^{194}Ir IT decay (31.85 ms) 1968He11,1968Lu01,1998Ba85

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	Jun Chen and Balraj Singh	NDS 177, 1 (2021)	3-Sep-2021

Parent: ^{194}Ir: E=147.079 *3*; $J^\pi=4^+$; $T_{1/2}$=31.85 ms *24*; %IT decay=100.0

^{194}Ir-E: 147.073 *2* from Adopted Levels.

^{194}Ir-J^π: From Adopted Levels.

^{194}Ir isomer was produced via ^{193}Ir(n,γ) E=thermal in all studies below.

1968He11: thermal neutrons were from the Rossendorfer research reactor. Measured Eγ, Iγ, with a Ge(Li) spectrometer.

1968Lu01: thermal neutrons were from the Triga MK II reactor. Measured Eγ, Iγ, γ(t) with a Ge(Li) detector.

1971Kr09: thermal neutrons were from the Munich research reactor (FRM). Measured Eγ, Iγ with a Ge(Li)-NaI(Tl) pair spectrometer.

1988Ba49: thermal neutrons were from the reactor at Wurelingen. Measured Eγ, Iγ, $\gamma\gamma$-coin, γ(t), with a crystal spectrometer and a Ge(Li) spectrometer; measured E(ce), I(ce) with a β spectrograph at the Physics Institute, Latvian Academy of Sciences. Deduced levels, J, π. See also 1993BaZP, 1993Ko59.

Additional information 1.

1998Ba85 (also 1998Ba42): thermal neutrons were from the Gatchina VVRM reactor. Measured Eγ, Iγ, E(x ray), I(x ray), $\gamma\gamma$-coin with a HPGe detector and a NaI(Tl) scintillator.

Others: 1959Ca13, 1961Al21, 1962Fe02, 1969PrZU, 1972Br53.

The 31.85-ms isomer was proposed at E=195 keV based on a 83γ-112γ cascade by 1968Lu01, 1968He11 and 1971Kr09; later, it was proposed at E=147 keV by 1988Ba49 and confirmed based on $\gamma\gamma$ coin measurements in 1993BaZP, 1993Ko59, 1994KoZQ.

^{194}Ir Levels

E(level)†	J^π†	$T_{1/2}$†	Comments
0.0	1^-		
43.119 *1*	0^-		
82.334 *1*	1^-		
84.284 *1*	2^-		
112.230 *1*	2^-		
147.073 *2*	4^+	31.85 ms *24*	$T_{1/2}$: from 1972Br53. Others: 30 ms *2* (1968Lu01), 32 ms *2* (1961Al21), 50 ms (1959Ca13,1962Fe02).

† From Adopted Levels.

γ(^{194}Ir)

Iγ normalization: From ΣI(γ+ce to g.s.)=100.

Measured relative K x ray intensity of 677 *26* (weighted average of 770 *70* (1968He11) and 670 *20* (1968Lu01)) compares with 625 *30*, deduced by evaluators from decay scheme.

E_γ‡	I_γ[b]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[a]	δ[a]	α†	Comments
27.93 *3*	0.26& *6*	112.230	2^-	84.284	2^-	M1+E2	0.26 *1*	161 *9*	%Iγ=0.022 *5* α(N)=7.3 *4*; α(O)=1.16 *6*; α(P)=0.0254 *4* α(L)=122 *7*; α(M)=30.3 *17*
29.890 *6*	2.0& *2*	112.230	2^-	82.334	1^-	M1+E2	0.070 *4*	43.5 *10*	%Iγ=0.17 *2* α(L)=33.4 *7*; α(M)=7.83 *18* α(N)=1.92 *4*; α(O)=0.331 *7*; α(P)=0.02153 *30*
34.829# *10*	0.305 *15*	147.073	4^+	112.230	2^-	M2		1837 *26*	%Iγ=0.026 *2*

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^{194}Ir IT decay (31.85 ms) 1968He11,1968Lu01,1998Ba85 (continued)

γ(^{194}Ir) (continued)

E_γ[‡]	I_γ[b]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[a]	δ[a]	α[†]	Comments
									α(L)=1368 *19*; α(M)=362 *5* α(N)=90.6 *13*; α(O)=15.37 *22*; α(P)=0.871 *12* I_γ: deduced by evaluators from I(γ+ce) intensity balance at 112 level, known Iγ values of 27.9γ, 29.9γ and 112.2γ, and theoretical conversion coefficients from BrICC.
39.217 *1*	1.7[@] *2*	82.334	1⁻	43.119	0⁻	M1		16.66 *23*	%Iγ=0.144 *19* α(L)=12.84 *18*; α(M)=2.96 *4* α(N)=0.727 *10*; α(O)=0.1287 *18*; α(P)=0.00968 *14*
41.166[#] *10*	0.22	84.284	2⁻	43.119	0⁻	E2		276 *4*	%Iγ=0.0187 α(L)=208.2 *29*; α(M)=53.2 *7* α(N)=12.82 *18*; α(O)=1.939 *27*; α(P)=0.001714 *24* I_γ: deduced by evaluators from I(41.1γ)/I(84.2γ)=0.8/198.0 in 2008Ba25 in (n,γ) E=th and Iγ(84.2)=55 *6*.
43.119 *1*	6.7 *3*	43.119	0⁻	0.0	1⁻	M1		12.59 *18*	%Iγ=0.57 *4* α(L)=9.70 *14*; α(M)=2.236 *31* α(N)=0.550 *8*; α(O)=0.0973 *14*; α(P)=0.00732 *10* I_γ: deduced by evaluators from I(γ+ce) intensity balance, with deduced Iγ values of 39.2γ and 41.1γ, and theoretical conversion coefficients from BrICC.
62.793 *3*	4.75 *51*	147.073	4⁺	84.284	2⁻	M2		129.0 *18*	%Iγ=0.40 *5* α(L)=96.7 *14*; α(M)=24.94 *35* α(N)=6.22 *9*; α(O)=1.064 *15*; α(P)=0.0640 *9* I_γ: deduced by evaluators from I(γ+ce) intensity balance at 84 level, deduced Iγ values of 27.9γ, 41.1γ and 84.3γ, and theoretical conversion coefficients from BrICC.
82.339 *2*	5.0[@] *5*	82.334	1⁻	0.0	1⁻	M1+E2	0.105 *10*	10.67 *15*	%Iγ=0.43 *5* α(K)=8.69 *12*; α(L)=1.522 *25*; α(M)=0.353 *6* α(N)=0.0867 *14*; α(O)=0.01522 *24*; α(P)=0.001091 *15*
84.288 *2*	55 *6*	84.284	2⁻	0.0	1⁻	M1+E2	0.49 *2*	9.88 *14*	%Iγ=4.7 *3* α(K)=6.79 *13*; α(L)=2.36 *7*; α(M)=0.577 *19* α(N)=0.140 *5*; α(O)=0.0229 *7*; α(P)=0.000857 *17* E_γ: others: 83.5 *5* (1968He11) and 84.3 *20* (1968Lu01). I_γ: from Iγ(84.3γ + 82.3γ)=60 *6*, average of 63 *6* (1968He11) and 58 *6* (1968Lu01), and deduced Iγ(82.3γ)=5.0 *5*. L1/L2≤1.4 (1969PrZU).

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^{194}Ir IT decay (31.85 ms) 1968He11,1968Lu01,1998Ba85 (continued)

$\gamma(^{194}Ir)$ (continued)

E_γ ‡	I_γ [b]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[a]	δ[a]	α †	Comments
112.230 *1*	100 *5*	112.230	2^-	0.0	1^-	E2+M1	1.64 *10*	3.30 *6*	%Iγ=8.5 *6* α(K)=1.45 *8*; α(L)=1.402 *34*; α(M)=0.356 *9* α(N)=0.0862 *22*; α(O)=0.01340 *32*; α(P)=0.000172 *10* E_γ: others: 111.0 *5* (1968He11), 112.4 *20* (1968Lu01). I_γ: from 1968He11, 1968Lu01. δ: other: 1.2 *1* from L1/L3=0.57 *10*, L2/L3=1.19 *9* (1969PrZU).

† Additional information 2.
‡ From ^{193}Ir(n,γ) E=th. All value are from 1998Ba85; only 84γ (82.34γ+84.29γ doublet) and 112γ are seen in 1968He11 and 1968Lu01.
# From ce spectrum and not reported in γ-ray data in (n,γ) E=th.
@ Deduced by evaluators from I(γ+ce) intensity balance at the 82 level with deduced Iγ=2.0 *2* of 29.9γ (the only γ that feeds the 82 level), relative Iγ values of 39.2γ and 82.3γ from (n,γ) E=th, and theoretical conversion coefficients from BrICC.
& Deduced by evaluators from relative Iγ values of 27.9γ, 29.9γ and 112.2γ from the 112 level in (n,γ) E=th, and Iγ(112.2γ)=100 *5*.
[a] From Adopted Gammas.
[b] For absolute intensity per 100 decays, multiply by 0.085 *5*.

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Decay Scheme

Intensities: $I_{(\gamma+ce)}$ per 100 parent decays

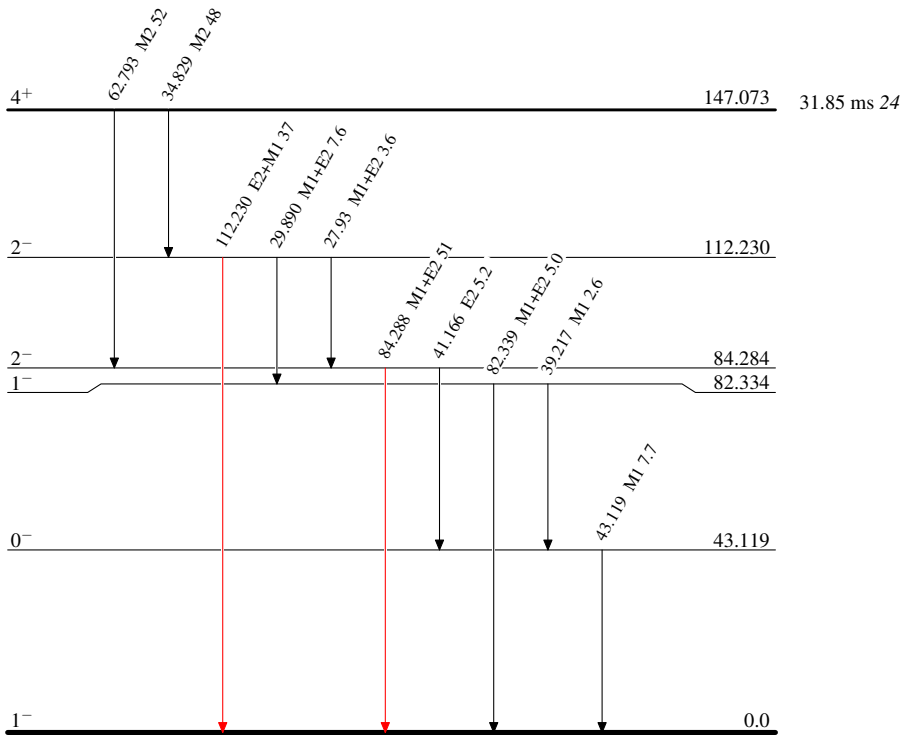
%IT=100.0

Legend

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

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

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



$^{194}_{77}Ir_{117}$