

Material Safety Data Sheet

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Version 1.5

According to 91/155/EEC

1 - Product and Company Information

Product Name COPPER(II) SULFATE PENTAHYDRATE, 98+%,
A.C.S. REAGENT
Product Number 209198
Company Sigma-Aldrich Company Ltd.
The Old Brickyard
New Road, Gillingham SP8 4XT
United Kingdom
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2 - Composition/Information on Ingredients

Product Name	CAS #	EC no	Annex I Index Number
COPPER (II) SULFATE PENTAHYDRATE	7758-99-8	231-847-6	029-004-00-0

Formula CuSO4.5H2O
Molecular Weight 249.68 AMU
Synonyms Blue copper AS * Copper(II) sulfate pentahydrate
* Copper(2+) sulfate pentahydrate * Cupric
sulfate pentahydrate * Kupfersulfat-pentahydrat
(German) * Kupfervitriol (German) * Salzburg
vitriol * Sulfuric acid, copper(2+) salt,
pentahydrate * Sulfuric acid copper(2+) salt
(1:1), pentahydrate (8CI,9CI) * Vencedor

3 - Hazards Identification

SPECIAL INDICATION OF HAZARDS TO HUMANS AND THE ENVIRONMENT

Harmful if swallowed. Irritating to eyes and skin. Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

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

EXTINGUISHING MEDIA

Suitable: Water spray. Carbon dioxide, dry chemical powder, or appropriate foam.

SPECIAL RISKS

Specific Hazard(s): 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.

PROCEDURE(S) OF PERSONAL PRECAUTION(S)

Wear respirator, chemical safety goggles, rubber boots, and heavy rubber gloves.

METHODS FOR CLEANING UP

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

7 - Handling and Storage

HANDLING

Directions for Safe Handling: Do not breathe dust. Avoid contact with eyes, skin, and clothing. Avoid prolonged or repeated exposure.

STORAGE

Conditions of Storage: Keep tightly closed. Handle and store under argon. Store in a cool dry place.

SPECIAL REQUIREMENTS: Air sensitive. Hygroscopic. Handle and store under inert gas.

8 - Exposure Controls / Personal Protection

ENGINEERING CONTROLS

Safety shower and eye bath. Mechanical exhaust required.

GENERAL HYGIENE MEASURES

Wash thoroughly after handling.

EXPOSURE LIMITS - UNITED KINGDOM

Source	Type	Value
OEL OEL	LTEL LTEL	0.2 MG(CU)/M3 1 MG(CU)/M3

Remarks: fumes

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	Color: Blue Form: Crystals	
Property	Value	At Temperature or Pressure
pH	3.7 - 4.5	
BP/BP Range	N/A	
MP/MP Range	110 °C	
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	7.3 mmHg	25 °C
SG/Density	2.284 g/cm ³	
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 to Avoid: Air sensitive. Hygroscopic.

Materials to Avoid: Finely powdered metals Anhydrous copper(II) sulfate reacts violently with: hydroxylamine, magnesium.

HAZARDOUS DECOMPOSITION PRODUCTS

Hazardous Decomposition Products: Copper oxide, Sulfur oxides.

HAZARDOUS POLYMERIZATION

Hazardous Polymerization: Will not occur

11 - Toxicological Information

RTECS NUMBER: GL8900000

ACUTE TOXICITY

LDLO

Oral

Human

1088 mg/kg

Remarks: Behavioral:Coma. Liver:Jaundice (or hyperbilirubinemia) hepatocellular. Blood:Other hemolysis with or without anemia.

LD50

Oral
Rat
300 mg/kg

LD50
Skin
Rat
> 2000 mg/kg

LD50
Intraperitoneal
Rat
18700 UG/KG

LD50
Intraperitoneal
Mouse
33 MG/KG

LD50
Intraperitoneal
Mammal
7500 UG/KG
Remarks: Behavioral:Somnolence (general depressed activity).
Gastrointestinal:Changes in structure or function of salivary
glands. Gastrointestinal:Nausea or vomiting.

SENSITIZATION

Skin: Prolonged or repeated exposure may cause allergic
reactions in certain sensitive individuals.

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. To the best
of our knowledge, the chemical, physical, and toxicological
properties have not been thoroughly investigated.

ROUTE OF EXPOSURE

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

TARGET ORGAN INFORMATION

Liver. Kidneys. Blood.

CHRONIC EXPOSURE - MUTAGEN

Human
76 UMOL/L
Cell Type: lymphocyte
DNA inhibition

Rat
31 UMOL/L
Cell Type: liver
Unscheduled DNA synthesis

Rat
300 MG/KG
Cell Type: Ascites tumor
Cytogenetic analysis

Mouse
5 MG/KG
Intraperitoneal
Micronucleus test

Mouse
1100 UG/KG
Intraperitoneal
Cytogenetic analysis

Mouse
5 MG/KG
Intraperitoneal
5D
sperm

Chicken
7500 UG/KG
Intraperitoneal
Micronucleus test

Chicken
10 MG/KG
Oral
Micronucleus test

Chicken
10 MG/KG
Oral
Cytogenetic analysis

Chicken
7500 UG/KG
Intraperitoneal
Cytogenetic analysis

CHRONIC EXPOSURE - TERATOGEN

Result: Possible risk of congenital malformation in the fetus.

CHRONIC EXPOSURE - REPRODUCTIVE HAZARD

Result: Overexposure may cause reproductive disorder(s) based on tests with laboratory animals.

12 - Ecological Information

ECOTOXICOLOGICAL EFFECTS

Test Type: LC50 Fish
Time: 96 h
Value: 1 - 2.5 mg/l

Test Type: EC50 Daphnia
Species: Daphnia magna
Time: 48 h
Value: 0.024 mg/l

13 - Disposal Considerations

SUBSTANCE DISPOSAL

Contact a licensed professional waste disposal service to dispose of this material. Dissolve or mix the material with a combustible solvent and burn in a chemical incinerator equipped with an afterburner and scrubber. Observe all federal, state, and local environmental regulations.

14 - Transport Information

RID/ADR

UN#: 3077
Class: 9
PG: III
Proper Shipping Name: Environmentally hazardous substance, solid, n.o.s

IMDG

UN#: 3077
Class: 9
PG: III
Proper Shipping Name: Environmentally hazardous substance, solid, n.o.s
Marine Pollutant: No
Severe Marine Pollutant: Yes
Technical Name: Required

IATA

UN#: 3077
Class: 9
PG: III
Proper Shipping Name: Environmentally hazardous substance, solid, n.o.s
Inhalation Packing Group I: No
Technical Name: Required

15 - Regulatory Information

CLASSIFICATION AND LABELING ACCORDING TO EU DIRECTIVES

ANNEX I INDEX NUMBER: 029-004-00-0

INDICATION OF DANGER: Xn N

Harmful. Dangerous for the environment.

R-PHRASES: 22 36/38 50/53

Harmful if swallowed. Irritating to eyes and skin. Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

S-PHRASES: 22 60 61

Do not breathe dust. This material and its container must be disposed of as hazardous waste. Avoid release to the environment. Refer to special instructions/safety data sheets.

COUNTRY SPECIFIC INFORMATION

Germany

WGK: 2

SWITZERLAND

SWISS POISON CLASS: 3

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. Copyright 2005 Sigma-Aldrich Co. License granted to make unlimited paper copies for internal use only.

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