^{194}Ir β^- decay (171 d) 1968Su02

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=190.0+x; J^π=(10,11); $T_{1/2}$=171 d *11*; Q(β^-)=2228.3 *13*; %β^- decay=100.0

^{194}Ir-E: x=50 keV to 250 keV. From an estimate of β- end-point energy x≤250 keV (1968Su02). Log *ft* (to 2438 level)≥5.0 gives x≥50.

^{194}Ir-J^π,$T_{1/2}$: From ^{194}Ir Adopted Levels.

^{194}Ir-Q(β^-): From 2021Wa16.

1968Su02: source of ^{194}Ir (171 d) formed by three successive neutron captures in ^{191}Ir via high-spin states in ^{192}Ir and ^{193}Ir with neutrons provided from the Materials Testing Reactor at BNL. γ rays were detected with high-resolution Ge(Li) detectors and electrons were detected with a Si(Li) detector. Measured Eγ, Iγ, E(x ray), I(x ray), E(ce), I(ce), $\gamma\gamma$-coin, γ-ce-coin, γ(t). Deduced levels, parent $T_{1/2}$, J, π, conversion coefficients, γ-ray multipolarities.

1970To14: ^{194}Ir (171 d) was formed by ^{196}Pt(d,α) reaction. Level half-life measurements by $\beta\gamma$(t), $\gamma\gamma$(t) and γ-ce(t) methods. See also 1970ToZZ from the same laboratory.

^{194}Pt Levels

E(level)†	J^π‡	$T_{1/2}$	Comments
0.0	0^+		
328.5 *5*	2^+		
811.1 *7*	4^+		
1373.5 *8*	(5^-)		$T_{1/2}$: from total $\gamma\gamma$(t) spectrum, 1970To14 estimate $T_{1/2}$≤0.8 ns.
1411.6 *8*	6^+		
1485.1 *9*	(7^-)	3.45 ns *12*	On the basis of delayed coincidence data 1970To14 conclude that 562γ precedes 112γ, thus defining a level at 1486 rather than at 1936 (1968Su02). $T_{1/2}$: from $\gamma\gamma$(t) (1970To14) using two plastic scintillators.
2047.5 *10*	(9^-)		
2099.5 *9*	$(8)^+$		
2423.4? *9*	$(6^+,7,8^+)$		
2438.3 *10*	(10^+)		$T_{1/2}$: 6.4 ns assigned to this level is now associated with a 12^+ level lying 12.7 keV above this level as proposed by 2006Le06.
(2451.0 *12*)	(12^+)	6.4 ns *8*	E(level): level proposed by 2006Le06 in (α,2nγ). $T_{1/2}$: from β(688γ)(t) (1970To14). 2006Le06 propose that 12^+ state above the 10^+ state at 2438 should be an isomeric state from systematics and comparison of measured g factor with calculated values. Proposed (2006Le06) configuration=$\nu i^{-2}_{13/2}$.

† From a least-squares fit to Eγ data.

‡ From the Adopted Levels.

β^- radiations

E(decay)	E(level)	Iβ^-†	Comments
(−20.0 *17*)	2438.3	97 *3*	The parent state is at 190+x, where x=50 keV to 250 keV (see ^{194}Ir Adopted Levels). The log *ft* value for this energy range varies from 5.0 to 7.2.
(−5.1‡ *16*)	2423.4?	3 *3*	The parent state is at 190+x, where x=50 keV to 250 keV. The log *ft* value for this energy range varies from >6.4 to >8.3.

† Absolute intensity per 100 decays.

‡ Existence of this branch is questionable.

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$\gamma(^{194}Pt)$

Iγ normalization: From I(γ+ce)(483γ)=100. No isomeric transitions have been reported (1968Su02,1970To14).
ce data given under comments are from 1968Su02.

E_γ[†]	I_γ[†#]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[‡]	α[@]	Comments
(12.7 *12*)		(2451.0)	(12^+)	2438.3	(10^+)			E_γ: from level-energy difference.
111.7 *5*	8.9 *4*	1485.1	(7^-)	1373.5	(5^-)	(E2)	3.12 *8*	α(K)=0.614 *10*; α(L)=1.88 *5*; α(M)=0.486 *13* α(N)=0.119 *3*; α(O)=0.0185 *5*; α(P)=6.62×10^{-5} *12* Mult.: from intensity balance.
324.0[a] *5*	≈2	2423.4?	$(6^+,7,8^+)$	2099.5	$(8)^+$			
328.5 *5*	93 *5*	328.5	2^+	0.0	0^+	E2	0.0755	α(K)=0.0488 *7*; α(L)=0.0202 *3*; α(M)=0.00504 *8* α(N)=0.001235 *19*; α(O)=0.000202 *3*; α(P)=4.97×10^{-6} *8*
338.8 *5*	55 *3*	2438.3	(10^+)	2099.5	$(8)^+$	(E2)	0.0691	α(K)exp=0.049 *6* α(K)=0.0453 *7*; α(L)=0.0181 *3*; α(M)=0.00450 *7* α(N)=0.001103 *17*; α(O)=0.000181 *3*; α(P)=4.63×10^{-6} *7*
390.8 *5*	35 *2*	2438.3	(10^+)	2047.5	(9^-)	(E1)	0.01416	α(K)exp=0.015 *5* α(K)=0.01176 *17*; α(L)=0.00185 *3*; α(M)=0.000425 *6* α(N)=0.0001044 *15*; α(O)=1.84×10^{-5} *3*; α(P)=1.101×10^{-6} *16*
482.6 *5*	97 *5*	811.1	4^+	328.5	2^+	E2	0.0270	α(K)=0.0198 *3*; α(L)=0.00551 *8*; α(M)=0.001342 *20* α(N)=0.000330 *5*; α(O)=5.56×10^{-5} *8*; α(P)=2.08×10^{-6} *3* %Iγ=97.4 *1*.
562.4[&] *5*	35[&] *2*	1373.5	(5^-)	811.1	4^+	(E1)	0.00646	α(K)exp=0.0114 *30* α(K)=0.00539 *8*; α(L)=0.000824 *12*; α(M)=0.000188 *3* α(N)=4.64×10^{-5} *7*; α(O)=8.22×10^{-6} *12*; α(P)=5.17×10^{-7} *8* I_γ: total Iγ of the doublet=70 *4* divided in two equal parts that is roughly consistent with the coincidence intensities and intensity balance. α(K)exp for the doublet consistent with E1 and E2 assignments for the two components.
562.4[&] *5*	35[&] *2*	2047.5	(9^-)	1485.1	(7^-)	(E2)	0.0187	α(K)=0.01413 *20*; α(L)=0.00348 *5*; α(M)=0.000839 *12* α(N)=0.000206 *3*; α(O)=3.52×10^{-5} *5*; α(P)=1.493×10^{-6} *21*
600.5 *5*	62 *3*	1411.6	6^+	811.1	4^+	E2	0.01607	α(K)exp=0.0147 *26* α(K)=0.01229 *18*; α(L)=0.00289 *4*; α(M)=0.000693 *10* α(N)=0.0001705 *25*; α(O)=2.92×10^{-5} *5*; α(P)=1.300×10^{-6} *19*
687.8 *5*	59 *3*	2099.5	$(8)^+$	1411.6	6^+	(E2)	0.01187	α(K)exp=0.0104 *25* α(K)=0.00927 *13*; α(L)=0.00199 *3*; α(M)=0.000475 *7* α(N)=0.0001169 *17*; α(O)=2.02×10^{-5} *3*; α(P)=9.81×10^{-7} *14*

Continued on next page (footnotes at end of table)

^{194}Ir β^- decay (171 d) 1968Su02 (continued)

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

E_γ [†]	I_γ [†#]	E_i(level)	J_i^π	E_f	J_f^π	Comments
1011.8[a] 5	3.6 2	2423.4?	$(6^+,7,8^+)$	1411.6	6^+	It is not established whether this transition follows or precedes an unobserved 15-keV transition.

† From 1968Su02.
‡ From ce data in 1968Su02, normalized to the 328γ and 811γ, both treated as E2, unless otherwise noted. The same assignments are given in the Adopted Gammas.
# For absolute intensity per 100 decays, multiply by 1.00 5.
@ 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.
& Multiply placed with intensity suitably divided.
a Placement of transition in the level scheme is uncertain.

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Decay Scheme

Intensities: $I_{(\gamma+ce)}$ per 100 parent decays
@ Multiply placed: intensity suitably divided