$^{43}K\ \beta^-$ decay (22.3 h) 1988Wa28,1972Wa20

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	Balraj Singh and Jun Chen#	NDS 126, 1 (2015)	31-Mar-2015

Parent: ^{43}K: E=0; J^π=3/2$^+$; $T_{1/2}$=22.3 h *1*; Q(β^-)=1833.4 *5*; %β^- decay=100.0

^{43}K-J^π,$T_{1/2}$: From Adopted Levels of ^{43}K.

^{43}K-Q(β^-): From 2012Wa38.

1988Wa28: ^{43}K was produced via the $^{44}Ca(t,\alpha)$ reaction with tritons of 3.2 MeV from the Brookhaven National Laboratory Van de Graaff accelerator. γ-rays were detected by a Ge(Li) detector. Measured Eγ, Iγ, β^- spectra. Deduced levels, β^- and γ branching ratios. Shell-model calculations.

1972Wa20: measured Eγ, Iγ, $T_{1/2}$.

Others:

γ: 1970La11, 1969Ta07, 1968Ch12, 1967Cl05, 1959Be72, 1957Ba07, 1955Ne01, 1954Li42.

β: 1959Be72, 1954Li42, 1949Ov01.

$\gamma\gamma$: 1957Ba07, 1959Be72.

$\beta\gamma$: 1959Be72.

$\beta\gamma$(t): 1970Ho26.

$\gamma\gamma(\theta)$, $\beta\gamma(\theta)$: 1957Li39.

$T_{1/2}$ and isotopic assignment: 1972Em01, 1963Ho17, 1954An25, 1954Li42, 1954Co70, 1949Ov01.

Additional information 1.

^{43}Ca Levels

E(level)†	J^π‡
0	7/2$^-$
372.762 *5*	5/2$^-$
593.394 *5*	3/2$^-$
990.257 *5*	3/2$^+$
1394.473 *8*	5/2$^+$

† From least-squares fit to Eγ data.

‡ From Adopted Levels.

β^- radiations

E(decay)	E(level)	Iβ^-†	Log *ft*	Comments
(438.9 *5*)	1394.473	2.60 *4*	6.10 *1*	av Eβ=143.09 *19*
(843.1 *5*)	990.257	90.9 *6*	5.60 *1*	av Eβ=304.85 *21*
(1240.0 *5*)	593.394	4.06 *13*	7.60 *2*	av Eβ=476.65 *23*
(1460.6 *5*)	372.762	0.9 *6*	8.5 *3*	av Eβ=575.59 *23* Iβ^-: from 1988Wa28.
(1833.4 *5*)	0	1.54 *18*	9.73^{1u} *5*	av Eβ=769.18 *23* From magnetic spectrometer measurements (1988Wa28), the Kurie plot has the expected unique first-forbidden shape. Iβ^-: from Iβ(g.s.)/Iβ(990)=0.017 *2* (adopted by 1988Wa28 as the average of 0.019 (1954Li42) and 0.015 (1959Be72)).

† Absolute intensity per 100 decays.

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$\gamma(^{43}Ca)$

Iγ normalization: I(γ+ce)(γs to g.s.)=98.46 *18*. Iβ(g.s.)=1.54 *18*.

E_γ [†]	I_γ [†@]	E_i(level)	J^π_i	E_f	J^π_f	Mult.[#]	δ[#]
220.632 *5*	5.53 *7*	593.394	3/2⁻	372.762	5/2⁻	M1+E2	−0.09 *4*
372.760[‡] *7*	100.0	372.762	5/2⁻	0	7/2⁻	M1+E2	−0.161 *14*
396.861 *6*	13.65 *9*	990.257	3/2⁺	593.394	3/2⁻	E1(+M2)	−0.1 *1*
404.214 *13*	0.420 *15*	1394.473	5/2⁺	990.257	3/2⁺	M1+E2	+0.32 *5*
593.390 *6*	12.97 *9*	593.394	3/2⁻	0	7/2⁻	E2(+M3)	≈0
617.490 *6*	91.2 *7*	990.257	3/2⁺	372.762	5/2⁻	E1(+M2)	−0.015 *17*
801.070 *13*	0.170 *15*	1394.473	5/2⁺	593.394	3/2⁻	E1(+M2)	−0.03 *4*
990.245 *8*	0.33 *4*	990.257	3/2⁺	0	7/2⁻		
1021.698 *13*	2.26 *3*	1394.473	5/2⁺	372.762	5/2⁻	E1(+M2)	+0.11 *12*
1394.448 *14*	0.151 *9*	1394.473	5/2⁺	0	7/2⁻	E1(+M2)	≈0

† From 1988Wa28.

‡ Recoil correction removed from Eγ=372.762 (1988Wa28).

\# From Adopted Gammas.

@ For absolute intensity per 100 decays, multiply by 0.868 *2*.

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Decay Scheme

Intensities: I_γ per 100 parent decays