



1 Decay Scheme

⁴⁰K is a natural isotope with an isotopic abundance of 0.011668 (8) %. It disintegrates by β^- emission to the ground state of ⁴⁰Ca at 89.56 (7) %, by electron capture to the 1460-keV level of ⁴⁰Ar at 10.34 (7) %, and to the ground state of ⁴⁰Ar by electron capture at 0.098 (25) % and by β^+ at 0.00103 (13) %.

Le ⁴⁰K est un isotope naturel dont l'abondance est de 0,011668 (8)%. Il se désintègre à 89,56 (7) % par émission β^- vers le niveau fondamental du ⁴⁰Ca, par capture électronique à 10,34 (7) % vers le niveau à 1460 keV du ⁴⁰Ar, et vers le niveau fondamental du ⁴⁰Ar à 0,098 (25) % par capture électronique et à 0,00103 (13) % par émission β^+ .

2 Nuclear Data

$T_{1/2}({}^{40}\text{K})$:	1,2522	(27)	10^9 a
$Q^+({}^{40}\text{K})$:	1504,40	(6)	keV
$Q^-({}^{40}\text{K})$:	1310,91	(6)	keV

2.1 Electron Capture Transitions

	Energy (keV)	Probability (%)	Nature	log ft	P_K	P_L	P_M
$\epsilon_{0,1}$	43,55 (6)	10,34 (7)	Unique 1st Forbidden	11,54	0,7537 (7)	0,22248 (33)	0,02379 (32)
$\epsilon_{0,0}$	1504,40 (6)	0,098 (25)	Unique 3rd Forbidden	21,64	0,8908 (7)	0,0965 (5)	0,01271 (15)

2.2 β^- Transitions

	Energy (keV)	Probability (%)	Nature	log ft
$\beta_{0,0}^-$	1310,91 (6)	89,56 (7)	Unique 3rd Forbidden	20,59

2.3 β^+ Transitions

	Energy (keV)	Probability (%)	Nature	log ft
$\beta_{0,0}^+$	482,40 (6)	0,00103 (13)	Unique 3rd Forbidden	21,64

2.4 Gamma Transitions and Internal Conversion Coefficients

	Energy (keV)	P $_{\gamma+ce}$ (%)	Multipolarity	α_K (10 ⁻⁵)	α_L (10 ⁻⁵)	α_M (10 ⁻⁵)	α_T (10 ⁻⁵)	α_π (10 ⁻⁵)
$\gamma_{1,0}(\text{Ar})$	1460,851 (6)	10,34 (7)	E2	2,63 (4)	0,215 (3)	0,0210 (3)	10,28 (15)	7,41 (11)

3 Atomic Data

3.1 Ar

ω_K	:	0,1199	(28)
$\bar{\omega}_L$:	0,00147	(30)
n_{KL}	:	1,697	(6)

3.1.1 X Radiations

	Energy (keV)	Relative probability
X _K	K α_2	2,95566
	K α_1	2,95774
	K β_1	3,1905
X _L	L ℓ	0,2195
	L η	0,2215
	L β	0,3112 - 0,3114

3.1.2 Auger Electrons

	Energy (keV)	Relative probability
Auger K		
KLL	2,511 - 2,669	100
KLX	2,831 - 2,942	21,6
KXY	3,149 - 3,174	1,16
Auger L		
	0,17 - 0,31	

4 Electron Emissions

		Energy (keV)	Electrons (per 100 disint.)
e _{AL}	(Ar)	0,17 - 0,31	2,307 (16)
e _{AK}	(Ar)		
	KLL	2,511 - 2,669	} 6,94 (6)
	KLX	2,831 - 2,942	
	KXY	3,149 - 3,174	
ec _{1,0 T}	(Ar)	1457,645 - 1460,835	0,001063 (17)
β _{0,0} ⁺	max:	482,40 (6)	} 0,00103 (13)
	avg:	251,757 (28)	
β _{0,0} ⁻	max:	1310,91 (6)	} 89,56 (7)
	avg:	582,898 (26)	

5 Photon Emissions**5.1 X-Ray Emissions**

		Energy (keV)	Photons (per 100 disint.)	
XL	(Ar)	0,2195 - 0,3114	0,0034 (7)	
XKα ₂	(Ar)	2,95566	0,286 (8)	} Kα
XKα ₁	(Ar)	2,95774	0,567 (14)	
XKβ ₁	(Ar)	3,1905	0,092 (4)	K'β ₁

5.2 Gamma Emissions

	Energy (keV)	Photons (per 100 disint.)
γ^\pm	511	0,00359 (25)
$\gamma_{1,0}(\text{Ar})$	1460,822 (6)	10,34 (7)

6 Main Production Modes

Naturally occurring

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