

**Material Safety Data Sheet**

acc. to OSHA and ANSI

Printing date 01/18/2010

Reviewed on 01/15/2010

**1 Identification of substance:****Product details:****Product name:** Copper(II) sulfate pentahydrate**Stock number:** 14178**Manufacturer/Supplier:**

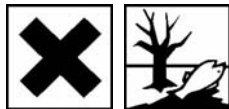
Alfa Aesar, A Johnson Matthey Company  
 Johnson Matthey Catalog Company, Inc.  
 30 Bond Street  
 Ward Hill, MA 01835-8099  
 Emergency Phone: (978) 521-6300  
 CHEMTREC: (800) 424-9300  
 Web Site: www.alfa.com

**Information Department:** Health, Safety and Environmental Department**Emergency information:**

During normal hours the Health, Safety and Environmental Department. After normal hours call Chemtrec at (800) 424-9300.

**2 Composition/Data on components:****Chemical characterization:****Description: (CAS#)**

Copper(II) sulfate pentahydrate (CAS# 7758-99-8)

**Identification number(s):****EINECS Number:** 231-847-6**Index number:** 029-004-00-0**Additional information:** CAS# for anhydrous form: 7758-98-7**3 Hazards identification****Hazard description:**

Xn Harmful  
 N Dangerous for the environment

**Information pertaining to particular dangers for man and environment**

R 22 Harmful if swallowed.

R 36/38 Irritating to eyes and skin.

R 50/53 Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment

**Classification system****HMIS ratings (scale 0-4)****(Hazardous Materials Identification System)**

HEALTH	2
FIRE	0
REACTIVITY	1

Health (acute effects) = 2  
 Flammability = 0  
 Reactivity = 1

**GHS label elements****Warning**

4.1/1 - Very toxic to aquatic life with long lasting effects.

**Warning**

3.1/4 - Harmful if swallowed.

3.2/2 - Causes skin irritation.

3.3/2A - Causes serious eye irritation.

**Prevention:**

Do not breathe dust/fume/gas/mist/vapours/spray.

Avoid release to the environment.

**Disposal:**

Dispose of contents/container in accordance with local/regional/national/international regulations.

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**4 First aid measures****After inhalation**

Supply fresh air. If required, provide artificial respiration. Keep patient warm.  
Seek immediate medical advice.

**After skin contact**

Immediately wash with water and soap and rinse thoroughly.  
Seek immediate medical advice.

**After eye contact**

Rinse opened eye for several minutes under running water. Then consult a doctor.

**After swallowing** Seek immediate medical advice.

**5 Fire fighting measures****Suitable extinguishing agents**

Product is not flammable. Use fire fighting measures that suit the surrounding fire.

**Special hazards caused by the material, its products of combustion or resulting gases:**

In case of fire, the following can be released:

Metal oxide fume

Sulfur oxides (SO<sub>x</sub>)

**Protective equipment:**

Wear self-contained respirator.

Wear fully protective impervious suit.

**6 Accidental release measures****Person-related safety precautions:**

Wear protective equipment. Keep unprotected persons away.

Ensure adequate ventilation

**Measures for environmental protection:**

Do not allow material to be released to the environment without proper governmental permits.

**Measures for cleaning/collecting:**

Dispose contaminated material as waste according to item 13.

**Additional information:**

See Section 7 for information on safe handling

See Section 8 for information on personal protection equipment.

See Section 13 for disposal information.

**7 Handling and storage****Handling****Information for safe handling:**

Keep container tightly sealed.

Store in cool, dry place in tightly closed containers.

Ensure good ventilation at the workplace.

Prevent formation of dust.

**Information about protection against explosions and fires:** The product is not flammable

**Storage**

**Requirements to be met by storerooms and receptacles:** No special requirements.

**Information about storage in one common storage facility:** Store away from oxidizing agents.

**Further information about storage conditions:**

Keep container tightly sealed.

Store in cool, dry conditions in well sealed containers.

**8 Exposure controls and personal protection****Additional information about design of technical systems:**

Properly operating chemical fume hood designed for hazardous chemicals and having an average face velocity of at least 100 feet per minute.

**Components with limit values that require monitoring at the workplace:**

Copper

	mg/m <sup>3</sup>
ACGIH TLV	1 (dust, mist); 0.2 (fume)
Austria MAK	1
	0.1 (fume)
Belgium TWA	0.2 (fume); 1 (dust)
Denmark TWA	0.1
Finland TWA	0.2 (fume); 1 (dust)
France VME	0.2 (fume); 1 (dust)
	1; 2-STEL (dust)
Germany MAK	0.1 (fume); 1 (dust)

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Hungary TWA 0.2; 0.4-STEL (dust)  
 Netherlands MAC-TGG 1 (dust)  
 Norway TWA 0.05  
 0.1 (fume)  
 Poland TWA 0.1; 0.3-STEL (fume)  
 1; 2-STEL (dust)  
 Russia 1-STEL (dust)  
 Sweden NGV 0.2 (resp. dust); 1 (total dust)  
 Switzerland MAK-W 0.1; 0.2-KZG-W (fume)  
 1; 1-KZG-W  
 United Kingdom TWA 0.2 (fume)  
 1; 2-STEL (dusts and mists as Cu)  
 1; 3-STEL  
 USA PEL 0.1 (fume, dusts & mists)

**Additional information:** No data**Personal protective equipment****General protective and hygienic measures**

The usual precautionary measures for handling chemicals should be followed.

Keep away from foodstuffs, beverages and feed.

Remove all soiled and contaminated clothing immediately.

Wash hands before breaks and at the end of work.

Avoid contact with the eyes and skin.

**Breathing equipment:** Use suitable respirator when high concentrations are present.

**Protection of hands:**

Impervious gloves

Check protective gloves prior to each use for their proper condition.

**Material of gloves**

The selection of suitable gloves not only depends on the material, but also on quality.

Quality will vary from manufacturer to manufacturer.

**Eye protection:** Safety glasses

**Body protection:** Protective work clothing.

**9 Physical and chemical properties:****General Information**

<b>Form:</b>	Crystalline
<b>Color:</b>	Blue
<b>Odor:</b>	Odorless

**Change in condition**

<b>Melting point/Melting range:</b>	110°C (230°F) (dec)
<b>Boiling point/Boiling range:</b>	Not determined
<b>Sublimation temperature / start:</b>	Not determined

<b>Flash point:</b>	Not applicable
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<b>Ignition temperature:</b>	Not determined
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<b>Decomposition temperature:</b>	Not determined
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<b>Danger of explosion:</b>	Product does not present an explosion hazard.
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**Explosion limits:**

<b>Lower:</b>	Not determined
<b>Upper:</b>	Not determined

<b>Vapor pressure:</b>	Not determined
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<b>Density at 20°C (68°F):</b>	2.28 g/cm <sup>3</sup>
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<b>Solubility in / Miscibility with Water at 20°C (68°F):</b>	317 g/l
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<b>pH-value (50 g/l) at 20°C (68°F):</b>	4
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**10 Stability and reactivity****Thermal decomposition / conditions to be avoided:**

Decomposition will not occur if used and stored according to specifications.

**Materials to be avoided:**

**Dangerous reactions** No dangerous reactions known

**Dangerous products of decomposition:**

Metal oxide fume

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Sulfur oxides (SOx)

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**11 Toxicological information****Acute toxicity:****LD/LC50 values that are relevant for classification:**

Oral	LD50	960 mg/kg (rat)
Dermal	LD50	>2000 mg/kg (rat)

**Primary irritant effect:****on the skin:** Irritant to skin and mucous membranes.**on the eye:** Irritating effect.**Sensitization:** No sensitizing effects known.**Subacute to chronic toxicity:**

Copper compounds may be irritating to the skin, eyes and respiratory tract. They may cause metal fume fever, hemolysis of the red blood cells and injury to the liver, lungs, kidneys and pancreas. Ingestion may also cause vomiting, gastric pain, dizziness, anemia, cramps, convulsions, shock, coma and death.

**Additional toxicological information:**

To the best of our knowledge the acute and chronic toxicity of this substance is not fully known.

No classification data on carcinogenic properties of this material is available from the EPA, IARC, NTP, OSHA or ACGIH.

**12 Ecological information:****Ecotoxicological effects:****Remark:** Very toxic for fish**General notes:**

Do not allow product to reach ground water, water course or sewage system, even in small quantities.

Danger to drinking water if even extremely small quantities leak into the ground.

Also poisonous for fish and plankton in water bodies.

Do not allow material to be released to the environment without proper governmental permits.

Very toxic for aquatic organisms

**13 Disposal considerations****Product:****Recommendation** Consult state, local or national regulations to ensure proper disposal.**Uncleaned packagings:****Recommendation:** Disposal must be made according to official regulations.**Recommended cleansing agent:** Water, if necessary with cleansing agents.**14 Transport information****DOT regulations:****Hazard class:**

9

**Identification number:**

UN3077

**Packing group:**

III

**Proper shipping name (technical name):**ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S.  
(Copper(II) sulfate pentahydrate)**Label**

9

**Remarks:**

Special marking with the symbol (fish and tree).

**Land transport ADR/RID (cross-border)****ADR/RID class:**

9 (M7) Miscellaneous dangerous substances and articles

**Danger code (Kemler):**

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**Product name: Copper(II) sulfate pentahydrate**

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**UN-Number:** 3077  
**Packaging group:** III  
**Special marking:** Symbol (fish and tree)  
**Description of goods:** 3077 ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S. (Copper(II) sulfate pentahydrate)

**Maritime transport IMDG:**

**IMDG Class:** 9  
**UN Number:** 3077  
**Label:** 9  
**Packaging group:** III  
**Marine pollutant:** Yes (P)  
 Symbol (fish and tree)  
**Proper shipping name:** ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S. (Copper(II) sulfate pentahydrate)

**Air transport ICAO-TI and IATA-DGR:**

**ICAO/IATA Class:** 9  
**UN/ID Number:** 3077  
**Label:** 9  
**Special marking:** Symbol (fish and tree)  
**Packaging group:** III  
**Proper shipping name:** ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S. (Copper(II) sulfate pentahydrate)

**UN "Model Regulation":** UN3077, ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S., 9, III

**15 Regulations****Product related hazard informations:****Hazard symbols:**

Xn Harmful  
 N Dangerous for the environment

**Risk phrases:**

22 Harmful if swallowed.  
 36/38 Irritating to eyes and skin.  
 50/53 Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment

**Safety phrases:**

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

**National regulations**

All components of this product are listed in the U.S. Environmental Protection Agency Toxic Substances Control Act Chemical substance Inventory.  
 All components of this product are listed on the Canadian Domestic Substances List (DSL).

**Information about limitation of use:**

For use only by technically qualified individuals.  
 This product is subject to the reporting requirements of section 313 of the Emergency Planning and Community Right to Know Act of 1986 and 40CFR372.  
 This product contains copper and is subject to the reporting requirements of section 313 of the Emergency Planning and Community Right to Know Act of 1986 and 40CFR372.

**16 Other information:**

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Employers should use this information only as a supplement to other information gathered by them, and should make independent judgement of suitability of this information to ensure proper use and protect the health and safety of employees. This information is furnished without warranty, and any use of the product not in conformance with this Material Safety Data Sheet, or in combination with any other product or process, is the responsibility of the user.

**Department issuing MSDS:** Health, Safety and Environmental Department.

**Contact:** Zachariah Holt

**Abbreviations and acronyms:**

ADR: Accord européen sur le transport des marchandises dangereuses par Route (European Agreement concerning the International Carriage of Dangerous Goods by Road)

RID: Règlement international concernant le transport des marchandises dangereuses par chemin de fer (Regulations Concerning the International Transport of Dangerous Goods by Rail)

IMDG: International Maritime Code for Dangerous Goods

DOT: US Department of Transportation

IATA: International Air Transport Association

IATA-DGR: Dangerous Goods Regulations by the "International Air Transport Association" (IATA)

ICAO: International Civil Aviation Organization

ICAO-TI: Technical Instructions by the "International Civil Aviation Organization" (ICAO)

P: Marine Pollutant

GHS: Globally Harmonized System of Classification and Labelling of Chemicals

EINECS: European Inventory of Existing Commercial Chemical Substances

CAS: Chemical Abstracts Service (division of the American Chemical Society)

HMIS: Hazardous Materials Identification System (USA)

LC50: Lethal concentration, 50 percent

LD50: Lethal dose, 50 percent

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