^{42}K β^- decay (12.355 h)　　1970Ka17

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	Jun Chen[#] and Balraj Singh	NDS 135, 1 (2016)	31-May-2016

Parent: ^{42}K: E=0; J^π=2$^-$; $T_{1/2}$=12.355 h 7; Q(β^-)=3525.22 18; %β^- decay=100.0

^{42}K-J^π,$T_{1/2}$: From Adopted Levels of ^{42}K.

^{42}K-Q(β^-): From 2012Wa38.

γ, $\gamma\gamma$: 1970Ka17. Others: 1966He11, 1965Mi09, 1964Ma05, 1962Pe19, 1961Mc03, 1960Ga06, 1959Mo17, 1959Ma27, 1956Po07, 1955Em04, 1954Ca64, 1953Ka26, 1947Si08.

%Iγ: 1990Mi05, 2004HaZW. Others: 1959Ma27, 1955Em04, 1953Ka26.

$\gamma\gamma$(t): 1963Bl09, 1961Si01.

$\gamma\gamma(\theta)$: 1966Az04, 1959As65 (also 1960As03), 1959Mo17, Arkiv Fysik 15, 303 (1959).

β: 1989He11 (also 1986HeZY), 1987Na28, 1976Ra30, 1975Ra09, 1968Va06, 1968Da12, 1965Ch30, 1964Da16, 1956Po07, 1954Ko55, 1949Sh26, 1947Si08.

$\beta\gamma$: 2001Si09, 1961Si01, 1953Ka26, 1947Bl33.

Pair conversion, E0 strength: 1971Be76.

$\beta\gamma(\theta)$: 1975Ve06, 1961St12, 1953Ha40, 1951St68, 1950Be60.

$\beta\gamma$(circ pol,θ): 1968He06, 1968Da12, 1964He10, 1964De09, 1961Da02.

$\beta\gamma$(lin pol,θ): 1953Ha40.

$T_{1/2}$(^{42}K isotope): 2005Li66, 2004Un01, 2001Ko07, 1994Mi03, 1967Go21, 1962Me06. Others: 1984Ke14, 1982RuZV, 1963Ho17, 1962Mo21, 1959Ma27, 1957Wr37, 1953Bu58, 1953Ka26, 1947Si08.

Isotopic assignment: 1954An25, 1937Hu01.

^{42}Ca Levels

E(level)[†]	J^π[‡]	$T_{1/2}$	Comments
0.0	0$^+$		
1524.6 3	2$^+$		
1837.2 4	0$^+$	0.33 ns 2	J^π: from $\gamma\gamma(\theta)$.
			$T_{1/2}$: $\gamma\gamma$(t) (1961Si01). Other: 0.42 ns 11 (1963Bl09).
2424.3 4	2$^+$		Iγ(γ to 1587 level)<0.002 (1970Ka17).
2753.2 9	4$^+$		
3445.4 7	3$^-$		

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

[‡] From Adopted Levels, unless otherwise noted.

β^- radiations

E(decay)	E(level)	Iβ^-[†]	Log ft	Comments
(79.8 7)	3445.4	0.07 1	4.98 7	av Eβ=21.41 21
(1100.9 4)	2424.3	0.05 1	9.05 9	av Eβ=415.41 20
(1688.0 4)	1837.2	0.34 3	9.92^{1u} 4	av Eβ=702.95 20
(2000.6 4)	1524.6	17.64 9	7.5501 23	av Eβ=824.32 17
				E(decay): 1985 10 (1956Po07), 1970 (1954Ko55).
				Iβ^-: 18 (1954Ko55).
(3525.22 18)	0.0	81.90 9	9.4768^{1u} 6	av Eβ=1565.86
				F-K plot first-forbidden unique shape (1956Po07,1954Ko55).
				E(decay): 3524 6 (1975Ra09), 3519 4 (1968Va06). Others: 1956Po07, 1954Ko55.
				Iβ^-: 82 (1954Ko55).

[†] Absolute intensity per 100 decays.

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$\gamma(^{42}$Ca)

Iγ normalization: %Iγ(1524.7γ)=18.08 *9* (1990Mi05). Others: 17.9 *5* (1962Pe19), 18.4 *5* (1959Ma27), 17.8 *9* (1955Em04).

E$_\gamma$[†]	I$_\gamma$[†‡]	E$_i$(level)	J$_i^\pi$	E$_f$	J$_f^\pi$	Mult.	α[#]	Comments
312.60 *25*	1.86 *11*	1837.2	0$^+$	1524.6	2$^+$	[E2]	0.00349	(313γ)(1525γ)(θ): A$_2$=+0.33 *4*, A$_4$=+1.07 *5* (1959As65).
692.0 *8*	0.018 *4*	3445.4	3$^-$	2753.2	4$^+$			
899.7 *4*	0.285 *14*	2424.3	2$^+$	1524.6	2$^+$			
1021.2 *9*	0.111 *8*	3445.4	3$^-$	2424.3	2$^+$			
1228.0 *15*	0.013 *6*	2753.2	4$^+$	1524.6	2$^+$			
1524.6 *3*	100	1524.6	2$^+$	0.0	0$^+$			
1920.8 *10*	0.228 *22*	3445.4	3$^-$	1524.6	2$^+$			
2424.3 *7*	0.110 *16*	2424.3	2$^+$	0.0	0$^+$			

[†] From 1970Ka17.
[‡] For absolute intensity per 100 decays, multiply by 0.1808 *9*.
[#] Total theoretical internal conversion coefficients, calculated using the BrIcc code (2008Ki07) with Frozen orbital approximation based on γ-ray energies, assigned multipolarities, and mixing ratios, unless otherwise specified.

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Decay Scheme

Intensities: I$_{(\gamma+ce)}$ per 100 parent decays