



**SIGMA-ALDRICH**

SIGMA CHEMICAL COMPANY  
POST OFFICE BOX 14508  
SAINT LOUIS, MISSOURI 63178, USA

ATTN: SAFETY DIRECTOR  
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DATE 02/15/00  
CUST#: 0-495-04629  
PO#: 2152000

M A T E R I A L S A F E T Y D A T A S H E E T PAGE 1

THIS MSDS IS FOR A COMPONENT OF CATALOG #: BCA-1

SECTION 1. - - - - - CHEMICAL IDENTIFICATION- - - - -

CATALOG #: C2284  
NAME: COPPER (II) SULFATE PENTAHYDRATE 4%  
SOLUTION

SECTION 2. - - - - - COMPOSITION/INFORMATION ON INGREDIENTS - - - - -

CAS #: 7758-99-8

SYNONYMS

BLUE COPPER AS \* COPPER(II) SULFATE PENTAHYDRATE \* COPPER(2+) SULFATE  
PENTAHYDRATE \* CUPRIC SULFATE PENTAHYDRATE \* KUPFERSULFAT-PENTAHYDRAT  
(GERMAN) \* KUPFERVITRIOL (GERMAN) \* SALZBURG VITRIOL \* SULFURIC ACID,  
COPPER(2+) SALT, PENTAHYDRATE \* SULFURIC ACID COPPER(2+) SALT (1:1),  
PENTAHYDRATE (8CI, 9CI) \* VENCEDOR \*

SECTION 3. - - - - - HAZARDS IDENTIFICATION - - - - -

LABEL PRECAUTIONARY STATEMENTS

TOXIC (USA)  
HARMFUL (EU)  
MAY IMPAIR FERTILITY.  
POSSIBLE RISK OF HARM TO THE UNBORN CHILD.  
HARMFUL IF SWALLOWED.  
RISK OF SERIOUS DAMAGE TO EYES.  
IRRITATING TO RESPIRATORY SYSTEM AND SKIN.  
MAY CAUSE SENSITIZATION BY SKIN CONTACT.  
TARGET ORGAN(S):

LIVER  
KIDNEYS

IN CASE OF ACCIDENT OR IF YOU FEEL UNWELL, SEEK MEDICAL ADVICE  
IMMEDIATELY (SHOW THE LABEL WHERE POSSIBLE).  
IN CASE OF CONTACT WITH EYES, RINSE IMMEDIATELY WITH PLENTY OF  
WATER AND SEEK MEDICAL ADVICE.  
WEAR SUITABLE PROTECTIVE CLOTHING, GLOVES AND EYE/FACE  
PROTECTION.

SECTION 4. - - - - - FIRST-AID MEASURES- - - - -

IN CASE OF CONTACT, IMMEDIATELY WASH SKIN WITH SOAP AND COPIOUS  
AMOUNTS OF WATER.  
IN CASE OF CONTACT, IMMEDIATELY FLUSH EYES WITH COPIOUS AMOUNTS OF  
WATER FOR AT LEAST 15 MINUTES.  
IF INHALED, REMOVE TO FRESH AIR. IF NOT BREATHING GIVE ARTIFICIAL  
RESPIRATION. IF BREATHING IS DIFFICULT, GIVE OXYGEN.  
IF SWALLOWED, WASH OUT MOUTH WITH WATER PROVIDED PERSON IS CONSCIOUS.  
CALL A PHYSICIAN.

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CATALOG #: C2284  
NAME: COPPER (II) SULFATE PENTAHYDRATE 4%  
SOLUTION

REMOVE AND WASH CONTAMINATED CLOTHING PROMPTLY.

SECTION 5. FIRE FIGHTING MEASURES

EXTINGUISHING MEDIA  
NONCOMBUSTIBLE.  
USE EXTINGUISHING MEDIA APPROPRIATE TO SURROUNDING FIRE CONDITIONS.

SPECIAL FIREFIGHTING PROCEDURES  
WEAR SELF-CONTAINED BREATHING APPARATUS AND PROTECTIVE CLOTHING TO  
PREVENT CONTACT WITH SKIN AND EYES.

UNUSUAL FIRE AND EXPLOSIONS HAZARDS  
EMITS TOXIC FUMES UNDER FIRE CONDITIONS.

SECTION 6. ACCIDENTAL RELEASE MEASURES

WEAR RESPIRATOR, CHEMICAL SAFETY GOGGLES, RUBBER BOOTS AND HEAVY  
RUBBER GLOVES.  
ABSORB ON SAND OR VERMICULITE AND PLACE IN CLOSED CONTAINERS FOR  
DISPOSAL.  
VENTILATE AREA AND WASH SPILL SITE AFTER MATERIAL PICKUP IS COMPLETE.

SECTION 7. HANDLING AND STORAGE

REFER TO SECTION 8.

SECTION 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

WEAR APPROPRIATE NIOSH/MSHA-APPROVED RESPIRATOR, CHEMICAL-RESISTANT  
GLOVES, SAFETY GOGGLES, OTHER PROTECTIVE CLOTHING.  
USE ONLY IN A CHEMICAL FUME HOOD.  
SAFETY SHOWER AND EYE BATH.  
DO NOT BREATHE VAPOR.  
DO NOT GET IN EYES, ON SKIN, ON CLOTHING.  
KEEP TIGHTLY CLOSED.  
WASH THOROUGHLY AFTER HANDLING.  
STORE IN A COOL DRY PLACE.

SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE AND ODOR  
LIQUID.

PHYSICAL PROPERTIES  
SPECIFIC GRAVITY: 2.284

SECTION 10. STABILITY AND REACTIVITY

INCOMPATIBILITIES  
SENSITIVE TO AIR

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THIS MSDS IS FOR A COMPONENT OF CATALOG #: BCA-1

CATALOG #: C2284  
NAME: COPPER (II) SULFATE PENTAHYDRATE 4%  
SOLUTION

CORRODES STEEL  
FINELY POWDERED METALS  
HEAT

HAZARDOUS COMBUSTION OR DECOMPOSITION PRODUCTS  
TOXIC FUMES OF:  
SULFUR OXIDES

SECTION 11. - - - - - TOXICOLOGICAL INFORMATION - - - - -

ACUTE EFFECTS

HARMFUL IF SWALLOWED.  
MAY BE HARMFUL IF INHALED.  
MAY BE HARMFUL IF ABSORBED THROUGH THE SKIN.  
CAUSES SEVERE EYE IRRITATION.  
CAUSES SKIN IRRITATION.  
MATERIAL IS IRRITATING TO MUCOUS MEMBRANES AND UPPER  
RESPIRATORY TRACT.  
MAY CAUSE ALLERGIC SKIN REACTION.  
ABSORPTION INTO THE BODY LEADS TO THE FORMATION OF METHEMOGLOBIN  
WHICH IN SUFFICIENT CONCENTRATION CAUSES CYANOSIS. ONSET MAY BE  
DELAYED 2 TO 4 HOURS OR LONGER.  
EXPOSURE CAN CAUSE:  
DAMAGE TO THE EYES  
GASTROINTESTINAL DISTURBANCES

CHRONIC EFFECTS

POSSIBLE RISK OF CONGENITAL MALFORMATION IN THE FETUS.  
MAY CAUSE REPRODUCTIVE DISORDERS.  
TARGET ORGAN(S):  
LIVER  
KIDNEYS  
BLOOD

ADDITIONAL INFORMATION

CHRONIC COPPER POISONING IS TYPIFIED BY HEPATIC CIRRHOSIS, BRAIN  
DAMAGE AND DEMYELINATION, KIDNEY DEFECTS, AND COPPER DEPOSITION IN THE  
CORNEA AS EXEMPLIFIED BY HUMANS WITH WILSON'S DISEASE. IT HAS ALSO  
BEEN REPORTED THAT COPPER POISONING HAS LEAD TO HEMOLYTIC ANEMIA AND  
ACCELERATES ARTERIOSCLEROSIS.

RTECS #: GL8900000  
COPPER(II) SULFATE, PENTAHYDRATE (1:1:5)

TOXICITY DATA

ORL-HMN LDLO:1088 MG/KG	IPRAA8 18,807,1965
UNR-MAN LDLO:221 MG/KG	85DCAI 2,73,1970
ORL-RAT LD50:300 MG/KG	85ARAE 2,182,1977
SKN-RAT LD50:>2 GM/KG	NNGADV 18,5161,1993
IPR-RAT LD50:18700 UG/KG	GISAAA 53(4),78,1988
IPR-MUS LD50:33 MG/KG	BCPCA6 14,289,1965

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CATALOG #: C2284  
NAME: COPPER (II) SULFATE PENTAHYDRATE 4%  
SOLUTION

IPR-MAM LD50:7500 UG/KG JANSAG 55,337,1982

TARGET ORGAN DATA  
AUTONOMIC NERVOUS SYSTEM (OTHER: PARASYMPATHOMIMETIC)  
BEHAVIORAL (SOMNOLENCE)  
BEHAVIORAL (COMA)  
GASTROINTESTINAL (CHANGES IN STRUCTURE OR FUNCTION OF SALIVARY GLANDS)  
GASTROINTESTINAL (HYPERMOTILITY, DIARRHEA)  
GASTROINTESTINAL (NAUSEA OR VOMITING)  
LIVER (JAUNDICE, HEPATOCELLULAR)  
KIDNEY, URETER, BLADDER (OTHER CHANGES)  
BLOOD (HEMORRHAGE)  
BLOOD (OTHER HEMOLYSIS WITH OR WITHOUT ANEMIA)  
NUTRITIONAL AND GROSS METABOLIC (WEIGHT LOSS OR DECREASED WEIGHT GAIN)  
ONLY SELECTED REGISTRY OF TOXIC EFFECTS OF CHEMICAL SUBSTANCES  
(RTECS) DATA IS PRESENTED HERE. SEE ACTUAL ENTRY IN RTECS FOR  
COMPLETE INFORMATION.

SECTION 12. ----- ECOLOGICAL INFORMATION -----

DATA NOT YET AVAILABLE.

SECTION 13. ----- DISPOSAL CONSIDERATIONS -----

CONTACT A LICENSED PROFESSIONAL WASTE DISPOSAL SERVICE TO DISPOSE OF  
THIS MATERIAL.  
OBSERVE ALL FEDERAL, STATE AND LOCAL ENVIRONMENTAL REGULATIONS.

SECTION 14. ----- TRANSPORT INFORMATION -----

CONTACT SIGMA CHEMICAL COMPANY FOR TRANSPORTATION INFORMATION.

SECTION 15. ----- REGULATORY INFORMATION -----

EUROPEAN INFORMATION

CAUTION: SUBSTANCE NOT YET FULLY TESTED.

HARMFUL

R 60

MAY IMPAIR FERTILITY.

R 63

POSSIBLE RISK OF HARM TO THE UNBORN CHILD.

R 22

HARMFUL IF SWALLOWED.

R 41

RISK OF SERIOUS DAMAGE TO EYES.

R 37/38

IRRITATING TO RESPIRATORY SYSTEM AND SKIN.

R 43

MAY CAUSE SENSITIZATION BY SKIN CONTACT.

S 45

IN CASE OF ACCIDENT OR IF YOU FEEL UNWELL, SEEK MEDICAL ADVICE

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NAME: COPPER (II) SULFATE PENTAHYDRATE 4%  
SOLUTION

IMMEDIATELY (SHOW THE LABEL WHERE POSSIBLE).

S 26  
IN CASE OF CONTACT WITH EYES, RINSE IMMEDIATELY WITH PLENTY OF  
WATER AND SEEK MEDICAL ADVICE.

S 36/37/39  
WEAR SUITABLE PROTECTIVE CLOTHING, GLOVES AND EYE/FACE  
PROTECTION.

REVIEWS, STANDARDS, AND REGULATIONS

OEL=MAK  
EPA FIFRA 1988 PESTICIDE SUBJECT TO REGISTRATION OR RE-REGISTRATION  
FEREAC 54,7740,1989  
OEL-ARAB REPUBLIC OF EGYPT:TWA 0.1 MG(CU)/M3 (FUME) JAN 1993  
OEL-AUSTRALIA:TWA 0.2 MG(CU)/M3 (FUME) JAN 1993  
OEL-AUSTRALIA:TWA 1 MG(CU)/M3 (DUST) JAN 1993  
OEL-BELGIUM:TWA 0.2 MG(CU)/M3 (FUME) JAN 1993  
OEL-BELGIUM:TWA 1 MG(CU)/M3 (DUST) JAN 1993  
OEL-FINLAND:TWA 0.2 MG(CU)/M3 (FUME) JAN 1993  
OEL-FINLAND:TWA 1 MG(CU)/M3 (DUST) JAN 1993  
OEL-GERMANY:TWA 0.1 MG(CU)/M3 (FUME) JAN 1993  
OEL-GERMANY:TWA 1 MG(CU)/M3 (DUST) JAN 1993  
OEL-HUNGARY:TWA 0.2 MG(CU)/M3;STEL 0.4 MG(CU)/M3 (DUST) JAN 1993  
OEL-INDIA:TWA 0.2 MG(CU)/M3 (FUME) JAN 1993  
OEL-THE NETHERLANDS:TWA 0.2 MG(CU)/M3 (FUME) JAN 1993  
OEL-THE NETHERLANDS:TWA 1 MG(CU)/M3 (DUST) JAN 1993  
OEL-THE PHILIPPINES:TWA 1.0 MG(CU)/M3 (FUME) JAN 1993  
OEL-RUSSIA:STEL 0.5 PPM (1 MG(CU)/M3) (DUST) JAN 1993  
OEL-SWEDEN:TWA 0.2 MG(CU)/M3 (RESP. DUST) JAN 1993  
OEL-SWEDEN:TWA 0.2 MG(CU)/M3 (FUME) JAN 1993  
OEL-SWEDEN:TWA 1 MG(CU)/M3 (TOTAL DUST) JAN 1993  
OEL-SWITZERLAND:TWA 0.1 MG(CU)/M3;STEL 0.2 MG(CU)/M3 (FUME) JAN 1993  
OEL-SWITZERLAND:TWA 1 MG(CU)/M3;STEL 1 MG(CU)/M3 JAN 1993  
OEL-THAILAND:TWA 0.1 MG(CU)/M3 (FUME) JAN 1993  
OEL-THAILAND:TWA 1 MG(CU)/M3 JAN 1993  
OEL-UNITED KINGDOM:TWA 0.2 MG(CU)/M3 (FUME) JAN 1993  
OEL-UNITED KINGDOM:TWA 1 MG(CU)/M3 JAN 1993  
NOES 1983: HZD X5421; NIS 13; TNF 979; NOS 21; TNE 10821; TFE 3606  
NTP TOXICITY STUDIES, RPT# TOX-29, SEPTEMBER 1999

U.S. INFORMATION

THIS PRODUCT IS SUBJECT TO SARA SECTION 313 REPORTING REQUIREMENTS -  
COPPER COMPOUNDS.

SECTION 16. - - - - - OTHER INFORMATION - - - - -

THE ABOVE INFORMATION IS BELIEVED TO BE CORRECT BUT DOES NOT PURPORT TO  
BE ALL INCLUSIVE AND SHALL BE USED ONLY AS A GUIDE. SIGMA SHALL NOT BE  
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THIS MSDS IS FOR A COMPONENT OF CATALOG #:                      BCA-1

CATALOG #:                      C2284  
NAME:                              COPPER (II) SULFATE PENTAHYDRATE 4%  
   SOLUTION

P.O. BOX 355  
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