

Product Safety Summary

Ethyl chloroformate

This Product Safety Summary is intended to provide a general overview of the chemical substance. The information on the Summary is basic information and is not intended to provide emergency response information, medical information or treatment information. The summary should not be used to provide in-depth safety and health information. In-depth safety and health information can be found on the Material Safety Data Sheet (MSDS) for the chemical substance.

Chemical Identity

Abbreviation:	ECF
CAS Number:	541-41-3
Common Names:	Chloroformic acid, ethyl ester Carbonochloridic acid Formic acid, chloro-, ethyl ester

Product Overview

- Ethyl chloroformate is a chemical intermediate. Chloroformates are used in the production of carbamates, which are used to make dyes, drugs, veterinary medicines, herbicides and insecticides. Ethyl chloroformate is also used in the production of modified penicillins.
- BASF produces ethyl chloroformate in state-of-the-art chemical production plants using the most advanced equipment and controls.
- Because ethyl chloroformate is used to make other chemicals, there is no consumer exposure to this material.
- Chemical facilities using this product must observe strict safety, handling, transportation and emergency requirements.
- The primary potential hazards associated with overexposure to ethyl chloroformate vapors are severe eye and skin irritation and pulmonary edema, a build-up of large amounts of fluid in the lungs. It is very toxic if inhaled. Ethyl chloroformate is flammable.
- The American Industrial Hygiene Association (AIHA) has set a 1 hour Emergency Response Planning Guidelines (ERPG 3) of 10 ppm, to be used for emergency response planning only. ERPG 3 is the maximum airborne concentration below which nearly all people could be exposed for 1 hour without developing or experiencing life-threatening symptoms.
- For further safety and health information, request the current Material Safety Data Sheet (MSDS) for this substance.

Physical/Chemical Properties

- BASF ethyl chloroformate is more than 99% pure.
- It is a clear liquid with a pungent smell.
- Ethyl chloroformate is heavier than water, with a density of density of 1.14.
- It boils at about 203°F, which is close to the 212°F boiling temperature for water. It will evaporate faster than water, which results in potential exposures to vapors in the workplace.

- The flash point of ethyl chloroformate, or minimum temperature at which its vapors form an ignitable mixture, is 50 °F. It is considered flammable.

Health Information

Acute Hazards

Ethyl chloroformate is severely irritating and corrosive to the eyes, skin and mucous membranes of the respiratory tract. Eye and skin contact with the liquid can result in severe burns. Accidental ingestion of ethyl chloroformate will cause burns of the gastrointestinal tract.

Effects on Respiratory System:

This chemical is a severe health hazard and may be fatal if inhaled. Symptoms of overexposure include burning, coughing, wheezing, laryngitis, headache, nausea, and vomiting. Breathing vapors at toxic levels can cause pulmonary edema, a build-up of large amounts of fluid in the lungs.

Effects on Eyes:

Contact with the liquid is corrosive to the eyes. Exposures to vapors cause eye irritation, which may remain for some time after the exposure ends.

Effects on Skin:

Ethyl chloroformate is corrosive and may cause skin burns.

Effects on Ingestion:

Although ingestion is highly unlikely in a workplace setting, accidental ingestion will cause burns of the mouth, stomach and gastrointestinal tract.

Chronic Hazards

No chronic hazards related to ethyl chloroformate overexposure have been reported.

Environmental Information

Spills should be contained in a diked area. Only trained and appropriately equipped personnel should perform clean up operations. Refer to the BASF Material Safety Data Sheet and product literature for more information. Any spill or release to the environment of over 100 pounds must be reported to the National Response Center (NRC) and the local emergency planning commission as outlined under Emergency Planning and Community Right-to-Know Act (EPCRA) regulations. Each facility should have a system for dealing with emergencies to limit spills and releases to the environmental.

Ethyl chloroformate must be disposed of in accordance with national, state and local regulations and must not be released into waterways or sewer systems without proper authorization. Unused product must be disposed of in a licensed facility.

Studies in fish indicate that it is unstable in water and moderately toxic.

Additional Hazard Information

Because ethyl chloroformate is flammable, care must be taken when handling it to avoid exposure to flames and other sources of ignition. Also, chloroformates react with water to produce heat, carbon dioxide and hydrogen chloride gas.

The following safety recommendations must be observed:

- Store in an area designed for flammable liquids.
- Specify proper electrical equipment and adequate grounding for static electricity.
- Maintain adequate ventilation in all work areas to control vapors.
- Provide adequate firefighting equipment, including automatic sprinklers, in work and storage areas.
- Avoid contact with water.
- Ensure that all ethyl chloroformate storage tanks are diked.

Exposure Potential

Consumer exposure to ethyl chloroformate does not exist since the chemical is converted to other materials before it becomes available outside of the workplace.

Workplace exposure must be limited through the use of engineering controls, such as ventilation and hoods. For emergency situations and some specially controlled areas, personal protective equipment, such as respirators, may be employed. In general, skin and eye exposures are prevented through the use of protective eye and face equipment and impermeable gloves and clothing.

Risk Management

Workers handling ethyl chloroformate can safely work with this material if adequately instructed and educated regarding proper handling procedures.

Workers should be trained to realize that exposure to this product requires immediate washing of affected areas using large amounts of soap and water, and that immediate attention should be obtained in case of exposure. Properly designed emergency showers and eyewash fountains must be placed in convenient locations wherever it is used. All employees should know the location and operation of this equipment.

Appropriate clothing, gloves, boots and eye protection must be worn when handling ethyl chloroformate. Protective clothing should be made of impervious materials and soiled or contaminated clothing should be laundered or destroyed.

Ventilation must be available in work areas to control potential airborne exposures to acceptable levels.

Federal/Science Findings

US department of Transportation

<http://hazmat.dot.gov/pubs/erg/q155.pdf>

National Institute for Occupational Safety and Health (NIOSH)

<http://www.cdc.gov/niosh/ipcsneng/neng1025.html>

National Library of Medicine/National Institutes of Health

<http://toxnet.nlm.nih.gov/cgi-bin/sis/search/r?dbs+hsdb:@term+@rn+@rel+541-41-3>

Contact Information

<http://www.basf.com>

MSDS

http://worldaccount.basf.com/wa/PublicMSDS~en_US/Search

References

Hazardous Substances Data Bank, National Library of Medicine/National Institutes of Health
Acid Chlorides and Chloroformates A Summary of Safety and Handling, BASF Corporation, 2003

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