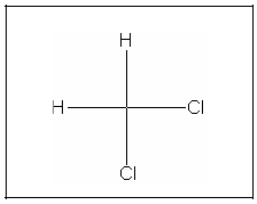
Illinois Environmental Protection Agency
Bureau of Water – Water Quality Standards Section

Lake Michigan Basin Water Quality Standards

METHYLENE CHLORIDE



CAS:	75-09-2
Water Solubility:	1.32 g/100 mL
Log K_{ow}:	1.25

Derived Criteria

Aquatic Life: Where no standard is applicable for a chemical substance within waters of the Lake Michigan Basin, acute and chronic numeric values may be calculated pursuant to 35 IAC 302.540. Tier II methodology (35 IAC 302.563-565) indicate that, except possibly where a locally important species is very sensitive, aquatic organisms should not be adversely affected providing the four (4) day average concentration of methylene chloride does not exceed 1,200 μg/L, and if 10,803 μg/L is not exceeded at any time.

Human Health: Human health standards for methylene chloride were adopted during the GLI rulemaking (35 IAC 302.504). The Lake Michigan Human Health Nonthreshold Value for drinking water sources and nondrinking water sources are 47 μg/L and 2,600 μg/L, respectively.

Aquatic Life Calculations

Acute Aquatic Life:

LMAATV = lowest GMAV / SAF

LMAATV = 172,850 / 16 = **10,803 μg/L**

Chronic Aquatic Life:

LMCATV = SAV / SACR

LMCATV = 21.6 / 18 = **1,200 μg/L**

Table 1. GMAVs and SMAVs for methylene chloride, referenced toxicity values are denoted in superscript.

Species	GMAV (mg/L)	SMAV (mg/L)	ACR	Concentration (mg/L)
Water flea Daphnia magna	172.85	172.85	-	220[6], 135.8[1]
Bluegill Lepomis macrochirus	220.0	220.0	-	220[3]
Fathead minnow Pimephales promelas	317.4	317.4	-	502[4], 330[5], 193[2]

References

1. Abernethy, S, AM Bobra, WY Shiu, PG Wells, and D MacKay. 1986. Acute lethal toxicity of hydrocarbons and chlorinated hydrocarbons to two planktonic crustaceans: the key role of organism-water partitioning. Aquat. Toxicol. 8(3): 163-174.
    - Species Name: Daphnia magna, water flea
    - Data Value: 135,808 ug/L
        Dose metric: 48 hr LC50
        Comments: Static, unmeasured

2. Alexander, HC, WM McCarty, and EA Bartlett. 1978. Toxicity of perchloroethylene, trichloroethylene, 1,1,1-trichloroethane, and methylene chloride to fathead minnows. Bull. Environ. Contam. Toxicol. 20(3): 344-352.
    - Species Name: Pimephales promelas, fathead minnow
    - Data Value: 193,000 ug/L
        Dose metric: 96 hr LC50
        Comments: Static, unmeasured

3. Buccafusco, RJ, SJ Ells, and GA LeBlanc. 1981. Acute toxicity of priority pollutants to bluegill (Lepomis macrochirus). Bull. Environ. Contam. Toxicol. 26(4): 446-452.
    - Species Name: Lepomis macrochirus, bluegill
    - Data Value: 220,000 ug/L
        Dose metric: 96 hr LC50
        Comments: Static, unmeasured

4. Dill, DC, PG Murphy, and MA Mayes. 1987. Toxicity of methylene chloride to life stages of the fathead minnow, Pimephales promelas Rafinesque. Bull. Environ. Contam. Toxicol. 39(5): 869-876.
    - Species Name: Pimephales promelas, fathead minnow
    - Data Value: 502,000 ug/L
        Dose metric: 96 hr LC50
        Comments: Flow-through, measured

5. Geiger, DL, SH Poirier, LT Brooke, and DJ Call. 1986. Acute toxicities of organic chemicals to fathead minnows (Pimephales promelas). Vol. III. Center for Lake Superior Environmental Studies, University of Wisconsin - Superior. Superior, WI. 328p.
    - Species Name: Pimephales promelas, fathead minnow
    - Data Value: 330,000 ug/L
        Dose metric: 96 hr LC50
        Comments: Flow-through, measured

6. LeBlanc, GA. 1980. Acute toxicity of priority pollutants to water flea (Daphnia magna). Bull. Environ. Contam. Toxicol. 24(5): 684-691.
    - Species Name: Daphnia magna, water flea
    - Data Value: 220,000 ug/L
        Dose metric: 48 hr LC50
        Comments: Static, unmeasured

Derivation History

Derived June 20, 2006

Contact Information

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