^{131}In β^- decay (0.32 s) 2004Fo06,1984Fo03,1984Fo19

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	Yu. Khazov, I. Mitropolsky, A. Rodionov	NDS 107, 2715 (2006)	17-Jul-2006

Parent: ^{131}In: E=3764 *88*; J^π=(21/2$^+$); $T_{1/2}$=0.32 s *6*; Q(β^-)=9177 *18*; %β^- decay=100.0
^{131}In-%β^- decay: %IT<1 (1984Fo19).
See the ^{131}In β- decay 0.28 s data set for experimental details. All data are from 2004Fo06, except as noted.
Coincidences shown on drawing are from 2004Fo06.

^{131}Sn Levels

E(level)	J^π[†]	$T_{1/2}$[‡]	Comments
0.0[†]	(3/2$^+$)	56.0[†] s *5*	
0+x[†]	(11/2$^-$)	58.4[†] s *5*	%β^-=100; %IT=? Additional information 1. From the β-spectrum x=69 *14*; or x=65.1 *3* from the level scheme (2004Fo06).
4102.07+x *20*	(15/2$^-$)		
4273.26+x *18*	(17/2$^+$)	<0.2 ns	
4446.45+x *18*	(19/2$^-$)	<0.2 ns	
4557.89+x *20*	(19/2$^+$)	<2 ns	
4605.02+x *21*	(23/2$^-$)	300 ns *20*	
4705.6+x *4*			
4875.36+x *23*			
6653.65+x *23*	(19/2$^+$,21/2$^+$)		

[†] From the Adopted Levels.
[‡] From $\gamma\gamma$(t) (1984Fo19), except as noted.

β^- radiations

Iβ,log *ft* From net γ feeding of each level.

E(decay)	E(level)	Iβ^-[†]	Log *ft*	Comments
(3×10^3[‡] *3*)	6653.65+x	36.4 *25*	4.67 *10*	av Eβ=2769 *50* E(decay): 6169 *109* from β(2096γ+2380γ) coin. E(decay): 6252 *95* from β(285γ) coin.
(4×10^3[‡] *4*)	4875.36+x	8.1 *8*	5.81 *10*	av Eβ=3610 *50*
(4×10^3[‡] *4*)	4705.6+x	1.9 *4*	6.48 *13*	av Eβ=3691 *50*
(4×10^3[‡] *4*)	4605.02+x	26.0 *19*	5.37 *9*	av Eβ=3738 *50*
(4×10^3[‡] *4*)	4557.89+x	15 *3*	5.62 *13*	av Eβ=3760 *50*
(4×10^3[‡] *4*)	4446.45+x	12 *3*	5.74 *14*	av Eβ=3813 *50*
(4×10^3[‡] *4*)	4273.26+x	<7	>6.0	av Eβ=3895 *50*
(4×10^3[‡] *5*)	4102.07+x	3.2 *14*	6.39 *21*	av Eβ=3975 *50*

[†] Absolute intensity per 100 decays.
[‡] Estimated for a range of levels.

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$\gamma(^{131}Sn)$

Iγ normalization: from Iγ(4273γ)=100−%β^-n; %β^-n≤0.03 see comment for ^{131}In Adopted Levels dataset.
Relative intensities in delayed spectrum (gated 100-900 ns after prompt βγ events) are given in the comments (1984Fo19).
I(Sn Kα)=31 *6*; relative intensity in delayed spectrum (1984Fo19).

E_γ	I_γ[‡]	E_i(level)	J_i^π	E_f	J_f^π	Mult.	α[#]	Comments
158.57 *10*	25.9[†] *13*	4605.02+x	(23/2$^-$)	4446.45+x	(19/2$^-$)	E2	0.313	α(K)exp=0.33 *7* α(K)=0.249 *4*; α(L)=0.0514 *8*; α(M)=0.01034 *15*; α(N+..)=0.00197 *3* α(N)=0.00186 *3*; α(O)=0.0001040 *15* B(E2)(W.u.)=0.363 *25* α(K)exp=(Iγ(Sn Kα)-ωα(K)(173γ)Iγ(173γ))/ ωIγ(158γ) using delayed intensities; here ω=ω$_K$(Sn)=0.86, the fluorescent yield (1996Sc06). Iγ(delayed)=77 *4*. Mult.: D,E2,(M3) from comparison to RUL; E2 based on α(K)exp deduced from Sn Kα observed in delayed spectrum.
171.1 *3*	1.3 *4*	4273.26+x	(17/2$^+$)	4102.07+x	(15/2$^-$)			
173.185 *23*	38[†] *2*	4446.45+x	(19/2$^-$)	4273.26+x	(17/2$^+$)	(E1)	0.0384	α(K)=0.0334 *5*; α(L)=0.00411 *6*; α(M)=0.000800 *12*; α(N+..)=0.0001607 *23* α(N)=0.0001488 *21*; α(O)=1.186×10^{-5} *17* B(E1)(W.u.)>0.00020 Iγ(delayed)=98 *10*. Eγ: from 1979Bo26 (curved crystal spect). Assigned to 0.32 s β^- decay by evaluators based on agreement with 173.28 *10* (2004Fo06). Mult.: D from comparison to RUL; Δπ=yes from decay scheme (evaluators).
259.2 *3*	1.9 *4*	4705.6+x		4446.45+x	(19/2$^-$)			
270.34 *10*	8.1 *8*	4875.36+x		4605.02+x	(23/2$^-$)			
284.67 *10*	36 *2*	4557.89+x	(19/2$^+$)	4273.26+x	(17/2$^+$)	(M1,E2)	0.037 *5*	α(K)=0.032 *4*; α(L)=0.0045 *10*; α(M)=0.00089 *21*; α(N+..)=0.00018 *4* α(N)=0.00017 *4*; α(O)=1.27×10^{-5} *14* Mult.: D,E2 from comparison to RUL; Δπ=no from decay scheme (evaluators).
344.40 *10*	5.7 *5*	4446.45+x	(19/2$^-$)	4102.07+x	(15/2$^-$)			
[x]2078.8 *5*	5.4 *12*							Eγ: possibly in coin with a 4273γ from 4338 level. The 2078.8γ may as well belong to the decay of the 1/2$^-$ 0.35 s isomer of ^{131}In.

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^{131}In β^- decay (0.32 s) 2004Fo06,1984Fo03,1984Fo19 (continued)

$\gamma(^{131}Sn)$ (continued)

E_γ	I_γ[‡]	E_i(level)	J_i^π	E_f	J_f^π	Comments
2095.9 *2*	21.9 *20*	6653.65+x	$(19/2^+,21/2^+)$	4557.89+x	$(19/2^+)$	
2380.2 *2*	14.5 *15*	6653.65+x	$(19/2^+,21/2^+)$	4273.26+x	$(17/2^+)$	
4102.3 *5*	10.2 *12*	4102.07+x	$(15/2^-)$	0+x	$(11/2^-)$	
4273.20 *20*	87 *9*	4273.26+x	$(17/2^+)$	0+x	$(11/2^-)$	Iγ(delayed)=100 *10*.
4446.0 *5*	3.2 *5*	4446.45+x	$(19/2^-)$	0+x	$(11/2^-)$	

[†] $\beta\gamma$ coincidence spectra showed that Iγ's for the 158 and 173 approximately 0% and 35%, respectively, of the total intensities were in prompt coincidences with the β's (1984Fo19).

[‡] Absolute intensity per 100 decays.

[#] 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.

[x] γ ray not placed in level scheme.

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Decay Scheme

Intensities: I_γ per 100 parent decays