

Adopted Levels, Gammas

Type	Author	History	Citation	Literature Cutoff Date
Full Evaluation	Zoltan Elekes and Janos Timar		NDS 129, 191 (2015)	28-Feb-2015

$Q(\beta^-)=4363$ 19; $S(n)=6002$ 20; $S(p)=8448$ 22; $Q(\alpha)=-619\times 10^1$ 4 2012Wa38

 ^{128}Sb LevelsCross Reference (XREF) Flags

A ^{128}Sn β^- decay (59.07 min)

B ^{128}Sb IT decay (10.4 min)

E(level) [†]	J ^π	T _{1/2}	XREF	Comments
0.0	8 ⁻	9.05 h 4	AB	$\% \beta^- = 100$ $\mu = 1.31$ 19 (1989Ra17) μ : from static nuclear orientation (1972Kr15). J^π : J=8 from atomic-beam magnetic resonance (1974Ek01). ^{128}Sb g.s. μ agrees with theoretical value of 1.3 for configuration= $((\pi 1g_{7/2})(\nu 1h_{11/2}))8^-$ (1972Kr15). $T_{1/2}$: from weighted average of 9.06 h 3 (1967Ha27), 8.9 h 2 (1962Dr01), 9.9 h 5 (1962Ha16), 8.6 h 2 (1962Uh01), 9.6 h 3 (1965Br34), 8.6 h 6 (1971Ki15), 9.03 h 9 (1972Pa13). Other: 9.6 h (1967Ha27). μ : from $\gamma(\theta)$ in polarized ^{128}Sb (1972Kr15).
0.0+x	5 ⁺ [‡]	10.41 min 18	AB	$\% \beta^- = 96.4$ 10; $\% \text{IT} = 3.6$ 10 E(level): energy difference between this level and ground state is estimated to be ≤ 20 keV from $T_{1/2}$ systematics for E3 transitions of even Sb isotopes (1975Im01). The fact that no K x ray of ^{128}Sb is found in its decay partially supports the above result. $T_{1/2}$: weighted average of 10.3 min 3 (1955Fr11), 10.8 min 2 (1962De11), 10.1 min 2 (1962Dr01), 9.9 min 5 (1962Ha16), 11.0 min 5 (1962Uh01), 9 min 1 (1966To02).
45.70+x 20	4 ⁺ [‡]		A	
77.8+x 3	3 ⁺ [‡]		A	
152.7+x 3	(2 ⁺ , 3 ⁺)		A	J^π : γ from 1 ⁺ and M1 γ to 3 ⁺ .
482.4+x 3	(2, 3) ⁺		A	J^π : γ from 1 ⁺ and γ to 4 ⁺ .
635.2+x 3	1 ⁺		A	J^π : $\log ft = 4.4$ from 0 ⁺ .
751.6+x?			A	E(level): cascade order of 80.9 γ and 115.9 γ has not been determined in ^{128}Sn β^- decay.
833.0+x	1 ⁺		A	J^π : $\log ft = 4.6$ from 0 ⁺ .

[†] E(levels) are adopted from ^{128}Sn β^- decay.

[‡] J(0.0+x) is 5,6,7 from $\log ft = 6.0$ of β^- decay to 6⁺. Three-step γ -cascade relation, 557.3 γ -32.1 γ (M1)-45.7 γ (M1) between 635.1+x 1⁺ and 0.0+x establishes $J^\pi(0.0+x) = 5^+$, $J^\pi(45.7+x) = 4^+$, and $J^\pi(77.8+x) = 3^+$ as the most likely spin sequence.

Adopted Levels, Gammas (continued)

$\gamma(^{128}\text{Sb})$								
$E_i(\text{level})$	J_i^π	$E_\gamma^\dagger$	$I_\gamma^\dagger$	E_f	J_f^π	Mult.	$\alpha^@$	Comments
0.0+x	5 ⁺	(<20.0)		0.0	8 ⁻	[E3]		$E_\gamma, \text{Mult.}$: expected E3 from ΔJ^π . Energy difference between this level and g.s. was estimated to be ≤ 20 keV from $T_{1/2}$ systematics for E3 transitions of even Sb isotopes (1975Im01).
45.70+x	4 ⁺	45.7 2	100	0.0+x	5 ⁺	M1 [#]	5.94 12	$\alpha(\text{K})=5.11$ 10; $\alpha(\text{L})=0.665$ 13; $\alpha(\text{M})=0.132$ 3; $\alpha(\text{N})=0.0254$ 5; $\alpha(\text{O})=0.00249$ 5
77.8+x	3 ⁺	32.1 2	100	45.70+x	4 ⁺	M1 [#]	16.5 4	$\alpha(\text{K})=14.2$ 3; $\alpha(\text{L})=1.89$ 5; $\alpha(\text{M})=0.374$ 9; $\alpha(\text{N})=0.0720$ 17; $\alpha(\text{O})=0.00705$ 17
152.7+x	(2 ⁺ ,3 ⁺)	75.1 2	100	77.8+x	3 ⁺	M1 [#]	1.403 23	$\alpha(\text{K})=1.209$ 20; $\alpha(\text{L})=0.1562$ 25; $\alpha(\text{M})=0.0309$ 5; $\alpha(\text{N})=0.00597$ 10; $\alpha(\text{O})=0.000587$ 10
482.4+x	(2,3) ⁺	404.4 2	100 10	77.8+x	3 ⁺			
		436.7 2	70 10	45.70+x	4 ⁺			
635.2+x	1 ⁺	152.7 2	11 1	482.4+x	(2,3) ⁺	[M1,E2]	0.28 9	$\alpha(\text{K})=0.23$ 7; $\alpha(\text{L})=0.043$ 22; $\alpha(\text{M})=0.009$ 5; $\alpha(\text{N})=0.0016$ 9; $\alpha(\text{O})=0.00014$ 6
		482.3 2	100 5	152.7+x	(2 ⁺ ,3 ⁺)			
		557.3 2	28 3	77.8+x	3 ⁺			
751.6+x?		115.9 [‡] 2	100	635.2+x	1 ⁺			
833.0+x	1 ⁺	80.9 [‡] 2	1.1 4	751.6+x?				
		680.5 1	100 11	152.7+x	(2 ⁺ ,3 ⁺)			

[†] From $^{128}\text{Sn} \beta^-$ decay.[‡] Placement uncertain. Assumed that 80.9 γ precedes 115.9 γ .[#] The multipolarities of 32.1 γ , 45.8 γ , 75.1 γ are limited to M1 from intensity balance at the respective levels and sum peak analysis of $K\alpha$ x ray+ $K\alpha$ x ray, $K\alpha$ x ray+45.8 γ , $K\alpha$ x ray+75.1 γ in $^{128}\text{Sn} \beta^-$ decay.[@] 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.

Adopted Levels, Gammas

Legend

Level Scheme

Intensities: Relative photon branching from each level

-----> γ Decay (Uncertain)
• Coincidence

