ALDRICH CHEMICAL COMPANY, INC.
P.O. BOX 355
MILWAUKEE, WISCONSIN 53201, USA

ATTN: SAFETY DIRECTOR

BEZRYADIN
HARVARD UNIVERSITY
DIVISION OF APPLIED SCIENCES
PURCHASING DEPT/PIERCE HALL
29 OXFORD STREET
CAMBRIDGE MA 02138-2901

EMERGENCY PHONE 1-414-273-3850

DATE 09/29/97

CUST#: 250120
PO#: 69112

MATERIAL SAFETY DATA SHEET

-- -- -- -- -- -- -- -- -- -- -- -- -- -- -- -- -- -- -- -- -- -- -- -- -- -- -- -- -- -- -- --

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

CATALOG #: 27057-1
NAME: 1,2-DICHLOROETHANE, 99.8%, HPLC GRADE

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

CAS #: 107-06-2
MF: C2H4Cl2
EC NO: 203-458-1

SYNONYMS
- ETHYLENCHLORID (GERMAN)
- 1,2-DICHLOROETHANE
- BICHLORURE D'ETHYLENE
- (FRENCH)
- BORER SOL
- BROCIDE
- CHLORURE D'ETHYLENE
- (FRENCH)
- CLORURO DI ETHENE
- (ITALIAN)
- 1,2-DECE
- DESTRUXOL BORER-SOL
- 1,2-
- DICHLORETHAAN
- (DUTCH)
- 1,2-DICHLOR-ÆTHAN
- (GERMAN)
- PURCHAREMULSION
- 1,2-DICHLORETHANE
- DI-CHLOR-MULSION
- DICHLOOR-1,2-
- ETHAN
- (FRENCH)
- ALPHA,BETA-DICHLOORETHANE
- SYM-DICHLOORETHANE
- 1,2-
- DICHLOROETHANE
- (OSHA)
- DICHLOROETHYLENE
- 1,2-DICHLOROETANO
- (ITALIAN)
- DUTCH LIQUID
- DUTCH OIL
- EDC
- ENT 1,656
- ETHANE
- DICHLORIDE
- ETHYLEN DICHLORIDE
- (DUTCH)
- ETHYLENE CHLORIDE
- ETHYLENE DICHLORIDE
- (ACGIH;DOT;OSHA)
- 1,2-ETHYLENE DICHLORIDE
- GLYCOL DICHLORIDE
- NCI-C00511
- RCRA WASTE NUMBER U077
- UN1184 (DOT)

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

LABEL PRECAUTIONARY STATEMENTS
- FLAMMABLE (USA)
- HIGHLY FLAMMABLE (EU)
- TOXIC
- MAY CAUSE CANCER.
- MAY CAUSE HERITABLE GENETIC DAMAGE.
- INHALED, IN CONTACT WITH SKIN AND IF SWALLOWED.
- IRRITATING TO EYES, RESPIRATORY SYSTEM AND SKIN.
- TARGET ORGAN(S):
- LIVER
- KIDNEYS
- KEEP AWAY FROM SOURCES OF IGNITION - NO SMOKING.
- 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 VAPOR.
- STORE UNDER NITROGEN.

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

IN CASE OF CONTACT, IMMEDIATELY FLUSH EYES OR SKIN WITH COPIOUS
AMOUNTS OF WATER FOR AT LEAST 15 MINUTES WHILE REMOVING CONTAMINATED
CONTINUED ON NEXT PAGE

1921
CLOTHING AND SHOES.
ASSURE ADEQUATE FLUSHING OF THE EYES BY SEPARATING THE EYELIDS
WITH FINGERS.
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.
WATER MAY BE EFFECTIVE FOR COOLING, BUT MAY NOT EFFECT EXTINGUISHMENT.

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

UNUSUAL FIRE AND EXPLOSIONS HAZARDS
FLAMMABLE LIQUID.
VAPOR MAY TRAVEL CONSIDERABLE DISTANCE TO SOURCE OF IGNITION AND
FLASH BACK.
EMITS TOXIC FUMES UNDER FIRE CONDITIONS.

SECTION 6. --- --- --- --- --- ACCIDENTAL RELEASE MEASURES--- --- --- --- ---

EVACUATE AREA.
SHUT OFF ALL SOURCES OF IGNITION.
WEAR SELF-CONTAINED BREATHING APPARATUS, 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, OR CLOTHING.
AVOID PROLONGED OR REPEATED EXPOSURE.
WASH THOROUGHLY AFTER HANDLING.
IRRITANT.
CARCINOGEN.
MUTAGEN.
CATALOG #: 27057-1
NAME: 1,2-DICHLOROETHANE, 99.8%, HPLC GRADE

HARMFUL LIQUID.
TOXIC.
KEEP TIGHTLY CLOSED.
KEEP AWAY FROM HEAT, SPARKS, AND OPEN FLAME.
STORE IN A COOL, DRY PLACE.

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

APPEARANCE AND ODOR
COLORLESS LIQUID

PHYSICAL PROPERTIES
BOILING POINT: 83 C
MELTING POINT: -85 C
FLASHPOINT: 60 F
EXPLOSION LIMITS IN AIR:
UPPER 15.6%
LOWER 6.2%
AUTOIGNITION TEMPERATURE: 775 F
VAPOR PRESSURE: 87MM 25 C
SPECIFIC GRAVITY: 1.256
VAPOR DENSITY: 3.4

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

INCOMPATIBILITIES
OXIDIZING AGENTS
ALUMINUM

HAZARDOUS COMBUSTION OR DECOMPOSITION PRODUCTS
TOXIC FUMES OF:
CARBON MONOXIDE, CARBON DIOXIDE
HYDROGEN CHLORIDE GAS
PHOSGENE GAS

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

ACUTE EFFECTS
HARMFUL IF SWALLOWED, INHALED, OR ABSORBED THROUGH SKIN.
VAPOR OR MIST IS IRRITATING TO THE EYES, MUCOUS MEMBRANES AND UPPER RESPIRATORY TRACT.
CAUSES SKIN IRRITATION.
CAN CAUSE CNS DEPRESSION.
CAUSES DERMATITIS.
PROLONGED EXPOSURE CAN CAUSE:
NAUSEA, HEADACHE AND VOMITING
DAMAGE TO THE LIVER
GASTROINTESTINAL DISTURBANCES
DAMAGE TO THE KIDNEYS

CHRONIC EFFECTS

CONTINUED ON NEXT PAGE
ALDRICH CHEMICAL COMPANY, INC.
P.O. BOX 355
MILWAUKEE, WISCONSIN 53201, USA

CUST#: 250120
PO#: 69112

MATERIAL SAFETY DATA SHEET PAGE 4

CATALOG #: 27057-1
NAME: 1,2-DICHLOROETHANE, 99.8%, HPLC GRADE

CARCINOGEN.
MAY ALTER GENETIC MATERIAL.
TARGET ORGAN(S):
LIVER, KIDNEYS

RETECS #: K10525000
ETHANE, 1,2-DICHLORO-

IRRITATION DATA
SKIN-RBT 625 MG OPEN MLD
SKIN-RBT 500 MG/24H MLD
EYE-RBT 63 MG SEV
EYE-RBT 500 MG/24H MLD

TOXICITY DATA
ORL-MMN LD50: 286 MG/KG
ORL-MAN LD50: 714 MG/KG
ORL-RAT LD50: 670 MG/KG
IH-L RAT LC50: 1000 PPM/7H
IPR-RAT LD50: 807 MG/KG
SCU-RAT LD50: 1 GM/KG
ORL-MUS LD50: 413 MG/KG
IPR-MUS LD50: 470 MG/KG
ORL-DOG LD50: 5700 MG/KG
IH-L-MKY LC50: 3000 PPM/7H
ORL-RBT LD50: 860 MG/KG
SKIN-RBT LD50: 2800 MG/KG

TARGET ORGAN DATA
SENSE ORGANS AND SPECIAL SENSES (LACRIMATION)
BEHAVIORAL (GENERAL ANESTHETIC)
BEHAVIORAL (SOMNOLENCE)
BEHAVIORAL (ATAXIA)
BEHAVIORAL (coma)
CARDIAC (CHANGE IN RATE)
LUNGS, THORAX OR RESPIRATION (COUGH)
LUNGS, THORAX OR RESPIRATION (CYANOSIS)
LUNGS, THORAX OR RESPIRATION (OTHER CHANGES)
LUNGS, THORAX OR RESPIRATION (TUMORS)
GASTROINTESTINAL (ULCERATION OR BLEEDING FROM STOMACH)
GASTROINTESTINAL (HYPERMOTILITY, DIARRHEA)
GASTROINTESTINAL (NAUSEA OR VOMITING)
LIVER (FATTY LIVER DEGENERATION)
LIVER (jaundice, other or unclassified)
LIVER (OTHER CHANGES)
KIDNEY (URETER, BLADDER (CHANGES IN TUBULES))
BLOOD (Leukemia)
SKIN AND APPENDAGES (TUMORS)
EFFECTS ON FERTILITY (POST-IMPLANTATION MORTALITY)
NUTRITIONAL AND GROSS METABOLIC (BODY TEMPERATURE DECREASE)
TUMORIGENIC (EQUIVOCAL TUMORIGENIC AGENT BY RTECS CRITERIA)
BIOCHEMICAL EFFECTS (OTHER TRANSFERASES)

CONTINUED ON NEXT PAGE

1924
CATALOG #: 27057-1
NAME: 1,2-DICHLOROETHANE, 99.8%, HPLC GRADE

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 - - - - - - - -
BURN IN A CHEMICAL INCINERATOR EQUIPPED WITH AN AFTERBURNER AND SCRUNCHER BUT EXERT EXTRA CARE IN IGNITING AS THIS MATERIAL IS HIGHLY FLAMMABLE.
OBSERVE ALL FEDERAL, STATE AND LOCAL ENVIRONMENTAL REGULATIONS.

SECTION 14. - - - - - - - - TRANSPORT INFORMATION - - - - - - - -
CONTACT ALDRICH CHEMICAL COMPANY FOR TRANSPORTATION INFORMATION.

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

EUROPEAN INFORMATION
EC INDEX NO: 602-012-00-7
HIGHLY FLAMMABLE
TOXIC R 11
HIGHLY FLAMMABLE. R 22
HARMFUL IF SWALLOWED. R 36/37/38
IRRITATING TO EYES, RESPIRATORY SYSTEM AND SKIN. R 45
MAY CAUSE CANCER. S 45
IN CASE OF ACCIDENT OR IF YOU FEEL UNWELL, SEEK MEDICAL ADVICE IMMEDIATELY (SHOW THE LABEL WHERE POSSIBLE). S 53

AVOID EXPOSURE - OBTAIN SPECIAL INSTRUCTIONS BEFORE USE.

REVIEWS, STANDARDS, AND REGULATIONS

OEL=MAK
ACGIH TLV-NOT CLASSIFIABLE AS A HUMAN CARCINOGEN DTLVS* TLV/BEI,1996
ACGIH TLV-TWA 40 MG/M3 (10 PPM) DTLVS* TLV/BEI,1996
IARC CANCER REVIEW: ANIMAL SUFFICIENT EVIDENCE IMMMDT 20,429,1979
IARC CANCER REVIEW: HUMAN NO ADEQUATE DATA IMMMDT 20,429,1979
IARC CANCER REVIEW: GROUP 2B IMSUDL 7,66,1987
EPA FIFRA 1988 PESTICIDE SUBJECT TO REGISTRATION OR RE-REGISTRATION
PERBEAC 54,7740,1989
MSHA STANDARD-AIR: TWA 50 PPM (200 MG/M3)
DTLVS* 3,79,1971
OSHA PEL (GEN INDU): 8H TWA 50 PPM; CL 100 PPM; PK 200 PPM/5M/3H
CONTINUED ON NEXT PAGE
ALDRICH CHEMICAL COMPANY, INC.
P.O. BOX 355
MILWAUKEE, WISCONSIN 53201, USA

CUST#: 250120
PO#: 69112

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

CATALOG #: 27057-1
NAME: 1,2-DICHLOROETHANE, 99.8%, HPLC GRADE

CFRGRB 29.1910.1000.1994
OSHA PEL (CONSTRUC): 8H TWA 50 PPM (200 MG/M3)
CFRGRB 29.1926.55.1994
OSHA PEL (SHIPIYARD): 8H TWA 50 PPM (200 MG/M3)
CFRGRB 29.1915.1000.1993
OSHA PEL (FED CONT): 8H TWA 50 PPM (200 MG/M3)
CFRGRB 41.50-204.50.1994
OEL-ARAB REPUBLIC OF EGYPT: TWA 5 PPM (2 MG/M3) JAN 1993
OEL-AUSTRALIA: TWA 10 PPM (40 MG/M3) JAN 1993
OEL-AUSTRIA: TWA 20 PPM (80 MG/M3) JAN 1993
OEL-BELGIUM: TWA 10 PPM (40 MG/M3) JAN 1993
OEL-DENMARK: TWA 1 PPM (4 MG/M3); SKIN JAN 1993
OEL-FINLAND: TWA 10 PPM (40 MG/M3); STEL 20 PPM (80 MG/M3); CARCINOGEN JAN 1993
OEL-FRANCE: TWA 10 PPM (40 MG/M3) JAN 1993
OEL-GERMANY: CARCINOGEN JAN 1993
OEL-HUNGARY: STEL 4 MG/M3; CARCINOGEN JAN 1993
OEL-JAPAN: TWA 10 PPM (40 MG/M3) JAN 1993
OEL-THE NETHERLANDS: TWA 50 PPM (200 MG/M3) JAN 1993
OEL-THE PHILIPPINES: TWA 50 PPM (200 MG/M3) JAN 1993
OEL-RUSSIA: TWA 10 PPM JAN 1993
OEL-SWEDEN: TWA 1 PPM (4 MG/M3); STEL 5 PPM (20 MG/M3); SKIN; CARCINOGEN JAN 1993
OEL-SWITZERLAND: TWA 10 PPM (40 MG/M3); STEL 20 PPM (80 MG/M3) JAN 1993
OEL-TURKEY: TWA 50 PPM (200 MG/M3) JAN 1993
OEL-UNITED KINGDOM: TWA 10 PPM (40 MG/M3); STEL 15 PPM (60 MG/M3) JAN 1993
OEL IN BULGARIA, COLOMBIA, JORDAN, KOREA CHECK AGCH TLEV
OEL IN NEW ZEALAND, SINGAPORE, VIETNAM CHECK AGCH TLEV
NIOSH REL TO ETHYLENE DICHLORIDE-AIR: 10H CA TWA 1 PPM; STEL 2 PPM
NIOSH* DHIS #: 92-100.1992
NIOSH 1974: H2D 24/140; NOS 92; TNF 7148; NOS 60; TNE 77671
NIOSH 1983: H2D 24/140; NIS 38; TNF 2226; NIS 61; TNE 83246; TPE 33361
ATSDR TOXICOLOGY PROFILE (NTIS#: PB/90/171422/AS)
EPA GENETOX PROGRAM 1988, POSITIVE: CARCINOGENICITY-MOUSE/RAT; CELL TRANSFORM.-SA7/SHE
EPA GENETOX PROGRAM 1988, POSITIVE: D MELANOGASTER-WHOLE SEX CHROM.
LOSS
EPA GENETOX PROGRAM 1988, POSITIVE: D MELANOGASTER-NONDISJUNCTION; E COLI POLA WITHOUT SS
EPA GENETOX PROGRAM 1988, POSITIVE: HISTIDINE REVERSION-AMES TEST
EPA GENETOX PROGRAM 1988, POSITIVE: D MELANOGASTER SEX-LINKED LETAL
EPA GENETOX PROGRAM 1988, POSITIVE: CHO GENE MUTATION
EPA TSCA SECTION 8(B) CHEMICAL INVENTORY
EPA TSCA SECTION 8(D) UNPUBLISHED HEALTH/SAFETY STUDIES
ON EPA IRIS DATABASE
EPA TSCA TEST SUBMISSION (TSCATS) DATA BASE, APRIL 1997
NIOSH ANALYTICAL METHOD, 1994: HYDROCARBONS, HALOGENATED. 100%
NCI CARCINOGENESIS BIOASSAY (GAVAGE); CLEAR EVIDENCE: MOUSE, RAT
NCI TR* NCI-TR-55.78
NTP 7TH ANNUAL REPORT ON CARCINOGENS, 1992: ANTICIPATED TO BE CONTINUED ON NEXT PAGE
CATALOG #: 27057-1
NAME: 1,2-DICHLORETHANE, 99.8%, HPLC GRADE

CARCINOGEN
NTP TOXICITY STUDIES, RPT# TOX-04, APRIL 1997
OSHA ANALYTICAL METHOD #03

U.S. INFORMATION
THIS PRODUCT IS SUBJECT TO SARA SECTION 313 REPORTING REQUIREMENTS.
CALIFORNIA PROPOSITION 65:
THIS PRODUCT IS OR CONTAINS CHEMICAL(S) KNOWN TO THE STATE OF
CALIFORNIA TO CAUSE CANCER.

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. ALDRICH SHALL NOT BE
HELD LIABLE FOR ANY DAMAGE RESULTING FROM HANDLING OR FROM CONTACT WITH
THE ABOVE PRODUCT. SEE REVERSE SIDE OF INVOICE OR PACKING SLIP FOR
ADDITIONAL TERMS AND CONDITIONS OF SALE.

COPYRIGHT 1997 ALDRICH CHEMICAL CO., INC.
LICENSE GRANTED TO MAKE UNLIMITED PAPER COPIES FOR INTERNAL USE ONLY.