(HI,xnγ) 1988Kr17

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

1988Kr17 (see also 1986Kr09): ^{174}Yb(^{14}N,4nγ), E=65,68,70,73,75,80 MeV; ^{175}Lu(^{13}C,4nγ), E=64 MeV; ^{176}Yb(^{14}N,6nγ), E=96 MeV; ^{176}Lu(^{12}C,4nγ), E=68 MeV; intrinsic Ge with NaI(Tl) Compton suppression spectrometer; measured Eγ, Iγ, γγ-coin, γγ(θ).

^{184}Ir Levels

E(level)†	Jπ‡	T1/2#	E(level)†	Jπ‡	E(level)†	Jπ‡
0.0@	5⁻		633.9a 6	(9⁺)	1591.5@ 6	(15⁻)
41.80@ 25	(6)⁻		648.4@ 5	(11)⁻	1792.4 5	(14⁺)
70.9 3	4⁻		658.8& 4	(9)⁺	1977.1@ 6	(16⁻)
111.0@ 4	(7)⁻		858.3& 4	(10)⁺	2039.1& 6	(15⁺)
207.8@ 5	(8)⁻		877.2@ 6	(12)⁻	2179.7a 7	(15⁺)
225.8a 4	3⁺	470b μs 30	1030.7a 5	(11⁺)	2204.5@ 6	(17⁻)
232.6a 8	(5⁺)		1071.1@ 6	(13⁻)	2291.3 6	(16⁺)
327.3@ 5	(9)⁻		1076.0& 4	(11)⁺	2556.8& 7	(17⁺)
328.40& 24	(7)⁺	350 ns 90	1307.9 5	(12⁺)	2655.5?@ 9	(18⁻)
367.9a 6	(7)⁺		1377.5@ 6	(14⁻)	2837.6 7	(18⁺)
481.4& 4	(8)⁺		1548.4& 5	(13⁺)	2899.0?@ 10	(19⁻)
485.5@ 5	(10)⁻		1550.0a 6	(13⁺)	3138.2?& 7	(19⁺)

† From least-squares fit to Eγ.
‡ From Adopted Levels.
# From γγ(t) for isomers in the nanosecond region; from pulsed beam multispectrum analysis for the microsecond isomer (1988Kr17).
@ Band(A): K^π=5⁻ g.s. decoupled band. Likely configuration: (π 1/2[541])+(ν 9/2[624]) (1988Kr17).
& Band(B): K^π=(7)⁺ band. Likely (π 5/2[402])⊗(ν $i_{13/2}$) band. assignment supported by δ>0 for ΔJ=1 intraband transitions and magnitude of deduced (g_K-g_R) (1988Kr17).
a Band(C): K^π=3+? ΔJ=2 band. Doubly-decoupled (π $h_{9/2}$)⊗(ν 1/2[521]) band with both particles occupying predominantly Ω=1/2 orbitals (1988Kr17).
b From 155γ(t) In ^{176}Lu(^{12}C,4nγ), E=68 MeV, pulsed beam.

γ(^{184}Ir)

Eγ†	Iγ‡	Ei(level)	Jπi	Ef	Jπf	Mult.#	αd	Comments
(6.8 8)		232.6	(5⁺)	225.8	3⁺			Eγ: from level energy difference. Transition unobserved.
41.7 3	9 1	41.80	(6)⁻	0.0	5⁻	M1	13.9 4	Mult.: from the intensity balance, α(exp)=11 1 which is slightly lower than α(M1 theory)=13.9. Additional, unidentified feeding could remove this difference. There is no experimental reason to exclude E1+M2; however, the systematics of odd-odd Ir levels favor Δπ=No.
69.2 3	25ab 4	111.0	(7)⁻	41.80	(6)⁻	M1	3.14 6	Mult.: from intensity balance, α(exp)=3.0 7 in agreement with α(M1 theory)=3.14.
70.9 3	4.2 9	70.9	4⁻	0.0	5⁻			Iγ: includes $K\alpha_1$ x ray contaminant.
96.8 3	13 1	207.8	(8)⁻	111.0	(7)⁻	M1+E2	6.0 8	Mult.: A_2=−0.72 3, A_4=+0.52 4. M1+E2 is consistent with intensity balance through lower levels.

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(HI,xnγ) 1988Kr17 (continued)

γ(^{184}Ir) (continued)

Eγ[†]	Iγ[‡]	E_i(level)	J^π_i	E_f	J^π_f	Mult.[#]	δ	α[d]	Comments
119.6 *3*	17[a] *2*	327.3	(9)⁻	207.8	(8)⁻	M1(+E2)		3.0 *7*	contains ^{182}Os contaminant. Mult.: from intensity balance, α(exp)=4.2 *6* which is consistent with α(M1 theory)=3.67.
135.3 *3*	4.3 *4*	367.9	(7)⁺	232.6	(5⁺)	E2		1.402 *23*	Mult.: A_2=+0.61 *8*, A_4 consistent with 0. From intensity balance, α(exp)=1.5 *2* which is consistent with α(E2 theory)=1.40.
152.9 *3*	8.3 *8*	481.4	(8)⁺	328.40	(7)⁺	D+Q			Mult.: A_2=+0.41 *4*, A_4=+0.13 *6*. contains ^{183}Ir contaminant.
154.9 *3*	17.0 *17*	225.8	3⁺	70.9	4⁻	E1+M2[@]	0.09[@] *3*	0.22 *7*	
158.2 *3*	17 *2*	485.5	(10)⁻	327.3	(9)⁻	D+Q			Mult.: A_2=−0.40 *4*, A_4 consistent with 0.
163.1 *3*	15.0 *15*	648.4	(11)⁻	485.5	(10)⁻	D+Q			Mult.: A_2=−0.41 *5*, A_4 consistent with 0.
177.4 *3*	6.1[a] *6*	658.8	(9)⁺	481.4	(8)⁺	D+Q			contains ^{174}Yb contaminant. Mult.: A_2=+0.39 *12*, A_4=+0.29 *22*.
193.2 *3*	8.8 *9*	1071.1	(13⁻)	877.2	(12)⁻				
199.5 *3*	4.6[a] *7*	858.3	(10)⁺	658.8	(9)⁺	D+Q			Mult.: A_2=+0.38 *25*, A_4=+0.7 *4*.
214.4 *3*	4.6[a] *9*	1591.5	(15⁻)	1377.5	(14⁻)	D+Q			Mult.: A_2 consistent with 0.
216.3 *3*	4.5[a] *9*	327.3	(9)⁻	111.0	(7)⁻	[E2]		0.0265	
217.5 *3*	4.5 *7*	1076.0	(11)⁺	858.3	(10)⁺	D+Q			Mult.: A_2=+0.25 *16*, A_4=+0.33 *24*.
(225.8)	1.2 *2*	225.8	3⁺	0.0	5⁻				Eγ: from E(level) difference.
226.8 *3*	4.7 *5*	2204.5	(17⁻)	1977.1	(16⁻)				Mult.: A_2=+0.23 *14*.
229.0 *3*	19.0 *19*	877.2	(12)⁻	648.4	(11)⁻	D+Q			Mult.: A_2=−0.18 *5*, A_4=−0.18 *7*.
231.7 *3*	1.5[a] *3*	1307.9	(12⁺)	1076.0	(11)⁺				
243[f]	[c]	2899.0?	(19⁻)	2655.5?	(18⁻)				
266.0 *3*	9.5 *9*	633.9	(9⁺)	367.9	(7)⁺	Q			Mult.: A_2=+0.43 *9*, A_4 consistent with 0.
277.5 *3*	4.3[a] *6*	485.5	(10)⁻	207.8	(8)⁻				
286.5 *3*	8 *3*	328.40	(7)⁺	41.80	(6)⁻	(E1(+M2))		0.7 *7*	Mult.: A_2=+0.32 *6*, A_4=−0.11 *7*; consistent with D (ΔJ=0) or ΔJ=2 or D+Q (ΔJ=1). Systematics of neighboring odd-odd Ir isotopes favor E1. Were the 287γ a ΔJ=0 transition, an unobserved band member near the g.s. should exist.
306.0 *3*	5.9 *9*	1377.5	(14⁻)	1071.1	(13⁻)	D+Q			Mult.: A_2=−0.50 *26*, A_4 consistent with 0.
321.4 *3*	15.0 *15*	648.4	(11)⁻	327.3	(9)⁻	Q			Mult.: A_2=+0.17 *7*, A_4 consistent with 0.
328.5 *3*	7.0[a] *11*	328.40	(7)⁺	0.0	5⁻	M2		0.814	Mult.: A_2=0, A_4 consistent with 0. From the intensity balance through the 328.4 level, α(exp)=1.4 *9* which compares favorably with α(M2 theory)=0.81. Any additional,

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(HI,xnγ) 1988Kr17 (continued)

γ(^{184}Ir) (continued)

E_γ[†]	I_γ[‡]	E_i(level)	J^π_i	E_f	J^π_f	Mult.[#]	α[d]	Comments
								unobserved population of the 328.4 level would increase α(exp).
330.5 *3*	4.9[a] *7*	658.8	$(9)^+$	328.40	$(7)^+$			contains a ^{183}Ir contaminant.
376.7 *3*	9.0 *14*	858.3	$(10)^+$	481.4	$(8)^+$	Q		Mult.: A_2=+0.87 *17*, A_4 consistent with 0.
385.3 *3*	5.4 *5*	1977.1	(16^-)	1591.5	(15^-)	D+Q		Mult.: A_2=0, A_4 consistent with 0.
391.1 *3*	12.0 *18*	877.2	$(12)^-$	485.5	$(10)^-$	Q		Mult.: A_2=+0.35 *16*, A_4 consistent with 0. contains a ^{184}Os contaminant.
396.8 *3*	8.0 *13*	1030.7	(11^+)	633.9	(9^+)	[E2]	0.0430	Mult.: A_2=+0.25 *18*, A_4=−0.39 *24*. Authors assign E2, but A_2 and A_4 are also consistent with D+Q.
417.4 *3*	10.0[a] *15*	1076.0	$(11)^+$	658.8	$(9)^+$			
423.2 *3*	20 *2*	1071.1	(13^-)	648.4	$(11)^-$			
449.8 *3*	10.0 *15*	1307.9	(12^+)	858.3	$(10)^+$			
450[f]	[c]	2655.5?	(18^-)	2204.5	(17^-)			
472.4 *3*	10 *1*	1548.4	(13^+)	1076.0	$(11)^+$	Q		Mult.: A_2=+0.55 *22*, A_4 consistent with 0.
484.5 *3*	7.0 *12*	1792.4	(14^+)	1307.9	(12^+)			
490.7 *3*	3.4[a] *5*	2039.1	(15^+)	1548.4	(13^+)	[E2]	0.0249	
498.9 *3*	9.0[a] *14*	2291.3	(16^+)	1792.4	(14^+)			
500.5 *3*	5.3[a] *8*	1377.5	(14^-)	877.2	$(12)^-$			
517.7[e] *3*	4[e&] *1*	1548.4	(13^+)	1030.7	(11^+)			
517.7[e] *3*	3[e&] *1*	2556.8	(17^+)	2039.1	(15^+)			
519.3 *3*	3.5[a] *5*	1550.0	(13^+)	1030.7	(11^+)			
520.5 *3*	14 *2*	1591.5	(15^-)	1071.1	(13^-)	Q		Mult.: A_2=+0.6 *3*, A_4 consistent with 0.
546.3 *3*	4.6[a] *7*	2837.6	(18^+)	2291.3	(16^+)			
581.4[f] *3*	2.8[a] *7*	3138.2?	(19^+)	2556.8	(17^+)			
599.2 *3*	5.1[a] *8*	1977.1	(16^-)	1377.5	(14^-)			
613.6 *3*	8.0 *13*	2204.5	(17^-)	1591.5	(15^-)			
629.7 *3*	1.1[a] *3*	2179.7	(15^+)	1550.0	(13^+)			
679[f]	[c]	2655.5?	(18^-)	1977.1	(16^-)			
695[f]	[c]	2899.0?	(19^-)	2204.5	(17^-)			

† From 1988Kr17 except As noted. The authors state that uncertainties range from 0.15 to 0.25 keV. since Eγ is given to only the nearest tenth of a keV, the evaluator assigns 0.3 keV to all Eγ data.
‡ Relative Iγ from ^{172}Yb(^{14}N,4nγ) At E=73 MeV (1988Kr17).
# From γγ(θ) In (HI,xnγ), except As noted.
@ From Adopted Gammas.
& The 517.7-keV transition is placed twice in the level scheme. Iγ=6.8 *7* for doublet has been divided between placements on the basis of intensity balance at the 2039 and 1030 levels. The component from the 2557 level cannot exceed Ti(491γ)=3.5 *5*, leaving I(γ+ce)≥3.3 *9* to feed the 1030 level. however, the latter cannot exceed Ti(397γ)-Ti(519γ)=4.8 *14* so the evaluator estimates 4 *1* for this component and 3 *1* for the other component.
a From coincidence data.
b Re $K\alpha_1$ x ray contaminant.
c Transition not shown in authors′ table, only in level scheme.
d 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.
e Multiply placed with intensity suitably divided.
f Placement of transition in the level scheme is uncertain.

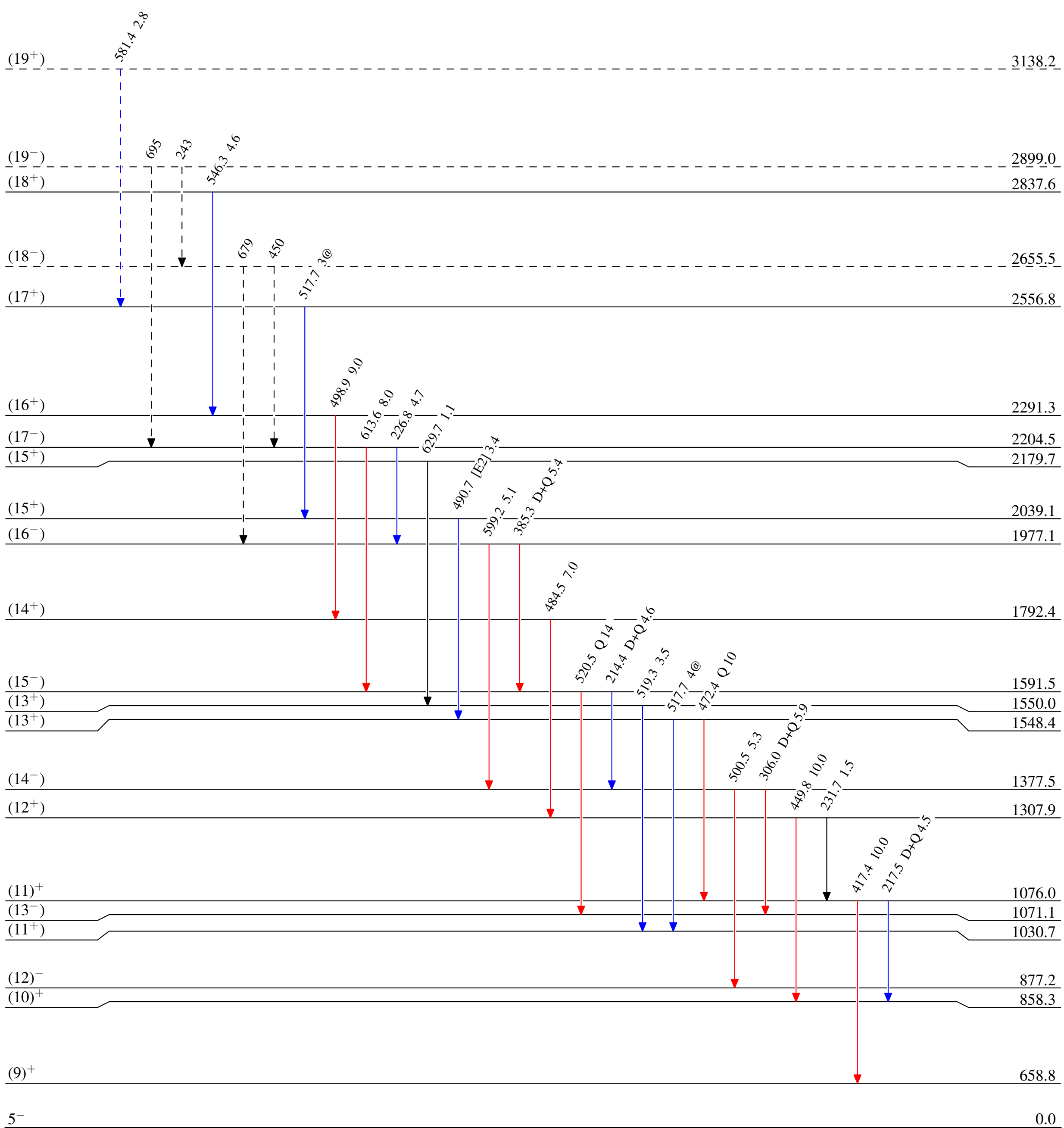
(HI,xnγ) 1988Kr17

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)

Level Scheme

Intensities: Iγ from ^{172}Yb(^{14}N,4nγ) At E=73 MeV.
@ Multiply placed: intensity suitably divided

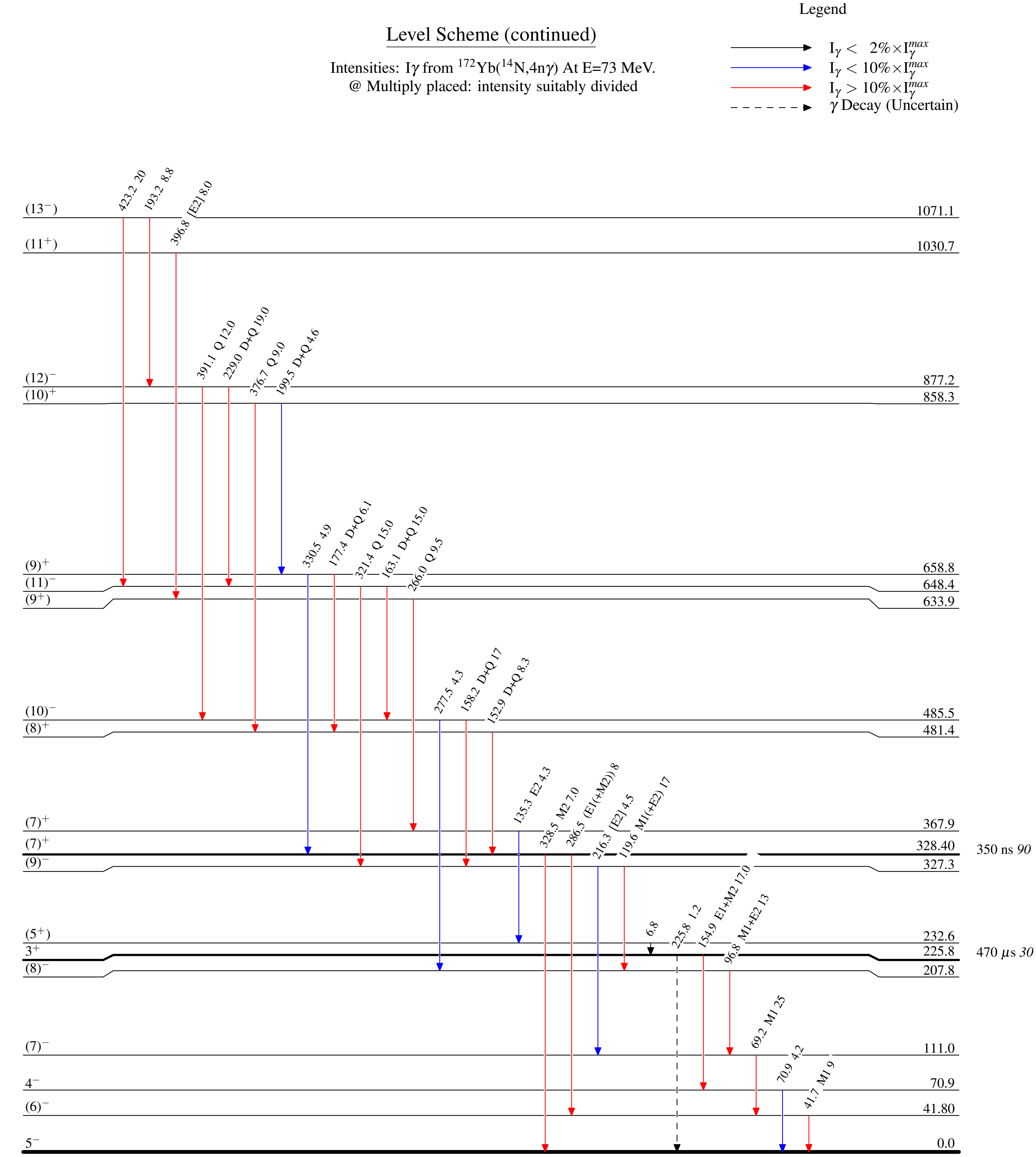


$^{184}_{77}Ir_{107}$

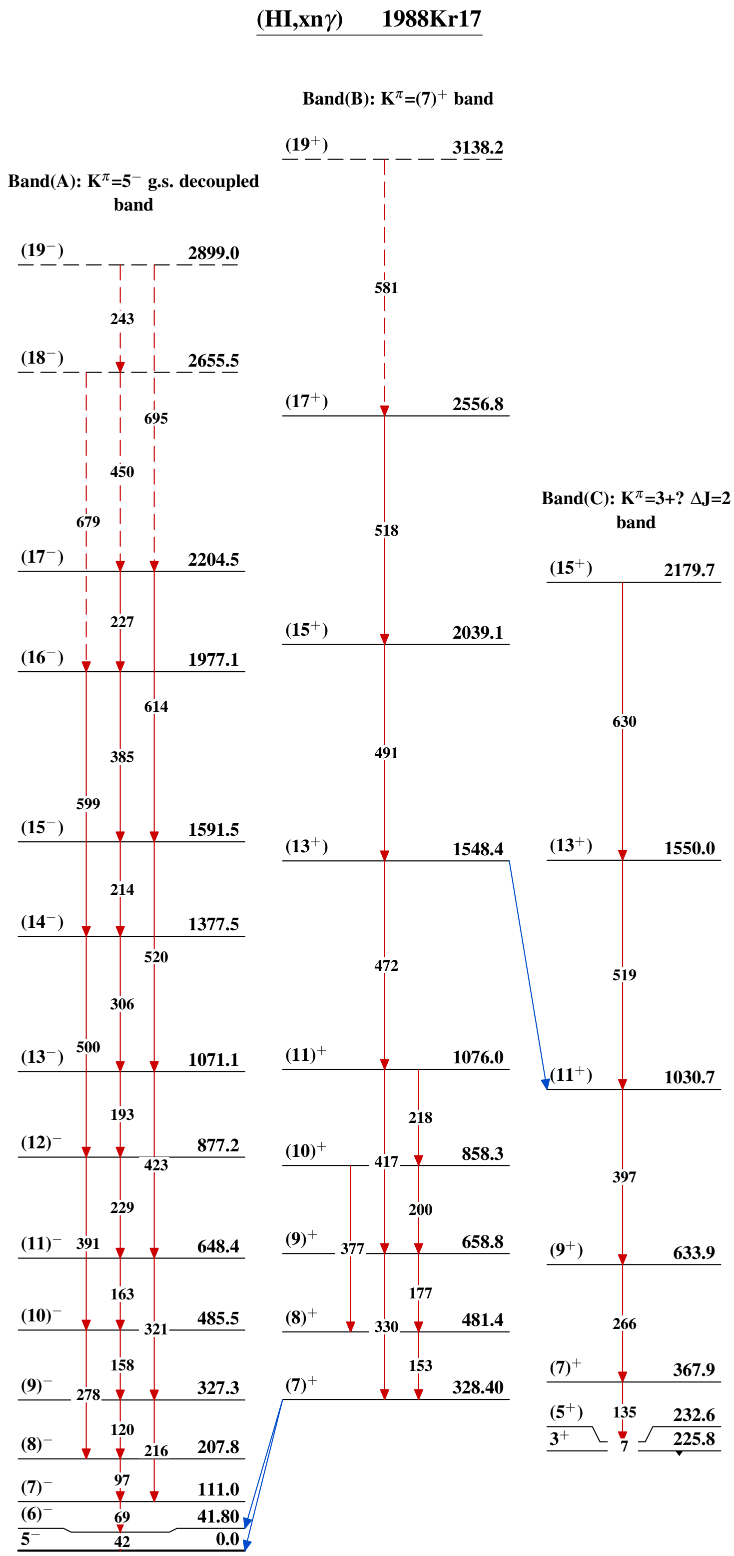
(HI,xnγ) 1988Kr17

Level Scheme (continued)

Intensities: Iγ from $^{172}Yb(^{14}N,4n\gamma)$ At E=73 MeV.
@ Multiply placed: intensity suitably divided



$^{184}_{77}Ir_{107}$


(HI,xnγ) 1988Kr17
Band(A): Kπ=5− g.s. decoupled band
Band(B): Kπ=(7)+ band
Band(C): Kπ=3+? ΔJ=2 band
(19−) 2899.0
(18−) 2655.5
(17−) 2204.5
(16−) 1977.1
(15−) 1591.5
(14−) 1377.5
(13−) 1071.1
(12)− 877.2
(11)− 648.4
(10)− 485.5
(9)− 327.3
(8)− 207.8
(7)− 111.0
(6)− 41.80
5− 0.0
243
695
450
679
227
614
385
599
214
520
306
500
193
423
229
391
163
321
158
278
120
216
97
69
42
(19+) 3138.2
(17+) 2556.8
(15+) 2039.1
(13+) 1548.4
(11)+ 1076.0
(10)+ 858.3
(9)+ 658.8
(8)+ 481.4
(7)+ 328.40
581
518
491
472
218
417
200
377
177
330
153
(15+) 2179.7
(13+) 1550.0
(11+) 1030.7
(9+) 633.9
(7)+ 367.9
(5+) 232.6
3+ 225.8
630
519
397
266
135
7

$^{184}_{77}Ir_{107}$