^{103}Sn ε decay (7.0 s) 2005Ka34,2005Ka48

Type	Author	History Citation	Literature Cutoff Date
Full Evaluation	D. De Frenne	NDS 110, 2081 (2009)	1-Mar-2009

Parent: ^{103}Sn: E=0; J^π=(5/2$^+$); $T_{1/2}$=7.0 s *2*; Q(ε)=7640 *70*; %ε+%$β^+$ decay=100.0

^{103}Sn-Q(ε): from 2005Ka34. Other: 7630 *300* (syst,2003Au03).

2005Ka34,2005Ka48: ^{103}Sn isotope produced in ^{50}Cr(^{58}Ni,αn).

reaction at E=5 MeV/nucleon Ion-beam facility at GSI, recoil mass separator. Measured Eγ, Iγ, γγ, βγ, βγγ using an array of three Silicon detectors, 17 Ge crystals. Total absorption β spectrum, delayed proton decay.

All data are from 2005Ka34. The Total absorption spectrum in 2005Ka34 shows that the decay scheme is highly incomplete. Large number of additional levels must be populated between 3.5 and 7.5 MeV.

^{103}In Levels

E(level)†	Jπ	E(level)†	Jπ	E(level)†	E(level)†
0.0	(9/2$^+$)	1428.91 *10*	(9/2$^+$)	2176.83 *14*	3280.6 *3*
1077.61 *18*	(11/2$^+$)	1669.64 *18*		2209.2 *3*	3462.1 *4*
1272.8 *3*	(13/2$^+$)	1908.5 *5*		2320.1 *6*	
1355.80 *10*		2025.0 *3*		2812.7 *4*	
1396.81 *10*		2148.92 *23*		3196.7? *4*	

† From least-squares fit to Eγ's by the evaluator.

ε,$β^+$ radiations

E(decay)	E(level)	Iβ+ ‡	Iε‡	Log *ft*	I(ε+β+)†‡	Comments
(4.18×10^3 *7*)	3462.1	0.9 *3*	0.15 *5*	5.3 *1*	1.0 *3*	av Eβ=1431 *33*; εK=0.128 *8*; εL=0.0163 *10*; εM+=0.00414 *25*
(4.36×10^3 *7*)	3280.6	7 *2*	1 *1*	4.5 *1*	8 *2*	av Eβ=1517 *33*; εK=0.111 *7*; εL=0.0141 *8*; εM+=0.00358 *21*
(4.83×10^3 *7*)	2812.7	5 *2*	0.5 *2*	5.0 *2*	5 *2*	av Eβ=1738 *34*; εK=0.078 *4*; εL=0.0100 *6*; εM+=0.00253 *13*
(5.46×10^3 *7*)	2176.83	<0.5	<0.03	>6.3	<0.5	av Eβ=2040 *34*; εK=0.0512 *23*; εL=0.0065 *3*; εM+=0.00165 *8*
(5.62×10^3 *7*)	2025.0	<0.5	<0.03	>6.3	<0.5	av Eβ=2113 *34*; εK=0.0466 *21*; εL=0.0059 *3*; εM+=0.00150 *7*
(5.97×10^3 *7*)	1669.64	2.1 *6*	0.10 *3*	5.8 *1*	2.2 *6*	av Eβ=2283 *34*; εK=0.0378 *16*; εL=0.00481 *20*; εM+=0.00122 *5*

† From total absorption spectrum (TAS) (2005Ka34). The TAS data shows no direct population of the ground state of ^{103}In.

‡ Absolute intensity per 100 decays.

γ(^{103}In)

Iγ normalization: from 2005Ka34. %εp=1.2 *1* (2005Ka34).

Eγ	Iγ‡	Ei(level)	J_i^π	Ef	J_f^π
314.0 *2*	45 *2*	1669.64		1355.80	
351.3 *2*	9 *1*	1428.91	(9/2$^+$)	1077.61	(11/2$^+$)
355.4 *2*	11 *1*	2025.0		1669.64	
627.4 *14*	1.2 *5*	2025.0		1396.81	

Continued on next page (footnotes at end of table)

^{103}Sn ε decay (7.0 s) 2005Ka34,2005Ka48 (continued)

γ(^{103}In) (continued)

E_γ	I_γ[‡]	E_i(level)	J_i^π	E_f	J_f^π
635.4 *5*	4 *1*	2812.7		2176.83	
[x]643.1 *1*	15 *1*				
752.1 *2*	8 *1*	2148.92		1396.81	
[x]780.0[†] *2*	3.0 *5*				
821.0 *1*	12 *1*	2176.83		1355.80	
830.6[#] *2*	2.9 *5*	1908.5		1077.61	(11/2$^+$)
853.0 *5*	3.4 *5*	2209.2		1355.80	
964.3 *6*	3 *1*	2320.1		1355.80	
[x]993.7 *3*	7 *1*				
[x]1071.3 *3*	5 *1*				
1077.6 *3*	22 *1*	1077.61	(11/2$^+$)	0.0	(9/2$^+$)
[x]1134.5 *2*	5 *1*				
1272.8 *3*	1.9 *5*	1272.8	(13/2$^+$)	0.0	(9/2$^+$)
1355.8 *1*	100	1355.80		0.0	(9/2$^+$)
1396.8 *1*	43 *2*	1396.81		0.0	(9/2$^+$)
1428.9 *1*	15 *1*	1428.91	(9/2$^+$)	0.0	(9/2$^+$)
[x]1548.8 *3*	4 *1*				
[x]1579.8 *4*	4 *1*				
1610.9 *2*	13 *1*	3280.6		1669.64	
1669.3 *3*	5 *1*	1669.64		0.0	(9/2$^+$)
1840.9[#] *4*	5 *1*	3196.7?		1355.80	
1908.5 *5*	4 *1*	1908.5		0.0	(9/2$^+$)
[x]1958.8 *3*	11 *1*				
[x]2049.7 *3*	7 *1*				
2106.3 *3*	7 *1*	3462.1		1355.80	
2209.3 *3*	4 *1*	2209.2		0.0	(9/2$^+$)
2813.2 *5*	10 *2*	2812.7		0.0	(9/2$^+$)

[†] In coin with 351γ.
[‡] For absolute intensity per 100 decays, multiply by 0.40 *5*.
[#] Placement of transition in the level scheme is uncertain.
[x] γ ray not placed in level scheme.

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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
- Coincidence (Uncertain)