

$^{50}\text{Sc} \beta^-$ decay (102.5 s) 1984Al18,1970Co32,1970No04

Type	Author	History	Citation	Literature Cutoff Date
Full Evaluation	Jun Chen and Balraj Singh		NDS 157, 1 (2019)	15-Apr-2019

Parent: ^{50}Sc : $E=0.0$; $J^\pi=5^+$; $T_{1/2}=102.5$ s 5; $Q(\beta^-)=6884$ 15; $\% \beta^-$ decay=100.0

$^{50}\text{Sc}-J^\pi, T_{1/2}$: From ^{50}Sc Adopted Levels.

$^{50}\text{Sc}-Q(\beta^-)$: From 2017Wa10.

1984Al18: measured E_γ , I_γ (pneumatic transfer system), $\beta\gamma(t)$, at BNL.

1970Co32, 1973Gi03 (also 1970No04): measured $\beta\gamma(t)$, half-life of 6^+ state.

1970Wa29: measured $T_{1/2}$, E_γ and I_γ of three γ rays.

1969Wa24: measured E_γ , I_γ , $E\beta$, $I\beta$, $\beta\gamma$ -coin.

1968Ch11: measured E_γ , I_γ . Three γ rays of 524, 1122, 1554 keV reported, and placed in a $\gamma\gamma$ cascade up to 6^+ .

1964Sh14: measured E_γ , I_γ . Three γ rays of 520, 1130 and 1570 keV reported using scintillation detector, and placed in a $\gamma\gamma$ cascade up to 6^+ .

1963Ch03 (from the same lab as 1964Sh14): measured E_γ , I_γ , $E\beta$, $T_{1/2}$. Three γ rays of 520, 1120 and 1570 keV reported using scintillation detector, and placed in a $\gamma\gamma$ cascade up to 6^+ .

1963Ka16: measured E_γ , I_γ , $E\beta$, $T_{1/2}$. Three γ rays of 524, 1121 and 1555 keV reported using scintillation detector, and placed in a $\gamma\gamma$ cascade up to 4^+ .

All data are from 1984Al18, except as noted.

 ^{50}Ti Levels

E(level) [†]	J^π [‡]	$T_{1/2}$	Comments
0.0	0^+		
1553.794 8	2^+		
2674.931 10	4^+		
3198.732 20	6^+	418 ps 20	$T_{1/2}$: weighted average of 0.41 ns 2 (1973Gi03,1970No04) and 437 ps 21 (1970Co32).
4147.22 7	4^+		
(4171.95 14)	3^+		
4880.80 5	5^+		
5379.90 14	4^+		
5440.74 20	$4^+, 5^+$		
5807.25 20	$4^+, 5^+$		

[†] From least-squares fit to E_γ data.

[‡] From Adopted Levels.

 β^- radiations

E(decay)	E(level)	$I\beta^-$ [‡]	Log f_t	Comments
(1077 15)	5807.25	0.251 15	5.70 4	av $E\beta=402.7$ 66
(1443 15)	5440.74	0.145 18	6.44 6	av $E\beta=565.3$ 68
(1504 15)	5379.90	0.149 19	6.50 6	av $E\beta=592.8$ 68
(2003 15)	4880.80	1.55 5	6.00 2	av $E\beta=822.8$ 70
(2712# 15)	(4171.95)	<0.35	>7.2	av $E\beta=1157.7$ 72
(2737 15)	4147.22	0.61 4	6.98 3	av $E\beta=1169.5$ 72
(3685 15)	3198.732	88.4 [†] 15	5.39 1	av $E\beta=1625.8$ 73 Measured $E\beta(\text{max})=3.05$ MeV 10, $I\beta=74$ (1969Wa24); $E\beta=3.3$ MeV 1 (1963Ch03); $E\beta=3.6$ MeV 2 (1963Ka16).
(4209 15)	2674.931	8.4 [†] 18	6.7 1	av $E\beta=1879.9$ 73 Measured $E\beta(\text{max})=3.60$ MeV 10, $I\beta=26$ (1969Wa24); $E\beta=3.8$ MeV 2 (1963Ch03).

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$^{50}\text{Sc} \beta^-$ decay (102.5 s) 1984A118,1970Co32,1970No04 (continued) β^- radiations (continued)

[†] Any other γ decay from energetically possible levels was estimated as <2% (1984A118).

[‡] Absolute intensity per 100 decays.

[#] Existence of this branch is questionable.

 $\gamma(^{50}\text{Ti})$

I_γ normalization: from $\Sigma I_\gamma(\text{to g.s.})=100$. The g.s. not fed directly ($\Delta J^\pi=5^+$). Feeding to the first 2^+ state estimated as <5% (1970Wa29).

E_γ	$I_\gamma^{\#}$	$E_i(\text{level})$	J_i^π	E_f	J_f^π	Mult. [‡]	Comments
523.792 [†] 18	88.7 15	3198.732	6 ⁺	2674.931	4 ⁺	E2	E_γ : $E_\gamma=529.653$ 11 (1979He19) from the decay of ^{83}Rb was used as reference (1984A118); 523.50 10 (1970Wa29); 524 1 (1969Wa24).
1121.124 [†] 5	99.5 9	2674.931	4 ⁺	1553.794	2 ⁺	E2	E_γ : $E_\gamma=1115.546$ 4 (1979He19) from the decay of ^{65}Zn was used as reference (1984A118); 1121.03 10 (1970Wa29); 1122 1 (1969Wa24).
1472.36 8	0.61 4	4147.22	4 ⁺	2674.931	4 ⁺	D,E2	
1553.768 [†] 8	100	1553.794	2 ⁺	0.0	0 ⁺	E2	E_γ : $E_\gamma=1562.302$ 5 (1979He19) from the decay of $^{110\text{m}}\text{Ag}$ was used as reference (1984A118); 1553.71 20 (1970Wa29); 1554 1 (1969Wa24).
1681.95 7	0.28 3	4880.80	5 ⁺	3198.732	6 ⁺	D,E2	
2205.84 7	1.27 3	4880.80	5 ⁺	2674.931	4 ⁺	D,E2	
2705.15 20	0.105 16	5379.90	4 ⁺	2674.931	4 ⁺	D,E2	
2765.73 20	0.145 18	5440.74	4 ⁺ ,5 ⁺	2674.931	4 ⁺		
3132.21 20	0.251 15	5807.25	4 ⁺ ,5 ⁺	2674.931	4 ⁺		
3825.99 20	0.044 10	5379.90	4 ⁺	1553.794	2 ⁺	(E2)	

[†] 1984A118 used reference source whose E_γ values was known precisely, and the final E_γ value was the weighted averages of several runs.

[‡] From Adopted Gammas.

[#] Absolute intensity per 100 decays.

$^{50}\text{Sc} \beta^-$ decay (102.5 s) 1984Al18,1970Co32,1970No04**Decay Scheme**Intensities: I_γ per 100 parent decays

Legend

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

