



1 Decay Scheme

K-40 is a natural isotope with an isotopic abundance of 0.0117 (1) %. It disintegrates by beta minus emission to the Ca-40 fundamental level for 89.25 (17) %, by electron capture to the 1460 keV level of Ar-40 for 10.55 (11) %, to the ground state level of Ar-40 for 0.2 (1) % and by beta plus for 0.00100 (12) %.

Le potassium 40 est un isotope naturel dont l'abondance est de 0,0117 (1)%. Il se désintègre pour 89,25 (17) % par émission bêta moins vers le niveau fondamental du calcium 40, par capture électronique vers l'argon 40, pour 10,55 (11) % vers le niveau de 1460 keV et pour 0,2 (1) % vers le niveau fondamental.

2 Nuclear Data

$T_{1/2}({}^{40}\text{K})$:	1,2504	(30)	10^9 a
$Q^+({}^{40}\text{K})$:	1504,69	(19)	keV
$Q^-({}^{40}\text{K})$:	1311,07	(11)	keV

2.1 Electron Capture Transitions

	Energy keV	Probability × 100	Nature	lg ft	P_K	P_L	P_M
$\epsilon_{0,1}$	44,0 (3)	10,55 (11)	Unique 1st Forbidden	11,55	0,763	0,209	0,027
$\epsilon_{0,0}$	1504,69 (19)	0,2 (1)	Unique 3rd Forbidden	21,35	0,88	0,086	0,013

2.2 β^+ Transitions

	Energy keV	Probability × 100	Nature	lg ft
$\beta_{0,0}^+$	482,9 (3)	0,00100 (12)	Unique 3rd Forbidden	21,35

2.3 β^- Transitions

	Energy keV	Probability $\times 100$	Nature	lg ft
$\beta_{0,0}^-$	1311,07 (11)	89,25 (17)	Unique 3rd Forbidden	20,58

2.4 Gamma Transitions and Internal Conversion Coefficients

	Energy keV	$P_{\gamma+ce}$ $\times 100$	Multipolarity	α_K (10^{-5})	α_L (10^{-6})	α_M (10^{-7})	α_T (10^{-5})	α_π (10^{-5})
$\gamma_{1,0}(\text{Ar})$	1460,822 (6)	10,55 (11)	E2	2,63 (4)	2,15 (3)	2,10 (3)	10,28 (15)	7,3 (5)

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	$K\alpha_2$	2,95566
	$K\alpha_1$	2,95774
	$K\beta_1$	3,1905
	$K\beta_5''$	
		} 50,49
		} 100
		} 16,24
X_L	$L\ell$	0,2195
	$L\eta$	0,2215
	$L\beta$	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	2,22 (2)
e _{AK}	(Ar)			7,24 (11)
	KLL	2,511	- 2,669	}
	KLX	2,831	- 2,942	}
	KXY	3,149	- 3,174	}
ec _{1,0 T}	(Ar)	1457,645	- 1460,835	0,001085 (19)
$\beta_{0,0}^+$	max:	482,9	(3)	0,00100 (12)
$\beta_{0,0}^+$	avg:			
$\beta_{0,0}^-$	max:	1311,07	(11)	89,25 (17)
$\beta_{0,0}^-$	avg:	508,32	(6)	

5 Photon Emissions

5.1 X-Ray Emissions

		Energy keV		Photons per 100 disint.
XL	(Ar)	0,2195	— 0,3114	0,003 (1)
XK α_2	(Ar)	2,95566		0,299 (9) } K α
XK α_1	(Ar)	2,95774		0,592 (17) }
XK β_1	(Ar)	3,1905	}	0,096 (4) K' β_1

5.2 Gamma Emissions

	Energy keV	Photons per 100 disint.
γ^{\pm}	511	0,00200 (24)
$\gamma_{1,0}(\text{Ar})$	1460,822 (6)	10,55 (11)

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