^{187}Re(α,3nγ) 1984Kr18

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	F. G. Kondev, S. Juutinen, D. J. Hartley	NDS 150, 1 (2018)	1-Feb-2018

1984Kr18: E=30-55 MeV. Most data reported at E=40 MeV. Measured γ, $\gamma\gamma$, γX, ce, γ(t).
Others: 1975An08, 1981RoZY (also 1973RoYQ), 1975GoZB, 1975BuZF, 1973KeZL, 1971Go21.
1975An08: ^{187}Re(α,3nγ) E=31.4 MeV, ^{185}Re(α,nγ) E=27.6 MeV. γ, γ(t) data.
1981RoZY: ^{187}Re(α,3nγ) E=38 MeV. Delayed Ce(t), ce ce data.

The level scheme is from 1984Kr18 and it is based on $\gamma\gamma$, $\gamma\gamma$ x coin data and comparison of intensities in singles and coincidence spectra. The authors stated that all the γ rays were also observed in the delayed spectra. The level scheme is firmly established up to the 642 level, but less certain above it. The earlier level scheme proposed by 1981RoZY is in complete disagreement above the 97-keV level, although some $\gamma\gamma$ cascades are the same in both studies.

^{188}Ir Levels

E(level)[†]	J$^\pi$[‡]	$T_{1/2}$	Comments
0.0	1^-		J$^\pi$: From Adopted Levels.
54.84 *9*	2^-		J$^\pi$: From Adopted Levels.
96.73 *10*	2^-		J$^\pi$: From Adopted Levels.
151.97 *13*	$(3)^-$		
166.18 *9*	(3^-)		
211.21 *10*	$(3)^-$		
354.15 *10*	$(4)^+$		
435.80 *18*	$(5)^+$		E(level): Level not included in the adopted level scheme. See Adopted Levels for details.
492.04 *14*	$(6)^+$		
641.94 *17*	(8^+)		
674.9 *3*	(8^-)		
708.14 *20*	(8^-)		
877.8?			
915.5?			
923.54 *22*	$(7\text{ to }10)^-$		
923.5+x	(11^-)	4.15 ms *15*	Additional information 1. E(level): Transitions directly depopulating this level have not been observed. The authors stated that the isomer may decay via low-energy, highly converted gamma rays. The value of x is probably less than ≈ 100 keV. J$^\pi$: From Adopted Levels. $T_{1/2}$: Weighted average of 4.1 ms *3* (1984Kr18), 4.1 ms *4* (1975An08), and 4.2 ms *2* (1971Go21). Other: 3.8 ms *2* (1973RoYQ).

[†] From a least-squares fit to Eγ's.
[‡] From 1984Kr18, unless otherwise stated.

γ(^{188}Ir)

E$_\gamma$	I$_\gamma$[†]	E$_i$(level)	J$_i^\pi$	E$_f$	J$_f^\pi$	Mult.[‡]	Comments
^{x}23[#b]							
33.0 *2*	1.5 *5*	674.9	(8^-)	641.94	(8^+)	E1	Mult.: from intensity balance. Mult=M1 is quoted by 1981RoZY.
42.0 *1*	4.8 *5*	96.73	2^-	54.84	2^-	M1+E2[&]	
54.8 *1*	7.8 *5*	54.84	2^-	0.0	1^-	M1+E2[&]	
55.2		151.97	$(3)^-$	96.73	2^-		I$_\gamma$: not available, probably not resolved from 54.8γ.
56.2 *2*	2.3 *2*	492.04	$(6)^+$	435.80	$(5)^+$	M1	Mult.: from intensity balance.

Continued on next page (footnotes at end of table)

^{187}Re(α,3nγ) 1984Kr18 (continued)

$\gamma(^{188}Ir)$ (continued)

E_γ	I_γ[†]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[‡]	δ	Comments
59.4[b]		211.21	(3)$^-$	151.97	(3)$^-$			
66.2 *1*	45 *3*	708.14	(8$^-$)	641.94	(8$^+$)	E1		Mult.: from intensity balance. Mult=M1 quoted by 1981RoZY.
81.6 *2*	3.5 *2*	435.80	(5)$^+$	354.15	(4)$^+$	M1		Mult.: from intensity balance.
x83.0[@b] *1*								Iγ(83γ)/Iγ(143γ)=0.6 in ^{185}Re(α,nγ).
96.8[a] *2*	1.6[a] *8*	96.73	2$^-$	0.0	1$^-$	E2+M1[&]		I_γ: unresolved from 97.2γ. Iγ(96.8γ) deduced from branching ratio in ^{188}Pt ε decay. Total Iγ for the doublet=9.1 *6*.
97.2[a] *2*	7.5[a] *14*	151.97	(3)$^-$	54.84	2$^-$	M1		I_γ: see the comment for 96.8γ. Mult.: from α(L)exp=0.6 *3* for the doublet.
114.6 *1*	23.0 *14*	211.21	(3)$^-$	96.73	2$^-$	M1(+E2)	<0.9	Mult.,δ: from α(L)exp=0.7 *3*. Mult=M1 quoted by 1984Kr18 and M1+E2 (δ=1.2) by 1981RoZY.
x115.8[@b] *1*								Iγ(116γ)/Iγ(143γ)=0.3 in ^{185}Re(α,nγ).
x120.8[@b] *1*								Iγ(121γ)/Iγ(143γ)=0.1 (prompt), 0.3 (delayed).
x121.8[@b] *1*								Iγ(122γ)/Iγ(143γ)=1.1 in ^{185}Re(α,nγ).
137.9 *1*	55 *3*	492.04	(6)$^+$	354.15	(4)$^+$	E2		Mult.: from α(L)exp=0.7 *2*.
x141.2[@b] *1*								Iγ(141γ)/Iγ(143γ)=0.24 (prompt), 0.06 (delayed).
142.9 *1*	100 *5*	354.15	(4)$^+$	211.21	(3)$^-$	E1		Mult.: from α(L)exp=0.03 *2*.
149.9 *1*	52 *3*	641.94	(8$^+$)	492.04	(6)$^+$	E2		Mult.: α(L)exp=0.4 *1* gives mult=E2,M1; but intensity balance favors E2. 1981RoZY quote mult=M1.
156.2 *1*	12.4 *11*	211.21	(3)$^-$	54.84	2$^-$	E2		
166.2 *1*	7.2 *7*	166.18	(3$^-$)	0.0	1$^-$	(E2)		Mult.: from intensity balance. Others: M1 (1984Kr18), E1 (1981RoZY).
188.0 *1*	10.9 *9*	354.15	(4)$^+$	166.18	(3$^-$)			
202.2 *1*	48 *3*	354.15	(4)$^+$	151.97	(3)$^-$	E1		Mult.: from α(L)exp=0.025 *15*.
202.9[b]		877.8?		674.9	(8$^-$)			
207.4[b]		915.5?		708.14	(8$^-$)			
215.4 *1*	28 *2*	923.54	(7 to 10)$^-$	708.14	(8$^-$)	M1,E2		Mult.: from α(L)exp=0.14 *8*.
x281.3[#@b] *1*								Iγ(281γ)/Iγ(143γ)=0.06 (delayed, 1975An08), 0.04 (1981RoZY).
x441.2[@b] *1*								Iγ(441γ)/Iγ(143γ)=0.34 (prompt).

[†] Prompt gamma-ray intensities relative to 143γ at E(α)=40 MeV.
[‡] From ce data in 1984Kr18, normalized to the 186.0γ from ^{187}Ir, Mult.=E3.
[#] Gamma ray reported by 1981RoZY.
[@] Complex gamma ray reported by 1975An08, but not by 1984Kr18. Treated here as uncertain.
[&] From adopted gammas.
[a] Multiply placed with intensity suitably divided.
[b] Placement of transition in the level scheme is uncertain.
[x] γ ray not placed in level scheme.

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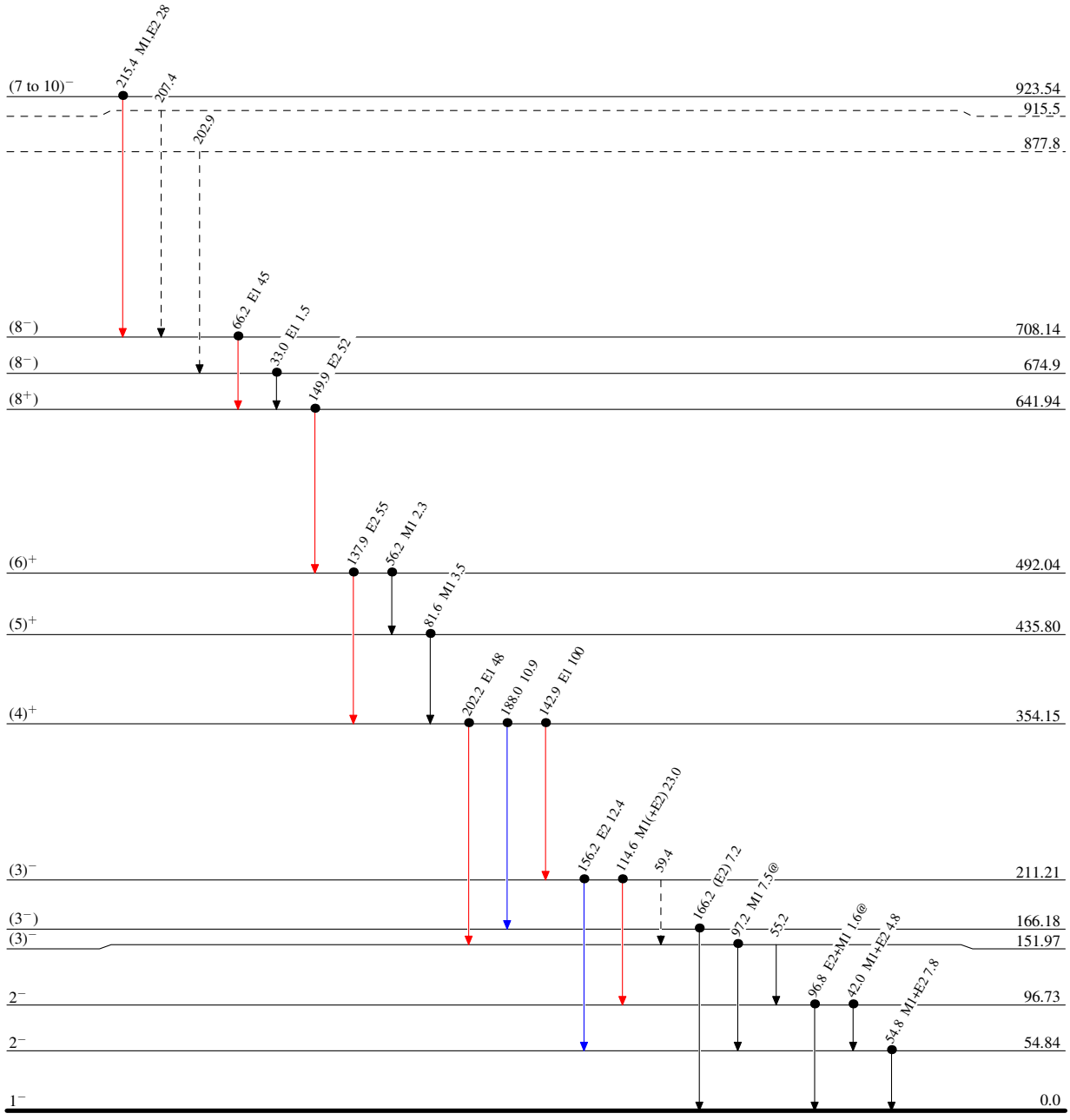
Level Scheme

Intensities: Relative I_γ
@ Multiply placed: intensity suitably divided

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)
Coincidence



$^{188}_{77}Ir_{111}$