

¹²⁰Sb ε+β⁺ decay (5.76 d) 1970Pa17,1971Li09,1984Iw03

Type	Author	History	Citation	Literature Cutoff Date
Full Evaluation	K. Kitao, Y. Tendow and A. Hashizume		NDS 96,241 (2002)	1-Dec-2001

Parent: ¹²⁰Sb: E=0.0+x; J^π=8⁻; T_{1/2}=5.76 d 2; Q(ε)=2681 7; %ε+%β⁺ decay=100

¹²⁰Sb-E: Assumed 151 1.

1970Pa17: ¹²¹Sb(γ,n) E=25 MeV; semi, scin; γ, γγ.

1971Li09: ¹²⁰Sn(n,p) E=14-15 MeV; semi, scin; γ, γγ, (K x ray)γ coin.

1984Iw03: ¹²⁰Sn(p,n); semi.

Others: 1958Mc59, 1960Ik01, 1961Ik03.

Decay scheme was first suggested by 1961Bo13 and 1961Ik03.

¹²⁰Sn Levels

E(level) [‡]	J ^π [†]	T _{1/2}	Comments
0.0	0 ⁺	stable	
1171.7 3	2 ⁺		
2195.1 5	4 ⁺	≤0.15 ns	T _{1/2} : from γγ(t) (1967Ra26); other:≤0.6 (1962Bo16).
2284.9 5	5 ⁻	5.55 ns 3	g=-0.074 10 T _{1/2} : from γγ(t); weighted average of 6.05 ns 20 (1960Ik01), 5.2 ns 4 (1961Bo13), 5.53 ns 6 (1962Bo16), 5.55 ns 25 (1967Ra26), 5.55 ns 3 (1980Mi13); other 8.2 ns 23 (1963Cu04).
2482.2 6	7 ⁻	11.8 μs 5	T _{1/2} : from Xγ(t) (1960Ik01); others: 11 μs 1 (1960Ik01), 11.2 μs 10 (1961Bo13).

[†] From Adopted Levels.

[‡] From a least-squares fit to E(γ's) by the evaluators.

ε,β⁺ radiations

E(decay)	E(level)	I _ε [†]	Log ft	Comments
≈199	2482.2	100	5.174 20	εK=0.8432 5; εL=0.1243 4; εM+=0.03250 11

[†] Absolute intensity per 100 decays.

γ(¹²⁰Sn)

I_γ normalization: based on assumption of no direct feeding to ¹²⁰Sn g.s. and adopted decay scheme.

ce from 1960Ik01; K/(L+M) from 1958Mc59.

γγ coin from 1958Mc59, 1960Ik01, 1961Ik03; see also 1968Ra14, 1970Pa17, 1971Li09.

See 1958Mc59 for coincidence intensity ratios of (x-ray)(89.8γ) coin to (x-ray)(197.3γ) coin. 1960Ik01; results are consistent with adopted ε feeding to 2482.2 level.

γγ(θ), (ce(K))γ(θ), (pol γ)γ(θ); see 1960Ik01 for results generally consistent with adopted level spins.

γγ(θ,H,t) – γ(2285 level) from 1962Bo16; see also 1964DeZZ.

γγ(θ,T,t) – Q(2285 level) from 1970Wo02.

E _γ [†]	I _γ ^{‡@}	E _i (level)	J _i ^π	E _f	J _f ^π	Mult. #	α&	Comments
89.8 3	79.5 16	2284.9	5 ⁻	2195.1	4 ⁺	E1	0.247	α(K)= 0.2133; α(L)= 0.0271; α(M)=0.00524; α(N+..)=0.00113
197.3 3	87.0 11	2482.2	7 ⁻	2284.9	5 ⁻	E2	0.147	α(K)exp=0.300 26, K/(L+M)=8 1. α(K)= 0.1195; α(L)=0.02176; α(M)=0.00432; α(N+..)=0.00093 α(K)exp=0.152 12, K/(L+M)=4.6 2.

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^{120}Sb $\varepsilon+\beta^+$ decay (5.76 d) 1970Pa17,1971Li09,1984Iw03 (continued) $\gamma(^{120}\text{Sn})$ (continued)

E_γ †	I_γ ‡@	$E_i(\text{level})$	J_i^π	E_f	J_f^π	Mult. #	Comments
1023.3 4	99.4 3	2195.1	4 ⁺	1171.7	2 ⁺	E2	$\alpha(\text{K})_{\text{exp}}=0.00115$ 10
1113.4 6	0.821 10	2284.9	5 ⁻	1171.7	2 ⁺		
1171.7 3	100	1171.7	2 ⁺	0.0	0 ⁺	E2	

† From 1971Li09; values from 1970Pa17 seem systematically low.

‡ From 1984Iw03.

Deduced by the evaluators by normalizing I_{ice} to I_γ assuming $\alpha(1171.7\gamma)=0.00092$ for an E2 transition and comparing with theory (1968Ha52).

@ Absolute intensity per 100 decays.

& 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.

^{120}Sb ϵ decay (5.76 d) 1970Pa17,1971Li09,1984Iw03