



SIGMA-ALDRICH

SIGMA CHEMICAL COMPANY
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DATE 05/27/97
CUST#: 2-097-94816
PO#: VISA 05/23/97

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

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

CATALOG #: B0252
NAME: BORIC ACID

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

CAS #: 10043-35-3
MF: H3BO3
EC NO: 233-139-2

SYNONYMS
BORACIC ACID * BOROFAX * BORSAURE (GERMAN) * NCI-C56417 * ORTHOBORIC ACID * THREE ELEPHANT *

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

LABEL PRECAUTIONARY STATEMENTS

TOXIC
MAY IMPAIR FERTILITY.
POSSIBLE RISK OF HARM TO THE UNBORN CHILD.
HARMFUL BY INHALATION, IN CONTACT WITH SKIN AND IF SWALLOWED.
IRRITATING TO EYES, RESPIRATORY SYSTEM AND SKIN.
TARGET ORGAN(S):
CENTRAL NERVOUS SYSTEM
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.
DO NOT BREATHE DUST.

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

IN CASE OF CONTACT, IMMEDIATELY FLUSH EYES WITH COPIOUS AMOUNTS OF WATER FOR AT LEAST 15 MINUTES.
IN CASE OF CONTACT, IMMEDIATELY WASH SKIN WITH SOAP AND COPIOUS AMOUNTS OF WATER.
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.
WASH CONTAMINATED CLOTHING BEFORE REUSE.

SECTION 5. - - - - - FIRE FIGHTING MEASURES - - - - -

EXTINGUISHING MEDIA
CARBON DIOXIDE, DRY CHEMICAL POWDER OR APPROPRIATE FOAM.

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5001

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CATALOG #: B0252
NAME: BORIC ACID

WATER SPRAY.

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- - - - -

EVACUATE AREA.
WEAR SELF-CONTAINED BREATHING APPARATUS, RUBBER BOOTS AND HEAVY
RUBBER GLOVES.
SWEEP UP, PLACE IN A BAG AND HOLD FOR WASTE DISPOSAL.
AVOID RAISING DUST.
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 DUST.
DO NOT GET IN EYES, ON SKIN, ON CLOTHING.
AVOID PROLONGED OR REPEATED EXPOSURE.
WASH THOROUGHLY AFTER HANDLING.
KEEP TIGHTLY CLOSED.
STORE IN A COOL DRY PLACE.

SECTION 9. - - - - - PHYSICAL AND CHEMICAL PROPERTIES - - - - -

APPEARANCE AND ODOR
WHITE CRYSTALLINE POWDER

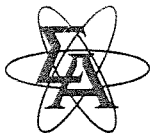
PHYSICAL PROPERTIES
VAPOR PRESSURE: 2.6MM 20 C
SPECIFIC GRAVITY: 1.435

SECTION 10. - - - - - STABILITY AND REACTIVITY - - - - -

INCOMPATIBILITIES
REACTS VIOLENTLY WITH:
POTASSIUM
ACID ANHYDRIDES

HAZARDOUS COMBUSTION OR DECOMPOSITION PRODUCTS

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CATALOG #: B0252
NAME: BORIC ACID

BORON OXIDES.

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

ACUTE EFFECTS

HARMFUL IF SWALLOWED, INHALED, OR ABSORBED THROUGH SKIN.
CAUSES EYE AND SKIN IRRITATION.
MATERIAL IS IRRITATING TO MUCOUS MEMBRANES AND UPPER
RESPIRATORY TRACT.

CHRONIC EFFECTS

OVEREXPOSURE MAY CAUSE REPRODUCTIVE DISORDER(S) BASED ON TESTS WITH
LABORATORY ANIMALS.
TARGET ORGAN(S):
CENTRAL NERVOUS SYSTEM
KIDNEYS
MALE REPRODUCTIVE SYSTEM
FEMALE REPRODUCTIVE SYSTEM

ADDITIONAL INFORMATION

TOXICITY REPORTED FOR BORIC ACID IN HUMANS: INGESTION OR ABSORPTION
MAY CAUSE NAUSEA, VOMITING, DIARRHEA, ABDOMINAL CRAMPS, ERYTHEMATOUS
LESIONS ON THE SKIN AND MUCOUS MEMBRANES. OTHER SYMPTOMS INCLUDE:
CIRCULATORY COLLAPSE, TACHYCARDIA, CYANOSIS, DELIRIUM, CONVULSIONS AND
COMA. DEATH HAS BEEN REPORTED TO OCCUR IN INFANTS FROM LESS THAN
5 GRAMS AND IN ADULTS FROM 5 TO 20 GRAMS.

RTECS #: ED4550000
BORIC ACID

IRRITATION DATA

SKN-HMN 15 MG/3D-I MLD

85DKA8 -,127,77

TOXICITY DATA

ORL-MAN LDLO:429 MG/KG
ORL-WMN LDLO:200 MG/KG
ORL-INF LDLO:934 MG/KG
SKN-INF LDLO:1200 MG/KG
SKN-CHD LDLO:4 GM/KG/4D
SKN-MAN LDLO:2430 MG/KG
SKN-CHD LDLO:1500 MG/KG
SCU-INF LDLO:1100 MG/KG
UNR-MAN LDLO:147 MG/KG
ORL-RAT LD50:2660 MG/KG
SCU-RAT LD50:1400 MG/KG
IVN-RAT LD50:1330 MG/KG
ORL-MUS LD50:3450 MG/KG
SCU-MUS LD50:1740 MG/KG
IVN-MUS LD50:1240 MG/KG
SCU-GPG LD50:1200 MG/KG

JTCTDW 31,345,93
LANCAO 2,162,17
JAMAAP 90,382,28
JAMAAP 129,332,45
MMWOAU 52,763,05
JAMAAP 128,266,45
OJPPAL 6,714,33
MDSR** #2,50
85DCAI 2,73,70
JAMAAP 128,266,45
14KTAK -,693,64
MDSR** #2,50
JAMAAP 128,266,45
JAMAAP 128,266,45
JPETAB 134,117,61
MDSR** #2,50

TARGET ORGAN DATA

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5003

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CATALOG #: B0252
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BRAIN AND COVERINGS (MENINGEAL CHANGES)
PERIPHERAL NERVE AND SENSATION (FLACCID PARALYSIS WITHOUT ANESTHESIA)
SENSE ORGANS AND SPECIAL SENSES (CONJUNCTIVA IRRITATION)
BEHAVIORAL (WAKEFULNESS)
BEHAVIORAL (SOMNOLENCE)
BEHAVIORAL (TREMOR)
BEHAVIORAL (CONVULSIONS OR EFFECT ON SEIZURE THRESHOLD)
BEHAVIORAL (ANOREXIA, HUMAN)
BEHAVIORAL (FLUID INTAKE)
BEHAVIORAL (ATAXIA)
CARDIAC (OTHER CHANGES)
LUNGS, THORAX OR RESPIRATION (CYANOSIS)
LUNGS, THORAX OR RESPIRATION (RESPIRATORY DEPRESSION)
GASTROINTESTINAL (HYPERMOTILITY, DIARRHEA)
GASTROINTESTINAL (NAUSEA OR VOMITING)
GASTROINTESTINAL (OTHER CHANGES)
KIDNEY, URETER, BLADDER (CHANGES IN TUBULES)
SKIN AND APPENDAGES (AFTER SYSTEMIC EXPOSURE: DERMATITIS, OTHER)
PATERNAL EFFECTS (SPERMATOGENESIS)
PATERNAL EFFECTS (TESTES, EPIDIDYMIS, SPERM DUCT)
MATERNAL EFFECTS (UTERUS, CERVIX, VAGINA)
MATERNAL EFFECTS (OTHER EFFECTS ON FEMALE)
NUTRITIONAL AND GROSS METABOLIC (BODY TEMPERATURE INCREASE)
NUTRITIONAL AND GROSS METABOLIC (BODY TEMPERATURE DECREASE)
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 - - - - -

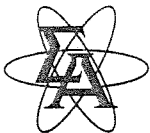
CONTACT SIGMA CHEMICAL COMPANY FOR TRANSPORTATION INFORMATION.

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

EUROPEAN INFORMATION

TOXIC
R 60
MAY IMPAIR FERTILITY.
R 63
POSSIBLE RISK OF HARM TO THE UNBORN CHILD.
R 20/21/22
HARMFUL BY INHALATION, IN CONTACT WITH SKIN AND IF SWALLOWED.

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R 36/37/38
IRRITATING TO EYES, RESPIRATORY SYSTEM AND SKIN.
S 45
IN CASE OF ACCIDENT OR IF YOU FEEL UNWELL, SEEK MEDICAL ADVICE 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.
S 22
DO NOT BREATHE DUST.

REVIEWS, STANDARDS, AND REGULATIONS

OEL=MAK
EPA FIFRA 1988 PESTICIDE SUBJECT TO REGISTRATION OR RE-REGISTRATION
FEREAC 54,7740,89
OEL-RUSSIA: STEL 10 MG/M3 JAN93
NOES 1983: HZD X7080; NIS 187; TNF 27071; NOS 128; TNE 489668; TFE 211838
NOES 1983: HZD X8324; NIS 3; TNF 84; NOS 4; TNE 2919; TFE 1712
EPA TSCA SECTION 8(B) CHEMICAL INVENTORY
EPA TSCA SECTION 8(D) UNPUBLISHED HEALTH/SAFETY STUDIES
EPA TSCA TEST SUBMISSION (TSCATS) DATA BASE, JANUARY 1997
NTP CARCINOGENESIS STUDIES (FEED); NO EVIDENCE: MOUSE
NTPTR* NTP-TR-324,87

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

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