SAFETY DATA SHEET

# Copper Sulphate Solution – Mining Grade

## SECTION 01 - IDENTIFICATION

| | |
|---|---|
| **Product identifier** | Copper Sulphate Solution |
| **Other means of identification** | Cupric Sulphate Solution, Aqueous Copper Sulphate, Liquid Blue Vitriol |
| **Recommended use of chemical** | Used in the flotation of mineral products |
| **Supplier name** | Ixom Operations Pty Limited trading as LogiChem |
| **Supplier address** | Lot 33 Bulong Road Parkeston-Kalgoorlie, Australia<br>PO Box 878 Kalgoorlie WA 6433 Australia |
| **Supplier phone** | 1800 033 111 / Int. +61 (0) 3 9663 2130 |
| **24 Hour emergency phone** | 1800 033 111 |

## SECTION 02 – HAZARD(S) IDENTIFICATION

| | |
|---|---|
| **Classification** | Skin Corrosion/Irritation - Category 2<br>Serious Eye Damage/Irritation - Category 2B<br>Acute Toxicity (Oral) - Category 4<br>Acute Toxicity (Dermal) - Category 4<br>Acute Toxicity (Inhalation) - Category 4<br>Acute Hazard To The Aquatic Environment - Category 1 |
| **Signal word** | Warning |
| **Hazard statements** | **H302** – Harmful if swallowed.<br>**H312** – Harmful if in contact with skin.<br>**H315** – Causes skin irritation.<br>**H319** – Causes serious eye irritation.<br>**H332** – Harmful if inhaled.<br>**H410** – Very toxic to aquatic life with long lasting effects. |
| **Precautionary statements** | *Prevention*<br>**P261** – Avoid breathing dust/fume/gas/mist/vapours/spray.<br>**P264** – Wash contacted areas thoroughly after handling.<br>**P270** – Do not eat, drink or smoke when using this product.<br>**P271** – Use only outdoors or in a well ventilated area.<br>**P273** – Avoid release to the environment.<br>**P280** – Wear protective gloves/protective clothing/eye protection/face protection.<br>*Response*<br>**P301 / P312** – IF SWALLOWED: Call a POISON CENTRE or doctor/physician if you feel unwell.<br>**P302 / P352** – IF ON SKIN: Wash with plenty of soap and water.<br>**P304 / P340** – IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing.<br>**P305 / P351 / P338** – IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.<br>**P322** – Specific measures (See First Aid Measures on SDS).<br>**P330** – Rinse mouth.<br>**P332 / P313** – If skin irritation occurs: Get medical advice/attention.<br>**P337 / P313** – If eye irritation persists: Get medical advice/attention.<br>**P362** – Take off contaminated clothing and wash before reuse.<br>**P363** – Wash contaminated clothing before reuse.<br>*Disposal*<br>**P501** – Dispose of contents/container in accordance with local / regional / national / international regulations. |

SAFETY DATA SHEET

# Copper Sulphate Solution – Mining Grade

## SECTION 03 – COMPOSITION / INFORMATION ON INGREDIENTS

| Chemical Components | Cas No: | Proportion % w/w |
|---|---|---|
| Copper Sulphate Pentahydrate | 7758-99-8 | 20.0-30.0% |
| Water | 7732-18-5 | 70.0-80.0% |

## SECTION 04 – FIRST AID MEASURES

| | |
|---|---|
| **Description of necessary first aid measures** | ***Eye*** – Immediately flush with warm, running water, including under the eyelids, for at least 15 minutes. Seek medical attention immediately.<br>***Ingestion*** – If victim is conscious and can swallow, dilute stomach contents with 2 to 4 cupfuls of water or milk. DO NOT induce vomiting. Ingestion of cupric sulphate normally leads to spontaneous vomiting. When vomiting occurs naturally, rinse mouth and repeat administration of water. Seek medical attention immediately and bring a copy of this SDS. Never give anything by mouth to an unconscious person.<br>***Inhalation*** – Remove victim from exposure area to fresh air immediately. If breathing has stopped, give artificial respiration. Medical oxygen may be administered, if available, when breathing is difficult. Seek immediate medical attention.<br>***Skin*** – Remove contaminated clothing and wash affected area with soap and warm water. Seek medical attention if irritation develops or persists. Wash contaminated clothing before reuse. |
| **Medical attention / special treatment** | Treat symptomatically based on judgement of doctor and individual reactions of patient. |
| **Symptoms caused by exposure** | May cause skin sensitization in certain individuals. Sulpur allergies may occur. Wilson's disease can be aggravated by excessive exposure. Symptoms include nausea, vomiting, epigastria pain, diarrhea, dizziness, jaundice and general debility. |

## SECTION 05 – FIRE FIGHTING MEASURES

| | |
|---|---|
| **Suitable extinguishing media** | Use any means of extinction appropriate for surrounding fire conditions such as water spray, carbon dioxide, dry chemical, or foam. |
| **Specific hazards arising from the chemical** | Copper sulphate solution is not flammable or combustible. If heated, corrosive and toxic vapours/gases may be formed. Decomposition produces sulfur oxides, strong oxidizing agents, which may add to combustion. May yield oxides of nitrogen. |
| **Special protective equipment & precautions for fire fighters** | Clear fire area of all non-emergency personnel. Stay upwind. Keep out of low areas. Eliminate ignition sources. Move fire exposed containers from fire area if it can be done without risk. Do NOT allow fire fighting water to reach waterways, drains or sewers. Store fire fighting water for treatment. Fire fighters should wear a positive-pressure self-contained breathing apparatus (SCBA) and protective fire fighting clothing (includes fire fighting helmet, coat, trousers, boots and gloves) or chemical splash suit. |

## SECTION 06 – ACCIDENTAL RELEASE MEASURES

| | |
|---|---|
| **Personal precautions, protective equipment and emergency procedures** | Isolate hazard area and deny entry to unprotected personnel. Eliminate all sources of ignition. Increase ventilation. Avoid walking through spilled product as it may be slippery. Control source of spillage if possible to do so safely. Use clean, non-sparking tools and equipment. Personnel involved in the clean up should wear full protective clothing as listed in section 08. |
| **Environmental precautions** | This product can pose a threat to the environment. Contamination of soil and water should be prevented. Keep spillage from entering ground, streams or sewers. |
| **Methods and materials for containment and cleaning up.** | If spill is small, mop up. For larger spill use absorbent (sand or other inert materials) to soak up spilled material. Place contaminated material and neutralization wastes in |

| | |
|---|---|
| | suitable containers for recovery or disposal. Treat or dispose of waste material in accordance with applicable regulations. Wash cleaned areas with an excess of water. |

## SECTION 07 – HANDLING AND STORAGE

| | |
|---|---|
| **Precautions for safe handling** | Ensure an eye bath and safety shower are available and ready for use. Refrain from eating, drinking, or smoking in work areas. Thoroughly wash hands before eating, drinking, or smoking in appropriate, designated areas. |
| **Conditions for Safe Storage (Including Any Incompatibles)** | Store containers in a dry, cool, well-ventilated area away from incompatible materials. Keep container tightly closed. Protect from physical damage. Minimize generation of mist. Do not allow to freeze; if frozen thaw completely and mix prior to use. |

## SECTION 08 – EXPOSURE CONTROLS / PERSONAL PROTECTION

| | |
|---|---|
| **Control parameters – exposure standards, biological monitoring** | No exposure standard has been established for this product by Safe Work Australia. |
| **Appropriate engineering controls** | A system of local and/or general exhaust is recommended to keep employee exposures as low as possible. Local exhaust ventilation is generally preferred because it can control the emissions of the contaminant at its source, preventing dispersion of it into the general work area. |
| **Personal protective equipment (PPE)** | ***Clothing*** – Long-sleeved protective clothing (AS3765/2210).<br>***Eyes*** – Chemical goggles. Wear a face shield if splashing hazard exists (AS1336/1337).<br>***Footwear*** –Safety footwear (AS3765/2210).<br>***Gloves*** – Wear rubber or plastic gloves. The most suitable glove must be chosen in consultation with the gloves supplier, who can inform about the breakthrough time of the glove material (AS2161).<br>***Other*** - RESPIRATOR: None normally required. For prolonged or excessive exposure to heated material or mist, a full face chemical respirator with inorganic vapour/dust and mist cartridge is recommended. NOTE: A respiratory protection program that meets AS1715/1716 or applicable federal/provincial requirements must be followed whenever workplace conditions warrant respirator use (AS1715/1716). |

## SECTION 09 – PHYSICAL AND CHEMICAL PROPERTIES

| | |
|---|---|
| **Appearance** | Clear, deep-blue coloured solution |
| **Odour** | Odourless |
| **Odour threshold** | Not available |
| **pH** | Approximately 1 |
| **Melting point/freezing point** | below 0°C |
| **Specific gravity (water = 1)** | 1.145-1.22 (based on concentration) |
| **Boiling point and boiling range** | above 100°C |
| **Flash point** | Not available |
| **Evaporation rate** | Not available |
| **Flammability** | Not available |
| **Upper/lower flammability or explosive limits** | Not available |
| **Vapour pressure (hPa @ 20°C)** | Negligible at 20°C |
| **Vapour density** | Not available |
| **Relative density** | Not available |
| **Solubility(ies) (water)** | 100% at 20°C |
| **Partition coefficient: n-octanol/water** | Not available |
| **Auto-ignition temperature** | Not available |
| **Decomposition temperature** | Not available |
| **Viscosity** | Not available |
| **Specific heat value** | Not available |

| | |
|---|---|
| Particle size | Not available |
| Volatile organic compounds content | Not available |
| % volatile | Not available |
| Saturated vapour concentration | Not available |
| Release of invisible flammable vapours and gases | Not available |

## SECTION 10 – STABILITY AND REACTIVITY

| | |
|---|---|
| Reactivity | Copper salts are incompatible with acetylene and may react to form explosive acetylides. Copper sulfate can cause ignition upon contact with hydroxylamine due to the release of heat. Reducing agents react vigorously with copper salts. |
| Chemical stability | This material is stable and not considered reactive under normal temperatures and pressures. |
| Conditions to avoid | Avoid heat, especially heating to dryness, which increases the probability and the hazard of oxidizing reactions. |
| Incompatible materials | Avoid contact with alkalies, hydroxylamine, magnesium, ammonia, cetylene, sodium hypobromite, and nitromethane. Can be highly corrosive to most ferrus-based metals. |
| Hazardous decomposition products | Combustion may produce irritating copper fumes and toxic gaseous oxides (sulfur oxides). |

## SECTION 11– TOXICOLOGICAL INFORMATION

| | |
|---|---|
| Information on routes of exposure | ***Eyes*** – Liquid and mist are likely to cause moderate to severe eye irritation.<br>***Ingestion*** - Ingestion will cause nausea, vomiting, gastric pain, diarrhoea and cramps. Large doses by ingestion may cause renal injury, coma and possibly death.<br>***Inhalation*** – Inhalation of mist is irritating to the lungs and upper respiratory passages. Coughing and difficulty with breathing will occur with brief severe exposure. Mists may also be corrosive to the nose, throat and mucous membranes.<br>***Skin*** - Skin contact is likely to cause irritation, with itching and redness of the skin. |
| Symptoms related to exposure | Not available |
| Numerical measures of toxicity | No LD50 data available for the product. However, for the anhydrous form:<br>Oral LD50 Rat: 300 mg/Kg<br>Oral LD50 Rat: >472.5 mg/Kg<br>Oral LD50 Mouse: 369 mg/Kg<br>Dermal LD50 Rabbit: 1000 mg/Kg<br>Dermal LD50 Rabbit: >8000 mg/Kg<br>Eye Irritation: Corrosive, irreversible eye damage.<br>Skin Irritation: No skin irritation.<br>IPR LD50 Mouse: 30 mg/Kg |
| Immediate, delayed and chronic health effects from exposure | Repeated inhalation of a copper sulphate mist has resulted in a condition known as "vineyard sprayer's lung". The condition is asymptomatic until later stages, when symptoms include weakness, malaise, loss of appetite and weight, cough and greenish-brown sputum. Greenish tumours may occur in the liver and lungs of affected persons. Copper sulphate is not listed as a carcinogen by OSHA, National Toxicology Program (NTP), International Agency for Research on Cancer (IARC), ACGIH or the EU. Sulphuric acid is not listed as a carcinogen by OSHA, NTP, IARC, ACGIH or the EU. Both IARC and the NTP have concluded that there is sufficient evidence that occupational exposure to strong inorganic acid mists containing sulphuric acid is carcinogenic to humans, resulting in an increased incidence of primarily laryngeal cancers. The ACGIH also list strong inorganic acid mists containing sulfuric acid as a suspect human carcinogen (A2). OSHA and the EU do not list sulfuric acid mist as a carcinogen. |
| Exposure levels | Not available |
| Interactive effects | Not available |

| | |
|---|---|
| Data limitations | Not available |

## SECTION 12– ECOLOGICAL INFORMATION

| | |
|---|---|
| Ecotoxicity | Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment. Product is a Marine Pollutant.<br>Cupric sulfate: Freshwater Fish (Oncorhynchus mykiss) LC50/96hr: 0.1 mg/L<br>Water Flea EC50/48hr: 0.024 mg/L |
| Persistence and degradability | Not available |
| Bioaccumulative potential | Not available |
| Mobility in soil | Not available |
| Other adverse effects | Not available |

## SECTION 13 – DISPOSAL CONSIDERATIONS

| | |
|---|---|
| Safe handling and disposal methods | Dispose of in accordance with all local, state and federal regulations. |
| Disposal of any contaminated packaging | All empty packaging should be disposed of in accordance with Local, State, and Federal Regulations or recycled/reconditioned at an approved facility. |
| Environmental regulations | Do not wash down drain or allow to reach natural watercourses. |

## SECTION 14 – TRANSPORT INFORMATION

| | |
|---|---|
| UN number | Not applicable |
| Proper shipping name | Copper Sulphate Solution |
| Transport hazard class(es) | Not applicable |
| Subsidiary risk | Not applicable |
| Packaging group | Not applicable |
| Environmental hazards | Not applicable |
| Special precautions during transport | Not applicable |
| Hazchem code | Not applicable |

## SECTION 15 – REGULATORY INFORMATION

| | |
|---|---|
| AICS name | Sulphuric acid, copper(2+) salt (1:1) pentahydrate |
| Poisons Schedule number | 6 |

## SECTION 16 – OTHER INFORMATION

| | |
|---|---|
| SDS creations date | 14 December 2006 |
| Most recent revision date | 01 February 2018 |
| Revision number | 012<br>THIS ISSUE NUMBER REPLACES ALL ISSUES |
| Reason for revision | Annual Update |
| Contact person | Ixom 1800 033 111 |

*Note: The responsibility to provide a safe workplace remains with the user. The user should consider the health hazards and safety information contained herein as a guide and should take those precautions required in an individual operation to instruct employees and develop work practice procedures for a safe work environment. The information contained herein is, to the best of our knowledge and belief, accurate. However, since the conditions of handling and use are beyond our control we make no guarantee of results, and assume no liability for damages incurred by the use of this material. It is the responsibility of the user to comply with all applicable laws and regulations.*

*END OF SDS*