^{37}Ca ε decay (181.1 ms) 1997Ka10,1991Ga23,1995Tr03

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	John Cameron, Jun Chen and Balraj Singh, Ninel Nica	NDS 113, 365 (2012)	15-Jan-2012

Parent: ^{37}Ca: E=0.0; $J^\pi=3/2^+$; $T_{1/2}$=181.1 ms *10*; Q(ε)=11664.5 *8*; %ε+%$β^+$ decay=100.0

^{37}Ca-Q(ε): From 2011AuZZ; ^{37}Ca also decays to ^{36}Ar by εp (%εp=76 *3*).

1997Ka10 (also 1991Ga23): used mass-separated ^{37}Ca beam and studied ^{37}K levels by detecting delayed protons In coincidence with γ-rays In ^{36}Ar; deduced B(GT) values assuming $\Gamma=\Gamma_p$.

1997Tr05,1995Tr03: found high Γ_γ/Γ_p values and corrected for B(GT) values of P-unbound low-lying levels In ^{37}K; measured $T_{1/2}'$s (1995Tr03).

Others: 1995Ga03, 1990Ga17, 1987Ad05, 1974Se11, 1966Ha22, 1966Po12, 1964Ha42, 1964Re08, 1960Wa04, 1958Su60.

^{37}K Levels

E(level)†	J^π‡	$T_{1/2}$	E(level)†	J^π‡
0.0	$3/2^+$	1.225& s *7*	6416 *5*	$1/2^+$
1370.9# *2*	$1/2^+$		6432 *3*	$(1/2,3/2,5/2)^+$
2750.5# *2*	$5/2^+$	1.52[a] fs *14*	6543 *5*	
3239.5# *2*	$5/2^+$	97[b] fs *28*	6606 *5*	$3/2^+$
3622.8 *20*	$3/2^+$		6684 *5*	$(1/2^+)$
3839 *3*	$(1/2,3/2,5/2)^+$		6740 *5*	(1/2,3/2,5/2)
3853 *3*	(1/2,3/2,5/2)		6824 *5*	$1/2^-$
4192 *9*	(1/2,3/2,5/2)		6912 *5*	
4414.7 *24*	$(1/2,3/2,5/2)^+$		6974 *5*	$5/2^+$
4496 *3*	$1/2^+$		7071 *3*	$(1/2,3/2,5/2)^+$
5017 *4*	$3/2^+$		7183 *3*	$5/2^+$
5050 *3*	$3/2^+$		7240 *5*	$3/2^+$
5120 *3*	$1/2^+$		7370 *3*	$5/2^+$
5323.3 *19*	$(3/2,5/2)^+$		7473.8 *18*	$5/2^+$
5358 *6*	(1/2,3/2,5/2)		7542 *3*	$3/2^+$
5424.1 *23*	$3/2^+,5/2^+$		7634 *3*	$5/2^+$
5459 *4*	$1/2^+$		7662 *5*	$3/2^+$
5479.8 *21*	$3/2^+,5/2^+$		7807 *4*	$(1/2,3/2,5/2)^+$
5569?@ *5*	$5/2^-$		7835 *4*	$(1/2,3/2,5/2)^+$
5624.1 *20*	$(1/2,3/2,5/2)^+$		8029 *5*	$(1/2,3/2,5/2)^+$
5713 *4*			8273 *5*	$(1/2,3/2,5/2)^+$
5789 *5*	$3/2^+$		8314 *5*	$(1/2,3/2,5/2)^+$
5933 *4*	$5/2^+$		8378 *5*	(1/2,3/2,5/2)
6014.7 *23*	$5/2^+$		8429 *5*	(1/2,3/2,5/2)
6047 *4*	$1/2^-$		8486 *5*	$(1/2,3/2,5/2)^+$
6092.4 *23*	$1/2^+$		8525 *5*	(1/2,3/2,5/2)
6274 *5*			8605 *5*	(1/2,3/2,5/2)
6324 *5*	$5/2^+$		8653 *5*	(1/2,3/2,5/2)

† From 1997Ka10, except when noted otherwise. Two levels reported In the previous work (1991Ga23) but not observed In 1997Ka10 have been excluded here: 5446 and 5465.

‡ From Adopted Levels, Gammas dataset.

From 1995Tr03 based on measured Eγ.

@ From 1997Ka10 only.

& From Adopted Levels, Gammas dataset.

[a] Mean lifetime τ In fs: 2.2 *2* (1995Tr03).

[b] Mean lifetime τ In fs: 140 *40* (1995Tr03).

^{37}Ca ε decay (181.1 ms) 1997Ka10,1991Ga23,1995Tr03 (continued)

ε,β$^+$ radiations

E(decay)	E(level)	Iβ$^+$ ‡@	Log ft†	I(ε+β$^+$)@	Comments
(3012 5)	8653	0.0023 16	5.6 3	0.0023 16	av Eβ=866.9 24 B(GT)=1.64×10^{-2} 99.
(3060 5)	8605	0.0035 16	5.47 19	0.0035 16	av Eβ=889.3 24 B(GT)=2.06×10^{-2} 89.
(3140 5)	8525	0.0043 20	5.45 20	0.0043 20	av Eβ=926.6 24 B(GT)=2.2×10^{-2} 10.
(3179 5)	8486	0.005 3	5.39 21	0.005 3	av Eβ=944.8 24 B(GT)=2.5×10^{-2} 12.
(3236 5)	8429	0.0029 21	5.7 3	0.0029 21	av Eβ=971.5 24 B(GT)=1.22×10^{-2} 82.
(3287 5)	8378	0.0034 20	5.68 25	0.0034 20	av Eβ=995.4 24 B(GT)=1.29×10^{-2} 74.
(3351 5)	8314	0.015 3	5.10 8	0.015 3	av Eβ=1025.5 24 B(GT)=4.89×10^{-2} 85.
(3392 5)	8273	0.009 3	5.33 12	0.009 3	av Eβ=1044.8 24 B(GT)=2.86×10^{-2} 77.
(3636 5)	8029	0.040 5	4.88 5	0.040 5	av Eβ=1160.6 24 B(GT)=8.1×10^{-2} 10.
(3830 4)	7835	0.115 8	4.56 3	0.115 8	av Eβ=1252.7 20 B(GT)=17.0×10^{-2} 12.
(3858 4)	7807	0.166 12	4.42 3	0.166 12	av Eβ=1266.0 20 B(GT)=23.4×10^{-2} 17.
(4003 5)	7662	0.022 3	5.40 5	0.022 3	av Eβ=1335.1 25 B(GT)=2.47×10^{-2} 27.
(4031 3)	7634	0.104 8	4.74 3	0.104 8	av Eβ=1348.2 15 B(GT)=11.08×10^{-2} 37.
(4123 3)	7542	0.043 4	5.18 4	0.043 4	av Eβ=1392.2 15 B(GT)=4.05×10^{-2} 38.
(4190.7 20)	7473.8	0.217 15	4.52 3	0.217 15	av Eβ=1424.86 95 B(GT)=18.5×10^{-2} 12.
(4295 3)	7370	0.158 11	4.72 3	0.158 11	av Eβ=1474.6 15 B(GT)=11.83×10^{-2} 74.
(4425 5)	7240	0.034 4	5.46 4	0.034 4	av Eβ=1537.1 25 B(GT)=2.12×10^{-2} 18.
(4482 3)	7183	0.134 13	4.90 4	0.134 13	av Eβ=1564.5 15 B(GT)=7.76×10^{-2} 80.
(4594 3)	7071	0.214 15	4.76 3	0.214 15	av Eβ=1618.4 15 B(GT)=10.69×10^{-2} 84.
(4691 5)	6974	0.136 7	5.01 2	0.136 7	av Eβ=1665.2 25 B(GT)=6.06×10^{-2} 26.
(4753 5)	6912	0.0046 12	6.51 11	0.0046 12	av Eβ=1695.1 25 B(GT)=1.9×10^{-3} 5.
(4841 5)	6824	0.0133 22	6.10 7	0.0133 22	av Eβ=1737.6 25 B(GT)=4.9×10^{-3} 8.
(4925 5)	6740	0.0099 21	6.27 9	0.0099 21	av Eβ=1778.3 25 B(GT)=3.3×10^{-3} 7.
(4981 5)	6684	0.0160 23	6.09 6	0.0160 23	av Eβ=1805.4 25 B(GT)=5.0×10^{-3} 7.
(5059 5)	6606	0.011 10	6.3 4	0.011 10	av Eβ=1843.2 25 B(GT)=3.4×10^{-3} 34.
(5122 5)	6543	0.014 4	6.23 10	0.014 4	av Eβ=1873.7 25 B(GT)=3.6×10^{-3} 8.
(5233 3)	6432	0.140 10	5.27 3	0.140 10	av Eβ=1927.6 15

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^{37}Ca ε decay (181.1 ms) 1997Ka10,1991Ga23,1995Tr03 (continued)

ε,β+ radiations (continued)

E(decay)	E(level)	Iβ+ ‡@	Log ft†	I(ε+β+)@	Comments
					B(GT)=3.27×10^{-2} *22*.
(5249 *5*)	6416	0.078 *6*	5.53 *3*	0.078 *6*	av Eβ=1935.4 *25*
					B(GT)=1.82×10^{-2} *14*.
(5341 *5*)	6324	0.119 *9*	5.39 *3*	0.119 *9*	av Eβ=1980.1 *25*
					B(GT)=2.51×10^{-2} *15*.
(5391 *5*)	6274	0.0076 *21*	6.61 *12*	0.0076 *21*	av Eβ=2004.4 *25*
					B(GT)=1.5×10^{-3} *4*.
(5572.1 *24*)	6092.4	0.381 *18*	4.99 *2*	0.381 *18*	av Eβ=2092.8 *12*
					B(GT)=6.35×10^{-2} *29*.
(5618 *4*)	6047	0.34 *4*	5.06 *5*	0.34 *4*	av Eβ=2114.9 *20*
					B(GT)=5.3×10^{-3} *6*.
(5649.8 *24*)	6014.7	0.60 *3*	4.83 *2*	0.60 *3*	av Eβ=2130.7 *12*
					B(GT)=9.06×10^{-2} *37*.
(5732 *4*)	5933	0.166 *8*	5.42 *2*	0.166 *8*	av Eβ=2170.5 *20*
					B(GT)=2.35×10^{-2} *13*.
(5876 *5*)	5789	0.039 *5*	6.11 *5*	0.039 *5*	av Eβ=2240.8 *25*
					B(GT)=4.8×10^{-3} *5*.
(5952 *4*)	5713	0.0062 *18*	6.94 *12*	0.0062 *18*	av Eβ=2277.9 *20*
					B(GT)=7×10^{-4} *2*.
(6040.4 *22*)	5624.1	0.147 *11*	5.60 *3*	0.147 *11*	av Eβ=2321.2 *11*
					B(GT)=1.53×10^{-2} *11*.
(6096 *5*)	5569?	0.040# *8*	6.19 *8*	0.040 *8*	av Eβ=2348.2 *25*
(6184.7 *23*)	5479.8	0.022 *6*	6.49 *11*	0.022 *6*	av Eβ=2391.8 *11*
					B(GT)=2.0×10^{-3} *5*.
(6206 *4*)	5459	0.333 *8*	5.31 *1*	0.333 *8*	av Eβ=2402.0 *20*
					B(GT)=2.98×10^{-2} *15*.
(6240.4 *24*)	5424.1	0.106 *15*	5.82 *6*	0.106 *15*	av Eβ=2419.0 *12*
					B(GT)=9.4×10^{-3} *13*.
(6307 *6*)	5358	0.028 *5*	6.43 *8*	0.028 *5*	av Eβ=2451.4 *30*
					B(GT)=2.3×10^{-3} *4*.
(6341.2 *21*)	5323.3	0.57 *3*	5.13 *2*	0.57 *3*	av Eβ=2468.4 *10*
					B(GT)=54.54-2 *19*.
(6545 *3*)	5120	6.04 *15*	4.18 *1*	6.04 *15*	av Eβ=2568.0 *16*
					B(GT)=0.405 *13*.
(6615 *3*)	5050	46.7	4.8 *+7−3*	46.7	av Eβ=2602.3 *16*
					I(ε+β+): taken to Be a pure Fermi decay.
					B(GT)=10.3×10^{-2} *+81−84*.
(6648 *4*)	5017	≤0.4	≥5.43	≤0.4	av Eβ=2618.5 *20*
					B(GT)<2.3×10^{-2}.
(7169 *3*)	4496	1.34 *4*	5.05 *1*	1.34 *4*	av Eβ=2874.4 *16*
					B(GT)=5.41×10^{-2} *18*.
(7250 *3*)	4414.7	1.08 *3*	5.17 *1*	1.08 *3*	av Eβ=2914.4 *13*
					B(GT)=4.11×10^{-2} *14*.
(7473 *9*)	4192	0.088 *9*	6.33 *4*	0.088 *9*	av Eβ=3024.1 *45*
					B(GT)=2.9×10^{-3} *3*.
(7812 *3*)	3853	0.398 *19*	5.78 *2*	0.398 *19*	av Eβ=3191.1 *16*
					B(GT)=1.03×10^{-2} *5*.
(7826 *3*)	3839	3.20 *8*	4.88 *1*	3.20 *8*	av Eβ=3198.0 *16*
					B(GT)=8.08×10^{-2} *25*.
(8041.7 *22*)	3622.8	3.30 *8*	4.93 *1*	3.30 *8*	av Eβ=3304.6 *11*
					B(GT)=7.15×10^{-2} *22*.
(8425.0 *8*)	3239.5	4.5 *12*	4.90 *11*	4.5 *12*	av Eβ=3493.89 *41*
					I(ε+β+): 5.0 *2* (1995Tr03).
					B(GT)=7.7×10^{-2} *20*.

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^{37}Ca ε decay (181.1 ms) 1997Ka10,1991Ga23,1995Tr03 (continued)

ε,β+ radiations (continued)

E(decay)	E(level)	Iβ+ ‡@	Log *ft*†	I(ε+β+)@	Comments
(8914.0 *8*)	2750.5	7.9 *13*	4.79 *7*	7.9 *13*	av Eβ=3735.63 *41* I(ε+β+): 8.0 *5* (1995Tr03). B(GT)=9.9×10^{-2} *15*.
(10293.6 *8*)	1370.9	2.14 *10*	5.69 *2*	2.14 *10*	av Eβ=4419.09 I(ε+β+): 2.1 *1* (1995Tr03). B(GT)=1.24×10^{-2} *6*.
(11664.5 *8*)	0.0	18.5 *22*	5.04 *5*	18.5 *22*	av Eβ=5099.81 I(ε+β+): 15.6 *5* inferred value based on log *ft* for mirror ^{37}Ar β− decay. B(GT)=5.54×10^{-2} *62*.

† Deduced by evaluators from the experimental B(GT) values from 1997Ka10 using B(GT)=(6140 *10*)/*ft*, equation listed in reference 11 of 1997Ka10 for pure Gamow-Teller transitions.
‡ Deduced by evaluators from the *ft* values., unless otherwise stated. The Fermi function *f* was calculated using LOGFT code at NNDC, BNL. Partial half-lives were then converted to β feedings.
# From 1991Ga23 only.
@ Absolute intensity per 100 decays.

γ(^{37}K)

Eγ	Iγ#	Ei(level)	J^π_i	Ef	J^π_f
1370.9† *2*	2.1‡ *1*	1370.9	1/2+	0.0	3/2+
2750.4† *2*	2.8‡ *1*	2750.5	5/2+	0.0	3/2+
3239.3† *2*	4.8‡ *2*	3239.5	5/2+	0.0	3/2+

† From 1995Tr03.
‡ From ε+β+ branching ratios (1995Tr03).
# Absolute intensity per 100 decays.

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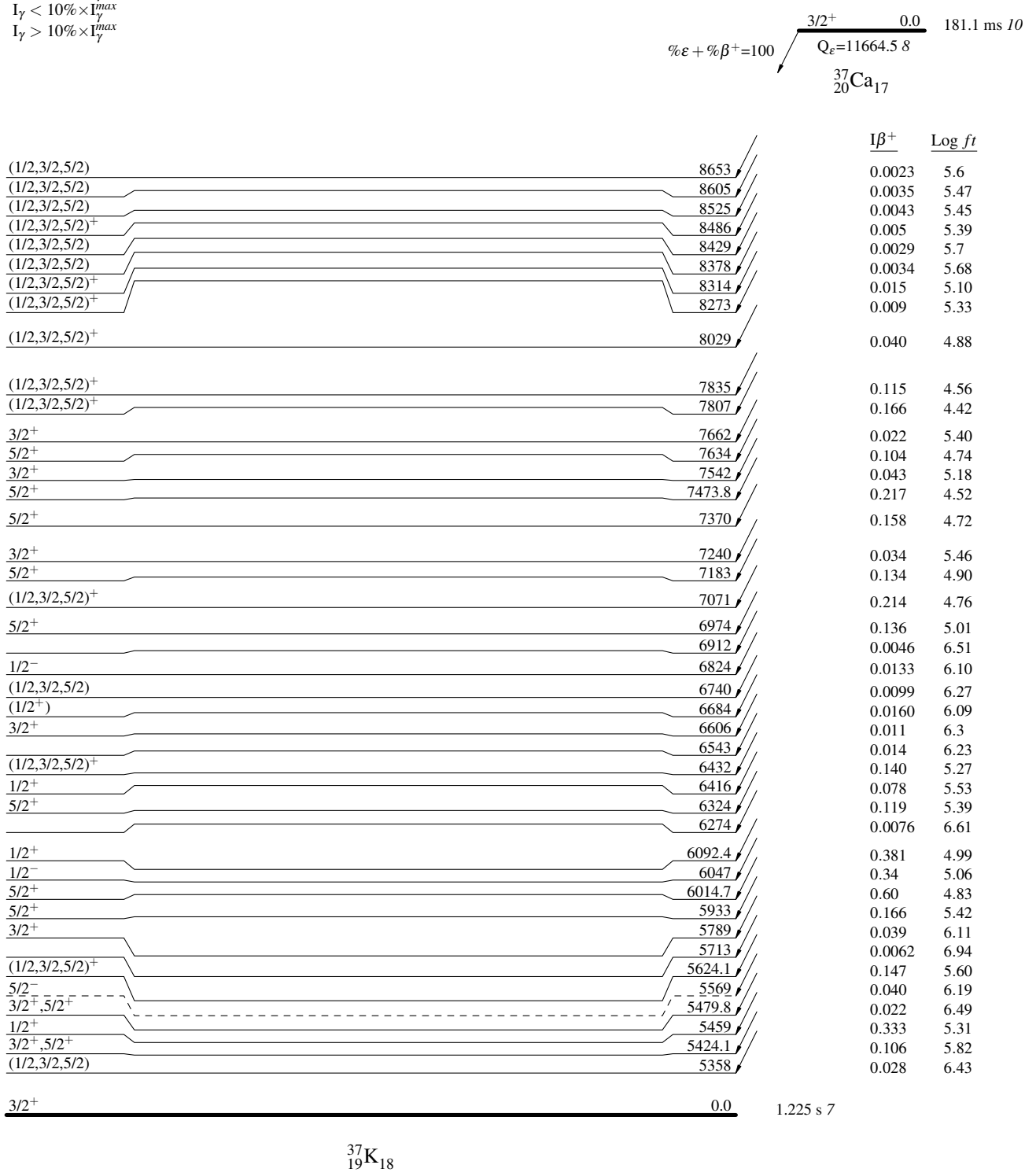
Decay Scheme

Intensities: I_γ per 100 parent decays

Legend

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



^{37}Ca ε decay (181.1 ms) 1997Ka10,1991Ga23,1995Tr03

Decay Scheme (continued)

Intensities: I_γ per 100 parent decays