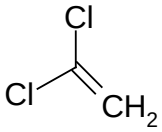
CHAPTER 4. CHEMICAL AND PHYSICAL INFORMATION

4.1 CHEMICAL IDENTITY

Table 4-1 lists common synonyms and other identification information for 1,1-dichloroethene.

Table 4-1. Chemical Identity of 1,1-Dichloroethene

Characteristic	Information	Reference
Chemical name	1,1-Dichloroethene	NLM 2018
Synonym(s) and registered trade name(s)	1,1-DCE; 1,1-dichloroethylene; asym-dichloroethylene; VDC; vinylidene chloride; vinylidene chloride (II); vinylidene dichloride; vinylidene chloride	NLM 2018; EPA 2017a; NIOSH 2016
Chemical formula	$C_2H_2Cl_2$	EPA 2017a
Chemical structure		NLM 2018
CAS Registry Number	75-35-4	EPA 2017a

CAS = Chemical Abstracts Service

4.2 PHYSICAL AND CHEMICAL PROPERTIES

1,1-Dichloroethene is a colorless, volatile liquid at room temperature, has a mild, sweet odor, is flammable, and burns quickly. This chemical readily polymerizes, and commercial products therefore typically contain an inhibitor (Larranaga et al. 2016). 1,1-Dichloroethene does not occur naturally in the environment; it is produced commercially from ethylene chloride. The major use for 1,1-dichloroethene is in the synthesis of various industrial and consumer plastics, such as packaging materials and flexible films (O'Neil et al. 2013). It also has reported use as a filler, binding agent, and adhesive in paints and synthetic fibers (Larranaga et al. 2016). Effective as of August 15, 2000, 1,1-dichloroethene is categorized as a volatile organic compound (VOC) (EPA ID: E761502) and hazardous air pollutant (HAP) (EPA ID: E761346) (EPA 2017b).

Physical and chemical properties of 1,1-dichloroethene are listed in Table 4-2.

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

Property	Information	Reference
Molecular weight	96.94	EPA 2017a
Color	Colorless	Larranaga et al. 2016
Physical state	Liquid	Haynes 2014
Melting point	-122.5°C	Haynes 2014
Boiling point	31.7°C at 760 mmHg	O'Neil et al. 2013
Density at 20°C	1.213 g/cm^3	Haynes 2014
Odor	Mild sweet odor resembling that of chloroform	O'Neil et al. 2013
Odor threshold:		
Air	2,000–5,000 mg/m^3	EPA 1987
Solubility:		
Water at 25°C	2,420 mg/L	Horvath et al. 1999
Organic solvents	Soluble in organic solvents	O'Neil et al. 2013
Partition coefficients:		
Log K_{ow}	2.13; 1.32	Hansch et al. 1995; WHO 2003
Log K_{oc}	1.81	Chu and Chan 2000; Sabljic et al; 1995
Vapor pressure at 25°C	600 mm Hg	Boublik et al. 1984
Henry's law constant at 20–25°C	2.61x10^{-2} atm-m^3/mol	Gossett 1987
Autoignition temperature	457°C	Larranaga et al. 2016
Flashpoint	-10°C (open-cup) -19°C (closed-cup)	EPA 1985; Larranaga et al. 2016
Conversion factors	1 ppm=3.97 mg/m^3 1 mg/m^3=0.25 ppm	Verschueren 1983 Verschueren 1983
Explosive limits	5.6–11.4% v/v in air	Larranaga et al. 2016