^{36}Ca ε decay (101.2 ms)　　　2001Lo11,1997Tr05

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	Ninel Nica, John Cameron and Balraj Singh	NDS 113, 1 (2012)	31-Dec-2011

Parent: ^{36}Ca: E=0; J$^\pi$=0$^+$; T$_{1/2}$=101.2 ms 20; Q(ε)=10966 40; %ε+%β^+ decay=100.0

^{36}Ca-Q(ε): From 2011AuZZ. Other: 10990 40 (2003Au03).

^{36}Ca-%ε+%β^+ decay: %εp=57 5.

1997Tr05, 1995Tr02, 1995Ga16: ^{36}Ca from ^{9}Be(^{40}Ca,X)] E=300 MeV/nucleon; measured β-delayed E(p), I(p), Eγ, Iγ, $\beta\gamma$ coin, $\beta\gamma$p coin, T1/2. Comparison with sd-shell model calculations.

2001Lo11: ^{36}Ca beam from fragmentation of ^{40}Ca beam at 95 MeV/nucleon by nickel target using LISE3 spectrometer at GANIL. Measured Eγ, Eβ, β-delayed proton spectra; deduced log ft, B(GT). ^{36}K deduced IAS proton decay features. Comparison with shell model predictions.

2007Do17: measured half-life and delayed proton spectra.

Others: 1981Ay01, 2007Do17.

^{36}Ca also decays to ^{35}Ar by εp (51.2% 10).

Additional information 1.

^{36}K Levels

E(level)[†]	J$^\pi$	T$_{1/2}$	Comments
0	2$^+$	342 ms 2	
1112.4 4	1$^+$		
1618.6 7	1$^+$		
3357 22	1$^+$		E(level): average of 3358 23 (2001Lo11) and 3370 29 (1997Tr05); E(level)$_{recalculated}$=3357 22.
4281.9 8	0$^+$		T=2
			E(level): isobar analog state of ^{36}Ca g.s.. Energy: 4289 8 (1995Ga16), 4290 23 (2001Lo11), 4286 8 (1997Tr05); E(level)$_{recalculated}$=4281.9 8.
4450 22	1$^+$		E(level): average of 4457 23 (2001Lo11) and 4457 33 (1997Tr05); E(level)$_{recalculated}$=4450 22.
4658 36	1$^+$		E(level): average of 4644 46 (2001Lo11) and 4687 37 (1997Tr05); E(level)$_{recalculated}$=4658 36.
5243[‡] 22			E(level): E(level)$_{recalculated}$=5243 22.
5754[‡] 69			E(level): E(level)$_{recalculated}$=5754 69.
5926 45	1$^+$		E(level): average of 5919 46 (2001Lo11) and 5947 47 (1997Tr05); E(level)$_{recalculated}$=5926 45.
6787 69	1$^+$		E(level): average of 6791 69 (2001Lo11) and 6798 71 (1997Tr05); E(level)$_{recalculated}$=6787 69.

[†] Based on 1993Au07 and 1995Au04, the S(p)=1666 8 was presumably used to calculate the E(level) and their uncertainties by 2001Lo11, 1997Tr05, and 1995Ga16 for the unbound levels listed In the table (3364 to 6794). However neither S(p) nor the proton energies leading to levels In ^{35}Ar, from which E(level)′s could Be calculated, are consistently given by the references mentioned above. Consequently the more precise S(p)=1658.9 8 (2011AuZZ) is used here to recalculate E(level) As follows: E(level)$_{recalculated}$=E(level)−1666+1658.9.

[‡] From 2001Lo11 only.

ε,β^+ radiations

E(decay)	E(level)	Iβ^+ [†]	Iε [†]	Log ft	I(ε+β^+)[†]	Comments
(4.18×10^3 8)	6787	0.5 2	0.002 1	3.90 18	0.5 2	av Eβ=1421 39; εK=0.0036 3; εL=0.00035 3; εM+=5.7×10^{-5} 5 E(decay): average of 0.3 1 (2001Lo11) and 0.7 2 (1997Tr05).
(5.04×10^3 6)	5926	2.2 4	0.0043 8	3.73 9	2.2 4	av Eβ=1836 30; εK=0.00175 9; εL=0.000172 8; εM+=2.79×10^{-5} 13 E(decay): average of 1.7 3 (2001Lo11) and 2.7 4 (1997Tr05).

Continued on next page (footnotes at end of table)

^{36}Ca ε decay (101.2 ms)   2001Lo11,1997Tr05 (continued)

ϵ,β^+ radiations (continued)

E(decay)	E(level)	Iβ^+ †	Iε †	Log ft	I($\varepsilon+\beta^+$)†	Comments
(5.21×10³ 8)	5754	0.9 2	0.002	4.21 11	0.9 2	av Eβ=1920 39; εK=0.00155 9; εL=0.000152 9; εM+=2.46×10⁻⁵ 15
(5.72×10³ 5)	5243	0.6 2	0.0007 2	4.61 15	0.6 2	av Eβ=2168 23; εK=0.00110 4; εL=0.000108 4; εM+=1.75×10⁻⁵ 6
(6.31×10³ 5)	4658	1.2 2	0.0010 2	4.55 8	1.2 2	av Eβ=2454 27; εK=0.000778 25; εL=7.63×10⁻⁵ 24; εM+=1.24×10⁻⁵ 4 E(decay): average of 1.0 3 (2001Lo11) and 1.4 2 (1997Tr05).
(6.52×10³ 5)	4450	2.6 10	0.0020 8	4.29 17	2.6 10	av Eβ=2556 23; εK=0.000694 18; εL=6.81×10⁻⁵ 18; εM+=1.10×10⁻⁵ 3 E(decay): average of 3.5 5 (2001Lo11) and 1.7 2 (1997Tr05).
(6.68×10³ 4)	4281.9	38 1	0.027 1	3.184 19	38 1	av Eβ=2638 20; εK=0.000635 14; εL=6.23×10⁻⁵ 14; εM+=1.008×10⁻⁵ 22 E(decay): average of 37 1 (2001Lo11) and 39 1 (1997Tr05).
(7.61×10³ 5)	3357	10.3 10	0.0047 5	4.06 5	10.3 10	av Eβ=3093 23; εK=0.000405 9; εL=3.98×10⁻⁵ 9; εM+=6.44×10⁻⁶ 14 E(decay): average of 9.3 8 (2001Lo11) and 11.3 6 (1997Tr05). 2001Lo11 give <13.4 for proton+possible γ decay.
(9.35×10³ 4)	1618.6	31.0 17	0.0070 4	4.06 3	31.0 17	av Eβ=3956 20; εK=0.000202 3; εL=1.98×10⁻⁵ 3; εM+=3.21×10⁻⁶ 5 E(decay): weighted average of 31.3 17 (2001Lo11) and 30 3 (1997Tr05).
(9.85×10³ 4)	1112.4	14.3 6	0.0027 1	4.519 21	14.3 6	av Eβ=4206 20; εK=0.0001696 2; εL=1.664×10⁻⁵ 23; εM+=2.69×10⁻⁶ 4 E(decay): weighted average of 14.4 6 (2001Lo11) and 13 2 (1997Tr05).

† Absolute intensity per 100 decays.

$\gamma(^{36}$K)

E$_\gamma$	I$_\gamma$ †	E$_i$(level)	J$^\pi_i$	E$_f$	J$^\pi_f$	Comments
1112.4 4	13 2	1112.4	1⁺	0	2⁺	E$_\gamma$: average of 1112.8 4 (1997Tr05) and 1111.9 4 (2001Lo11).
1618.6 7	30 3	1618.6	1⁺	0	2⁺	E$_\gamma$: weighted average of 1619.0 2 (1997Tr05) and 1617.2 4 (2001Lo11).

† Absolute intensity per 100 decays.

^{36}**Ca ε decay (101.2 ms)   2001Lo11,1997Tr05**

Decay Scheme

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

Legend

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

0^+ 0 101.2 ms 20

$\%\varepsilon + \%\beta^+ = 100.0$ $Q_\varepsilon = 10966$ 40

$^{36}_{20}Ca_{16}$

		$I\beta^+$	$I\varepsilon$	Log ft
1^+	6787	0.5	0.002	3.90
1^+	5926	2.2	0.0043	3.73
	5754	0.9	0.002	4.21
	5243	0.6	0.0007	4.61
1^+	4658	1.2	0.0010	4.55
1^+	4450	2.6	0.0020	4.29
0^+	4281.9	38	0.027	3.184
1^+	3357	10.3	0.0047	4.06
1^+	1618.6	31.0	0.0070	4.06
1^+	1112.4	14.3	0.0027	4.519
2^+	0			

1618.6 *30*

1112.4 *16*

342 ms *2*

$^{36}_{19}K_{17}$