^{126}Sb β^- decay (12.35 d) 1975Ba17,1972Bu28

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	H. Iimura, J. Katakura, S. Ohya	NDS 180, 1 (2022)	1-Oct-2021

Parent: ^{126}Sb: E=0.0; $J^\pi=(8^-)$; $T_{1/2}$=12.35 d *6*; Q(β^-)=3670 *30*; %β^- decay=100.0

The decay scheme is that proposed by 1975Ba17 on the basis of $\gamma\gamma$-coin and Eγ sums.

1972Bu28: semi γ, $\gamma\gamma$.

1972SoZQ: Te(γ,pxn) chem;semi γ, $\gamma\gamma$.

1972Kr15: U(n,F) chem, oriented nuclei, $\gamma(\theta)$.

1974Li14: ^{124}Sn(α,pn) chem; semi γ, $\gamma\gamma$.

1975Ba17: ^{128}Te(d,α) chem; semi γ, $\gamma\gamma$; $\gamma\gamma(\theta)$.

1975So09: ^{128}Te(d,α) chem; semi γ, $\gamma\gamma$; scin-scin $\beta\gamma$(t), $\gamma\gamma$(t).

1975Ba46: ^{128}Te(d,α) chem; scin-scin $\beta\gamma$(t).

2010Fe02:Fission product;plasma-mass spectrometry;semi(HPGe);γ,Iγ,; liquid scin.;β.

^{126}Te Levels

E(level)[†]	J$^\pi$[‡]	$T_{1/2}$	Comments
0.0	0^+	stable	
666.5 *3*	2^+		
1361.5 *4*	4^+		
1776.1 *4*	6^+	68 ps *2*	$T_{1/2}$: unweighted av of 66 ps *3* from (≈600β)(≈700γ)(t) (1975Ba46) and 69 ps *2* from (1370-1500β)(695γ)(t) (1975So09).
2218.3 *4*	5^-		
2396.2 *6*	6^+		
2496.7 *5*	7^-	0.152 ns *5*	$T_{1/2}$: from (1200β)(≈700γ)(t) (1975Ba46); other: 0.15 ns *2* from (610<Eβ<720)(695γ,720γ)(t) (1975So09).
2514.7 *5*	5^-		
2765.7 *5*	8^+		
2811.6 *5*	(7^-)		
2837.4 *5*			
2839.7 *7*	$(6)^+$		
2974.3 *10*	10^+		
2989.4 *5*	(8^+)		
3070.8 *5*	5^-,6,7^-		
3171.4 *6*			
3193.7 *5*	9^-		
3450.4 *6*	6^+,7^-		
3473.0 *9*			

[†] E(levels) are based on a least-squares fit (by evaluators).

[‡] Spin and parity values are those given under Adopted Levels.

β^- radiations

E(decay)	E(level)	Iβ^-[†]	Log *ft*	Comments
(2.0×10^2 *3*)	3473.0	0.5 *1*	7.43 *25*	av Eβ=54 *9*
(2.2×10^2 *3*)	3450.4	2.09 *14*	6.96 *21*	av Eβ=61 *9*
(4.8×10^2 *3*)	3193.7	29 *7*	6.92 *15*	av Eβ=145 *11*
(5.0×10^2 *3*)	3171.4	5.9 *10*	7.68 *12*	av Eβ=153 *11*
(6.0×10^2 *3*)	3070.8	8.4 *4*	7.80 *8*	av Eβ=190 *12*
(6.8×10^2 *3*)	2989.4	4.2 *4*	8.30 *8*	av Eβ=220 *12*
(7.0×10^2 *3*)	2974.3	0.5 *2*	9.54^{1u} *20*	av Eβ=243 *12*

Continued on next page (footnotes at end of table)

^{126}Sb β^- decay (12.35 d) 1975Ba17,1972Bu28 (continued)

β^- radiations (continued)

E(decay)	E(level)	Iβ^-[†]	Log *ft*	Comments
(8.3×10^2[‡] *3*)	2839.7	0.8 *7*	9.7[1u] *4*	av Eβ=294 *12*
(8.6×10^2 *3*)	2811.6	8.1 *6*	8.37 *7*	av Eβ=289 *12*
(9.0×10^2 *3*)	2765.7	4.9 *4*	8.67 *7*	av Eβ=307 *12*
(1.17×10^3 *3*)	2496.7	16 *8*	8.57 *23*	av Eβ=418 *13*
(1.27×10^3 *3*)	2396.2	0.9 *4*	10.68[1u] *21*	av Eβ=471 *13*
(1.45×10^3 *3*)	2218.3	3.0 *13*	9.65 *20*	av Eβ=537 *13*
(1.89×10^3 *3*)	1776.1	20 *4*	10.31[1u] *10*	av Eβ=734 *13*

[†] Absolute intensity per 100 decays.
[‡] Existence of this branch is questionable.

^{126}Sb β^- decay (12.35 d) 1975Ba17,1972Bu28 (continued)

$\gamma(^{126}Te)$

Iγ normalization: The evaluators assume no β^- feedings to gs, 666.5(2^+) and 1362.1(4^+) levels, so Iγ(666.5γ)=Iγ(695.0γ)=100.

$\gamma\gamma(\theta)$ data

1975Ba17

cascade	A_2	A_4	cascade	A_2	A_4
224-990	0.13 *5*	-0.01 *4*	278-857	-0.10 *6*	0.10 *5*
297-857	0.16 *4*	0.01 *2*	593-857	-0.08 *3*	0.03 *3*
857-696	-0.04 *2*	0.03 *2*	587-667	-0.08 *2*	-0.01 *2*

E_γ[†]	I_γ[‡&]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[#]	δ[#]	α[a]	Comments
148.7 *9*	0.4 *2*	2989.4	(8^+)	2839.7	$(6)^+$				E_γ,I_γ: Eγ and RI from γγ coin.
208.6 *8*	0.5 *2*	2974.3	10^+	2765.7	8^+	E2		0.130 *3*	α(K)=0.1049 *20*; α(L)=0.0199 *4*; α(M)=0.00408 *9*
									E_γ,I_γ: Eγ and RI from γγ coin.
223.9 *7*	1.4 *1*	2989.4	(8^+)	2765.7	8^+				
278.2 *3*	2.4 *6*	2496.7	7^-	2218.3	5^-	E2		0.0493	α(K)=0.0409 *6*; α(L)=0.00681 *10*; α(M)=0.001382 *20*
296.5 *3*	4.5 *4*	2514.7	5^-	2218.3	5^-	M1+E2	−7.0 *7*	0.0400	α(K)=0.0333 *5*; α(L)=0.00539 *8*; α(M)=0.001092 *16*
									δ: −0.25 *1* or −5.4 *+20−55* in γγ(θ) (1975Ba17).
296.8	0.5 *2*	2811.6	(7^-)	2514.7	5^-				E_γ,I_γ: This transition was found from γγ coin. Eγ from the difference of the level energies assigned to the transition. RI from γγ coin (1975Ba17).
414.7 *2*	83.6 *21*	1776.1	6^+	1361.5	4^+	E2		0.0140 *5*	α(K)=0.01188 *17*; α(L)=0.001740 *25*; α(M)=0.000350 *5*
									α(K)exp=0.015 (1971Or04). Obtained from ratio of α(K)exp(414.8γ) to α(K)exp(666.3γ) (1971Or04).
415.3	1.0 *3*	2811.6	(7^-)	2396.2	6^+				E_γ,I_γ: This transition was found from γγ coin. Eγ from the difference of the level energies assigned to the transition. RI from γγ coin (1975Ba17).
556.3 *3*	1.7 *2*	3070.8	5^-,$6,7^-$	2514.7	5^-				
573.9 *3*	6.7 *3*	3070.8	5^-,$6,7^-$	2496.7	7^-				
593.2 *3*	7.5 *4*	2811.6	(7^-)	2218.3	5^-	E2		0.00511	
619.9 *4*	0.9 *1*	2396.2	6^+	1776.1	6^+	M1(+E2)	−0.17 *+6−8*		
638.8 *8*	0.9 *1*	3450.4	6^+,7^-	2811.6	(7^-)				
656.3 *6*	2.2 *1*	3171.4		2514.7	5^-				
666.5 *3*	100	666.5	2^+	0.0	0^+	E2		0.00378 *6*	α(K)=0.00324 *5*; α(L)=0.000429 *6*; α(M)=8.58×10^{-5} *12*
									α(K)exp=0.0034 (assumed as E2 (1971Or04)).
674.8 *3*	3.7 *10*	3171.4		2496.7	7^-				
684.7 *10*	0.9	3450.4	6^+,7^-	2765.7	8^+				E_γ,I_γ: from 2010Fe02.
695.0 *2*	100	1361.5	4^+	666.5	2^+	E2		0.00340 *5*	α(K)=0.00292 *5*; α(L)=0.000384 *6*; α(M)=7.67×10^{-5} *11*
									E_γ: from 1972Bu28. The authors of 1975Ba17 quoted Eγ=694.8 *2*

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^{126}Sb β^- decay (12.35 d) 1975Ba17,1972Bu28 (continued)

$\gamma(^{126}Te)$ (continued)

E_γ [†]	I_γ [‡&]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[#]	δ[#]	α[a]	Comments
									in text from 1972SoZQ. However, there is no uncertainty of the Eγ in 1972SoZQ. I_γ: Iγ=129 *7* (Sum 695γ and 697γ) (1975Ba17). Iγ=100 from 1972Bu28, 1972SoZQ, 1969KlZZ. From the decay scheme and α, Iγ=100 is apparent and the uncertainty is negligibly small. α(K)exp(695γ+697γ)=0.0030 (1971Or04).
697.0 *2*	32 *6*	3193.7	9^-	2496.7	7^-	E2		0.00337	E_γ: from 1972Bu28. The authors of 1975Ba17 quoted Eγ=696.7 *3* in text from 1972SoZQ. However, there is no uncertainty of the Eγ in 1972SoZQ. I_γ: from 1969KlZZ.
720.7 *4*	54.0 *24*	2496.7	7^-	1776.1	6^+	E1(+M2)	−0.01 *3*		
x726[@] *1*	0.05[@]								
x730.7[@] *10*	0.13[@]								
856.8 *2*	17.7 *9*	2218.3	5^-	1361.5	4^+	E1+M2	+0.029 *6*		
934 *1*	0.8	3450.4	$6^+,7^-$	2514.7	5^-				E_γ,I_γ: from 2010Fe02.
953.7 *4*	1.2 *1*	3450.4	$6^+,7^-$	2496.7	7^-				
958.3 *7*	0.5 *1*	3473.0		2514.7	5^-				
989.6 *3*	6.8 *3*	2765.7	8^+	1776.1	6^+	E2		1.48×10^{-3}	
1036.2 *12*	1.00 *5*	2396.2	6^+	1361.5	4^+	E2			
1061.3 *2*	0.4	2837.4		1776.1	6^+				E_γ: from 1972Bu28. However, the authors of 1975Ba15 state that they do not see the line in γγ coin.
1064.4 *15*	0.9 *6*	2839.7	$(6)^+$	1776.1	6^+				
x1191[@] *1*	0.27[@]								
1213.3 *3*	2.4 *2*	2989.4	(8^+)	1776.1	6^+	(E2)			
x1290[@] *1*	0.23[@]								
1476.9 *9*	0.28 *3*	2839.7	$(6)^+$	1361.5	4^+				
x1589[@] *1*	0.09[@]								

[†] from 1975Ba17, unless otherwise noted.
[‡] From 1975Ba17, unless otherwise noted.
[#] From Adopted Levels, gammas.
[@] From 2010Fe02 with ^{126}Sn/^{126}Sb equilibrium source whitch include γ-rays from ^{126}Sb β^- decay (12.35 d) and ^{126}Sbβ^- decay (19.15 M). The γ-ray could belong to either, or both decays. In each case, RI′s must be corrected.
[&] For absolute intensity per 100 decays, multiply by 0.996 *1*.
[a] 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.

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^{126}Sb β^- decay (12.35 d) 1975Ba17,1972Bu28

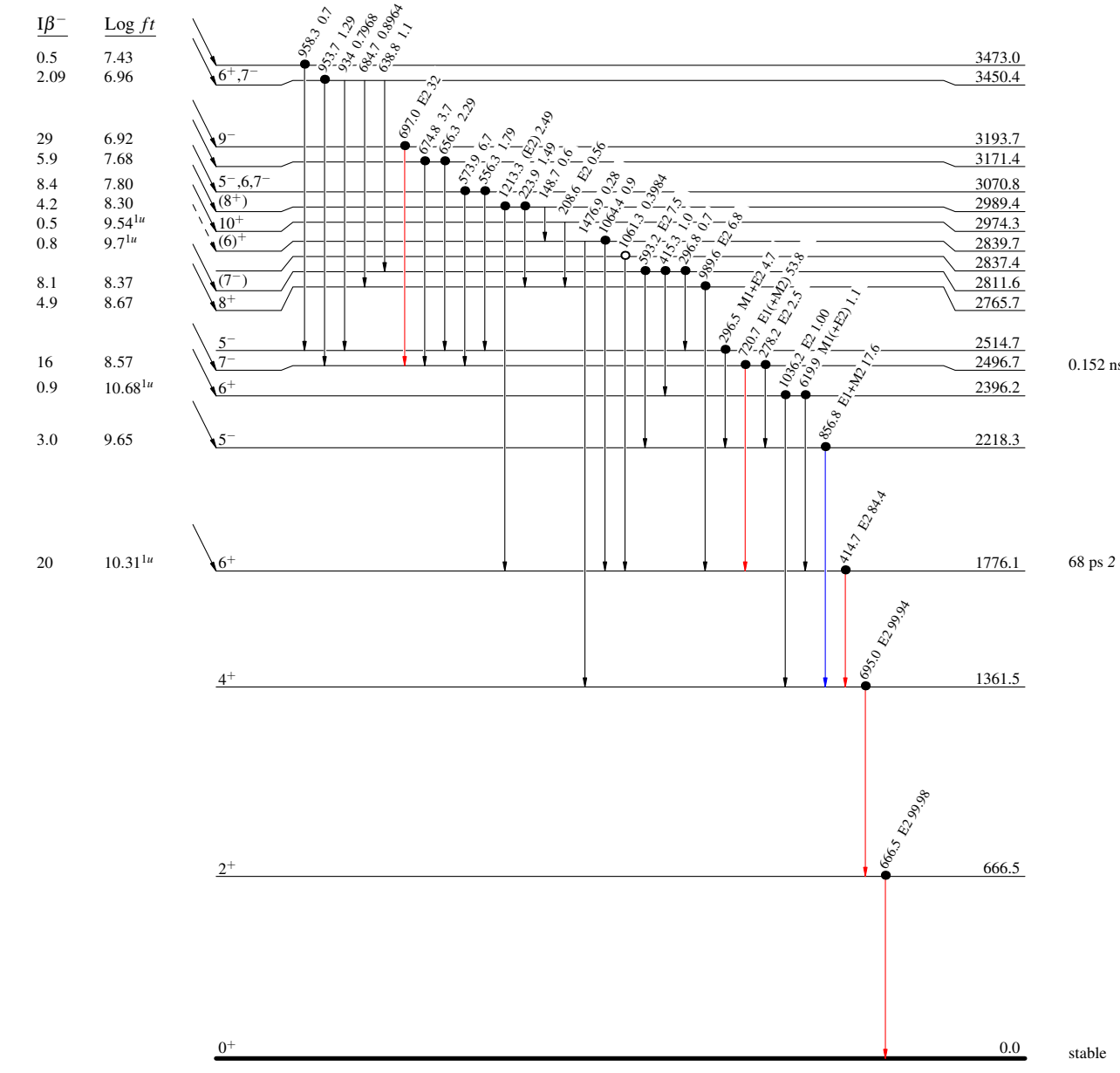
Decay Scheme

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

Legend
- $I_\gamma < 2\% \times I_\gamma^{max}$
- $I_\gamma < 10\% \times I_\gamma^{max}$
- $I_\gamma > 10\% \times I_\gamma^{max}$
- Coincidence
- Coincidence (Uncertain)

(8^-) 0.0 12.35 d *6*
Q_{β^-}=3670 *30* $\%\beta^-$=100
$^{126}_{51}Sb_{75}$

Iβ⁻	Log *ft*
0.5	7.43
2.09	6.96
29	6.92
5.9	7.68
8.4	7.80
4.2	8.30
0.5	9.54[1u]
0.8	9.7[1u]
8.1	8.37
4.9	8.67
16	8.57
0.9	10.68[1u]
3.0	9.65
20	10.31[1u]



$^{126}_{52}Te_{74}$