Adopted Levels, Gammas

Type	Author	History Citation	Literature Cutoff Date
Full Evaluation	J. Katakura	NDS 112,495 (2011)	1-Jan-2010

Q(β^-)=2360 *3*; S(n)=5733.50 *20*; S(p)=1.232×10^4 *3*; Q(α)=−7247.5 *22* 2012Wa38
Note: Current evaluation has used the following Q record 2357.0 275733.1 6 *12319* 31 −7262 *85* 2009AuZZ.

^{125}Sn Levels

Cross Reference (XREF) Flags

A	^{124}Sn(α,^{3}He)	E	^{125}In β^- decay (12.2 s)
B	^{124}Sn(d,p)	F	^{125}In β^- decay (2.36 s)
C	^{124}Sn(d,pγ)	G	^{125}Sn IT decay (0.23 μs)
D	^{124}Sn(n,γ) E=0.05-11.5 keV	H	^{125}Sn IT decay (6.2 μs)

E(level)[†]	J$^\pi$	T$_{1/2}$	XREF	Comments
0.0	11/2$^-$	9.64 d *3*	ABCDEFGH	%β^-=100 μ=−1.348 *2*; Q=+0.14 *21* J$^\pi$: L=5 in (d,p), (α,^{3}He); ΔJ=2, yes shape to 7/2$^+$ from F-K plot. T$_{1/2}$: Value recommended by 1968Er03 based on their value of 9.67 d *4*, along with 9.4 d *1* from 1950Ne52 and 9.625 d *25* from 1966La13. Others: 10 d (1939Li04), 9.5 d (1949Ne06), 10.0 d *3* (1949Le05). μ: LASER spectroscopy (1986An24). See also 2005St24 compilation. Q: LASER spectroscopy (2004Le13,2005Le34). See also 2005St24 compilation. <r^2>$^{1/2}$=4.678 fm *3* (2004An14, evaluation). 2005Le34 gave measured value of 4.677 fm *3*. Configuration=(ν 1h$_{11/2}$).
27.50 *14*	3/2$^+$	9.52 min *5*	ABCDEF	%β^-=100 μ=+0.764 *3*; Q=+0.79 *7* Additional information 1. J$^\pi$: L=2 in (d,p), M1+E2 γ from 1/2$^+$. T$_{1/2}$: From 1968Er03. Others: 9 min (1939Li04), 10 min (1947Su21), 9.8 min *2* (1949Le05), 9.5 min *1* (1950Ne52). μ: LASER spectroscopy (2004Le13,2005Le34). See also 2005St24 compilation. Q: LASER spectroscopy (2004Le13). 2004Le13 gave measured Q value of +0.79 *7*, but 2005Le34 by the same author gave no value because the weakest line was buried in the strongest component of the 11/2$^-$ state and could not be isolated. See also 2005St24 compilation. <r^2>$^{1/2}$=4.676 fm *3* (2005Le34). Configuration=(ν 2d$_{3/2}$).
215.12 *15*	1/2$^+$		BCDE	J$^\pi$: L=0 in (d,p). Configuration=(ν 3s$_{1/2}$).
617.89 *8*	(9/2$^-$)		C F	J$^\pi$: M1,E2 γ to 11/2$^-$; systematics of odd-Sn isotopes favors 9/2$^-$.
854.69 *17*	7/2$^+$		BCD F	XREF: B(859). J$^\pi$: log *ft*=6.23 from 9/2$^+$, M1,E2 γ in ^{124}Sn(d,pγ) to 3/2$^+$.
930.38 *23*	1/2,3/2		CD	J$^\pi$: γ from 1/2$^-$ (n,γ) resonance (62 eV); γ to 1/2$^+$.
936.49 *8*	(7/2)$^-$		BCD F	J$^\pi$: L=(3) in (d,p); M1,E2 γ in ^{124}Sn(d,pγ) to 11/2$^-$.
1059.25 *18*	7/2$^+$		bC F	XREF: b(1069). J$^\pi$: Log *ft*=5.44 from 9/2$^+$, γ to 3/2$^+$.
1072.0 *4*	1/2,3/2		bCD	XREF: b(1069). J$^\pi$: γ from 1/2$^-$ (n,γ) resonance (62 eV); γ to 1/2$^+$.
1087.35 *18*	(15/2$^-$)[‡]		GH	
1187.5 *7*	1/2$^+$,3/2$^+$,5/2$^+$		CD	J$^\pi$: M1,E2 γ to 1/2$^+$.

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Adopted Levels, Gammas (continued)

^{125}Sn Levels (continued)

E(level)[†]	Jπ	$T_{1/2}$	XREF	Comments
1218.86 *18*	(13/2⁻)		GH	Jπ: Systematics.
1258.9 *6*	(5/2)⁺		BCD	XREF: B(1261). Jπ: L=2 in (d,p); J^π=(5/2)⁺ in ^{124}Sn(pol p,p) IAR in ^{125}Sb.
1362.52 *7*	7/2⁺		AB F	XREF: A(1377)B(1364). Jπ: L=4 in (d,p), (α,^{3}He); γ to 3/2⁺.
1540.3 *10*	(5/2)⁺		BC	Jπ: L=2 in (d,p); J^π=(5/2)⁺ in ^{124}Sn(pol p,p) IAR in ^{125}Sb.
1757.0 *11*	1/2,3/2		BCD	Jπ: γ from 1/2⁻ (n,γ) resonance (62 eV); γ to 1/2⁺.
1803 *10*			B	
1875.3 *12*			D	
1880.01 *20*	(15/2⁺)		GH	Jπ: Systematics.
1892.8 *3*	(19/2⁺)	6.2 μs *2*	B GH	Jπ: Systematics. $T_{1/2}$: From 2008Lo07; Other 6.2 μs 7 (2000Pi03).
2059.5 *4*	(23/2⁺)	0.6 μs *2*	G	$T_{1/2}$: From 2008Lo07.
2076.0 *3*	(19/2⁻)[‡]		G	
2135.6 *3*	(19/2⁻)[‡]		G	
2176.1 *4*	7/2,9/2,11/2		F	Jπ: Log *ft*=5.91 from 9/2⁺.
2249.5 *9*	(3/2⁺,5/2⁺)		B D	XREF: B(2254). Jπ: L=(2) in (d,p).
2284.2 *10*			D	
2308.1 *4*	(21/2⁺)		G	
2331.5 *16*			D	
2347.2 *11*			D	
2355 *10*	(1/2⁻,3/2⁻)		B	Jπ: L=(1) in (d,p).
2462.2 *3*	(23/2⁻)[‡]		B G	
2519 *4*			B	
2532.6 *16*			D	
2589 *10*	(5/2⁻,7/2⁻)		B	Jπ: L=(3) in (d,p).
2623.5 *5*	(27/2⁻)[‡]	0.23 μs *2*	G	$T_{1/2}$: From 2008Lo07; other: 0.23 μs 3 (2000Pi03).
2760 *10*	7/2⁻		AB	Jπ: L=3 in (d,p), (α,^{3}He); J^π=7/2⁻ in ^{124}Sn(pol p,p) IAR in ^{125}Sb.
2800 *10*			B	
2883 *10*	(5/2⁻,7/2⁻)		B	Jπ: L=(3) in (d,p).
2990 *15*			B	
3020 *15*			B	
3080 *10*	5/2⁻,7/2⁻		B	Jπ: L=3 in (d,p).
3109 *3*			B	
3150 *15*			B	
3180 *10*			B	
3195 *7*	5/2⁻,7/2⁻		AB	Jπ: L=3 in (d,p), (α,^{3}He).
3247 *10*			B	
3344 *10*	(3/2⁻)		B	Jπ: L=(1) in (d,p); J^π=(3/2⁻) in ^{124}Sn(pol p,p) IAR in ^{125}Sb.
3375 *6*			B	
3416 *10*	(3/2)⁻		B	Jπ: L=1 in (d,p); J^π=(3/2⁻) in ^{125}Sn(pol p,p) IAR in ^{125}Sb.
3482 *10*	1/2⁻,3/2⁻		B	Jπ: L=1 in (d,p).
3530 *10*	(9/2⁻,11/2⁻)		AB	Jπ: L=(5) in (d,p), (α,^{3}He); but L=(1) reported in another (d,p) experiment (1967Sc12).
3610 *10*	(5/2⁻,7/2⁻)		B	Jπ: L=(3) in (d,p).
3703 *10*			aB	XREF: a(3730).
3738 *7*			aB	XREF: a(3730).
3774 *14*			aB	XREF: a(3730).
3820 *15*	(1/2)⁻		aB	XREF: a(3830). L=(1)+(5) in (d,p); J^π=(1/2)⁻ in ^{124}Sn(pol p,p) IAR in ^{125}Sb.
3850 *15*			aB	XREF: a(3830).
3870 *15*			B	
3920 *15*			aB	XREF: a(3940).

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Adopted Levels, Gammas (continued)

^{125}Sn Levels (continued)

E(level)[†]	J^π	XREF	Comments
3970 *15*	(−)	aB	XREF: a(3940). L=(3)+(5) in (d,p), (α,^{3}He).
4030 *15*	(9/2−,11/2−)	AB	XREF: A(4010). J^π: L=(5) in (α,^{3}He).
4100 *15*	(1/2−,3/2−)	B	J^π: L=(1) in (d,p).
4160 *15*	(5/2−,7/2−)	aB	XREF: a(4200). J^π: L=(3) in (d,p).
4200 *15*	(5/2−,7/2−)	aB	XREF: a(4200). J^π: L=(3) in (d,p).
4290 *15*		B	
4320 *15*		B	
4430 *15*		B	
4510 *15*		B	
4550 *15*	(9/2−,11/2−)	AB	XREF: A(4580). J^π: L=(5) in (d,p), (α,^{3}He).
4650 *15*	(5/2−,7/2−)	B	J^π: L=(3) in (d,p).
4730 *15*	(5/2−,7/2−)	B	J^π: L=(3) in (d,p).
4780 *15*		B	
4830 *15*	(5/2−,7/2−)	B	J^π: L=(3) in (d,p).
4880 *15*		B	
4900 *15*	(9/2−,11/2−)	AB	XREF: A(4930). J^π: L=(5) in (α,^{3}He).
4980 *15*		B	
5060 *15*	(9/2−,11/2−)	AB	XREF: A(5020). J^π: L=(5) in (d,p), (α,^{3}He).
5120 *40*	(9/2−,11/2−)	A	J^π: L=(5) in (α,^{3}He).
5230 *40*	(9/2−,11/2−)	A	J^π: L=(5) in (α,^{3}He).

[†] From a least-squares fit to the adopted Eγ's for levels connected by γ's. Others from (d,p) and (α,^{3}He).

[‡] Spin-parity assignments are based on agreement between the experimental level energies and those predicted for $(\nu h_{11/2})^n$ ν=3 states (2000Zh47).

Adopted Levels, Gammas (continued)

$\gamma(^{125}Sn)$

E_i(level)	J_i^π	E_γ[†]	I_γ[†]	E_f	J_f^π	Mult.[c]	δ[c]	α[d]	Comments
215.12	$1/2^+$	187.63[‡] *3*	100	27.50	$3/2^+$	M1+E2	0.9 *+13−6*	0.13 *3*	α(K)=0.110 *22*; α(L)=0.018 *6*; α(M)=0.0035 *13*; α(N+..)=0.00069 *23* α(N)=0.00065 *22*; α(O)=4.5×10^{-5} *9*
617.89	$(9/2^-)$	617.88 *10*	100	0.0	$11/2^-$	(M1,E2)		0.0044 *4*	α(K)=0.0038 *3*; α(L)=0.000482 *20*; α(M)=9.4×10^{-5} *4*; α(N+..)=1.92×10^{-5} *9* α(N)=1.77×10^{-5} *8*; α(O)=1.50×10^{-6} *13*
854.69	$7/2^+$	827.15 *10*	100	27.50	$3/2^+$	(E2)		0.00199 *3*	α(K)=0.001722 *25*; α(L)=0.000216 *3*; α(M)=4.22×10^{-5} *6*; α(N+..)=8.57×10^{-6} *12* α(N)=7.91×10^{-6} *11*; α(O)=6.64×10^{-7} *10* Mult.: M1,E2 in ^{124}Sn(d,pγ) and relevant levels.
930.38	1/2,3/2	715.4[&] *2*	28[@]	215.12	$1/2^+$				
		902.3[&] *4*	100[@]	27.50	$3/2^+$				
936.49	$(7/2)^-$	936.50 *10*	100	0.0	$11/2^-$	(E2)		0.001491 *21*	α(K)=0.001293 *19*; α(L)=0.0001599 *23*; α(M)=3.13×10^{-5} *5*; α(N+..)=6.36×10^{-6} α(N)=5.86×10^{-6} *9*; α(O)=4.97×10^{-7} *7* Mult.: (M1,E2) in ^{124}Sn(d,pγ) and relevant levels.
1059.25	$7/2^+$	1031.75 *10*	100	27.50	$3/2^+$				
1072.0	1/2,3/2	857.1[&] *4*	86[@] *7*	215.12	$1/2^+$				I_γ: 100 in (n,γ).
		1043.9[a] *6*	100[@]	27.50	$3/2^+$				
1087.35	$(15/2^-)$	1087.5 *2*	100	0.0	$11/2^-$				
1187.5	$1/2^+$,$3/2^+$,$5/2^+$	972.4[&] *9*	95[#] *25*	215.12	$1/2^+$	M1,E2		0.00152 *15*	α(K)=0.00132 *14*; α(L)=0.000160 *14*; α(M)=3.1×10^{-5} *3*; α(N+..)=6.4×10^{-6} *6* α(N)=5.9×10^{-6} *5*; α(O)=5.1×10^{-7} *6* I_γ: 54 *25* in (n,γ).
		1159.9[&] *8*	100[#] *10*	27.50	$3/2^+$	M1,E2		0.00103 *10*	α(K)=0.00090 *9*; α(L)=0.000107 *9*; α(M)=2.10×10^{-5} *18*; α(N+..)=7.06×10^{-6} *21* α(N)=3.9×10^{-6} *4*; α(O)=3.4×10^{-7} *4*; α(IPF)=2.77×10^{-6} *21*
1218.86	$(13/2^-)$	1218.7 *2*	100	0.0	$11/2^-$				
1258.9	$(5/2)^+$	1043.9[a] *6*	30	215.12	$1/2^+$				
		1231.1[&] *11*	100	27.50	$3/2^+$	M1,E2		0.00092 *9*	α(K)=0.00079 *8*; α(L)=9.4×10^{-5} *8*; α(M)=1.84×10^{-5} *16*; α(N+..)=1.43×10^{-5} *5* α(N)=3.5×10^{-6} *3*; α(O)=3.0×10^{-7} *3*; α(IPF)=1.05×10^{-5} *7*
1362.52	$7/2^+$	426.03 *10*	3.3 *3*	936.49	$(7/2)^-$				
		507.7 *2*	0.66 *13*	854.69	$7/2^+$				
		744.62 *10*	7.4 *7*	617.89	$(9/2^-)$				

$^{125}_{50}Sn_{75}$-4

Adopted Levels, Gammas (continued)

γ(^{125}Sn) (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[†]	E_f	J_f^π	Mult.[c]	α[d]	Comments
1362.52	7/2$^+$	1335.04 *10*	100 *5*	27.50	3/2$^+$	(E2)	0.000728 *11*	α(K)=0.000607 *9*; α(L)=7.29×10^{-5} *11*; α(M)=1.422×10^{-5} *20*; α(N+..)=3.37×10^{-5} *5* α(N)=2.68×10^{-6} *4*; α(O)=2.32×10^{-7} *4*; α(IPF)=3.08×10^{-5} *5* Mult.: (M1,E2) in ^{125}In β- decay and relevant levels.
		1362.5 *3*	0.33 *7*	0.0	11/2$^-$			
1540.3	(5/2)$^+$	1512.8[#] *9*	100	27.50	3/2$^+$			
1757.0	1/2,3/2	1541.9[@] *10*	100	215.12	1/2$^+$			
1875.3		616.4[@] *10*	100	1258.9	(5/2)$^+$			
1880.01	(15/2$^+$)	661.0[b] *2*	53[b] *5*	1218.86	(13/2$^-$)			
		792.8[b] *2*	100[b] *10*	1087.35	(15/2$^-$)			
1892.8	(19/2$^+$)	≈10		1880.01	(15/2$^+$)			
		805.5[b] *2*	100[b] *10*	1087.35	(15/2$^-$)			
2059.5	(23/2$^+$)	167.0 *3*	100	1892.8	(19/2$^+$)			
2076.0	(19/2$^-$)	988.4 *3*	100	1087.35	(15/2$^-$)			
2135.6	(19/2$^-$)	1048.3 *3*	100	1087.35	(15/2$^-$)			
2176.1	7/2,9/2,11/2	1558.2 *4*	100	617.89	(9/2$^-$)			
2249.5	(3/2$^+$,5/2$^+$)	2034.5[@] *10*	100	215.12	1/2$^+$			
		2221.5[@] *15*	20	27.50	3/2$^+$			
2284.2		2256.7[@] *10*	100	27.50	3/2$^+$			
2308.1	(21/2$^+$)	415.3 *3*	100	1892.8	(19/2$^+$)			
2331.5		1259.5[@] *15*	100	1072.0	1/2,3/2			
2347.2		1275.2[@] *10*	100	1072.0	1/2,3/2			
2462.2	(23/2$^-$)	154.0 *3*		2308.1	(21/2$^+$)			
		326.7 *3*	20 *2*	2135.6	(19/2$^-$)			
		385.9 *3*	100 *10*	2076.0	(19/2$^-$)			
		402.9 *3*	65 *7*	2059.5	(23/2$^+$)			
2532.6		1460.6[@] *15*	100	1072.0	1/2,3/2			
2623.5	(27/2$^-$)	161.3 *3*		2462.2	(23/2$^-$)			

[†] From ^{125}In β^- decay (2.36 s), unless otherwise noted.
[‡] From ^{125}In β^- decay (12.2 s).
[#] From ^{124}Sn(d,pγ).
[@] From ^{124}Sn(n,γ).
[&] Weighted av from ^{124}Sn(d,pγ) and ^{124}Sn(n,γ).
[a] Doubly placed; energy values are weighted av from ^{124}Sn(d,pγ) and ^{124}Sn(n,γ), intensity from ^{125}Sn(n,γ).

$^{125}_{50}Sn_{75}$-5

Adopted Levels, Gammas (continued)

$\gamma(^{125}Sn)$ (continued)

[b] From IT ^{125}Sn IT decay (6.2 μs).
[c] From α(K)exp in ^{125}In β^- decay (12.2 s, 2.36 s) and α(K)exp in ^{124}Sn(d,pγ).
[d] 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.

$^{125}_{50}Sn_{75}$-6

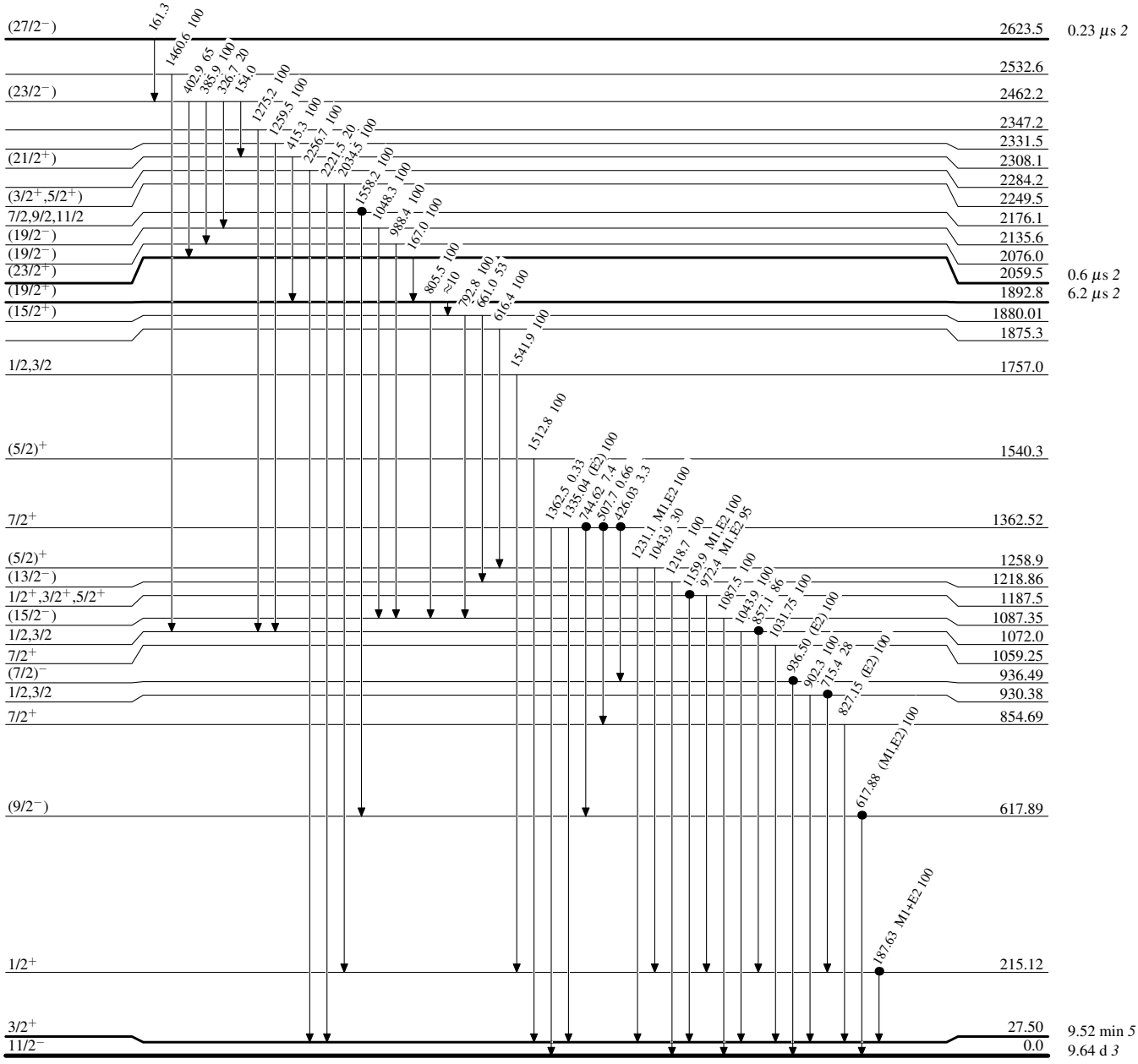
Adopted Levels, Gammas

Legend

Level Scheme

Intensities: Relative photon branching from each level

● Coincidence



$^{125}_{50}Sn_{75}$