



>>Entry Name: Chromium

CAS Registry Number: 7440-47-3

Related CAS Registry Numbers(s): 12184-82-6 14067-03-9 14280-17-2 14392-02-0 15723-28-1 16065-83-1 18540-29-9 22541-79-3 37185-66-3

Cr

Molecular Formula: Cr

Molecular Weight: 51.996

Accurate Mass: 51.940509

Percentage Composition: Cr 100.00%

General Statement: Atomic No. 24. Ground state electron config. [Ar]3d⁵4s¹. There are 9 isotopes of which 4 are natural. ⁵³Cr used in nmr spectroscopy. ⁵¹Cr is radioactive. First isol. by N.L. Vauquelin (Paris) in 1780. Abundance: 122 ppm (earth's crust), traces (sea water). Bcc form transforms into fcc form at *ca.* 1840°

Source/Synthesis: Occurs as crocoite (PbCrO₄) but main ore is chromite (FeCr₂O₄). Reduced with coke, this yields ferrochrome (alloy) directly. Pure metal also obt. from Cr₂O₃ + Al, Si or C or by electrolysis of chrome alum

Use/Importance: Essential trace element. Employed in hard alloys (e.g. *Ferrochrome*) and electroplating. ⁵¹Cr used as radioactive tracer

Physical Description: Hard ductile blue-white metal. Resists oxidation in air. More reactive to acids than Mo or W and can be rendered passive. Rapidly attacked by fused NaOH + KNO₃ or KClO₄

Melting Point: Mp 1900° (1857°, 1875°)

Boiling Point: Bp 2690° (2670°)

Hazard & Toxicity: Finely divided metal may be explosive. Human poison by ingestion

Aldrich: 26629-9

Fluka: 27060

>>Variant: Chromium 48

CAS Registry Number: 14833-09-1

General Statement: Radioactive, *t*_{1/2} 21.6 h

Source/Synthesis: Prod. from ⁴⁶Ti (α,2n)

Other Data: *I* = +0. Decays by orbital electron capture to ⁴⁸V

>>Variant: Chromium 49

CAS Registry Number: 15758-14-2

General Statement: Radioactive, *t*_{1/2} 42.09 min.

Source/Synthesis: Prod. from ⁴⁸Ti (α,3n), ⁴⁷Ti (α,2n), ⁴⁶Ti (α,n), ⁵¹V (p,3n), or ⁵⁰Cr (n,2n)

Other Data: *I* = - 5/2 ; *μ* = 0.476 *μ*_N. Decays by orbital electron capture or β⁽⁺⁾ emission to ⁴⁹V

>>Variant: Chromium 50

CAS Registry Number: 14304-94-0

General Statement: Stable. Representative abundance 4.345 atom %

Other Data: *I* = +0

>>Variant: Chromium 51

CAS Registry Number: 14392-02-0

General Statement: Radioactive, *t*_{1/2} 27.70 d

Source/Synthesis: Prod. from ⁵⁰Cr (n,γ)

Use/Importance: Used in diagnostic nuclear medicine; also (as sodium chromate) to label red blood cells

Other Data: *I* = - 7/2 . *μ* = -0.934 *μ*_N. Decays by orbital electron capture to ⁵¹V

>>Variant: Chromium 52

CAS Registry Number: 14092-98-9

General Statement: Stable. Representative abundance 83.789 atom %

Other Data: *I* = +0

>>Variant: Chromium 53

CAS Registry Number: 13981-78-7

General Statement: Stable. Representative abundance 9.501atom %

Other Data: *I* = - 3/2 . *μ* = -0.47454 *μ*_N. Nmr relative sensitivity (¹H=1.00) 9.03 x 10⁻⁴; receptivity (¹³C=1.00) 0.49