



>>Entry Name: Titanium

CAS Registry Number: 7440-32-6

Related CAS Registry Numbers(s): 12777-23-0 12777-24-1 12777-25-2 14067-04-0 15969-58-1 16043-45-1 18129-95-8 22541-75-9

Ti

Molecular Formula: Ti

Molecular Weight: 47.88

Accurate Mass: 47.947947

Percentage Composition: Ti 100.00%

Klaproth (1795) and J.J. Berzelius (1825). α -form (hcp) transforms into β -form (bcc) at 882°. β -form stable to Mp but can be found at r.t. if stabilising elements are present

Source/Synthesis: Ilmenite and rutile are the main ores. Extraction is by the Kroll process in which the ore is converted to TiCl_4 by $\text{Cl}_2 + \text{C}$ and TiCl_4 reduced by either Mg or Na at 950-1150°. Metal also obt. from $\text{TiO}_2 + \text{Ca}$, and $\text{Na}_2\text{TiF}_6 + \text{Na}$

Use/Importance: Chief use is in aero engines and airframes because of its low density and corrosion resistance. It is also used in some chemical plant and special marine structs. Specialised use is in prostheses. Bulk metal has high strength: weight ratio

Physical Description: Hard, lustrous, silvery metal (bulk), or dark grey amorphous powder. Not attacked by alkalis or cold mineral acids (except HF). Resists corrosion (oxide layer)

Melting Point: Mp 1667°

Boiling Point: Bp 3285° (3260°)

Other Data: Attacked by boiling HCl or H_2SO_4 , hot alkalis, and H_3PO_4

Hazard & Toxicity: Powdered metal will burn in air and can burn in CO_2 , N_2 . Addn. of H_2O to burning Ti causes explosion

Aldrich: 34714-0

Fluka: 89470

>>Variant: Titanium 44

CAS Registry Number: 15749-33-4

Source/Synthesis: Prod. by ^{44}Sc (p,2n), or ^{44}Sc (d,3n). Also obt. by proton spallation in MnCl_2 targets (commercial production route)

Other Data: $I = +0$. Decays by orbital electron capture to ^{44}Sc

>>Variant: Titanium 45

CAS Registry Number: 14392-00-8

Source/Synthesis: Prod. by ^{45}Sc (p,n), or ^{45}Sc (d,2n)

Other Data: $I = +7/2$; $\mu = +0.095 \mu_N$. Decays by $\beta^{(+)}$ emission, or orbital electron capture to ^{45}Sc

>>Variant: Titanium 46

CAS Registry Number: 14304-89-3

Other Data: $I = +0$

>>Variant: Titanium 47

CAS Registry Number: 14304-90-6

Other Data: $I = -5/2$; $\mu = -0.78848 \mu_N$. Nmr relative sensitivity ($^1\text{H}=1.00$) 2.09×10^{-3} ; receptivity ($^{13}\text{C}=1.00$) 0.864

>>Variant: Titanium 48

CAS Registry Number: 14304-91-7

Other Data: $I = +0$

>>Variant: Titanium 49

CAS Registry Number: 14304-92-8

Other Data: $I = -7/2$; $\mu = -1.10417 \mu_N$. Nmr relative sensitivity ($^1\text{H}=1.00$) 3.76×10^{-3} ; receptivity ($^{13}\text{C}=1.00$) 1.18