

CHAPTER 4. CHEMICAL AND PHYSICAL INFORMATION

4.1 CHEMICAL IDENTITY

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

Table 4-1. Chemical Identity of Bromomethane

Characteristic	Information	Reference
Chemical name	Bromomethane	Windholz 1983
Synonym(s) and registered trade name(s)	Methyl bromide; monobromomethane; methyl fume; Embafume; Terabol	EPA 1986b; IRIS 2002
Chemical formula	CH ₃ Br	Windholz 1983
Chemical structure	$\begin{array}{c} \text{H} \\ \\ \text{H}-\text{C}-\text{Br} \\ \\ \text{H} \end{array}$	Windholz 1983
CAS Registry Number	74-83-9	Sax and Lewis 1987

CAS = Chemical Abstracts Service

4.2 PHYSICAL AND CHEMICAL PROPERTIES

Table 4-2 lists important physical and chemical properties of bromomethane.

Table 4-2. Physical and Chemical Properties of Bromomethane

Property	Information	Reference
Molecular weight	94.94	HSDB 2014
Color	Colorless	HSDB 2014
Physical state	Gas	HSDB 2014
Melting point	-93.68°C	HSDB 2014
Boiling point	3.5°C	HSDB 2014
Density at 20°C ^a	3.97 at 20°C (gas); 1.73 at 0°C (liquid)	HSDB 2014
Odor	Usually odorless; sweetish chloroform-like odor at high concentrations	HSDB 2014
Odor threshold:		
Water	No data	
Air	80 mg/m ³ (20 ppm)	Ruth 1986

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Table 4-2. Physical and Chemical Properties of Bromomethane

Solubility:		
Water at 20°C	15.2 g/L at 25°C 18.5 g/L at 20°C 13.4 g/L at 25°C	HSDB 2014
Organic solvents	Readily soluble in lower alcohols, ethers, esters, ketones, halogenated hydrocarbons, aromatic hydrocarbons, and carbon disulfide; freely soluble in benzene, carbon tetrachloride, and carbon disulfide; miscible in ethanol and chloroform	HSDB 2014
Partition coefficients:		
Log K _{ow}	1.19	HSDB 2014
Log K _{oc}	0.95–1.3	Yates et al. 2003
Vapor pressure at 20°C	1,420 mmHg	HSDB 2014
Henry's law constant at 25°C	0.00734 atm m ³ /mole	HSDB 2014
Autoignition temperature	Nonflammable	EPA 1986b
Flashpoint	Nonflammable	EPA 1986b
Flammability limits	Nonflammable	EPA 1986b
Conversion factors ^b	1 ppm=3.88 mg/m ³ 1 mg/m ³ =0.26 ppm	
Explosive limits	Nonflammable	EPA 1986b

^aDensity of vapor relative to air.

^bBased on the following formulas: ppm = (mg/m³) (24.45)/ (molecular weight), and mg/m³ = (ppm) (molecular weight)/ 24.45.