

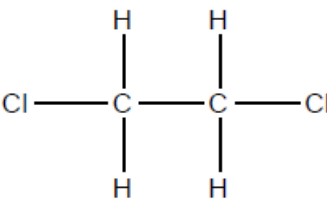
## CHAPTER 4. CHEMICAL AND PHYSICAL INFORMATION

### 4.1 CHEMICAL IDENTITY

1,2-Dichloroethane is a colorless, oily liquid composed of two carbon atoms each bound to each other, one chlorine atom, and two hydrogen atoms. 1,2-Dichloroethane is primarily used in the production of vinyl chlorides, though it is also added to leaded gasoline, used as a dispersant in rubber and plastics, 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	Reference
Chemical name	1,2-Dichloroethane	PubChem 2021
Synonym(s) and Registered trade name(s)	1,2-Bichloroethane; 1,2-Ethylene dichloride; alpha,beta-Dichloroethane; Borer sol; Brocide; Destruxol borer-sol; Di-chlor-mulsion; Dichlor-Mulsion; Dichloremulsion; Dichloroethylene; Dutch liquid; Dutch oil; EDC; Ethane dichloride; Ethylene dichloride; Ethylenechloride; Ethylene dichloride; Glycol dichloride; sym- Dichloroethane	PubChem 2021
Chemical formula	C <sub>2</sub> H <sub>4</sub> Cl <sub>2</sub>	PubChem 2021
		Budavari et al. 1996
Chemical structure		
CAS registry number	107-06-2	PubChem 2021
NIOSH RTECS	KI0525000	PubChem 2021
EPA hazardous waste	U077	PubChem 2021
DOT/UN/NA/IMO shipping	UN 1184	PubChem 2021
HSDB	65	PubChem 2021

CAS = Chemical Abstracts Service; HSDB = Hazardous Substances Data Bank

## 4. CHEMICAL AND PHYSICAL INFORMATION

**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 relatively high vapor pressure. 1,2-Dichloroethane has a very high  $K_{oc}$  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	PubChem 2021
Color	Clear, colorless	PubChem 2021
Physical state	Oily liquid; heavy liquid	PubChem 2021
Melting point(s)	-35.6 °C	PubChem 2021
Boiling point(s)	83.4 °C	PubChem 2021
Critical temperature and pressure	563 K and 5360 kPa	PubChem 2021
Density	1.2454 at 25°C	PubChem 2021
Taste	Sweet	PubChem 2021
Taste threshold:	No data	PubChem 2021
Odor	Pleasant, chloroform-like; sweet	PubChem 2021
Odor threshold:		
Water	20 mg/L	Verschueren 1996
Air	12 ppm 50 ppm 100 ppm	Verschueren 1996 Torkelson and Rowe 1981 Weiss 1980
Solubility:		
Water	8600 mg/L at 25 °C 8690 mg/L at 20 °C	PubChem 2021 Verschueren 1996
Organic solvent(s)	Miscible with alcohol, chloroform, ether; Soluble in acetone, benzene, chloroform	PubChem 2021
Inorganic solvent(s)	No data	PubChem 2021
Partition coefficients:		
Log $K_{ow}$	1.48	PubChem 2021
Log $K_{oc}$	33	
Vapor pressure at 25 °C	78.9 mmHg (10.5 kPa)	PubChem 2021
Henry's law constant at 25 °C	$1.18 \times 10^{-3}$ atm-m <sup>3</sup> /mole	PubChem 2021
Degradation half-life in air via reaction with OH radicals	$2.48 \times 10^{-13}$ cu cm/molc-sec at 25 °C	PubChem 2021
Dissociation constants:	No data	PubChem 2021
Autoignition temperature	413 °C	PubChem 2021

## 4. CHEMICAL AND PHYSICAL INFORMATION

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

Property	Information	Reference
Flash point	13 °C	PubChem 2021
Flammability limits in air	6.2 – 16% by volume	PubChem 2021
Conversion factors:	1 ppm in air = 4 mg/m <sup>3</sup> ppm(v/v)x4.05=mg/m <sup>3</sup> mg/m <sup>3</sup> x0.247=ppm(v/v)	PubChem 2021 Torkelson and Rowe 1981 Torkelson and Rowe 1981
Explosive limits	6.2 – 15.9%	PubChem 2021
Incompatibilities and reactivity	Incompatible with strong oxidizing agents; Violent reaction with aluminum, dinitrogen tetroxide, ammonia, dimethylaminopropylamine	PubChem 2021