

^{50}K β^- decay (472 ms) 1998Ba80,1986Mi08,1983RaZR

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

Parent: ^{50}K : $E=0.0$; $J^\pi=0^{(-)}$; $T_{1/2}=472$ ms 4; $Q(\beta^-)=13861$ 8; $\% \beta^-$ decay=100.0

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

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

^{50}K - $\% \beta^-$ decay: $\% \beta^- n=28.6$ 30 for the decay of ^{50}K .

1998Ba80: measured $\beta^- \gamma$ - and $\beta^- n$ -coincidences at CERN. Deduced levels, β^- intensities, $\log ft$, J , π , first-forbidden branch enhancement factor. Comparison with shell-model calculations.

1986Mi08: measured β^- ($\Delta E/E$ telescope), neutrons using scintillation detectors, and $\beta^- n$ -coincidences at CERN. Deduced $Q(\beta^-)$.

1983RaZR, 1982Ca04: measured neutrons, γ rays, and $n\gamma$ -coincidences at CERN.

1978De17: measured $\beta\gamma$ -coincidences.

All information is from 1998Ba80, except as noted.

 ^{50}Ca Levels

E(level) [†]	J^π [‡]	Comments
0.0	0 ⁺	
1026.9 4	2 ⁺	
3002.3 6	(2 ⁺)	
3531.9 4	(1,2 ⁺)	
4035.9 4	(1,2 ⁺)	
4476.1 6	(0 ⁺)	
4886.3 5	(1 ⁻)	
6519 8		$\% n \approx 100$
7039 36		$\% n \approx 100$
7269 46		$\% n \approx 100$
7309 51		$\% n \approx 100$
7619 66		$\% n \approx 100$
7999 87		$\% n \approx 100$
8249 97		$\% n \approx 100$
8.81×10^3 12	(0 ⁻ , 1 ⁻)	$\% n \approx 100$
9239 46	(0 ⁻ , 1 ⁻)	$\% n \approx 100$
9779 72	(0 ⁻ , 1 ⁻)	$\% n \approx 100$
10430 36	(0 ⁻ , 1 ⁻)	$\% n \approx 100$
1.055×10^4 11	(0 ⁻ , 1 ⁻)	$\% n \approx 100$
11059 36	(0 ⁻ , 1 ⁻)	$\% n \approx 100$
11479 52	(0 ⁻ , 1 ⁻)	$\% n \approx 100$

[†] From least-squares fit to $E\gamma$ data up to 4886 keV. Above this energy level energies are from Table IV in 1998Ba80, but adjusted upward by 8.6 keV to consider updated $S(n)(^{50}\text{Ca})=6360.8$ 16 (2017Wa10), whereas 1998Ba80 used $S(n)=6352$ 10.

[‡] From Adopted Levels.

 β^- radiations

E(decay)	E(level)	$I\beta^-$ ^{†‡}	Log ft	Comments
(2.38×10^3) 5)	11479	1.05 25	4.1 2	av $E\beta=1008$ 81
(2.80×10^3) 4)	11059	0.90 21	4.5 2	av $E\beta=1208$ 82
(3.31×10^3) 11)	10550	2.5 9	4.4 2	av $E\beta=1453$ 78
(3.43×10^3) 4)	10430	0.93 20	4.9 1	av $E\beta=1506$ 73
(4.08×10^3) 7)	9779	2.5 10	4.8 2	av $E\beta=1826$ 69
(4.62×10^3) 5)	9239	5.6 11	4.7 1	av $E\beta=2089$ 64

Continued on next page (footnotes at end of table)

^{50}K β^- decay (472 ms) 1998Ba80,1986Mi08,1983RaZR (continued) β^- radiations (continued)

E(decay)	E(level)	$I\beta^-$ ^{†‡}	Log <i>ft</i>	Comments
(5.05×10 ³ 12)	8810	9.8 18	4.6 1	av E β =2299 59
(5.61×10 ³ 10)	8249	0.8 4	5.9 2	av E β =2573 50
(5.86×10 ³ 9)	7999	0.8 3	6.0 2	av E β =2695 45
(6.24×10 ³ 7)	7619	1.7 9	5.8 3	av E β =2882 35
(6.55×10 ³ 5)	7309	0.38 15	6.5 2	av E β =3034 25
(6.59×10 ³ 5)	7269	0.29 8	6.7 1	av E β =3053 25
(6.82×10 ³ 4)	7039	0.38 8	6.6 1	av E β =3166 20
(7342 11)	6519	1.3 5	6.2 2	av E β =3422.5 71
(8975 8)	4886.3	1.06 18	6.7 1	av E β =4219.1 40
(9385 8)	4476.1	0.19 6	7.6 2	av E β =4420.6 40
(9825 8)	4035.9	3.5 5	6.4 1	av E β =4636.8 40
(10329 8)	3531.9	0.79 14	7.1 1	av E β =4884.3 40
(10859 8)	3002.3	0.83 14	9.7 ^{1u} 1	av E β =5155.1 40
(12834 8)	1026.9	3.7 4	9.50 ^{1u} 5	av E β =6127.9 40
(13861 8)	0.0	61.0 74	5.85 5	av E β =6615.6 40

[†] All feedings are from the measurements ($\beta\gamma$ -coin and $n\beta$ -coin) by 1998Ba80. $I\beta$ to unbound states were normalized to $\beta^-n=29\%$ 3. $I\beta$ to the ground state is from the difference between the total β intensity and the measured β intensity to the excited states.

[‡] Absolute intensity per 100 decays.

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

I_γ normalization: Deduced by evaluators from equating measured $I\beta=3.7$ 4 (1998Ba80) to the first 2^+ state to net γ feeding of the first 2^+ state (100-summed γ intensity feeding the first 2^+ state).

E_γ	I_γ [†]	$E_i(\text{level})$	J_i^π	E_f	J_f^π	Comments
1027.0 5	100	1026.9	2^+	0.0	0^+	
1975.3 5	12.9 10	3002.3	(2^+)	1026.9	2^+	
2504.9 5	6.4 8	3531.9	($1,2^+$)	1026.9	2^+	
3008.9 5	20.2 13	4035.9	($1,2^+$)	1026.9	2^+	
3449.0 5	2.9 8	4476.1	(0^+)	1026.9	2^+	
3531.8 5	5.9 8	3531.9	($1,2^+$)	0.0	0^+	
4035.6 5	33.5 20	4035.9	($1,2^+$)	0.0	0^+	
4886.0 5	16.6 14	4886.3	(1^-)	0.0	0^+	
6510 [‡]	≤ 0.17	6519		0.0	0^+	I_γ : limit deduced by comparing to I_γ of 1027 γ .

[†] For absolute intensity per 100 decays, multiply by 0.064 7.

[‡] Placement of transition in the level scheme is uncertain.

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Decay Scheme

Intensities: I_γ per 100 parent decays

Legend

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

$0(-)$ 0.0
 $Q_{\beta^-} = 13861.8$ 472 ms 4
 $\% \beta^- = 100.0$
 $^{50}_{19}\text{K}_{31}$

