

^{57}Cu β^+ decay [1984Sh28,1996Se01](#)

Type	Author	History Citation	Literature Cutoff Date
Full Evaluation	M. R. Bhat	NDS 85, 415 (1998)	24-Sep-1998

Parent: ^{57}Cu : $E=0.0$; $J^\pi=3/2^-$; $T_{1/2}=196.3$ ms 7; $Q(\beta^+)=8770$ 16; $\% \beta^+$ decay=100.0

[1996Se01](#): produced from $^1\text{H}(^{58}\text{Ni}, ^{57}\text{Cu})$, $E=29\text{-}31$ MeV/u. Recoil ions analyzed by the momentum achromat recoil spectrometer (mars). Measured absolute branching ratios for β^+ decay, $T_{1/2}$ (^{75}Cu).

[1984Sh28](#): produced ^{57}Cu activity by $^{58}\text{Ni}(p,2n)$, $E=25\text{-}34$ MeV. Measured γ -ray spectra, excitation functions, $1331\gamma(t)$ of ^{57}Ni , β^+ -spectrum.

Others: [1979ChZX](#), [1978LeZA](#).

 ^{57}Ni Levels

E(level) [†]	J^π [†]
0.0	$3/2^-$
768.5 5	$5/2^-$
1112.6 5	$1/2^-$
2443.3 5	$5/2^-$
2577.4 5	$7/2^-$
3007.1 10	$3/2^-$
3230.1 7	$7/2^-$

[†] From Adopted Levels.

 ϵ, β^+ radiations

E(decay)	E(level)	$I\beta^{+\ddagger}$	$I\epsilon^\ddagger$	Log f_t	$I(\epsilon + \beta^+)^{\ddagger\ddagger}$	Comments
(5540 16)	3230.1	<0.06		>5.8	<0.06	av $E\beta=2078$ 8; $\epsilon K=0.00502$ 6; $\epsilon L=0.000543$ 6; $\epsilon M+=9.17 \times 10^{-5}$ 10
(5763 16)	3007.1	0.35 4		5.08 5	0.35 4	av $E\beta=2188$ 8; $\epsilon K=0.00435$ 5; $\epsilon L=0.000470$ 5; $\epsilon M+=7.93 \times 10^{-5}$ 8
(6193 16)	2577.4	<0.03		>6.3	<0.03	av $E\beta=2397$ 8; $\epsilon K=0.00336$ 3; $\epsilon L=0.000363$ 4; $\epsilon M+=6.14 \times 10^{-5}$ 6
(6327 16)	2443.3	0.17 3		5.62 8	0.17 3	av $E\beta=2463$ 8; $\epsilon K=0.00312$ 3; $\epsilon L=0.000337$ 3; $\epsilon M+=5.69 \times 10^{-5}$ 6
(7657 16)	1112.6	8.6 6		4.37 3	8.6 6	av $E\beta=3115$ 8; $\epsilon K=0.001609$; $\epsilon L=0.0001738$ 1; $\epsilon M+=2.934 \times 10^{-5}$ 21
(8002 16)	768.5	0.94 9		5.44 5	0.94 9	av $E\beta=3284$ 8; $\epsilon K=0.001386$ 10; $\epsilon L=0.0001497$ 1; $\epsilon M+=2.527 \times 10^{-5}$ 18
(8770 16)	0.0	89.8 8	0.103 2	3.67 1	89.9 8	av $E\beta=3662$ 8; $\epsilon K=0.001018$ 7; $\epsilon L=0.0001099$ 7; $\epsilon M+=1.855 \times 10^{-5}$ 12

[†] Absolute branching ratios measured by [1996Se01](#).

[‡] Absolute intensity per 100 decays.

^{57}Cu β^+ decay 1984Sh28,1996Se01 (continued) $\gamma(^{57}\text{Ni})$

$E_\gamma^\dagger$	$I_\gamma^{\ddagger@}$	$E_i(\text{level})$	J_i^π	E_f	J_f^π	Mult. [#]	$\delta^\#$	Comments
768.5 5	0.94 9	768.5	5/2 ⁻	0.0	3/2 ⁻	M1+E2	+0.23 2	I_γ : 3.7 17 from $I\beta^+/I_\gamma$ (1984Sh28).
1112.6 5	8.6 6	1112.6	1/2 ⁻	0.0	3/2 ⁻	M1,E2		
1674.6 &		2443.3	5/2 ⁻	768.5	5/2 ⁻			
2443.1 5	0.17 3	2443.3	5/2 ⁻	0.0	3/2 ⁻	(M1(+E2))	<+0.8	
2461.6	<0.04	3230.1	7/2 ⁻	768.5	5/2 ⁻	(M1+E2)	+0.58 8	
2577.5 5	<0.03	2577.4	7/2 ⁻	0.0	3/2 ⁻	E2		
3007 1	0.35 4	3007.1	3/2 ⁻	0.0	3/2 ⁻	M1,E2		
3230.1	<0.02	3230.1	7/2 ⁻	0.0	3/2 ⁻	(E2(+M3))	-0.02 5	

[†] From adopted gammas.[‡] Derived from absolute branching ratios for β^+ decay and relative photon branching from each level from adopted gammas.[#] From adopted gammas.

@ Absolute intensity per 100 decays.

& Placement of transition in the level scheme is uncertain.

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Decay Scheme

Legend

- $I_\gamma < 2\% \times I_\gamma^{\text{max}}$
 ————— $I_\gamma < 10\% \times I_\gamma^{\text{max}}$
 ————— $I_\gamma > 10\% \times I_\gamma^{\text{max}}$
 - - - - - γ Decay (Uncertain)

Intensities: I_γ per 100 parent decays