

$^{56}\text{Sc} \beta^-$ decay (75 ms) 2010Cr02

Type	History		Literature Cutoff Date
	Author	Citation	
Full Evaluation	Balraj Singh	ENSDF	25-Mar-2022

Parent: ^{56}Sc : $E=0+x$; $J^\pi=(5^+,6^+)$; $T_{1/2}=75$ ms 6; $Q(\beta^-)=1391 \times 10^1$ 28; $\% \beta^-$ decay=100.0

^{56}Sc -E, J^π : From ^{56}Sc Adopted Levels.

^{56}Sc - $T_{1/2}$: Measured by fitting the implants-correlated isomeric transition decay curve to a single exponential function with a constant background (2010Cr02).

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

^{56}Sc - $\% \beta^-$ decay: Delayed neutron decay branch is estimated as $\geq 14\%$ 2 (2010Cr02).

2010Cr02: ^{56}Sc activity was produced in $^9\text{Be}(^{76}\text{Ge},X)$ at $E^{76}\text{Ge}$ of 130 MeV/nucleon provided by the K500 and K1200 cyclotrons at NSCL, followed by fragment separation using A1900 fragment separator, and time-of-flight technique. Fully stripped secondary fragments were sent to Beta Counting System (BCS) of three Si PIN detectors, a double-sided silicon strip detector, six single sided silicon strip detectors, and 16 HPGe detectors of the Segmented Germanium Array (SeGA). Measured E_γ , I_γ , $\gamma\gamma$ -coin, and $T_{1/2}$ of ^{56}Sc decay.

 ^{56}Ti Levels

E(level) [†]	J^π [‡]	$T_{1/2}$ [‡]	Comments
0.0	0^+	200 ms 5	
1128.7 3	2^+		
2289.3 4	(4^+)		
2978.9 5	(6^+)		
4473.7 6			
5660+y			E(level): S(n)(^{56}Ti)+y, where $y < 8250$ 300, from $Q(\beta^-)(^{56}\text{Sc})-S(n)(^{56}\text{Ti})$; $Q(\beta^-)=13910$ 300, S(n)=5660 100.

[†] From E_γ values.

[‡] From the Adopted Levels.

 β^- radiations

The decay scheme is likely incomplete as only apparent $I\beta$ feedings are given, and in view of large Q value of 13.9 MeV and highest level in ^{56}Ti populated at 4474 keV in this decay. Thus, no log ft values are deduced.

E(decay)	E(level)	$I\beta^-$ ^{†‡}	Comments
$(4 \times 10^3)^{\#}$ 4)	5660+y	≥ 14	$I\beta^-$: measured $\% \beta^- n \geq 14$ 2 (2010Cr02).
(9.4×10^3) 3)	4473.7	3 1	
(1.09×10^4) 3)	2978.9	15 2	
(1.16×10^4) 3)	2289.3	12 4	

[†] Apparent β feedings from transition intensity balances.

[‡] Absolute intensity per 100 decays.

[#] Estimated for a range of levels.

$^{56}\text{Sc} \beta^-$ decay (75 ms) 2010Cr02 (continued) $\gamma(^{56}\text{Ti})$

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

E_γ^\dagger	I_γ^{\ddagger}	$E_i(\text{level})$	J_i^π	E_f	J_f^π	Comments
689.6 3	18 2	2978.9	(6 ⁺)	2289.3	(4 ⁺)	Total observed intensity=48 4 (2010Cr02) from the two activities.
1128.7 3	30 3	1128.7	2 ⁺	0.0	0 ⁺	
1160.6 3	30 3	2289.3	(4 ⁺)	1128.7	2 ⁺	
^x 1466.8 3	6 1					
1494.8 3	3 1	4473.7		2978.9	(6 ⁺)	

[†] From 2010Cr02.

[‡] Absolute intensity per 100 decays.

^x γ ray not placed in level scheme.

 $^{56}\text{Sc} \beta^-$ decay (75 ms) 2010Cr02Decay Scheme

Intensities: I γ per 100 parent decays

Legend

