^{108}Sn ε decay **1978Hs01,1981Bu20**

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	Jean Blachot	ENSDF	1-Jul-2008

Parent: ^{108}Sn: E=0.0; J$^\pi$=0$^+$; T$_{1/2}$=10.30 min *8*; Q(ε)=2075 *19*; %ε+%β^+ decay=100.0

^{108}In Levels

The decay scheme proposed by 1981Bu20 is identical to that of 1978Hs01, except for the 847.6, 1926.8 and 1957.2 levels for which the deexciting transitions were not observed by 1981Bu20.

E(level)†#	J$^\pi$‡	T$_{1/2}$	Comments
0	7$^+$	58.0 min *12*	
29.7 *10*	2$^+$	39.6 min *7*	
198.1 *10*	3$^+$		
265.9 *10*	3$^+$		
302.4 *10*	2$^+$		J$^\pi$: J$^\pi$=2$^+$ not compatible with log *ft*=4.6 from 0$^+$.
698.8 *10*	1$^+$		
867.4? *11*			E(level): the 565γ was placed feeding the g.s. by 1978Hs01, 1981Bu20.
1191.6 *10*	1$^+$		

† All levels have been determined by evaluator considering the energy and the position of the two isomers.
‡ From Adopted Levels, except as noted.
# From evaluator.

ε,β^+ radiations

E(decay)	E(level)	Iβ^+ ‡	Iε‡	Log *ft*	I($\varepsilon+\beta^+$)†‡	Comments
(883 *19*)	1191.6		5.2 *5*	4.38 *5*	5.2 *5*	εK=0.8569; εL=0.11400 *16*; εM+=0.02912 *5*
(1208 *19*)	867.4?		0.06 *4*	6.6 *3*	0.06 *4*	εK=0.8584; εL=0.1126; εM+=0.02870
(1376 *19*)	698.8	0.33 *10*	87.5 *12*	3.540 *18*	87.8 *12*	av Eβ=173 *11*; εK=0.8560 *9*; εL=0.11173 *19*; εM+=0.02846 *5*
(1773 *19*)	302.4	0.30 *12*	5.1 *19*	5.00 *17*	5.4 *20*	av Eβ=345 *11*; εK=0.812 *6*; εL=0.1052 *8*; εM+=0.02676 *19* I($\varepsilon+\beta^+$): the feeding leads to too small a log *ft* for a 0$^+$ to 2$^+$ transition. There must be additional feeding of the 302 level by unplaced or unobserved γ's.

† From I(γ+ce)-imbalance at each level.
‡ Absolute intensity per 100 decays.

γ(^{108}In)

Iγ normalization: from sum I(γ+ce to g.s.)=100.

E$_\gamma$[†]	I$_\gamma$[@b]	E$_i$(level)	J$^\pi_i$	E$_f$	J$^\pi_f$	Mult.[&]	δ[a]	α[c]	I$_{(\gamma+ce)}$[b]	Comments
36.7 *2*	0.67 *17*	302.4	2$^+$	265.9	3$^+$	M1+(E2)	<0.45	14 *4*	10.2 *4*	α(K)=9.0 *8*; α(L)=3.8 *27*; α(M)=0.8 *6* I$_{(\gamma+ce)}$: from int. balance at the 266 level. I$_\gamma$: Iγ from 1977Va14. Mult.: 1978Hs01 estimate I(γ+ce)(36.6γ)/Iγ(396γ)≈0.10 on the basis of coincidence data although the transition is not seen in their singles spectrum; thus, α≈14. The requirement of an intensity balance at the 266 level leads to α= 14 *4*. α(theory)=60.4(E2), 9.5(M1); thus, δ<0.45.
104.31 *12*	21.5 *7*	302.4	2$^+$	198.1	3$^+$	M1(+E2)	−0.06 *10*	0.468		α(K)=0.7 *3*; α(L)=0.17 *10* α(K)exp=0.6 *1* (1977Va14), 0.47 *10* (1975Ad10).
168.24 *9*	31.0 *6*	198.1	3$^+$	29.7	2$^+$	M1		0.121		α(K)=0.105; α(L)=0.013 K/L=7.0 *7* (1975Ad10); α(K)exp=0.096 *15* (1977Va14); α(K)exp=0.13 *2* (1975Ad10)
236.19 *8*	9.7 *4*	265.9	3$^+$	29.7	2$^+$	M1+E2	+0.07 *3*	0.049		α(K)=0.042 α(K)exp=0.041 *9* (1975Ad10)
272.69 *11*	70.8 *10*	302.4	2$^+$	29.7	2$^+$	M1+(E2)	+0.14 *14*	0.034		α(K)=0.039; α(L)=0.0061 α(K)exp=0.032 *8* (1975Ad10); α(K)exp=0.051 *7* (1977Va14) Mult.: 1978Hs01, in (p,nγ), determine δ=−2.25 *24* for J(279 level)=2$^+$.
^{x}363.0[‡] *3*	<0.2[#]									I$_\gamma$: Iγ= 1.1 *3* (1978Hs01).
396.34 *8*	100 *1*	698.8	1$^+$	302.4	2$^+$	M1+E2	+0.4 *+11−6*	0.0133 *3*		α(K)exp=0.014 *3* (1975Ad10); α(K)exp=0.015 *2* (1977Va14)
492.65 *17*	1.6 *3*	1191.6	1$^+$	698.8	1$^+$	D+Q	−0.53 *8*			
500.4 *3*	1.7 *4*	698.8	1$^+$	198.1	3$^+$					I$_\gamma$: from 1977Va14 corrected for contribution from summing of 396 and 104γ's. 1978Hs01 report Iγ= 2.7 *2*.
565.00 *15*	<0.2	867.4?		302.4	2$^+$					I$_\gamma$: from 1977Va14 who established that most of the intensity in the 565 peak is from summing of the 396.3 and 168.2γ's. 1978Hs01 report Iγ= 3.0 *4*, 1981Bu20 report Iγ= 2.1 *6*.
669.16 *13*	35.1 *6*	698.8	1$^+$	29.7	2$^+$	D+Q				
^{x}829.3[‡] *5*	<0.2									I$_\gamma$: Iγ= 5.7 *6* (1978Hs01).
^{x}847.6 *4*	<0.2[#]									1978Hs01 report Iγ= 3.3 *8* and, on the basis of this transition, postulate a level at 847.6.
^{x}858.7[‡] *6*	<0.2[#]									I$_\gamma$: Iγ= 4.0 *10* (1978Hs01).
889.16[‡] *17*	5.1[#] *5*	1191.6	1$^+$	302.4	2$^+$	D+Q	+1.3 *+17−8*			

γ(^{108}In) (continued)

E_γ[†]	I_γ[@b]	E_i(level)	J^π_i	E_f	J^π_f	Mult.[&]	Comments
[x]903.5 *6*	<0.2[#]						I_γ: Iγ= 1.0 *2* (1978Hs01).
1161.83 *12*	1.4 *4*	1191.6	1$^+$	29.7	2$^+$	Q	
[x]1231.0[‡] *5*	<0.2[#]						I_γ: Iγ= 1.0 *2* (1978Hs01).
[x]1654.4[‡] *5*	<0.2[#]						1978Hs01 report Iγ= 2.8 *3* and, on the basis of this transition, postulate a level at 1926.
[x]1684.8[‡] *6*	<0.2[#]						1978Hs01 report Iγ= 4.3 *5*. See 1957γ.
[x]1957.2 *6*	<0.2[#]						1978Hs01 report Iγ= 1.2 *3* and, on the basis of this transition and the 1684.8γ, postulate a level at 1957.

[†] From 1981Bu20, except where noted otherwise. Others: 1978Hs01, 1977Va14, 1975Ad10, 1970Ki04.
[‡] From 1978Hs01.
[#] From 1981Bu20.
[@] From 1978Hs01, except where noted otherwise. Others: 1981Bu20, 1979Pl06, 1977Va14, 1975Ad10, 1970Ki04.
[&] From α(K)exp based on Iγ and Ice(K) of 1977Va14 (Ice for 36γ). Data are normalized so that α(K)exp(633γ ^{108}Cd)=0.00301 (E2 theory) multipolarities designated D,Q are from $\gamma(\theta)$ in ^{108}Cd(p,n) (1978Hs01). α(K)exp for the 236γ is from Ice(K) of 1975Ad10 normalized to α(K)exp(168γ) value of 1977Va14. Other α(K)exp: 1975Ad10.
[a] From $\gamma(\theta)$ in ^{108}Cd(p,nγ) (1978Hs01) with adopted J^π.
[b] For absolute intensity per 100 decays, multiply by 0.643 *6*.
[c] 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.

$^{108}_{49}$In$_{59}$-3

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Decay Scheme

Intensities: I_{γ} per 100 parent decays