Ethylene Dichloride

dichloride has been found in human milk and in the exhaled breath of nursing mothers who were exposed to the chemical.

Ethylene dichloride in contact with eyes or skin can result in local pain and irritation. Dermatitis may result from removal of natural skin oils and moisture, although permanent eye or skin injury has not been known to occur. If EDC is held close to the skin, as by contaminated clothing, severe irritation and moderate edema and necrosis may result.

Chronic Exposure—There are reports of two mild cases of human exposure for periods of two to five months which showed symptoms of central nervous system depression and gastrointestinal upset with nausea and vomiting. These persons recovered when removed from exposure. The liver and kidneys may be damaged by prolonged or repeated inhalation of the vapor.

Animal studies conducted by the National Cancer Institute (NCI) suggested that ethylene dichloride can cause cancer in rats and mice by oral administration. However, a later EDC inhalation study of rats and mice by Maltoni, et al failed to confirm the NIC findings.

Ethylene dichloride is listed by the National Toxicology Program (NTP) in Group II (substances that may reasonably be anticipated to be a carcinogen based on animal studies). It is not listed by OSHA or the International Agency for Research on Cancer (IARC).

The current OSHA permissible exposure limits for EDC are 50 ppm (8-hour TWA) 100 ppm (ceiling) and 200 ppm acceptable maximum peak above the ceiling concentration for 5 minutes during a 3-hour period. PPG has established an internal permissible exposure limit for EDC of 5 ppm (8-hour TWA). Although no evidence now exists showing that ethylene dichloride can cause cancer in human beings, PPG strongly suggests that EDC users review their health programs and operations and institute operating and housekeeping practices designed to limit employee exposure as much below currently established exposure limits as practical.

Additional health and safety information is contained in the Material Safety Data Sheet, available on request.

Ethylene dichloride serves as an intermediate in the manufacture of vinyl chloride, leading to polyvinyl chloride. Vinyl siding is one application.

Handling and Storage

Ethylene dichloride is a flammable liquid. It introduces a fire hazard wherever it is handled, stored or used. At high temperatures, such as occur in open flames, it decomposes to give off toxic and corrosive gases. Mixed with air at ordinary temperatures, ethylene dichloride is explosive within the limits of 6.2 to 15.6% by volume. Fire and explosion hazards can be minimized by adequate ventilation, the proper types and arrangement of equipment, and reasonable precautions and care in handling.

Packaging and Shipping

PPG Industries delivers ethylene dichloride by tank truck, tank car, barge and ship from its Lake Charles, Louisiana plant. Tank truck shipments also can be made from a terminal in Chicago, Illinois.

Tank car capabilities are 10,000 and 20,000 gallons. Tank truck capacity is generally 4,000 gallons.

Samples and Service

Samples of ethylene dichloride are available in various sizes to meet customer requirements.

The technical service staff of PPG Industries' Chemicals Group is available for consulting on handling, storage and use.

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Ethylen Dichloride

High-purity ethylene dichloride (EDC) is produced by PPG Industries at Lake Charles, Louisiana. PPG, one of the world's largest producers, ships ethylene dichloride to customers in tank trucks, tank cars, barges and oceangoing ships. A terminal in Chicago also makes tank truck shipments.

General Application

Almost three-quarters of the ethylene dichloride produced in the United States is used as an intermediate for making vinyl chloride. Other important intermediate uses for EDC include making 1,1,1-trichloroethane, trichlorethylene, perchlorethylene, ethylene amines and polysulfide elastomers.

PPG recommends that any application of ethylene dichloride be very carefully considered to insure that personnel are adequately protected from exposure. Use of EDC as a solvent for general applications is not authorized. This material must be used in an enclosed system to minimize exposure.

Government Specifcations

PPG technical-grade ethylene dichloride meets the chemical and physical requirements of military specifications MIL-E-10662.

H alth Hazards

Ethylene dichloride can be taken into the body by ingestion, inhalation or skin absorption. By any of these means it can be highly toxic. Acute poisoning may cause headache, dizziness, feelings of drunkenness, loss of consciousness, internal bleeding and death. Repeated exposures can bring on nausea, vomiting, stomach pain, irritated mucous membranes, loss of appetite, liver and kidney failure and possible death.

Numerous cases of ethylene dichloride poisoning, both fatal and nonfatal, have been documented by the National Institute for Occupational Safety and Health.

When ethylene dichloride is ingested, the predominant characteristic is blood disorder, including clotting problems. With skin absorption or inhalation, the first effects are headache, weakness, eye irritation, cyanosis (blackening of skin) and nausea. Ethylene

Typical Properties

Chemical Names	Ethylene dichloride; ethylene chloride, 1, 2-dichloroethane
Chemical Formula	CH_2ClCH_2Cl
Molecular Weight	98.97
Description	Ethylene dichloride is clear and colorless, but darkens slowly upon exposure to sunlight. It has an odor like chloroform. The liquid is mobile, volatile and flammable, and its vapor is toxic and flammable.
Boiling Point, °C	82
°F	180
Freezing Point, °C	−35.3
°F	−32.6
Flash Point, Tag closed cup, °C	13.3
°F	56
Explosive Limits, volume % in air	6.2 to 15 6
Autoignition Temperature, °C	413
°F	775
Viscosity at 25 °C, cps	0.78
Density at 25 °C, pounds/gallon	10.3
Refractive Index at 20 °C, n_D	1.444
Vapor Pressure at 25 °C, mm HG	87.0
Vapor Density, air = 1	3.42
Solubility at 25 °C, g EDC/100 g water	[redacted]86
at 20 °C, g water/100 g EDC	[redacted].16
Solubility	Ethylene dichloride is soluble in most organic solvents.
Reactivity	At moderate temperatures, ethylene dichloride is stable and resistant to oxidation. When moisture-free at ordinary temperatures, it does not corrode metals. But in contact with water at elevated temperatures, ethylene dichloride will corrode iron and certain other common metals

Specification and Typical Analysis

	Specification	***Typical Analysis***
Purity, minimum %	99.7	99.99
Color, maximum APHA	10	8
Appearance	clear, free of suspended matter	clear, free of suspended matter
Acidity, as HCl, maximum ppm	10	<1
Alkalinity, as NaOH, maximum ppm	10	—
Water, maximum ppm	200	50
Free Chlorine	none	0
Nonvolatile Residue, maximum ppm	100	1
Total Chlorinated Hydrocarbons, low-boiling, maximum ppm	500	75
Total Chlorinated Hydrocarbons, high-boiling, maximum ppm	500	100
Total Oxygenated Compounds, maximum ppm	300	0
C_3 and Higher Compounds, maximum ppm	300	10
Total Soluble Iron, maximum ppm	0.5	0.5
Specific Gravity, 60°/60 °F	1.261-1.264	1.262

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