

**<sup>116</sup>Sb ε decay (60.3 min) 1994Ga14**

Type	Author	History Citation	Literature Cutoff Date
Full Evaluation	Jean Blachot	NDS 111, 717 (2010)	1-Dec-2009

Parent: <sup>116</sup>Sb: E=383 40; J<sup>π</sup>=8<sup>-</sup>; T<sub>1/2</sub>=60.3 min 6; Q(ε)=4707 5; %ε+%β<sup>+</sup> decay=100.0

Activity: <sup>113</sup>In(α,n),<sup>116</sup>Sn(p,n) (1994Ga14).

Measured: E<sub>γ</sub>,I<sub>γ</sub> (1972GeZF,1994Ga14); β (1964Bo21); γγ(t), γγ(θ), γγ(θ,H,t) (1966Rg02), ce (1960Je03,1968Ra23,1970KiZW). Others: 1954At34, 1958Ni24, 1968Ra14.

See 1975Ca10 for discrepancy between I<sub>γ</sub> of 1968Ra14 and others.

The level scheme is as given by 1994Ga14.

<sup>116</sup>Sn Levels

E(level)	J <sup>π</sup>	T <sub>1/2</sub>	Comments
0.0	0 <sup>+</sup>	stable	
1293.564 11	2 <sup>+</sup>		
2266.141 18	3 <sup>-</sup>		
2365.943 18	5 <sup>-</sup>	0.35 μs 2	g=-0.065 5 (1966Rg02) T <sub>1/2</sub> : from 1966Rg02. Other: 0.23 μs 2 (1964Bo21).
2773.295 21	6 <sup>-</sup>		
2908.808 21	7 <sup>-</sup>	≤0.5 ns	T <sub>1/2</sub> : from 1966Rg02.
3209.953 24	7 <sup>-</sup>	≤0.5 ns	T <sub>1/2</sub> : from 1966Rg02.
3228.05 13	8 <sup>-</sup>		
3522.69 13	9 <sup>-</sup>		
3985.53 14			

ε,β<sup>+</sup> radiations

Exp ε/β<sup>+</sup>=4.22 20 (1964Bo21) scin.

E(β<sup>+</sup>)=1160 40 (1960Je03) mag spect.

E(decay)	E(level)	Iβ <sup>+</sup> †	Iε †	Log ft	I(ε+β <sup>+</sup> ) †	Comments
(1.10×10 <sup>3</sup> 4)	3985.53	0.001 1	0.9 3	6.29 15	0.9 3	av Eβ=147 23; εK=0.8563 11; εL=0.1130 3; εM+=0.02909 8
(1.57×10 <sup>3</sup> 4)	3522.69	0.005 3	0.09 5	7.58 25	0.09 5	av Eβ=348 22; εK=0.814 11; εL=0.1064 15; εM+=0.0274 4
(1.86×10 <sup>3</sup> 4)	3228.05	0.035 10	0.21 5	7.33 12	0.24 6	av Eβ=477 23; εK=0.735 18; εL=0.0957 23; εM+=0.0246 6
(1.88×10 <sup>3</sup> 4)	3209.953	2.2 3	12.6 7	5.55 4	14.8 7	av Eβ=485 23; εK=0.729 18; εL=0.0949 24; εM+=0.0244 6
(2.18×10 <sup>3</sup> 4)	2908.808	24 2	58 4	5.00 4	82 4	av Eβ=619 23; εK=0.613 21; εL=0.080 3; εM+=0.0204 7

† Absolute intensity per 100 decays.

γ(<sup>116</sup>Sn)

E <sub>γ</sub> †	I <sub>γ</sub> †#	E <sub>i</sub> (level)	J <sub>i</sub> <sup>π</sup>	E <sub>f</sub>	J <sub>f</sub> <sup>π</sup>	Mult. ‡	α@	Comments
99.802 11	100	2365.943	5 <sup>-</sup>	2266.141	3 <sup>-</sup>	E2	1.607	α(K)=1.165 17; α(L)=0.356 5; α(M)=0.0726 11; α(N+..)=0.01341 19

Continued on next page (footnotes at end of table)

$^{116}\text{Sb}$   $\varepsilon$  decay (60.3 min) **1994Ga14** (continued) $\gamma(^{116}\text{Sn})$  (continued)

$E_\gamma^\dagger$	$I_\gamma^{\ddagger\#}$	$E_i(\text{level})$	$J_i^\ddagger$	$E_f$	$J_f^\ddagger$	Mult. $^\ddagger$	$\delta$	$\alpha^\@$	Comments
									$\alpha(\text{N})=0.01285$ 18; $\alpha(\text{O})=0.000558$ 8
									$\alpha(\text{K})_{\text{exp}}=1.4$ ; $\text{K/L}=2.8$ (1960Je03); $\alpha(\text{exp})=1.5$ 2 (1964Bo21)
135.511 10	28.5 3	2908.808	7 <sup>-</sup>	2773.295	6 <sup>-</sup>	M1(+E2)	-0.04 3	0.242	$\alpha(\text{K})=0.209$ 1; $\alpha(\text{L})=0.0266$ 2; $\alpha(\text{M})=0.00520$ 5; $\alpha(\text{N}+\dots)=0.00117$ 1 $\delta$ : from 1964Bo21, 1966Rg02, 1977Kr17.
294.6 2	0.09 5	3522.69	9 <sup>-</sup>	3228.05	8 <sup>-</sup>				
319.24 12	0.33 3	3228.05	8 <sup>-</sup>	2908.808	7 <sup>-</sup>				
407.351 15	100	2773.295	6 <sup>-</sup>	2365.943	5 <sup>-</sup>	M1(+E2)	+0.02 2	0.01314	$\alpha(\text{K})=0.01141$ 16; $\alpha(\text{L})=0.001400$ 20; $\alpha(\text{M})=0.000274$ 4; $\alpha(\text{N}+\dots)=5.61 \times 10^{-5}$ 8 $\alpha(\text{N})=5.16 \times 10^{-5}$ 8; $\alpha(\text{O})=4.52 \times 10^{-6}$ 7 $\alpha(\text{K})_{\text{exp}}=0.012$ 2 (1970KiZW); $\alpha(\text{exp})=0.0123$ 7 (1964Bo21) $\delta$ : from $\gamma\gamma(\theta)$ of 1966Rg02, 1977Kr17.
436.666 21	3.58 7	3209.953	7 <sup>-</sup>	2773.295	6 <sup>-</sup>	M1,E2		0.0110	$\alpha(\text{K})_{\text{exp}}=0.012$ 3 (1970KiZW)
542.867 15	48.1 4	2908.808	7 <sup>-</sup>	2365.943	5 <sup>-</sup>	E2		0.00593	$\alpha=0.00593$ ; $\alpha(\text{K})=0.00504$ ; $\alpha(\text{L})=0.00067$
844.001 19	11.2 2	3209.953	7 <sup>-</sup>	2365.943	5 <sup>-</sup>	E2		0.00191	$\alpha=0.00191$ ; $\alpha(\text{K})=0.00164$ ; $\alpha(\text{L})=0.00020$
972.573 16	74.2 7	2266.141	3 <sup>-</sup>	1293.564	2 <sup>+</sup>	E1		0.00058	$\alpha=0.00058$ ; $\alpha(\text{K})=0.00050$
1072.373 20	25.5 3	2365.943	5 <sup>-</sup>	1293.564	2 <sup>+</sup>	E3		0.00229	$\alpha=0.00229$ ; $\alpha(\text{K})=0.00195$ ; $\alpha(\text{L})=0.00026$
1076.72 13	0.9 3	3985.53		2908.808	7 <sup>-</sup>				
1293.557 11	100.0 9	1293.564	2 <sup>+</sup>	0.0	0 <sup>+</sup>	E2		0.00075	$\alpha=0.00075$ ; $\alpha(\text{K})=0.00065$
<sup>x</sup> 1315.53 4	0.40 4								
<sup>x</sup> 1501.03 17	0.57 15								

$^\dagger$  From 1994Ga14.

$^\ddagger$   $\alpha(\text{K})_{\text{exp}}$  are from  $\text{ce}(\text{K})/I_\gamma$ , normalized to  $\alpha(\text{K})(1293\gamma, \text{E}2)=0.00065$ .

$\#$  For absolute intensity per 100 decays, multiply by 1.00 4.

$^\@$  Total theoretical internal conversion coefficients, calculated using the BrIcc code (2008Ki07) with Frozen orbital approximation based on  $\gamma$ -ray energies, assigned multipolarities, and mixing ratios, unless otherwise specified.

<sup>x</sup>  $\gamma$  ray not placed in level scheme.

$^{116}\text{Sb}$   $\epsilon$  decay (60.3 min) 1994Ga14

Decay Scheme

Intensities: Relative  $I_\gamma$

Legend

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

$^{116}_{51}\text{Sb}_{65}$  60.3 min 6  
 $Q_e = 4707.5$   
 $\% \epsilon + \% \beta^+ = 100$

