^{131}In β^- decay (0.28 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=0.0; J^π=(9/2$^+$); $T_{1/2}$=0.28 s *3*; Q(β^-)=9177 *18*; %β^- decay=100.0

^{131}In-%β^- decay: %β^-n≤2.0 *3* (see comments for ^{131}In Adopted Levels dataset).

1963Gr13,1966St25,1974Gr29,1981Hu09: measured $T_{1/2}$.

1984Fo19,1984Fo03: measured β's, $\beta\gamma$-coin, γ's, γ(t), $\gamma\gamma$(t), and $\gamma\gamma$-coin; HPGe, Ge(Li), plastic scin, OSIRIS.

1995Me16,1999Fo01: measured β^- decay energy, $\beta\gamma$-coin, Si(Li), HPGe, OSIRIS.

2004Fo06: ^{131}In isotopes produced continuously by fission in the combined target and ion source of OSIRIS mass spectrometer. Measured Eγ, Iγ, $\gamma\gamma$, Eβ, Iβ, $\beta\gamma$-coin using two HPGe spectrometers of 80% and 30% relative efficiencies, and an HPGe diode used as β spectrometer.

All data are from 2004Fo06, except as noted. Other: 1980De35.

Coincidences shown on drawing are from 2004Fo06.

^{131}Sn Levels

E(level)	J^π[†]	Comments
0.0	(3/2$^+$)	
0+x	11/2$^-$	From the β-spectrum x=69 *14*; or x=65.1 *3* from the level scheme (2004Fo06). Additional information 1.
331.72 *10*	(1/2$^+$)	
1654.55 *8*	(5/2$^+$)	
2434.17 *8*	(7/2$^+$)	
3989.94 *19*	(7/2$^+$)	
4098.8?[‡] *6*		Not supported by 2004Fo06.
4262.2 *7*		
4292.8?[‡] *12*		Not supported by 2004Fo06.
4352.7 *7*		
4404.8 *4*		
4487.08 *20*	(7/2$^+$)	
4770.8?[‡] *5*		
5111.9 *7*		
5215.7 *5*		
5323.1?[‡] *20*		Not supported by 2004Fo06.
5412.5 *4*		
5591.1 *15*		

[†] From the Adopted Levels.

[‡] 1984Fo19 assumed that these states were populated by the 0.28 s (9/2$^+$) ^{131}In β^- decay for simplicity. Some of these states may be populated in 0.32 s (21/2$^+$) ^{131}In β^- decay and, therefore, would not deexcite directly to the g.s.

β^- radiations

E(decay)	E(level)	Iβ^-[†]	Log *ft*	Comments
(3586 *18*)	5591.1	0.1	6.1	av Eβ=1519.9 *85*
(3765 *18*)	5412.5	0.5	5.5	av Eβ=1604.1 *85*
(3961 *18*)	5215.7	0.16	6.0	av Eβ=1696.9 *85*
(4065 *18*)	5111.9	0.1	6.4	av Eβ=1745.9 *86*
(4406 *18*)	4770.8?	0.4	6.0	av Eβ=1907.2 *86*
4745 *34*	4487.08	3.4	5.1	av Eβ=2041.6 *86*
(5×10^3[‡#] *5*)	0+x	<20	>5.6	av Eβ=4155.6 *85*

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^{131}In β^- decay (0.28 s) 2004Fo06,1984Fo03,1984Fo19 (continued)

β^- radiations (continued)

E(decay)	E(level)	Iβ^-[†]	Log *ft*	Comments
(4772 *18*)	4404.8	0.3	6.2	av Eβ=2080.6 *86*
(4824 *18*)	4352.7	0.1	6.7	av Eβ=2105.2 *86*
(4915 *18*)	4262.2	0.1	6.7	av Eβ=2148.1 *86*
5151 *37*	3989.94	3.6	5.3	av Eβ=2277.2 *86*
6795 *12*	2434.17	90	4.4	av Eβ=3014.9 *86* E(decay): from $\beta\gamma$-coincidence (2004Fo06). Significant β-feeding suggests allowed transition.

[†] Absolute intensity per 100 decays.
[‡] Existence of this branch is questionable.
[#] Estimated for a range of levels.

$\gamma(^{131}Sn)$

Iγ normalization: data are not sufficient for calculation of normalization, due to the level scheme is incomplete.
The evaluators treat existence and placement of 2192γ as questionable; in 2004Fo06 that transition is not confirmed.

E$_\gamma$	I$_\gamma$[@]	E$_i$(level)	J$_i^\pi$	E$_f$	J$_f^\pi$	Comments
331.72 *10*	<0.06	331.72	(1/2$^+$)	0.0	(3/2$^+$)	E$_\gamma$,I$_\gamma$: from figure 4 of 2004Fo06; not listed amongst transitions in table II. See 0/35 s 1/2$^-$ ^{131}In decay dataset.
779.64 *10*	1.7 *1*	2434.17	(7/2$^+$)	1654.55	(5/2$^+$)	
1322.9	<0.06	1654.55	(5/2$^+$)	331.72	(1/2$^+$)	Possible E2 from 1654.55, d$_{1/2}$ to 331.72 s$_{1/2}$ (2004Fo06).
1555.6 *5*	0.13 *3*	3989.94	(7/2$^+$)	2434.17	(7/2$^+$)	
1654.55 *10*	1.7 *2*	1654.55	(5/2$^+$)	0.0	(3/2$^+$)	
2192.2[&] *8*	0.8 *3*	2434.17	(7/2$^+$)			Data from 1984Fo19 and 1984Fo03; not confirmed by 2004Fo06.
2434.12[†] *10*	90	2434.17	(7/2$^+$)	0.0	(3/2$^+$)	I$_\gamma$: ΔI$_\gamma$=+2-20. Intensity of the transition represents a normalization from the decay scheme (2004Fo06).
2677.7 *7*	0.06 *2*	5111.9		2434.17	(7/2$^+$)	
2750.0 *5*	0.11 *2*	4404.8		1654.55	(5/2$^+$)	
2978.3 *3*	0.50 *5*	5412.5		2434.17	(7/2$^+$)	
3936.5 *15*	0.05 *2*	5591.1		1654.55	(5/2$^+$)	
3989.9[†] *2*	3.5 *2*	3989.94	(7/2$^+$)	0.0	(3/2$^+$)	
4098.7[‡&] *6*	0.24 *6*	4098.8?		0.0	(3/2$^+$)	According to 2004Fo06, has other intensity and placement, see ^{131}In 0.35S decay dataset.
4262.1[‡#] *7*	0.11 *2*	4262.2		0.0	(3/2$^+$)	
4292.7[‡&] *12*	0.29 *5*	4292.8?		0.0	(3/2$^+$)	Not confirmed by 2004Fo06.
4352.6[‡#] *7*	0.10 *2*	4352.7		0.0	(3/2$^+$)	
4404.9 *4*	0.17 *2*	4404.8		0.0	(3/2$^+$)	
4487.00[†#] *20*	2.8 *2*	4487.08	(7/2$^+$)	0.0	(3/2$^+$)	
4770.8[‡&] *5*	0.40 *5*	4770.8?		0.0	(3/2$^+$)	
5215.6[‡#] *5*	0.16 *4*	5215.7		0.0	(3/2$^+$)	
5323.0[#&] *20*	0.13 *4*	5323.1?		0.0	(3/2$^+$)	Not confirmed by 2004Fo06.

[†] Attributed solely to g.s. decay based on T$_{1/2}$ (1984Fo19).
[‡] Assumed to follow the g.s. decay (2004Fo06).
[#] May belong to the decay of (1/2$^-$) 0.35 s 131In isomer (2004Fo06).

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^{131}In β^- decay (0.28 s) 2004Fo06,1984Fo03,1984Fo19 (continued)

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

[@] Absolute intensity per 100 decays.
[&] Placement of transition in the level scheme is uncertain.

^{131}In β^- decay (0.28 s) 2004Fo06,1984Fo03,1984Fo19

Decay Scheme

Intensities: I_γ per 100 parent decays

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

$(9/2^+)$ 0.0 0.28 s *3*

Q_{β^-}=9177 *18* $\%\beta^-$=100

$^{131}_{49}In_{82}$

Iβ⁻	Log *ft*	
0.1	6.1	5591.1
0.5	5.5	5412.5
		5323.1
0.16	6.0	5215.7
0.1	6.4	5111.9
0.4	6.0	4770.8
3.4	5.1	$(7/2^+)$ 4487.08
0.3	6.2	4404.8
0.1	6.7	4352.7
		4292.8
0.1	6.7	4262.2
		4098.8
3.6	5.3	$(7/2^+)$ 3989.94
90	4.4	$(7/2^+)$ 2434.17
		$(5/2^+)$ 1654.55
		$(1/2^+)$ 331.72
<20	>5.6	$11/2^-$ 0+x
		$(3/2^+)$ 0.0

3936.5 0.06; 2978.3 0.50; 5323.0 0.13; 5215.6 0.16; 2677.7 0.07; 4770.8 0.40; 4487.00 2.9; 4404.9 0.18; 2750.0 0.12; 4352.6 0.11; 4292.7 0.29; 4262.1 0.12; 4098.7 0.24; 3989.9 3.6; 1555.6 0.13; 2434.12 90; 779.64 1.8; 1654.55 1.8; 1322.9 <0.06; 331.72 <0.06

$^{131}_{50}Sn_{81}$