>>**Entry Name: Rhenium**

CAS Registry Number: 7440-15-5

Re

Molecular Formula: Re
Molecular Weight: 186.207
Accurate Mass: 186.955744
Percentage Composition: Re 100.00%

natural. Abundance: 0.0007 ppm (earth's crust). Discovered by W. Noddack, I. Tacke and O. Berg (Berlin) in gadolinite and independently by F.H. Loring and J.F.G. Druce in Mn minerals. V. rare. No biological role. Hcp struct. ^{187}Re is a β emitter ($t_{½}$ 90.64 h)
Source/Synthesis: Obt. from molybdenite concentrates and from Cu deposits. Re_2O_7 also obt. from uranium ores and isol. from Mo flue dusts. Otherwise available as the sulfide. Metal obt. by reducing NH_4ReO_4 or $KReO_4$ with H_2
Use/Importance: Used as a catalyst and in filaments and thermistors. The isotope ^{186}Re may have a use via diphosphonate complexes for the treatment of bone cancer. Forms important alloys with Mo and W; forms catalysts in the petrochemicals industry
Physical Description: Silvery-grey metal, grey powder. The massive metal resists oxidation but slowly tarnishes in air. Burns at high temp. yielding Re_2O_7
Melting Point: Mp 3170°
Boiling Point: Bp 5630°
Other Data: Weakly paramagnetic. Reacts readily with F_2 and Cl_2. Sol. in dil. HNO_3, H_2SO_4, Br_2 aq. Attacked by fused NaOH containing KNO_3 or Na_2O_2 → perrhenates
Hazard & Toxicity: Potentially pyrophoric. Violent reactions with F_2 and Cl_2

Aldrich: 45997-6
Fluka: 83670

>>**Variant: Rhenium 181**

CAS Registry Number: 14993-65-8

Source/Synthesis: Prod. from Ta (α,4n), ^{182}W (p,2n), or ^{181}Ta (^{3}He,3n)
Other Data: *I* = + 5/2 ; μ = 3.19 μ_N. Decays by orbital electron capture to ^{181}W

>>**Variant: Rhenium 182**

CAS Registry Number: 21459-71-2

Source/Synthesis: Prod. from Ta (α,3n), or ^{182}W (p,n)
Other Data: *I* = +7 (value uncertain); μ = 2.8 μ_N. Decays by orbital electron capture to ^{182}W

>>**Variant: Rhenium 182m**

Source/Synthesis: Prod. from Ta (α,3n), or ^{182}W (p,n). Daughter of ^{182}Os
Other Data: *I* = +2; μ = 3.3 μ_N. Decays by orbital electron capture or $\beta^{(+)}$ emission to ^{182}W

>>**Variant: Rhenium 183**

CAS Registry Number: 14484-13-0

Source/Synthesis: Prod. from Ta (α,2n). Daughter of ^{183}Os
Other Data: *I* = + 5/2 . Decays by orbital electron capture to ^{183}W

>>**Variant: Rhenium 184**

CAS Registry Number: 14983-46-1

Source/Synthesis: Prod. from Ta (α,n), ^{184}W (p,n), ^{185}Re (n,2n), ^{186}W (p,3n), or deuteron bombardment of W
Other Data: *I* = -3; μ = 2.53 μ_N. Decays by orbital electron capture to ^{184}W

>>**Variant: Rhenium 184m**

Source/Synthesis: Prod. from Ta (α,n), ^{84}W (p,n), ^{185}Re (n,2n), ^{186}W (p,3n), or deuteron bombardment of W
Other Data: *I* = +8; μ = +2.9 μ_N. Decays by orbital electron capture (25%) to ^{184}W, or isomeric transition (75%) to ^{184}Re