaction. Projectile: ^{31}P, E= 148 MeV. Target: ^{150}Sm, 1.2 mg/cm^2 thick, isotopically enriched. Measured Eγ, Iγ, γγ coin, γγ(t), γX coin, γX(t), γ(θ). Detectors: CAESAR γ-ray array comprised of six Compton-suppressed Ge detectors (±145°, ±97°, ±48°) and a small volume, planar Ge detector (LEPS) (135°). Additional data using the ^{149}Sm(^{32}S,p3nγ) reaction were also collected (for details see 1991Dr06).

1995Ba51,2002OdZZ: Produced using the ^{146}Nd(^{35}Cl,4nγ) reaction. Projectile: ^{35}Cl, E= 166 MeV. Target ^{146}Nd, two stacked self-supporting foils each of 0.5 mg/cm^2 thickness, isotopically enriched. Detectors: NORDBALL γ-ray array comprised of 20 Compton-suppressed Ge detectors with a 60 element BaF_2 inner ball (multiplicity filter). Measured Eγ, Iγ, γγ coin, DCO ratios. Data were recorded when the multiplicity of the BaF_2 inner ball was greater than eight.

^{177}Ir Levels

E(level)[†]	Jπ[‡]	$T_{1/2}$	Comments
0.0[#]	5/2⁻	29.8 s *17*	Jπ,$T_{1/2}$: From Adopted Levels.
0.0+x[g]	9/2⁻	>100 ns	Additional information 1. $T_{1/2}$: A lower limit based on the non-observation of a direct decay from this state to the Jπ=5/2⁻ ground state and/or the Jπ=9/2⁻ band member and the applied coincidence window. The value depends on the excitation energy of this state and the decay pattern.
44.1[#] *6*	9/2⁻		
118.7+x[g] *4*	11/2⁻		
180.6[f] *7*	5/2⁺	>100 ns	$T_{1/2}$: Lower limit based on the non-observation of a direct decay from this state via the 180.6γ to the Jπ=5/2⁻ ground state and the applied coincidence window. Using B(E1)=2.8×10^{-8} *3* (W.u.) from equivalent decay to the Jπ=5/2⁻, π1/2⁻[541] ground state of ^{181}Ir (1993Dr02), one may expect $T_{1/2}$ ≈ 1.2 μs.
223.0[&] *5*	7/2⁻		
258.2[#] *6*	13/2⁻		
278.8+x[g] *4*	13/2⁻		
281.5[f] *7*	7/2⁺		
404.4[f] *6*	9/2⁺		
433.0[&] *6*	11/2⁻		
454.3+x[g] *5*	15/2⁻		
549.6[f] *7*	11/2⁺		
575.4?[a]	(11/2⁻)		
614.7[#] *7*	17/2⁻		
650.1+x[g] *6*	17/2⁻		
712.3[f] *7*	13/2⁺		
712.6[b] *5*	(9/2⁺)		
764.0[&] *6*	15/2⁻		
806.8[b] *6*	13/2⁺		
858.1[a] *7*	15/2⁻		
860.9+x[g] *6*	19/2⁻		
897.2[f] *7*	15/2⁺		
954.5[b] *6*	17/2⁺		
1075.6[#] *7*	21/2⁻		
1088.8+x[g] *6*	21/2⁻		
1099.1[f] *7*	17/2⁺		
1188.4[&] *7*	19/2⁻		

Continued on next page (footnotes at end of table)

(HI,xnγ) 1991Dr06,1995Ba51,2002OdZZ (continued)

^{177}Ir Levels (continued)

E(level)[†]	Jπ[‡]	E(level)[†]	Jπ[‡]	E(level)[†]	Jπ[‡]	E(level)[†]	Jπ[‡]
1214.9[b] *8*	$21/2^+$	2444.1+x[g] *8*	$31/2^-$	3461.0[&] *12*	$(35/2^-)$	4740.2+x[g] *14*	$45/2^-$
1224.7[a] *7*	$19/2^-$	2482.2[b] *11*	$33/2^+$	3614.4[@] *10*	$37/2^-$	4910.0[e] *12*	$(45/2^+)$
1314.3[f] *8*	$19/2^+$	2532.3+x *9*	$(27/2^-)$	3616.5[d] *11*	$37/2^+$	5057.3[b] *13*	$49/2^+$
1330.6+x[g] *7*	$23/2^-$	2549.1[@] *10*	$29/2^-$	3659.9[b] *12*	$41/2^+$	5113.4+x?[g]	$47/2^-$
1548.9[f] *8*	$21/2^+$	2623.1[f] *10*	$29/2^+$	3736.1+x[g] *9*	$39/2^-$	5120.0[@] *15*	$45/2^-$
1562.8[b] *10*	$25/2^+$	2702.7[a] *9*	$31/2^-$	3786.2[e] *12*	$(37/2^+)$	5259.9?[c] *13*	$(47/2^+)$
1588.6+x[g] *7*	$25/2^-$	2754.7+x[g] *8*	$33/2^-$	3795.7?[f]	$(37/2^+)$	5268.0[d] *12*	$49/2^+$
1610.9[#] *8*	$25/2^-$	2757.4+x *8*	$(29/2^-)$	3941.0 *12*	$(39/2^-)$	5386.4[#] *14*	$49/2^-$
1652.7[a] *7*	$23/2^-$	2802.0[c] *11*	$31/2^+$	3950.1[c] *12*	$39/2^+$	5435.2+x?[g]	$49/2^-$
1694.5[&] *9*	$23/2^-$	2823.1[#] *10*	$33/2^-$	3976.7[a] *15*	$(39/2^-)$	5542.2[e] *13*	$(49/2^+)$
1790.2[f] *9*	$23/2^+$	2855.8[&] *11*	$31/2^-$	3988.3[#] *12*	$41/2^-$	5810.6[b] *14*	$53/2^+$
1859.6+x[g] *8*	$27/2^-$	2978.1[d] *12*	$(29/2^+)$	3998.4+x *10*	$(39/2^-)$	5845.3 *16*	
1876.2[c]	$(23/2^+)$	2995.6[@] *10*	$33/2^-$	4069.2+x[g] *10*	$41/2^-$	5966.0[d] *13*	$53/2^+$
1987.4[b] *11*	$29/2^+$	3041.1[b] *11*	$37/2^+$	4102.0[d] *12*	$41/2^+$	6172.7[#] *15*	$(53/2^-)$
2059.2[f] *9*	$25/2^+$	3075.6+x[g] *9*	$35/2^-$	4324.4[e] *12*	$(41/2^+)$	6575.9[b] *15*	$57/2^+$
2145.4+x[g] *8*	$29/2^-$	3192.4[d] *11*	$33/2^+$	4333.0[@] *12*	$41/2^-$	6679.3 *19*	
2149.3[a] *8*	$27/2^-$	3192.7?[f]	$(33/2^+)$	4334.3[b] *12*	$45/2^+$	6760.3[d] *14*	$57/2^+$
2202.9[#] *9*	$29/2^-$	3304.7[e] *12*	$(33/2^+)$	4394.6+x *10*	$(43/2^-)$	7023.8?[#] *9*	$(57/2^-)$
2256.6[&] *10*	$27/2^-$	3305.7[a] *10*	$35/2^-$	4408.7+x[g] *12*	$43/2^-$	7372.8[b] *16*	$61/2^+$
2299.6[c] *11*	$27/2^+$	3349.8[c] *11*	$35/2^+$	4599.9[c] *12*	$43/2^+$	7629.0?[d]	$(61/2^+)$
2319.1+x *8*	$(25/2^-)$	3394.2[#] *11*	$37/2^-$	4651.4[#] *13*	$45/2^-$	8220.9[b] *16*	$65/2^+$
2389.4 *11*	$(29/2^+)$	3405.2+x[g] *9*	$37/2^-$	4651.5[d] *12*	$45/2^+$	9125.1[b] *17*	$(69/2^+)$

[†] From a least-squares fit to Eγ.

[‡] From 1991Dr06, 1995Ba51 and 2002OdZZ, based on the measured angular distributions (1991Dr06) and DCO ratios (2002OdZZ), the apparent band structures with both cascade (ΔJ=1) and crossover (ΔJ=2) transitions, and the complex γ-ray decay patterns.

[#] Band(A): $K^\pi=1/2^-$, $\pi 1/2[541]$ band ($\alpha=+1/2$).

[@] Band(B): Low-K, 3-qp band ($\alpha=+1/2$); most likely configuration=$\pi 1/2[541] \otimes \nu(i_{13/2})^2$.

[&] Band(C): Low-K, 1-qp band ($\alpha=-1/2$). Tentatively assigned the Coriolis-mixed ($h_{9/2}$) configuration.

[a] Band(D): Low-K, 1-qp band ($\alpha=-1/2$); Tentatively assigned the Coriolis-mixed ($h_{9/2}$) configuration.

[b] Band(E): $K^\pi=1/2^+$, $\pi 1/2[660]$ band ($\alpha=+1/2$).

[c] Band(F): Low-K band. Possible configuration=$\pi 1/2[660]$ ($i_{13/2}$) band ($\alpha=-1/2$).

[d] Band(G): Low-K, 3-qp band ($\alpha=+1/2$); most likely configuration=$\pi 1/2[660] \otimes \nu(i_{13/2})^2$.

[e] Band(H): Low-K, 3-qp band ($\alpha=+1/2$).

[f] Band(I): $K^\pi=5/2^+$, $\pi 5/2[402]$ band.

[g] Band(J): $K^\pi=9/2^-$, $\pi 9/2[514]$ band.

$\gamma(^{177}Ir)$

Mixing ratios values given in the Comments section were deduced from the branching ratios and the rotational model, and by assuming pure K. The sign of δ is determined from $\gamma(\theta)$ and it is assumed that it does not change within a given band.

E_i(level)	J^π_i	E_γ[†]	I_γ[‡]	E_f	J^π_f	Mult.[#]	δ	α[b]	Comments
44.1	9/2⁻	(44.1[a] *6*)		0.0	5/2⁻	[E2]			E_γ: From level energy differences.
118.7+x	11/2⁻	118.6 *5*	57 *4*	0.0+x	9/2⁻	M1+E2	+0.19 *+19−15*		I_γ: Other: 51 *17* from 2002OdZZ. Mult.: A_2= 0.05 *11*. DCO= 0.63 *9*. δ: From $\gamma(\theta)$ in 1991Dr06.
180.6	5/2⁺	(180.6 *7*)		0.0	5/2⁻	[E1]		0.0883 *17*	
223.0	7/2⁻	223.0 *5*	≈10	0.0	5/2⁻	M1(+E2)			I_γ: Other: 8 *5* from 2002OdZZ. Mult.: DCO= 0.69 *9*.
258.2	13/2⁻	214.2 *5*	325 *5*	44.1	9/2⁻	E2			I_γ: Other: 165 *12* from 2002OdZZ. Mult.: A_2= 0.22 *3*, A_4=− 0.06 *4*. DCO= 0.93 *11*.
278.8+x	13/2⁻	160.1 *5*	62 *5*	118.7+x	11/2⁻	M1+E2	+0.26 *11*		I_γ: Other: 123 *14* from 2002OdZZ. Mult.: A_2= 0.16 *7*, A_4= 0.14 *8*. DCO= 0.70 *9*. δ: From $\gamma(\theta)$ in 1991Dr06. Other: δ= 0.23 *1*, assuming K=9/2.
		278.9 *5*	26 *2*	0.0+x	9/2⁻	E2			I_γ: Other: 20.9 *16* from 2002OdZZ. $I\gamma(\Delta J=2)/I\gamma(\Delta J=1)$=0.12 *2* (1991Dr06) and 0.17 *1* (2002OdZZ). Mult.: A_2= 0.41 *17*, A_4=− 0.02 *20*.
281.5	7/2⁺	100.8 *5*	38 *5*	180.6	5/2⁺	M1(+E2)			I_γ: Other: 8 *5* from 2002OdZZ. Mult.: DCO= 0.73 *9*.
404.4	9/2⁺	122.9 *5*	63 *5*	281.5	7/2⁺	M1+E2			I_γ: Other: 37 *4* from 2002OdZZ. Mult.: A_2= 0.03 *11*. DCO= 0.81 *10*. δ: δ= 0.23 *1*, assuming K=5/2.
		223.9 *5*	28 *4*	180.6	5/2⁺	[E2]			I_γ: Other: 9.4 *12* from 2002OdZZ. $I\gamma(\Delta J=2)/I\gamma(\Delta J=1)$=0.32 *4* (1991Dr06) and 0.26 *3* (2002OdZZ).
433.0	11/2⁻	174.9 *5*	5 *1*	258.2	13/2⁻	[M1+E2]			I_γ: Other: 9.7 *8* from 2002OdZZ.
		210.0 *5*	14 *3*	223.0	7/2⁻	E2			I_γ: Other: 17.8 *14* from 2002OdZZ. Mult.: DCO= 0.99 *11*.
		388.7 *5*	30 *4*	44.1	9/2⁻	M1(+E2)			I_γ: Other: 49 *4* from 2002OdZZ. Mult.: A_2=− 0.04 *8*, A_4=− 0.19 *10*. DCO= 0.64 *9*.
454.3+x	15/2⁻	175.4 *5*	64 *5*	278.8+x	13/2⁻	M1+E2			I_γ: Other: 125 *9* from 2002OdZZ. Mult.: A_2=− 0.06 *19*. DCO= 0.72 *9*. δ: δ= 0.20 *1*, assuming K=9/2.
		335.5 *5*	40 *5*	118.7+x	11/2⁻	(E2)			I_γ: Other: 46 *4* in 2002OdZZ. $I\gamma(\Delta J=2)/I\gamma(\Delta J=1)$=0.31 *2* (1991Dr06) and 0.37 *2* (2002OdZZ). Mult.: A_2= 0.40 *20*.
549.6	11/2⁺	145.4 *5*	57 *3*	404.4	9/2⁺	M1+E2			I_γ: Other: 46 *4* from 2002OdZZ. Mult.: A_2=− 0.02 *9*, A_4= 0.29 *11*. DCO= 0.91 *25*. δ: δ= 0.14 *1*, assuming K=5/2.
		268.1 *5*	26 *3*	281.5	7/2⁺	E2			I_γ: Other: 22.1 *19* from 2002OdZZ. $I\gamma(\Delta J=2)/I\gamma(\Delta J=1)$=0.30 *4* (1991Dr06) and 0.48 *3* (2002OdZZ). Mult.: DCO= 0.94 *11*.

γ(^{177}Ir) (continued)

E_i(level)	J^{π}_i	E_{γ}[†]	I_{γ}[‡]	E_f	J^{π}_f	Mult.[#]	δ	Comments
575.4?	(11/2⁻)	530.6[&c] 5	25[&] 10	44.1	9/2⁻			
614.7	17/2⁻	356.6 5	221 4	258.2	13/2⁻	E2		I_{γ}: Other: 390 28 from 2002OdZZ. Mult.: A_2= 0.27 3, A_4=− 0.05 4. DCO= 0.98 11.
650.1+x	17/2⁻	195.7 5	156 3	454.3+x	15/2⁻	M1+E2	+0.16 5	I_{γ}: Other: 122 9 from 2002OdZZ. Mult.: A_2= 0.02 4, A_4= 0.02 4. DCO= 0.73 9. δ: From γ(θ) in 1991Dr06. δ= 0.18 1, assuming K=9/2.
		371.5 5	68 3	278.8+x	13/2⁻	E2		I_{γ}: Other: 63 5 from 2002OdZZ. Iγ(ΔJ=2)/Iγ(ΔJ=1)=0.45 2 (1991Dr06) and 0.52 2 (2002OdZZ). Mult.: A_2= 0.26 7, A_4=− 0.05 9. DCO= 0.91 11.
712.3	13/2⁺	162.7 5	25 5	549.6	11/2⁺	[M1+E2]		I_{γ}: Other: 50 4 from 2002OdZZ. δ: δ= 0.15 1, assuming K=5/2.
		308.0 5	34 3	404.4	9/2⁺	E2		I_{γ}: Other: 39 3 in 2002OdZZ. Iγ(ΔJ=2)/Iγ(ΔJ=1)=0.68 5 (1991Dr06) and 0.79 4 (2002OdZZ). Mult.: A_2= 0.22 14. DCO= 0.94 11.
764.0	15/2⁻	331.1 5	26 5	433.0	11/2⁻	E2		I_{γ}: Other: 63 5 from 2002OdZZ. Mult.: A_2= 0.19 9. DCO= 0.95 11.
		505.7 5	46 7	258.2	13/2⁻	M1(+E2)		I_{γ}: Other: 42 3 from 2002OdZZ. Mult.: A_2= 0.31 11. DCO= 0.49 8.
806.8	13/2⁺	94.3[&c] 5	5.4[&] 4	712.6	(9/2⁺)	[E2]		
		257.5 5	9 1	549.6	11/2⁺	M1(+E2)		I_{γ}: Other: 26.0 19 in 2002OdZZ. Mult.: DCO= 0.83 10.
		373.7 5	20 4	433.0	11/2⁻	(E1)		I_{γ}: Other: 50 4 in 2002OdZZ. Mult.: DCO= 0.78 10.
		402.0 5	8 1	404.4	9/2⁺	(E2)		I_{γ}: Other: 12.9 11 in 2002OdZZ. Mult.: DCO= 0.95 11.
		548.6 5	45 7	258.2	13/2⁻	(E1)		I_{γ}: Other: 62 5 in 2002OdZZ. Mult.: DCO= 0.99 11.
858.1	15/2⁻	282.7[&c] 5	4.6[&] 6	575.4?	(11/2⁻)	[E2]		
		599.8 5	25 2	258.2	13/2⁻	M1(+E2)		I_{γ}: Other: 24 3 in 2002OdZZ. Mult.: DCO= 0.60 9.
860.9+x	19/2⁻	210.8 5	97 3	650.1+x	17/2⁻	M1+E2	+0.14 8	I_{γ}: Other: 116 8 from 2002OdZZ. Mult.: A_2=− 0.01 6, A_4= 0.02 8.DCO= 0.82 10. δ: From γ(θ) in 1991Dr06. δ= 0.19 1, assuming K=9/2.
		406.5 5	87 5	454.3+x	15/2⁻	(E2)		I_{γ}: Other: 87 5 from 2002OdZZ, used as normalization Iγ(ΔJ=2)/Iγ(ΔJ=1)=0.67 5 (1991Dr06) and 0.75 3 (2002OdZZ). Mult.: A_2= 0.11 11. DCO= 0.97 11.
897.2	15/2⁺	185.0[&] 5	32.3[&] 24	712.3	13/2⁺	M1+E2		I_{γ}: Other: 28 from 1991Dr06. Iγ(ΔJ=2)/Iγ(ΔJ=1)= 1.03 7 (2002OdZZ). Mult.: DCO= 0.74 10. δ: δ=0.16 1, assuming K=5/2.
		347.5[&] 5	33[&] 3	549.6	11/2⁺	[E2]		
954.5	17/2⁺	147.7 5	80 5	806.8	13/2⁺	E2		I_{γ}: Other: 78 6 in 2002OdZZ. Mult.: A_2= 0.15 4, A_4= 0.14 6.DCO= 1.02 12.
		190.6 5	36 5	764.0	15/2⁻	(E1)		I_{γ}: Other: 59 4 in 2002OdZZ. Mult.: A_2= 0.02 7, A_4= 0.03 9.DCO= 0.80 10.
		242.2 5	61 6	712.3	13/2⁺	E2		I_{γ}: Other: 68 5 in 2002OdZZ.

$^{177}_{77}Ir_{100}$-4

γ(^{177}Ir) (continued)

E_i(level)	J^π_i	E_γ [†]	I_γ [‡]	E_f	J^π_f	Mult. [#]	δ	Comments
								Mult.: DCO= 0.94 *11*.

$^{177}_{77}Ir_{100}$-5

$\gamma(^{177}Ir)$ (continued)

E_i(level)	J^π_i	E_γ[†]	I_γ[‡]	E_f	J^π_f	Mult.[#]	δ	Comments
954.5	17/2$^+$	339.7 *5*	106 *5*	614.7	17/2$^-$	(E1)		I_γ: Other: 115 *8* in 2002OdZZ. Mult.: A_2= 0.38 *6*, A_4= 0.06 *8*.DCO= 0.97 *11*.
1075.6	21/2$^-$	460.7 *5*	253 *4*	614.7	17/2$^-$	E2		I_γ: Other: 234 *17* from 2002OdZZ. Mult.: A_2= 0.22 *3*, A_4=− 0.07 *3*.177ir2cg DCO= 1.08 *12*.
1088.8+x	21/2$^-$	227.7 *5*	74 *5*	860.9+x	19/2$^-$	M1+E2	+0.20 *+15−11*	I_γ: Other: 107 *8* from 2002OdZZ. Mult.: A_2= 0.08 *9*, A_4= 0.03 *10*.DCO= 0.73 *9*. δ: From $\gamma(\theta)$ in 1991Dr06. δ= 0.19 *1*, assuming K=9/2.
		438.8 *5*	55 *4*	650.1+x	17/2$^-$	E2		I_γ: Other: 99 *7* from 2002OdZZ. $I\gamma(\Delta J=2)/I\gamma(\Delta J=1)$=0.92 *7* (1991Dr06) and 0.93 *4* (2002OdZZ). Mult.: A_2= 0.17 *12*. DCO= 0.93 *10*.
1099.1	17/2$^+$	201.9[&] *5*	21.8[&] *17*	897.2	15/2$^+$	M1(+E2)		I_γ: Other: 24 *5* from 1991Dr06. Mult.: A_2= 0.23 *17*. δ: δ=0.12 *1*, assuming K=5/2.
		386.9[&] *5*	19.9[&] *16*	712.3	13/2$^+$	E2		I_γ: Other: 47 *4* from 1991Dr06. $I\gamma(\Delta J=2)/I\gamma(\Delta J=1)$= 0.92 *5* (2002OdZZ). Mult.: DCO= 0.98 *11*.
1188.4	19/2$^-$	424.4[&] *5*	27.0[&] *22*	764.0	15/2$^-$	[E2]		
		574.1[&] *5*	23.1[&] *19*	614.7	17/2$^-$	M1(+E2)		Mult.: DCO= 0.72 *9*.
1214.9	21/2$^+$	260.4 *5*	144 *12*	954.5	17/2$^+$	E2		I_γ: Other: 382 *28* in 2002OdZZ. Mult.: A_2= 0.17 *2*, A_4=− 0.06 *2*.DCO= 0.97 *11*.
1224.7	19/2$^-$	366.4 *5*	13 *2*	858.1	15/2$^-$	E2		I_γ: Other: 28.0 *22* from 2002OdZZ. Mult.: DCO= 1.19 *13*.
		460.6[&] *5*	9.4[&] *10*	764.0	15/2$^-$	[E2]		
		609.8 *5*	21 *2*	614.7	17/2$^-$	M1(+E2)		I_γ: Other: 42 *3* from 2002OdZZ. Mult.: DCO= 0.61 *9*.
1314.3	19/2$^+$	215.3[&] *5*	14.7[&] *12*	1099.1	17/2$^+$	M1+E2		E_γ: 216 keV in 1991Dr06. Mult.: A_2=− 0.22 *10*, A_4=− 0.06 *11*. δ: δ=0.12 *1*, assuming K=5/2.
		417.1[&] *5*	16.4[&] *14*	897.2	15/2$^+$	[E2]		I_γ: $I\gamma(\Delta J=2)/I\gamma(\Delta J=1)$= 1.12 *8* (2002OdZZ).
1330.6+x	23/2$^-$	241.7 *5*	56 *4*	1088.8+x	21/2$^-$	M1+E2		I_γ: Other: 100 *7* from 2002OdZZ. Mult.: DCO= 0.54 *8*. δ: δ= 0.17 *1*, assuming K=9/2.
		469.7 *5*	64 *5*	860.9+x	19/2$^-$	E2		I_γ: Other: 107 *8* from 2002OdZZ. $I\gamma(\Delta J=2)/I\gamma(\Delta J=1)$=1.01 *4* (1991Dr06) and 1.07 *5* (2002OdZZ). Mult.: A_2= 0.21 *10*, A_4=− 0.15 *11*.DCO= 0.91 *11*.
1548.9	21/2$^+$	234.5[&] *5*	17.5[&] *13*	1314.3	19/2$^+$	[M1+E2]		δ: δ=0.11 *1*, assuming K=5/2.
		449.7[&] *5*	21.8[&] *16*	1099.1	17/2$^+$	E2		I_γ: $I\gamma(\Delta J=2)/I\gamma(\Delta J=1)$= 1.24 *7* (2002OdZZ). Mult.: DCO= 1.03 *12*.
1562.8	25/2$^+$	347.9 *5*	182 *12*	1214.9	21/2$^+$	E2		I_γ: Other: 390 *28* in 2002OdZZ. Mult.: A_2= 0.18 *3*, A_4=− 0.03 *4*. DCO= 1.04 *12*.

γ(^{177}Ir) (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[‡]	E_f	J_f^π	Mult.[#]	Comments
1588.6+x	25/2⁻	257.9 *5*	38 *1*	1330.6+x	23/2⁻	M1+E2	I_γ: Other: 81 *6* from 2002OdZZ. Mult.: DCO= 0.64 *9*. δ: δ= 0.20 *1*, assuming K=9/2.
		499.8 *5*	99 *7*	1088.8+x	21/2⁻	E2	I_γ: Other: 106 *8* from 2002OdZZ. Iγ(ΔJ=2)/Iγ(ΔJ=1)=1.62 *8* (1991Dr06) and 1.31 *6* (2002OdZZ). Mult.: DCO= 0.99 *11*.
1610.9	25/2⁻	534.9 *5*	211 *10*	1075.6	21/2⁻	E2	I_γ: Other: 195 *14* from 2002OdZZ. Mult.: A_2= 0.24 *5*, A_4=− 0.06 *5*.DCO= 1.17 *13*.
1652.7	23/2⁻	427.7 *5*	28 *5*	1224.7	19/2⁻	E2	I_γ: Other: 43 *3* from 2002OdZZ. Mult.: DCO= 1.16 *13*.
		464.8[&] *5*	15.7[&] *13*	1188.4	19/2⁻	[E2]	
		577.3 *5*	18 *2*	1075.6	21/2⁻	M1(+E2)	I_γ: Other: 29.7 *23* from 2002OdZZ. Mult.: DCO= 0.41 *7*.
1694.5	23/2⁻	506.1[&] *5*	42[&] *3*	1188.4	19/2⁻	E2	Mult.: DCO= 1.45 *20*.
1790.2	23/2⁺	241.1[&] *5*	11.7[&] *10*	1548.9	21/2⁺	[M1+E2]	δ: δ=0.11 *1*, assuming K=5/2.
		476.1[&] *5*	19.3[&] *16*	1314.3	19/2⁺	E2	I_γ: Iγ(ΔJ=2)/Iγ(ΔJ=1)= 1.65 *12* (2002OdZZ). Mult.: DCO= 1.03 *12*.
1859.6+x	27/2⁻	270.9 *5*	52 *3*	1588.6+x	25/2⁻	M1+E2	I_γ: Other: 66 *5* from 2002OdZZ. Mult.: A_2= 0.17 *22*. DCO= 0.71 *9*. δ: δ= 0.18 *1*, assuming K=9/2.
		529.0 *5*	91 *4*	1330.6+x	23/2⁻	E2	I_γ: Other: 99 *7* from 2002OdZZ. Iγ(ΔJ=2)/Iγ(ΔJ=1)=1.72 *9* (1991Dr06) and 1.48 *6* (2002OdZZ). Mult.: DCO= 1.18 *13*.
1876.2	(23/2⁺)	661.2[&c] *5*	12.2[&] *15*	1214.9	21/2⁺	[M1]	
1987.4	29/2⁺	425.1 *5*	167 *5*	1562.8	25/2⁺	E2	I_γ: Other: 331 *24* in 2002OdZZ. Mult.: A_2= 0.35 *4*, A_4=− 0.20 *6*. DCO= 1.02 *12*.
2059.2	25/2⁺	269.0[&] *5*	13.2[&] *11*	1790.2	23/2⁺	[M1+E2]	δ: δ=0.14 *1*, assuming K=5/2.
		510.3[&] *5*	36[&] *3*	1548.9	21/2⁺	E2	I_γ: Iγ(ΔJ=2)/Iγ(ΔJ=1)= 2.75 *16* (2002OdZZ). Mult.: DCO= 0.90 *11*.
2145.4+x	29/2⁻	285.8 *5*	37 *5*	1859.6+x	27/2⁻	M1+E2	I_γ: Other: 54 *4* from 2002OdZZ. Mult.: DCO= 0.72 *9*. δ: δ= 0.19 *1*, assuming K=9/2.
		556.9 *5*	59 *6*	1588.6+x	25/2⁻	E2	I_γ: Other: 94 *7* from 2002OdZZ. Iγ(ΔJ=2)/Iγ(ΔJ=1)=2.22 *14* (1991Dr06) and 1.73 *8* (2002OdZZ). Mult.: DCO= 1.04 *12*.
2149.3	27/2⁻	497.0 *5*	≈6	1652.7	23/2⁻	E2	I_γ: Other: 66 *5* from 2002OdZZ. Mult.: DCO= 1.14 *13*.
		538.3 *5*	9 *1*	1610.9	25/2⁻	M1(+E2)	I_γ: Other: 18.2 *14* from 2002OdZZ. Mult.: DCO= 0.38 *7*.
2202.9	29/2⁻	591.6 *5*	101 *9*	1610.9	25/2⁻	E2	I_γ: Other: 153 *11* from 2002OdZZ. Mult.: DCO= 1.15 *13*.
2256.6	27/2⁻	562.1[&] *5*	33[&] *3*	1694.5	23/2⁻	E2	Mult.: DCO= 1.15 *13*.

γ(^{177}Ir) (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[‡]	E_f	J_f^π	Mult.[#]	δ	Comments
2299.6	27/2+	423.7[&c] 5	8.6[&] 9	1876.2	(23/2+)	[E2]		
		736.4[&] 5	21.4[&] 17	1562.8	25/2+	M1(+E2)		Mult.: DCO= 0.57 8.
2319.1+x	(25/2−)	1230.5[&] 5	5.3[&]	1088.8+x	21/2−	[E2]		
2389.4	(29/2+)	826.6[&] 5	15.2[&] 13	1562.8	25/2+	[E2]		
2444.1+x	31/2−	298.8 5	30 5	2145.4+x	29/2−	M1+E2		I_γ: Other: 44 3 from 2002OdZZ. Mult.: DCO= 0.74 9. δ: δ= 0.15 1, assuming K=9/2.
		584.4 5	50 2	1859.6+x	27/2−	E2		I_γ: Other: 86 6 from 2002OdZZ. Iγ(ΔJ=2)/Iγ(ΔJ=1)=1.67 13 (1991Dr06) and 1.96 9 (2002OdZZ). Mult.: DCO= 1.05 12.
2482.2	33/2+	494.8 5	95 7	1987.4	29/2+	E2		I_γ: Other: 282 20 in 2002OdZZ. Mult.: A_2= 0.34 15, A_4=− 0.18 17. DCO= 1.00 12.
2532.3+x	(27/2−)	1201.7[&] 5	5.6[&]	1330.6+x	23/2−			
2549.1	29/2−	938.2[&] 5	4.0[&] 7	1610.9	25/2−	E2		Mult.: DCO= 1.24 13.
2623.1	29/2+	563.9[&] 5	24.9[&] 19	2059.2	25/2+	[E2]		
2702.7	31/2−	499.4 5	8 2	2202.9	29/2−	[M1+E2]		
		553.8 5	≈7	2149.3	27/2−	E2		I_γ: Other: 80 6 from 2002OdZZ. Mult.: DCO= 0.92 11.
2754.7+x	33/2−	310.5 5	16 5	2444.1+x	31/2−	M1+E2		I_γ: Other: 38 3 from 2002OdZZ. Mult.: DCO= 0.70 9. δ: δ= 0.17 1, assuming K=9/2.
		609.2 5	46 3	2145.4+x	29/2−	E2		I_γ: Other: 72 5 from 2002OdZZ. Iγ(ΔJ=2)/Iγ(ΔJ=1)=2.5 3 (1991Dr06) and 1.89 9 (2002OdZZ). Mult.: DCO= 0.96 11.
2757.4+x	(29/2−)	438.6[&] 5	2.4[&]	2319.1+x	(25/2−)			
		1168.6[&] 5	6.8[&]	1588.6+x	25/2−			
2802.0	31/2+	501.9[&] 5	17.5[&] 14	2299.6	27/2+	[E2]		
		814.9[&] 5	12.2[&] 10	1987.4	29/2+	M1(+E2)		Mult.: DCO= 0.47 8.
2823.1	33/2−	620.1 5	95 7	2202.9	29/2−	E2		I_γ: Other: 110 8 from 2002OdZZ. Mult.: DCO= 1.03 12.
2855.8	31/2−	599.2[&] 5	30.0[&] 23	2256.6	27/2−	E2		Mult.: DCO= 0.95 11.
2978.1	(29/2+)	1415[@] 1		1562.8	25/2+	[E2]		
2995.6	33/2−	446.2[&c] 5	3.5[&] 4	2549.1	29/2−	[E2]		
		792.8 5	21 4	2202.9	29/2−	E2		I_γ: Other: 17.8 15 from 2002OdZZ. Mult.: DCO= 0.94 11.
3041.1	37/2+	559.2 5	80 12	2482.2	33/2+	E2		I_γ: Other: 224 16 in 2002OdZZ. Mult.: DCO= 1.01 12.
3075.6+x	35/2−	321.0 5	19 6	2754.7+x	33/2−	M1+E2	+0.19 11	I_γ: Other: 31.5 22 from 2002OdZZ. Mult.: A_2= 0.03 9, A_4= 0.15 11.DCO= 0.69 9. δ: From γ(θ) in 1991Dr06. δ= 0.17 1, assuming K=9/2.

γ(^{177}Ir) (continued)

E_i(level)	J^π_i	E_γ[†]	I_γ[‡]	E_f	J^π_f	Mult.[#]	Comments
3075.6+x	35/2⁻	631.6 *5*	35 *8*	2444.1+x	31/2⁻	E2	I_γ: Other: 68 *5* from 2002OdZZ. Iγ(ΔJ=2)/Iγ(ΔJ=1)=2.8 *3* (1991Dr06) and 2.18 *10* (2002OdZZ). Mult.: DCO= 1.09 *12*.
3192.4	33/2⁺	214[@] *1*		2978.1	(29/2⁺)	[E2]	
		1205.2[&] *5*	2.7[&] *4*	1987.4	29/2⁺	E2	Mult.: DCO= 0.99 *11*.
3192.7?	(33/2⁺)	570.3[&c] *5*	11.0[&] *10*	2623.1	29/2⁺	[E2]	
3304.7	(33/2⁺)	1317.3[&] *5*	≈1.3[&]	1987.4	29/2⁺	[E2]	
3305.7	35/2⁻	603.0 *5*	8 *2*	2702.7	31/2⁻	E2	I_γ: Other: 66 *5* from 2002OdZZ. Mult.: DCO= 1.03 *12*.
3349.8	35/2⁺	547.7[&] *5*	26[&] *3*	2802.0	31/2⁺	[E2]	
		868.0[&] *5*	10.4[&] *13*	2482.2	33/2⁺	M1(+E2)	Mult.: DCO= 0.57 *8*.
3394.2	37/2⁻	571.1 *5*	57 *7*	2823.1	33/2⁻	E2	I_γ: Other: 63 *5* from 2002OdZZ. Mult.: DCO= 1.02 *12*.
3405.2+x	37/2⁻	329.9 *5*	19 *5*	3075.6+x	35/2⁻	[M1+E2]	I_γ: Other: 26.5 *20* from 2002OdZZ. δ: δ=+ 0.14 *1*, assuming K=9/2.
		650.3 *5*	25 *8*	2754.7+x	33/2⁻	E2	I_γ: Other: 59 *4* from 2002OdZZ. Iγ(ΔJ=2)/Iγ(ΔJ=1)= 2.24 *10* (2002OdZZ). Mult.: DCO= 1.09 *12*.
3461.0	(35/2⁻)	605.2[&] *5*	5.9[&] *6*	2855.8	31/2⁻	[E2]	
3614.4	37/2⁻	619.0 *5*	≈9	2995.6	33/2⁻	[E2]	I_γ: Other: 7.4 *10* from 2002OdZZ.
		791.2 *5*	9 *3*	2823.1	33/2⁻	E2	I_γ: Other: 26.5 *20* from 2002OdZZ. Mult.: DCO= 0.94 *11*.
3616.5	37/2⁺	424.3[&] *5*	2.5[&] *3*	3192.4	33/2⁺	[E2]	
		1134.3[&] *5*	8.9[&] *8*	2482.2	33/2⁺	E2	Mult.: DCO= 1.08 *12*.
3659.9	41/2⁺	619.2 *5*	46 *3*	3041.1	37/2⁺	E2	I_γ: Other: 166 *12* in 2002OdZZ. Mult.: DCO= 1.08 *12*.
3736.1+x	39/2⁻	330.9[&] *5*	20 *5*	3405.2+x	37/2⁻	[M1+E2]	I_γ: Other: 22.7 *17* from 2002OdZZ. δ: δ= 0.09 *1*, assuming K=9/2.
		660.4 *5*	25 *8*	3075.6+x	35/2⁻	E2	I_γ: Other: 43 *3* from 2002OdZZ. Iγ(ΔJ=2)/Iγ(ΔJ=1)=1.2 *2* (1991Dr06) and 1.89 *10* (2002OdZZ). Mult.: DCO= 1.10 *12*.
3786.2	(37/2⁺)	480.8[&c] *5*	1.6[&] *3*	3304.7	(33/2⁺)	[E2]	
		1303.5[&] *5*	4.3[&] *4*	2482.2	33/2⁺	[E2]	
3795.7?	(37/2⁺)	603.2[&c] *5*	11.2[&] *10*	3192.7?	(33/2⁺)	[E2]	
3941.0	(39/2⁻)	635.3[&] *5*	17.5[&] *14*	3305.7	35/2⁻	[E2]	
3950.1	39/2⁺	600.5[&] *5*	19.1[&] *15*	3349.8	35/2⁺	[E2]	
		908.6[&] *5*	8.7[&] *9*	3041.1	37/2⁺	M1(+E2)	Mult.: DCO= 0.53 *8*.
3976.7	(39/2⁻)	671 *1*	8 *2*	3305.7	35/2⁻	E2	E_γ: 570.6γ, Iγ= 15.8 *13*, DCO= 1.00 *12* from 2002OdZZ.
3988.3	41/2⁻	594.1 *5*	32 *2*	3394.2	37/2⁻	[E2]	I_γ: Other: 37 *3* from 2002OdZZ.
3998.4+x	(39/2⁻)	922.8[&] *5*	4.9[&]	3075.6+x	35/2⁻		

γ(^{177}Ir) (continued)

E_i(level)	J^π_i	E_γ[†]	I_γ[‡]	E_f	J^π_f	Mult.[#]	Comments
4069.2+x	41/2⁻	332.9[&] 5	≈5	3736.1+x	39/2⁻	[M1+E2]	I_γ: Other: 19.6 15 from 2002OdZZ. δ: δ=0.11 1, assuming K=9/2.
		664.2[&] 5	16 2	3405.2+x	37/2⁻	E2	I_γ: Other: 35 3 from 2002OdZZ. Iγ(ΔJ=2)/Iγ(ΔJ=1)=1.79 9 (2002OdZZ). Mult.: DCO= 0.91 11.
4102.0	41/2⁺	485.5[&] 5	13.8[&] 11	3616.5	37/2⁺	E2	Mult.: DCO= 1.02 12.
		1060.9[&] 5	4.8[&] 5	3041.1	37/2⁺	E2	Mult.: DCO= 1.14 13.
4324.4	(41/2⁺)	537.7[&] 5	3.1[&] 5	3786.2	(37/2⁺)	[E2]	
		1283.4[&] 5	2.0[&] 3	3041.1	37/2⁺	[E2]	
4333.0	41/2⁻	718.5 5	12 2	3614.4	37/2⁻	E2	I_γ: Other: 26.5 20 from 2002OdZZ. Mult.: DCO= 1.04 12.
		938.8[&c] 5	2.0[&] 5	3394.2	37/2⁻	[E2]	
4334.3	45/2⁺	674.4 5	28 2	3659.9	41/2⁺	E2	I_γ: Other: 112 8 in 2002OdZZ. Mult.: DCO= 1.12 12.
4394.6+x	(43/2⁻)	325.2[&] 5	10.2[&] 8	4069.2+x	41/2⁻		
		658.6[&] 5	15.0[&] 14	3736.1+x	39/2⁻		
4408.7+x	43/2⁻	340 1	≈6	4069.2+x	41/2⁻	[M1+E2]	δ: δ=+ 0.14 2, assuming K=9/2. E_γ,I_γ: Eγ= 325.2 keV, Iγ=10.2 (2002OdZZ).
		672 1		3736.1+x	39/2⁻	[E2]	E_γ,I_γ: Eγ= 658.6 keV, Iγ=15.0 (2002OdZZ).
4599.9	43/2⁺	649.7[&] 5	14.8[&] 13	3950.1	39/2⁺	[E2]	
		940.2[&] 5	5.4[&] 6	3659.9	41/2⁺	[M1+E2]	
4651.4	45/2⁻	663.1 5	22 2	3988.3	41/2⁻	E2	I_γ: Other: 27.5 21 from 2002OdZZ. Mult.: DCO= 0.96 11.
4651.5	45/2⁺	549.6[&] 5	10.0[&] 9	4102.0	41/2⁺	E2	Mult.: DCO= 1.02 12.
		991.5[&] 5	5.4[&] 5	3659.9	41/2⁺	E2	Mult.: DCO= 1.05 12.
4740.2+x	45/2⁻	671 1	≈12	4069.2+x	41/2⁻	E2	Mult.: DCO= 1.03 12. I_γ: Other: 30.8 23 from 2002OdZZ.
4910.0	(45/2⁺)	585.2[&] 5	6.1[&] 6	4324.4	(41/2⁺)	[E2]	
		1250.5[&] 5	1.7[&] 3	3659.9	41/2⁺	[E2]	
5057.3	49/2⁺	723.0 5	11 1	4334.3	45/2⁺	E2	I_γ: Other: 70 5 in 2002OdZZ. Mult.: DCO= 1.06 12.
5113.4+x?	47/2⁻	706[c] 1	≈5	4408.7+x	43/2⁻		E_γ,I_γ: Eγ= 730.9 keV, Iγ=11.9 9 (2002OdZZ).
5120.0	45/2⁻	787 1	≈8	4333.0	41/2⁻		E_γ,I_γ: Eγ= 761.2 keV, Iγ=12.8 11 (2002OdZZ). DCO= 1.15 13.
5259.9?	(47/2⁺)	660.0[&c] 5	11.2[&] 11	4599.9	43/2⁺	[E2]	
		925.6[&] 5	1.9[&] 4	4334.3	45/2⁺	[M1+E2]	
5268.0	49/2⁺	616.5[&] 5	11.7[&] 10	4651.5	45/2⁺	E2	Mult.: DCO= 1.13 13.
		933.7[&] 5	3.5[&] 4	4334.3	45/2⁺	E2	Mult.: DCO= 1.13 13.
5386.4	49/2⁻	735.0 5	≈10	4651.4	45/2⁻	E2	I_γ: Other: 20.3 16 from 2002OdZZ. Mult.: DCO= 1.04 12.
5435.2+x?	49/2⁻	696[c] 1	≈5	4740.2+x	45/2⁻		E_γ,I_γ: Eγ= 801.3 keV, Iγ=5.9 6 (2002OdZZ).

γ(^{177}Ir) (continued)

E_i(level)	J^{π}_i	E_γ[†]	I_γ[‡]	E_f	J^{π}_f	Mult.[#]	Comments
5542.2	(49/2$^+$)	632.2[&] *5*	10.2[&] *9*	4910.0	(45/2$^+$)	[E2]	
5810.6	53/2$^+$	753.3 *5*	4 *1*	5057.3	49/2$^+$	E2	I_γ: Other: 43 *3* in 2002OdZZ. Mult.: DCO= 1.07 *12*.
5845.3		788 *1*	0.6 *2*	5057.3	49/2$^+$		
5966.0	53/2$^+$	698.0[&] *5*	13.3[&] *11*	5268.0	49/2$^+$	E2	Mult.: DCO= 0.97 *11*.
		908.6[&] *5*	7.1[&] *7*	5057.3	49/2$^+$	[E2]	
6172.7	(53/2$^-$)	786.3[&] *5*	9.2[&] *8*	5386.4	49/2$^-$	[E2]	
6575.9	57/2$^+$	765.3[&] *5*	1.0 *3*	5810.6	53/2$^+$	E2	I_γ: Other: 26.4 *19* in 2002OdZZ. Mult.: DCO= 0.96 *11*.
6679.3		834 *1*	0.4	5845.3			
6760.3	57/2$^+$	794.3[&] *5*	11.4[&] *10*	5966.0	53/2$^+$	E2	Mult.: DCO= 1.04 *12*.
		949.4[&c] *5*	0.7[&] *3*	5810.6	53/2$^+$	[E2]	
7023.8?	(57/2$^-$)	850.0[&c] *5*	4.4[&] *4*	6172.7	(53/2$^-$)	[E2]	
7372.8	61/2$^+$	796.9[&] *5*	13.0[&] *10*	6575.9	57/2$^+$	E2	Mult.: DCO= 0.93 *11*.
7629.0?	(61/2$^+$)	866.2[&c] *5*	4.9[&] *6*	6760.3	57/2$^+$	[E2]	
8220.9	65/2$^+$	848.1[&] *5*	7.7[&] *6*	7372.8	61/2$^+$	E2	Mult.: DCO= 1.13 *13*.
9125.1	(69/2$^+$)	904.2[&] *5*	2.0[&] *3*	8220.9	65/2$^+$	[E2]	

[†] From 1991Dr06, unless otherwise stated. Uncertainties were estimated by the evaluator.

[‡] From singles spectra in 1991Dr06, unless otherwise stated. For precisely determined branching ratios, using γγ coin data by gating above the level of interest, see also 1991Dr06 and 2002OdZZ.

[#] Determined on the basis on the measured angular distributions (1991Dr06) and DCO ratios (2002OdZZ), and the apparent band structures with both cascade (ΔJ=1) and crossover (ΔJ=2) transitions. The quoted DCO values are obtained by gating on stretched quadrupole transition, unless otherwise stated. A value of approximately unity is expected for a ΔJ=2 transition and about 0.4-0.7 for a ΔJ=1 transition.

[@] From 1995Ba51.

[&] From 2002OdZZ. Intensity is normalized to the 1991Dr06 data using Iγ(406.5γ)=87 *5* (1991Dr06) and Iγ(406.5γ)=52.8 *17* (2002OdZZ).

[a] Not observed directly, but required by the coincidence relationships.

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

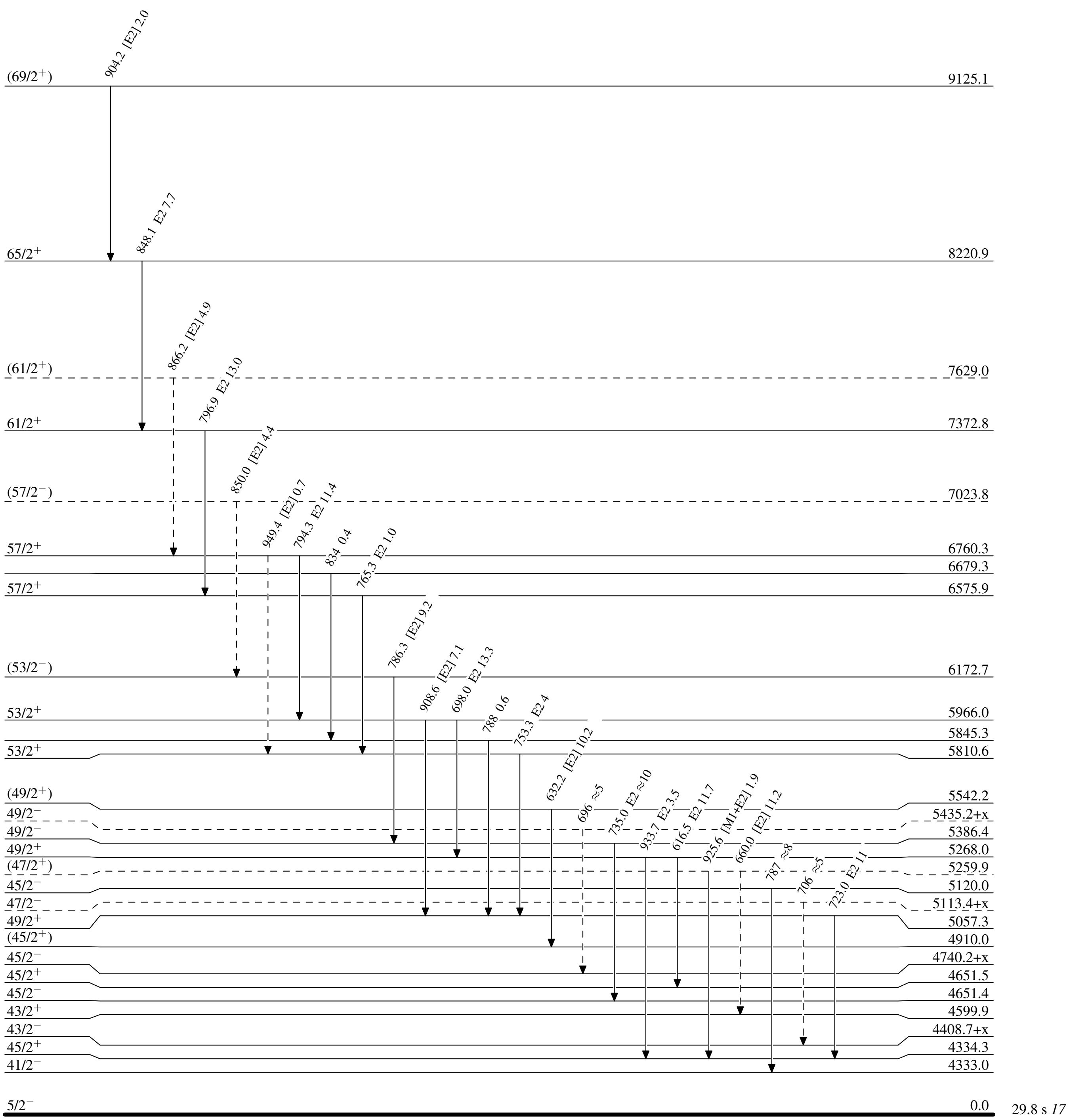
(HI,xnγ) 1991Dr06,1995Ba51,2002OdZZ

Legend

Level Scheme

Intensities: % photon branching from each level

γ Decay (Uncertain)

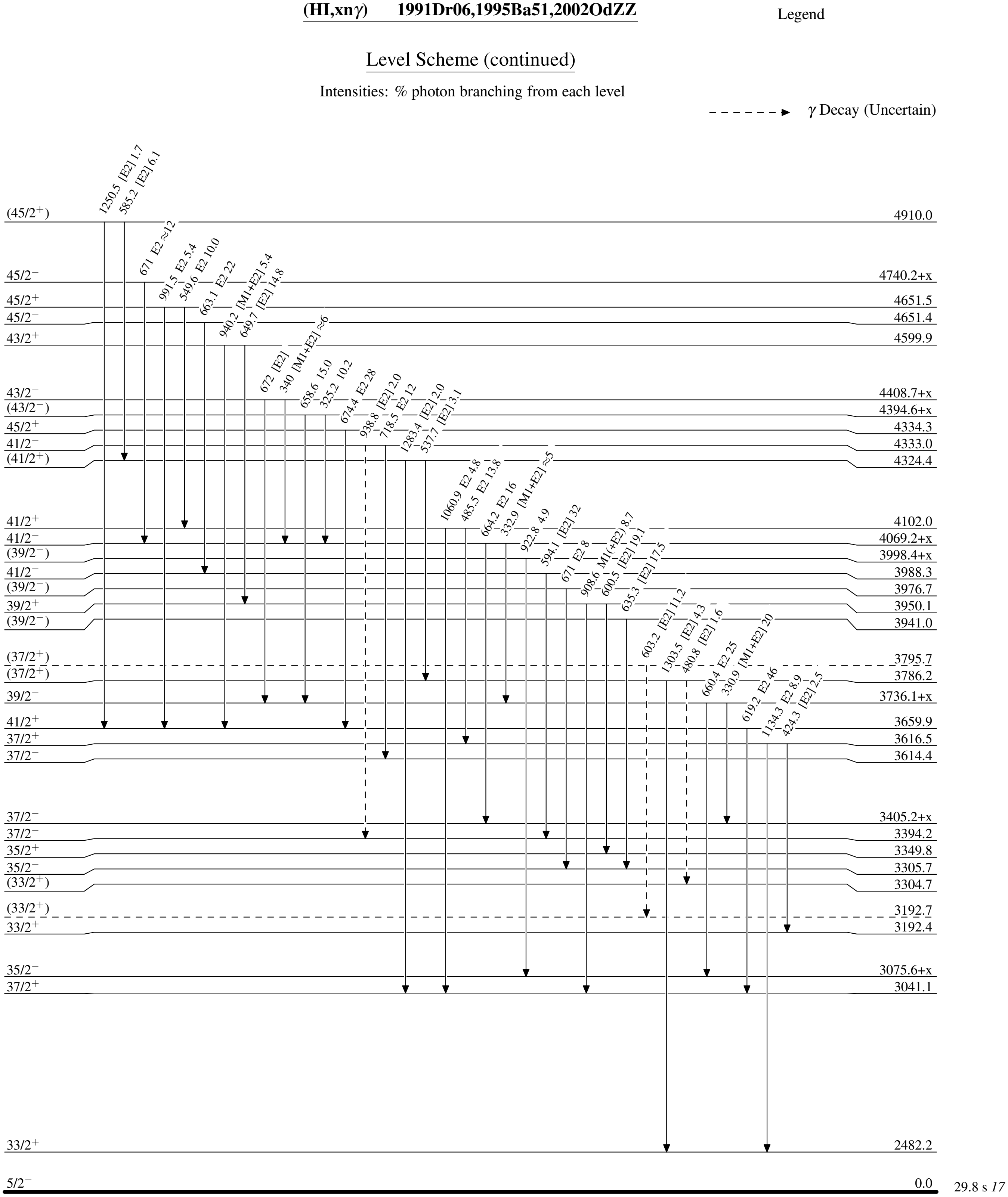


$^{177}_{77}Ir_{100}$

(HI,xnγ) 1991Dr06,1995Ba51,2002OdZZ

Level Scheme (continued)

Intensities: % photon branching from each level



$^{177}_{77}Ir_{100}$

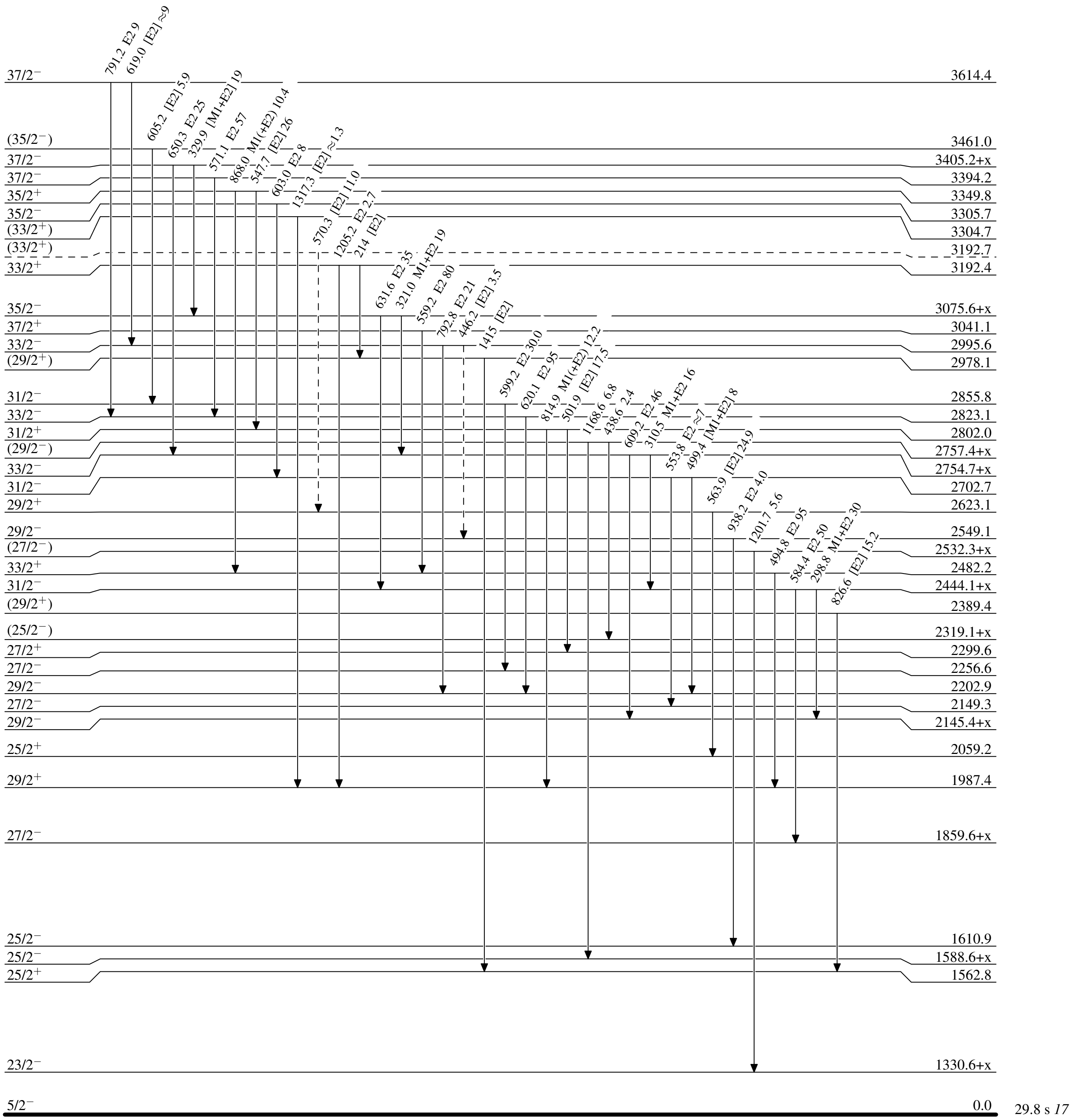
(HI,xnγ) 1991Dr06,1995Ba51,2002OdZZ

Legend

Level Scheme (continued)

Intensities: % photon branching from each level

γ Decay (Uncertain)



$^{177}_{77}Ir_{100}$

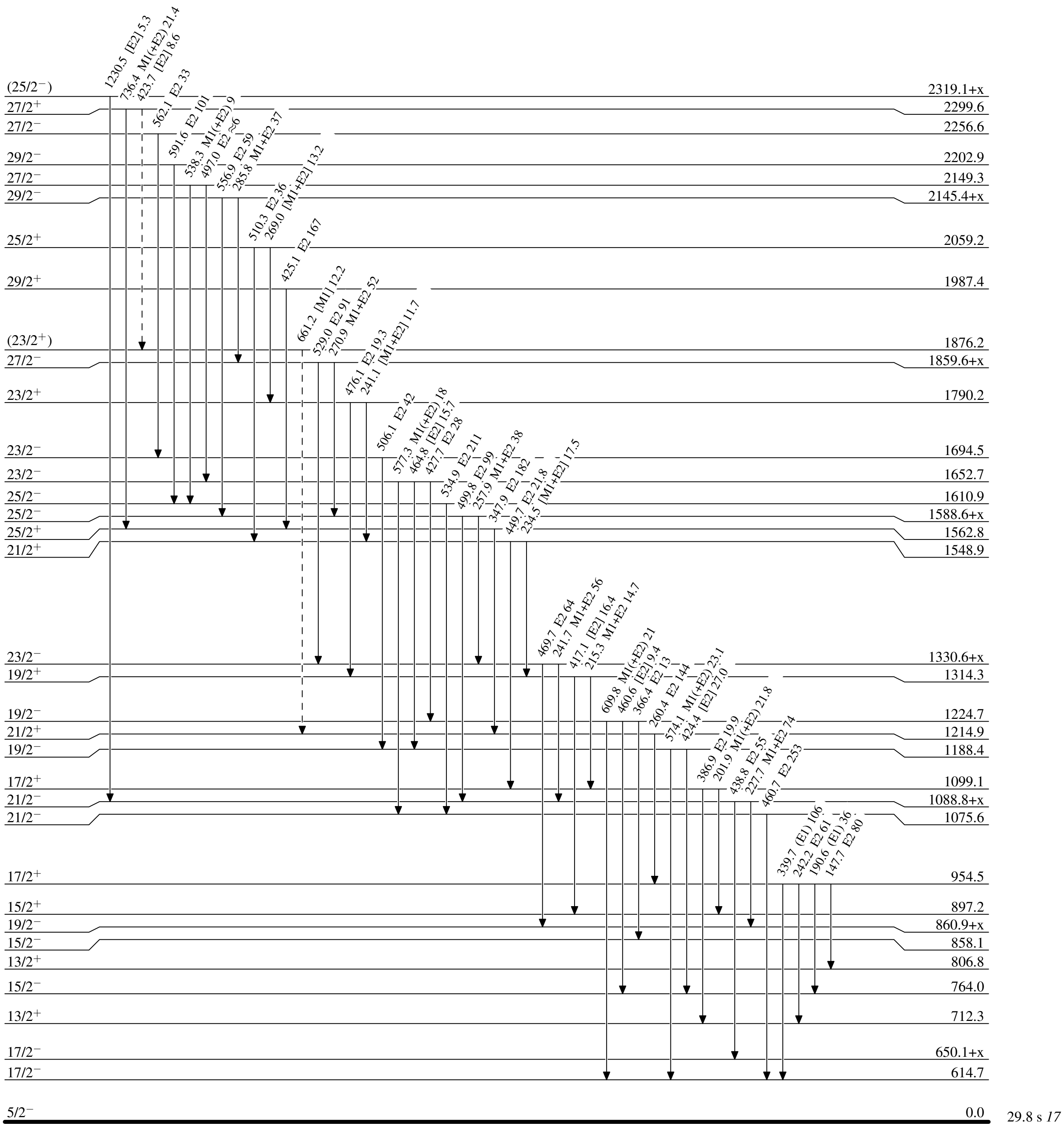
(HI,xnγ) 1991Dr06,1995Ba51,2002OdZZ

Legend

Level Scheme (continued)

Intensities: % photon branching from each level

γ Decay (Uncertain)



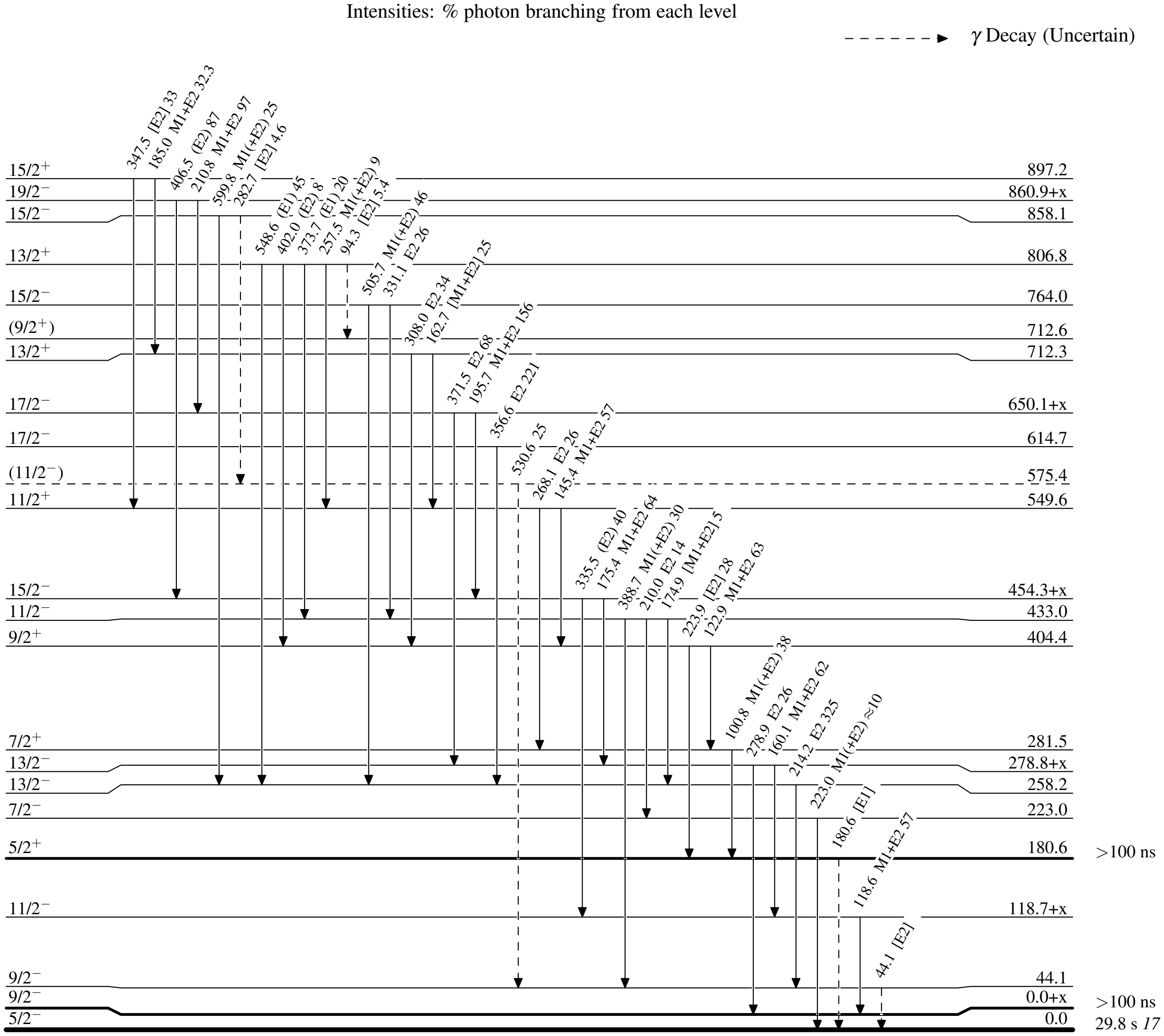
$^{177}_{77}Ir_{100}$

(HI,xnγ) 1991Dr06,1995Ba51,2002OdZZ

Legend

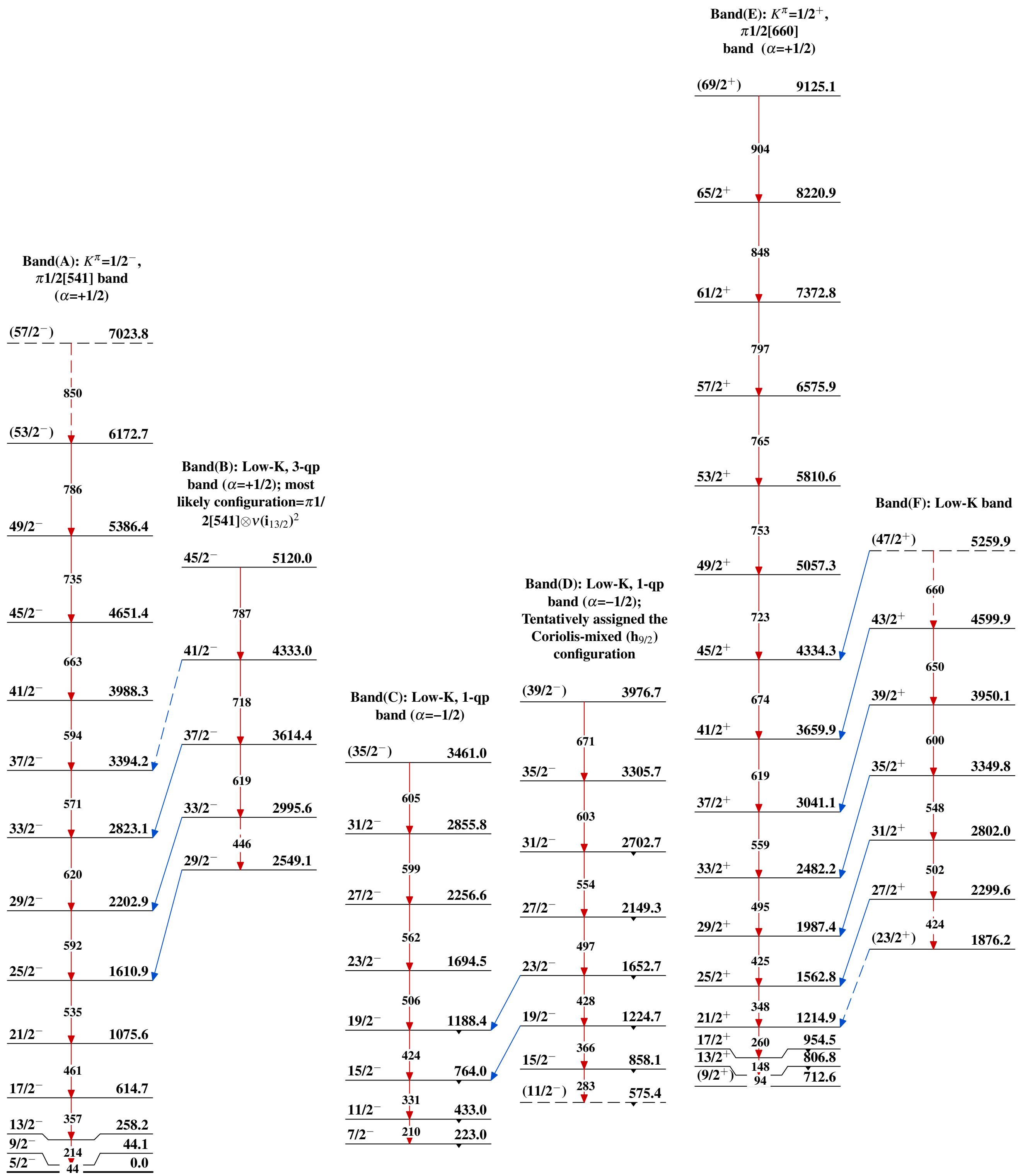
Level Scheme (continued)

Intensities: % photon branching from each level



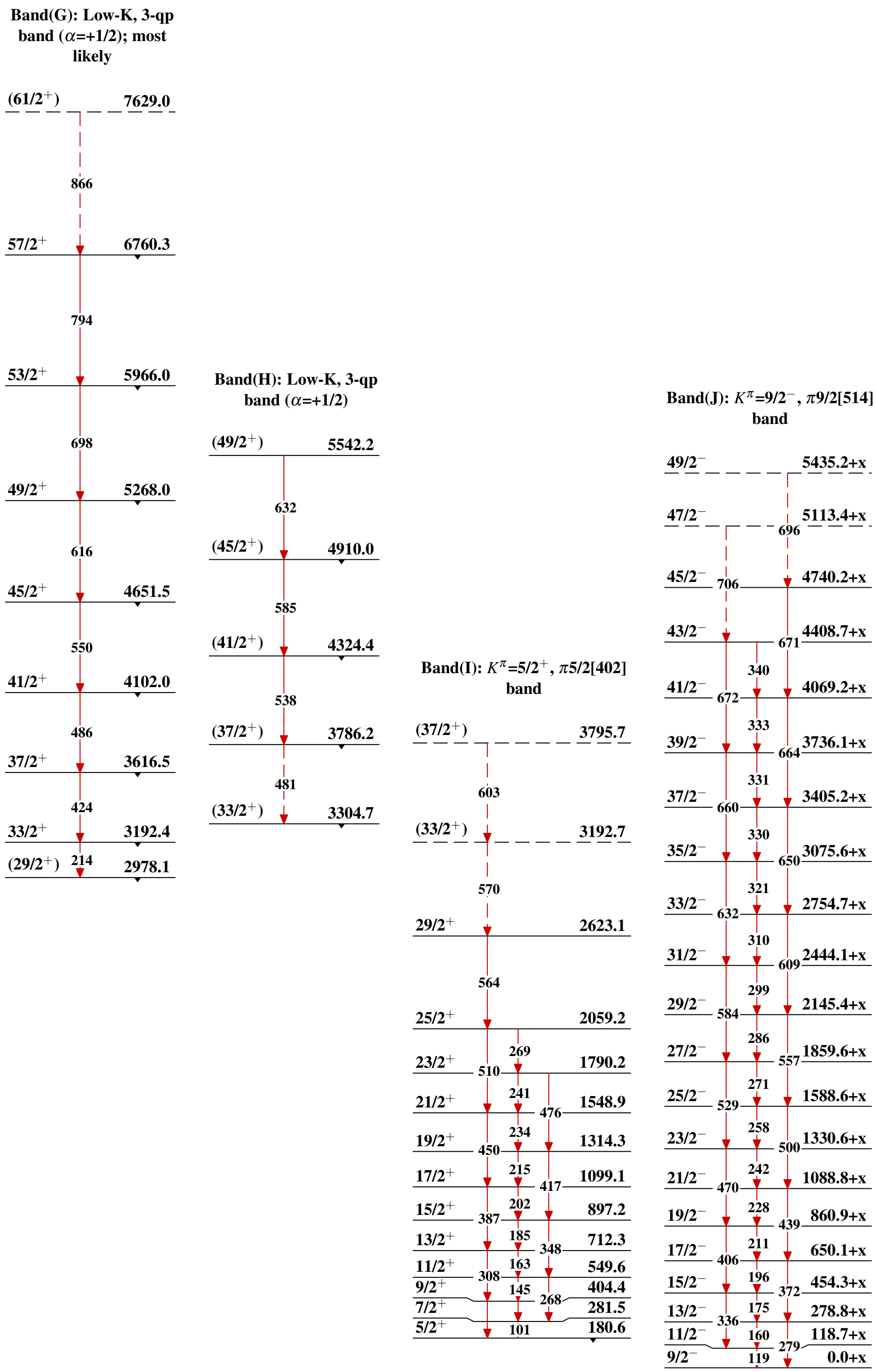
$^{177}_{77}Ir_{100}$

(HI,xnγ) 1991Dr06,1995Ba51,2002OdZZ



$^{177}_{77}Ir_{100}$

(HI,xnγ) 1991Dr06,1995Ba51,2002OdZZ (continued)



$^{177}_{77}Ir_{100}$