SIGMA-ALDRICH

Material Safety Data Sheet

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Section 1 - Product and Company Information

Product Name	1,2-DICHLOROETHANE, 99+%, A.C.S. REAGENT
Product Number	319929
Brand	Aldrich Chemical
Company	Sigma-Aldrich
Street Address	3050 Spruce Street
City, State, Zip, Country	St. Louis, MO, 63103, US
Technical Phone:	314 771 5765
Emergency Phone:	414 273 3850 Ext.5996
Fax	800 325 5052

Section 2 - Composition/Information on Ingredient

Substance Name	CAS #	SARA 313
1,2-DICHLOROETHANE	107-06-2	Yes

Formula C2H4Cl2

Synonyms Aethylenchlorid (German), 1,2-Bichloroethane, Bichlorure d'ethylene (French), Borer sol, Brocide, Chlorure d'ethylene (French), Cloruro di ethene (Italian), 1,2-DCE, Destruxol borer-sol, 1,2-Dichloorethaan (Dutch), 1,2-Dichlor-aethan (German), Dichloremulsion, 1,2-Dichlorethane, Di-chlor-mulsion, Dichloro-1,2-ethane (French), alpha,beta-Dichloroethane, sym-Dichloroethane, 1,2-Dichloroethane (OSHA), Dichloroethylene, 1,2-Dicloroetano (Italian), Dutch liquid, Dutch oil, EDC, ENT 1,656, Ethane dichloride, Ethyleendichloride (Dutch), Ethylene chloride, Ethylene dichloride (ACGIH:OSHA), 1,2-Ethylene dichloride, Glycol dichloride, NCI-C00511, RCRA waste number U077

Section 3 - Hazards Identification

Emergency Overview

Flammable (USA) Highly Flammable (EU). Toxic.
May cause cancer. Toxic by inhalation, in contact with skin, and if swallowed. Irritating to eyes, respiratory system, and skin.
Target organ(s): Liver. Kidneys.

For additional information on toxicity, please refer to Section 11.

Section 4 - First Aid Measures

Immediate Treatment - Work Site

In case of contact, immediately flush eyes or skin with copious amounts of water for at least 15 minutes while removing contaminated clothing and shoes.

Inhalation Exposure

If inhaled, remove to fresh air. If not breathing give artificial respiration. If breathing is difficult, give oxygen.

Eye Exposure

Assure adequate flushing of the eyes by separating the eyelids with fingers.

Section 5 - Fire Fighting Measures

Explosion Hazards
Vapor may travel considerable distance to source of ignition and flash back.

Flash Point:	55.4 °F	13 °C	
Explosion Limits:	**Lower:** 6.2 %	**Upper:** 15.6 %	
Autoignition Temp:	413 °C	**Flammability:**	N/A

Extinguishing Media
Suitable
Carbon dioxide, dry chemical powder, or appropriate foam.
Unsuitable
Water may be effective for cooling, but may not effect extinguishment.

Firefighting
Protective Equipment
Wear self-contained breathing apparatus and protective clothing to prevent contact with skin and eyes.
Specific Hazard(s)
Flammable liquid. Vapor may travel considerable distance to source of ignition and flash back. Emits toxic fumes under fire conditions.

Exposure Hazard(s)
Material
Irritant. Harmful liquid. Toxic.

Section 6 - Accidental Release Measures

Procedure to be Followed in Case of Leak or Spill
Evacuate area. Shut off all sources of ignition.

Procedure(s) of Personal Precaution(s)
Wear self-contained breathing apparatus, rubber boots, and heavy rubber gloves.

Methods for Cleaning Up
Absorb on sand or vermiculite and place in closed containers for disposal.

Section 7 - Handling and Storage

Handling
User Exposure
Do not breathe vapor. Do not get in eyes, on skin, on clothing. Avoid prolonged or repeated exposure.

Storage
Suitable
Keep tightly closed. Keep away from heat, sparks, and open flame. Store in a cool dry place.

Section 8 - Exposure Controls / PPE

Engineering Controls
Use only in a chemical fume hood. Safety shower and eye bath.

Personal Protective Equipment
Other
Wear appropriate NIOSH/MSHA-approved respirator, chemical-resistant gloves, safety goggles, other protective clothing.

General Hygiene Measures
Wash thoroughly after handling. Wash contaminated clothing before reuse.

Exposure Limits, RTECS

Country	Source	Type	Value	Remarks
USA	ACGIH	TWA	40 MG/M3 (10 PPM)	
USA	MSHA Standard-air	TWA	50 PPM (200 MG/M3)	
USA	OSHA.	PEL	8H TWA 50 PPM;CL 100 PPM;PK 20	
New Zealand	OEL			check ACGIH TLV
USA	NIOSH	TWA STEL	1 PPM 2 PPM	

Section 9 - Physical/Chemical Properties

Appearance

Physical State	Color	Form
Liquid	Colorless	Clear liquid

Molecular Weight: 98.96 AMU

Property	Value	At Temperature or Pressure
pH	N/A	
BP/BP Range	82 - 84 °C	
MP/MP Range	-35 °C	
Freezing Point	N/A	
Vapor Pressure	87 mmHg	25 °C
Vapor Density	3.4 g/l	
Saturated Vapor Conc.	N/A	
SG/Density	1.253 g/cm3	
Bulk Density	N/A	
Odor Threshold	N/A	
Volatile%	N/A	
VOC Content	N/A	
Water Content	N/A	
Solvent Content	N/A	
Evaporation Rate	N/A	
Viscosity	N/A	
Partition Coefficient	N/A	
Decomposition Temp.	N/A	
Flash Point °F	55.4 °F	
Flash Point °C	13 °C	
Explosion Limits	Lower: 6.2 % Upper: 15.6 %	
Autoignition Temp	413 °C	
Refractive Index	1.444	
Solubility	N/A	

Section 10 - Stability and Reactivity

Stability

Materials to Avoid
Oxidizing agents.

Hazardous Decomposition Products

Hazardous Decomposition Products
Carbon monoxide, Carbon dioxide.

Section 11 - Toxicological Information

Route of Exposure

Skin Contact

Causes skin irritation.

Multiple Routes

Harmful if swallowed, inhaled, or absorbed through skin. Vapor or mist is irritating to the eyes, mucous membranes, and upper respiratory tract.

Sensitization

Sensitization

Causes dermatitis.

Target Organ(s) or System(s)

Damage to the liver. Damage to the kidneys. Liver. Kidneys.

Signs and Symptoms of Exposure

Can cause CNS depression. Prolonged exposure can cause: Damage to the liver. Gastrointestinal disturbances. Damage to the kidneys.

RTECS Number: KI0525000

Toxicity Data

Oral - Human: 286 mg/kg (LDLO)
Remarks: Gastrointestinal:Ulceration or bleeding from stomach.
Gastrointestinal:Nausea or vomiting.
Liver:Fatty liver degeneration.

Oral - Man: 714 mg/kg (LDLO)
Remarks: Behavioral:Somnolence (general depressed activity).
Cardiac: Change in rate.
Lungs, Thorax, or Respiration:Cyanosis.

Oral - Rat: 670 mg/kg (LD50)

Inhalation - Rat: 1,000 ppm (LC50)
Remarks: Behavioral:Coma.
Lungs, Thorax, or Respiration:Cyanosis.
Nutritional and Gross Metabolic:Changes in:Body temperature decrease.

Intraperitoneal - Rat: 807 MG/KG (LD50)

Subcutaneous - Rat: 1 GM/KG (LD50)
Remarks: Sense Organs and Special Senses (Nose, Eye, Ear, and Taste):Eye:Lacrimation.
Behavioral:General anesthetic.
Behavioral:Ataxia.

Oral - Mouse: 413 mg/kg (LD50)
Remarks: Lungs, Thorax, or Respiration:Other changes.
Liver:Other changes.

Intraperitoneal - Mouse: 470 MG/KG (LD50)

Oral - Dog: 5,700 mg/kg (LD50)
Remarks: Sense Organs and Special Senses (Nose, Eye, Ear, and Taste):Eye:Lacrimation.
Behavioral:General anesthetic.
Behavioral:Ataxia.

Inhalation - Monkey: 3,000 ppm (LC50)

Oral - Rabbit: 860 mg/kg (LD50)

Skin - Rabbit: 2,800 mg/kg (LD50)
Remarks: Sense Organs and Special Senses (Nose, Eye, Ear, and Taste):Eye:Lacrimation.
Behavioral:General anesthetic.
Behavioral:Ataxia.

Irritation Data

Skin - Rabbit: 625 mg
Remarks: Open irritation test

Skin - Rabbit: 500 mg 24H
Remarks: mild irritation effect

Eyes - Rabbit: 63 mg
Remarks: severe irritation effect

Eyes - Rabbit: 500 mg 24H
Remarks: mild irritation effect

Chronic Exposure Carcinogen
Result: Carcinogen.

Rat - Oral: 5286 MG/KG 69W I
Result: Tumorigenic:Carcinogenic by RTECS criteria. Gastrointestinal:Tumors. Skin and Appendages: Other: Tumors.

Rat - Inhalation: 5 PPM 7H/78W I
Result: Tumorigenic:Equivocal tumorigenic agent by RTECS criteria. Blood:Leukemia Skin and Appendages: Other: Tumors.

Mouse - Oral: 3536 MG/KG 78W I
Result: Tumorigenic:Carcinogenic by RTECS criteria. Lungs, Thorax, or Respiration:Tumors. Skin and Appendages: Other: Tumors.

Mouse - Inhalation: 5 PPM 7H/78W I
Result: Tumorigenic:Equivocal tumorigenic agent by RTECS criteria. Lungs, Thorax, or Respiration:Tumors. Skin and Appendages: Other: Tumors.

Mouse - Skin: 1120 GM/KG 74W I
Result: Tumorigenic:Neoplastic by RTECS criteria. Lungs, Thorax, or Respiration:Tumors. Skin and Appendages: Other: Tumors.

Rat - Oral: 38 GM/KG 78W I
Result: Tumorigenic:Carcinogenic by RTECS criteria. Vascular:Tumors. Gastrointestinal:Tumors.

Mouse - Oral: 76 GM/KG 78W I
Result: Tumorigenic:Carcinogenic by RTECS criteria. Skin and Appendages: Other: Tumors. Tumorigenic Effects: Uterine tumors

Rat - Oral: 18 GM/KG 78W I
Result: Tumorigenic:Carcinogenic by RTECS criteria. Vascular:Tumors. Gastrointestinal:Tumors.

Mouse - Oral: 38 GM/KG 78W I
Result: Tumorigenic:Carcinogenic by RTECS criteria. Skin and Appendages: Other: Tumors. Tumorigenic Effects: Uterine tumors

IARC Carcinogen List

Rating
Group 2B

NTP Carcinogen List

Rating	*Species*	*Route*
Clear evidence.	Mouse/rat	Gavage
Anticipated to be a carcinogen.		

ACGIH Carcinogen List

Rating
A4

Chronic Exposure - Mutagen

Species	*Dose*	*Route*	*Exposure Time*	*Cell Type*	*Mutation test*
Human	5 ML/L			lymphocyte	DNA inhibition
Human	100 MG/L			lymphocyte	Mutation in mammalian somatic cells.
Rat	150 MG/KG	Oral			DNA damage
Rat	150 PPM	Inhalation	6H		DNA damage
Rat	130 UMOL/L			liver	Unscheduled DNA synthesis
Mouse	300 MG/KG	Intraperitoneal			specific locus test
Mouse	2 MMOL/KG	Intraperitoneal			DNA damage
Mouse	100 MG/KG	Oral			DNA damage
Mouse	29 MG/KG	Intraperitoneal			DNA inhibition
Mouse	80 MG/KG			S. typhimurium	Body fluid assay
Hamster	2 MMOL/L (+S9)			ovary	Mutation in microorganisms
Hamster	200 UL/PLATE			Embryo	Morphological transformation.
Hamster	1 GM/L			lung	Cytogenetic analysis
Hamster	40 MMOL/L			ovary	Mutation in mammalian somatic cells.

Chronic Exposure - Reproductive Hazard

Species	*Dose*	*Route of Application*	*Exposure Time*
Rat	300 PPM/7H	Inhalation	(6-15D PREG)

Result: Effects on Fertility: Post-implantation mortality (e.g., dead and/or resorbed implants per total number of implants).

Rat	208 MG/M3/6H	Inhalation	(2W PRE/1-21D PREG)

Result: Effects on Fertility: Pre-implantation mortality (e.g., reduction in number of implants per female; total number of implants per corpora lutea).

Section 12 - Ecological Information

Section 13 - Disposal Considerations

Appropriate Method of Disposal of Substance or Preparation
Burn in a chemical incinerator equipped with an afterburner and scrubber but exert extra care in igniting as this material is highly flammable.
Observe all federal, state, and local environmental regulations.

Section 14 - Transport Information

DOT

Proper Shipping Name: Ethylene dichloride
UN#: 1184
Class: 3
Packing Group: Packing Group II
PIH: Not PIH

IATA

Proper Shipping Name: Ethylene dichloride
IATA Number: 1184
Hazard Class: 3
Packing Group: II

Section 15 - Regulatory Information

EU Directives Classification

Symbol of Danger: F T

Indication of Danger

Highly Flammable. Toxic.

Risk Statements **R:** 45 11 22 36/37/38

May cause cancer. Highly flammable. Harmful if swallowed. Irritating to eyes, respiratory system, and skin.

Safety Statements **S:** 53 45

Avoid exposure - obtain special instructions before use. In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).

US Classification and Label Text

Indication of Danger

Flammable (USA) Highly Flammable (EU). Toxic.

Risk Statements

May cause cancer. Toxic by inhalation, in contact with skin, and if swallowed. Irritating to eyes, respiratory system, and skin.

Safety Statements

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.

US Statements

Target organ(s): Liver. Kidneys.

Handling and Storage

Store under nitrogen.

United States Regulatory Information

SARA 313 Listed: Yes

Deminimis: 0.1 %

Notes: This product is subject to SARA section 313 reporting requirements.

TSCA Inventory Item: Yes

United States - State Regulatory Information

California Prop - 65

California Proposition 65: This product is or contains chemical(s) known to the state of California to cause cancer. California Proposition 65: This product is or contains chemical(s) known to the state of California to cause cancer.

Section 16 - Other Information

Warranty

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-Aldrich Inc., 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.