^{187}Re(α,2nγ) 1975Ke06,1975An08

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	T. D. Johnson, Balraj Singh	NDS 142, 1 (2017)	15-Apr-2017

Includes ^{189}Os(p,nγ) from 1975Ke06.

1975Ke06: ^{187}Re(α,2nγ), Eα=23,27 MeV; ^{189}Os(p,nγ), E(p)=10 MeV; Enriched target; measured Eγ, Iγ, γ(θ,t), γγ-coin, γ(t), I(ce). Prompt and delayed γ rays detected.

1975An08: ^{187}Re(α,2nγ), E=23-43 MeV; measured Eγ, Iγ, γ(θ), γγ-coin, γ(t). Prompt and delayed γ rays detected.

1978Ya06: E=28 MeV. Measured Eγ, Iγ. Five γ rays of 243.3, 247.6, 252.5, 254.5 and 545.6 keV shown in a singles γ-ray spectrum; and another nine γ rays are shown in a level-scheme Fig. 2 with relative intensities. The gamma-ray energy precision is claimed to be 0.06 keV. Main emphasis of this work is on establishing an upper limit of intensity for a 246.2-keV transition from 19/2⁻ level to 15/2⁻ level in order to make a comparison with predictions of Meyer-ter-Vehn's triaxial rotor model.

1983Fa11: ^{192}Os(d,5nγ),E=52 MeV. Measured conversion electron spectra, and ce(θ) using permanent magnets and a Si(Li) detector. Positive A_2 values obtained for 300.5, 340.3 445.3, 550.4, 563.6 and 623.7 keV transitions in the 3/2⁺ band; and for 364.8, 400.6, 401.2, 430.5, 441.2 and 545.8 keV transitions in the 11/2⁻ band, which are consistent with their being stretched quadrupole transitions. Negative A_2 for 186.7 and 378.1 keV transitions in the 3/2⁺ band, and for 387.9 keV transition in the 11/2⁻ band are consistent with stretched dipole transitions.

2012MaZP: ^{186}W(^{7}Li,4nγ): E(^{7}Li)=31 MeV from tandem van de Graaff accelerator at IFIN-HH in Bucharest. Measured Eγ, γγ, half-life of 564-keV state in ^{189}Ir by γγ(t) method using an array of eight HPGe detectors and 11 $LaBr_3$:Ce detectors. Half-life was measured from time difference between feeding and depopulating transitions.

Level scheme is from 1975Ke06 and 1975An08.

^{189}Ir Levels

A tentative 2186.8 level proposed by 1975Ke06 (also in 1978Ya06) is omitted here as the 531.3γ is placed from a 1268 level, as proposed by 1975An08.

A tentative 688.4, (9/2⁺) level proposed by 1975An08 is omitted here as the 223.5- and 387.9-keV gammas from this level are doubly placed in 1975An08, but singly placed in 1975Ke06.

A tentative 1667.5 level proposed by 1975An08 is omitted here as the 529.9 gamma from this level is placed from a 1248 level in 1975Ke06.

A 2096.5, 21/2⁺ level proposed by 1975An08 is omitted here as the 614.1 gamma from this level is placed from a 1910, 19/2⁺ level in 1975Ke06, and a tentatively placed 177γ in 1975An08 is placed from 741 level in 1975Ke06.

E(level)[†]	Jπ[‡]	$T_{1/2}$[#]	Comments
0.0[@]	3/2⁺	13.2 d *1*	
94.24[&] *20*	1/2⁺		
113.74[@] *8*	5/2⁺		
176.53[&] *18*	3/2⁺		
300.44[@] *8*	7/2⁺		
317.60[&] *17*	5/2⁺		
372.12[a] *12*	11/2⁻	13.3 ms *3*	
453.87[@] *11*	9/2⁺		
464.69[&] *16*	7/2⁺		
563.67[b] *13*	9/2⁻	0.54 ns *10*	$T_{1/2}$: measured by 2012MaZP from time difference between the 178γ feeding this level, and the deexciting 263γ.
615.48 *15*	7/2⁻	0.18 ns *2*	
719.01[&] *18*	9/2⁺		Level only from 1975Ke06.
736.82[a] *15*	13/2⁻		
741.57[b] *16*	13/2⁻		
745.82[@] *12*	11/2⁺		

Continued on next page (footnotes at end of table)

^{187}Re(α,2nγ) 1975Ke06,1975An08 (continued)

^{189}Ir Levels (continued)

E(level)[†]	J$^{\pi}$[‡]	$T_{1/2}$[#]	Comments
831.72 *20*	(9/2,11/2)$^-$		Level only from 1975Ke06.
837.84[a] *14*	15/2$^-$		
899.32[&] *20*	11/2$^+$		
899.92 *23*	9/2$^-$		
918.10[@] *17*	13/2$^+$		
945.9 *4*	11/2$^-$		
948.7? *3*	(11/2$^-$)		Level only from 1975An08.
1074.1? *4*			Level only from 1975Ke06, in authors′ Fig. 6, E(level)=1054.0 seems a misprint.
1100.77[b] *19*	17/2$^-$		
1114.4 *3*	11/2$^-$		
1137.22 *18*	15/2$^-$		
1221.1 *3*	15/2$^-$		
1248.9[&] *3*	13/2$^+$		Level only from 1975Ke06.
1268.23[a] *16*	17/2$^-$		
1288.0 *5*	(13/2$^-$)		Level only from 1975Ke06.
1296.14[@] *14*	15/2$^+$		
1383.54[a] *16*	19/2$^-$		
1396.0? *4*			Level only from 1975Ke06.
1447.5 *4*			Level only from 1975Ke06.
1481.54[@] *22*	17/2$^+$		
1578.3 *3*	(17/2$^-$)		
1608.8[b] *4*	21/2$^-$		Level only from 1975Ke06.
1615.2 *4*	(17/2$^-$)		
1651.2 *4*	(19/2$^-$)		
1655.9 *4*	19/2$^-$		
1790.8? *4*			Level only from 1975Ke06.
1875.47[a] *21*	21/2$^-$		
1910.21 *20*	19/2$^+$		Level only from 1975Ke06.
1919.74[@] *16*	19/2$^+$		
2059.83 *22*			Level only from 1975Ke06.
2085.00[a] *24*	23/2$^-$		
2108.8 *4*			841γ and a tentative 972γ placed by 1975An08 deexciting this level, but the intensity balance arguments for levels fed by these two transitions in the 3.7-ms IT decay dataset do not support these placements. The 841γ is tentatively placed from a 1548 level, and the 972γ is unplaced here.
2109.6[@] *4*	(21/2$^+$)		
2127.82 *22*	23/2$^+$		
2248.4 *3*	(23/2)$^-$		E(level),J$^{\pi}$: this level is defined at 2212 keV with J^{π}=(25/2,27/2)$^+$ in 1975An08 due to reversed ordering of the 121γ-85γ cascade.
2332.8 *4*	25/2$^+$	3.7 ms *2*	J$^{\pi}$: (27/2)$^-$ in 1975An08. $T_{1/2}$: weighted average of 3.8 ms *2* (1975Ke06) and 3.2 ms *4* (1975An08); from γ(t).

† From least-squares fit to Eγ values.

‡ As proposed in 1975Ke06 and 1975An08 based on $\gamma(\theta)$ data, multipolarity assignments from conversion coefficients and band associations.

\# From Adopted Levels, unless otherwise stated.

@ Band(A): π3/2[402] band.

& Band(B): π1/2[400] band.

a Band(C): $\pi h_{11/2}$ band.

b Band(D): $\pi h_{9/2}$ band.

γ(^{189}Ir)

Experimental conversion coefficients are from 1975Ke06, typical uncertainty in electron intensity is stated by the authors as 30%. Evaluators assign the same uncertainty in experimental conversion coefficients in Table 3 of 1975Ke06.

E_γ[†]	I_γ[@]	E_i(level)	J^π_i	E_f	J^π_f	Mult.[&]	δ	α[f]	Comments
(68.1)		2127.82	23/2$^+$	2059.83					
(71.7 *1*)	1.5[a] *4*	372.12	11/2$^-$	300.44	7/2$^+$				
82.3 *3*	1.2 *2*	176.53	3/2$^+$	94.24	1/2$^+$				Eγ=82.3 (1975An08), mixed with (α,3nγ) channel. Eγ=82.2, Iγ=11.7 in (p,nγ), 1.1 in (α,2nγ) (1975Ke06).
84.5[c] *3*	0.40 *15*	2332.8	25/2$^+$	2248.4	(23/2)$^-$	(E1+M2)	0.18 *+5−6*	3.8 *19*	α(K)=2.5 *13*; α(L)=0.9 *5*; α(M)=0.24 *13* α(N)=0.06 *4*; α(O)=0.010 *6*; α(P)=0.0006 *4* Mult.,δ: from Adopted Gammas. Eγ=84.4 (1975An08), placed from a 2213 level. Eγ=84.6, Iγ=0.6 in (α,2nγ) (1975Ke06).
94.3 *3*	3.7 *4*	94.24	1/2$^+$	0.0	3/2$^+$				Eγ=94.3 (1975An08), possibly mixed with (α,3nγ) channel. Eγ=94.3, Iγ=22.0 in (p,nγ), 2.6 in (α,2nγ) (1975Ke06).
[x]98.6[‡] *6*	1.9 *3*								
101.0 *3*	1.7 *3*	837.84	15/2$^-$	736.82	13/2$^-$	(M1)		5.95	A_2=−0.13 *12*; A_4=+0.4 *2* (1975An08); A_2=−0.2 *2* (1975Ke06) Eγ=101.0 (1975An08). Eγ=101.0, Iγ=1.8 in (α,2nγ) (1975Ke06). Mult.: dipole from γ(θ), M1 from intensity balance arguments.
110.1[‡] *3*	4.5[d] *10*	563.67	9/2$^-$	453.87	9/2$^+$	[E1]		0.312	α(K)=0.253 *4*; α(L)=0.0456 *8*; α(M)=0.01054 *17* α(N)=0.00255 *4*; α(O)=0.000423 *7*; α(P)=2.20×10^{-5} *4* Note that 110.1 *3* and 110.1 *6* γ rays, the latter from tentative 949 level are not resolved, however, based on results from 1975An08, most of the intensity of the 110γ belongs from the decay of 564 level.
110.1[‡g] *6*		948.7?	(11/2$^-$)	837.84	15/2$^-$				I_γ: see comment for 110.1γ from 564 level.
113.8 *1*	39.5 *30*	113.74	5/2$^+$	0.0	3/2$^+$	D+Q			A_2=−0.22 *2*; A_4=−0.03 *3* (1975An08); A_2=−0.04 *8* (1975Ke06) Eγ=113.8 (1975An08), mixed with (α,3nγ) channel. Eγ=113.7, Iγ=50.0 in (p,nγ), 38.3 in (α,2nγ) (1975Ke06).
115.2 *3*	0.6 *2*	1383.54	19/2$^-$	1268.23	17/2$^-$				E_γ,I_γ: from 1975Ke06. In 1975An08, Eγ=115 seen only in γγ-coin.
120.8[c] *3*	1.9 *3*	2248.4	(23/2)$^-$	2127.82	23/2$^+$	(E1)		0.246	α(K)=0.200 *3*; α(L)=0.0355 *6*; α(M)=0.00820 *13* α(N)=0.00198 *3*; α(O)=0.000331 *6*; α(P)=1.76×10^{-5} *3* A_2=−0.05 *10*; A_4=−0.14 *15* (1975An08); A_2=+0.26 *16* (1975Ke06) Mult.: dipole from γ(θ), intensity balance suggests E1. Eγ=120.8 (1975An08), mixed with (α,3nγ) channel. Placed from a 2333 level to 2213 level, and also tentatively from a 1221 level. Eγ=120.7, Iγ=2.7 in (α,2nγ) (1975Ke06).

From ENSDF

γ(^{189}Ir) (continued)

Eγ[†]	Iγ[@]	Ei(level)	J^{π}_{i}	E_f	J^{π}_{f}	Mult.[&]	α[f]	Comments
140.1[b] *3*	2.0[b] *6*	2059.83		1919.74	19/2+			
141.0[b] *3*	2.5[b] *8*	317.60	5/2+	176.53	3/2+			Eγ=141.2, Iγ=4.7 *6* (1975An08), but mixed with contribution from 3n channel. Eγ=141.0, Iγ=12.0 in (p,nγ), 2.5 in (α,2nγ) (1975Ke06).
x141.6[b] *3*	1.7[b] *5*							
147.2 *3*	2.3 *5*	464.69	7/2+	317.60	5/2+	(D)		α(K)= 1.73; α(L)= 0.283; α(M)= 0.0651; α(N+..)= 0.0203 A_2=−0.10 *14* (1975Ke06) Eγ=147.3 (1975An08). Eγ=147.1, Iγ=5.7 in (p,nγ), 1.8 in (α,2nγ) (1975Ke06).
149.6 *3*	1.2 *5*	2059.83		1910.21	19/2+	D		A_2=−0.13 *17* (1975Ke06) Eγ=149.5 (1975An08). Eγ=149.8, Iγ=0.9 in (α,2nγ) (1975Ke06). Placement from 1975Ke06.
153.6 *3*	2.8 *6*	453.87	9/2+	300.44	7/2+	D		A_2=−0.54 *14*; A_4=0.0 *2* (1975An08); A_2=−0.31 *11* (1975Ke06) Eγ=153.7 (1975An08). Eγ=153.5, Iγ=3.0 in (p,nγ), 2.6 in (α,2nγ) (1975Ke06).
x159.1[b] *3*	0.37[b] *11*							
172.1[b] *3*	0.3[b] *1*	918.10	13/2+	745.82	11/2+			
176.4[b] *3*	0.4[b] *2*	176.53	3/2+	0.0	3/2+			Iγ=2.9 in (p,nγ) (1975Ke06). In 1975An08, a 177γ, seen only in γγ-coin data, is tentatively placed from a 2096 level.
177.9 *1*	18.5 *10*	741.57	13/2−	563.67	9/2−	E2	0.517	α(K)exp=0.25 *8* A_2=+0.35 *3*; A_4=−0.06 *4* (1975An08); A_2=+0.30 *5* (1975Ke06) α(K)=0.229 *4*; α(L)=0.218 *3*; α(M)=0.0554 *8* α(N)=0.01342 *19*; α(O)=0.00208 *3*; α(P)=2.28×10^{-5} *4* Mult.: α(K)exp gives δ(E2/M1)>2.5. The ce(K) for 177.9 transition used for normalization of other ce data. Eγ=178.0 (1975An08). Eγ=177.8, Iγ=5.3 in (p,nγ), 18.3 in (α,2nγ) (1975Ke06).
180.4[b] *3*	0.4[b] *2*	899.32	11/2+	719.01	9/2+			
186.7 *1*	59.0 *20*	300.44	7/2+	113.74	5/2+	D+Q		A_2=−0.20 *2*; A_4=−0.06 *6* δ: negative sign from parametric plots of A_2 from ce(θ) and γ(θ) (1983Fa11). Eγ=186.7 (1975An08), placed also tentatively from a 1482 level. Eγ=186.6, Iγ=66.7 in (p,nγ), 61.7 in (α,2nγ) (1975Ke06).
x195[‡]								This γ seen only in γγ-coin and placed from a 1159 level (1975An08).
x200.4[b] *3*	1.0[b] *3*							
204[g]		945.9	11/2−	741.57	13/2−			
208.2 *3*	3.7 *5*	2127.82	23/2+	1919.74	19/2+	E2[e]	0.301	α(K)exp=0.11 *3* A_2=+0.34 *7*; A_4=−0.24 *10* (1975An08); A_2=+0.41 *7* (1975Ke06) α(K)=0.1532 *23*; α(L)=0.1119 *17*; α(M)=0.0283 *5* α(N)=0.00687 *11*; α(O)=0.001074 *17*; α(P)=1.556×10^{-5} *23* Eγ=208.3 (1975An08). Eγ=208.1, Iγ=4.3 in (α,2nγ) (1975Ke06).

γ(^{189}Ir) (continued)

E_γ [†]	I_γ [@]	E_i(level)	J_i^π	E_f	J_f^π	Mult. [&]	α [f]	Comments
209.3[‡] *6*	0.6 *4*	2085.00	23/2⁻	1875.47	21/2⁻			
214.6 *3*	1.5 *4*	1114.4	11/2⁻	899.92	9/2⁻			Eγ=214.8 (1975An08). Eγ=214.3, Iγ=2.0 in (p,nγ), 1.3 in (α,2nγ) (1975Ke06).
216.3[b] *3*	1.0[b] *3*	831.72	(9/2,11/2)⁻	615.48	7/2⁻			Iγ=5.7 in (p,nγ) (1975Ke06).
217.5 *3*	2.0 *4*	2127.82	23/2⁺	1910.21	19/2⁺			Eγ=217.3 (1975An08). Eγ=217.8, Iγ=1.8 in (α,2nγ) (1975Ke06). Placement from 1975Ke06.
223.4 *3*	1.0 *2*	317.60	5/2⁺	94.24	1/2⁺	(E2)	0.239	A_2=+0.22 *14* (1975Ke06) α(K)=0.1278 *19*; α(L)=0.0837 *13*; α(M)=0.0211 *4* α(N)=0.00513 *8*; α(O)=0.000805 *12*; α(P)=1.312×10^{-5} *19* Eγ=223.5 (1975An08), placed tentatively also from a 688 level. Eγ=223.2, Iγ=5.0 in (p,nγ), 1.1 in (α,2nγ) (1975Ke06).
224 *1*		2332.8	25/2⁺	2108.8				E_γ: from 1975Ke06. In delayed spectrum, Iγ=0.5 relative to 1.8 for 84.5γ. In 1975An08, a 223.5γ with Iγ=1.0 *2* is placed from 318 and tentatively from 688 level.
242.4[bg] *3*	1.7[b] *5*	1074.1?		831.72	(9/2,11/2)⁻			Iγ=2.2 in (p,nγ) (1975Ke06).
243.4 *1*	16.4 *15*	615.48	7/2⁻	372.12	11/2⁻	(E2)	0.181	A_2=+0.07 *5*; A_4=+0.06 *6* (1975An08); A_2=+0.11 *4* (1975Ke06) α(K)=0.1025 *15*; α(L)=0.0592 *9*; α(M)=0.01489 *21* α(N)=0.00361 *5*; α(O)=0.000570 *8*; α(P)=1.066×10^{-5} *15* Eγ=243.5 (1975An08), 243.3 (1978Ya06). Eγ=243.4, Iγ=50.0 in (p,nγ), 15.0 in (α,2nγ) (1975Ke06).
246.2[g]	<0.14	1383.54	19/2⁻	1137.22	15/2⁻			I_γ: from 1978Ya06.
247.6 *3*	2.7 *5*	2332.8	25/2⁺	2085.00	23/2⁻	(D)		A_2=+0.03 *14*; A_4=+0.06 *20* (1975An08); A_2=+0.03 *7* (1975Ke06) Eγ=247.6 (1975An08), 247.6 (1978Ya06). Eγ=247.6, Iγ=3.0 in (α,2nγ) (1975Ke06).
252.5 *3*	2.2 *4*	2127.82	23/2⁺	1875.47	21/2⁻			Eγ=252.6 (1975An08), 252.5 (1978Ya06). Eγ=252.5, Iγ=4.0 in (p,nγ), 2.2 in (α,2nγ) (1975Ke06).
254.3 *3*	2.6 *5*	719.01	9/2⁺	464.69	7/2⁺			Eγ=254.4 (1975An08), 254.5 (1978Ya06). Eγ=254.1, Iγ=5.7 in (p,nγ), 2.6 in (α,2nγ) (1975Ke06). Placement from 1975Ke06.
258.3 *2*	5.1 *8*	372.12	11/2⁻	113.74	5/2⁺	E3	0.877	α(L)exp=0.46 *14* A_2=−0.02 *10*; A_4=−0.22 *20* (1975An08); A_2=+0.02 *6* (1975Ke06) α(K)=0.248 *4*; α(L)=0.470 *7*; α(M)=0.1237 *18* α(N)=0.0302 *5*; α(O)=0.00468 *7*; α(P)=4.27×10^{-5} *6* The ce(L) for 258.3 transition used for normalization of other ce data. Mult.: α(L)exp gives δ(M4/E3)<0.1. Eγ=258.4 (1975An08). Eγ=258.2, Iγ=5.0 in (p,nγ), 5.7 in (α,2nγ) (1975Ke06).
263.2 *1*	36.0 *25*	563.67	9/2⁻	300.44	7/2⁺	E1	0.0346	α(K)exp=0.05 *2* A_2=−0.19 2; A_4=−0.03 *3* (1975An08); A_2=−0.15 *2* (1975Ke06) α(K)=0.0286 *4*; α(L)=0.00461 *7*; α(M)=0.001058 *15* α(N)=0.000258 *4*; α(O)=4.42×10^{-5} *7*; α(P)=2.80×10^{-6} *4*

γ(^{189}Ir) (continued)

E_γ[†]	I_γ[@]	E_i(level)	J^π_i	E_f	J^π_f	Mult.[&]	α[f]	Comments
								Mult.: α(K)exp gives δ(M2/E1)<0.2. Eγ=263.2 (1975An08). Eγ=263.1, Iγ=27.7 in (p,nγ), 35.0 in (α,2nγ) (1975Ke06).
275.4[‡g] 3	2.5 5	1221.1	15/2⁻	945.9	11/2⁻			I_γ: includes contribution from (α,nγ) channel.
281.6[bg] 3	1.3[b] 4	1396.0?		1114.4	11/2⁻			In 1975An08, a 281.3γ seen in delayed spectrum assigned tentatively to (α,3nγ) channel.
282.5 3	2.7 7	1114.4	11/2⁻	831.72	(9/2,11/2)⁻	M1	0.331	α(K)exp=0.36 11; A_2=+0.05 8 (1975Ke06) α(K)=0.274 4; α(L)=0.0442 7; α(M)=0.01017 15 α(N)=0.00250 4; α(O)=0.000443 7; α(P)=3.35×10^{-5} 5 Mult.: α(K)exp gives δ(E2/M1)<0.4. Eγ=282.5 (1975An08). Eγ=282.6, Iγ=3.3 in (p,nγ), 2.9 in (α,2nγ) (1975Ke06). Placement from 1975Ke06.
284.5 2	6.4 7	899.92	9/2⁻	615.48	7/2⁻	M1	0.325	α(K)exp=0.33 10; A_2=+0.15 5 (1975Ke06) α(K)=0.268 4; α(L)=0.0434 7; α(M)=0.00998 15 α(N)=0.00245 4; α(O)=0.000435 7; α(P)=3.29×10^{-5} 5 Mult.: α(K)exp gives δ(E2/M1)<0.5. Eγ=284.6 (1975An08). Eγ=284.3, Iγ=12.0 in (p,nγ), 6.3 in (α,2nγ) (1975Ke06).
288.1 3	4.0 8	464.69	7/2⁺	176.53	3/2⁺	(E2)	0.1071	A_2=+0.24 7 (1975Ke06) α(K)=0.0665 10; α(L)=0.0307 5; α(M)=0.00766 12 α(N)=0.00186 3; α(O)=0.000297 5; α(P)=7.11×10^{-6} 11 Eγ=288.1 (1975An08). Eγ=288.1, Iγ=9.0 in (p,nγ), 4.2 in (α,2nγ) (1975Ke06).
292.1 2	6.0 20	745.82	11/2⁺	453.87	9/2⁺	M1	0.302	α(K)exp=0.29 9 A_2=−0.42 8 (1975Ke06) α(K)=0.250 4; α(L)=0.0404 6; α(M)=0.00928 14 α(N)=0.00228 4; α(O)=0.000404 6; α(P)=3.06×10^{-5} 5 Mult.: α(K)exp gives δ(E2/M1)<0.6. Eγ=292.2 (1975An08). Eγ=291.9, Iγ=4.7 in (α,2nγ) (1975Ke06).
300.4 1	100.0	300.44	7/2⁺	0.0	3/2⁺	E2	0.0944	α(K)exp=0.053 16 A_2=+0.07 2; A_4=−0.03 2 (1975An08); A_2=+0.05 6 (1975Ke06) ce(K)/(γ+ce)=0.0547 8; ce(L)/(γ+ce)=0.0239 4; ce(M)/(γ+ce)=0.00596 9 ce(N)/(γ+ce)=0.001449 21; ce(O)/(γ+ce)=0.000232 4; ce(P)/(γ+ce)=5.88×10^{-6} 9 α(K)=0.0599 9; α(L)=0.0262 4; α(M)=0.00652 10 α(N)=0.001586 23; α(O)=0.000254 4; α(P)=6.43×10^{-6} 9 Mult.: α(K)exp gives δ(E2/M1)>4. The ce(K) for 300.3 transition used for normalization of other ce data. Eγ=300.5 (1975An08). Eγ=300.3, Iγ=100 in (p,nγ), 100 in (α,2nγ) (1975Ke06).
317.5 3	2.6 5	317.60	5/2⁺	0.0	3/2⁺	D+Q		A_2=−0.45 7; A_4=0.0 1 (1975An08); A_2=−0.48 10 (1975Ke06) Eγ=317.5 (1975An08). Eγ=317.4, Iγ=10.7 in (p,nγ), 2.6 in (α,2nγ) (1975Ke06).

γ(^{189}Ir) (continued)

E_γ [†]	I_γ [@]	E_i(level)	J_i^π	E_f	J_f^π	Mult. [&]	α [f]	Comments
[x]323.2 *6*	2.0 *4*					D		A_2=−0.52 *14* (1975Ke06) Eγ=323.2 (1975An08), not assigned to any reaction channel. Eγ=322.8, Iγ=1.4 in (α,2nγ) (1975Ke06).
333.1 *3*	1.8 *5*	1447.5		1114.4	11/2$^-$			A_2=−0.2 *3* (1975Ke06) Note that 333.1 *3* and 333.3 *3* γ rays, the latter from tentative 949 level are not resolved. The placement here is mainly assigned to 1447 level based on results from 1975Ke06. Eγ=333.3 (1975An08), placed from only the 949 level. Eγ=332.8, Iγ=1.3 in (α,2nγ) (1975Ke06), placed from 1448 level.
333.3[g] *3*		948.7?	(11/2$^-$)	615.48	7/2$^-$			In 1975Ke06, a 332.8γ placed only from the 1448 level. See comment for 333.1 *3* γ ray from 1448 level.
340.2 *1*	37.5 *20*	453.87	9/2$^+$	113.74	5/2$^+$	E2	0.0658	α(K)exp=0.039 *13* A_2=+0.26 *2*; A_4=−0.06 *4* (1975An08); A_2=+0.23 *3* (1975Ke06) α(K)=0.0439 *7*; α(L)=0.01661 *24*; α(M)=0.00411 *6* α(N)=0.000999 *14*; α(O)=0.0001611 *23*; α(P)=4.79×10^{-6} *7* Mult.: α(K)exp gives δ(E2/M1)>3.5. Eγ=340.3 (1975An08). Eγ=340.1, Iγ=33.3 in (p,nγ), 33.3 in (α,2nγ) (1975Ke06).
342.1[b] *3*	1.3[b] *4*	1288.0	(13/2$^-$)	945.9	11/2$^-$			
349.5 *3*	1.0 *6*	1248.9	13/2$^+$	899.32	11/2$^+$	(M1)	0.186	α(K)exp=0.16 *5* α(K)=0.1539 *22*; α(L)=0.0247 *4*; α(M)=0.00569 *8* α(N)=0.001398 *20*; α(O)=0.000248 *4*; α(P)=1.88×10^{-5} *3* Mult.: α(K)exp gives δ(E2/M1)<0.8, but the 349.5γ is a weak component therefore the multipolarity assignment is considered as tentative. α(K)exp for 349+351 doublet. Eγ=349.5 (1975An08). Eγ=349.6, Iγ=1.7 in (α,2nγ) (1975Ke06). Placement from 1975Ke06.
350.9 *2*	6.8 *10*	464.69	7/2$^+$	113.74	5/2$^+$	M1	0.184	α(K)exp=0.16 *5* A_2=−0.41 *14*; A_4=+0.2 *2* (1975An08) α(K)=0.1523 *22*; α(L)=0.0245 *4*; α(M)=0.00563 *8* α(N)=0.001383 *20*; α(O)=0.000245 *4*; α(P)=1.86×10^{-5} *3* α(K)exp for 349+351 doublet. Mult.: α(K)exp gives δ(E2/M1)<0.8. Eγ=351.0 (1975An08). Eγ=350.8, Iγ=14.3 in (p,nγ), 5.7 in (α,2nγ) (1975Ke06).
359.2 *1*	12.5 *15*	1100.77	17/2$^-$	741.57	13/2$^-$	(E2)	0.0564	A_2=+0.38 *4*; A_4=−0.18 *6* (1975An08); A_2=+0.30 *4* (1975Ke06) α(K)=0.0384 *6*; α(L)=0.01369 *20*; α(M)=0.00337 *5* α(N)=0.000821 *12*; α(O)=0.0001330 *19*; α(P)=4.22×10^{-6} *6* Eγ=359.3 (1975An08). Eγ=358.9, Iγ=11.7 in (α,2nγ) (1975Ke06).
364.7 *1*	39.0 *30*	736.82	13/2$^-$	372.12	11/2$^-$	D		A_2=+0.14 *2*; A_4=−0.06 *3* (1975An08); A_2=+0.12 *2* (1975Ke06)

$^{189}_{77}$Ir$_{112}$-7

γ(^{189}Ir) (continued)

E_γ[†]	I_γ[@]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[&]	α[f]	Comments
								E_γ: γ assigned from 836.4-keV level in 1975Ke06. Eγ=364.8 (1975An08). Eγ=364.5, Iγ=14.7 in (p,nγ), 36.7 in (α,2nγ) (1975Ke06). Eγ=364.7, Iγ=43 (1978Ya06).
378.1 *3*	3.3 *4*	1296.14	15/2$^+$	918.10	13/2$^+$	D+Q		A_2=−0.58 *18*; A_4=−0.1 *3* (1975An08); A_2=−0.47 *7* (1975Ke06) δ: negative sign from parametric plots of A_2 from ce(θ) and γ(θ) (1983Fa11). Value not given. Eγ=378.1 (1975An08). Eγ=378.0, Iγ=3.2 in (α,2nγ) (1975Ke06).
382.2 *3*	4.5 *7*	945.9	11/2$^-$	563.67	9/2$^-$	D		A_2=−0.44 *9*; A_4=0.0 *2* (1975An08); A_2=−0.40 *8* (1975Ke06) Eγ=382.3 (1975An08). Eγ=382.1, Iγ=6.3 in (p,nγ), 4.3 in (α,2nγ) (1975Ke06).
387.7 *3*	4.5 *7*	1655.9	19/2$^-$	1268.23	17/2$^-$	(M1)	0.1409	α(K)exp=0.26 *8*; A_2=+0.16 *8* (1975Ke06) A_2=+0.06 *7*; A_4=−0.16 *12* (1975An08) α(K)=0.1167 *17*; α(L)=0.0187 *3*; α(M)=0.00430 *6* α(N)=0.001056 *15*; α(O)=0.000187 *3*; α(P)=1.420×10^{-5} *21* α(K)exp is about a factor of two larger than α(K)(theory,M1)=0.117, there may be some impurity mixed in the ce line for 387.7 transition. Eγ=387.9 (1975An08); also tentative placement from a 688 level. Eγ=387.6, Iγ=4.1 in (α,2nγ) (1975Ke06). Eγ=387.7, Iγ=4.7 (1978Ya06).
394.1 *3*	1.4 *6*	1615.2	(17/2$^-$)	1221.1	15/2$^-$			Eγ=394.3 (1975An08). Eγ=393.8, Iγ=1.1 in (α,2nγ) (1975Ke06).
400.4 *1*	15.8 *16*	1137.22	15/2$^-$	736.82	13/2$^-$	M1	0.1293	α(K)exp=0.11 *3* A_2=+0.16 *3*; A_4=−0.20 *4* (1975An08) α(K)=0.1071 *15*; α(L)=0.01715 *24*; α(M)=0.00394 *6* α(N)=0.000969 *14*; α(O)=0.0001717 *24*; α(P)=1.303×10^{-5} *19* Mult.: α(K)exp gives δ(E2/M1)<0.8. α(K)exp for 400.6+401.2 doublet. Eγ=400.6 (1975An08). Eγ=400.2, Iγ=11.3 in (α,2nγ) (1975Ke06). Eγ=400.3, Iγ=16.3 (1978Ya06).
401.2[b] *3*	2.7[b] *9*	719.01	9/2$^+$	317.60	5/2$^+$			α(K)exp=0.11 *3* α(K)=0.1065 *15*; α(L)=0.01705 *25*; α(M)=0.00392 *6* α(N)=0.000963 *14*; α(O)=0.0001708 *25*; α(P)=1.296×10^{-5} *19* Mult.: α(K)exp gives δ(E2/M1)<0.8, but 401.2 component is much weaker than the 400.6, thus the multipolarity assignment is tentative. α(K)exp for 400.6+401.2 doublet. Iγ=7.0 in (p,nγ) (1975Ke06).
407.3[g] *3*	2.2 *5*	1790.8?		1383.54	19/2$^-$	D		A_2=−0.30 *14* (1975Ke06) Eγ=407.3 (1975An08). Eγ=407.3, Iγ=2.1 in (α,2nγ) (1975Ke06). Placement from 1975Ke06.
419.0 *3*	1.3 *7*	719.01	9/2$^+$	300.44	7/2$^+$			Eγ=419.0 (1975An08).

$^{189}_{77}$Ir$_{112}$-8

γ(^{189}Ir) (continued)

E_γ [†]	I_γ [@]	E_i(level)	J^π_i	E_f	J^π_f	Mult. [&]	α [f]	Comments
								Eγ=418.2, Iγ=1.5 in (α,2nγ) (1975Ke06). Placement from 1975Ke06.
429[b] *1*	1.3[b] *4*	1910.21	19/2$^+$	1481.54	17/2$^+$			
430.4 *1*	15.0 *20*	1268.23	17/2$^-$	837.84	15/2$^-$	M1	0.1067	α(L)exp=0.028 *9*; A_2=+0.17 *3* (1975Ke06) A_2=+0.14 *3*; A_4=−0.05 *6* (1975An08) α(K)=0.0884 *13*; α(L)=0.01413 *20*; α(M)=0.00325 *5* α(N)=0.000798 *12*; α(O)=0.0001415 *20*; α(P)=1.074×10^{-5} *15* Eγ=430.5 (1975An08). Eγ=430.4, Iγ=6.0 in (p,nγ), 13.7 in (α,2nγ) (1975Ke06). Eγ=430.4, Iγ=15.0 (1978Ya06). Mult.: for M1 assignment, α(L)exp is twice as large as the theoretical value of 0.014, but agrees within about 1.5σ. Moreover, E1 has α(L)=0.001419 E2 has α(L)=0.00742, thus the measured value is only consistent with M1.
434.6 *3*	4.5 *5*	899.32	11/2$^+$	464.69	7/2$^+$	(E2)	0.0338	A_2=+0.11 *12*; A_4=−0.3 *2* (1975An08); A_2=+0.14 *12* (1975Ke06) α(K)=0.0244 *4*; α(L)=0.00719 *11*; α(M)=0.001751 *25* α(N)=0.000427 *6*; α(O)=7.01×10^{-5} *10*; α(P)=2.73×10^{-6} *4* Eγ=434.7 (1975An08). Eγ=434.5, Iγ=4.3 in (p,nγ), 4.3 in (α,2nγ) (1975Ke06).
438.3 *3*	3.8 *6*	1919.74	19/2$^+$	1481.54	17/2$^+$	M1	0.1017	α(K)exp=0.08 *2* α(K)=0.0843 *12*; α(L)=0.01346 *19*; α(M)=0.00309 *5* α(N)=0.000760 *11*; α(O)=0.0001348 *19*; α(P)=1.023×10^{-5} *15* Mult.: α(K)exp gives δ(E2/M1)<0.7. α(K)exp for 438+441 doublet. Eγ=438.5 (1975An08). Eγ=438.1, Iγ=1.7 in (α,2nγ) (1975Ke06).
441.1 *2*	6.5 *10*	1578.3	(17/2$^-$)	1137.22	15/2$^-$	M1	0.1000	α(K)exp=0.08 *2*; A_2=+0.33 *8* (1975Ke06) A_2=+0.21 *9*; A_4=−0.15 *14* (1975An08) α(K)=0.0829 *12*; α(L)=0.01323 *19*; α(M)=0.00304 *5* α(N)=0.000747 *11*; α(O)=0.0001325 *19*; α(P)=1.006×10^{-5} *15* Mult.: α(K)exp gives δ(E2/M1)<0.7. α(K)exp for 438+441 doublet. Eγ=441.2 (1975An08), mixed with (α,3nγ) channel. Eγ=441.1, Iγ=4.7 in (α,2nγ) (1975Ke06). Eγ=441.1, Iγ=4.3 (1978Ya06).
445.3 *1*	25.0 *30*	745.82	11/2$^+$	300.44	7/2$^+$	E2	0.0318	α(K)exp=0.024 *8* A_2=+0.19 *2*; A_4=−0.19 *4* (1975An08); A_2=+0.21 *2* (1975Ke06) α(K)=0.0230 *4*; α(L)=0.00665 *10*; α(M)=0.001616 *23* α(N)=0.000394 *6*; α(O)=6.49×10^{-5} *9*; α(P)=2.58×10^{-6} *4* Note that 445.3 *1* and 445.3 *3* γ rays, the latter from 899 level are not resolved, however, based on γ-branching ratios in ^{189}Ir IT decay (3.7 ms), most of the intensity of the 445γ must belong from the decay of 746 level. Mult.: α(K)exp gives δ(E2/M1)>2.5. α(K)exp for doublet.

$^{189}_{77}$Ir$_{112}$-9

γ(^{189}Ir) (continued)

E_γ[†]	I_γ[@]	E_i(level)	J^π_i	E_f	J^π_f	Mult.[&]	δ	α[f]	Comments
445.3 *3*		899.32	$11/2^+$	453.87	$9/2^+$				The ce(K) for 445.3 transition used for normalization of other ce data. Eγ=445.3 (1975An08), also tentative placement from 899 level. Eγ=445.4, Iγ=11.0 in (p,nγ), 22.7 in (α,2nγ) (1975Ke06). α(K)= 0.0232; α(L)= 0.00671; α(M)= 0.00163; α(N+..)= 0.000491 I_γ: see comment for 445.3γ from 745 level.
459.5 *2*	5.5 *10*	831.72	$(9/2,11/2)^-$	372.12	$11/2^-$	M1		0.0898	α(K)exp=0.09 *3*; A_2=+0.06 *11* (1975Ke06) α(K)=0.0744 *11*; α(L)=0.01186 *17*; α(M)=0.00273 *4* α(N)=0.000670 *10*; α(O)=0.0001188 *17*; α(P)=9.03×10^{-6} *13* Mult.: α(K)exp gives δ(E2/M1)<0.6. Eγ=459.5 (1975An08). Eγ=459.6, Iγ=11.3 in (p,nγ), 5.0 in (α,2nγ) (1975Ke06). Placement from 1975Ke06.
464.4 *2*	18.0 *30*	918.10	$13/2^+$	453.87	$9/2^+$	E2		0.0285	α(K)exp=0.020 *7*; A_2=+0.27 *5* (1975Ke06) α(K)=0.0209 *3*; α(L)=0.00581 *9*; α(M)=0.001410 *20* α(N)=0.000344 *5*; α(O)=5.68×10^{-5} *8*; α(P)=2.35×10^{-6} *4* Mult.: α(K)exp gives δ(E2/M1)>2.7. α(K)exp for 465+466 doublet. Eγ=464.7 (1975An08). Eγ=464.1, Iγ=19.3 in (α,2nγ) (1975Ke06).
465.7 *1*	32.5 *40*	837.84	$15/2^-$	372.12	$11/2^-$	E2		0.0283	α(K)exp=0.020 *7*; A_2=+0.30 *4* (1975Ke06) α(K)=0.0208 *3*; α(L)=0.00576 *8*; α(M)=0.001398 *20* α(N)=0.000341 *5*; α(O)=5.63×10^{-5} *8*; α(P)=2.34×10^{-6} *4* Mult.: α(K)exp gives δ(E2/M1)>2.7. α(K)exp for 465+466 doublet. Eγ=466.0 (1975An08). Eγ=465.6, Iγ=35.3 in (α,2nγ) (1975Ke06). Eγ=465.6, Iγ=33.7 (1978Ya06).
[x]469.6[b] *3*	1.3[b] *4*								
479.5 *2*	6.4 *7*	1221.1	$15/2^-$	741.57	$13/2^-$	M1+E2	1.1 *+7−4*	0.051 *12*	α(K)exp=0.04 *1*; A_2=−0.93 *8* (1975Ke06) α(K)=0.041 *11*; α(L)=0.0077 *12*; α(M)=0.0018 *3* α(N)=0.00044 *7*; α(O)=7.6×10^{-5} *12*; α(P)=4.8×10^{-6} *13* Eγ=479.5 (1975An08). Eγ=479.5, Iγ=5.3 in (α,2nγ) (1975Ke06). Mult.,δ: from α(K)exp and γ(θ).
491.9 *2*	5.1 *7*	1875.47	$21/2^-$	1383.54	$19/2^-$				A_2=+0.17 *5* (1975Ke06) α(K)=0.0184 *3*; α(L)=0.00486 *7*; α(M)=0.001175 *17* α(N)=0.000287 *4*; α(O)=4.75×10^{-5} *7*; α(P)=2.07×10^{-6} *3* Eγ=492.0 (1975An08). Eγ=492.0, Iγ=4.0 in (α,2nγ) (1975Ke06). Eγ=491.8, Iγ=3.7 (1978Ya06).
498.9[g] *3*	0.8 *4*	1114.4	$11/2^-$	615.48	$7/2^-$				Eγ=499.2 (1975An08). Eγ=498.5, Iγ=1.0 in (α,2nγ) (1975Ke06).
502.6[bg] *3*	1.7[b] *5*	1248.9	$13/2^+$	745.82	$11/2^+$				

$^{189}_{77}$Ir$_{112}$-10

γ(^{189}Ir) (continued)

Eγ[†]	Iγ[@]	Ei(level)	J^π_i	Ef	J^π_f	Mult.[&]	α[f]	Comments
508.0[b] *3*	4.0[b] *13*	1608.8	21/2⁻	1100.77	17/2⁻			
528.0[‡g] *3*	1.0 *7*	899.92	9/2⁻	372.12	11/2⁻			
530.0 *3*	4.0 *10*	1248.9	13/2⁺	719.01	9/2⁺			Placement from 1975Ke06. Other placement from 1667 level in 1975An08 rejected by evaluators assuming incorrect assignment on the basis of coincidence with 400γ doublet. Eγ=529.9 (1975An08). Eγ=530.1, Iγ=2.7 in (α,2nγ) (1975Ke06).
531.4 *3*	2.9 *8*	1268.23	17/2⁻	736.82	13/2⁻			Eγ=531.6 (1975An08). Eγ=531.3, Iγ=1.0 in (α,2nγ) (1975Ke06) placed tentatively from a 2187 level. Eγ=531.2, Iγ=1.7 (1978Ya06) placed tentatively from 2187 level.
545.7 *1*	21.0 *30*	1383.54	19/2⁻	837.84	15/2⁻	E2	0.0192	α(K)exp=0.017 *5*; A_2=+0.23 *4* (1975Ke06) A_2=+0.26 *4*; A_4=−0.12 *6* (1975An08) α(K)=0.01457 *21*; α(L)=0.00356 *5*; α(M)=0.000854 *12* α(N)=0.000209 *3*; α(O)=3.49×10^{-5} *5*; α(P)=1.652×10^{-6} *24* Mult.: α(K)exp gives δ(E2/M1)>1.8. Eγ=545.8 (1975An08). Eγ=545.7, Iγ=18.7 in (α,2nγ) (1975Ke06). Eγ=545.6, Iγ=17.0 (1978Ya06).
550.3 *1*	23.0 *30*	1296.14	15/2⁺	745.82	11/2⁺	E2	0.0188	α(K)exp=0.020 *6*; A_2=+0.10 *3* (1975Ke06) A_2=+0.14 *4*; A_4=−0.15 *6* (1975An08) α(K)=0.01431 *20*; α(L)=0.00347 *5*; α(M)=0.000833 *12* α(N)=0.000203 *3*; α(O)=3.40×10^{-5} *5*; α(P)=1.623×10^{-6} *23* Note that 550.3 *1* and 550.4 *3* γ rays, the latter from 1651.2 level are not resolved, however, based on γ-branching ratios in ^{189}Ir IT decay (3.7 ms), most of the intensity of the 550γ must belong from the decay of 1296 level. Mult.: α(K)exp gives δ(E2/M1)>1.3. Eγ=550.4 (1975An08). Eγ=550.1, Iγ=19.0 in (α,2nγ) (1975Ke06).
550.4 *3*		1651.2	(19/2⁻)	1100.77	17/2⁻			Iγ: see comment for 550.3γ from 1296 level.
563.5 *2*	9.5 *15*	1481.54	17/2⁺	918.10	13/2⁺	(E2)	0.01783	A_2=+0.22 *4*; A_4=−0.17 *6* (1975An08); A_2=+0.26 *3* (1975Ke06) α(K)=0.01359 *19*; α(L)=0.00324 *5*; α(M)=0.000777 *11* α(N)=0.000190 *3*; α(O)=3.18×10^{-5} *5*; α(P)=1.542×10^{-6} *22* Eγ=563.6 (1975An08). Eγ=563.4, Iγ=9.0 in (α,2nγ) (1975Ke06).
576.8[‡g] *6*	0.7 *4*	948.7?	(11/2⁻)	372.12	11/2⁻			
607.4 *3*	3.5 *10*	1875.47	21/2⁻	1268.23	17/2⁻			Eγ=607.5 (1975An08). Eγ=607.2, Iγ=10.0 in (p,nγ), 3.3 in (α,2nγ) (1975Ke06); doublet, placed also from a 607.2 level based on a previous work.
[x]610.2[‡] *6*	2.3 *8*							
614.0 *2*	5.2 *10*	1910.21	19/2⁺	1296.14	15/2⁺	(Q)		A_2=+0.32 *15* (1975Ke06) Placement from 1975Ke06. Eγ=614.1 (1975An08), placement from a 2096 level. Eγ=613.8, Iγ=6.0 in (α,2nγ) (1975Ke06).

$^{189}_{77}Ir_{112}$-11

γ(^{189}Ir) (continued)

Eγ†	Iγ@	Ei(level)	J^π_i	Ef	J^π_f	Mult.&	α f	Comments
623.6 *1*	11.5 *15*	1919.74	19/2+	1296.14	15/2+	E2	0.01411	α(K)exp=0.013 *4*; A_2=+0.28 *4* (1975Ke06) A_2=+0.3 *1*; A_4=−0.3 *2* (1975An08) α(K)=0.01093 *16*; α(L)=0.00243 *4*; α(M)=0.000580 *9* α(N)=0.0001417 *20*; α(O)=2.39×10^{-5} *4*; α(P)=1.244×10^{-6} *18* Mult.: α(K)exp gives δ(E2/M1)>1.7. Eγ=623.7 (1975An08). Eγ=623.5, Iγ=11.3 in (α,2nγ) (1975Ke06).
628.1 *3*	2.3 *5*	2109.6	(21/2+)	1481.54	17/2+			Eγ=628.3 (1975An08). Eγ=627.9, Iγ=2.2 in (α,2nγ) (1975Ke06). Placement from 1975Ke06.
x641.3# *6*	1.5 *5*							
x644.8# *6*	1.5 *5*							
x665.2# *6*	1.3 *5*							
676.3 *3*	1.2 *5*	2059.83		1383.54	19/2−			Eγ=676.2 (1975An08). Eγ=676.5, Iγ=0.87 in (α,2nγ) (1975Ke06). Placement from 1975Ke06.
701.4 *2*	7.0 *15*	2085.00	23/2−	1383.54	19/2−	E2	0.01087	α(K)exp=0.007 *2*; A_2=+0.14 *7* (1975Ke06) A_2=+0.26 *7*; A_4=−0.1 *1* (1975An08) α(K)=0.00856 *12*; α(L)=0.001775 *25*; α(M)=0.000420 *6* α(N)=0.0001027 *15*; α(O)=1.747×10^{-5} *25*; α(P)=9.75×10^{-7} *14* Mult.: α(K)exp gives δ(E2/M1)>6. Eγ=701.4 (1975An08). Eγ=701.5, Iγ=6.7 in (α,2nγ) (1975Ke06).
725.3 *3*	1.5 *5*	2108.8		1383.54	19/2−			Eγ=725.5 (1975An08). Eγ=725.1, Iγ=1.7 in (α,2nγ) (1975Ke06).
x733.2# *6*	0.8 *3*							
743.9‡g *3*	2.3 *6*	1114.4	11/2−	372.12	11/2−			
x760.3# *6*	1.6 *4*							
x772.0# *6*	1.3 *5*							
x800.7# *6*	2.0 *8*							
840.9‡g *3*	3.0 *10*	1578.3	(17/2−)	736.82	13/2−			placement from 2109 level by 1975An08 seems incorrect due to intensity imbalance in the 3.7-ms IT decay dataset. Evaluators suggest placement from 1578 level based on energy difference and possible coincidence with 364.8γ.
x971.0‡ *6*	2.0 *10*							In 1975An08, γ tentatively placed from 2109 to 1137 level, but the energy agreement is poor, and also in 3.7 ms IT decay dataset, intensity balance arguments do not support the placement.

† From unweighted average of values from 1975An08, 1975Ke06 and a few values available in 1978Ya06. All the energy values are listed in comments. Uncertainties are assigned by the evaluators as follows: 0.1 keV for gamma rays with Iγ≥10, 0.2 keV for Iγ=5-10, 0.3 keV for Iγ<5, 0.6 keV for some

γ(^{189}Ir) (continued)

uncertain weak (Iγ<1) γ rays from 1975An08. These uncertainties are based on the following general statements by different authors: 0.1 to 0.3 keV stated by 1975Ke06, 0.1 to 0.2 keV general and 0.6 keV for poorly resolved peaks stated by 1975An08, and 0.06 keV by 1978Ya06.

‡ This γ from only 1975An08.

This γ from only 1975An08 with a tentative assignment to (α,2nγ).

@ From ^{187}Re(α,2nγ) at E=27.6 MeV (1975An08). Values of intensity ratios for E(α)=31.4 MeV and 27.6 MeV are also available in 1975An08. Delayed γ intensities are reported at E(α)=31.6 MeV. 1975Ke06 provide intensity data for E(α)=27 and 23 MeV and for E(p)=10 MeV. Their values at E(α)=27 MeV and E(p)=10 MeV are listed under comments. The branching ratios obtained from these values are compared with those from 1975An08 and found to be in general agreement. Note that the intensities given in 1975Ke06 are divided by a factor of 3, and those in 1975An08 by a factor of 10 to express these values relative to 100 for the 300.4γ.

& From α(K)exp from 1975Ke06 with 178.0, 258.4 and 300.5 γ rays for normalization; and A_2, A_4 from 1975An08, or 1975Ke06. For the conversion electrons from 1975Ke06, the authors state that only those with uncertainties less than 50% are given and that uncertainties of 30% may be typical. For deducing mixing ratios, evaluators assigned 30% uncertainty in conversion coefficients. Only the dominant multipolarity such as M1 or E2 is given in the data field while the other possible admixture is stated in comments as an upper or lower limit of δ(E2/M1).

[a] From Adopted Gammas.

[b] This γ from only 1975Ke06, listed intensity is divided by a factor of 3 to normalize to 100 for 300.4γ.

[c] Ordering of the 85γ-121γ cascade is reversed in 1975An08.

[d] Corrected by 1975An08 for contribution from ^{16}O(α,p).

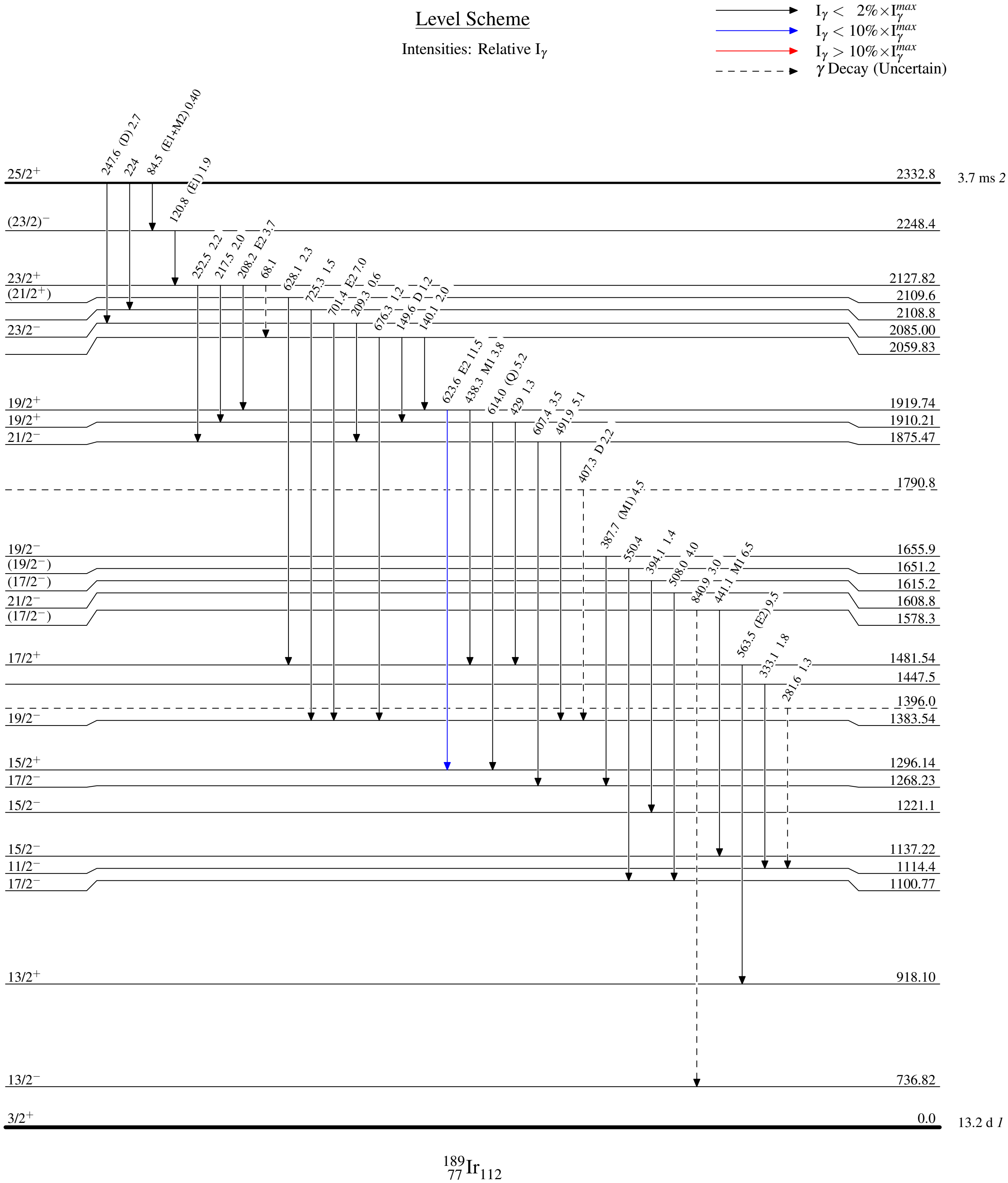
[e] Based on γ intensity balance in the delayed γ decay data from 1975Ke06.

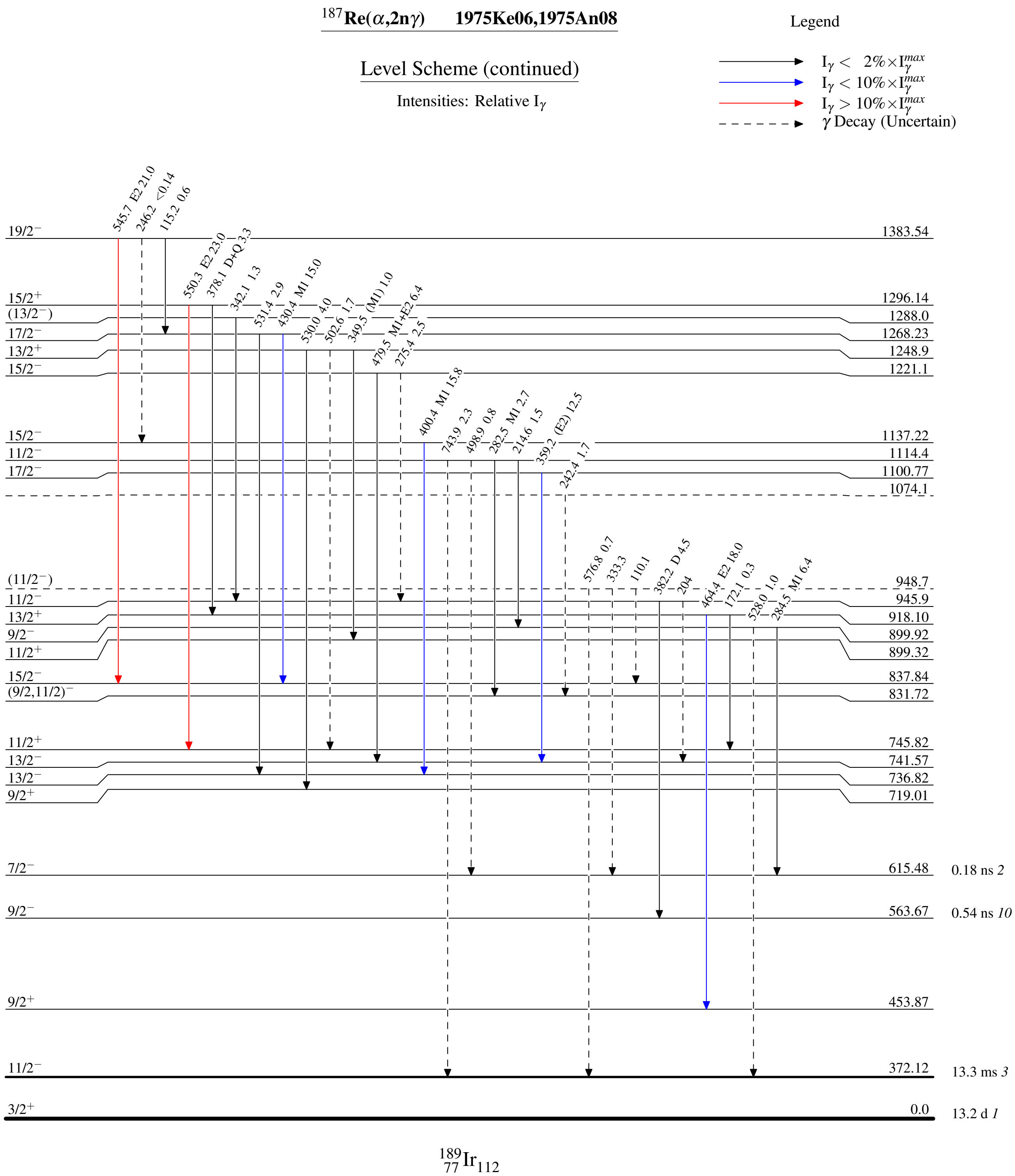
[f] Theoretical values from BrIcc code (2008Ki07) with "Frozen Orbitals" approximation, unless otherwise stated.

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

[x] γ ray not placed in level scheme.

^{187}Re(α,2nγ) 1975Ke06,1975An08





^{187}Re(α,2nγ) 1975Ke06,1975An08
Level Scheme (continued)
Intensities: Relative I_γ
Legend
I_γ < 2%×I_γ^{max}
I_γ < 10%×I_γ^{max}
I_γ > 10%×I_γ^{max}
γ Decay (Uncertain)
19/2− 1383.54
15/2+ 1296.14
(13/2−) 1288.0
17/2− 1268.23
13/2+ 1248.9
15/2− 1221.1
15/2− 1137.22
11/2− 1114.4
17/2− 1100.77
1074.1
(11/2−) 948.7
11/2− 945.9
13/2+ 918.10
9/2− 899.92
11/2+ 899.32
15/2− 837.84
(9/2,11/2)− 831.72
11/2+ 745.82
13/2− 741.57
13/2− 736.82
9/2+ 719.01
7/2− 615.48 0.18 ns 2
9/2− 563.67 0.54 ns 10
9/2+ 453.87
11/2− 372.12 13.3 ms 3
3/2+ 0.0 13.2 d 1
545.7 E2 21.0
246.2 <0.14
115.2 0.6
550.3 E2 23.0
378.1 D+Q 3.3
342.1 1.3
531.4 2.9
430.4 M1 15.0
530.0 4.0
502.6 1.7
349.5 (M1) 1.0
479.5 M1+E2 6.4
275.4 2.5
400.4 M1 15.8
743.9 2.3
498.9 0.8
282.5 M1 2.7
214.6 1.5
359.2 (E2) 12.5
242.4 1.7
576.8 0.7
333.3
110.1
382.2 D 4.5
204
464.4 E2 18.0
172.1 0.3
528.0 1.0
284.5 M1 6.4
$^{189}_{77}Ir_{112}$

^{187}Re(α,2nγ) 1975Ke06,1975An08

Level Scheme (continued)

Intensities: Relative I_γ

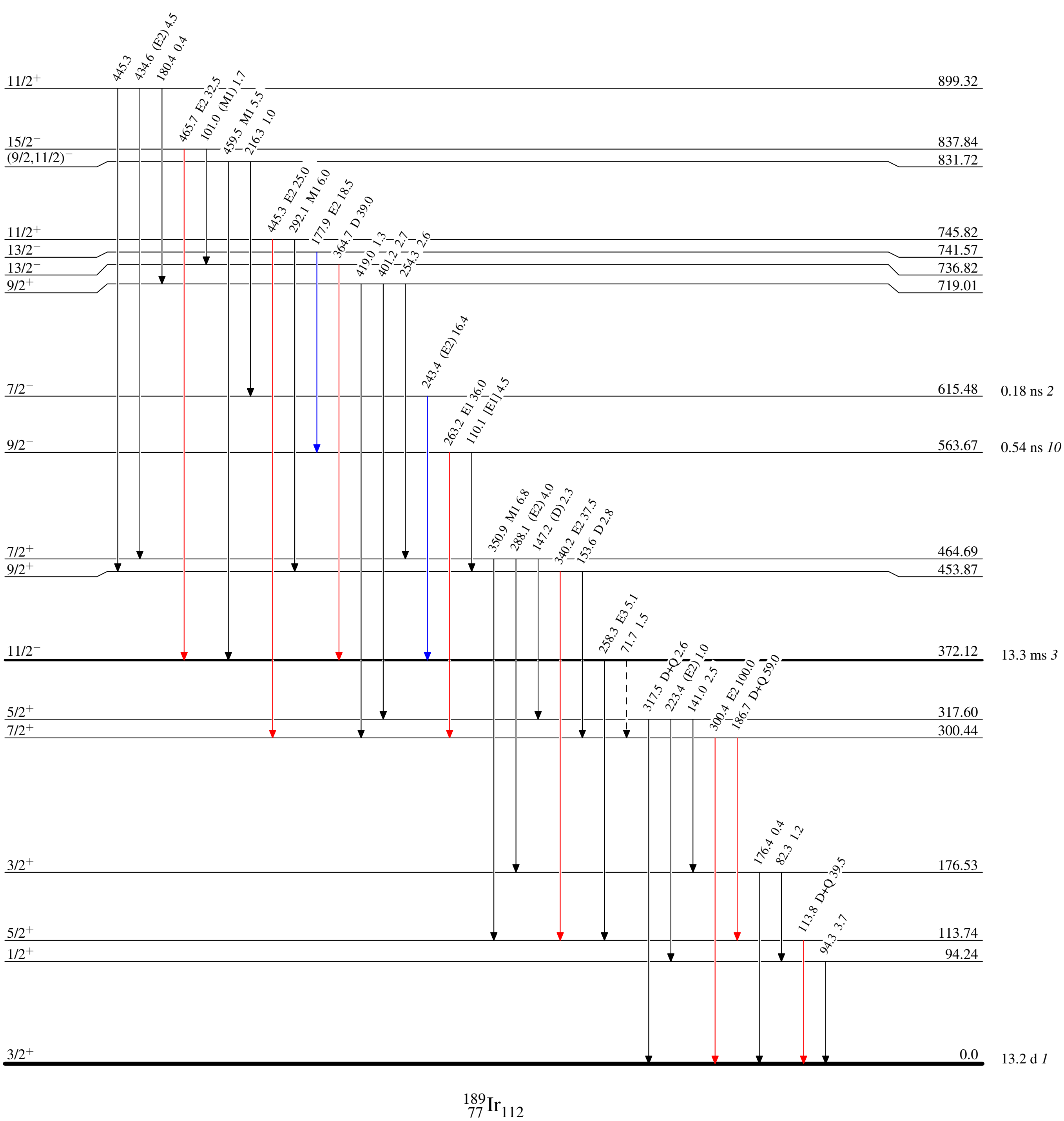
Legend

$I_\gamma < 2\% \times I_\gamma^{max}$

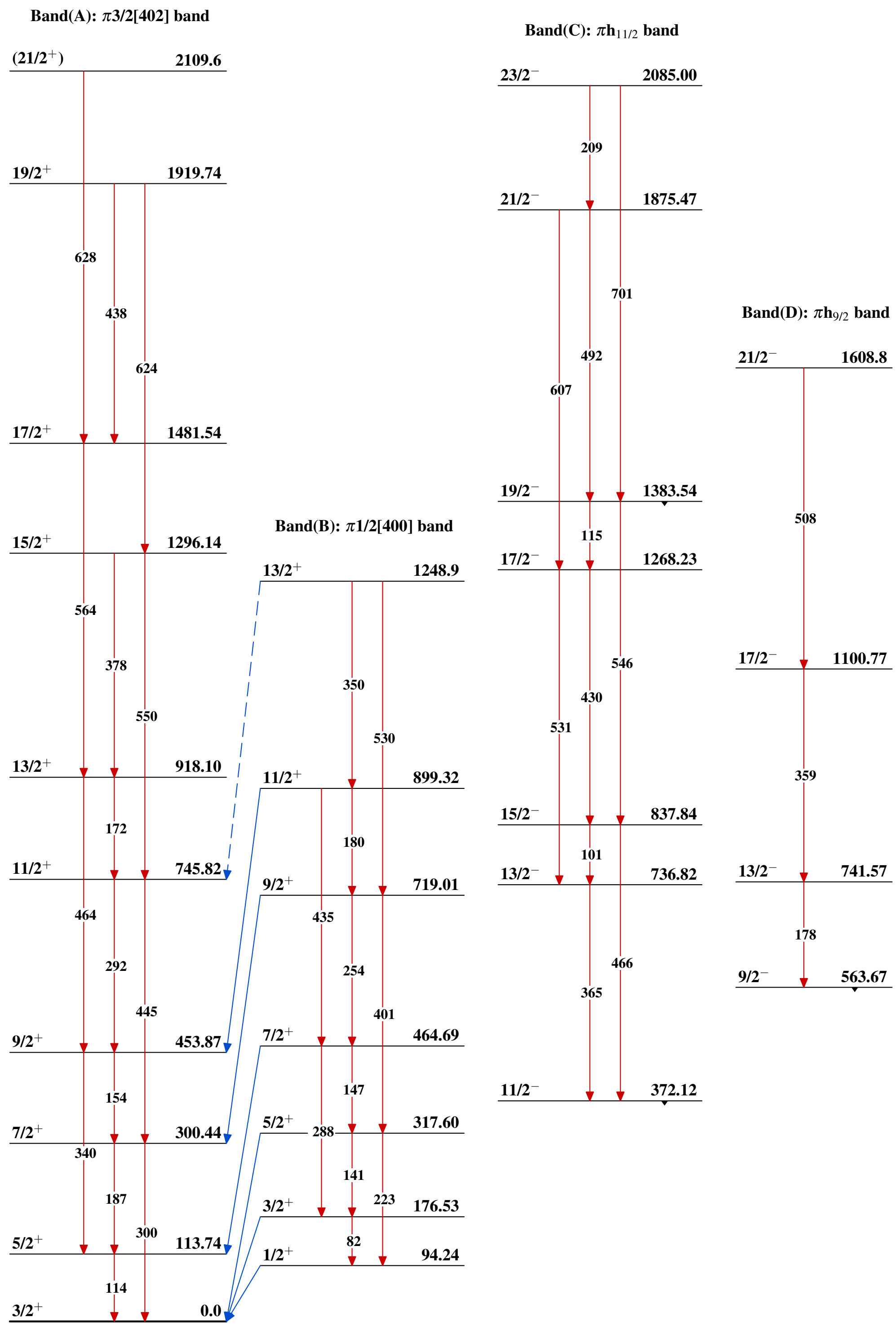
$I_\gamma < 10\% \times I_\gamma^{max}$

$I_\gamma > 10\% \times I_\gamma^{max}$

γ Decay (Uncertain)



^{187}Re(α,2nγ) 1975Ke06,1975An08



$^{189}_{77}Ir_{112}$