^{35}K ε decay (178 ms) 1980Ew02

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	Jun Chen, John Cameron and Balraj Singh	NDS 112,2715 (2011)	20-Oct-2011

Parent: ^{35}K: E=0; $J^\pi=(3/2)^+$; $T_{1/2}$=178 ms *8*; Q(ε)=11874.5 *9*; %ε+%$β^+$ decay=100.0

^{35}K-Q(ε): From 2011AuZZ. Other: 11879 *20* (2003Au03).

^{35}K-J^π,$T_{1/2}$: From Adopted Levels of ^{35}K.

1980Ew02, 1979Ca15: Activity of ^{35}K produced by ^{45}Sc(p,8n3p) at E_p=600 MeV from the synchrocyclotron at the ISOLDE facility at CERN on a 13.6 g/cm^2 ScC_2 target. A 109 cm^3 Ge(Li) detector (FWHM= 2.1 keV at 1.33 MeV) for detecting gammas and a telescope (FWHM=50 keV) of two surface barrier detectors (ΔE: 20 μm, 50 mm^2 and E: 700 μm, 150 mm^2) for detecting protons. Measured Eγ, Iγ, Ep, Ip, $T_{1/2}$. Deduced levels, J^π, log *ft*.

^{35}K also decays to ^{34}Cl by εp (0.37% *15*) (1980Ew02).

^{35}Ar Levels

E(level)†	J^π#	Comments
0	$3/2^+$	
1184.01 *25*	$1/2^+$	
1750.7 *3*	$(5/2)^+$	
2638.0 *3*	$3/2^+$,$5/2^+$	
2982.79 *12*	$3/2^+$,$5/2^+$	
4065.0? *4*	$1/2^+$,$3/2^+$,$5/2^+$	
4528.2 *4*	$1/2^+$,$3/2^+$,$5/2^+$	
4725.9 *6*	$1/2^+$	
4785.8 *11*	$1/2^+$	
5572.66 *15*	$3/2^+$	T=3/2
7510?‡ *20*	$1/2^+$,$3/2^+$,$5/2^+$	
8395?‡ *20*	$1/2^+$,$3/2^+$,$5/2^+$	

† From least-squares fit to Eγ's in 1980Ew02.

‡ Tentative identification based on proton groups by authors in 1980Ew02.

From Adopted Levels.

ε,$β^+$ radiations

E(decay)	E(level)	Iβ+ ‡	Iε‡	Log *ft*	I(ε+β+)‡	Comments
(3480 *20*)	8395?	0.06 *3*	0.00044 *18*	4.57 *19*	0.062 *26*	av Eβ=1086.0 *95*; εK=0.00633 *16*; εL=0.000612 *16*; εM+=8.97×10^{-5} *23*
(4365 *20*)	7510?	0.15 *6*	0.00042 *17*	4.79 *18*	0.15 *6*	av Eβ=1507.6 *97*; εK=0.00253 *5*; εL=0.000244 *5*; εM+=3.58×10^{-5} *7*
(6301.8 *9*)	5572.66	36 *3*	0.026 *2*	3.31 *5*	36 *3*	av Eβ=2449.07 *45*; εK=0.0006498 *4*; εL=6.283×10^{-5} *4*; εM+=9.206×10^{-6} *5*
(7088.7 *14*)	4785.8	1.0 *4*		5.15 *18*	1.0 *4*	av Eβ=2835.05 *70*
(7148.6 *11*)	4725.9	2.1 *4*		4.85 *9*	2.1 *4*	av Eβ=2864.51 *54*
(7346.3 *10*)	4528.2	0.7 *4*		5.39 *25*	0.7 *4*	av Eβ=2961.80 *49*
(7809.5 *10*)	4065.0?	0.55 *30*		5.64 *24*	0.55 *30*	av Eβ=3190.05 *49*
(8891.7 *9*)	2982.79	26 *3*	0.0057 *7*	4.27 *6*	26 *3*	av Eβ=3724.65 *45*; εK=0.000199; εL=1.9241×10^{-5} *7*; εM+=2.819×10^{-6} *1*
(9236.5 *10*)	2638.0	≤0.4		≥6.2	≤0.4	av Eβ=3895.30 *47*
(10123.8 *10*)	1750.7	11.9 *9*	0.00171 *13*	4.91 *4*	11.9 *9*	av Eβ=4335.01 *47*; εK=0.0001293; εL=1.2499×10^{-5} *4*; εM+=1.8313×10^{-6} *6*
(10690.5 *9*)	1184.01	2.2 *7*		5.77 *14*	2.2 *7*	av Eβ=4616.20 *47*

Continued on next page (footnotes at end of table)

^{35}K ε decay (178 ms) 1980Ew02 (continued)

ε,β+ radiations (continued)

E(decay)	E(level)	Iβ+ ‡	Iε‡	Log *ft*	I(ε+β+)‡	Comments
(11874.5 *9*)	0	19† *4*	0.0016 *3*	5.07 *10*	19 *4*	av Eβ=5204.42; εK=7.671×10^{-5} *2*; εL=7.414×10^{-6} *2*; εM+=1.0863×10^{-6} *3*

† Deduced from mirror symmetry in 1980Ew02.
‡ Absolute intensity per 100 decays.

γ(^{35}Ar)

Eγ	Iγ@&	Ei(level)	J_i^π	Ef	J_f^π
886.8 *5*	0.9 *3*	2638.0	3/2+,5/2+	1750.7	(5/2)+
1044.4 *4*	1.3 *4*	5572.66	3/2+	4528.2	1/2+,3/2+,5/2+
1184.0 *3*	14.3 *7*	1184.01	1/2+	0	3/2+
1426.8 *4*	3.0 *5*	4065.0?	1/2+,3/2+,5/2+	2638.0	3/2+,5/2+
1507.4 *5*	1.9 *4*	5572.66	3/2+	4065.0?	1/2+,3/2+,5/2+
1750.5 *3*	28 *1*	1750.7	(5/2)+	0	3/2+
1798.9 *5*	3.5 *6*	2982.79	3/2+,5/2+	1184.01	1/2+
2589.8# *1*	52 *2*	5572.66	3/2+	2982.79	3/2+,5/2+
2638.0 *4*	5.5 *7*	2638.0	3/2+,5/2+	0	3/2+
x2698†					
2934.5 *5*	3.5 *6*	5572.66	3/2+	2638.0	3/2+,5/2+
2982.68# *13*	100 *4*	2982.79	3/2+,5/2+	0	3/2+
3542.0 *6*	2.9 *6*	4725.9	1/2+	1184.01	1/2+
3821.7 *7*	3.5 *7*	5572.66	3/2+	1750.7	(5/2)+
4387.2 *9*	3.5 *8*	5572.66	3/2+	1184.01	1/2+
4527.9 *7*	2.6 *7*	4528.2	1/2+,3/2+,5/2+	0	3/2+
4724.5 *11*	1.2 *5*	4725.9	1/2+	0	3/2+
4785.4 *11*	1.9 *7*	4785.8	1/2+	0	3/2+
5572.3‡ *10*	6.1 *16*	5572.66	3/2+	0	3/2+

† This unplaced γ-ray accounts for 1.2% β-feeding (1980Ew02).
‡ Deduced from the analysis of its double escape peak in 1980Ew02.
# From 1979Ca15.
@ From 1980Ew02.
& For absolute intensity per 100 decays, multiply by 0.50 *2*.
x γ ray not placed in level scheme.

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Decay Scheme

Intensities: I_γ per 100 parent decays

Legend

$I_\gamma < 2\% \times I_\gamma^{max}$
$I_\gamma < 10\% \times I_\gamma^{max}$
$I_\gamma > 10\% \times I_\gamma^{max}$