

SAFETY DATA SHEETS

According to the UN GHS revision 9

Version: 1.2
Creation Date: July 15, 2019
Revision Date: August 08, 2025

SECTION 1: Identification

1.1 GHS Product identifier

Product name 1,2-Dichloroethylene, mixture of cis and trans

1.2 Other means of identification

Product number CCPD100865

Other names Residual Solvent Class 2 - 1,2-Dichloroethene;cis/trans-1,2-Dichloroethene;cis/trans-1,2-Dichloroethylene

1.3 Recommended use of the chemical and restrictions on use

Identified uses For laboratory and Industrial use only.
Uses advised against no data available

1.4 Supplier's details

Company CATO Research Chemicals Inc.
Address 3/F,Building B,No.179 BASIGO, Guangpu Rd East,Huangpu Dist,Guangzhou
Telephone +86-20-81960175

1.5 Emergency phone number

Emergency phone number +86-20-81960175
Service hours 'Monday to Friday, 9am-5pm (Standard time zone: UTC/GMT +8 hours).

SECTION 2: Hazard identification

2.1 Classification of the substance or mixture

Flammable liquids, Category 2
Acute toxicity - Category 4, Inhalation
Hazardous to the aquatic environment, long-term (Chronic) - Category Chronic 3

2.2 GHS label elements, including precautionary statements

Pictogram(s)



Signal word

Danger

Hazard statement(s)

H225 Highly flammable liquid and vapour
H332 Harmful if inhaled
H412 Harmful to aquatic life with long lasting effects

Precautionary statement(s)

Prevention

P210 Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
P233 Keep container tightly closed.
P240 Ground and bond container and receiving equipment.
P241 Use explosion-proof [electrical/ventilating/lighting/...] equipment.
P242 Use non-sparking tools.
P243 Take action to prevent static discharges.
P280 Wear protective gloves/protective clothing/eye protection/face protection/hearing protection/...
P261 Avoid breathing dust/fume/gas/mist/vapours/spray.
P271 Use only outdoors or in a well-ventilated area.
P273 Avoid release to the environment.

Response	P303+P361+P353 IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse affected areas with water [or shower]. P370+P378 In case of fire: Use ... to extinguish. P304+P340 IF INHALED: Remove person to fresh air and keep comfortable for breathing. P317 Get medical help.
Storage	P403+P235 Store in a well-ventilated place. Keep cool.
Disposal	P501 Dispose of contents/container to an appropriate treatment and disposal facility in accordance with applicable laws and regulations, and product characteristics at time of disposal.

2.3 Other hazards which do not result in classification

no data available

SECTION 3: Composition/information on ingredients

3.1 Substances

Chemical name	Common names and synonyms	CAS number	EC number	Concentration
1,2-Dichloroethylene, mixture of cis and trans	1,2-dichloroethylene	540-59-0	208-750-2	100%

SECTION 4: First-aid measures

4.1 Description of necessary first-aid measures

If inhaled

Fresh air, rest. Refer for medical attention.

Following skin contact

Remove contaminated clothes. Rinse skin with plenty of water or shower.

Following eye contact

First rinse with plenty of water for several minutes (remove contact lenses if easily possible), then refer for medical attention.

Following ingestion

Rinse mouth. Give one or two glasses of water to drink. Refer for medical attention .

4.2 Most important symptoms/effects, acute and delayed

Inhalation causes nausea, vomiting, weakness, tremor, epigastric cramps, central nervous depression. Contact with liquid causes irritation of eyes and (on prolonged contact) skin. Ingestion causes slight depression to deep narcosis. (USCG, 1999)

4.3 Indication of immediate medical attention and special treatment needed, if necessary

Immediate first aid: Ensure that adequate decontamination has been carried out. If patient is not breathing, start artificial respiration, preferably with a demand-valve resuscitator, bag-valve-mask device, or pocket mask, as trained. Perform CPR as necessary. Immediately flush contaminated eyes with gently flowing water. Do not induce vomiting. If vomiting occurs, lean patient forward or place on left side (head-down position, if possible) to maintain an open airway and prevent aspiration. Keep patient quiet and maintain normal body temperature. Obtain medical attention. Chlorinated fluorocarbons (CFCs) and related compounds

SECTION 5: Fire-fighting measures

5.1 Suitable extinguishing media

Use dry chemical, foam, carbon dioxide, or water spray. Use flooding quantities of water to blanket the fire. Water may be ineffective. Use water spray to keep fire-exposed containers cool. Fight fire from protected location or maximum possible distance.

5.2 Specific hazards arising from the chemical

Special Hazards of Combustion Products: Phosgene and hydrogen chloride fumes may form in fires. Behavior in Fire: Vapor is heavier than air and may travel a considerable distance to a source of ignition and flash back. (USCG, 1999)

5.3 Special protective actions for fire-fighters

Use water spray, powder, foam, carbon dioxide. In case of fire: keep drums, etc., cool by spraying with water.

SECTION 6: Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures

Personal protection: complete protective clothing including self-contained breathing apparatus. Ventilation. Remove all ignition sources. Do NOT wash away into sewer. Collect leaking and spilled liquid in sealable containers as far as possible. Absorb remaining liquid in dry sand or inert absorbent. Then store and dispose of according to local regulations.

6.2 Environmental precautions

Personal protection: complete protective clothing including self-contained breathing apparatus. Ventilation. Remove all ignition sources. Do NOT wash away into sewer. Collect leaking and spilled liquid in sealable containers as far as possible. Absorb remaining liquid in dry sand or inert absorbent. Then store and dispose of according to local regulations.

6.3 Methods and materials for containment and cleaning up

Spill or leak procedures: Eliminate all ignition sources. Stop or control the leak, if this can be done without undue risk. Use appropriate foam to blanket release and suppress vapors. Absorb in noncombustible material for proper disposal.

SECTION 7: Handling and storage

7.1 Precautions for safe handling

NO open flames, NO sparks and NO smoking. Closed system, ventilation, explosion-proof electrical equipment and lighting. Do NOT use compressed air for filling, discharging, or handling. Handling in a well ventilated place. Wear suitable protective clothing. Avoid contact with skin and eyes. Avoid formation of dust and aerosols. Use non-sparking tools. Prevent fire caused by electrostatic discharge steam.

7.2 Conditions for safe storage, including any incompatibilities

Fireproof. Well closed. See Chemical Dangers. Store in a cool, dry, well-ventilated location. Separate from air, light, heat, strong oxidizing materials.

SECTION 8: Exposure controls/personal protection

8.1 Control parameters

Occupational Exposure limit values

TLV: 200 ppm as TWA. MAK: 800 mg/m³, 200 ppm; peak limitation category: II(2)

Biological limit values

no data available

8.2 Appropriate engineering controls

Ensure adequate ventilation. Handle in accordance with good industrial hygiene and safety practice. Set up emergency exits and the risk-elimination area.

8.3 Individual protection measures, such as personal protective equipment (PPE)

Eye/face protection

Wear safety spectacles.

Skin protection

Protective gloves.

Respiratory protection

Use ventilation, local exhaust or breathing protection.

Thermal hazards

no data available

SECTION 9: Physical and chemical properties and safety characteristics

Physical state	1,2-dichloroethylene, (mixed isomers) is a clear colorless liquid with ether-like odor. Mixture of cis and trans isomers. Flashpoint 36 - 43° F. Denser than water and insoluble in water. Vapors heavier than air.
Colour	Mobile liquid
Odour	Ethereal, slightly acrid
Melting point/freezing point	-57°C(lit.)
Boiling point or initial boiling point and boiling range	48-60°C(lit.)
Flammability	Class IB Flammable Liquid: Fl.P. below 73°F and BP at or above 100°F.
Lower and upper explosion limit/flammability limit	Lower flammable limit: 5.6% by volume; Upper flammable limit: 12.8% by volume
Flash point	6.1°C
Auto-ignition temperature	860° F (USCG, 1999)
Decomposition temperature	no data available
pH	no data available
Kinematic viscosity	no data available
Solubility	less than 1 mg/mL at 70° F (NTP, 1992)
Partition coefficient n-octanol/water	log Kow = 1.86
Vapour pressure	180 to 265 mm Hg at 68° F (NTP, 1992)
Density and/or relative density	1.243g/cm ³
Relative vapour density	3.34 (NTP, 1992) (Relative to Air)
Particle characteristics	no data available

SECTION 10: Stability and reactivity

10.1 Reactivity

Decomposes on heating and under the influence of air, light and moisture. This produces toxic and corrosive fumes including hydrogen chloride (see ICSC 0163). Reacts with strong oxidants. Reacts with copper, copper alloys and bases. This produces toxic chloroacetylene which is spontaneously flammable in contact with air. Attacks plastics.

10.2 Chemical stability

Gradually decomposed by air, light, and moisture, forming HCl.

10.3 Possibility of hazardous reactions

Flammable liquid. The vapour is heavier than air and may travel along the ground; distant ignition possible. 1,2-DICHLOROETHYLENE reacts violently with sodium, sodium hydroxide, copper and copper alloys. It can react with caustic alkynes or their concentrated solutions. It forms explosive mixtures with N₂O₄. It is incompatible with strong oxidizers. It is corrosive to metals. It attacks some forms of plastics, rubber and coatings. (NTP, 1992)

10.4 Conditions to avoid

no data available

10.5 Incompatible materials

May release explosive chloroacetylene by the contact with copper or copper alloys.

10.6 Hazardous decomposition products

Gradually decomposed by light, air, and moisture to form hydrogen chloride.

SECTION 11: Toxicological information

Acute toxicity

- Oral: LD₅₀ Rat oral 770 mg/kg
- Inhalation: no data available
- Dermal: no data available

Skin corrosion/irritation

no data available

Serious eye damage/irritation

no data available

Respiratory or skin sensitization

no data available

Germ cell mutagenicity

no data available

Carcinogenicity

EPA: Not classifiable as to human carcinogenicity, IARC: Not evaluated, NTP: Not evaluated

Reproductive toxicity

no data available

STOT-single exposure

The substance is irritating to the eyes and respiratory tract. The substance may cause effects on the central nervous system at high levels. This may result in lowering of consciousness.

STOT-repeated exposure

The substance defats the skin, which may cause dryness or cracking. The substance may have effects on the liver.

Aspiration hazard

A harmful contamination of the air will be reached quickly on evaporation of this substance at 20°C; on spraying or dispersing, however, much faster.

SECTION 12: Ecological information

12.1 Toxicity

- Toxicity to fish: LC₅₀; Species: *Lepomis macrochirus* (Bluegill) Young of Year, weight 0.32-1.2 g; Conditions: freshwater, static, 21-23 deg C, pH 6.5-7.9, hardness 32-48 mg/L CaCO₃, alkalinity 28-34 mg/L CaCO₃, conductivity 93-190 umhos/cm, dissolved oxygen 0.3-9.7 mg/L; Concentration: 165000 uM for 69.5 hr /> or = 80 ppm
- Toxicity to daphnia and other aquatic invertebrates: no data available
- Toxicity to algae: no data available
- Toxicity to microorganisms: no data available

12.2 Persistence and degradability

AEROBIC: Chlorinated ethenes generally resist biodegradation when incubated under aerobic conditions(1). cis- and trans-1,2-Dichloroethylene, present at 2.62 and 2.32 mg/L, respectively, reached 0% of its theoretical BOD in 4 weeks using an activated sludge

inoculum in the Japanese MITI test(2). trans-1,2-Dichloroethylene was recalcitrant in shake flask tests modified to accommodate volatile chemicals(3,4); the concentrations examined in these studies ranged from 0.80 to 25 ppm, and a 21 day acclimation period and the addition of a lactose cometabolite did not alter the biodegradability(3,4). Similarly, no biodegradation occurred in a river die-away test(4). Other studies under aerobic conditions showed similar results of limited degradation for 1,2-dichloroethylene(5). However, mineralization of C14-labeled 1,2-dichloroethylene (mixture of 20% trans- and 71% cisisomers) was observed under aerobic conditions in streambed sediments characterized by a high content of natural organic matter (2.5% dry mass organic content) and saturated with humic acid-laden black water(6); 67% of C14-labeled CO₂ was recovered in 50 days under aerobic conditions(6) which corresponds to a first-order half-life of 31 days(SRC). It has been suggested that ammonia-oxidizing aerobic bacteria and facultative-sulfur bacteria can biodegrade chlorinated aliphatic hydrocarbons(1).

12.3 Bioaccumulative potential

An estimated BCF of 8 was calculated in fish for 1,2-dichloroethylene(SRC), using a log Kow of 1.86(1) and a regression-derived equation(2). According to a classification scheme(3), this BCF suggests the potential for bioconcentration in aquatic organisms is low(SRC).

12.4 Mobility in soil

Using a structure estimation method based on molecular connectivity indices(1), the Koc of 1,2-dichloroethylene can be estimated to be 40(SRC). According to a classification scheme(2), this estimated Koc value suggests that 1,2-dichloroethylene is expected to have very high mobility in soil(SRC).

12.5 Other adverse effects

no data available

SECTION 13: Disposal considerations

13.1 Disposal methods

Product

The material can be disposed of by removal to a licensed chemical destruction plant or by controlled incineration with flue gas scrubbing. Do not contaminate water, foodstuffs, feed or seed by storage or disposal. Do not discharge to sewer systems.

Contaminated packaging

Containers can be triply rinsed (or equivalent) and offered for recycling or reconditioning. Alternatively, the packaging can be punctured to make it unusable for other purposes and then be disposed of in a sanitary landfill. Controlled incineration with flue gas scrubbing is possible for combustible packaging materials.

SECTION 14: Transport information

14.1 UN Number

ADR/RID: UN1150 (For reference only, please check.) IMDG: UN1150 (For reference only, please check.) IATA: UN1150 (For reference only, please check.)

14.2 UN Proper Shipping Name

ADR/RID: 1,2-DICHLOROETHYLENE (For reference only, please check.) IMDG: 1,2-DICHLOROETHYLENE (For reference only, please check.) IATA: 1,2-DICHLOROETHYLENE (For reference only, please check.)

14.3 Transport hazard class(es)

ADR/RID: 3 (For reference only, please check.) IMDG: 3 (For reference only, please check.) IATA: 3 (For reference only, please check.)

14.4 Packing group, if applicable

ADR/RID: II (For reference only, please check.) IMDG: II (For reference only, please check.) IATA: II (For reference only, please check.)

14.5 Environmental hazards

ADR/RID: No IMDG: No IATA: No

14.6 Special precautions for user

no data available

14.7 Transport in bulk according to IMO instruments

no data available

SECTION 15: Regulatory information

15.1 Safety, health and environmental regulations specific for the product in question

Chemical name	Common names and synonyms	CAS number	EC number
1,2-dichloroethylene	1,2-dichloroethylene	540-59-0	208-750-2
European Inventory of Existing Commercial Chemical Substances (EINECS)			Listed.
EC Inventory			Listed.
United States Toxic Substances Control Act (TSCA) Inventory			Listed.

China Catalog of Hazardous chemicals 2015	Listed.
New Zealand Inventory of Chemicals (NZIoC)	Listed.
Philippines Inventory of Chemicals and Chemical Substances (PICCS)	Listed.
Vietnam National Chemical Inventory	Listed.
Chinese Chemical Inventory of Existing Chemical Substances (China IECSC)	Not Listed.
Korea Existing Chemicals List (KECL)	Listed.

SECTION 16: Other information

Information on revision

Creation Date July 15, 2019
Revision Date August 08, 2025

Abbreviations and acronyms

- CAS: Chemical Abstracts Service
- ADR: European Agreement concerning the International Carriage of Dangerous Goods by Road
- RID: Regulation concerning the International Carriage of Dangerous Goods by Rail
- IMDG: International Maritime Dangerous Goods
- IATA: International Air Transportation Association
- TWA: Time Weighted Average
- STEL: Short term exposure limit
- LC50: Lethal Concentration 50%
- LD50: Lethal Dose 50%
- EC50: Effective Concentration 50%

References

- IPCS - The International Chemical Safety Cards (ICSC), website: <http://www.ilo.org/dyn/icsc/showcard.home>
- HSDB - Hazardous Substances Data Bank, website: <https://toxnet.nlm.nih.gov/newtoxnet/hsdb.htm>
- IARC - International Agency for Research on Cancer, website: <http://www.iarc.fr/>
- eChemPortal - The Global Portal to Information on Chemical Substances by OECD, website: http://www.echemportal.org/echemportal/index?pageID=0&request_locale=en
- CAMEO Chemicals, website: <http://cameochemicals.noaa.gov/search/simple>
- ChemIDplus, website: <http://chem.sis.nlm.nih.gov/chemidplus/chemidlite.jsp>
- ERG - Emergency Response Guidebook by U.S. Department of Transportation, website: <http://www.phmsa.dot.gov/hazmat/library/erg>
- Germany GESTIS-database on hazard substance, website: <http://www.dguv.de/ifa/gestis/gestis-stoffdatenbank/index-2.jsp>
- ECHA - European Chemicals Agency, website: <https://echa.europa.eu/>

Other Information

This compound has two isomers, cis and trans. Data for the isomers: cis-isomer (CAS 156-59-2), trans isomer (CAS 156-60-5), other boiling point 60.3, melting point -81.5°C (cis), -49.4°C (trans); flash point c.c. 6°C (cis), 2-4°C (trans); relative density (water = 1) 1.28 (cis), 1.26 (trans); vapour pressure 24.0 kPa (cis), 35.3 kPa (trans) at 20°C; relative density of the vapour/air-mixture at 20°C (air = 1): 1.6 (cis), 1.8 (trans); octanol/water partition coefficient as log Pow: 1.86 (cis), 2.09 (trans). Depending on the degree of exposure, periodic medical examination is suggested.

Any questions regarding this SDS, Please send your inquiry to info@cato-chem.com

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