

Adopted Levels, Gammas

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

$Q(\beta^-)=6573$ 20; $S(n)=7.20\times 10^3$ 4; $S(p)=11930$ 22; $Q(\alpha)=-9.78\times 10^3$ 4 [2012Wa38](#)

Note: Current evaluation has used the following Q record 6510 30 7240 60 11950 70 -9460 syst [2003Au03](#).

$\Delta(Q(\alpha))=210$ ([2003Au03](#)).

Measured $Q(\beta^-)$ from 1.09 s state in ^{127}In to ground state in ^{127}Sn by β - γ coincidence method is 6579 keV 20 ([2004Ga24](#)) and 6514 31 ([1987Sp09](#)).

Measured $Q(\beta^-)$ for 3.67 s state in ^{127}In to ground state in ^{127}Sn by β - γ coincidence method is 6999 keV 63 ([2004Ga24](#)).

Measured $Q(\beta^-)$ from 1.04 s state in ^{127}In to ground state in ^{127}Sn by β - γ coincidence method is 8442 keV 56 ([2004Ga24](#)).

Nuclear structure calculations on the levels and their properties: ([2004Po10](#)), ([1992Ar26](#)), ([1986Ar09](#)).

 ^{127}In Levels

[2000Pi03](#) suggested an existence of possible high-spin isomer in ^{127}In which decays to $19/2^+$ state in ^{127}Sn . This isomer can be attributed to the 1863 keV ($21/2^-$) state proposed by [2004Ga24](#).

Cross Reference (XREF) Flags

- A** ^{127}Cd β^- decay
B ^{127}In IT decay (9 μs)

E(level) [†]	J^π	$T_{1/2}$	XREF	Comments
0.0	($9/2^+$)	1.09 s 1	AB	$\% \beta^- = 100$; $\% \beta^- n \leq 0.03$ (1993Ru01) $\% \beta^- n$: others: < 0.15 (1981En05), < 0.04 (1980Lu04). J^π : syst for g.s. of odd-In isotopes. J^π : configuration= $(\pi g_{9/2})^{-1}$. $T_{1/2}$: weighted av of following data: γ -multiscaling: 1.15 s 5 (1980De35) 1.22 s 5 (1986Go10); β^- or delayed neutron counting: 1.3 s 2 (1974Gr29) 1.12 s 2 (1980Lu04), 1.10 s 4 (1981En05), 1.083 s 7 (1993Ru01). $\langle r^2 \rangle^{1/2}(\text{charge}) = 4.676$ 7 (2004An14).
408.9 3	($1/2^-$)	3.67 s 4	A	$\% \beta^- = 100$; $\% \beta^- n = 0.69$ 4 E(level): 420 65 from the end point energy of β , using $\beta\gamma$ coincidence (2004Ga24). Delayed neutron precursor; $\% \beta^- n$ from weighted av of 0.68 6 (1980Lu04), 0.54 11 (1986ReZU), and 0.72 4 (1993Ru01). J^π : syst for isomers of odd-In isotopes suggest $1/2^-$. Configuration= $(\pi p_{1/2})^{-1}$. $T_{1/2}$: weighted av of following data: γ -multiscaling: 3.7 s 1 (1980De35), 3.8 s 2 (1986Go10); β^- or delayed neutron counting: 3.7 s 1 (1974Gr29), 3.76 s 3 (1976Lu02), 3.70 s 4 (1986ReZU), 3.580 s 25 (1993Ru01).
932.5 3	($3/2^-$)		A	J^π : syst of odd-In isotopes, γ to ($1/2^-$). Configuration= $(\pi p_{3/2})^{-1}$.
1066.26 13	($5/2^+, 7/2$) [#]		A	J^π : From analogy with the levels in ^{123}In and ^{125}In , ($7/2^+$) is preferred.
1202.30 10	($5/2^+, 7/2$) [#]		A	
1235.16 10	($5/2^+, 7/2$) [#]		A	
1300.7 5			A	
1589.2 6			A	
1611.44 14			A	
1863 [‡] 58	($21/2^-$)	1.04 s 10	B	$\% \beta^- = 100$ E(level): From β end point energy, using $\beta\gamma$ coincidence (2004Ga24). J^π : log $ft \neq 4.5$ to ($19/2^-$).

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Adopted Levels, Gammas (continued) ^{127}In Levels (continued)

E(level) [†]	J ^π	T _{1/2}	XREF	Comments
2085? [‡] 58	(23/2 ⁻)		B	T _{1/2} : From (2004Ga24). From systematics of E(level) and J ^π of odd-In isotopes and comparison to shell model (2004Sc42). E(level): The order of 221.3-233.4 γ-ray cascade is uncertain. E(level)=2097 is possible.
2317? [‡] 59	(25/2 ⁺)		B	From systematics of E(level) and J ^π of odd-In isotopes and comparison to shell model (2004Sc42).
2364? [‡] 60	(29/2 ⁺)	9 μs 2	B	From systematics of E(level) and J ^π of odd-In isotopes and comparison to shell model (2004Sc42).
2677.27 25			A	
2688.0 5			A	
2756.7 6			A	
2825.1 4			A	
2852.0 6			A	
2893.95 25			A	
3589.5 9			A	

[†] From ^{127}Cd β⁻ decay, unless otherwise noted.

[‡] The levels excited in the decay of the 9 μs isomer: The level energies are obtained from the cascade γ's and from the energy of the last level which is 1.04 s isomer and decays by β. The level energy of 1.04 s isomer is 1863 58 determined using βγ-coincidence by 2004Ga24.

[#] β-feeding from (3/2⁺), γ to (9/2⁺).

γ(^{127}In)

E _i (level)	J _i ^π	E _γ	I _γ [†]	E _f	J _f ^π	Mult.	α [‡]	Comments
932.5	(3/2 ⁻)	523.60 10	100	408.9	(1/2 ⁻)			
1066.26	(5/2 ⁺ , 7/2)	1067.0 3	100	0.0	(9/2 ⁺)			
1202.30	(5/2 ⁺ , 7/2)	270.2 4		932.5	(3/2 ⁻)			I _γ : not available.
		1202.27 10	100	0.0	(9/2 ⁺)			
1235.16	(5/2 ⁺ , 7/2)	168.98 10	15.0 10	1066.26	(5/2 ⁺ , 7/2)			
		1235.07 10	100 5	0.0	(9/2 ⁺)			
1300.7		368.2 4	100	932.5	(3/2 ⁻)			
1589.2		656.7 5	100	932.5	(3/2 ⁻)			
1611.44		376.28 10	100	1235.16	(5/2 ⁺ , 7/2)			
2085?	(23/2 ⁻)	221.3 5	100	1863	(21/2 ⁻)			
2317?	(25/2 ⁺)	233.4 5	100	2085?	(23/2 ⁻)			
2364?	(29/2 ⁺)	47.0 5	100	2317?	(25/2 ⁺)	E2	23.1 10	B(E2)(W.u.)=0.30 7 α(K)=10.7 4; α(L)=10.0 6; α(M)=2.05 11; α(N+..)=0.351 19 α(N)=0.343 19; α(O)=0.0076 4 Mult.: From X-ray/ce(L)=1.2 3 (2004Sc42).
2677.27		1744.7 2	50 9	932.5	(3/2 ⁻)			
		2677.4 3	100 17	0.0	(9/2 ⁺)			
2688.0		1755.4 4	100 17	932.5	(3/2 ⁻)			
		2688.6 10	40 17	0.0	(9/2 ⁺)			
2756.7		1145.3 5	100	1611.44				
2825.1		1622.8 3	100	1202.30	(5/2 ⁺ , 7/2)			
2852.0		1240.6 5	100	1611.44				
2893.95		1282.5 2	100	1611.44				
3589.5		1978.0 8	100	1611.44				

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Adopted Levels, Gammas (continued)

 $\gamma(^{127}\text{In})$ (continued)

[†] From ^{127}Cd β^- decay.

[‡] 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.

Adopted Levels, GammasLevel Scheme

Intensities: Relative photon branching from each level

