^{132}In β^- decay (0.200 s) 1994Fo14,1986Bj01

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	Balraj Singh	ENSDF	28-Feb-2018

Parent: ^{132}In: E=0.0; J$^\pi$=(7$^-$); T$_{1/2}$=0.200 s *2*; Q(β^-)=14140 *60*; %β^- decay=100.0
^{132}In-J$^\pi$,T$_{1/2}$: From ^{132}In Adopted Levels.
^{132}In-Q(β^-): From 2017Wa10.
1994Fo14 (also 1995Fo20,1995Ma49): measured Eγ, Iγ, $\gamma\gamma$, $\beta\gamma\gamma$(t), ce, $\gamma\gamma(\theta)$. Details of ce and $\gamma\gamma(\theta)$ data are not available.
1986Bj01 (also 1982Bj02,1980Bj01): measured Eγ, Iγ, ce, $\gamma\gamma$, β, $\beta\gamma$, delayed neutrons. Energies and intensities of 16 γ rays reported.
1973Ke06 (also 1973Ke27): measured Eγ, β, T$_{1/2}$.
1995Me16: measured β, deduced Q(β^-) and mass excess.
2002Di12, 1993Ru01 (also 1982Ru01,1980Lu04,1976Lu02), 1986Wa17: measured T$_{1/2}$ by timing of delayed neutrons, %β^-n.
Additional information 1.
The level scheme is from 1994Fo14, based on γ and $\gamma\gamma$ coin data.

^{132}Sn Levels

E(level)[†]	J$^\pi$[‡]	T$_{1/2}$[#]	Comments
0.0	0$^+$		
4041.20 *15*	2$^+$	<0.4 ns	T$_{1/2}$: from 1980Bj01.
4351.94 *14*	(3$^-$)	<5.0 ps	
4416.29 *14*	(4$^+$)	3.95 ns *13*	
4715.91 *17*	(6$^+$)	20.1 ns *5*	T$_{1/2}$: other: 20.2 ns *8* (1982Ka25).
4830.97 *17*	(4$^-$)	26.0 ps *5*	
4848.52 *20*	(8$^+$)	2.03 μs *4*	
4885.21 *19*	(5$^+$)	<40.0 ps	
4919.00 *20*	(7$^+$)	62.0 ps *7*	
4942.53 *16*	(5$^-$)	17.0 ps *5*	
5387.89 *20*	(4$^-$)		
5399.22 *21*	(6$^+$)		
5478.98 *23*	(8$^+$)		
5629.26 *19*	(7$^+$)	13.0 ps *5*	T$_{1/2}$: uncertainty not quoted by 1994Fo14; assigned by the evaluators based on that for other levels.
6173.20 *20*	(5,6,7)		J$^\pi$: (6$^+$) (1994Fo14).
6235.9 *3*	(6,7,8$^+$)		J$^\pi$: (7$^+$) (1994Fo14).
6598.5 *3*	(6,7$^-$)		J$^\pi$: (6$^-$) (1994Fo14).
6630.3 *3*	(6,7,8$^+$)		J$^\pi$: (6$^+$) (1994Fo14).
6709.04 *21*	(6,7$^-$)		J$^\pi$: (6$^-$) (1994Fo14).
6896.0 *3*	(6,7,8)		J$^\pi$: (7$^+$) (1994Fo14).
7211.14 *17*	(6$^-$)		Possibly decays also by neutron emission to ^{131}Sn, E(n)=230 *10* (1986Bj01).
7244.06 *20*	(7$^-$)		
7353+x			E(level): S(n)(^{132}Sn)+x, where S(n)=7353 keV *4* (2017Wa10), x<Q(β^-)−S(n) i.e. x<6782 keV.
≈7550?			E(level): from 1986Bj01; possibly decays by neutron emission to ^{131}Sn, E(n)=330 *10* (1986Bj01).

† From least-squares fit to Eγ data, assuming Δ(Eγ)=0.2 keV for each γ ray. Assumption of 0.2 keV uncertainty is consistent with that assigned in a related paper (1999Sa31) on ^{133}Sn β^- decay, and with reduced $\chi^2\approx0.5$ in least-squares adjustment.
‡ From Adopted Levels.
\# From $\beta\gamma\gamma$(t) (1994Fo14), unless otherwise stated.

^{132}In β^- decay (0.200 s) 1994Fo14,1986Bj01 (continued)

β^- radiations

E(decay)	E(level)	Iβ^- [†‡]	Log *ft*	Comments
(3×10^3 [@] *4*)	7353+x	7.4 *14*		Iβ^-: from %β^-n=7.4 *14* for the decay of ^{132}In.
(6.90×10^3 *6*)	7244.06	4.5 *4*	5.57 *5*	av Eβ=3087 *29*
(6.93×10^3 *6*)	7211.14	42 *2*	4.61 *3*	av Eβ=3103 *29*
(7.24×10^3 *6*)	6896.0	0.22 *6*	7.0 *1*	av Eβ=3252 *29*
(7.43×10^3 *6*)	6709.04	1.8 *3*	6.1 *1*	av Eβ=3341 *29*
(7.51×10^3 *6*)	6630.3	1.2 *2*	6.3 *1*	av Eβ=3378 *29*
(7.54×10^3 *6*)	6598.5	2.3 *3*	6.0 *1*	av Eβ=3393 *29*
(7.90×10^3 *6*)	6235.9	0.33 *6*	7.0 *1*	av Eβ=3564 *29*
(7.97×10^3 [#] *6*)	6173.20	<0.3	>7.0	av Eβ=3594 *29*
(8.51×10^3 *6*)	5629.26	11.5 *8*	5.57 *4*	av Eβ=3851 *29*
(8.66×10^3 *6*)	5478.98	2.6 *5*	6.3 *1*	av Eβ=3922 *29*
(8.74×10^3 *6*)	5399.22	2.1 *4*	6.4 *1*	av Eβ=3959 *29*
(9.22×10^3 *6*)	4919.00	2.0 *5*	6.5 *1*	av Eβ=4186 *29*
(9.25×10^3 [#] *6*)	4885.21	0.6 *2*	9.3^{1u} *2*	av Eβ=4194 *29*
(9.29×10^3 *6*)	4848.52	13 *2*	5.7 *1*	av Eβ=4219 *29*
(9.42×10^3 *6*)	4715.91	5 *3*	6.1 *3*	av Eβ=4281 *29*

† From level scheme, assuming uncertainties of 5-15% on relative γ-ray intensities.
‡ Absolute intensity per 100 decays.
\# Existence of this branch is questionable.
@ Estimated for a range of levels.

γ(^{132}Sn)

Iγ normalization: From Σ(I(γ+ce) of γ rays to g.s.)=92.6 *14*; %β^-n=7.4 *14*.
α(K)exp in 1986Bj01 are normalized to ce data for 340-keV transition in ^{132}Sb.

E$_\gamma$ [†]	I$_\gamma$ [†@]	E$_i$(level)	J$^\pi_i$	E$_f$	J$^\pi_f$	Mult. [‡]	α [&]	Comments
64.4	1.3 *2*	4416.29	(4$^+$)	4351.94	(3$^-$)	[E1]	0.625	α(K)=0.538 *8*; α(L)=0.0710 *10*; α(M)=0.01379 *20* α(N)=0.00252 *4*; α(O)=0.0001778 *25* Additional information 5.
70.4	0.20 *3*	4919.00	(7$^+$)	4848.52	(8$^+$)	[M1]	1.534	α(K)=1.324 *19*; α(L)=0.1698 *24*; α(M)=0.0333 *5* α(N)=0.00626 *9*; α(O)=0.000540 *8*
88.9 [a] *10*		4919.00	(7$^+$)	4830.97	(4$^-$)	[E3]		α(K)=10.6; α(L)=15.5; α(M)=3.29; α(N+..)=0.688 Additional information 12. E$_\gamma$: tentative γ from 1986Bj01 only.
111.5	2.9 *3*	4942.53	(5$^-$)	4830.97	(4$^-$)	[M1]	0.414	α(K)=0.357 *5*; α(L)=0.0455 *7*; α(M)=0.00893 *13* α(N)=0.001679 *24*; α(O)=0.0001453 *21* Additional information 14.
132.5	23.1 *12*	4848.52	(8$^+$)	4715.91	(6$^+$)	E2	0.589	α(K)=0.456 *7*; α(L)=0.1071 *15*; α(M)=0.0217 *3* α(N)=0.00387 *6*; α(O)=0.000198 *3* Mult.: from ^{132}Sn IT decay. Additional information 11.
169.0	0.3 *1*	4885.21	(5$^+$)	4715.91	(6$^+$)	[M1,E2]	0.190 *60*	α(K)=0.157 *44*; α(L)=0.027 *13*; α(M)=0.0054 *26* α(N)=9.8×10^{-4} *46*; α(O)=6.4×10^{-5} *19*

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^{132}In β^- decay (0.200 s) 1994Fo14,1986Bj01 (continued)

γ(^{132}Sn) (continued)

E_γ †	I_γ †@	E_i(level)	J_i^π	E_f	J_f^π	Mult.‡	α&	Comments
203.1	7.5 *7*	4919.00	(7$^+$)	4715.91	(6$^+$)	(M1)	0.0797	α(K)=0.0690 *10*; α(L)=0.00865 *13*; α(M)=0.001695 *24* α(N)=0.000319 *5*; α(O)=2.78×10^{-5} *4* Additional information 13.
226.7	0.9 *2*	4942.53	(5$^-$)	4715.91	(6$^+$)	[E1]	0.0182	α(K)=0.01583 *23*; α(L)=0.00193 *3*; α(M)=0.000376 *6* α(N)=7.02×10^{-5} *10*; α(O)=5.71×10^{-6} *8*
230.0	1.0 *2*	5629.26	(7$^+$)	5399.22	(6$^+$)	[M1,E2]	0.072 *15*	α(K)=0.060 *11*; α(L)=0.0091 *30*; α(M)=0.00181 *60* α(N)=3.3×10^{-4} *11*; α(O)=2.4×10^{-5} *5*
299.6	78 *4*	4715.91	(6$^+$)	4416.29	(4$^+$)	(E2)#	0.0356	α(K)exp=0.028 *5* (1986Bj01) α(K)=0.0299 *5*; α(L)=0.00460 *7*; α(M)=0.000912 *13* α(N)=0.0001675 *24*; α(O)=1.183×10^{-5} *17* Additional information 8.
310.7	5.0 *5*	4351.94	(3$^-$)	4041.20	2$^+$	(E1)	0.00781	α(K)=0.00680 *10*; α(L)=0.000823 *12*; α(M)=0.0001603 *23* α(N)=3.00×10^{-5} *5*; α(O)=2.49×10^{-6} *4* Additional information 3.
375.1	100 *5*	4416.29	(4$^+$)	4041.20	2$^+$	(E2)#	0.01739	α(K)exp=0.020 *5* (1986Bj01) α(K)=0.01476 *21*; α(L)=0.00213 *3*; α(M)=0.000420 *6* α(N)=7.76×10^{-5} *11*; α(O)=5.80×10^{-6} *9* Additional information 6.
414.6	0.9 *2*	4830.97	(4$^-$)	4416.29	(4$^+$)			Additional information 9.
469.1	1.5 *2*	4885.21	(5$^+$)	4416.29	(4$^+$)			
479.1	42.3 *21*	4830.97	(4$^-$)	4351.94	(3$^-$)	(M1)	0.00880	α(K)=0.00765 *11*; α(L)=0.000933 *13*; α(M)=0.000182 *3* α(N)=3.43×10^{-5} *5*; α(O)=3.01×10^{-6} *5* Additional information 10.
502.1	1.2 *2*	7211.14	(6$^-$)	6709.04	(6,7$^-$)			
526.2	31.8 *16*	4942.53	(5$^-$)	4416.29	(4$^+$)	(E1)	0.00212	α(K)=0.00184 *3*; α(L)=0.000220 *3*; α(M)=4.29×10^{-5} *6* α(N)=8.04×10^{-6} *12*; α(O)=6.83×10^{-7} *10* Additional information 15.
590.6	2.1 *3*	4942.53	(5$^-$)	4351.94	(3$^-$)			
630.5	6.8 *7*	5478.98	(8$^+$)	4848.52	(8$^+$)			
683.3	5.2 *5*	5399.22	(6$^+$)	4715.91	(6$^+$)			
710.3	3.2 *4*	5629.26	(7$^+$)	4919.00	(7$^+$)			
774.0	0.3 *1*	6173.20	(5,6,7)	5399.22	(6$^+$)			
780.8	4.1 *4*	5629.26	(7$^+$)	4848.52	(8$^+$)			
913.3	14 *1*	5629.26	(7$^+$)	4715.91	(6$^+$)			
1035.8	1.4 *2*	5387.89	(4$^-$)	4351.94	(3$^-$)			
1038.2	1.5 *2*	7211.14	(6$^-$)	6173.20	(5,6,7)			
1457.5	1.5 *2*	6173.20	(5,6,7)	4715.91	(6$^+$)			
1520.0	0.6 *1*	6235.9	(6,7,8$^+$)	4715.91	(6$^+$)			
1581.9	1.3 *2*	7211.14	(6$^-$)	5629.26	(7$^+$)			
1656.0	4.1 *4*	6598.5	(6,7$^-$)	4942.53	(5$^-$)			
1765.1	2.1 *3*	7244.06	(7$^-$)	5478.98	(8$^+$)			
1766.5	4.4 *5*	6709.04	(6,7$^-$)	4942.53	(5$^-$)			
1823.1	1.3 *2*	7211.14	(6$^-$)	5387.89	(4$^-$)			
1914.4	2.2 *3*	6630.3	(6,7,8$^+$)	4715.91	(6$^+$)			
1977.0	0.4 *1*	6896.0	(6,7,8)	4919.00	(7$^+$)			
2268.6	27.9 *14*	7211.14	(6$^-$)	4942.53	(5$^-$)			Additional information 16.
2292.0	1.3 *2*	7211.14	(6$^-$)	4919.00	(7$^+$)			

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^{132}In β^- decay (0.200 s) 1994Fo14,1986Bj01 (continued)

$\gamma(^{132}Sn)$ (continued)

E_γ †	I_γ †@	E_i(level)	J_i^π	E_f	J_f^π	Mult.‡	α&	Comments
2301.5	1.9 *3*	7244.06	(7^-)	4942.53	(5^-)			
2325.8	0.8 *2*	7211.14	(6^-)	4885.21	(5^+)			
2380.2	41.4 *21*	7211.14	(6^-)	4830.97	(4^-)			Additional information 17.
2395.4	2.4 *3*	7244.06	(7^-)	4848.52	(8^+)			
2528.2	1.8 *3*	7244.06	(7^-)	4715.91	(6^+)			
4041.1	107 *5*	4041.20	2^+	0.0	0^+			Additional information 2.
4351.9	45.3 *23*	4351.94	(3^-)	0.0	0^+	[E3]		Additional information 4.
4416.2	16.7 *8*	4416.29	(4^+)	0.0	0^+	[E4]	1.69×10^{-4}	α(K)=0.0001473 *21*; α(L)=1.737×10^{-5} *25*; α(M)=3.38×10^{-6} *5* α(N)=6.38×10^{-7} *9*; α(O)=5.65×10^{-8} *8* Additional information 7.

† From 1994Fo14. It is assumed (by the evaluators) that the intensities quoted in figure 2 are relative photon intensities. Uncertainty in Eγ is expected to be 0.2 keV, and in relative intensity as 5-15%, as reported in ^{133}Sn β^- decay (1999Sa31) study at the same laboratory as that by 1994Fo14. The evaluator assigns 5% uncertainty in Iγ>10 values, 10% in Iγ=3-10 and ≈15% for Iγ<3.

‡ From ce data of 1994Fo14, unless otherwise stated. The values of conversion coefficients, however, are not given by 1994Fo14.

From α(K)exp of 1986Bj01.

@ For absolute intensity per 100 decays, multiply by 0.548 *22*.

& 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.

[a] Placement of transition in the level scheme is uncertain.

^{132}In β^- decay (0.200 s) 1994Fo14,1986Bj01

Decay Scheme

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

Legend

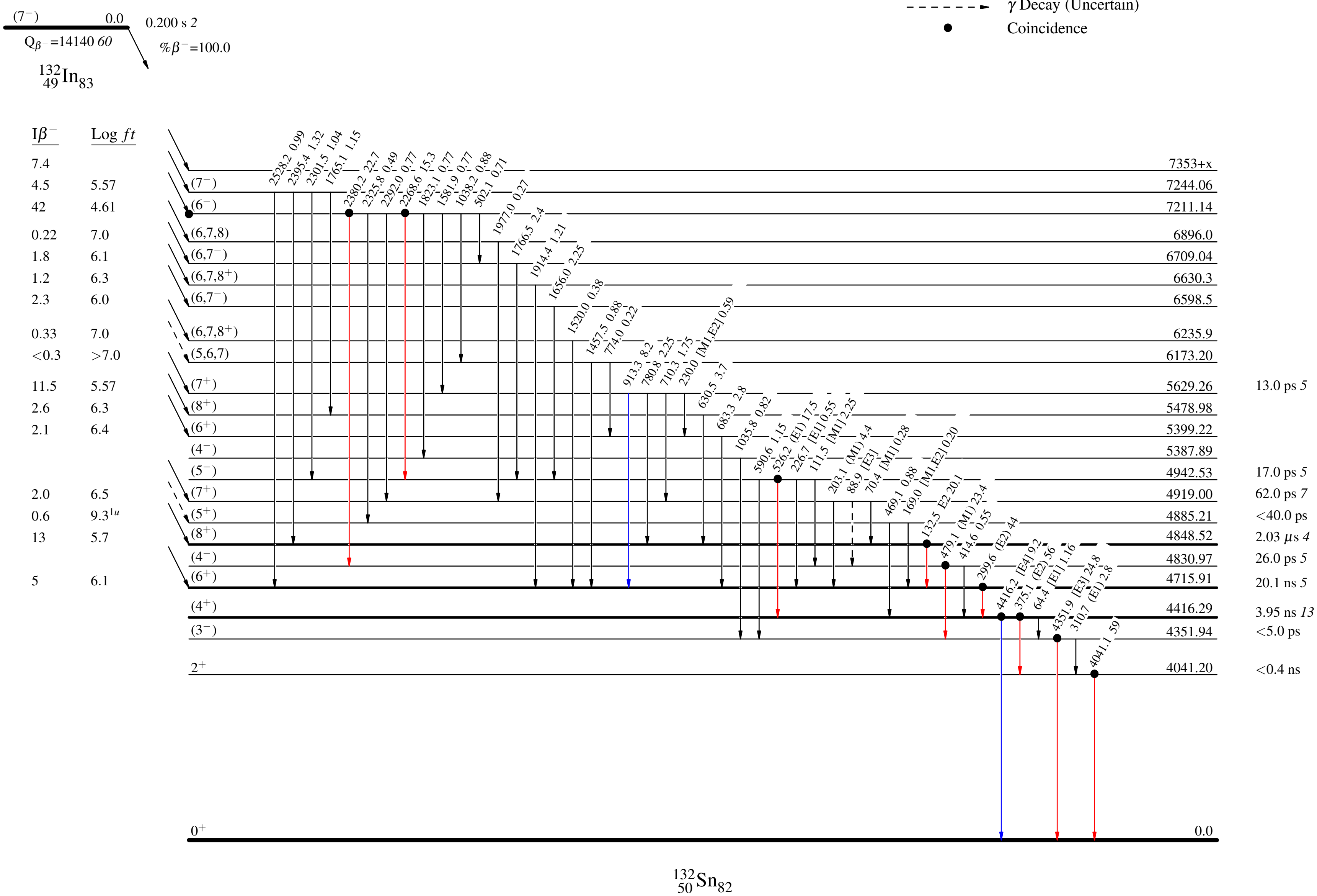
$I_\gamma < 2\% \times I_\gamma^{max}$

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

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

γ Decay (Uncertain)

Coincidence



From ENSDF