Material Safety Data Sheet

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Version 1.4
According to 91/155/EEC

Classified as Hazardous according to the criteria of EU Annex 1 and NOHSC.

1 - Product and Company Information

Product Name	COPPER, POWDER, 99%, FOR ORGANIC SYNTHES IS
Product Number	292583
Company	Sigma-Aldrich Pty. Ltd. 12 Anella Avenue Castle Hill NSW 2154 Australia
Technical Phone #	+61 2 9841 0555 (1800 800 097)
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2 - Composition/Information on Ingredients

Product Name	CAS #	EC no	Annex I Index Number
COPPER	7440-50-8	231-159-6	None

Formula	Cu
Molecular Weight	63.54 AMU
Synonyms	Allbri natural copper * ANAC 110 * Arwood copper * Bronze powder * CDA 101 * CDA 102 * CDA 110 * CDA 122 * C.I. 77400 * C.I. Pigment Metal 2 * Copper (ACGIH:OSHA) * Copper-airborne * Copper bronze * Copper-milled * Copper slag-airborne * Copper slag-milled * 1721 Gold * Gold bronze * Kafar copper * M 1 * M 3 * M 4 * M1 (Copper) * M2 (Copper) * M3 (Copper) * M4 (Copper) * M3R * M3S * OFHC Cu * Raney copper

3 - Hazards Identification

SPECIAL INDICATION OF HAZARDS TO HUMANS AND THE ENVIRONMENT
Highly flammable.

4 - First Aid Measures

AFTER INHALATION
If inhaled, remove to fresh air. If not breathing give artificial respiration. If breathing is difficult, give oxygen.

AFTER SKIN CONTACT
In case of skin contact, flush with copious amounts of water for at least 15 minutes. Remove contaminated clothing and shoes. Call a physician.

AFTER EYE CONTACT

In case of contact with eyes, flush with copious amounts of water for at least 15 minutes. Assure adequate flushing by separating the eyelids with fingers. Call a physician.

AFTER INGESTION
If swallowed, wash out mouth with water provided person is conscious. Call a physician.

5 - Fire Fighting Measures

EXPLOSION DATA
Dust Potential: This material, like most materials in powder form, is capable of creating a dust explosion.

EXTINGUISHING MEDIA
Suitable: Dry chemical powder.
Unsuitable: Do not use water.

SPECIAL RISKS
Specific Hazard(s): Flammable solid. Emits toxic fumes under fire conditions.

SPECIAL PROTECTIVE EQUIPMENT FOR FIREFIGHTERS
Wear self-contained breathing apparatus and protective clothing to prevent contact with skin and eyes.

6 - Accidental Release Measures

PERSONAL PRECAUTION PROCEDURES TO BE FOLLOWED IN CASE OF LEAK OR SPILL
Evacuate area. Shut off all sources of ignition. Use nonsparking tools.

PROCEDURE(S) OF PERSONAL PRECAUTION(S)
Wear self-contained breathing apparatus, rubber boots, and heavy rubber gloves.

METHODS FOR CLEANING UP
Avoid raising dust. Sweep up, place in a bag and hold for waste disposal. Ventilate area and wash spill site after material pickup is complete.

7 - Handling and Storage

HANDLING
Directions for Safe Handling: Avoid contact with eyes, skin, and clothing. Avoid breathing dust. Avoid prolonged or repeated exposure.

STORAGE
Conditions of Storage: Keep tightly closed. Store under nitrogen.

8 - Exposure Controls / Personal Protection

ENGINEERING CONTROLS
Safety shower and eye bath. Use nonsparking tools. Mechanical exhaust required.

GENERAL HYGIENE MEASURES
Wash thoroughly after handling.

EXPOSURE LIMITS

Country	Source	Type	Value

Poland	NDS	1 MG/M3
Poland	NDSCh	0.3 MG/M3
Poland	NDSP	-
Poland	NDS	0.1 MG/M3
Poland	NDSP	-
Poland	NDSCh	2 MG/M3

EXPOSURE LIMITS - DENMARK

Source	Type	Value
OEL	TWA	0.1 mg/m3

EXPOSURE LIMITS - GERMANY

Source	Type	Value
TRGS 900	OEL	0.1 mg/m3, A

Remarks: 4

EXPOSURE LIMITS - NORWAY

Source	Type	Value
	OEL	0.1 mg/m3

EXPOSURE LIMITS - SWEDEN

Source	Type	Value
	LLV (Level	1 mg/m3

EXPOSURE LIMITS - UNITED KINGDOM

Source	Type	Value
OEL	TWA	0.2 mg/m3

Remarks: fumes

OEL	STEL	2 mg/m3

Remarks: dusts and mists as Cu

PERSONAL PROTECTIVE EQUIPMENT

Respiratory Protection: Government approved respirator.
Hand Protection: Compatible chemical-resistant gloves.
Eye Protection: Chemical safety goggles.

9 - Physical and Chemical Properties

Appearance: Physical State: Solid
Color: Light red
Form: Turnings

Property	Value	At Temperature or Pressure
pH	N/A	
BP/BP Range	N/A	
MP/MP Range	N/A	
Flash Point	N/A	
Flammability	N/A	
Autoignition Temp	N/A	
Oxidizing Properties	N/A	
Explosive Properties	N/A	
Explosion Limits	N/A	
Vapor Pressure	N/A	
SG/Density	8.94 g/cm3	
Partition Coefficient	N/A	
Viscosity	N/A	
Vapor Density	N/A	
Saturated Vapor Conc.	N/A	
Evaporation Rate	N/A	
Bulk Density	N/A	
Decomposition Temp.	N/A	

Solvent Content	N/A
Water Content	N/A
Surface Tension	N/A
Conductivity	N/A
Miscellaneous Data	N/A
Solubility	N/A

10 - Stability and Reactivity

STABILITY

Stable: Stable.
Conditions of Instability: May discolor on exposure to air and moisture.
Materials to Avoid: Violent reaction may occur with acetylene, ammonium nitrate, bromates, chlorates, iodates, chlorine, chlorine trifluoride, ethylene oxide, fluorine, hydrogen peroxide, hydrazine mononitrite, hydrogen sulfide, hydrazoic acid, lead azide, potassium peroxide, sodium azide, and sodium peroxide. Reaction of copper wool, trichloroacetic acid in dimethyl sulfoxide is very exothermic, Strong acids, Strong oxidizing agents, Acid chlorides, Halogens

HAZARDOUS DECOMPOSITION PRODUCTS

Hazardous Decomposition Products: Nature of decomposition products not known.

HAZARDOUS POLYMERIZATION

Hazardous Polymerization: Will not occur

11 - Toxicological Information

RTECS NUMBER: GL5325000

ACUTE TOXICITY

LD50
Intraperitoneal
Mouse
3500 UG/KG

SIGNS AND SYMPTOMS OF EXPOSURE

Chronic copper poisoning is typified by hepatic cirrhosis, brain damage and demyelination, kidney defects, and copper deposition in the cornea as exemplified by humans with Wilson's disease. It has also been reported that copper poisoning has lead to hemolytic anemia and accelerates arteriosclerosis. Exposure can cause: Damage to the lungs. Stomach pains, vomiting, diarrhea. Blood effects.

ROUTE OF EXPOSURE

Skin Contact: May cause skin irritation.
Skin Absorption: May be harmful if absorbed through the skin.
Eye Contact: May cause eye irritation.
Inhalation: May be harmful if inhaled. Material may be irritating to mucous membranes and upper respiratory tract.
Ingestion: May be harmful if swallowed.

TARGET ORGAN INFORMATION

Lungs.

CHRONIC EXPOSURE - CARCINOGEN

Rat
Route of Application: Intrapleural
Result: Tumorigenic:Equivocal tumorigenic agent by RTECS criteria. Lungs, Thorax, or Respiration:Fibrosis, focal (pneumoconiosis). Lungs, Thorax, or Respiration:Tumors.

CHRONIC EXPOSURE - TERATOGEN

Species: Rat
Dose: 152 MG/KG
Route of Application: Oral
Exposure Time: (22W PRE)
Result: Effects on Embryo or Fetus: Fetotoxicity (except death, e.g., stunted fetus). Specific Developmental Abnormalities: Central nervous system.

Species: Rat
Dose: 1520 UG/KG
Route of Application: Oral
Exposure Time: (22W PRE)
Result: Specific Developmental Abnormalities: Musculoskeletal system.

CHRONIC EXPOSURE - REPRODUCTIVE HAZARD

Species: Rat
Dose: 1210 UG/KG
Route of Application: Oral
Exposure Time: (35W PRE)
Result: Effects on Fertility: Pre-implantation mortality (e.g., reduction in number of implants per female; total number of implants per corpora lutea). Effects on Fertility: Post-implantation mortality (e.g., dead and/or resorbed implants per total number of implants).

Species: Rat
Dose: 250 UG/KG
Route of Application: Intrauterine
Exposure Time: (1D PRE)
Result: Maternal Effects: Uterus, cervix, vagina. Effects on Fertility: Female fertility index (e.g., # females pregnant per # sperm positive females; # females pregnant per # females mated).

12 - Ecological Information

ECOTOXICOLOGICAL EFFECTS

Test Type: EC50 Daphnia
Species: Daphnia magna
Time: 48 h
Value: 0.04 - 0.050 mg/l

Test Type: LC50 Fish
Species: Onchorhynchus mykiss (Rainbow trout)
Time: 96 h
Value: 0.15 mg/l

Test Type: LC50 Fish
Species: other fish
Time: 96 h
Value: 0.11 mg/l

Test Type: EC50 Algae
Time: 72 h
Value: 0.01 - 0.020 mg/l

Test Type: LC50 Fish
Species: Cyprinus carpio
Time: 96 h
Value: 0.8 mg/l

13 - Disposal Considerations

SUBSTANCE DISPOSAL
Contact a licensed professional waste disposal service to dispose of this material. Material in the elemental state should be recovered for reuse or recycling. Observe all federal, state, and local environmental regulations.

14 - Transport Information

RID/ADR
UN#: 3089
Class: 4.1
PG: II
Proper Shipping Name: Metal powder, flammable, n.o.s.

IMDG
UN#: 3089
Class: 4.1
PG: II
Proper Shipping Name: METAL POWDER, FLAMMABLE, N.O.S.
Marine Pollutant: No
Severe Marine Pollutant: Yes
Technical Name: Required

IATA
UN#: 3089
Class: 4.1
PG: II
Proper Shipping Name: Metal powder, flammable, n.o.s.
Inhalation Packing Group I: No
Technical Name: Required

15 - Regulatory Information

CLASSIFICATION AND LABELING ACCORDING TO EU DIRECTIVES
INDICATION OF DANGER: F
Highly Flammable.
R-PHRASES: 11
Highly flammable.
S-PHRASES: 16
Keep away from sources of ignition - no smoking.

COUNTRY SPECIFIC INFORMATION

Germany
WGK: No hazard to waters.

16 - Other Information

WARRANTY
The above information is believed to be correct but does not

purport to be all inclusive and shall be used only as a guide. The information in this document is based on the present state of our knowledge and is applicable to the product with regard to appropriate safety precautions. It does not represent any guarantee of the properties of the product. Sigma-Aldrich Inc., shall not be held liable for any damage resulting from handling or from contact with the above product. See reverse side of invoice or packing slip for additional terms and conditions of sale.

DISCLAIMER

For R&D use only. Not for drug, household or other uses.