

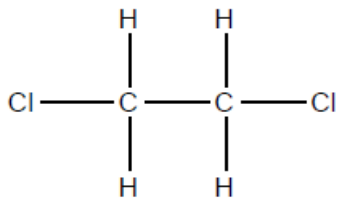
CHAPTER 4. CHEMICAL AND PHYSICAL INFORMATION

4.1 CHEMICAL IDENTITY

1,2-Dichloroethane is a colorless, oily liquid composed of two carbon atoms bonded together, with each carbon atom also bonded to one chlorine atom, and two hydrogen atoms. 1,2-Dichloroethane is primarily used in the production of vinyl chlorides, and as a solvent in organic synthesis. 1,2-Dichloroethane was previously used as an insect and soil fumigant, in cleaning products (especially for use on textiles), and in adhesives. 1,2-Dichloroethane is produced by chlorination of ethylene using a catalyst.

Table 4-1 lists common synonyms, trade names, and other pertinent identification information for 1,2-dichloroethane.

Table 4-1. Chemical Identity of 1,2-Dichloroethane

Characteristic	Information
Chemical name	1,2-Dichloroethane
Synonym(s) and Registered trade name(s)	1,2-Dichloroethane; 1,2-Ethylene dichloride; alpha,beta-Dichloroethane; Borer sol; Brocide; Destruxol borer-sol; Di-chlor-mulsion; Dichlor-Mulsion; Dichloremlusion; Dichloroethylene; Dutch liquid; Dutch oil; EDC; Ethane dichloride; Ethylene dichloride; Ethylenechloride; Ethylene dichloride; Glycol dichloride; sym-Dichloroethane
Chemical formula	C ₂ H ₄ Cl ₂
Chemical structure	 <pre> H H Cl — C — C — Cl H H </pre>
CAS Registry Number	107-06-2

CAS = Chemical Abstracts Service

Source: NLM 2021

4.2 PHYSICAL AND CHEMICAL PROPERTIES

1,2-Dichloroethane is a colorless oily liquid. It is slightly soluble in water and is very soluble in a number of organic solvents. It also has a high vapor pressure and is therefore expected to volatilize in the

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environment. 1,2-Dichloroethane has a very low K_{oc} and is expected to be very mobile in the environment. Table 4-2 lists important physical and chemical properties of 1,2-dichloroethane.

Table 4-2. Physical and Chemical Properties of 1,2-Dichloroethane

Property	Information	Reference
Molecular weight	98.96	NLM 2021
Color	Clear, colorless	NLM 2021
Physical state	Oily liquid; heavy liquid	NLM 2021
Melting point(s)	-35.6°C	NLM 2021
Boiling point(s)	83.4°C	NLM 2021
Critical temperature and pressure	563 K and 5,360 kPa	NLM 2021
Density	1.2454 at 25°C	NLM 2021
Taste	Sweet	NLM 2021
Taste threshold:	No data	
Odor	Pleasant, chloroform-like; sweet	NLM 2021
Odor threshold:		
Water	20 mg/L	Verschueren 1996
Air	12 ppm 50 ppm 100 ppm	Torkelson and Rowe 1981 Verschueren 1996 Weiss 1980
Solubility:		
Water	8,600 mg/L at 25°C 8,690 mg/L at 20°C	NLM 2021 Verschueren 1996
Organic solvent(s)	Miscible with alcohol, chloroform, ether; soluble in acetone, benzene, chloroform	NLM 2021
Inorganic solvent(s)	No data	
Partition coefficients:		
Log K_{ow}	1.48	NLM 2021
Log K_{oc}	1.5	
Vapor pressure at 25 °C	78.9 mmHg (10.5 kPa)	NLM 2021
Henry's law constant at 25 °C	1.18×10^{-3} atm-m ³ /mole	NLM 2021
Degradation half-life in air via reaction with OH radicals	2.48×10^{-13} cm ³ /molecule-second at 25°C	NLM 2021
Dissociation constants:	No data	
Autoignition temperature	413°C	NLM 2021
Flash point	13°C	NLM 2021
Flammability limits in air	6.2–16% by volume	NLM 2021
Conversion factors:	1 ppm in air = 4 mg/m ³ ppm(v/v) × 4.05 = mg/m ³ mg/m ³ × 0.247 = ppm(v/v)	NLM 2021 Torkelson and Rowe 1981 Torkelson and Rowe 1981
Explosive limits	6.2–15.9%	NLM 2021

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Table 4-2. Physical and Chemical Properties of 1,2-Dichloroethane

Property	Information	Reference
Incompatibilities and reactivity	Incompatible with strong oxidizing agents; violent reaction with aluminum, dinitrogen tetroxide, ammonia, dimethylaminopropylamine	NLM 2021