

# Material Safety Data Sheet



## Copper Sulfate Pentahydrate

### Section 1. Chemical product and company identification

- Common name** : **Copper Sulfate Pentahydrate**  
**Synonym** : Triangle Brand Copper Sulfate/Sulphate, Phelps Dodge Copper Sulfate/Sulphate, Triangle Brand Copper Sulfate/Sulphate Crystal, Triangle Brand Copper Sulfate/Sulphate Instant Powder, Triangle Brand Copper Sulfate/Sulphate Pentahydrate – **Note:** This product contains essentially no anhydrous material.
- Material uses** : Industrial manufacturing, animal feed, algicide, fungicide, herbicide, pesticide or as a fertilizer.
- Manufacturer** : Phelps Dodge Corporation, One North Central Avenue, Phoenix, AZ 85004  
Tel: (602) 366-8100  
Phelps Dodge Refining Corporation, 897 Hawkins Blvd. El Paso, TX 79915  
Tel : (915) 778-9881  
Phelps Dodge Sierrita, 6200 W. Duval Mine Rd, Green Valley, AZ 85614  
Tel : (520) 648-8500
- In case of emergency** : CHEMTREC, U.S. : (800) 424-9300 International: (703) 527-3887

### Section 2. Hazards identification

- Physical state** : Solid. (Powder, granules or crystal.)  
**Emergency overview** : DANGER!  
CAUSES EYE BURNS.  
HARMFUL IF SWALLOWED.  
MAY CAUSE SKIN IRRITATION.  
Do not ingest. Do not get in eyes or on skin or clothing. Avoid breathing dust. Keep container closed. Use only with adequate ventilation. Wash thoroughly after handling.
- Routes of entry** : Dermal contact. Eye contact. Inhalation. Ingestion.
- Potential acute health effects**
- Eyes** : Corrosive to eyes. Direct contact with the eyes can cause irreversible damage.
- Skin** : Moderately irritating to the skin.
- Inhalation** : Can result in irritation of the upper respiratory tract and in excessive quantities may cause ulceration and perforation of the nasal septum.
- Ingestion** : Harmful if swallowed. May cause burns to mouth, throat and stomach.
- Potential chronic health effects** : Carcinogenic effects: Not classified or listed by IARC, NTP, OSHA, EU and ACGIH.  
Mutagenic effects: Not available.  
Teratogenic effects: Not available.
- Medical conditions aggravated by over-exposure** : Repeated skin exposure can produce local skin destruction or dermatitis. Repeated exposure of the eyes to a low level of dust can produce eye irritation.

See toxicological information (section 11)

### Section 3. Composition, Information on Ingredients

	CAS number	% by weight
<b>United States</b>		
Copper (II) sulfate pentahydrate	7758-99-8	90 - 100
Copper sulfate, trihydrate	16448-28-5	0 - 10
<b>Canada</b>		
Copper (II) sulfate pentahydrate	7758-99-8	90 - 100
Copper (II) sulfate trihydrate	16448-28-5	0 - 10

This material is classified hazardous under OSHA regulations in the United States and the WHMIS Controlled Product Regulation in Canada.

The following are present at concentrations below the OSHA and MSHA thresholds for inclusion in the MSDS :  
Arsenic at 1 ppm, maximum of 13 ppm.

See sections 8, 11 and 14 for details.

## Section 4. First aid measures

- Eye contact** : Check for and remove any contact lenses. In case of contact, immediately flush eyes with plenty of water for at least 20 minutes. Get medical attention immediately.
- Skin contact** : In case of contact, immediately flush skin with plenty of water for at least 20 minutes while removing contaminated clothing and shoes. Get medical attention if irritation persists.
- Inhalation** : If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention immediately.
- Ingestion** : Do not induce vomiting. Never give anything by mouth to an unconscious person. Get medical attention immediately.
- Notes to physician** : No specific antidote. Medical staff must contact Poison Control Center.

## Section 5. Fire fighting measures

- Flammability of the product** : Non-flammable.  
Use an extinguishing agent suitable for the surrounding fire.  
Not available.
- Special protective equipment for fire-fighters** : Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.

## Section 6. Accidental release measures

- Personal precautions** : Immediately contact emergency personnel. Keep unnecessary personnel away. Use suitable protective equipment.
- Environmental precautions** : Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers.
- Methods for cleaning up** : If emergency personnel are unavailable, vacuum or carefully scoop up spilled material and place in an appropriate container for disposal by incineration. Avoid creating dusty conditions and prevent wind dispersal.

## Section 7. Handling and storage

- Handling** : Do not ingest. Do not get in eyes or on skin or clothing. Keep container closed. Use only with adequate ventilation. Avoid breathing dust. Wash thoroughly after handling.
- Storage** : Keep container tightly closed. Keep container in a cool, well-ventilated area.

## Section 8. Exposure controls, personal protection

- Engineering controls** : Use process enclosures, local exhaust ventilation or other engineering controls to keep airborne levels below recommended exposure limits. If user operations generate dust, fumes or mist, use ventilation to keep exposure to airborne contaminants below the exposure limit.
- Personal protection**
- Eyes** : Safety eyewear complying with an approved standard should be used when a risk assessment indicates this is necessary to avoid exposure to liquid splashes, mists, gases or dusts.  
Recommended: Splash goggles or face shield with safety glasses.
- Respiratory** : Not required if handled in a ventilated enclosure.
- Hands** : Chemical-resistant, impervious gloves complying with an approved standard should be worn at all times when handling chemical products if a risk assessment indicates this is necessary.  
>8 hour/hours (breakthrough time): Nitrile gloves.
- Skin/Body** : Personal protective equipment for the body should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.  
Body: Recommended: Lab coat.



**Personal protection in case of a large spill** : Splash goggles or face shield with safety glasses. Impervious gloves. Full suit. Boots. Under IDLH conditions, or if exposure levels are unknown, wear NIOSH-approved self-contained breathing apparatus or equivalent full protective gear.

**Product name****Exposure limits****United States**

Copper compounds

**OSHA PEL (United States).**TWA: 1 mg/m<sup>3</sup> 8 hour/hours. Form: Dusts and mists**ACGIH TLV (United States).**TWA: 1 mg/m<sup>3</sup> 8 hour/hours. Form: Dusts and mists**Canada**

Copper compounds

**ACGIH TLV (United States).**TWA: 1 mg/m<sup>3</sup> 8 hours. Form: As copper, dusts and mists.

## Section 9. Physical and chemical properties

**Physical state** : Solid. (Powder, granules or crystal.)

**Color** : Blue.

**Odor** : Odorless.

**Specific gravity** : 2.284 (Water = 1)

**Dispersibility properties** : See solubility in water.

**Solubility** : 83.1 g/100 cc water @ 30 °C

## Section 10. Stability and reactivity

**Stability and reactivity** : The product is stable.

**Incompatibility with various substances** : Reactive with oxidizing materials, acetylene gas, aluminum powder, hydroxylamine, magnesium, moist air. Contact with magnesium metal can generate dangerous levels of hydrogen gas.

**Hazardous polymerization** : Will not occur.

## Section 11. Toxicological information

<u>Ingredient name</u>	<u>Test</u>	<u>Result</u>	<u>Route</u>	<u>Species</u>
Copper (II) sulfate pentahydrate	LD50	300 mg/kg	Oral	Rat
	LD50	>5050 mg/kg	Dermal	Rabbit

**Acute Effects**

**Eyes** : Corrosive to eyes. Direct contact with the eyes can cause irreversible damage.

**Skin** : Moderately irritating to the skin.

**Inhalation** : Can result in irritation of the upper respiratory tract and in excessive quantities may cause ulceration and perforation of the nasal septum.

**Ingestion** : Harmful if swallowed. May cause burns to mouth, throat and stomach.

**Potential chronic health effects** : Carcinogenic effects: Not classified or listed by IARC, NTP, OSHA, EU and ACGIH.  
Mutagenic effects: Not available.  
Teratogenic effects: Not available.

## Section 12. Ecological information

**Ecotoxicity data**

<u>Ingredient name</u>	<u>Species</u>	<u>Period</u>	<u>Result</u>
Copper (II) sulfate pentahydrate	Daphnia magna (EC50)	48 hour/hours	0.18 mg/l
	Oncorhynchus mykiss (LC50)	96 hour/hours	0.032 mg/l
	Oncorhynchus mykiss (LC50)	96 hour/hours	0.13 mg/l
	Lepomis macrochirus (LC50)	96 hour/hours	0.892 mg/l
	Oncorhynchus mykiss (LC50)	96 hour/hours	1.2 mg/l
	Lepomis macrochirus (LC50)	96 hour/hours	1.3 mg/l

**Products of degradation** : These products are sulfur oxides. Some metallic oxides.

## Section 13. Disposal considerations

**Waste disposal** : The generation of waste should be avoided or minimized wherever possible. Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers. Disposal of this product, solutions and any by-products should at all times comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements.

Consult your local or regional authorities.

## Section 14. Transport information

### Classification

TDG/DOT/ IMDG/IATA:	Proper shipping name	Class	UN number	Packing group
	ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S. Marine pollutant (Copper sulfate pentahydrate)	9	UN3077	III
<b>NAERG</b>				
: 171				

### Label

UN/Other regulations



DOT



### Additional information

DOT	TDG
<b>Marine pollutant</b> Marine pollutant (P)	<b>Marine pollutant</b> Marine pollutant (P)

## Section 15. Regulatory information

### United States

**HCS Classification** : Corrosive material

**U.S. Federal regulations** : TSCA : All components listed.  
 SARA 302/304/311/312 extremely hazardous substances: No products were found.  
 SARA 302/304 emergency planning and notification: No products were found.  
 SARA 302/304/311/312 hazardous chemicals: Copper (II) sulfate pentahydrate  
 SARA 311/312 MSDS distribution - chemical inventory - hazard identification: Copper (II) sulfate pentahydrate: Immediate (acute) health hazard, Delayed (chronic) health hazard  
 Clean Water Act (CWA) 307: Copper (II) sulfate pentahydrate; Arsenic  
 Clean Water Act (CWA) 311: No products were found.  
 Clean Air Act (CAA) 112 accidental release prevention: No products were found.  
 Clean Air Act (CAA) 112 regulated flammable substances: No products were found.  
 Clean Air Act (CAA) 112 regulated toxic substances: No products were found.

**State regulations** : Pennsylvania RTK: Copper (II) sulfate pentahydrate: (environmental hazard, generic environmental hazard); Arsenic: (environmental hazard, generic environmental hazard)  
 Massachusetts RTK: Arsenic  
 New Jersey: Copper (II) sulfate pentahydrate; Arsenic  
**WARNING:** This product contains chemical/chemicals known to the state of California to cause cancer.

Ingredient name	Cancer	Reproductive	No significant risk level	Maximum acceptable dosage level
Arsenic	Yes.	No.	0.06 µg/day (inhalation)	No.

**Canada**

**WHMIS (Canada)** : Class E: Corrosive material



DSL : All components listed.

**International regulations**

**International lists** : All components listed are listed on major international inventories or exempted from being listed in Australia (AICS), Europe (EINECS/ELINCS), Korea (TCCL), Japan (METI/MOL), Philippines (RA6969).

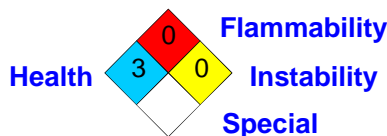
## Section 16. Other information

**Label requirements** : CAUSES EYE BURNS.  
HARMFUL IF SWALLOWED.  
MAY CAUSE SKIN IRRITATION.

**Hazardous Material Information System (U.S.A.)** :

Health	3
Fire hazard	0
Reactivity	0
Personal protection	C

**National Fire Protection Association (U.S.A.)** :

**References**

: ANSI Z400.1, MSDS Standard, 2004. - Manufacturer's Material Safety Data Sheet. - 29CFR Part1910.1200 OSHA MSDS Requirements. - 49CFR Table List of Hazardous Materials, UN#, Proper Shipping Names, PG. - Canada Gazette Part II, Vol. 122, No. 2. Registration SOR/88-64, 31 December 1987. Hazardous Products Act "Ingredient Disclosure List" - Canadian Transport of Dangerous Goods, Regulations and Schedules, Clear Language version 2005. - Official Mexican Standards NOM-018-STPS-2000 and NOM-004-SCT2-1994.

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**Notice to reader**

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