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MATERIAL SAFETY DATA SHEET

Copper Sulphate

Section 01 - Chemical And Product And Company Information

Product Identifier ..... Cupric Sulphate

Product Use ..... Industrial manufacturing, algaecide, fungicide, herbicide, pesticide, animal feed additive

Supplier Name..... ClearTech Industries Inc.
2302 Hanselman Avenue
Saskatoon, SK. Canada
S7L 5Z3

Prepared By..... ClearTech Industries Inc. Technical Department
Phone: (306)664-2522

Preparation Date..... July 12, 2010

24-Hour Emergency Phone..... 306-664-2522

Section 02 - Composition / Information on Ingredients

Hazardous Ingredients..... Copper Sulphate Pentahydrate 99%

CAS Number..... Copper Sulphate Pentahydrate 7758-99-8

Synonym (s)..... Cupric sulphate, Bluestone, copper (II) sulphate

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Section 03 - Hazard Identification

Inhalation..... Inhalation may cause irritation of the respiratory tract. Excessive inhalation may also cause ulceration and nasal septum perforation.

Skin Contact / Absorption..... Repeated contact may cause skin irritation, itching of skin, and localized discoloration of the skin. Can cause allergic contact dermatitis.

Eye Contact..... Will cause eye irritation and may result in irreversible eye damage.

Ingestion..... Ingestion may result in gastritis, nausea, vomiting, diarrhea and ulceration of the gastrointestinal tract. Severe poisoning or death may result from ingesting large doses.

Exposure Limits..... OSHA/PEL-TWA: 1.0mg/m^3
ACGIH/TLV-TWA: 1.0mg/m^3
NIOSH/REL-TWA: 1.0mg/m^3

Section 04 - First Aid Measures

Inhalation..... Remove victim to fresh air. Give artificial respiration only if breathing has stopped. If breathing is difficult, give oxygen. Seek medical attention if difficulties persist.

Skin Contact / Absorption..... Remove contaminated clothing. Wash affected area with soap and water. Seek medical attention if irritation occurs or persists.

Eye Contact..... Flush immediately with water for at least 20 minutes. Forcibly hold eyelids apart to ensure complete irrigation of eye tissue. Seek immediate medical attention if irritation persists.

Ingestion..... Contact a poison control center or physician for treatment advice immediately. Have affected person sip a glass of water if able to swallow. Do not give anything by mouth if victim in unconscious. Do not induce vomitting unless instructed to do so. Seek immediate medical attention.

Additional Information..... Not available

Section 05 - Fire Fighting

Conditions of Flammability..... Non-flammable

Means of Extinction..... Product does not burn. Use appropriate extinguishing media (water spray, carbon dioxide, dry chemical, or foam) for material that is supplying the fuel to the fire. Do not release runoff from fire control methods to sewers or waterways.

Flash Point..... Not applicable

Auto-ignition Temperature..... Not applicable

Upper Flammable Limit ..... Not applicable

Lower Flammable Limit..... Not applicable

Hazardous Combustible Products.... At temperatures above 600°C the material will decompose into cupric oxide and sulphur dioxide.

Special Fire Fighting Procedures..... Wear NIOSH-approved self-contained breathing apparatus and protective clothing.

Explosion Hazards..... Not available

Section 06 - Accidental Release Measures

Leak / Spill..... Wear appropriate personal protective equipment if required. Stop or reduce leak if safe to do so. Vacuum or sweep up spilled material, making sure to avoid generation of dust. If material is diluted in water, prevent from entering sewers and carefully neutralize with lime or soda ash to form insoluble copper salts which should be disposed of by approved method.

Deactivating Materials..... Lime or soda ash

Section 07 - Handling and Storage

Handling Procedures..... Use proper equipment for lifting and transporting all containers. Use sensible industrial hygiene and housekeeping practices. Wash thoroughly after handling. Avoid all situations that could lead to harmful exposure.

Storage Requirements..... Store in a cool, dry, well-ventilated place. Keep container tightly closed, and away from incompatible materials. Storage materials compatible for copper sulphate storage include stainless steel, fiberglass, polypropylene, PVC or other plastic material. Keep away from galvanized piping and nylon material.

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Section 08 - Personal Protection and Exposure Controls

Protective Equipment

Eyes..... Chemical goggles, full-face shield, or a full-face respirator is to be worn at all times when product is handled. Contact lenses should not be worn; they may contribute to severe eye injury.

Respiratory..... Respiratory protection is not normally required if handling crystal or granular material. If handling the powdered form of copper sulphate produces dust, then a NIOSH or MSHA approved air-purifying respirator is needed. For concentrations ten times greater than occupational exposure limits use a self contained breathing apparatus (SCBA).

Gloves..... Impervious gloves of chemically resistant material should be worn at all times. Wash contaminated clothing and dry thoroughly before reuse.

Clothing..... Body suits, aprons, and/or coveralls of chemical resistant material should be worn at all times. Wash contaminated clothing and dry thoroughly before reuse.

Footwear..... Impervious boots of chemically resistant material should be worn.

Engineering Controls

Ventilation Requirements..... Mechanical ventilation (dilution or local exhaust), process or personnel enclosure and control of process conditions should be provided. Supply sufficient replacement air to make up for air removed by exhaust systems.

Other..... Keep an eye wash fountain and safety shower available and in close proximity to work area.

Section 09 - Physical and Chemical Properties

Physical State..... Solid

Odor and Appearance..... Transparent blue crystals, granules or powder

Odor Threshold..... Not available

Specific Gravity (Water=1)..... 2.284 at 15.6°C

Vapor Pressure (mm Hg, 20°C)..... Not applicable

Vapor Density (Air=1)..... Not applicable

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Evaporation Rate..... Not applicable

Boiling Point..... Not applicable

Freeze/Melting Point..... Decomposes at 560°C. Copper sulphate pentahydrate loses two water molecules of hydration at 30°C, 2 more at 110°C and becomes anhydrous by 250°C.

pH..... 4.0 (5% solution)

Water/Oil Distribution Coefficient..... Not available

Bulk Density..... Not available

% Volatiles by Volume..... Not available

Solubility in Water..... 83.1g/100 mL at 30°C

Molecular Formula..... $CuSO_4$-$5H_2O$

Molecular Weight..... 249.68

Section 10 - Stability and Reactivity

Stability..... Stable

Incompatibility..... Hydroxylamine, magnesium, aluminum, ammonia, acetylene, sodium hypobromite and nitromethane can be corrosive to most ferrous based metals when moist.

Hazardous Products of Decomposition.... Contact with magnesium metal can generate dangerous levels of hydrogen gas. Aluminum will evolve less hydrogen gas upon contact. Copper dust or mist may react with acetylene gas to form shock sensitive copper acetylides. Contact with hydroxylamine will ignite hydroxylamine. Copper sulphate is very hygroscopic and will absorb moisture from the air to form a solution.

Polymerization..... Will not occur

Section 11 - Toxicological Information

Irritancy..... Strong eye irritant. May cause skin irritation.

Sensitization..... Repeated contact may cause sensitization in some individuals.

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Chronic/Acute Effects..... Severe exposure or chronic exposure by ingestion or inhalation of copper sulphate may induce severe gastroenteric distress (vomiting, gastroenteric pain, local corrosion, and hemorrhages), a metallic taste in the mouth, prostration, anuria, hematuria, anemia, an increase in white blood cells, coma, respiration difficulties, and circulatory problems. Prolonged skin contact may cause irritation and eczema. Chronic inhalation may result in anemia.

Synergistic Materials..... Data not available

Animal Toxicity Data..... LD_{50}(oral, rat): 352mg/kg
LD_{50}(dermal, rabbit): > 5050mg/kg

Carcinogenicity..... Not considered to be carcinogenic (IARC, OSHA, ACGIH and NTP).

Reproductive Toxicity..... Not available

Teratogenicity..... Not available

Mutagenicity..... Data not available

Section 12 - Ecological Information

Fish Toxicity..... LC_{50}(daphnia, 24 hour): 600ppb
LC_{50}(blue crab,24 hour): 6.9mg/L
LC_{50}(pink shrimp, 48 hour): 17 mg/L

Biodegradability..... Not available

Environmental Effects..... This product is toxic to fish and aquatic organisms. Do not apply directly to water except as directed under specific instructions. Prevent drift and run off from treated areas. In soil, copper can be particularly toxic to invertebrates and phytotoxic to plants at elevated concentrations with soil properties being regulating factors.

Section 13 - Disposal Consideration

Waste Disposal..... Dispose in accordance with all federal, provincial, and/or local regulations including the Canadian Environmental Protection Act.

Section 14 - Transportation Information

TDG Classification

Class..... 9

Group..... III

PIN Number..... UN 3077

Other..... Secure containers (full and/or empty) with suitable hold down devises during shipment.

Section 15 - Regulatory Information

WHMIS Classification.....D1, D2, E

NOTE: THE PRODUCT LISTED ON THIS MSDS HAS BEEN CLASSIFIED IN ACCORDANCE WITH THE HAZARD CRITERIA OF THE CANADIAN CONTROLLED PRODUCTS REGULATIONS. THIS MSDS CONTAINS ALL INFORMATION REQUIRED BY THOSE REGULATIONS.

Section 16 - Other Information

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.

Attention: Receiver of the chemical goods / MSDS coordinator

As part of our commitment to the Canadian Association of Chemical Distributors (CACD) Responsible Distribution® initiative, ClearTech Industries Inc. and its associated companies require, as a condition of sale, that you forward the attached Material Safety Data Sheet(s) to all affected employees, customers, and end-users. ClearTech will send any available supplementary handling, health, and safety information to you at your request.

If you have any questions or concerns please call our customer service or technical service department.

ClearTech Industries Inc. - Locations

Corporate Head Office: 2302 Hanselman Avenue, Saskatoon, SK, S7L 5Z3
Phone: 306-664-2522
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www.ClearTech.ca

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Location	Address	Postal Code	Phone Number	Fax Number
Richmond, B.C.	12431 Horseshoe Way	V7A 4X6	604-272-4000	604-272-4596
Calgary, AB.	5516E - 40th St. S.E.	T2C 2A1	403-279-1096	403-236-0989
Edmonton, AB.	11750 - 180th Street	T5S 1N7	780-452-6000	780-452-4600
Saskatoon, SK.	2302 Hanselman Avenue	S7L 5Z3	306-933-0177	306-933-3282
Regina, SK.	555 Henderson Drive	S42 5X2	306-721-7737	306-721-8611
Winnipeg, MB.	340 Saulteaux Crescent	R3J 3T2	204-987-9777	204-987-9770
Mississauga, ON.	7480 Bath Road	L4T 1L2	905-612-0566	905-612-0575

24 Hour Emergency Number - All Locations - 306-664-2522