

Material Safety Data Sheet

(This document conforms to ISO 11014-1)

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Supplier / Manufacturer:



Kimleigh Chemicals SA (Pty) Ltd
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 Potchefstroom, North West Province, 2531, South Africa.
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Chemical Name:

Copper Sulphate Pentahydrate (technical and feed grade).

Product Range:

AqCua[®].

Synonyms:

Cupric sulphate, blue vitriol, blue stone or blue copperas.

Material Uses:

Agriculture (soil additive, pesticides, Bordeaux mixture), feed additive, germicides, textile mordant, leather industry, pigments, electric batteries, electroplated coatings, copper salts, reagent in analytical chemistry, medicine, wood preservative, preservation of pulp wood and ground pulp, process engraving and lithography, ore floatation, petroleum industry, synthetic rubber, steel manufacture, treatment of natural asphalts. The anhydrous salt is used as a dehydrating agent.

2. COMPOSITION / INFORMATION ON INGREDIENTS

Substance Name:

Copper Sulphate Pentahydrate.

Chemical Notation:

$CuSO_4 \cdot 5H_2O$

CAS Number:

7758-99-8

% by Weight:

98,0 (min)

EC Number:

231-847-6

EC Index:

029-004-00-0

EINECS Number:

231-847-6

RTECS Number:

GL 8900000

ICSC Number:

1416

IERG Number:

47

Appearance:

Hygroscopic, odourless, blue triclinic crystals. (White when dehydrated.)

Hazardous Ingredients:

| Ingredients | Content | GHS Classification |
|-------------|---------|------------------------|
| Copper | 25 % | H302, H315, H319, H410 |

3. HAZARD IDENTIFICATION

Physical State and Appearance: Blue crystals, powder or solid.

GHS Classification:

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| H302: | Harmful if swallowed. |
| H315: | Causes skin irritation. |
| H319: | Causes serious eye irritation. |
| H410: | Very toxic to aquatic life with long lasting effect. |
| P273: | Avoid release to the environment. |
| P302, P352: | If on skin – wash with plenty of soap and water. |
| P305, P351, P338: | If in eyes – rinse cautiously with water for several minutes. Remove contact lenses if present and easy to do. Continue rinsing. |

Pictogram:



Signal word:

Warning

Warning

Routes of Entry:

Eye Contact. Inhalation. Ingestion. Absorbed through skin.

Potential Health Effects:

Eyes Can cause eye irritation and local inflammation, tissue destruction, corneal opacity and adhesion of eyelid to the eye. May also cause conjunctivitis and ulcerations. Traces of impurities and sulphuric acid may contribute to these effects.

Skin May cause irritation and discolouration of skin.

Inhalation Dust and mists (copper solutions) may cause irritation of nasal passages and throat. Ulceration and perforation of the nasal septum is possible if inhaled in excessive quantities. Traces of sulphuric acid may contribute to these effects.

Ingestion It can cause a burning sensation in the throat and cause vomiting. More severe poisoning can cause abdominal pain, nausea, diarrhoea and ulceration of the gastrointestinal tract. May cause haemorrhaging of the digestive tract. Metallic taste may occur. Can be fatal.

Potential Chronic Health Effects:

CARCINOGENIC EFFECTS:
Not suspected for human by ACGIH, IARC, NIOSH, NTP or OSHA.
MUTAGENIC EFFECTS:
Not available.

TERATOGENIC EFFECTS:
Classified NONE for human.

Medical Conditions Aggravated by Overexposure:

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| <i>Inhalation</i> | Repeated exposure may cause lung damage. It can cause shrinking of the inner linings of the nose, with a watery discharge, or thickening of the skin. |
| <i>Skin</i> | Repeated exposure can cause skin allergy or dermatitis. If allergy develops, even low future exposures may trigger a rash. It can cause discoloration of skin and hair to a green colour. |
| <i>Swallowed</i> | Repeated exposure to dust and mists can cause liver damage. Metallic taste may occur. This substance has adverse reproductive and foetal effects in animals. Copper is an essential element and its level in the body is strictly controlled. Under most conditions, excess copper is excreted in the urine and faeces. |

4. FIRST AID MEASURES

General Advice:

Consult a physician. Show this material safety data sheet to the doctor in attendance.

Eye Contact:

Check for and remove any contact lenses. In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Cold water may be used. Get medical attention immediately.

Skin Contact:

In case of contact, immediately flush skin with plenty of water for at least 15 minutes, while removing contaminated clothing and shoes. Cover the irritated skin with an emollient. Cold water may be used. Wash clothing before reuse. Thoroughly clean shoes before reuse. Get medical attention immediately.

Inhalation:

If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention immediately.

Ingestion:

If swallowed, do not induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Loosen tight clothing such as a collar, tie, belt or waistband. Get medical attention immediately.

5. FIRE-FIGHTING MEASURES

Products of Combustion:

Oxides of sulphur and copper.

Auto-ignition Temperature:

Not applicable.

Flash Points:

Not applicable.

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| Flammable Limits: | Not applicable. |
| Explosion Hazards in Presence of Various Substances: | Risks of explosion of the product in presence of static discharge: No. Risks of explosion of the product in presence of mechanical impact: No. |
| Fire Hazards in Presence of Various Substances: | Not applicable. |
| Fire Fighting Media and Instructions: | Small fire: Use dry chemicals, CO ₂ , alcohol-resistant foam or water spray. Large fire: Use alcohol foam, water spray or fog. |
| Protective Clothing (Fire): | Wear NIOSH approved self-contained breathing apparatus or equivalent and full protective gear. |
| Special Remarks on Fire Hazards: | Not available. |
| Special Remarks on Explosion Hazards: | Not available. |

6. ACCIDENTAL RELEASE MEASURES

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| Small Spill and Leak: | Use appropriate tools to put the spilled solid into a convenient waste disposal container. |
| Large Spill and Leak: | Stop leak if without risk. Do not get water inside container. Do not touch spilled material. Use water spray to reduce vapors. Prevent entry into sewers, basements or confined areas; dyke if needed. Call for assistance on disposal. Finish cleaning by spreading water on the contaminated surface and allow to evacuate through the sanitary system. Be careful that the product is not present at a concentration level above TLV. Check TLV on the MSDS and with local authorities. |

7. HANDLING AND STORAGE

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| Handling: | Handle with care. Do not swallow or inhale, dust, spray, mist or vapours. Avoid contact with eyes and skin and any form of ingestion. Wear suitable protective clothing such as overalls, boots, rubber gloves, goggles, nose and mouth protection and wash contaminated clothing daily. Use dust mask or respirator with dust cartridge. Wash thoroughly with soap and water after use or accidental skin contact. Do not eat, drink or smoke during use. Avoid contamination of food, foodstuffs, eating utensils and drinking water. Do not discharge residues or any of the product into rivers, dams and canals. |
| Storage: | Store in a cool, dry place away from food and foodstuffs and incompatible substances, and away from steel structures or steel components. Store under lock and key and keep out of reach of children, uninformed persons and animals. Store only in sealed polypropylene or stainless steel containers. Minimise dust generation and accumulation and store away |

from direct sunlight and heat in original containers.

8. EXPOSURE CONTROL / PERSONAL PROTECTION

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| 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, fume or mist, use ventilation to keep exposure to airborne contaminants below the exposure limit. |
| Personal Protection: | <i>Eyes</i> Splash goggles. |
| | <i>Body</i> Full acid resistant suit. |
| | <i>Respiratory</i> Dust respirator. Be sure to use a MSHA/NIOSH approved respirator or equivalent. Wear appropriate respirator when ventilation is inadequate. |
| | <i>Hands</i> Gloves. |
| | <i>Feet</i> Boots. |
| Personal Protection in Case of a Large Spill: | Splash goggles. Full suit. Dust respirator. Boots. Gloves. A self-contained breathing apparatus should be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product. |
| Exposure Limits: | BAUA (Germany 1997) PEAK: 4 mg Cu/m ³ dust MAK: 1 mg Cu/m ³ dust Tyterveyslaitos (Finland, 1998) TWA: 1 mg Cu/m ³ dust AFS (Sweden, 1996) NGV: 1 mg Cu/m ³ dust |

9. PHYSICAL AND CHEMICAL PROPERTIES

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| Physical State and Appearance: | Hygroscopic, bluish triclinic crystals (white when dehydrated). Clear, blue crystalline granules or powder. |
| Molecular Weight: | 249.7 g / mole |
| Molecular Formula: | CuSO ₄ •5H ₂ O |
| pH (0.05 mole solution): | 3.7 (acidic) |
| Boiling/Condensation Point: | Not available. |
| Melting/Freezing Point: | Not available. |
| Critical Temperature: | Not available. |
| Specific Gravity: | 2.284 (water = 1) |
| Bulk density (not compacted): | 1.161 (water = 1) |
| Vapour Pressure: | Not available. |
| Vapour Density: | Not available. |

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| Volatility: | Not available. |
| Odour Threshold: | Not available. |
| Evaporation Rate: | Not available. |
| VOC: | Not available. |
| Log K_{ow} | Not available. |
| Ionicity (in Water): | Not available. |
| Dispersion Properties: | Not available. |
| Solubility: | 317 g / ℓ (20 °C) |

10. STABILITY AND REACTIVITY

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| Stability and Reactivity: | The product is stable. |
| Conditions of Instability: | Not available. |
| Incompatibility with Various Substances: | Avoid contact with acetylene, hydroxylamine and reducing agents. Avoid contact with steel. |
| Hazardous Decomposition Products: | Toxic sulphur dioxide fumes. |
| Hazardous Polymerization: | Will not occur. |

11. TOXICOLOGICAL INFORMATION

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| Toxicity: | Acute oral toxicity (LD50): | 300 mg / kg [RAT]. |
| | Acute dermal toxicity (LD50): | 2,000 mg / kg [RAT]. |
| | Lowest published oral lethal dose: | 1,088 mg / kg [Human]. |
| Chronic Effects on Humans: | <u>CARCINOGENIC EFFECTS:</u> | Not suspected for humans by ACGIH. |
| | <u>MUTAGENIC EFFECTS:</u> | Not available. |
| | <u>TERATOGENIC EFFECTS:</u> | Classified NONE for humans. |
| Acute Effects on Humans: | Hazardous in case of eye contact (irritant). Inflammation of the eye is characterized by redness, watering and itching. Hazardous in case of skin contact (irritant). Skin inflammation is characterized by itching, scaling, reddening or, occasionally blistering. Hazardous in case of inhalation (lung irritant). Hazardous in case of ingestion. | |
| Synergetic Products: (Toxicologically) | Not available. | |
| Irritancy: | Draize Test: Not available. | |

Sensitization: Not available.

Toxicity to Reproductive System: Tests on laboratory animals for reproductive effects are cited in Registry of Toxic Effects on Chemical Substances (RTECS).

12. ECOLOGICAL INFORMATION

Ecotoxicity: Harmful to both plant and aquatic life. Potential bio-accumulation may lead to ecological disturbances.

BOD5 and COD: Not available.

Biodegradable / OECD: Copper sulphate is slowly biodegradable.

Mobility: Copper sulphate is water soluble and will be dispersed in soil and water at a rate which will depend on the amount and concentration of the spill.

Toxicity of the Products of Biodegradation: The products of degradation are less toxic than the product itself.

13. DISPOSAL CONSIDERATIONS

EPA Waste Number: Not available.

Treatment: Material does not have an EPA Waste Number and is not a listed waste, however consultation with a permitted waste disposal site (TSD) should be accomplished. Always contact a permitted waste disposal site (TSD) to assure compliance with all current, local, national, state, Federal and Governmental Regulations.

14. TRANSPORT INFORMATION

| Regulatory information | Proper Shipping Name | Class | UN number | PG | Label |
|---|---|-------|-----------|-----|-------|
| UN / IMDG / IATA Classification: | ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, n.o.s. copper (II) sulphate pentahydrate. | 9 | UN 3077 | III | |
| DOT Classification: | ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, n.o.s. copper (II) sulphate pentahydrate. | 9 | UN 3077 | III | |

Hazchem Code: 2X

IERG Number: 47

Signal Word:



Warning



Warning

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|----------------------------------|-------------------|--|
| Hazard Statements: | H302: | Harmful if swallowed. |
| | H315: | Causes skin irritation. |
| | H319: | Causes serious eye irritation. |
| | H410: | Very toxic to aquatic life with long lasting effect. |
| Precautionary Statements: | P273: | Avoid release to the environment. |
| | P302, P352: | If on skin – wash with plenty of soap and water. |
| | P305, P351, P338: | If in eyes – rinse cautiously with water for several minutes. Remove contact lenses if present and easy to do. Continue rinsing. |

15. REGULATORY INFORMATION

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| Republic of South Africa Regulations: | National Water Act 36 of 1998. Occupational Health and Safety Act, 1993. Environmental Conservation Act 73 of 1989. Hazardous Substances Act, 1973. Provincial Ordinances and Local By-laws. |
| U.S. Federal Regulations: | TSCA 8(b) inventory: Cupric Sulphate Pentahydrate. 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: Cupric Sulphate Pentahydrate. SARA 311/312 MSDS distribution – chemical inventory – hazard identification: Cupric Sulphate Pentahydrate: Immediate (Acute) Health Hazard, Delayed (Chronic) Health Hazard. SARA 313 toxic chemical notification and release reporting: Cupric Sulphate Pentahydrate. Clean Water Act (CWA) 307: Cupric Sulphate Pentahydrate. Clean Water Act (CWA) 311: Cupric Sulphate Pentahydrate. 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: Cupric Sulphate Pentahydrate: (environmental hazard, generic environmental hazard). Massachusetts RTK: Cupric Sulphate Pentahydrate. New Jersey: Cupric Sulphate Pentahydrate. California prop. 65: No products were found. |
| WHMIS (Canada): | Class D-1B: Material causing immediate and serious toxic effects (TOXIC). Class D-2B: Material causing other toxic effects (TOXIC). CEPA DSL: Cupric Sulphate Pentahydrate. |
| International Regulations: | <i>EINECS</i> : Cupric Sulphate Pentahydrate 231-847-63. |

International Lists:

Australia (NICNAS): Cupric Sulphate Pentahydrate.

Japan (MITI): Cupric Sulphate Pentahydrate.

Korea (TCCL): Cupric Sulphate Pentahydrate.

Philippines (RA6969): Cupric Sulphate Pentahydrate.

China: No products were found.

16. OTHER INFORMATION

Label Requirements: Keep away from food and foodstuffs.

CERCLA Ratings:
(Scale 0 – 3)

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|--------------|-----|
| Health: | = 3 |
| Fire: | = 0 |
| Reactivity: | = 0 |
| Persistence: | = 3 |

NFPA Ratings:
(Scale 0 – 4)

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|-------------|-----|
| Health | = 2 |
| Fire | = 0 |
| Reactivity: | = 0 |

References:

National Institute for Occupational Safety and Health (NIOSH).
The Registry of Toxic Effects of Chemical Substances (RTECS).
LOLI Database: The regulated Chemicals List of Lists.
CHEMINFO: Canadian Centre for Occupational Health and Safety, Issue: 97-3 (August, 1997).
BDH: Hazard Data Disk, Version 3.
CESARS: Chemical Evaluation and Retrieval System, Produced by: Ontario Ministry of Environment and Michigan Department of Natural Resources, Issue: 97-3 (August, 1997).
TOMES Plus System: Toxicology, Occupational Medicine & Environmental Series: incorporating.
MEDITEX, HAZARDTEXT, 1st Medical Response Protocols, INFOTEXT, HSDB, CHRIS, OHM/TADS, IRIS, NIOSH Pocket Guide, RTECS, NJ Fact Sheets, North American Emergency Response Guides, REPROTEXT, REPROTOX, TERIS, Shepard's Catalog of Teratogenic Agents.

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