

SAFETY DATA SHEETS

According to the UN GHS revision 10

Version: 1.1
Creation Date: July 15, 2024
Revision Date: January 08, 2025

SECTION 1: Identification

1.1 GHS Product identifier

Product name Ethyl chloroformate

1.2 Other means of identification

Product number CCNP900157

Other names Cathyl chloride; chlorocarbonic acid ethyl ester; Formic acid,chloro-,ethyl ester

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, Oral

Skin corrosion, Sub-category 1B

Acute toxicity - Category 2, Inhalation

2.2 GHS label elements, including precautionary statements

Pictogram(s)



Signal word

Danger

Hazard statement(s)

H225 Highly flammable liquid and vapour

H302 Harmful if swallowed

H314 Causes severe skin burns and eye damage

H330 Fatal if inhaled

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/...

P264 Wash ... thoroughly after handling.

P270 Do not eat, drink or smoke when using this product.

P260 Do not breathe dust/fume/gas/mist/vapours/spray.

P271 Use only outdoors or in a well-ventilated area.

P284 [In case of inadequate ventilation] wear respiratory protection.

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. P301+P317 IF SWALLOWED: Get medical help. P330 Rinse mouth. P301+P330+P331 IF SWALLOWED: Rinse mouth. Do NOT induce vomiting. P363 Wash contaminated clothing before reuse. P304+P340 IF INHALED: Remove person to fresh air and keep comfortable for breathing. P316 Get emergency medical help immediately. P321 Specific treatment (see ... on this label). P305+P351+P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. P320 Specific treatment is urgent (see ... on this label).
Storage	P403+P235 Store in a well-ventilated place. Keep cool. P405 Store locked up.
Disposal	P403+P233 Store in a well-ventilated place. Keep container tightly closed. 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
Ethyl chloroformate	Ethyl chloroformate	541-41-3	208-778-5	≈ 99%

SECTION 4: First-aid measures

4.1 Description of necessary first-aid measures

If inhaled

Fresh air, rest. Half-upright position. Artificial respiration may be needed. Refer for medical attention. See Notes.

Following skin contact

Remove contaminated clothes. Rinse skin with plenty of water or shower. Refer for medical attention .

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. Do NOT induce vomiting. Refer for medical attention .

4.2 Most important symptoms/effects, acute and delayed

Inhalation causes mucous membrane irritation, coughing, and sneezing. Vapor causes severe lachrymation; liquid causes acid-type burns of eyes and skin, like those of hydrochloric acid. Ingestion causes severe burns of mouth and stomach. (USCG, 1999)

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

no data available

SECTION 5: Fire-fighting measures

5.1 Suitable extinguishing media

Use dry chemical, foam, carbon dioxide, or water spray. Water may be ineffective. Use water spray to keep fire exposed containers cool. Approach fire from upwind to avoid hazardous vapors and toxic decomposition products.

5.2 Specific hazards arising from the chemical

Special Hazards of Combustion Products: Toxic chlorine and phosgene gases may be formed in fires. (USCG, 1999)

5.3 Special protective actions for fire-fighters

Use alcohol-resistant foam, powder, carbon dioxide. NO water. In case of fire: keep cylinder cool by spraying with water. NO direct contact with water.

SECTION 6: Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures

Evacuate danger area! Consult an expert! Personal protection: gas-tight chemical protection suit including self-contained breathing apparatus. Ventilation. Remove all ignition sources. 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. Do NOT wash away into sewer.

6.2 Environmental precautions

Evacuate danger area! Consult an expert! Personal protection: gas-tight chemical protection suit including self-contained breathing apparatus. Ventilation. Remove all ignition sources. 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. Do NOT wash away into sewer.

6.3 Methods and materials for containment and cleaning up

Collect and arrange disposal. Keep the chemical in suitable and closed containers for disposal. Remove all sources of ignition. Use spark-proof tools and explosion-proof equipment. Adhered or collected material should be promptly disposed of, in accordance with appropriate laws and regulations.

SECTION 7: Handling and storage

7.1 Precautions for safe handling

NO open flames, NO sparks and NO smoking. NO contact with strong oxidizing agents. 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. Separated from strong oxidants, food and feedstuffs and incompatible materials. See Chemical Dangers. Cool. Dry. Well closed. Store in a cool, dry, well-ventilated location. Separate from acids, alkalies, amines, alcohols, oxidizing materials, & water. Normally kept refrigerated.

SECTION 8: Exposure controls/personal protection

8.1 Control parameters

Occupational Exposure limit values

MAK: carcinogen category: 3B

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 face shield or eye protection in combination with breathing protection.

Skin protection

Protective gloves. Protective clothing.

Respiratory protection

Use closed system or ventilation.

Thermal hazards

no data available

SECTION 9: Physical and chemical properties and safety characteristics

Physical state

Ethyl chloroformate is a colorless liquid with a pungent odor. Flash point 66°F. Very toxic by inhalation. Corrosive to metals and tissue. Vapors are heavier than air. Prolonged exposure to low concentrations or short exposure to high concentrations may have adverse health effects from inhalation.

Colour

WATER-WHITE LIQUID

Odour

Sharp, like hydrochloric acid

Melting point/freezing point

-81°C

Boiling point or initial boiling point and boiling range

94°C

Flammability

Highly flammable. Gives off irritating or toxic fumes (or gases) in a fire.

Lower and upper explosion limit/flammability limit

no data available

Flash point

16°C

Auto-ignition temperature

932° F (USCG, 1999)

Decomposition temperature

no data available

pH

no data available

Kinematic viscosity	no data available
Solubility	PRACTICALLY INSOL & GRADUALLY DECOMP IN WATER
Partition coefficient n-octanol/water	no data available
Vapour pressure	3.42 psi (20 °C)
Density and/or relative density	1.135
Relative vapour density	3.74 (vs air)
Particle characteristics	no data available

SECTION 10: Stability and reactivity

10.1 Reactivity

Decomposes on heating. This produces toxic and irritating fumes including hydrogen chloride and phosgene. Reacts with water and steam. This produces toxic and corrosive hydrogen chloride. Reacts violently with strong oxidants. This generates fire and explosion hazard. Reacts with amines and bases. Attacks many metals in the presence of moisture.

10.2 Chemical stability

no data available

10.3 Possibility of hazardous reactions

DANGEROUS; WHEN EXPOSED TO HEAT, FLAME, OXIDIZERSThe vapour is heavier than air and may travel along the ground; distant ignition possible. ETHYL CHLOROFORMATE decomposes slowly in water to form ethanol, HCl, and CO₂ Attacks many metals especially in humid atmosphere [Handling Chemicals Safely 1980. p. 476]. May react vigorously or explosively if mixed with diisopropyl ether or other ethers in the presence of trace amounts of metal salts [J. Haz. Mat., 1981, 4, 291].

10.4 Conditions to avoid

no data available

10.5 Incompatible materials

Will react with water or steam to produce toxic and corrosive fumes; can react vigorously with oxidizing material.

10.6 Hazardous decomposition products

Dangerous; when heated to decomposition, it emits highly toxic fumes of /hydrogen chloride/.

SECTION 11: Toxicological information

Acute toxicity

- Oral: no data available
- 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

no data available

Reproductive toxicity

no data available

STOT-single exposure

Lachrymation. The substance is corrosive to the eyes, skin and respiratory tract. Corrosive on ingestion. Inhalation of the vapour may cause lung oedema. See Notes.

STOT-repeated exposure

no data available

Aspiration hazard

A harmful contamination of the air can be reached rather quickly on evaporation of this substance at 20°C.

SECTION 12: Ecological information

12.1 Toxicity

- Toxicity to fish: no data available
- 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

Using the Japanese MITI protocol (4 week incubation period with activated sludge inoculum), ethyl chloroformate was found to be biodegradable with a theoretical BOD of 81-86%(1) but this is probably the hydrolysis product(SRC).

12.3 Bioaccumulative potential

Ethyl chloroformate hydrolyzes readily in water (half-life of 31.5 min at 25 deg C)(1); therefore, bioconcentration in aquatic organisms will not be an important process(SRC).

12.4 Mobility in soil

Using a structure estimation method based on molecular connectivity indexes, the Koc for ethyl chloroformate can be estimated to be approximately 10(1,SRC). According to a suggested classification scheme(2), this estimated Koc value suggests that ethyl chloroformate has high mobility in soil(SRC). However, ethyl chloroformate hydrolyzes readily in water (half-life of 31.5 min at 25 deg C)(3); therefore, leaching in soil is not expected to be an important fate process(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: UN1182 (For reference only, please check.) IMDG: UN1182 (For reference only, please check.) IATA: UN1182 (For reference only, please check.)

14.2 UN Proper Shipping Name

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

14.3 Transport hazard class(es)

ADR/RID: 6.1 (For reference only, please check.) IMDG: 6.1 (For reference only, please check.) IATA: 6.1 (For reference only, please check.)

14.4 Packing group, if applicable

ADR/RID: I (For reference only, please check.) IMDG: I (For reference only, please check.) IATA: I (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
Ethyl chloroformate	Ethyl chloroformate	541-41-3	208-778-5

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)	Listed.
Korea Existing Chemicals List (KECL)	Listed.

SECTION 16: Other information

Information on revision

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Revision Date January 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

Health effects of exposure to the substance have not been investigated adequately. The symptoms of lung oedema often do not become manifest until a few hours have passed and they are aggravated by physical effort. Rest and medical observation are therefore essential. Immediate administration of an appropriate spray, by a doctor or a person authorized by him/her, should be considered.

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

Disclaimer: The above information is believed to be correct but does not purport to be all inclusive and shall be used only as a guide. The information in this document is based on the present state of our knowledge and is applicable to the product with regard to appropriate safety precautions. It does not represent any guarantee of the properties of the product. We as supplier shall not be held liable for any damage resulting from handling or from contact with the above product.