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Kirkland, WA 98033
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For Emergency Assistance involving chemicals call - CHEMTREC (800) 424-9300

The Version Date for this MSDS is : 12/08/2004

PRODUCT NAME: COPPER SULFATE

MSDS NUMBER: MZC5918

DATE ISSUED: 12/8/2004

SUPERSEDES: 8/9/2001

ISSUED BY: 008614

1. PRODUCT IDENTIFICATION

SYNONYMS: COPPER (II) SULFATE PENTAHYDRATE (1:1:5); BLUE VITRIOL;
SULFURIC ACID COPPER (2+) SALT (1:1), PENTAHYDRATE

CAS NO: 7758-98-7 (ANHYDROUS) 7758-99-8 (PENTAHYDRATE)

MOLECULAR WEIGHT: 249.68

CHEMICAL FORMULA: $\text{CUSO}_4 \cdot 5\text{H}_2\text{O}$

Distributed by:

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Product is Non FIFRA Registered

2. COMPOSITION/INFORMATION ON INGREDIENTS

INGREDIENT CAS NO PERCENT HAZARDOUS

CUPRIC SULFATE 7758-98-7 100% YES

3. HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW

WARNING! HARMFUL IF SWALLOWED. AFFECTS THE LIVER AND KIDNEYS. CAUSES IRRITATION TO SKIN, EYES AND RESPIRATORY TRACT.

POTENTIAL HEALTH EFFECTS

INHALATION:

CAUSES IRRITATION TO RESPIRATORY TRACT, SYMPTOMS MAY INCLUDE COUGHING, SORE THROAT, AND SHORTNESS OF BREATH. MAY RESULT IN ULCERATION AND PERFORATION OF RESPIRATORY TRACT. WHEN HEATED, THIS COMPOUND MAY GIVE OFF COPPER FUME, WHICH CAN CAUSE SYMPTOMS SIMILAR TO THE COMMON COLD, INCLUDING CHILLS AND STUFFINESS OF THE HEAD.

INGESTION:

MAY CAUSE BURNING PAIN IN THE MOUTH, ESOPHAGUS, AND STOMACH. HEMORRHAGIC GASTRITIS, NAUSEA, VOMITING, ABDOMINAL PAIN, METALLIC TASTE, AND DIARRHEA MAY OCCUR. IF VOMITING DOES NOT OCCUR IMMEDIATELY SYSTEMIC COPPER POISONING MAY OCCUR. SYMPTOMS MAY INCLUDE CAPILLARY DAMAGE, HEADACHE, COLD SWEAT, WEAK PULSE, KIDNEY AND LIVER DAMAGE, CENTRAL NERVOUS EXCITATION FOLLOWED BY DEPRESSION, JAUNDICE, CONVULSIONS, BLOOD EFFECTS, PARALYSIS AND COMA. DEATH MAY OCCUR FROM SHOCK OR RENAL FAILURE. FATALITIES HAVE OCCURRED AS A RESULT OF INGESTING GRAM QUANTITIES OF COPPER SULFATE.

SKIN CONTACT:

MAY CAUSE IRRITATION AND ITCHING.

EYE CONTACT:

DUST MAY CAUSE IRRITATION. CONTACT MAY CAUSE CONJUNCTIVITIS, ULCERATION, OR CLOUDING OF THE CORNEA.

CHRONIC EXPOSURE:

PROLONGED OR REPEATED SKIN EXPOSURE MAY CAUSE DERMATITIS. PROLONGED OR REPEATED EXPOSURE TO DUSTS OF COPPER SALTS MAY CAUSE DISCOLORATION OF THE SKIN OR HAIR, BLOOD AND LIVER DAMAGE, ULCERATION AND PERFORATION OF THE NASAL SEPTUM, RUNNY NOSE, METALLIC TASTE, AND ATROPHIC CHANGES AND IRRITATION OF THE MUCOUS MEMBRANES.

AGGRAVATION OF PRE-EXISTING CONDITIONS:

PERSONS WITH PRE-EXISTING SKIN DISORDERS, IMPAIRED LIVER, KIDNEY, OR PULMONARY FUNCTION, GLUCOSE 6-PHOSPHATE-DEHYDROGENASE DEFICIENCY, OR PRE-EXISTING WILSON'S DISEASE MAY BE MORE SUSCEPTIBLE TO THE EFFECTS OF THIS MATERIAL.

4. FIRST AID MEASURES

INHALATION:

REMOVE TO FRESH AIR. IF NOT BREATHING, GIVE ARTIFICIAL RESPIRATION. IF BREATHING IS DIFFICULT, GIVE OXYGEN. CALL A PHYSICIAN.

INGESTION:

INDUCE VOMITING IMMEDIATELY AS DIRECTED BY MEDICAL PERSONNEL. NEVER GIVE ANYTHING BY MOUTH TO AN UNCONSCIOUS PERSON. CALL A PHYSICIAN IMMEDIATELY.

SKIN CONTACT:

IN CASE OF CONTACT, WIPE OFF EXCESS MATERIAL FROM SKIN THEN IMMEDIATELY FLUSH SKIN WITH PLENTY OF WATER FOR AT LEAST 15 MINUTES. REMOVE CONTAMINATED CLOTHING AND SHOES. WASH CLOTHING BEFORE REUSE. CALL A PHYSICIAN.

EYE CONTACT:

IMMEDIATELY FLUSH EYES WITH PLENTY OF WATER FOR AT LEAST 15 MINUTES, LIFTING LOWER AND UPPER EYELIDS OCCASIONALLY. GET MEDICAL ATTENTION IMMEDIATELY.

5. FIRE FIGHTING MEASURES

FIRE:

NOT CONSIDERED TO BE A FIRE HAZARD.

EXPLOSION:

NOT CONSIDERED TO BE AN EXPLOSION HAZARD. SEALED CONTAINER MAY RUPTURE DURING FIRE CONDITIONS FROM PRESSURE WATER VAPOR RELEASE.

FIRE EXTINGUISHING MEDIA:

USE ANY MEANS SUITABLE FOR EXTINGUISHING SURROUNDING FIRE. WATER SPRAY MAY BE USED TO KEEP FIRE EXPOSED CONTAINERS COOL.

SPECIAL INFORMATION:

IN THE EVENT OF A FIRE, WEAR FULL PROTECTIVE CLOTHING AND NIOSH-APPROVED SELF-CONTAINED BREATHING APPARATUS WITH FULL FACEPIECE OPERATED IN THE PRESSURE DEMAND OR OTHER POSITIVE PRESSURE MODE. WHEN HEATED ABOVE 110C (230F) MATERIAL WILL MELT. AVOID USING A DIRECT WATER STREAM ON MOLTEN MATERIAL AS IT MAY CAUSES SPLATTERING.

6. ACCIDENTAL RELEASE MEASURES

VENTILATE AREA OF LEAK OR SPILL. KEEP UNNECESSARY AND UNPROTECTED PEOPLE AWAY FROM AREA OF SPILL. WEAR APPROPRIATE PERSONAL PROTECTIVE EQUIPMENT AS SPECIFIED IN SECTION 8. SPILLS: PICK UP AND PLACE IN A SUITABLE CONTAINER FOR RECLAMATION OR DISPOSAL, USING A METHOD THAT DOES NOT GENERATE DUST. US REGULATIONS (CERCLA) REQUIRE REPORTING SPILLS AND RELEASES TO SOIL, WATER AND AIR IN EXCESS OF REPORTABLE QUANTITIES. THE TOLL FREE NUMBER FOR THE US

COAST GUARD NATIONAL RESPONSE CENTER IS (800) 424-8802.

7. HANDLING AND STORAGE

KEEP IN A TIGHTLY CLOSED CONTAINER, STORED IN A COOL, DRY, VENTILATED AREA. PROTECT AGAINST PHYSICAL DAMAGE. ISOLATE FROM INCOMPATIBLE SUBSTANCES. SOLUTIONS ARE CORROSIVE TO MILD STEEL. CONTAINERS OF THIS MATERIAL MAY BE HAZARDOUS WHEN EMPTY SINCE THEY RETAIN PRODUCT RESIDUES (DUST, SOLIDS); OBSERVE ALL WARNINGS AND PRECAUTIONS LISTED FOR THE PRODUCT.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

AIRBORNE EXPOSURE LIMITS:

-OSHA PERMISSIBLE EXPOSURE LIMIT (PEL):

1 MG/M3 (TWA) FOR COPPER DUSTS & MISTS AS CU

-ACGIH THRESHOLD LIMIT VALUE (TLV):

1 MG/M3 (TWA) FOR COPPER DUSTS & MISTS AS CU

VENTILATION SYSTEM:

A SYSTEM OF LOCAL AND/OR GENERAL EXHAUST IS RECOMMENDED TO KEEP EMPLOYEE EXPOSURES BELOW THE AIRBORNE EXPOSURE LIMITS. 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. PLEASE REFER TO THE ACGIH DOCUMENT, "INDUSTRIAL VENTILATION, A MANUAL OF RECOMMENDED PRACTICES", MOST RECENT EDITION, FOR DETAILS.

PERSONAL RESPIRATORS (NIOSH APPROVED):

IF THE EXPOSURE LIMIT IS EXCEEDED AND ENGINEERING CONTROLS ARE NOT FEASIBLE, A HALF FACEPIECE PARTICULATE RESPIRATOR (NIOSH TYPE N95 OR BETTER FILTERS) MAY BE WORN FOR UP TO TEN TIMES THE EXPOSURE LIMIT OR THE MAXIMUM USE CONCENTRATION SPECIFIED BY THE APPROPRIATE REGULATORY AGENCY OR RESPIRATOR SUPPLIER, WHICHEVER IS LOWEST.. A FULL-FACE PIECE PARTICULATE RESPIRATOR (NIOSH TYPE N100 FILTERS) MAY BE WORN UP TO 50 TIMES THE EXPOSURE LIMIT, OR THE MAXIMUM USE CONCENTRATION SPECIFIED BY THE APPROPRIATE REGULATORY AGENCY, OR RESPIRATOR SUPPLIER, WHICHEVER IS LOWEST. IF OIL PARTICLES (E.G. LUBRICANTS, CUTTING FLUIDS, GLYCERINE, ETC.) ARE PRESENT, USE A NIOSH TYPE R OR P FILTER. FOR EMERGENCIES OR INSTANCES WHERE THE EXPOSURE LEVELS ARE NOT KNOWN, USE A FULL-FACEPIECE POSITIVE-PRESSURE, AIR-SUPPLIED RESPIRATOR. WARNING: AIR-PURIFYING RESPIRATORS DO NOT PROTECT WORKERS IN OXYGEN-DEFICIENT ATMOSPHERES.

SKIN PROTECTION:

WEAR PROTECTIVE GLOVES AND CLEAN BODY-COVERING CLOTHING.

EYE PROTECTION:

USE CHEMICAL SAFETY GOGGLES. MAINTAIN EYE WASH FOUNTAIN AND QUICK-DRENCH

9. PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE: BOILING POINT:

TRANSPARENT BLUE TRICLINIC > 150C (> 302F)

CRYSTALS OR CRYSTALLINE GRANULES DECOMPOSES WITH LOSS OF 5H₂O
OR POWDER.

ODOR: MELTING POINT:

ODORLESS. 110C (230F) LOSES 4H₂O @ THIS
TEMPERATURE.

SOLUBILITY: VAPOR DENSITY (AIR=1):

31.6G/100CC H₂O @ 0C (32F) NO INFORMATION FOUND.

SPECIFIC GRAVITY: VAPOR PRESSURE (MM HG):

2.28 @ 15.6C/4C NO INFORMATION FOUND.

PH: EVAPORATION RATE (BUAC=1):

4.0 (0.2 M SOLUTION) (WATER=1): SLOWLY EFFLORESCENT.

% VOLATILES BY VOLUME @ 21C (70F):

0

10. STABILITY AND REACTIVITY

STABILITY:

STABLE UNDER ORDINARY CONDITIONS OF USE AND STORAGE.

HAZARDOUS DECOMPOSITION PRODUCTS:

WHEN HEATED TO DECOMPOSITION CUPRIC OXIDE AND SULFUR OXIDE MAY FORM.

HAZARDOUS POLYMERIZATION:

WILL NOT OCCUR.

INCOMPATIBILITIES:

SUBSTANCE WILL IGNITE HYDROXYLAMINE. SOLUTIONS ARE ACIDIC AND CAN REACT
WITH MAGNESIUM TO EVOLVE FLAMMABLE HYDROGEN GAS. MAY REACT WITH ACETYLENE
TO FORM DANGEROUS ACETYLIDES.

CONDITIONS TO AVOID:

INCOMPATIBLES.

11. TOXICOLOGICAL INFORMATION

ORAL RAT LD50: 300 MG/KG. INVESTIGATED AS A TUMORIGEN, MUTAGEN.

-----/CANCER LISTS/-----

---NTP CARCINOGEN---

INGREDIENT KNOWN ANTICIPATED IARC CATEGORY

CUPRIC SULFATE (7758-98-7) NO NO NONE

12. ECOLOGICAL INFORMATION

ENVIRONMENTAL FATE:

DATA FOR ANHYDROUS MATERIAL UNLESS OTHERWISE NOTED. WHEN RELEASED INTO THE SOIL, THIS MATERIAL IS NOT EXPECTED TO BIODEGRADE. WHEN RELEASED INTO THE SOIL, THIS MATERIAL MAY LEACH INTO GROUNDWATER. WHEN RELEASED INTO WATER, THIS MATERIAL IS NOT EXPECTED TO BIODEGRADE. WHEN RELEASED INTO WATER, THIS MATERIAL IS NOT EXPECTED TO EVAPORATE SIGNIFICANTLY. THIS MATERIAL IS EXPECTED TO SIGNIFICANTLY BIOACCUMULATE. THIS MATERIAL HAS AN EXPERIMENTALLY-DETERMINED BIOCONCENTRATION FACTOR (BCF) OF GREATER THAN 100. BIOACCUMULATION DATA FOR COPPER.

ENVIRONMENTAL TOXICITY:

THIS MATERIAL IS EXPECTED TO BE VERY TOXIC TO AQUATIC LIFE. THE LC50/96-HOUR VALUES FOR FISH ARE LESS THAN 1 MG/L. THE IC50/72-HOUR VALUES FOR ALGAE ARE LESS THAN 1 MG/L. TOXICITY DATA FOR COPPER.

CUPRIC SULFATE:

96 HR LC50 RAINBOW TROUT: 0.1 MG/L;

48 HR LC50 BLUEGILL: 0.6 MG/L;

96 HR LC50 GOLDFISH: 0.1 MG/L

48 HR EC50 WATER FLEA: 0.024 MG/L

13. DISPOSAL CONSIDERATIONS

WHATEVER CANNOT BE SAVED FOR RECOVERY OR RECYCLING SHOULD BE MANAGED IN AN APPROPRIATE AND APPROVED WASTE DISPOSAL FACILITY. PROCESSING, USE OR CONTAMINATION OF THIS PRODUCT MAY CHANGE THE WASTE MANAGEMENT OPTIONS. STATE AND LOCAL DISPOSAL REGULATIONS MAY DIFFER FROM FEDERAL DISPOSAL REGULATIONS.

DISPOSE OF CONTAINER AND UNUSED CONTENTS IN ACCORDANCE WITH FEDERAL, STATE AND LOCAL REQUIREMENTS.

14. TRANSPORT INFORMATION

DOMESTIC (LAND, D.O.T.)

 PROPER SHIPPING NAME: RQ, ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID,
 N.O.S. (CUPRIC SULFATE)

HAZARD CLASS: 9

UN/NA: UN3077 PACKING GROUP: III

INTERNATIONAL (WATER, I.M.O.)

 PROPER SHIPPING NAME: ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S.
 (CUPRIC SULFATE)

HAZARD CLASS: 9

UN/NA: UN3077 PACKING GROUP: III

INTERNATIONAL (AIR, I.C.A.O.)

 PROPER SHIPPING NAME: ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S.
 (CUPRIC SULFATE)

HAZARD CLASS: 9

UN/NA: UN3077 PACKING GROUP: III

 15. REGULATORY INFORMATION

-----/CHEMICAL INVENTORY STATUS - PART 1/-----

INGREDIENT TSCA EC JAPAN AUSTRALIA

 CUPRIC SULFATE (7758-98-7) YES YES YES YES

-----/CHEMICAL INVENTORY STATUS - PART 2/-----

--CANADA--

INGREDIENT KOREA DSL NDSL PHIL.

 CUPRIC SULFATE (7758-98-7) YES YES NO YES

-----/FEDERAL, STATE & INTERNATIONAL REGULATIONS - PART 1/-----

-SARA 302- -----SARA 313-----

INGREDIENT RQ TPQ LIST CHEMICAL CATG

 CUPRIC SULFATE (7758-98-7) NO NO NO COPPER COMPOUN

-----/FEDERAL, STATE & INTERNATIONAL REGULATIONS - PART 2/-----

-RCRA- -TSCA-

INGREDIENT CERCLA 261.33 8(D)

 CUPRIC SULFATE (7758-98-7) 10 NO NO

CHEMICAL WEAPONS CONVENTION: NO TSCA 12(B): NO CDTA: NO

SARA 311/312: ACUTE: YES CHRONIC: YES FIRE: NO PRESSURE: NO
REACTIVITY: NO (PURE / SOLID)

AUSTRALIAN HAZCHEM CODE: NONE ALLOCATED.
POISON SCHEDULE: S5

WHMIS: THIS MSDS HAS BEEN PREPARED ACCORDING TO THE HAZARD CRITERIA OF
THE CONTROLLED PRODUCTS REGULATIONS (CPR) AND THE MSDS CONTAINS
ALL OF THE INFORMATION REQUIRED BY THE CPR.

16. OTHER INFORMATION

NFPA RATINGS:
HEALTH: 2 FLAMMABILITY: 0 REACTIVITY: 0

For Additional Information:
Contact: MSDS Coordinator - Univar USA
During business hours, Pacific Time - (425) 889-3400

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END OF MSDS