



>>Entry Name: Potassium

Synonym(s): Kalium (L.)

CAS Registry Number: 7440-09-7

Related CAS Registry Numbers(s): 24203-36-9 25681-80-5 37279-39-3

K

Molecular Formula: K

Molecular Weight: 39.098

Accurate Mass: 38.963707

Percentage Composition: K 100.00%

decreasing abundance) are naturally occurring, ^{39}K , ^{41}K and ^{40}K ; ^{40}K is long-life radioactive. Abundance: 18,400 ppm (earth's crust), 380 ppm (sea water). Bcc struct.

Source/Synthesis: Synth. from K_2CrO_4 or $\text{K}_2\text{Cr}_2\text{O}_7$ + Zn powder at 700-1000°, from molten KCl + Na at 850°. Main ores are sylvite (KCl) and carnallite ($\text{KCl} \cdot \text{MgCl}_2 \cdot 6\text{H}_2\text{O}$).

Also synth. by thermal dec. of KN_3 . Obt. commercially from KCl + Na and by electrolysis of fused KOH or from KF + CaC_2

Use/Importance: Preferred metal for Rankine power conversion cycles. Potassium is an essential element for life processes (plant and animal)

Physical Description: Soft, bright silver, ductile metal. Tarnishes in air forming oxides, carbonates and the hydroxide

Melting Point: Mp 63.2°

Boiling Point: Bp 764°. Bp 774°

Solubility: Sol. NH_3 (l) → blue-black soln.

Other Data: Potassium and its salts impart pale lilac colour to flames

Hazard & Toxicity: Violent to explosive reactivity towards many substances, e.g. H_2SO_4 , halogens, CO_2 , H_2O . Flammable when dry, also explosion haz.

Aldrich: 24486-4

Fluka: 60030

>>Variant: Potassium 37

CAS Registry Number: 14092-89-8

Source/Synthesis: Prod. from Ca (p, α), or ^{36}Ar (^3He ,d)

Other Data: $I = +3/2$; $\mu = +0.2032 \mu_N$. Decays by orbital electron capture or $\beta^{(+)}$ emission to ^{37}Ar

>>Variant: Potassium 38

CAS Registry Number: 14092-90-1

Source/Synthesis: Prod. from Cl (α ,n), Ca (d, α), or ^{36}Ar (^3He ,p)

Other Data: $I = +3$; $\mu = +1.37 \mu_N$. Decays by orbital electron capture or $\beta^{(+)}$ emission to ^{38}Ar

>>Variant: Potassium 38m

Source/Synthesis: Prod. from Cl (α ,n), K (γ ,n), ^{40}Ca (d, α), or ^{36}Ar (t,n)

Use/Importance: $I = +0$. Decays by orbital electron capture or $\beta^{(+)}$ emission to ^{38}Ar

>>Variant: Potassium 39

CAS Registry Number: 14092-91-2

Use/Importance: Preferred isotope for nmr spectroscopy

Other Data: $I = +3/2$; $\mu = +0.391465 \mu_N$. Nmr relative sensitivity ($^1\text{H}=1.00$) 5.08×10^{-4} ; receptivity ($^{13}\text{C}=1.00$) 2.69

>>Variant: Potassium 40

Use/Importance: K/Ar or K/Ca used for radiometric dating of geological samples

Other Data: $I = -4$; $\mu = -1.298009 \mu_N$. Decays by $\beta^{(-)}$ emission to ^{40}Ca , or orbital electron capture to ^{40}Ar

>>Variant: Potassium 41

CAS Registry Number: 13965-93-0

Other Data: $I = +3/2$; $\mu = +0.214869 \mu_N$. Nmr relative sensitivity ($^1\text{H}=1.00$) 8.40×10^{-4} ; receptivity ($^{13}\text{C}=1.00$) 0.0328