^{127}Sn IT decay (4.52 μs) 2000Pi03,2004Ga24

Type	Author	History Citation	Literature Cutoff Date
Full Evaluation	A. Hashizume	NDS 112, 1647 (2011)	1-Oct-2009

Parent: ^{127}Sn: E=1826.67 *16*; J^π=(19/2$^+$); $T_{1/2}$=4.52 μs *15*; %IT decay=100.0

2004Ga24: ^{235}U(n,F) E=th, on-line mass separation; γ, β, γγ coin, βγ coin.

2000Pi03: ^{233}U(n,F),^{239}Pu(n,F), E=th, on-line mass separation; γ, ce, γγ coin,γ-ce coin, ce-ce coin.

An unknown excited state with half-life of 3.1 μs *9* has been proposed by 1980De35 from βγ(t) results for 715γ and 1094γ, which have equal delayed intensities.

The decay scheme is proposed at first by 2000Pi03. The detail of decay scheme including the 16.52 keV isomeric transition and 5 other γ-rays is reported by 2004Ga24.

^{127}Sn Levels

E(level)†	Jπ‡	$T_{1/2}$#	Comments
0.0	11/2$^-$		
646.34 *4*	(9/2)$^-$		
1094.60 *15*	(15/2$^-$)		
1242.79 *13*	(13/2$^-$)		
1625.32 *19*			
1810.12 *15*	(15/2$^+$)		No β feeding to this level was assumed.
1826.64 *16*	(19/2$^+$)	4.52 μs *15*	$T_{1/2}$: weighted average of 4.4 μs *2* (2008Lo07), 4.8 μs *3* (2004Ga24) and 4.5 μs *3* (2000Pi03); other: 3.1 μs *9* (1980De35).

† From adopted level.

‡ Spin and parity were estimated by analogy to ^{123}Sn isomer.

γ(t) from ^{127}Sn produced by by ^{9}Be(^{238}U,F) and ^{9}Be(^{136}Xe,X) (2008Lo07); γ(t) from ^{127}Sn produced by by ^{233}U(n,F) and ^{239}Pu(n,F) (2000Pi03)); from βγ(t) delayed coincidence (2004Ga24): for the 4.52 μs isomer.

γ(^{127}Sn)

Iγ normalization: From I(γ+ce)(732.04γ+184.81γ+567.26γ+715.52γ) -I(γ+ce)(236.0γ)=100. The 236.0γ is the transition to the 1810.13 state from the 2045.98 state in 1.04 s β decay. All I_γ from 2004Ga24 in 1.04 s β decay.

The cascade 184.8-979.1-646.34γ's were not reported by 2000Pi03.

E_γ†@	I_γ‡&	E_i(level)	J^π_i	E_f	J^π_f	Mult.	α#	Comments
16.52 *11*	0.0245 *16*	1826.64	(19/2$^+$)	1810.12	(15/2$^+$)	E2	2.32×10^3 *9*	α(L)=1.87×10^3 *7*; α(M)=384 *15*; α(N+..)=67.3 *25* α(N)=65.9 *25*; α(O)=1.36 *5* Mult.: From systematic of 19/2$^+$ Sn isomers. In ^{129}Sn, the ratio of the K-x-ray intensity over L-electron intensity of isomeric transition is 0.7(2), compatible only with an E2 transition(2000Pi03). B(E2)=34 4 (2000Pi03).
184.81 *13*	1.62 *19*	1810.12	(15/2$^+$)	1625.32		[M1]	0.1027	α(K)=0.0889 *13*; α(L)=0.01118 *16*; α(M)=0.00219 *3*; α(N+..)=0.000448 *7* α(N)=0.000412 *6*; α(O)=3.58×10^{-5} *5* Mult.: M1 was assumed for transition intensity calculation, not used for J estimate.

Continued on next page (footnotes at end of table)

^{127}Sn IT decay (4.52 μs) 2000Pi03,2004Ga24 (continued)

$\gamma(^{127}Sn)$ (continued)

E_γ †@	I_γ ‡&	E_i(level)	J_i^π	E_f	J_f^π	Mult.	Comments
567.26 *15*	10.2 *10*	1810.12	$(15/2^+)$	1242.79	$(13/2^-)$		
646.34 *4*	1.8 *2*	646.34	$(9/2)^-$	0.0	$11/2^-$	D,E2	I_γ: from the intensity balance of 184.8γ and 979.1γ (evaluator).
715.52 *4*	45 *4*	1810.12	$(15/2^+)$	1094.60	$(15/2^-)$		I_γ: From 1.04s ^{127}In decay (2000Pi03) for the 184.81, 567.26 and 715.52γ.
732.04 *11*	9.4 *7*	1826.64	$(19/2^+)$	1094.60	$(15/2^-)$		
979.1 *5*	1.8 *2*	1625.32		646.34	$(9/2)^-$		I_γ: from the intensity balance of 184.81γ (evaluator).
1094.7 *2*	54 *4*	1094.60	$(15/2^-)$	0.0	$11/2^-$		I_γ: from the intensity balance of 715.52γ and 732.04γ (evaluator).
1242.71 *15*	10.2 *10*	1242.79	$(13/2^-)$	0.0	$11/2^-$		I_γ: from the intensity balance of 567.26γ (evaluator).

† Proposed by (2004Ga24).
‡ From 1.04 s ^{127}In decay (2004Ga24), unless otherwise noted.
# Theoretical conversion coefficients are calculated using BrIcc code for the multipolarity indicated.
@ Isomeric transition from the 1818$(19/2^+)$ level to the 1810$(15/2^+)$ level is not directly measured.
& For absolute intensity per 100 decays, multiply by 1.51 *10*.

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