$^{107}\text{Sb } \varepsilon \text{ decay}$ **2002Re14**

| | | History | |
Type	Author	Citation	Literature Cutoff Date
Full Evaluation	Jean Blachot	NDS 109, 1383 (2008)	1-Mar-2008

Parent: ^{107}Sb: E=0.0; J$^\pi$=(5/2$^+$); T$_{1/2}$=4.0 s 2; Q(ε)=7.92×10^3 SY; %ε+%β^+ decay=100.0

2002RE14: Measured Eγ, Iγ, $\gamma\gamma$ using 3 large-volume HPGe detectors. Recoil products separated in mass and charge by Fragment Mass Analyzer.

1997Sh13: The ^{107}Sb was produced by fusion evaporation reactions induced by a ^{58}Ni beam on ^{50}Cr,^{52}Cr targets at GSI. On line mass separator with a "FEBIAD-E" ion source. Measured G.

The level scheme is from 2002RE14.

^{107}Sn Levels

E(level)†	J$^\pi$	Comments
0	5/2$^+$	d$_{5/2}$ state.
151.24 19	7/2$^+$	g$_{7/2}$ state.
703.72 24	(3/2$^+$)	d$^3_{5/2}$ state.
818.02 24	(5/2$^+$)	g$^3_{7/2}$ state.
970.42 24	(3/2$^+$,5/2$^+$)	
1280.1 3	3/2$^+$	d$_{3/2}$ state.
1453.9 3	(3/2$^+$)	
1619.5? 3		
2045.5? 3		

† From least-squares fit to Eγ's.

ε,β^+ radiations

E(decay)	E(level)	Iβ^+ ‡	I$\varepsilon^\ddagger$	Log $ft^\dagger$	I($\varepsilon+\beta^+$)†‡	Comments
(5874$^{\#}$ SY)	2045.5?	1.4 3	0.077 22	5.70 16	1.5 3	av Eβ=2227 149; εK=0.044 9; εL=0.0057 12; εM+=0.0015 3
(6300$^{\#}$ SY)	1619.5?	2.1 4	0.089 23	5.70 15	2.2 4	av Eβ=2431 150; εK=0.035 7; εL=0.0045 9; εM+=0.00115 22
(6466 SY)	1453.9	8.5 13	0.33 8	5.16 14	8.8 14	av Eβ=2511 150; εK=0.032 6; εL=0.0041 8; εM+=0.00105 19
(6639 SY)	1280.1	21 3	0.75 17	4.82 13	22 3	av Eβ=2595 150; εK=0.029 6; εL=0.0037 7; εM+=0.00096 17
(6949 SY)	970.42	11.4 17	0.34 8	5.20 13	11.7 17	av Eβ=2744 150; εK=0.025 5; εL=0.0032 6; εM+=0.00082 14
(7101 SY)	818.02	20 3	0.57 12	5.00 13	21 3	av Eβ=2818 151; εK=0.023 4; εL=0.0030 5; εM+=0.00077 13
(7216 SY)	703.72	7.9 13	0.21 5	5.45 13	8.1 13	av Eβ=2873 151; εK=0.022 4; εL=0.0028 5; εM+=0.00073 12
(7768$^{\#}$ SY)	151.24	<3.4		>6.0	<3.4	av Eβ=3141 151; εK=0.017 3; εL=0.0022 4; εM+=0.00057 9 I($\varepsilon+\beta^+$): 2002Re14 give 5.5 3 or 6.9 4; but the evaluator obtain 1.5 19 from intensity balance assuming 151γ as M1 or E2.
(7920 SY)	0	23 9	0.4 2	5.21 20	23 9	av Eβ=3215 151; εK=0.0163 23; εL=0.0021 3; εM+=0.00053 8 I($\varepsilon+\beta^+$): based on log ft=5.1-5.4 for a similar transition in ^{111}Sb decay to ^{111}Sn.

Continued on next page (footnotes at end of table)

^{107}Sb ε decay   **2002Re14 (continued)**

ε,β^+ radiations (continued)

† Deduced by the evaluator from intensity balance and the results of log *ft* code.
‡ Absolute intensity per 100 decays.
# Existence of this branch is questionable.

$\gamma(^{107}$Sn)

Iγ normalization: Σ(I(γ+ce) of γ's to g.s.)=77 *9*, assuming %ε+β^+ feeding to g.s.=23 *9*.

E_γ	I_γ‡	E_i(level)	J_i^π	E_f	J_f^π	Mult.	α#
151.5† *3*	64 *3*	151.24	$7/2^+$	0	$5/2^+$	[M1,E2]	0.28 *10*
552.7 *3*	3 *1*	703.72	$(3/2^+)$	151.24	$7/2^+$		
666.6 *3*	63 *3*	818.02	$(5/2^+)$	151.24	$7/2^+$		
703.5† *3*	34 *2*	703.72	$(3/2^+)$	0	$5/2^+$		
818.2† *3*	34 *2*	818.02	$(5/2^+)$	0	$5/2^+$		
819.4 *3*	9 *2*	970.42	$(3/2^+,5/2^+)$	151.24	$7/2^+$		
970.2 *3*	44 *2*	970.42	$(3/2^+,5/2^+)$	0	$5/2^+$		
1280.1† *3*	100	1280.1	$3/2^+$	0	$5/2^+$		
1453.9 *3*	40 *3*	1453.9	$(3/2^+)$	0	$5/2^+$		
1619.5 *3*	10 *1*	1619.5?		0	$5/2^+$		
2045.5 *3*	7 *1*	2045.5?		0	$5/2^+$		

† Already seen by by 1997Sh13.
‡ For absolute intensity per 100 decays, multiply by 0.22 *3*.
# 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.

^{107}Sb ε decay   **2002Re14 (continued)**

^{107}Sb ε decay   2002Re14

Decay Scheme

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

Legend

$I_\gamma < 2\% \times I_\gamma^{max}$
$I_\gamma < 10\% \times I_\gamma^{max}$
$I_\gamma > 10\% \times I_\gamma^{max}$

(5/2$^+$)   0.0   4.0 s 2

$\%\varepsilon + \%\beta^+ = 100.0$ $Q_\varepsilon = 7.92 \times 10^3$ SY

$^{107}_{51}\text{Sb}_{56}$

		$\underline{I\beta^+}$	$\underline{I\varepsilon}$	$\underline{\text{Log } ft}$
2045.5		1.4	0.077	5.70
1619.5		2.1	0.089	5.70
(3/2$^+$) 1453.9		8.5	0.33	5.16
3/2$^+$ 1280.1		21	0.75	4.82
(3/2$^+$,5/2$^+$) 970.42		11.4	0.34	5.20
(5/2$^+$) 818.02		20	0.57	5.00
(3/2$^+$) 703.72		7.9	0.21	5.45
7/2$^+$ 151.24		<3.4		>6.0
5/2$^+$ 0		23	0.4	5.21

2045.5 1.8
1619.5 2.4
1453.9 8.8
1280.1 22
970.2 9.9
819.4 2.2
818.2 7.7
666.6 13.9
703.5 7.7
552.7 0.9
151.5 [M1,E2] 18

$^{107}_{50}\text{Sn}_{57}$