

^{56}Sc β^- -n decay (75 ms) 2010Cr02

Type	History		Literature Cutoff Date
	Author	Citation	
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Parent: ^{56}Sc : $E=0+x$; $J^\pi=(5^+,6^+)$; $T_{1/2}=75$ ms 6; $Q(\beta^-n)=825\times 10^1$ 26; $\% \beta^-n$ decay ≈ 14.0

^{56}Sc -E, J^π : shell-model calculations (2004Li75) predict 6^+ at 543 keV from $\pi 1f_{7/2} \otimes \nu 1f_{5/2}$ configuration. 2004Li75 (also 2005Ma93) proposed $(6^+,7^+)$. However, 2010Cr02 (from the same group as 2004Li75) proposed $(5^+,6^+)$ from apparent large (probably allowed) β feeding of 6^+ state in ^{56}Ti , and apparent β feeding of 4^+ state in ^{56}Ti , although, for the latter, there is possibility of missing γ transitions from higher levels feeding the 4^+ state in ^{56}Ti .

^{56}Sc - $T_{1/2}$: from timing of β^- -correlated 691γ and 1161γ (2010Cr02). Other: 60 ms 7 (2004Li75, from β^- -correlated γ decay curve). 2010Cr02 AND 2004Li75 are from the same laboratory with some of the same authors.

^{56}Sc - $Q(\beta^-n)$: From 2021Wa16.

^{56}Sc - $\% \beta^-n$ decay: Given as $\% \beta^-n \geq 14$ 2 in 2010Cr02. Evaluators assign $\approx 14\%$.

2010Cr02: measured $E\gamma$, $I\gamma$, $\gamma\gamma$, and $T_{1/2}$ of ^{56}Sc decay using SeGA array with 16 HPGe detectors and BCS detectors at NSCL-MSU facility. ^{56}Sc produced in fragmentation of 130 MeV/nucleon $^{76}\text{Ge}^{30+}$ beam from K500 and K1200 cyclotrons with ^9Be target, followed by separation of fragments using A1900 fragment separator and Time-of-flight technique. Fully stripped secondary fragments were sent to NSCL Beta Counting System (BCS). System of three Si PIN detectors, a double-sided silicon strip detector and six single sided silicon strip detectors, and SeGA array for γ rays.

 ^{55}Ti Levels

<u>E(level)[†]</u>	<u>J^π[‡]</u>	<u>$T_{1/2}$[‡]</u>
0.0	$(1/2)^-$	1.3 s 1
591.7 3	$(5/2)^-$	
1795.1 5	$(7/2)^-$	

[†] From $E\gamma$ values.

[‡] From the Adopted Levels.

 $\gamma(^{55}\text{Ti})$

$I\gamma$ normalization: Absolute γ intensities are given in 2010Cr02.

<u>E_γ[†]</u>	<u>I_γ^{†‡}</u>	<u>$E_i(\text{level})$</u>	<u>J_i^π</u>	<u>E_f</u>	<u>J_f^π</u>
591.7 3	14 2	591.7	$(5/2)^-$	0.0	$(1/2)^-$
1203.4 3	8 1	1795.1	$(7/2)^-$	591.7	$(5/2)^-$

[†] From 2010Cr02.

[‡] For absolute intensity per 100 decays, multiply by ≈ 0.14 .

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Decay Scheme

Intensities: $I_{(\gamma+ee)}$ per 100 parent decays

Legend

- $I_{\gamma} < 2\% \times I_{\gamma}^{max}$
- $I_{\gamma} < 10\% \times I_{\gamma}^{max}$
- $I_{\gamma} > 10\% \times I_{\gamma}^{max}$

