^{36}K ε decay (342 ms) 1996Il02,1976Fr03

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}K: E=0; J$^{\pi}$=2^{+}; $T_{1/2}$=342 ms *2*; Q(ε)=12814.21 *35*; %ε+%β^{+} decay=100.0
^{36}K-Q(ε): From 2011AuZZ. Other: 12805 *8* (2003Au03).
1976Fr03, 1972Mi13: measured E(γ), I(γ).
1996Il02, 1980Es01, 1980Ew01: measured E(p), E(α), I(P), I(α).
1995Yo04 oriented ^{36}K produced by optical pumping of ^{36}K In ^{36}Ar target during 22 MeV P bombardment.
Source prepared by ^{36}Ar(p,n) (1972Mi13, 1976Fr03, 1980Es01, 1995Yo04); ^{45}Sc(P,^{7}n3p) (1980Ew01); Ca(p,X) (1996Il02).

^{36}Ar Levels

E(level)[†‡]	J$^{\pi}$	Comments
0.0	0^{+}	
1970.84 *22*	2^{+}	
4178.67 *20*	3^{-}	
4441.54 *20*	2^{+}	
4950.4 *9*	2^{+}	
4977.6 *11*	2^{-}	
6612.12 *20*	2^{+}	
6731.0 *5*	1^{+},2^{+}	
6867.5 *12*	(1^{+},2^{+})	
7140.9 *5*	3^{+}	
7178.0 *4*	(1,2)$^{+}$	
7338.7 *4*	3^{+}	
7709.3 *5*	1^{+}	
7971.4 *7*	1^{+},2^{+}	
8133.6 *14*	1^{+}	
8353 *3*	(1^{-},2^{+},3^{-})	E(α)=1522 *3* (1996Il02).
8398 *3*		E(α)=1562 *3* (1996Il02).
8556.6 *6*	2^{+}	
8850 *3*		E(α)=1963 *3* (1996Il02).
8909 *3*	2^{+}	E(α)=2016 *3* (1996Il02).
9023.3 *11*	2	E(p)=501.8 *11* (1996Il02).
9147.9 *13*	(2^{+},3^{-})	weighted average of 9147.6 *14* (E(p)=622.7 *14* (1996Il02)) and 9149 *3* (E(α)=2229 *3* (1996Il02)).
9219.7 *12*	1^{+}	E(p)=693.5 *8* (1996Il02).
9363 *3*	1^{-}	E(α)=2419 *3* (1996Il02).
9383.2 *10*	(2^{+},3,4^{+})	E(p)=851.7 *10* (1996Il02).
9469 *3*	1^{-},2^{+}	E(α)=2513 *3* (1996Il02).
9503.3 *11*	(2,3)	E(p)=969.6 *12* (1996Il02).
9709.2 *13*	(1^{-},2^{+})	weighted average of 9709 *3* (E(α)=2727 *3* (1996Il02)) and 9709.2 *14* (E(p)=1168.5 *14* (1996Il02)).
9740.0 *11*	3^{-}	E(p)=1198.5 *11* (1996Il02).
9815.6 *20*	(1,2,3^{-})	E(p)=1272.0 *20* (1996Il02).
9879.6 *7*	2^{+},3^{+}	E(p)=1334.2 *7* (1996Il02).
9956.9 *22*	(1,2^{+})	E(p)=1409.3 *22* (1996Il02).
9996 *4*		E(α)=2982 *3* (1996Il02).
10081 *10*	(1^{-},2,3)	E(p)=1530 *10* (1980Es01).
10208 *3*		E(α)=3170 *3* (1996Il02).
10329 *3*	2^{+}	E(α)=3278 *3* (1996Il02).
10449 *3*		weighted average of 10435 *10* (E(p)=1874 *10* (1980Es01)) and 10450 *3* (E(α)=3385 *3* (1996Il02)).
10563 *3*	3^{-}	weighted average of 10556 *10* (E(p)=1992 *10* (1980Es01)) and 10564 *3* (E(α)=3487 *3* (1996Il02)).
10599 *3*	3^{-}	E(α)=3518 *3* (1996Il02).
10614 *10*	1^{+},2^{+},3^{+}	E(p)=2048 *10* (1980Es01).
10706 *4*	(0^{+},1^{-},2^{+})	E(α)=3613 *4* (1996Il02).
10858 *3*	3^{-}	E(α)=3748 *3* (1996Il02).
10972 *4*	1,2	E(α)=3849 *4* (1996Il02).

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^{36}K ε decay (342 ms) 1996Il02,1976Fr03 (continued)

^{36}Ar Levels (continued)

E(level)[†‡]	J^π	Comments
11056 *3*	$1^+,2^+,3^+$	weighted average of 11036 *10* (E(p)=2458 *10* (1980Es01)) and 11058 *3* 11036 *10*(E(α)=3926 *3* (1996Il02)).
11236 *4*	$1^+,2^+,3^+$	weighted average of 11223 *10* (E(p)=2640 *10* (1980Es01)) and 11238 *4* (E(α)=4086 *4* (1996Il02)).
11640 *20*	$1^+,2^+,3^+$	E(α)=4443 *20* (1980Es01).

† From least-squares fit to Eγ's by evaluators.

‡ For unbound levels calculated by evaluators based on observed proton or α particle energies (E(p) and E(α) given In comments; also S(p)=8506.99 *5*, Q(α)=6640.92 *3*, and atomic masses all from 2011AuZZ), and the assumption that β^-delayed proton and α decays go to the ground state of ^{35}Cl and ^{32}S respectively (1996Il02).

ε,β^+ radiations

E(decay)	E(level)	Iβ^+ [#]	Iε[#]	Log *ft*[†]	I($\varepsilon+\beta^+$)[‡#]	Comments
(1174 *20*)	11640	$5.\times10^{-7}$ *4*	$4.\times10^{-5}$ *2*	4.95 *22*	0.4×10^{-4} *2*	av Eβ=63.9 *80*; εK=0.890 *7*; εL=0.0864 *6*; εM+=0.01266 *9*
(1578 *4*)	11236	0.00012 *5*	$9.\times10^{-5}$ *4*	4.84 *19*	2.1×10^{-4} *9*	av Eβ=228.0 *17*; εK=0.397 *6*; εL=0.0385 *6*; εM+=0.00564 *8*
(1758 *3*)	11056	0.00024 *9*	$8.\times10^{-5}$ *3*	5.02 *17*	3.2×10^{-4} *12*	av Eβ=303.9 *13*; εK=0.2126 *22*; εL=0.02060 *22*; εM+=0.00302 *4*
(1842 *4*)	10972	2.9×10^{-6} *12*	$6.\times10^{-7}$ *3*	7.15 *19*	3.5×10^{-6} *15*	av Eβ=339.9 *18*; εK=0.1605 *22*; εL=0.01555 *21*; εM+=0.00228 *3*
(1956 *3*)	10858	1.5×10^{-5} *4*	2.1×10^{-6} *6*	6.67 *13*	1.7×10^{-5} *5*	av Eβ=389.3 *14*; εK=0.1122 *11*; εL=0.01087 *10*; εM+=0.001593 *15*
(2108 *4*)	10706	$4.\times10^{-6}$ *2*	$3.\times10^{-7}$ *2*	7.55 *22*	4×10^{-6} *2*	av Eβ=456.0 *18*; εK=0.0727 *8*; εL=0.00705 *8*; εM+=0.001033 *12*
(2200 *10*)	10614	0.00044 *17*	3.0×10^{-5} *11*	5.62 *17*	4.7×10^{-4} *18*	av Eβ=496.8 *45*; εK=0.0573 *15*; εL=0.00555 *15*; εM+=0.000813 *21*
(2215 *3*)	10599	$6.\times10^{-5}$ *2*	$4.\times10^{-6}$ *1*	6.54 *15*	6×10^{-5} *2*	av Eβ=503.5 *14*; εK=0.0552 *5*; εL=0.00534 *4*; εM+=0.000783 *6*
(2251 *3*)	10563	0.00056 *18*	3.3×10^{-5} *11*	5.60 *14*	5.9×10^{-4} *19*	av Eβ=519.5 *14*; εK=0.0505 *4*; εL=0.00489 *4*; εM+=0.000717 *6*
(2365 *3*)	10449	0.00013 *5*	6.0×10^{-6} *22*	6.38 *16*	1.4×10^{-4} *5*	av Eβ=570.6 *14*; εK=0.0388 *3*; εL=0.00376 *3*; εM+=0.000551 *4*
(2485 *3*)	10329	0.0004 *1*	$1.\times10^{-5}$ *1*	6.08 *11*	4×10^{-4} *1*	av Eβ=624.8 *14*; εK=0.03003 *19*; εL=0.002908 *18*; εM+=0.000426 *3*
(2606 *3*)	10208	1.1×10^{-5} *4*	2.9×10^{-7} *11*	7.78 *16*	1.1×10^{-5} *4*	av Eβ=679.9 *14*; εK=0.02366 *14*; εL=0.002290 *14*; εM+=0.0003356 *2*
(2733 *10*)	10081	0.00029 *12*	6.2×10^{-6} *25*	6.49 *18*	3.0×10^{-4} *12*	av Eβ=737.3 *46*; εK=0.0187 *4*; εL=0.00182 *4*; εM+=0.000266 *5*
(2818 *4*)	9996	$8.\times10^{-6}$ *2*	$1.\times10^{-7}$ *1*	8.15 *11*	8×10^{-6} *2*	av Eβ=776.4 *19*; εK=0.01621 *11*; εL=0.001569 *11*; εM+=0.0002299 *1*
(2857.3 *22*)	9956.9	0.00010 *3*	1.7×10^{-6} *5*	7.10 *13*	1.0×10^{-4} *3*	av Eβ=795.2 *18*; εK=0.01520 *6*; εL=0.001471 *6*; εM+=0.0002156 *8*
(2934.6 *8*)	9879.6	0.0042 *11*	6.4×10^{-5} *16*	5.54 *12*	4.3×10^{-3} *11*	av Eβ=831.02 *37*; εK=0.013427 *17*; εL=0.0012996 *1*; εM+=0.00019044
(2998.6 *20*)	9815.6	0.00015 *4*	2.0×10^{-6} *5*	7.06 *12*	1.5×10^{-4} *4*	av Eβ=860.72 *95*; εK=0.01216 *4*; εL=0.001177 *4*; εM+=0.0001725 *6*
(3074.2 *12*)	9740.0	0.00024 *6*	2.9×10^{-6} *7*	6.93 *11*	2.4×10^{-4} *6*	av Eβ=895.89 *54*; εK=0.010865 *19*; εL=0.0010516 *1*; εM+=0.0001541 *3*
(3105.0 *14*)	9709.2	0.0011 *3*	1.3×10^{-5} *3*	6.29 *12*	1.1×10^{-3} *3*	av Eβ=910.25 *63*; εK=0.010390 *21*; εL=0.0010056 *2*; εM+=0.0001474 *3*

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^{36}K ε decay (342 ms) 1996Il02,1976Fr03 (continued)

ε,$β^+$ radiations (continued)

E(decay)	E(level)	I$β^+$ #	Iε#	Log *ft*†	I(ε+$β^+$)‡#	Comments
(3310.9 *12*)	9503.3	0.26 *4*	0.0023 *3*	4.10 *7*	0.26 *4*	av Eβ=1006.62 *55*; εK=0.007830 *12*; εL=0.0007578 *1*; εM+=0.00011104
(3345 *3*)	9469	8.×10^{-6} *3*	7.×10^{-8} *2*	8.64 *17*	8×10^{-6} *3*	av Eβ=1022.7 *15*; εK=0.00749 *3*; εL=0.000725 *3*; εM+=0.0001062 *5*
(3431.0 *11*)	9383.2	0.0022 *6*	1.6×10^{-5} *4*	6.27 *12*	2.2×10^{-3} *6*	av Eβ=1063.11 *50*; εK=0.006718 *9*; εL=0.0006501 *9*; εM+=9.526×10^{-5} *13*
(3451 *3*)	9363	1.1×10^{-5} *3*	8.0×10^{-8} *22*	8.59 *12*	1.1×10^{-5} *3*	av Eβ=1072.6 *15*; εK=0.006552 *25*; εL=0.0006340 *2*; εM+=9.29×10^{-5} *4*
(3594.5 *13*)	9219.7	0.15 *4*	0.00092 *25*	4.56 *12*	0.15 *4*	av Eβ=1140.33 *60*; εK=0.005519 *8*; εL=0.0005340 *8*; εM+=7.825×10^{-5} *12*
(3666.3 *14*)	9147.9	0.00030 *6*	1.7×10^{-6} *3*	7.31 *9*	3.0×10^{-4} *6*	av Eβ=1174.34 *64*; εK=0.005083 *8*; εL=0.0004918 *8*; εM+=7.207×10^{-5} *11*
(3790.9 *12*)	9023.3	0.00011 *3*	5.4×10^{-7} *15*	7.84 *12*	1.1×10^{-4} *3*	av Eβ=1233.29 *55*; εK=0.004429 *6*; εL=0.0004285 *6*; εM+=6.279×10^{-5} *8*
(3905 *3*)	8909	0.0015 *4*	6.5×10^{-6} *17*	6.78 *12*	1.5×10^{-3} *4*	av Eβ=1287.7 *15*; εK=0.003925 *13*; εL=0.0003797 *1*; εM+=5.564×10^{-5} *18*
(3964 *3*)	8850	6.×10^{-5} *2*	2.×10^{-7} *1*	8.22 *15*	0.6×10^{-4} *2*	av Eβ=1315.8 *15*; εK=0.003695 *12*; εL=0.0003574 *1*; εM+=5.238×10^{-5} *16*
(4257.6 *7*)	8556.6	0.16 *6*	0.00049 *19*	4.98 *17*	0.16 *6*	av Eβ=1456.23 *34*; εK=0.002783 *2*; εL=0.0002692 *2*; εM+=3.945×10^{-5} *3*
(4416 *3*)	8398	2.4×10^{-5} *8*	6.4×10^{-8} *21*	8.89 *15*	2.4×10^{-5} *8*	av Eβ=1532.4 *15*; εK=0.002413 *7*; εL=0.0002334 *7*; εM+=3.421×10^{-5} *9*
(4461 *3*)	8353	5.×10^{-5} *1*	1.×10^{-7} *1*	8.60 *9*	0.5×10^{-4} *1*	av Eβ=1554.1 *15*; εK=0.002321 *6*; εL=0.0002245 *6*; εM+=3.289×10^{-5} *9*
(4680.6 *15*)	8133.6	0.09 *3*	0.0002 *1*	5.47 *15*	0.09 *3*	av Eβ=1659.81 *70*; εK=0.0019306 *2*; εL=0.00018673; εM+=2.736×10^{-5} *4*
(4842.8 *8*)	7971.4	0.127 *23*	0.00024 *4*	5.40 *8*	0.127 *23*	av Eβ=1738.18 *38*; εK=0.001697 *1*; εL=0.0001641 *1*; εM+=2.405×10^{-5} *2*
(5104.9 *6*)	7709.3	0.53 *8*	0.00082 *12*	4.92 *7*	0.53 *8*	av Eβ=1865.15 *30*; εK=0.0013934 *7*; εL=0.000135; εM+=1.9745×10^{-5} *9*
(5475.5 *5*)	7338.7	1.93 *14*	0.00231 *17*	4.53 *4*	1.93 *14*	av Eβ=2045.41 *26*; εK=0.0010766 *4*; εL=0.000104; εM+=1.5256×10^{-5} *6*
(5636.2 *5*)	7178.0	0.70 *10*	0.00075 *11*	5.04 *7*	0.70 *10*	av Eβ=2123.71 *26*; εK=0.0009692 *4*; εL=9.372×10^{-5} *4*; εM+=1.3732×10^{-5} *5*
(5673.3 *6*)	7140.9	0.69 *9*	0.00073 *9*	5.06 *6*	0.69 *9*	av Eβ=2141.80 *30*; εK=0.0009464 *4*; εL=9.152×10^{-5} *4*; εM+=1.3410×10^{-5} *6*
(5946.7 *13*)	6867.5	0.44 *8*		5.37 *8*	0.44 *8*	av Eβ=2275.29 *61*
(6083.2 *6*)	6731.0	0.90 *11*		5.11 *6*	0.90 *11*	av Eβ=2342.03 *30*
(6202.1 *4*)	6612.12	42 *4*	0.032 *3*	3.49 *5*	42 *4*	av Eβ=2400.21; εK=0.0006877 *2*; εL=6.650×10^{-5} *2*; εM+=9.743×10^{-6} *3*
(7836.6 *12*)	4977.6	0.14 *5*		6.53 *16*	0.14 *5*	av Eβ=3203.42 *57*
(7863.8 *10*)	4950.4	0.16 *5*		6.48 *14*	0.16 *5*	av Eβ=3216.83 *48*
(8372.7 *4*)	4441.54	8.4 *10*	0.0023 *3*	4.90 *6*	8.4 *10*	av Eβ=3468.04; εK=0.0002437; εL=2.3558×10^{-5} *4*; εM+=3.4517×10^{-6} *6*
(10843.4 *4*)	1970.84	44 *4*	0.0050 *5*	4.78 *4*	44 *4*	av Eβ=4692.12; εK=0.0001032; εL=9.973×10^{-6} *2*; εM+=1.4612×10^{-6} *2*

† For an unbound level the log *ft* value is rather an upper limit (since usually only a fraction of the intensity was observed).
‡ For unbound levels the intensity is the sum of the intensities of each observed decay mode, reason for which they are rather lower limits.
\# Absolute intensity per 100 decays.

^{36}K ε decay (342 ms) 1996Il02,1976Fr03 (continued)

γ(^{36}Ar)

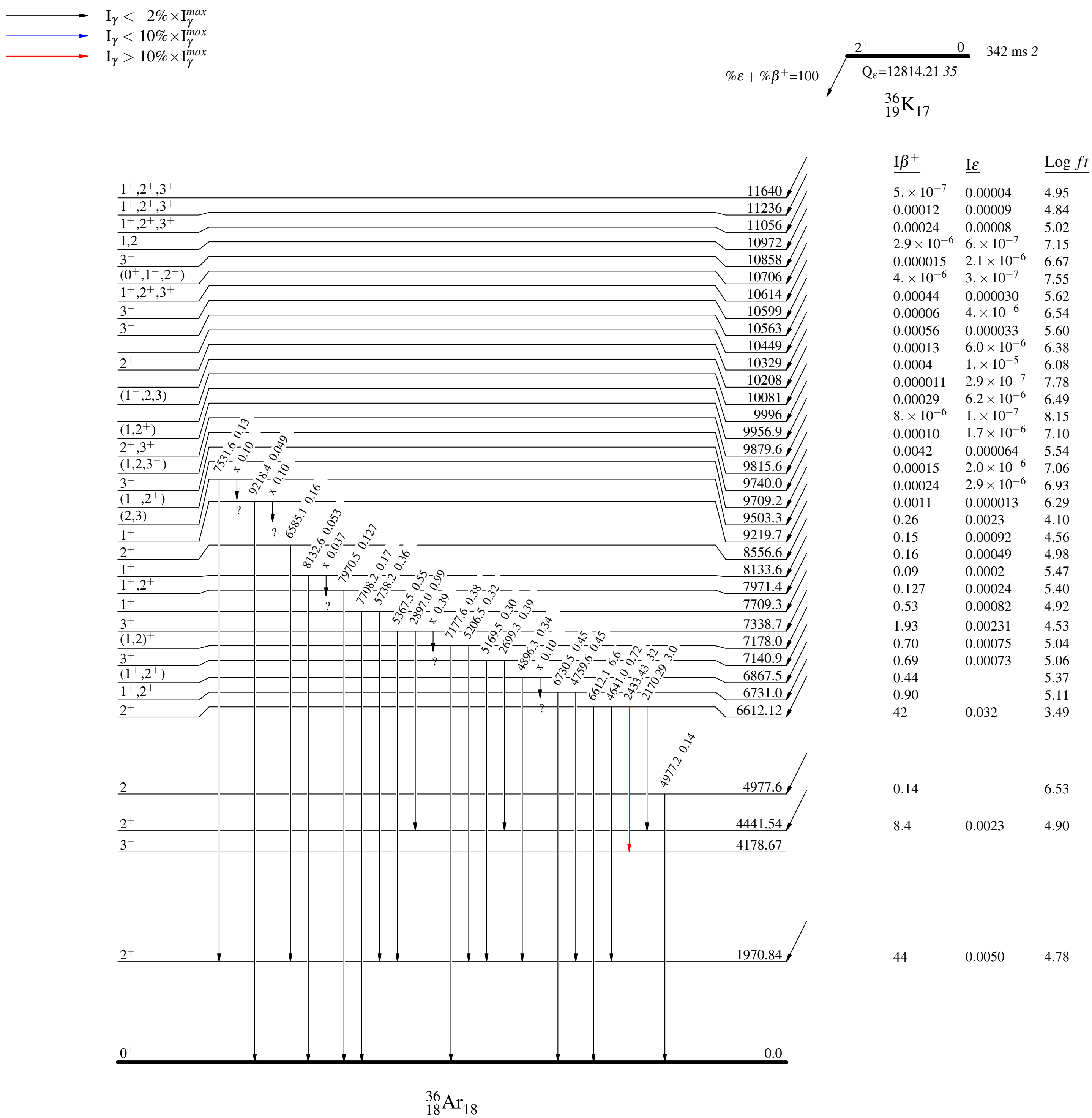
E_γ †	I_γ †‡	E_i(level)	J^π_i	E_f	J^π_f	Comments
x	0.10 *4*	6867.5	$(1^+,2^+)$			
x	0.39 *4*	7338.7	3^+			
x	0.037 *25*	8133.6	1^+			
x	0.10 *4*	9219.7	1^+			
x	0.10 *3*	9503.3	(2,3)			
1970.4 *5*	81.8 *16*	1970.84	2^+	0.0	0^+	%Iγ=81.8 *16*, using the calculated normalization.
2170.29 *20*	3.0 *4*	6612.12	2^+	4441.54	2^+	
2207.8 *3*	30 *3*	4178.67	3^-	1970.84	2^+	
2433.43 *21*	32 *3*	6612.12	2^+	4178.67	3^-	
2470.5 *4*	4.8 *4*	4441.54	2^+	1970.84	2^+	
2699.3 *5*	0.39 *5*	7140.9	3^+	4441.54	2^+	
2897.0 *3*	0.99 *11*	7338.7	3^+	4441.54	2^+	
4178.5 *3*	2.04 *19*	4178.67	3^-	0.0	0^+	%Iγ=2.04 *19*, using the calculated normalization.
4440.8 *3*	8.0 *8*	4441.54	2^+	0.0	0^+	%Iγ=8.0 *8*, using the calculated normalization.
4641.0 *5*	0.72 *10*	6612.12	2^+	1970.84	2^+	
4759.6 *7*	0.45 *8*	6731.0	$1^+,2^+$	1970.84	2^+	
4896.3 *11*	0.34 *7*	6867.5	$(1^+,2^+)$	1970.84	2^+	
4950.0 *9*	0.16 *5*	4950.4	2^+	0.0	0^+	%Iγ=0.16 *5*, using the calculated normalization.
4977.2 *11*	0.14 *5*	4977.6	2^-	0.0	0^+	%Iγ=0.14 *5*, using the calculated normalization.
5169.5 *8*	0.30 *7*	7140.9	3^+	1970.84	2^+	
5206.5 *4*	0.32 *8*	7178.0	$(1,2)^+$	1970.84	2^+	
5367.5 *5*	0.55 *8*	7338.7	3^+	1970.84	2^+	
5738.2 *6*	0.36 *7*	7709.3	1^+	1970.84	2^+	
6585.1 *5*	0.16 *6*	8556.6	2^+	1970.84	2^+	
6612.1 *4*	6.6 *8*	6612.12	2^+	0.0	0^+	%Iγ=6.6 *8*, using the calculated normalization.
6730.5 *5*	0.45 *7*	6731.0	$1^+,2^+$	0.0	0^+	%Iγ=0.45 *7*, using the calculated normalization.
7177.6 *5*	0.38 *6*	7178.0	$(1,2)^+$	0.0	0^+	%Iγ=0.38 *6*, using the calculated normalization.
7531.6 *10*	0.13 *3*	9503.3	(2,3)	1970.84	2^+	
7708.2 *7*	0.17 *3*	7709.3	1^+	0.0	0^+	%Iγ=0.17 *3*, using the calculated normalization.
7970.5 *7*	0.127 *23*	7971.4	$1^+,2^+$	0.0	0^+	%Iγ=0.127 *23*, using the calculated normalization.
8132.6 *14*	0.053 *17*	8133.6	1^+	0.0	0^+	%Iγ=0.053 *17*, using the calculated normalization.
9218.4 *12*	0.049 *13*	9219.7	1^+	0.0	0^+	%Iγ=0.049 *13*, using the calculated normalization.

† From 1976Fr03, unless noted otherwise.
‡ Absolute intensity per 100 decays.

^{36}K ε decay (342 ms) 1996Il02,1976Fr03

Decay Scheme

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

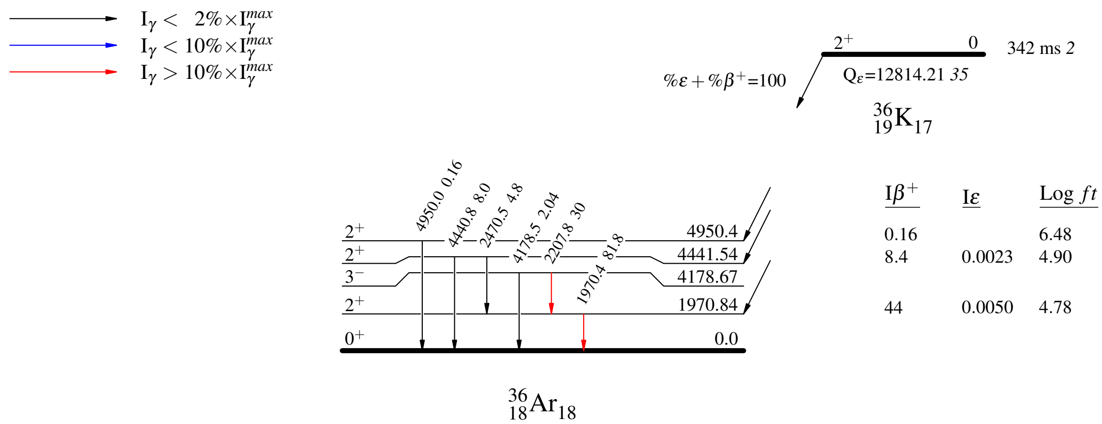


J^π	Level	$I\beta^+$	$I\varepsilon$	Log ft
$1^+,2^+,3^+$	11640	$5.\times10^{-7}$	0.00004	4.95
$1^+,2^+,3^+$	11236	0.00012	0.00009	4.84
$1^+,2^+,3^+$	11056	0.00024	0.00008	5.02
1,2	10972	2.9×10^{-6}	$6.\times10^{-7}$	7.15
3^-	10858	0.000015	2.1×10^{-6}	6.67
$(0^+,1^-,2^+)$	10706	$4.\times10^{-6}$	$3.\times10^{-7}$	7.55
$1^+,2^+,3^+$	10614	0.00044	0.000030	5.62
3^-	10599	0.00006	$4.\times10^{-6}$	6.54
3^-	10563	0.00056	0.000033	5.60
	10449	0.00013	6.0×10^{-6}	6.38
2^+	10329	0.0004	$1.\times10^{-5}$	6.08
	10208	0.000011	2.9×10^{-7}	7.78
$(1^-,2,3)$	10081	0.00029	6.2×10^{-6}	6.49
	9996	$8.\times10^{-6}$	$1.\times10^{-7}$	8.15
$(1,2^+)$	9956.9	0.00010	1.7×10^{-6}	7.10
$2^+,3^+$	9879.6	0.0042	0.000064	5.54
$(1,2,3^-)$	9815.6	0.00015	2.0×10^{-6}	7.06
3^-	9740.0	0.00024	2.9×10^{-6}	6.93
$(1^-,2^+)$	9709.2	0.0011	0.000013	6.29
(2,3)	9503.3	0.26	0.0023	4.10
1^+	9219.7	0.15	0.00092	4.56
2^+	8556.6	0.16	0.00049	4.98
1^+	8133.6	0.09	0.0002	5.47
$1^+,2^+$	7971.4	0.127	0.00024	5.40
1^+	7709.3	0.53	0.00082	4.92
3^+	7338.7	1.93	0.00231	4.53
$(1,2)^+$	7178.0	0.70	0.00075	5.04
3^+	7140.9	0.69	0.00073	5.06
$(1^+,2^+)$	6867.5	0.44		5.37
$1^+,2^+$	6731.0	0.90		5.11
2^+	6612.12	42	0.032	3.49
2^-	4977.6	0.14		6.53
2^+	4441.54	8.4	0.0023	4.90
3^-	4178.67			
2^+	1970.84	44	0.0050	4.78
0^+	0.0			

^{36}K ε decay (342 ms) 1996Il02,1976Fr03

Decay Scheme (continued)

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



Level	$I\beta^+$	$I\varepsilon$	Log ft
4950.4	0.16		6.48
4441.54	8.4	0.0023	4.90
1970.84	44	0.0050	4.78