>>**Entry Name: Copper**
Synonym(s): Cuprum (L.)

CAS Registry Number: 7440-50-8
Related CAS Registry Numbers(s): 12190-70-4 15158-11-9 15721-63-8 17493-86-6 19498-52-3 37366-57-7 39417-05-5 65357-62-2 66771-03-7 66771-05-9 68112-39-0 81543-63-7 81543-64-8

Cu

Molecular Formula: Cu
Molecular Weight: 63.546
Accurate Mass: 62.939598
Percentage Composition: Cu 100.00%
General Statement: Atomic No. 29. Ground state electron config. [Ar]3d^{10}4s^{1}. Known since *ca.* 5000 BC. 11 Isotopes are known of which ^{63}Cu and ^{65}Cu are natural, and useful in nmr spectroscopy. Abundance: 68 ppm (earth's crust), 0.003 ppm (sea water). Fcc struct. (A1 type)
Source/Synthesis: Occurs as natural metal; as oxides e.g. cuprite (Cu_2O), tenorite (CuO); malachite (basic carbonate); and as sulfides e.g. chalcocite (Cu_2S), covellite (CuS), chalcopyrite (main ore, $CuFeS_2$). Direct smelting v. rare. Ores concd. by flotation, S removed as SO_2 by roasting, and oxides reduced by CO or H_2. Metal refined electrolytically
Use/Importance: Excellent electrical and thermal conductor, and used mainly in electrical equipment. Essential trace element. Constit. of historically important alloys. Reagent for the cyclisation and/or coupling of various functional groups, decarboxylation, preparation of α-alkynic alcohols, cyclopropanes, nitriles and ketones by benzylic oxidn.
Physical Description: Reddish, malleable and ductile metal. Slowly weathers to green patina of the carbonate
Melting Point: Mp 1083°
Boiling Point: Bp 2595° (2570°)
Other Data: Stable in dry air at r.t. At red heat → Cu_2O. Attacked by S, and by halogens. Reactive to hot conc. H_2SO_4, and dil. HNO_3. Resistant to H_2O
Hazard & Toxicity: Toxic in excess

Aldrich: 36532-7
Fluka: 61144

>>**Variant: Copper 59**

CAS Registry Number: 15128-02-6
General Statement: Radioactive, $t_{½}$ 1.358 min.
Source/Synthesis: Prod. from ^{58}Ni (p,γ), or ^{58}Ni (d,n)
Other Data: *I* = - 3/2 . Decays by orbital electron capture or $\beta^{(+)}$ emission to ^{59}Ni

>>**Variant: Copper 60**

CAS Registry Number: 13982-06-4
General Statement: Radioactive, $t_{½}$ 23.2 min.
Source/Synthesis: Prod. from ^{60}Ni (p,n), or ^{60}Ni (d,2n)
Other Data: *I* = +2; μ = +1.219 μ_N. Decays by orbital electron capture or $\beta^{(+)}$ emission to ^{60}Ni

>>**Variant: Copper 61**

CAS Registry Number: 15128-03-7
General Statement: Radioactive, $t_{½}$ 3.408 h
Source/Synthesis: Prod. from ^{60}Ni (d,n), ^{63}Cu (γ,2n), or ^{59}Co (α,2n)
Other Data: *I* = - 3/2 ; μ = +2.14 μ_N. Decays by orbital electron capture or $\beta^{(+)}$ emission to ^{61}Ni

>>**Variant: Copper 62**

CAS Registry Number: 14276-53-0
General Statement: Radioactive, $t_{½}$ 9.74 min.
Source/Synthesis: Prod. from ^{59}Co (α,n), or ^{62}Ni (p,n). Daughter of ^{62}Zn
Other Data: *I* = +1; μ = -0.380 μ_N. Decays by orbital electron capture or $\beta^{(+)}$ emission to ^{62}Ni

>>**Variant: Copper 63**

CAS Registry Number: 14191-84-5
General Statement: Stable. Natural abundance 69.24-68.98 atom %
Other Data: *I* = - 3/2 ; μ = +2.2233 μ_N. Nmr relative sensitivity (^{1}H=1.00) 0.0931; receptivity (^{13}C=1.00) 365