^{121}Sb IT decay (179 μs) 2008Jo03,2008Ko03

Type	Author	History Citation	Literature Cutoff Date
Full Evaluation	S. Ohya	NDS 111,1619 (2010)	20-Jan-2009

Parent: ^{121}Sb: E=2721.5+x; J^π=(25/2); $T_{1/2}$=179 μs *6*; %IT decay=100

^{121}Sb-$T_{1/2}$: from Adopted Levels, gammas.

2008Jo03: The 179−μs isomer of ^{123}Sb produced in reaction ^{27}Al(^{178}Hf,X), E=1150 MeV, Measured Eγ, Iγ, γγ, γγ(θ), GAMMASPHERE array of 101 Compton-suppressed HPGe detectors. Pulsed beam with short pulses of ≈0.5 ns width and separated by 82.5 ns.

2008Ko03: ^{120}S(n)(^{10}B,Xγ), E=55 MeV, Measured Eγ, Iγ, γγ, OSIRIS-II array of 12 Compton-suppression HPGe detectors, 48 element BGO multiplicity filter.

^{121}Sb Levels

E(level)†	J^π‡	$T_{1/2}$	Comments
0.0	5/2+#		
37.13 *2*	7/2+#	3.46 ns *3*	$T_{1/2}$: from Adopted Levels.
946.97@ *22*	9/2+		
1035.6 *3*	9/2+#		
1139.2 *3*	9/2+,11/2+#		
1144.60 *19*	9/2+#		
1322.0 *3*	(11/2)+#		
1426.90& *24*	(11/2)−		
1649.8@ *3*	(13/2+)		
1997.9@ *3*	(15/2+)		
2057.1 *3*	(13/2+)		
2142.2& *3*	(15/2)−		
2150.7? *6*	(17/2)		
2356.8@ *3*	(17/2+)		
2434.5& *4*	(19/2)−	8.5 ns *5*	$T_{1/2}$: from γγ(t) (2008Jo03).
2551.6 *4*	(21/2−,19/2−)		
2680.0@ *4*	(19/2+)		
2721.5 *4*	(21/2+)		
2721.5+x	(25/2)	179 μs *6*	E(level): x<60 keV for E2, <80 keV for M2 based on typical Weisskopf estimates. $T_{1/2}$: from Adopted Levels.

† From least-squares fit to Eγ's.

‡ Based on γγ(θ), multipolarities and analogy with band structures in odd Sb isotopes, unless where noted otherwise.

From Adopted Levels.

@ Band(A): Band based on 9/2+.

& Band(B): Band based on 11/2−.

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$\gamma(^{121}Sb)$

Iγ from 2008Jo03: Intensity is normalized to 100 for 286.8γ in single-particle structure. Normalized ratio of intensities in the rotational band to those in the single-particle structure is 0.7 *1*.
α(exp) deduced by 2008Jo03 from intensity balances assuming M1 for 323γ, 348γ and 998γ and E2 for 682γ and 292γ.

E_γ [†]	I_γ [‡]	E_i(level)	J_i^π	E_f	J_f^π	Mult.	δ [#]	α [@]	Comments
x		2721.5+x	(25/2)	2721.5	(21/2$^+$)				E_γ: x<60 keV for E2, <80 keV for M2 based on typical Weisskopf estimates.
37.13		37.13	7/2$^+$	0.0	5/2$^+$				E_γ: Rounded-off value from adopted gammas.
41.1 *5*	5.0 *9*	2721.5	(21/2$^+$)	2680.0	(19/2$^+$)	M1+E2	0.50 *15*	15 *3*	α(K)=8.1 *7*; α(L)=5.3 *22*; α(M)=1.1 *5*; α(N+..)=0.21 *9* α(N)=0.20 *8*; α(O)=0.014 *6* α(exp)=15 *3*. δ: from α(exp)=15 *3*.
77.9 *3*	9.4 *10*	2434.5	(19/2)$^-$	2356.8	(17/2$^+$)	E1		0.381 *7*	α(K)=0.328 *6*; α(L)=0.0429 *8*; α(M)=0.00843 *16*; α(N+..)=0.00173 *3* α(N)=0.00159 *3*; α(O)=0.000145 *3* α(exp)=0.2 *4*.
85.3 *3*		2142.2	(15/2)$^-$	2057.1	(13/2$^+$)	E1		0.295	ce(K)/(γ+ce)=0.197 *3*; ce(L)/(γ+ce)=0.0255 *5*; ce(M)/(γ+ce)=0.00501 *9*; ce(N+)/(γ+ce)=0.001032 *19* ce(N)/(γ+ce)=0.000946 *17*; ce(O)/(γ+ce)=8.69×10^{-5} *16* Iγ=18 *2*. α(exp) ≤ 0.4.
117.4 *3*		2551.6	(21/2$^-$,19/2$^-$)	2434.5	(19/2)$^-$	M1(+E2)	<0.9	0.51 *13*	ce(K)/(γ+ce)=0.28 *5*; ce(L)/(γ+ce)=0.051 *22*; ce(M)/(γ+ce)=0.010 *5*; ce(N+)/(γ+ce)=0.0021 *9* ce(N)/(γ+ce)=0.0019 *9*; ce(O)/(γ+ce)=0.00017 *6* Iγ=2.5 *3*. α(exp)=0.47 *17*. δ: from α(exp)=0.47 *17*.
144.3 *5*		2142.2	(15/2)$^-$	1997.9	(15/2$^+$)				Iγ=1 *LT*.
170.3 *3*		2721.5	(21/2$^+$)	2551.6	(21/2$^-$,19/2$^-$)	D			Iγ=4.0 *5*. α(exp)=0.08 *12*.
243		2680.0	(19/2$^+$)	2434.5	(19/2)$^-$				E_γ: from 2008Ko03.
282.2 *3*		1426.90	(11/2)$^-$	1144.60	9/2$^+$	E1(+M2)	+0.01 *+19−14*	0.011 *6*	ce(K)/(γ+ce)=0.009 *5*; ce(L)/(γ+ce)=0.0011 *8*; ce(M)/(γ+ce)=0.00022 *15*; ce(N+)/(γ+ce)=5.E−5 *4* ce(N)/(γ+ce)=4.E−5 *3*; ce(O)/(γ+ce)=4.E−6 *3* Iγ=23 *3*. (282γ)(1145γ)(θ): A_2=−0.08 *5*, A_4=−0.01 *7*.
286.8 *3*		2721.5	(21/2$^+$)	2434.5	(19/2)$^-$	E1(+M2)	+0.02 *3*	0.0102 *4*	ce(K)/(γ+ce)=0.0088 *3*; ce(L)/(γ+ce)=0.00108 *5*;

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$\gamma(^{121}Sb)$ (continued)

E_γ [†]	I_γ [‡]	E_i(level)	J_i^π	E_f	J_f^π	Mult.	δ [#]	α [@]	Comments
									ce(M)/(γ+ce)=0.000211 *9*; ce(N+)/(γ+ce)=4.45×10^{-5} *18* ce(N)/(γ+ce)=4.05×10^{-5} *16*; ce(O)/(γ+ce)=3.93×10^{-6} *16* Iγ=100. I$_\gamma$: 13.3 *14* relative to 100 for 909.8γ. δ: weighted average of +0.03 *14*, −0.04 *6* and +0.05 *4* from $\gamma\gamma(\theta)$ in 2008Jo03. δ=+0.03 *14* from (287γ)(1145γ)(θ): A$_2$=−0.11 *5*, A$_4$=−0.04 *7*. δ=−0.04 *6* from (287γ)(715γ)(θ): A$_2$=−0.048 *19*, A$_4$=+0.01 *3*. δ=+0.05 *4* from (287γ)(292γ)(θ): A$_2$=−0.099 *13*, A$_4$=+0.03 *2*. α(exp)=0.02 *5*.
287.8 *4*		1426.90	(11/2)$^-$	1139.2	9/2$^+$,11/2$^+$				Iγ=6.9 *9*.
292.3 *3*		2434.5	(19/2)$^-$	2142.2	(15/2)$^-$	E2(+M3)	+0.02 *+9−7*	0.041 *7*	ce(K)/(γ+ce)=0.032 *5*; ce(L)/(γ+ce)=0.0052 *10*; ce(M)/(γ+ce)=0.00104 *20*; ce(N+)/(γ+ce)=0.00021 *4* ce(N)/(γ+ce)=0.00020 *4*; ce(O)/(γ+ce)=1.7×10^{-5} *4* Iγ=98 *9*. I$_\gamma$: 3.9 *5* relative to 100 for 909.8γ. (292γ)(715γ)(θ): A$_2$=+0.097 *19*, A$_4$=+0.05 *3*.
323.1 *3*	53 *5*	2680.0	(19/2$^+$)	2356.8	(17/2$^+$)				
327.8 *3*	70 *7*	1649.8	(13/2$^+$)	1322.0	(11/2)$^+$				
348.0 *3*	84 *9*	1997.9	(15/2$^+$)	1649.8	(13/2$^+$)				
359.0 *3*	58 *6*	2356.8	(17/2$^+$)	1997.9	(15/2$^+$)				
375.0 *3*	98 *10*	1322.0	(11/2)$^+$	946.97	9/2$^+$				
391.2 *3*		1426.90	(11/2)$^-$	1035.6	9/2$^+$				Iγ=43 *5*.
400.9[&] *4*		2551.6	(21/2$^-$,19/2$^-$)	2150.7?	(17/2)				Iγ=5.8 *7*.
409.3[&] *6*		2551.6	(21/2$^-$,19/2$^-$)	2142.2	(15/2)$^-$				Iγ=1.7 *4*.
479.4[&] *4*		1426.90	(11/2)$^-$	946.97	9/2$^+$				Iγ=1 *LT*.
492.4 *4*		2142.2	(15/2)$^-$	1649.8	(13/2$^+$)				Iγ=1.4 *4*. I$_\gamma$: 3.0 *4* relative to 100 for 909.8γ.
675.8 *3*	23 *3*	1997.9	(15/2$^+$)	1322.0	(11/2)$^+$				
682.0 *3*	20 *2*	2680.0	(19/2$^+$)	1997.9	(15/2$^+$)				
702.9 *3*	20 *2*	1649.8	(13/2$^+$)	946.97	9/2$^+$				
707.1 *3*	21 *2*	2356.8	(17/2$^+$)	1649.8	(13/2$^+$)				
715.2 *3*		2142.2	(15/2)$^-$	1426.90	(11/2)$^-$	E2(+M3)	−0.17 *+19−8*		ce(K)/(γ+ce)=0.0031 *6*; ce(L)/(γ+ce)=0.00041 *8*; ce(M)/(γ+ce)=8.0×10^{-5} *16*; ce(N+)/(γ+ce)=1.7×10^{-5} *4*

$^{121}_{51}Sb_{70}$-3

^{121}Sb IT decay (179 μs) 2008Jo03,2008Ko03 (continued)

$\gamma(^{121}Sb)$ (continued)

E_γ [†]	I_γ [‡]	E_i(level)	J_i^π	E_f	J_f^π	Comments
						ce(N)/(γ+ce)=1.5×10^{-5} *3*; ce(O)/(γ+ce)=1.5×10^{-6} *3* Iγ=72 *7*. (715γ)(391γ)(θ): A_2=−0.12 *3*, A_4=+0.02 *4*.
909.8 *3*	100	946.97	9/2$^+$	37.13	7/2$^+$	
912.7 *4*		2057.1	(13/2$^+$)	1144.60	9/2$^+$	Iγ=3.7 *5*.
917.8 *4*		2057.1	(13/2$^+$)	1139.2	9/2$^+$,11/2$^+$	Iγ=9.3 *10*.
947.0 *4*	11.7 *14*	946.97	9/2$^+$	0.0	5/2$^+$	
998.3 *4*		1035.6	9/2$^+$	37.13	7/2$^+$	Iγ=51 *5*.
1021.6 *5*		2057.1	(13/2$^+$)	1035.6	9/2$^+$	Iγ=5.2 *7*.
1102.2 *5*		1139.2	9/2$^+$,11/2$^+$	37.13	7/2$^+$	Iγ=15.9 *17*.
1107.5 *3*		1144.60	9/2$^+$	37.13	7/2$^+$	Iγ=10.8 *12*.
1144.6 *3*		1144.60	9/2$^+$	0.0	5/2$^+$	Iγ=15.3 *17*.

[†] From 2008Jo03, except where noted otherwise.

[‡] From 2008Jo03: Intensity is normalized to 100 for 909.8γ in the rotational band. Normalized ratio of intensities in the rotational band to those in the single-particle structure is 0.7 *1*.

[#] From $\gamma\gamma(\theta)$ of 2008Jo03, except where noted otherwise.

[@] 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.

[&] Placement of transition in the level scheme is uncertain.

$^{121}_{51}Sb_{70}$-4

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Decay Scheme

Intensities: Relative I_γ

%IT=100

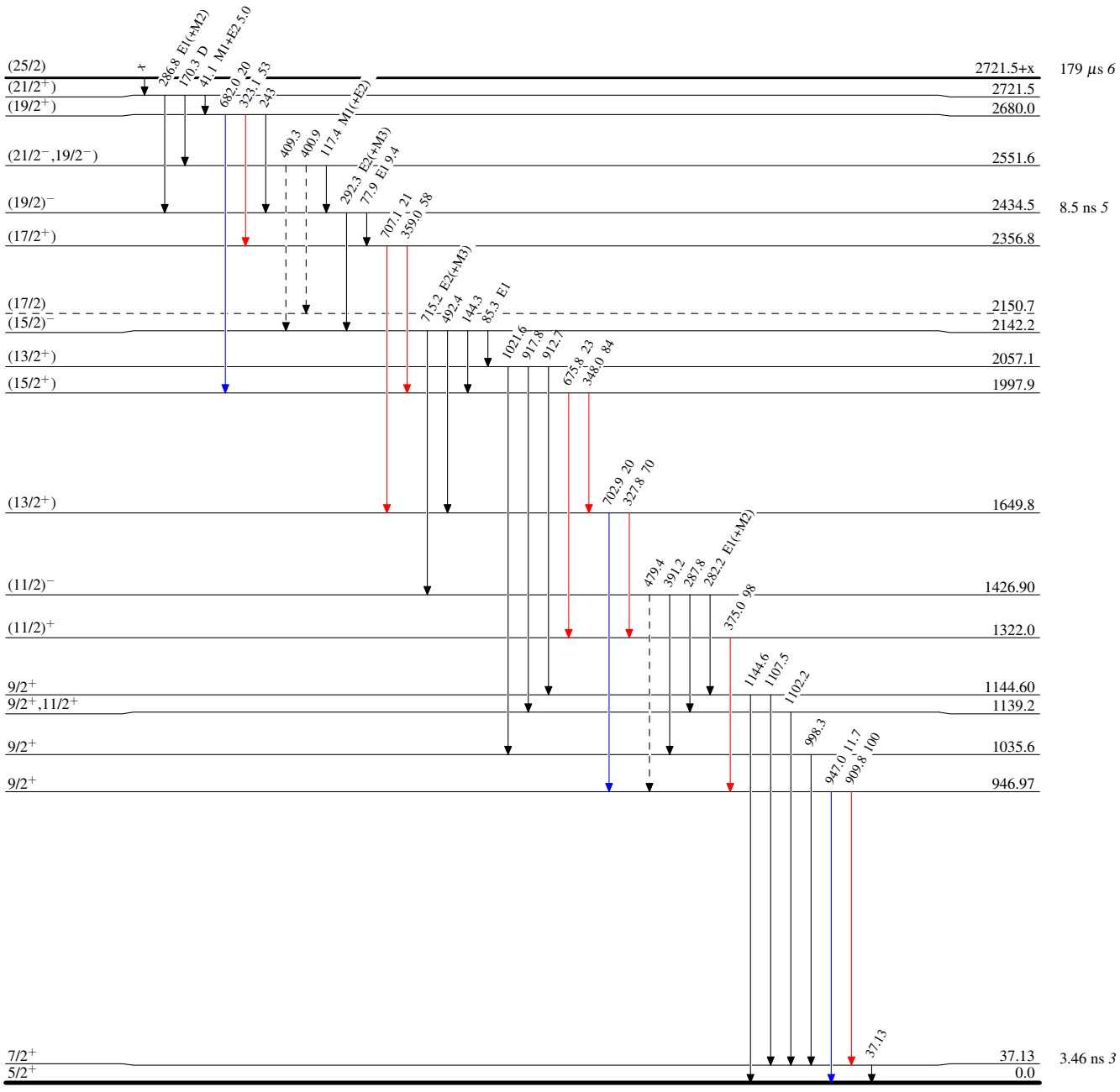
Legend

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

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

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

γ Decay (Uncertain)



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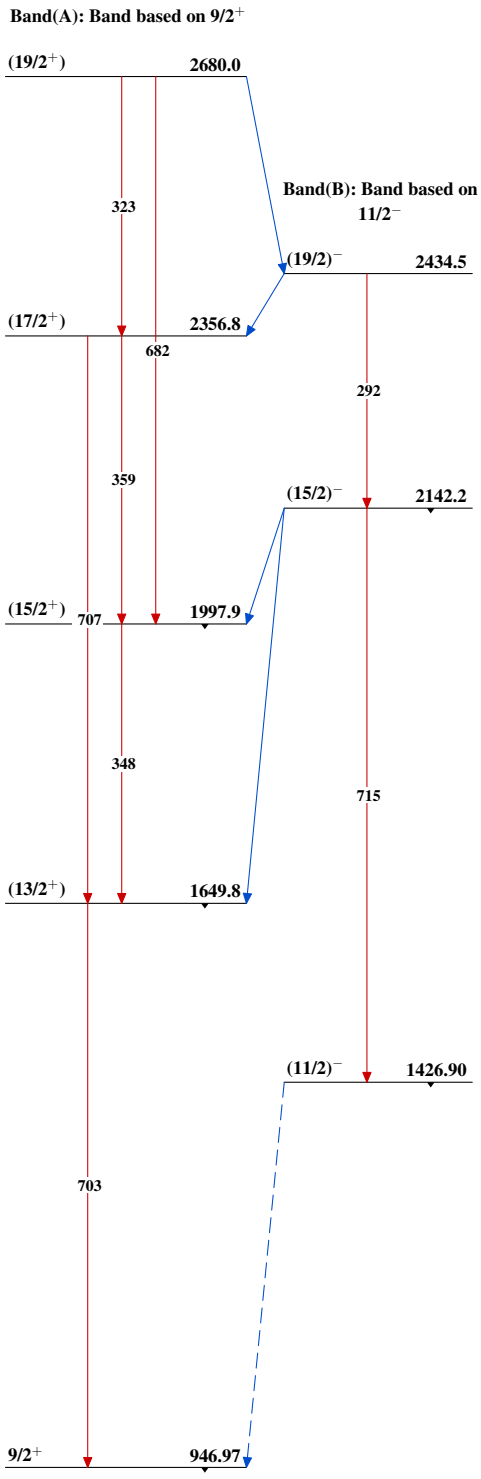

$^{121}_{51}Sb_{70}$