Adopted Levels, Gammas

Type	Author	History Citation	Literature Cutoff Date
Full Evaluation	Jun Chen	NDS 174, 1 (2021)	15-Apr-2021

Q(β^-)=−51.91 *7*; S(n)=8960.0 *21*; S(p)=6571.9 *24*; Q(α)=−3949 *7* 2021Wa16
S(2n)=15766.4 *21*, S(2p)=17966 *27* (2021Wa16).
Mass measurement: 2016Fi07: measured ^{123}Te and ^{123}Sb mass difference.

^{123}Sb Levels

Cross Reference (XREF) Flags

A	^{123}Sn β^- decay (129.2 d)	G	^{122}Sn(pol p,p) IAR	M	^{123}Sb(d,d′)
B	^{123}Sn β^- decay (40.06 min)	H	^{122}Sn(^{3}He,d)	N	^{124}Sn(p,2nγ)
C	^{123}Te ε decay	I	^{122}Sn(α,t)	O	^{124}Te(t,α)
D	^{123}Sb IT decay (214 ns)	J	^{122}Sn(^{7}Li,α2nγ)	P	^{176}Yb(^{31}P,Xγ)
E	^{123}Sb IT decay (61 μs)	K	^{123}Sb(γ,γ')	Q	Coulomb excitation
F	^{120}Sn(α,p)	L	^{123}Sb(n,n′γ)	R	^{9}Be(^{238}U,Fγ)

E(level)†	J$^\pi$‡	$T_{1/2}$	XREF	Comments
0.0	7/2$^+$	stable	ABCDEF HIJKLMNOPQR	μ=+2.5498 *2*; Q=−0.49 *5* Configuration=(π 1g$_{7/2}$) J$^\pi$: spin=7/2 from optical spectroscopy J=7/2 (1932Ba01, 1934Cr03, 1978Bu24); parity from L(t,α)=L(α,t)L(^{3}He,d)=4 from 0$^+$. μ: from 2014StZZ, deduced from ν(^{123}Sb)/ν(^{2}H)=0.84423 *8* measured by NMR (1951Pr02). See also 2014StZZ compilation. Q: from optical spectroscopy (1978Bu24). The 2016St14 compilation quotes a value of −0.692 *14*, from a calculation by R.L.A. Haiduke et al.: Jour Chem Phys 125, 064301 (2006). Nuclear rms charge radius=4.6879 fm *25* (2013An02).
160.33 *3*	5/2$^+$	0.61 ns *4*	AB DEF HIJKLMNOPQR	Configuration=(π 2d$_{5/2}$) XREF: O(144). J$^\pi$: L(t,α)=L(^{3}He,d)=2 from 0$^+$; 160.3γ M1+E2 to 7/2$^+$. $T_{1/2}$: from ^{123}Sn β^- decay (40.06 min), as weighted average of 0.60 ns *8* (1970Si21), 0.64 ns *5* (1963Sc12), 0.57 ns *7* (1969Sh12), 0.60 ns *4* (1973Be18) and 0.62 ns *21* (1964Sh23).
542.04 *5*	(3/2)$^+$	5.3 ps *+12−10*	B F HI LMNO Q	XREF: O(528). J$^\pi$: L(t,α)=L(^{3}He,d)=2 from 0$^+$; spin=3/2 proposed in (α,p) based on J-dependence. $T_{1/2}$: from B(E2)=0.033 *3* in Coulomb excitation, adopted branching=29% *3* for 541.9γ, if J=3/2.
712.58 *23*	1/2$^+$		B F HI L NO	XREF: O(705). J$^\pi$: L(t,α)=L(^{3}He,α)=0 from 0$^+$.
1017 *1*	9/2$^-$,11/2$^-$		I	J$^\pi$: L(α,t)=5 from 0$^+$.
1030.28 *10*	9/2$^+$	0.190 ps *+16−14*	A DE JKLM PQR	J$^\pi$: 1030.3γ M1+E2 to 7/2$^+$; J=9/2 (favored) or 11/2 (0.13% confidence) from $\gamma(\theta)$ in (n,n′γ) (1979Ho28). $T_{1/2}$: From Γ=0.0030 eV *2* in (γ,γ'). Others: 90 fs *35* DSAM (1975An16), 0.19 ps *3* (1978Ca25). 1978Ca25 superseded by 1981Ca10 whose width is already included in the average in (γ,γ').
1088.64 *10*	11/2$^+$	0.52 ps *+5−4*	A DE JKLM PQR	J$^\pi$: 1088.6γ E2, ΔJ=2 to 7/2$^+$; spin=(9/2,11/2) from

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Adopted Levels, Gammas (continued)

^{123}Sb Levels (continued)

E(level)[†]	J$^{\pi}$[‡]	$T_{1/2}$	XREF	Comments
				$\gamma(\theta)$ in (n,n′γ) (1979Ho28) and 11/2 from $\gamma(\theta)$ in Coulomb excitation (1989Ja13). But spin=9/2 from $\gamma(\theta)$ of 1977Ku23 in Coulomb excitation and 1978Be45 in (γ,γ') is inconsistent. $T_{1/2}$: weighted average of 0.53 ps *+5−4* from width in (γ,γ') and 0.45 ps *11* from DSAM in Coulomb excitation (1975An16).
1181.38 *16*	(5/2,7/2)		A H KLM Q	J$^{\pi}$: from $\gamma(\theta)$ in Coulomb excitation (1977Ku23). Other: 11/2 from $\gamma(\theta)$ in (γ,γ') is inconsistent with 1021.2γ to 5/2$^+$ and 1181.1γ D+Q to 7/2$^+$.
1260.90 *20*	(9/2$^+$)		A DE HIJKLM OP R	XREF: H(1253)M(1258). J$^{\pi}$: (5/2,7/2,9/2) from dipole excitation in (γ,γ'); 395.3γ from 11/2$^-$; 1100.6γ to 5/2$^+$; 9/2$^+$ proposed in (^{7}Li,α2nγ) (2009Wa02) and (^{31}P,Xγ) (2005Po03). But L(α,t)=5 from 0$^+$ gives 9/2$^-$,11/2$^-$ for a level at 1262 *1*.
1337.43 *15*	7/2$^+$,9/2$^+$		A JKL O Q	XREF: O(1324)Q(1334.2). J$^{\pi}$: L(t,α)=4 from 0$^+$.
1424.8 *4*			K	
1509.3 *4*	(5/2)$^+$		f HI KLm	XREF: f(1511)m(1510). J$^{\pi}$: L(^{3}He,d)=2 from 0$^+$; spin=(5/2,7/2,9/2) from dipole excitation from 7/2$^+$ g.s. in (γ,γ') (2002Br05).
1513.56 *24*	7/2		f KLm	XREF: f(1511)m(1510). J$^{\pi}$: from $\gamma(\theta)$ of 5651γ from 7163 level with J=7/2.
1575.5 *6*	3/2$^+$,5/2$^+$		HI L	J$^{\pi}$: L(^{3}He,d)=2 from 0$^+$.
1643 *3*	(5/2$^+$)		h K m o	XREF: m(1653)o(1649). J$^{\pi}$: L(^{3}He,d)=2+5 for a level at 1644 *1*, most likely the L=2 component; spin=(5/2,7/2,9/2) from dipole excitation from 7/2$^+$ in (γ,γ').
1656.18 *19*	11/2$^-$		DEF hIJ m oP R	XREF: F(1643)h(1644)I(1644)m(1653)o(1649). J$^{\pi}$: L(α,t)=5 from 0$^+$ for a level at 1644 *1*; L(^{3}He,d)=2+5 from 0$^+$ for a level at 1644 *1*, most likely the L=5 component; J=11/2 from J-dependence of $\sigma(\theta)$ in (α,p) for a level at 1643; 11/2$^-$ proposed in (^{7}Li,α2nγ) (2009Wa02) and (^{31}P,Xγ) (2005Po03).
1729 *10*	1/2$^-$,3/2$^-$		m O	XREF: m(1750). E(level): from (t,α). J$^{\pi}$: L(t,α)=1 from 0$^+$.
1732 *1*	3/2$^+$,5/2$^+$		HI m	XREF: m(1750). E(level): from (^{3}He,d) and L(α,t) (2014MiZZ). J$^{\pi}$: L(^{3}He,d)=2 and L(α,t)=(2) from 0$^+$.
1764.3 *3*	(7/2)$^+$		F I K m	XREF: F(1754)m(1750). J$^{\pi}$: L(α,t)=4 from 0$^+$; J=(7/2) from J-dependence of $\sigma(\theta)$ in (α,p).
1773.4 *11*	(11/2)		J m	XREF: m(1750). E(level),J$^{\pi}$: this level is only proposed by 1985Pi02 in (^{7}Li,α2nγ).
1777.7 *4*			K m	XREF: m(1750).
1810 *30*			M	
1884 *10*	1/2$^-$,3/2$^-$		O	J$^{\pi}$: L(t,α)=1 from 0$^+$.
1896.4 *3*			K	
2011.6 *4*			K	
2026 *3*			K	
2033 *3*			K	
2036.4 *4*			K	
2037.4 *3*	(15/2)$^-$	37.3 ns *8*	DE J P R	J$^{\pi}$: 381.1γ E2, ΔJ=2 to 11/2$^-$. $T_{1/2}$: from $\gamma\gamma$(t) in (^{7}Li,α2nγ) (2009Wa02). Other: 37 ns *4* from from $\gamma\gamma$(t) in 2008Jo03 in ^{123}Sb IT decay (214 ns).
2044.2 *3*	(15/2)$^+$		E J P R	J$^{\pi}$: 955.6γ E2, ΔJ=2 to 11/2$^+$.
2047.6 *3*			K m	XREF: m(2070).
2059.0 *6*			K m	XREF: m(2070).
2105 *4*	3/2$^+$,5/2$^+$		H m o	XREF: m(2070)o(2105).

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Adopted Levels, Gammas (continued)

^{123}Sb Levels (continued)

E(level)[†]	Jπ[‡]	$T_{1/2}$	XREF	Comments
				Jπ: L(^{3}He,d)=2 from 0^+.
2115 *3*			K o	XREF: o(2105).
2137.9 *8*			K	
2170.0 *6*			K m o	XREF: m(2200)o(2184).
2230.3 *4*			K m	XREF: m(2200).
2235 *10*	$1/2^-$,$3/2^-$		m O	XREF: m(2200). Jπ: L(t,α)=1 from 0^+.
2235.0 *6*			K	
2237.9 *4*	$(19/2^-)$	214 ns *3*	DE J P	%IT=100 Jπ: 200.5γ to $(15/2)^-$; 375.7γ from $(23/2^+)$ isomer (61 μs). $T_{1/2}$: from γγ(t) in (^{7}Li,α2nγ) (2009Wa02). Others: 190 ns *30* from γ(t) in ^{123}Sb IT decay (214 ns) (2008Jo03), 222 ns *23* from γ(t) in ^{9}Be(^{238}U,Fγ) (2019Bi04); 110 ns *10* from γ(t) in (^{31}P,Xγ) (2005Po03) is discrepant.
2238.6 *6*			K	
2252.0 *6*	$(5/2^+)$		H K	XREF: H(2250). Jπ: L(^{3}He,d)=(2) from 0^+; spin=(5/2,7/2,9/2) from dipole excitation from $7/2^+$ in (γ,γ′).
2270.0 *7*			K m	XREF: m(2270).
2273.7 *5*			K m	XREF: m(2270).
2278.7 *5*			K m	XREF: m(2270).
2283.3 *7*			K m	XREF: m(2270).
2292.1 *8*	$(9/2)^-$		I K m o	XREF: I(2289)m(2270)o(2296). Jπ: L(α,t)=5 from 0^+; spin=(5/2,7/2,9/2) from dipole excitation from $7/2^+$ in (γ,γ′).
2296.6 *4*			K m o	XREF: m(2270)o(2296).
2300.8 *5*			K o	XREF: o(2296).
2306.4 *3*			K	
2322.3 *3*			K	
2329.5 *3*			K	
2338.4 *8*	$(15/2^+)$		E J	Jπ: proposed by 2009Wa02 in (^{7}Li,α2nγ) based on 1249.7γ to $11/2^+$.
2371.3 *3*			K m o	XREF: m(2380)o(2378).
2377 *4*	$^+$		HI m o	XREF: m(2380)o(2378). Jπ: L(^{3}He,d)=0 and L(α,t)=4 components for a peak at 2377 in 2012MiZY.
2385.5 *7*	$(17/2,19/2)^-$		E J	Jπ: 147.5γ D to $(19/2^-)$, 347.9γ to $(15/2)^-$; 100.4γ E1 from $(19/2)^+$.
2423.0 *4*			K	
2429.3 *3*			K	
2447.3 *6*			K o	XREF: o(2441).
2455.4 *6*			I K o	XREF: I(2452)o(2441).
2459.1 *4*			K	
2472 *3*			K	
2486.0 *4*	$(19/2)^+$	0.7 ns *2*	E J P R	Jπ: 441.8γ E2 to $(15/2)^+$; band assignment. $T_{1/2}$: from centroid-shift analysis in (^{7}Li,α2nγ) (2009Wa02).
2507.3 *6*			K o	XREF: o(2506).
2521.8 *3*			K o	XREF: o(2506). E(level): since spin of this level in (γ,γ′) is expected to be (5/2,7/2,9/2) from dipole excitation from $7/2^+$ g.s., it could be a different level from the 2522, $1/2^+$ level in (^{3}He,d).
2522 *4*	$1/2^+$		HI o	XREF: o(2506). Jπ: L(^{3}He,d)=0 from 0^+.
2584 *5*	$3/2^+$,$5/2^+$		HI m	XREF: m(2580). Jπ: L(^{3}He,d)=2 from 0^+.
2597.7 *4*			K m	XREF: m(2580).

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Adopted Levels, Gammas (continued)

^{123}Sb Levels (continued)

E(level)†	Jπ‡	$T_{1/2}$	XREF	Comments
2605.9 *8*			K m	XREF: m(2580).
2613.6 *5*	(23/2$^+$)	62 μs *4*	E J P R	%IT=100 Jπ: 127.8γ (E2), ΔJ=(2) to (19/2)$^+$; band assignment. (21/2$^+$) proposed by 2005Po03 in (^{31}P,Xγ). $T_{1/2}$: unweighted average of 66 μs *4* from ^{9}Be(^{238}U,Fγ) (2019Bi04), 65 μs *1* (2009Wa02), 52 μs *3* (2008Jo03) and 66 μs *4* (2007Ju06), in ^{123}Sb IT decay (61 μs).
2620.1 *4*			K	
2633 *5*	7/2$^+$,9/2$^+$		I O	Jπ: L(^{3}He,d)=L(t,α)=4 from 0$^+$.
2647.4 *3*			K o	XREF: o(2636).
2687 *9*	(3/2$^+$,5/2$^+$)		H M	XREF: M(?). Jπ: L(^{3}He,d)=(2) from 0$^+$.
2701.6 *5*			K M	XREF: M(?).
2732 *6*	9/2$^-$,11/2$^-$		I M	XREF: M(?). Jπ: L(α,t)=5 from 0$^+$.
2735.2# *5*	(21/2$^-$)#		P	
2756.7 *4*	(5/2$^+$)		H K M	XREF: H(2757)M(?). Jπ: L(^{3}He,d)=(2) from 0$^+$; (5/2,7/2,9/2) from dipole excitation from 7/2$^+$ in (γ,γ').
2807 *7*	$^+$		HI O	XREF: O(2799). E(level): weighted average of 2811 *7* in (^{3}He,d) (2014MiZZ) and 2799 *10* in (t,α) (1973Co33). Jπ: L(^{3}He,d)=0 and L(α,t)=4 components for a peak at 2811 in 2012MiZY.
2843.1 *10*			K m	XREF: m(2860).
2860.6 *9*			K m	XREF: m(2860).
2883.1 *5*			K m	XREF: m(2860).
2891 *8*	3/2$^+$,5/2$^+$		H m	XREF: m(2860). Jπ: L(^{3}He,d)=2 from 0$^+$.
2904.9 *5*			K	
2917 *8*	7/2$^+$,9/2$^+$		I O	E(level): from (α,t). Other: 2915 *10* in (t,α). Jπ: L(α,t)=L(t,α)=4 from 0$^+$.
2919.0 *6*			K	
2934.6 *7*			K	
2968.0# *7*	(23/2$^+$)#		P	
2977 *10*	9/2$^-$,11/2$^-$		I m O	XREF: m(3000). E(level): weighted average of 2972 *10* in (α,t) and 2982 *10* in (t,α). Jπ: L(α,t)=5 from 0$^+$.
2989.0 *6*			K m	XREF: m(3000).
3000.8 *5*			K m	XREF: m(3000).
3017.3 *3*	(9/2$^-$)		I K m	XREF: I(3016)m(3000). Jπ: L(α,t)=(5) from 0$^+$; (5/2,7/2,9/2) from dipole excitation from 7/2$^+$ in (γ,γ').
3052.8 *11*	(25/2$^+$)		R	Jπ: proposed by 2019Bi04 in ^{9}Be(^{238}U,Fγ).
3056.8 *3*			K	
3062.6 *4*			K	
3098.1 *7*			K	
3147.9 *5*			K	
3152.4 *6*			K	
3158.5 *10*	(9/2)$^-$		I K	XREF: I(3156). Jπ: L(α,t)=5 from 0$^+$; (5/2,7/2,9/2) from dipole excitation from 7/2$^+$ in (γ,γ').
3184.5 *4*	7/2$^+$,9/2$^+$		K O	XREF: O(3178). Jπ: L(t,α)=4 from 0$^+$.
3190.6 *3*			K	

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Adopted Levels, Gammas (continued)

^{123}Sb Levels (continued)

E(level)[†]	Jπ[‡]	$T_{1/2}$	XREF	Comments
3198.2 *5*			K	
3209.8 *8*			K	
3228.4 *9*	$(9/2)^-$		I K	XREF: I(3225). Jπ: L(α,t)=5 from 0^+; (5/2,7/2,9/2) from dipole excitation from $7/2^+$ in (γ,γ′).
3277.6 *10*			K	
3281.1 *6*			K	
3294.2 *3*			K	
3296.9 *15*	$(27/2^+)$		R	Jπ: proposed by 2019Bi04 in ^{9}Be(^{238}U,Fγ).
3327 *10*	$1/2^-,3/2^-$		O	Jπ: L(t,α)=1 from 0^+.
3331.9 *5*			K	
3348.6[#] *5*	$(23/2^-)$[#]		P	
3351.7 *6*			K	
3385.7 *7*	$(9/2^-)$		i K	XREF: i(3391). Jπ: L(α,t)=5 for a probable doublet at 3391 *13*.
3399.7 *9*	$(9/2^-)$		i K	XREF: i(3391). Jπ: L(α,t)=5 for a probable doublet at 3391 *13*.
3412.3 *10*			K	
3418.3 *10*			K	
3427.6 *9*			K	
3476.2 *6*	$7/2^+,9/2^+$		I K	XREF: I(3464). Jπ: L(α,t)=4 from 0^+.
3544 *15*	$9/2^-,11/2^-$		I	Jπ: L(α,t)=5 from 0^+.
3738 *16*	$9/2^-,11/2^-$		I	Jπ: L(α,t)=5 from 0^+.
3786.8?[#] *6*	$(25/2^-)$[#]		P	
4025.3[#] *6*	$(27/2^-)$[#]		P	
4392.7?[#] *8*			P	
4773.0[#] *9*			P	
6417.5 *15*	9/2		K	Jπ: from 6418γ(θ) in (γ,γ′) (1978Be45).
6760.0 *14*	7/2		K	Jπ: from 6760γ(θ) in (γ,γ′) (1978Be45).
6874.4 *15*	7/2		K	Jπ: from 6874γ(θ) in (γ,γ′) (1978Be45).
7163.4 *15*	7/2		K	Jπ: from 7163γ(θ) in (γ,γ′) (1978Be45).
7309.7 *14*	9/2		K	Jπ: from 7310γ(θ) in (γ,γ′) (1978Be45).
14261	$3/2^+$	48 keV	G	Jπ: L(pol p,p)=2 from 0^+, J=3/2 from analyzing power.
14390	$1/2^+$	48 keV	G	Jπ: L(pol p,p)=0 from 0^+.
15429	$5/2^+$	74 keV	G	Jπ: L(pol p,p)=2 from 0^+, J=5/2 from analyzing power.
15729	$5/2^+$	93 keV	G	Jπ: L(pol p,p)=2 from 0^+, J=5/2 from analyzing power.
16927	$7/2^-$	94 keV	G	Jπ: L(pol p,p)=3 from 0^+, J=7/2 from analyzing power.
17371	$(7/2^-)$	140 keV	G	Jπ: L(pol p,p)=(3) from 0^+, J=(7/2) from analyzing power.
17558	$(3/2^-)$	202 keV	G	Jπ: L(pol p,p)=(1) from 0^+, J=(3/2) from analyzing power.
18251	$(1/2)^-$	130 keV	G	Jπ: L(pol p,p)=(1) from 0^+, J=(1/2) from analyzing power.

[†] From a least-squares fit to γ-ray energies for levels connected by γ transitions.
[‡] Spin of excited levels by dipole excitations from $7/2^+$ g.s. in (γ,γ′) are expected to be (5/2,7/2,9/2).
[#] Proposed in (^{31}P,Xγ) (2005Po03).

Adopted Levels, Gammas (continued)

γ(^{123}Sb)

E_i(level)	J_i^π	E_γ[‡]	I_γ[‡]	E_f	J_f^π	Mult.	δ	α[†]	Comments
160.33	5/2$^+$	160.34 *3*	100	0.0	7/2$^+$	M1+E2	0.078 *10*	0.1668	B(M1)(W.u.)=0.0075 *5*; B(E2)(W.u.)=1.25 *+36−31* α(K)=0.1439 *21*; α(L)=0.0185 *3*; α(M)=0.00365 *6* α(N)=0.000705 *10*; α(O)=6.94×10^{-5} *10* E_γ: from ^{123}Sn β$^-$ decay (40.06 min). Others: 160.3 *5* from ^{123}Sb IT decay (214 ns), 160.9 *10* from (n,n′γ), 159.8 *10* from ^{9}Be(^{238}U,Fγ). Mult.: from ce data in ^{123}Sn β$^-$ decay (40.06 min) and (p,2nγ), γ(θ) in Coulomb excitation. δ: deduced from $T_{1/2}$=0.61 ns *4* and B(E2)↑=0.0034 *6* from Coulomb excitation. Others: −0.10 *6* (1964Al28) and +0.86 *7* (1977Ku23) from γ(θ) in Coulomb excitation; 0.22 *+18−22* from α(K)exp=0.15 *2* in (p,2nγ), α(K)exp=0.15 *1* and K/L=7.6 *6* in ^{123}Sn β$^-$ decay (40.06 min), using the BrIccMixing program.
542.04	(3/2)$^+$	381.73 *5*	100.0 *13*	160.33	5/2$^+$	M1(+E2)		0.0171 *3*	B(M1)(W.u.)<0.07 α(K)=0.01462 *21*; α(L)=0.00198 *17*; α(M)=0.00039 *4* α(N)=7.5×10^{-5} *6*; α(O)=7.2×10^{-6} *3* E_γ: weighted average of 381.75 *5* from ^{123}Sn β$^-$ decay (40.06 min), 381.79 *15* from (n,n′γ), and 381.6 *1* from Coulomb excitation. I_γ: from Coulomb excitation. Other: 100 *6* from ^{123}Sn β$^-$ decay (40.06 min), 100 *7* from (n,n′γ). Mult.: mainly M1 from ce data in (p,2nγ).
		541.94 *10*	41 *5*	0.0	7/2$^+$	[E2]		0.00620	B(E2)(W.u.)=18.0 *+45−37* α(K)=0.00531 *8*; α(L)=0.000719 *10*; α(M)=0.0001427 *20* α(N)=2.73×10^{-5} *4*; α(O)=2.58×10^{-6} *4* E_γ: weighted average of 541.95 *10* from ^{123}Sn β$^-$ decay (40.06 min), 542.1 *2* from (n,n′γ), and 541.9 *1* from Coulomb excitation. I_γ: unweighted average of 45 *6* from ^{123}Sn β$^-$ decay (40.06 min), 47 *5* from (n,n′γ), and 31.6 *13* from Coulomb excitation.
712.58	1/2$^+$	170.9 *7* 552.21 *24*	44 *33* 100 *22*	542.04 160.33	(3/2)$^+$ 5/2$^+$				E_γ,I_γ: from ^{123}Sn β$^-$ decay (40.06 min). E_γ: weighted average of 552.37 *24* from ^{123}Sn β$^-$ decay (40.06 min) and 552.1 *2* from (n,n′γ). I_γ: from ^{123}Sn β$^-$ decay (40.06 min).
1030.28	9/2$^+$	1030.27 *10*	100	0.0	7/2$^+$	M1+E2	−0.54 *5*	1.51×10^{-3} *2*	B(M1)(W.u.)=0.082 *7*; B(E2)(W.u.)=15.9 *27* α(K)=0.001316 *21*; α(L)=0.0001591 *25*; α(M)=3.13×10^{-5} *5* α(N)=6.05×10^{-6} *10*; α(O)=6.03×10^{-7} *10* E_γ: weighted average of 1030.23 *10* from ^{123}Sn β$^-$ decay (129.2 d), 1030.3 *4* from ^{123}Sb IT decay (214 ns),

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Adopted Levels, Gammas (continued)

γ(^{123}Sb) (continued)

E_i(level)	J_i^π	E_γ[‡]	I_γ[‡]	E_f	J_f^π	Mult.	α[†]	Comments
								1030.5 *3* from (γ,γ′), 1030.3 *3* from (n,n′γ), 1030.1 *3* from (^{31}P,Xγ), and 1030.4 *2* from Coulomb excitation. Other: 1030.5 *10* from ^{9}Be(^{238}U,Fγ). Mult.: D+Q from γ(θ) in Coulomb excitation and (n,n′γ); M2 ruled out by RUL. δ: deduced from B(E2)=0.073 *4* in Coulomb excitation, adopted $T_{1/2}$=0.190 ps *+16−14*, with sign from δ=−1.6 *15* from γ(θ) in (n,n′γ) (1979Ho28).
1088.64	11/2$^+$	1088.63 *10*	100	0.0	7/2$^+$	E2	1.13×10^{-3}	α(K)=0.000984 *14*; α(L)=0.0001212 *17*; α(M)=2.39×10^{-5} *4* α(N)=4.60×10^{-6} *7*; α(O)=4.53×10^{-7} *7* B(E2)(W.u.)=19.5 *17* Eγ: weighted average of 1088.64 *10* from ^{123}Sn β$^-$ decay (129.2 d), 1088.6 *3* from ^{123}Sb IT decay (214 ns), 1088.6 *3* from ^{123}Sb IT decay (61 μs), 1088.8 *5* from (γ,γ′), 1088.7 *4* from (n,n′γ), 1088.6 *3* from (^{31}P,Xγ), and 1088.6 *2* from Coulomb excitation. Other: 1089.0 *10* from ^{9}Be(^{238}U,Fγ). Mult.: Q from γγ(θ) in ^{123}Sb IT decay (61 μs) (2009Wa02, 2008Jo03); M2 ruled out by RUL. Other: Q,D from γ(θ) in Coulomb excitation.
1181.38	(5/2,7/2)	1021.24 *24*	100 *5*	160.33	5/2$^+$			Eγ: weighted average of 1021.00 *20* from ^{123}Sn β$^-$ decay (129.2 d), 1021.2 *4* from (n,n′γ), and 1021.8 *3* from Coulomb excitation. Iγ: from ^{123}Sn β$^-$ decay (129.2 d).
		1181.23 *20*	15 *2*	0.0	7/2$^+$	D+Q		Eγ,Iγ: from ^{123}Sn β$^-$ decay (129.2 d). Mult.,δ: from γ(θ) in Coulomb excitation (1977Ku23), with δ=+0.39 *4* for J=5/2 and −0.039 *4* for J=7/2.
1260.90	(9/2$^+$)	1100.6 *3*	100 *22*	160.33	5/2$^+$			Eγ: weighted average of 1100.5 *4* from ^{123}Sn β$^-$ decay (129.2 d), 1100.9 *5* from ^{123}Sb IT decay (214 ns), 1101.0 *3* from (n,n′γ), and 1100.2 *3* from (^{31}P,Xγ). Other: 1101.0 *10* from ^{9}Be(^{238}U,Fγ). Iγ: from ^{123}Sb IT decay (214 ns). Others: 100 *50* from ^{123}Sn β$^-$ decay (129.2 d) and 100 *27* from (^{31}P,Xγ).
		1260.8 *4*	43 *11*	0.0	7/2$^+$			Eγ: weighted average of 1260.9 *4* from ^{123}Sn β$^-$ decay (129.2 d), 1260.9 *7* from ^{123}Sb IT decay (214 ns), 1261.0 *5* from (n,n′γ), and 1260.5 *4* from (^{31}P,Xγ). Iγ: weighted average of 64 *36* from ^{123}Sn β$^-$ decay (129.2 d), 39 *11* from ^{123}Sb IT decay (214 ns), and 47 *13* from (^{31}P,Xγ).
1337.43	7/2$^+$,9/2$^+$	1177.03 *20*	30 *3*	160.33	5/2$^+$			Eγ: weighted average of 1177.06 *20* from ^{123}Sn β$^-$ decay (129.2 d) and 1176.8 *6* from (n,n′γ). Iγ: from ^{123}Sn β$^-$ decay (129.2 d). Other: <45 from (n,n′γ).
		1337.49 *20*	100 *6*	0.0	7/2$^+$			Eγ: weighted average of 1337.44 *20* from ^{123}Sn β$^-$ decay (129.2 d) and 1337.6 *3* from (n,n′γ). Iγ: from ^{123}Sn β$^-$ decay (129.2 d). Other: 100 *9* from (n,n′γ).
1424.8		1424.8 *4*		0.0	7/2$^+$			
1509.3	(5/2)$^+$	1350.0 *20*	<119	160.33	5/2$^+$			Eγ,Iγ: from (n,n′γ).
		1509.2 *4*	100 *19*	0.0	7/2$^+$			Eγ: weighted average of 1509.0 *4* from (γ,γ′) and 1509.6 *6* from (n,n′γ). Iγ: from (n,n′γ).
1513.56	7/2	1353.4 *4*	56 *11*	160.33	5/2$^+$			

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Adopted Levels, Gammas (continued)

γ(^{123}Sb) (continued)

E_i(level)	J_i^π	E_γ ‡	I_γ ‡	E_f	J_f^π	Mult.	α †	Comments
1513.56	7/2	1513.5 *3*	100	0.0	$7/2^+$			E_γ: weighted average of 1513.4 *3* from (γ,γ′) and 1514.6 *12* from (n,n′γ).
1575.5	$3/2^+$,$5/2^+$	1575.5 *6*	100	0.0	$7/2^+$			E_γ: from (n,n′γ).
1643	$(5/2^+)$	1643 *3*	100	0.0	$7/2^+$			
1656.18	$11/2^-$	395.3 *3*	32 *3*	1260.90	$(9/2^+)$			E_γ: weighted average of 396.0 *5* from ^{123}Sb IT decay (214 ns), 395.2 *2* from (^{31}P,Xγ), and 395.4 *10* from ^{9}Be(^{238}U,Fγ). I_γ: weighted average of 30.9 *32* from ^{123}Sb IT decay (214 ns), 34.9 *79* from (^{31}P,Xγ), and 35 *19* from ^{9}Be(^{238}U,Fγ).
		567.5 *3*	16 *3*	1088.64	$11/2^+$			E_γ: weighted average of 567.7 *4* from ^{123}Sb IT decay (214 ns), 567.3 *3* from (^{31}P,Xγ), and 568.2 *10* from ^{9}Be(^{238}U,Fγ). I_γ: weighted average of 14.9 *32* from ^{123}Sb IT decay (214 ns) and 19.0 *48* from (^{31}P,Xγ). Other: 28 *14* from ^{9}Be(^{238}U,Fγ).
		625.9 *3*	100 *8*	1030.28	$9/2^+$	(E1)	1.51×10^{-3}	α(K)=0.001316 *19*; α(L)=0.0001576 *23*; α(M)=3.10×10^{-5} *5* α(N)=5.97×10^{-6} *9*; α(O)=5.88×10^{-7} *9* E_γ: weighted average of 626.1 *4* from ^{123}Sb IT decay (214 ns), 625.7 *3* from (^{31}P,Xγ), and 626.0 *10* from ^{9}Be(^{238}U,Fγ). I_γ: from ^{123}Sb IT decay (214 ns). Other: 100 *19* from (^{31}P,Xγ), 100 *45* from ^{9}Be(^{238}U,Fγ). Mult.: D from γγ(θ) in ^{123}Sb IT decay; E1 required by level scheme.
		1655.9		0.0	$7/2^+$	[M2]	1.25×10^{-3}	α(K)=0.001036 *15*; α(L)=0.0001262 *18*; α(M)=2.49×10^{-5} *4* α(N)=4.81×10^{-6} *7*; α(O)=4.81×10^{-7} *7*; α(IPF)=5.73×10^{-5} *8* E_γ: from ^{123}Sb IT decay (2009Wa02).
1764.3	$(7/2)^+$	1764.3 *3*		0.0	$7/2^+$			
1773.4	(11/2)	436		1337.43	$7/2^+$,$9/2^+$	(D)		Mult.: from γ(θ) in (^{7}Li,α2nγ).
1777.7		1777.7 *4*		0.0	$7/2^+$			
1896.4		1896.4 *3*		0.0	$7/2^+$			
2011.6		2011.6 *4*		0.0	$7/2^+$			
2026		2026 *3*		0.0	$7/2^+$			
2033		2033 *3*		0.0	$7/2^+$			
2036.4		2036.4 *4*		0.0	$7/2^+$			
2037.4	$(15/2)^-$	381.2 *3*	100.0 *25*	1656.18	$11/2^-$	E2	0.01734	α(K)=0.01467 *21*; α(L)=0.00215 *3*; α(M)=0.000429 *7* α(N)=8.14×10^{-5} *12*; α(O)=7.47×10^{-6} *11* B(E2)(W.u.)=0.0490 *11* E_γ: weighted average of 381.7 *4* from ^{123}Sb IT decay (214 ns), 381.0 *2* from (^{31}P,Xγ), and 382.0 *10* from ^{9}Be(^{238}U,Fγ). I_γ: from (^{7}Li,α2nγ) (2009Wa02). Mult.: from γγ(θ) in (^{7}Li,α2nγ) (2009Wa02) and RUL.
		949.0	1.6 *4*	1088.64	$11/2^+$	[M2]	0.00475	α(K)=0.00410 *6*; α(L)=0.000518 *8*; α(M)=0.0001026 *15* α(N)=1.98×10^{-5} *3*; α(O)=1.97×10^{-6} *3* B(M2)(W.u.)=6.5×10^{-4} *17* E_γ,I_γ: from (^{7}Li,α2nγ) (2009Wa02).

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Adopted Levels, Gammas (continued)

γ(^{123}Sb) (continued)

E_i(level)	J_i^π	E_γ ‡	I_γ ‡	E_f	J_f^π	Mult.	α †	Comments
2037.4	(15/2)$^-$	1007.3	2.6 *4*	1030.28	9/2$^+$	[E3]	0.00281	α(K)=0.00241 *4*; α(L)=0.000326 *5*; α(M)=6.48×10^{-5} *9* α(N)=1.241×10^{-5} *18*; α(O)=1.191×10^{-6} *17* B(E3)(W.u.)=0.85 *13* E_γ,I_γ: from (^{7}Li,α2nγ) (2009Wa02).
2044.2	(15/2)$^+$	955.6 *3*	100	1088.64	11/2$^+$	E2	1.51×10^{-3}	α(K)=0.001308 *19*; α(L)=0.0001631 *23*; α(M)=3.22×10^{-5} *5* α(N)=6.19×10^{-6} *9*; α(O)=6.06×10^{-7} *9* E_γ: weighted average of 955.8 *3* from ^{123}Sb IT decay (61 μs), 955.4 *3* from (^{31}P,Xγ), and 955.6 *10* from ^{9}Be(^{238}U,Fγ). Mult.: Q from γγ(θ) in ^{123}Sb IT decay (61 μs); M2 ruled out by RUL, since it would require an isomeric halflife.
2047.6		2047.6 *3*		0.0	7/2$^+$			
2059.0		2059.0 *6*		0.0	7/2$^+$			
2115		2115 *3*		0.0	7/2$^+$			
2137.9		2137.9 *8*		0.0	7/2$^+$			
2170.0		2170.0 *6*		0.0	7/2$^+$			
2230.3		2230.3 *4*		0.0	7/2$^+$			
2235.0		2235.0 *6*		0.0	7/2$^+$			
2237.9	(19/2$^-$)	200.5 *3*	100	2037.4	(15/2)$^-$	[E2]	0.1433	α(K)=0.1162 *18*; α(L)=0.0218 *4*; α(M)=0.00440 *7* α(N)=0.000821 *13*; α(O)=6.92×10^{-5} *11* B(E2)(W.u.)=0.1964 *32* E_γ: weighted average of 201.0 *4* from ^{123}Sb IT decay (214 ns), 200.4 *2* from (^{31}P,Xγ), and 200.4 *10* from ^{9}Be(^{238}U,Fγ).
2238.6		2238.6 *6*		0.0	7/2$^+$			
2252.0	(5/2$^+$)	2252.0 *6*		0.0	7/2$^+$			
2270.0		2270.0 *7*		0.0	7/2$^+$			
2273.7		2112.9 *9*	27 *13*	160.33	5/2$^+$			
		2273.8 *5*	100	0.0	7/2$^+$			
2278.7		2118.3 *6*	80 *24*	160.33	5/2$^+$			
		2278.7 *6*	100	0.0	7/2$^+$			
2283.3		2283.3 *7*		0.0	7/2$^+$			
2292.1	(9/2)$^-$	2292.1 *8*		0.0	7/2$^+$			
2296.6		2296.6 *4*		0.0	7/2$^+$			
2300.8		2300.8 *5*		0.0	7/2$^+$			
2306.4		2306.4 *3*		0.0	7/2$^+$			
2322.3		2322.3 *3*		0.0	7/2$^+$			
2329.5		2329.5 *3*		0.0	7/2$^+$			
2338.4	(15/2$^+$)	1249.7		1088.64	11/2$^+$			
2371.3		2371.3 *3*		0.0	7/2$^+$			
2385.5	(17/2,19/2)$^-$	147.5		2237.9	(19/2$^-$)	D		E_γ,Mult.: from (^{7}Li,α2nγ) (2009Wa02), with Mult=M1 or E1 from ce data.
		347.9		2037.4	(15/2)$^-$			E_γ: from (^{7}Li,α2nγ) (2009Wa02).
2423.0		2262.2 *6*	51 *12*	160.33	5/2$^+$			
		2423.2 *4*	100	0.0	7/2$^+$			

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Adopted Levels, Gammas (continued)

γ(^{123}Sb) (continued)

E_i(level)	J_i^π	E_γ[‡]	I_γ[‡]	E_f	J_f^π	Mult.	α[†]	Comments
2429.3		2429.3 *3*		0.0	7/2$^+$			
2447.3		2287.3 *10*	50 *17*	160.33	5/2$^+$			
		2447.2 *6*	100	0.0	7/2$^+$			
2455.4		2455.4 *6*		0.0	7/2$^+$			
2459.1		2459.1 *4*		0.0	7/2$^+$			
2472		2472 *3*		0.0	7/2$^+$			
2486.0	(19/2)$^+$	100.4	1.44 *10*	2385.5	(17/2,19/2)$^-$	E1	0.187	α(K)=0.1612 *23*; α(L)=0.0206 *3*; α(M)=0.00405 *6* α(N)=0.000768 *11*; α(O)=7.12×10^{-5} *10* B(E1)(W.u.)=5.3×10^{-6} *+21−13* E_γ,I_γ,Mult.: from (^{7}Li,α2nγ), with Mult from ce data in 2009Wa02.
		147.6	1.65 *21*	2338.4	(15/2$^+$)	[E2]	0.416	α(K)=0.325 *5*; α(L)=0.0737 *11*; α(M)=0.01505 *21* α(N)=0.00278 *4*; α(O)=0.000222 *4* B(E2)(W.u.)=5.0 *+21−13* E_γ,I_γ: from (^{7}Li,α2nγ).
		441.8 *3*	100 *3*	2044.2	(15/2)$^+$	E2	0.01111	α(K)=0.00945 *14*; α(L)=0.001336 *19*; α(M)=0.000266 *4* α(N)=5.06×10^{-5} *8*; α(O)=4.71×10^{-6} *7* B(E2)(W.u.)=1.26 *+49−28* E_γ: weighted average of 441.9 *3* from ^{123}Sb IT decay (61 μs) and 441.7 *4* from (^{31}P,Xγ), and 441.6 *10* from ^{9}Be(^{238}U,Fγ). I_γ,Mult.: from (^{7}Li,α2nγ), with Mult from γγ(θ) and RUL.
2507.3		2507.3 *6*		0.0	7/2$^+$			
2521.8		2521.8 *3*		0.0	7/2$^+$			
2597.7		2597.7 *4*		0.0	7/2$^+$			
2605.9		2605.9 *8*		0.0	7/2$^+$			
2613.6	(23/2$^+$)	127.6 *3*	100.0 *11*	2486.0	(19/2)$^+$	(E2)	0.691 *12*	α(K)=0.525 *9*; α(L)=0.1338 *23*; α(M)=0.0274 *5* α(N)=0.00504 *9*; α(O)=0.000393 *7* B(E2)(W.u.)=0.00435 *+40−34* E_γ: weighted average of 127.8 *3* from ^{123}Sb IT decay (61 μs) (2008Jo03), 127.0 *5* from (^{31}P,Xγ) (2005Po03), and 128.2 *10* from ^{9}Be(^{238}U,Fγ). I_γ: from (^{7}Li,α2nγ) (2009Wa02). Mult.: O+Q from γγ(θ) in (^{7}Li,α2nγ); M3 ruled out and E2 preferred by RUL.
		375.7	2.7 *6*	2237.9	(19/2$^-$)	[M2]	0.0671	α(K)=0.0572 *8*; α(L)=0.00802 *12*; α(M)=0.001605 *23* α(N)=0.000310 *5*; α(O)=3.02×10^{-5} *5* B(M2)(W.u.)=4.4×10^{-5} *10* E_γ,I_γ: from (^{7}Li,α2nγ).
2620.1		2620.1 *4*		0.0	7/2$^+$			
2647.4		2487.0 *4*	100	160.33	5/2$^+$			
		2647.4 *4*	51 *16*	0.0	7/2$^+$			
2701.6		2701.6 *5*		0.0	7/2$^+$			
2735.2	(21/2$^-$)	497.2[#] *3*	100	2237.9	(19/2$^-$)			

Adopted Levels, Gammas (continued)

γ(^{123}Sb) (continued)

E_i(level)	J_i^π	E_γ[‡]	I_γ[‡]	E_f	J_f^π	Comments
2756.7	(5/2$^+$)	2756.7 *4*		0.0	7/2$^+$	
2843.1		2843.1 *10*		0.0	7/2$^+$	
2860.6		2860.6 *9*		0.0	7/2$^+$	
2883.1		2883.1 *5*		0.0	7/2$^+$	
2904.9		2904.9 *5*		0.0	7/2$^+$	
2919.0		2919.0 *6*		0.0	7/2$^+$	
2934.6		2934.6 *7*		0.0	7/2$^+$	
2968.0	(23/2$^+$)	482.0[#] *5*	100	2486.0	(19/2)$^+$	
2989.0		2989.0 *6*		0.0	7/2$^+$	
3000.8		3000.8 *5*		0.0	7/2$^+$	
3017.3	(9/2$^-$)	3017.3 *3*		0.0	7/2$^+$	
3052.8	(25/2$^+$)	439.2 *10*	100	2613.6	(23/2$^+$)	E_γ: from ^{9}Be(^{238}U,Fγ) only.
3056.8		3056.8 *3*		0.0	7/2$^+$	
3062.6		3062.6 *4*		0.0	7/2$^+$	
3098.1		3098.1 *7*		0.0	7/2$^+$	
3147.9		3147.9 *5*		0.0	7/2$^+$	
3152.4		3152.4 *6*		0.0	7/2$^+$	
3158.5	(9/2)$^-$	3158.5 *10*		0.0	7/2$^+$	
3184.5	7/2$^+$,9/2$^+$	3184.5 *4*		0.0	7/2$^+$	
3190.6		3190.6 *3*		0.0	7/2$^+$	
3198.2		3198.2 *5*		0.0	7/2$^+$	
3209.8		3209.8 *8*		0.0	7/2$^+$	
3228.4	(9/2)$^-$	3228.4 *9*		0.0	7/2$^+$	
3277.6		3277.6 *10*		0.0	7/2$^+$	
3281.1		3120.3 *8*	35 *16*	160.33	5/2$^+$	
		3281.4 *8*	100	0.0	7/2$^+$	
3294.2		3134.5 *8*	19 *6*	160.33	5/2$^+$	
		3294.1 *3*	100	0.0	7/2$^+$	
3296.9	(27/2$^+$)	244.1 *10*	100	3052.8	(25/2$^+$)	E_γ: from ^{9}Be(^{238}U,Fγ) only.
3331.9		3331.9 *5*		0.0	7/2$^+$	
3348.6	(23/2$^-$)	613.4[#] *3*	92[#] *23*	2735.2	(21/2$^-$)	
		1110.8[#] *4*	100[#] *31*	2237.9	(19/2$^-$)	
3351.7		3351.7 *6*		0.0	7/2$^+$	
3385.7	(9/2$^-$)	3385.6 *7*		0.0	7/2$^+$	
3399.7	(9/2$^-$)	3399.6 *9*		0.0	7/2$^+$	
3412.3		3412.2 *10*		0.0	7/2$^+$	
3418.3		3418.2 *10*		0.0	7/2$^+$	
3427.6		3427.5 *9*		0.0	7/2$^+$	
3476.2	7/2$^+$,9/2$^+$	3476.1 *6*		0.0	7/2$^+$	
3786.8?	(25/2$^-$)	438.1[#] *3*	100	3348.6	(23/2$^-$)	
4025.3	(27/2$^-$)	238.5[#] *3*	100[#] *33*	3786.8?	(25/2$^-$)	
		676.8[#] *5*	50[#] *25*	3348.6	(23/2$^-$)	

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Adopted Levels, Gammas (continued)

γ(^{123}Sb) (continued)

E_i(level)	J_i^π	E_γ ‡	I_γ ‡	E_f	J_f^π
4392.7?		367.4# *4*	100	4025.3	(27/2$^-$)
4773.0		380.3# *4*	100	4392.7?	
6417.5	9/2	5236 *3*	3.6 *15*	1181.38	(5/2,7/2)
		5329 *3*	2.9 *22*	1088.64	11/2$^+$
		5386 *3*	18.8 *22*	1030.28	9/2$^+$
		6418 *3*	100.0 *15*	0.0	7/2$^+$
6760.0	7/2	5248 *3*	4 *3*	1513.56	7/2
		5498 *3*	9 *2*	1260.90	(9/2$^+$)
		5728 *3*	22 *4*	1030.28	9/2$^+$
		6600 *3*	69 *3*	160.33	5/2$^+$
		6760 *3*	100	0.0	7/2$^+$
6874.4	7/2	5362 *3*	6 *9*	1513.56	7/2
6874.4	7/2	5612 *3*	25 *9*	1260.90	(9/2$^+$)
		6714 *3*	9 *6*	160.33	5/2$^+$
		6874 *3*	100 *9*	0.0	7/2$^+$
7163.4	7/2	5651 *3*	24 *4*	1513.56	7/2
		5901 *3*	8 *3*	1260.90	(9/2$^+$)
		7003 *3*	100 *4*	160.33	5/2$^+$
		7163 *3*	81 *3*	0.0	7/2$^+$
7309.7	9/2	5973 *3*	15 *3*	1337.43	7/2$^+$,9/2$^+$
		6128 *3*	65 *3*	1181.38	(5/2,7/2)
		6221 *3*	14 *3*	1088.64	11/2$^+$
		6278 *3*	27 *3*	1030.28	9/2$^+$
		7310 *3*	100	0.0	7/2$^+$

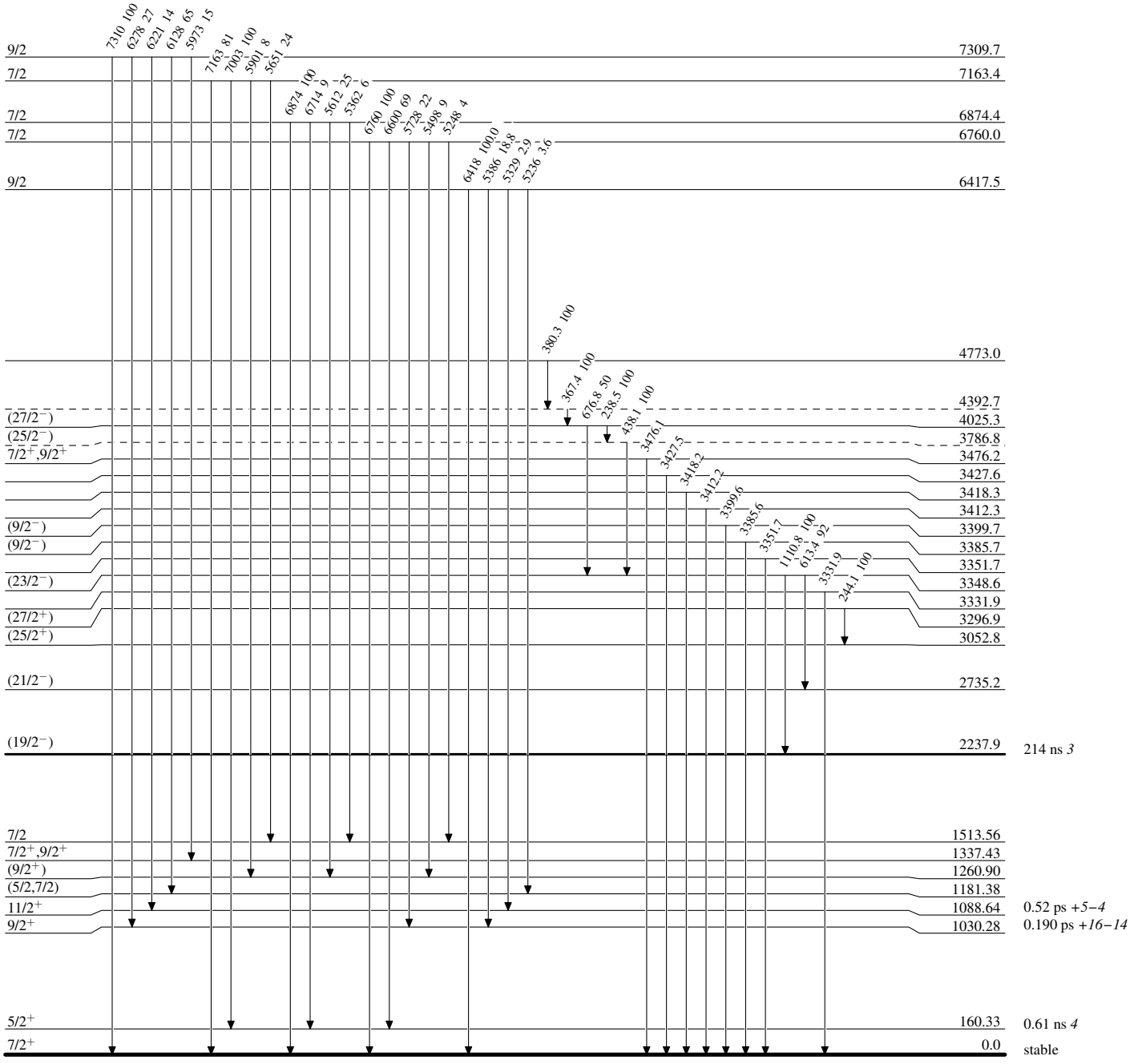
† Additional information 1.
‡ From (γ,γ′), unless otherwise noted.
# From (^{31}P,Xγ) (2005Po03).

$^{123}_{51}Sb_{72}$-12

Adopted Levels, Gammas

Level Scheme

Intensities: Relative photon branching from each level

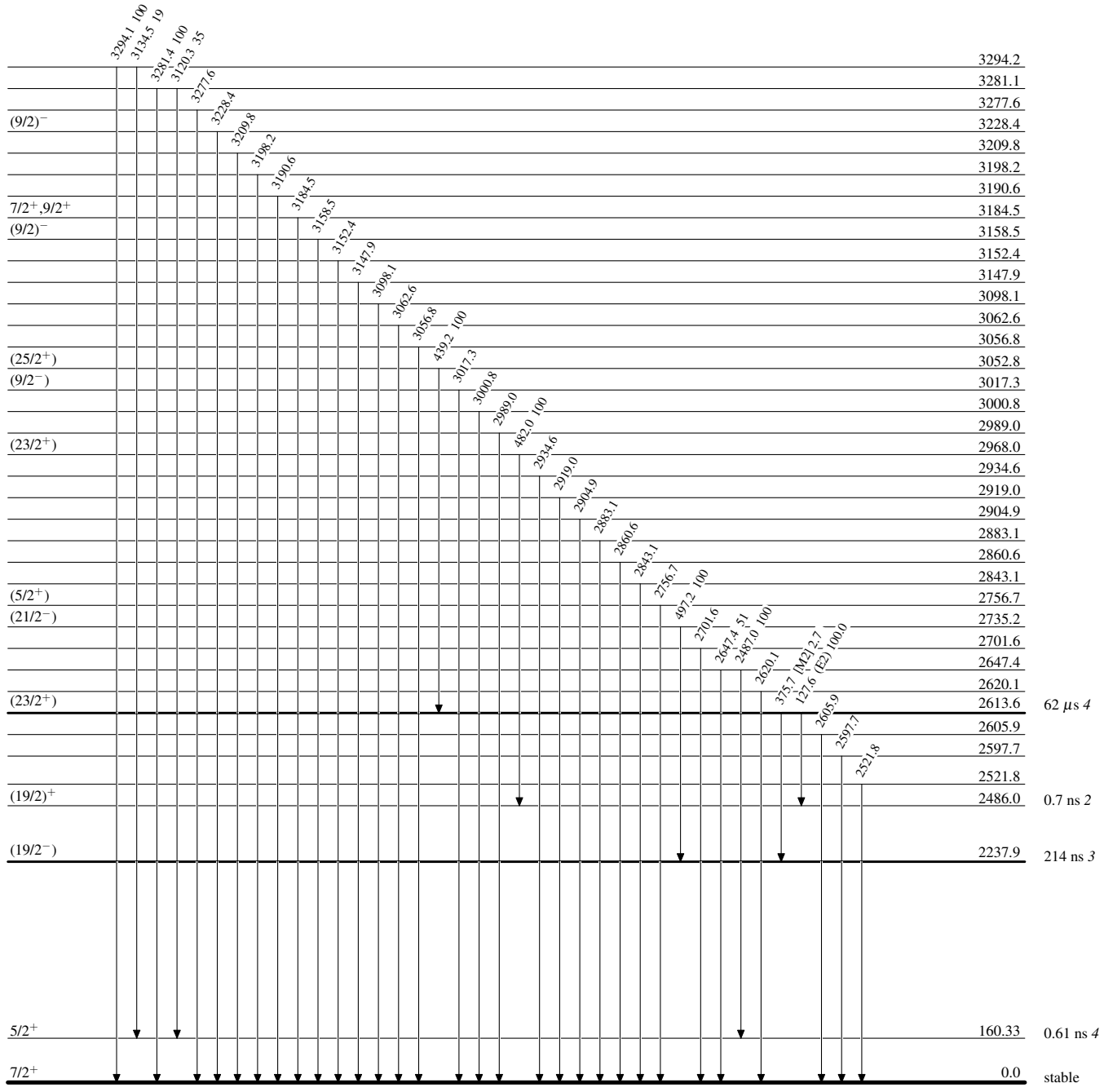


$^{123}_{51}Sb_{72}$

Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Relative photon branching from each level

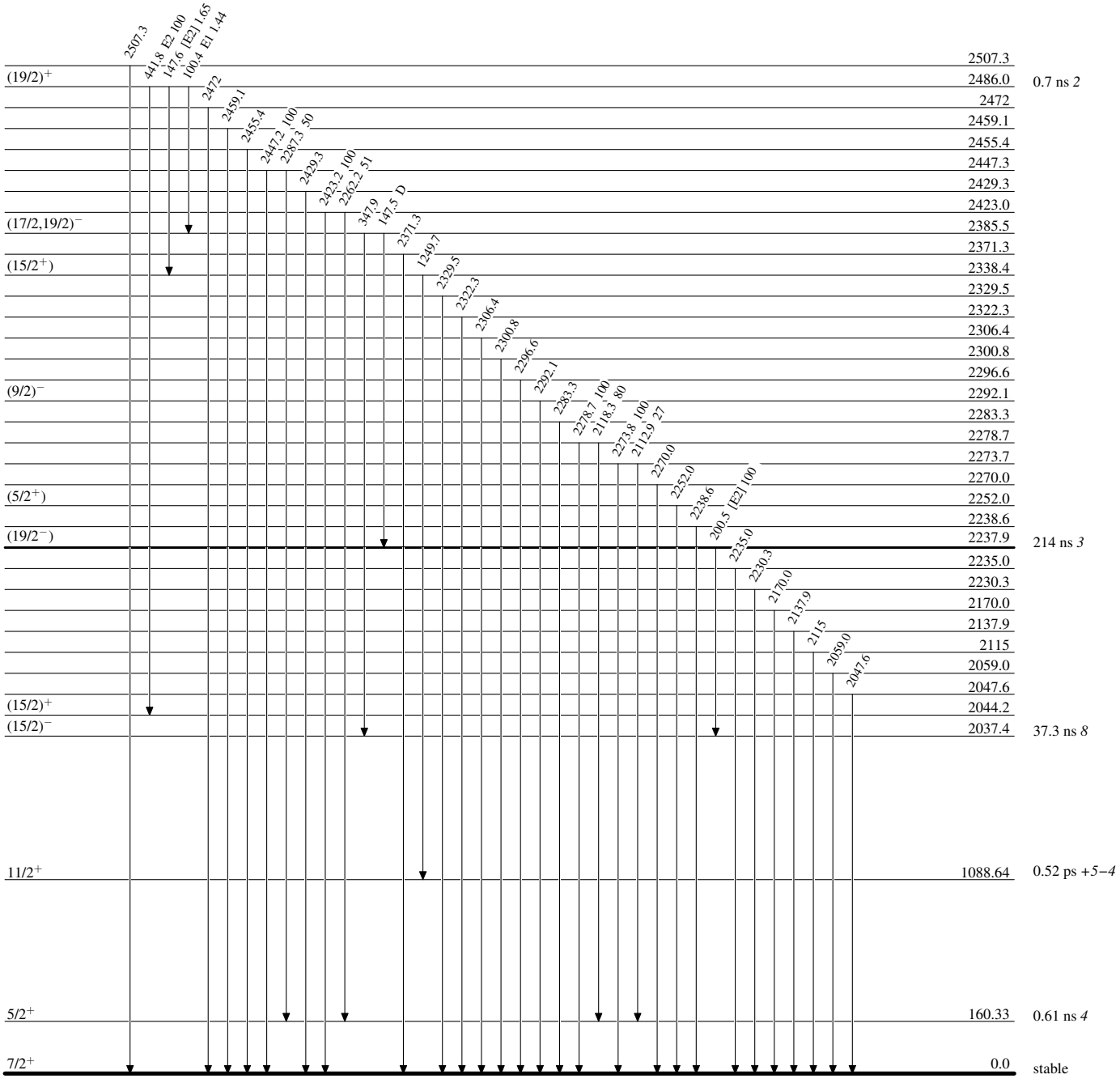


$^{123}_{51}Sb_{72}$

Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Relative photon branching from each level

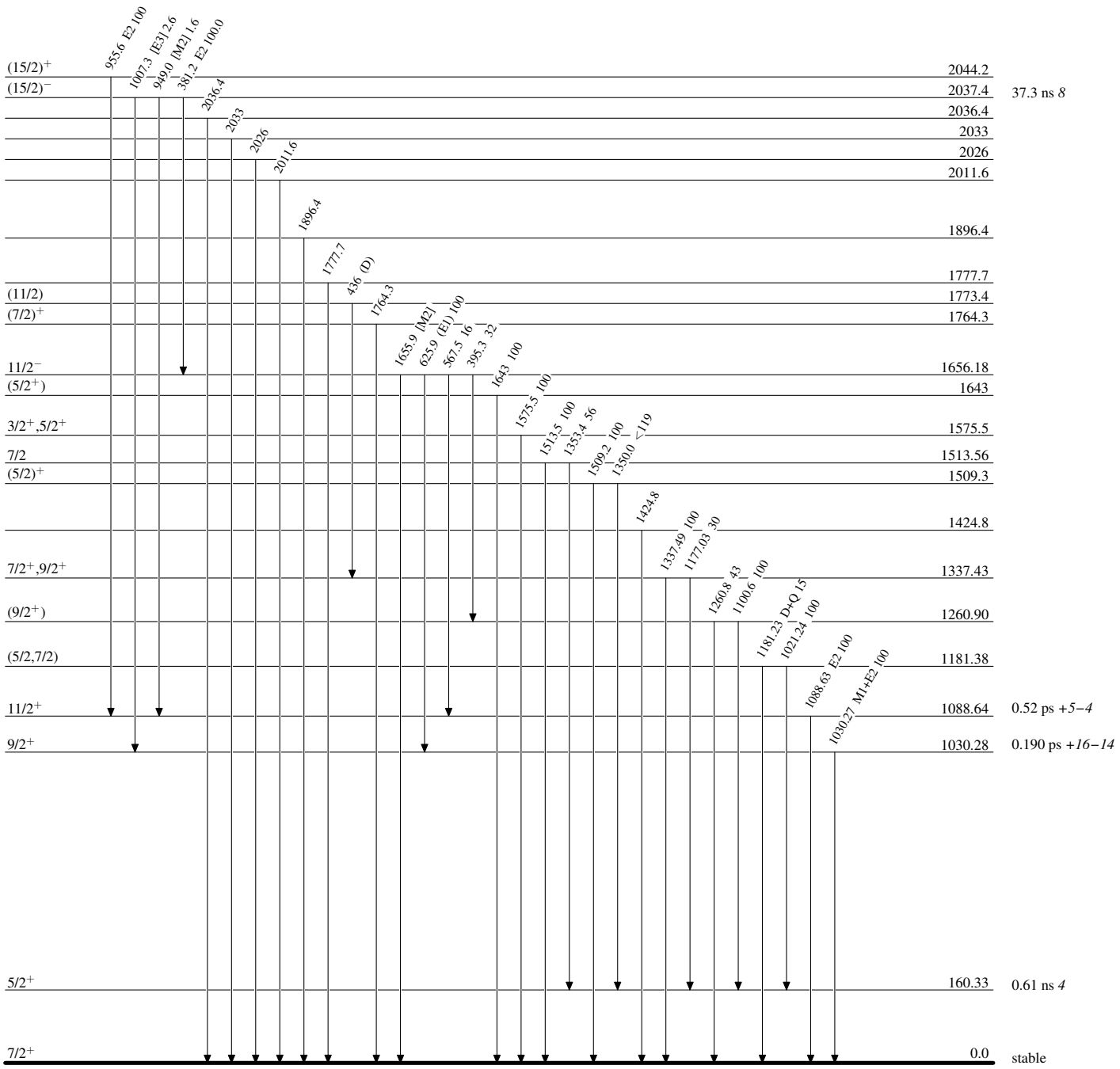


$^{123}_{51}Sb_{72}$

Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Relative photon branching from each level

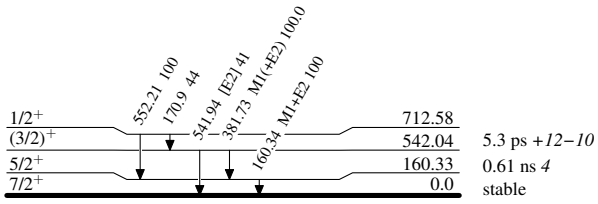


$^{123}_{51}Sb_{72}$

Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Relative photon branching from each level



$^{123}_{51}Sb_{72}$