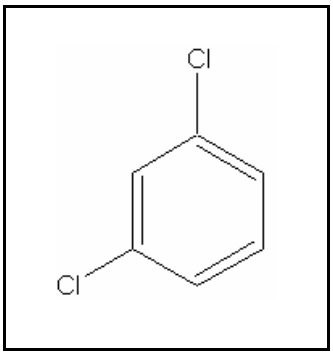
**Indiana Department of Environmental Management**
**Office of Water - Water Quality Standards Section**

# TIER II ACUTE AND CHRONIC AQUATIC LIFE VALUES

## 1,3-DICHLOROBENZENE

CAS RN: 541-73-1
Water Solubility: 0.0125 g/100 mL
Log $K_{ow}$:




## Standard

The procedures described in the Tier II methodology indicate that, except possibly where a locally important species is very sensitive, aquatic organisms should not be affected unacceptably if the four (4) day average concentration of 1,3-dichlorobenzene does not exceed 52 µg/L more than once every three (3) years on the average and if the one (1) hour average concentration does not exceed 310 µg/L more than once every three (3) years on the average.

## Calculations

Acute Aquatic Life:

SAV = lowest GMAV/SAF

Lowest GMAV = 5000 µg/L
SAF = 8.0

SAV = 5000/8.0 = 625 µg/L

SMC = SAV/2 = 625/2 = **310 µg/L**

Chronic Aquatic Life:

SCV = SAV/SACR

SACR = 12.11 (Geometric mean of 18, 18, and 5.482)

SCV = 625/12.11 = **52 μg/L**

Calculation of ACR:

Daphnia magna

NOEC = 690 μg/L
LOEC = 1500 μg/L

CV = Geometric Mean of 690 and 1500 = 1017

ACR = 5575/1017 = 5.482

## Data

Table 1. GMAVs and SMAVs for 1,3-dichlorobenzene

| Genus Mean Acute Value (μg/L) | Species | Species Mean Acute Value (μg/L) | Acute-Chronic Ratio | Reference Number |
|---|---|---|---|---|
| 8434 | Fathead Minnow Pimephales promelas | 9,120 | | 1 |
| | Fathead Minnow Pimephales promelas | 7,800 | | 5 |
| 5000 | Bluegill Lepomis macrochirus | 5000 | | 2 |
| 9547 | Cladoceran Daphnia magna | 28,000 | 3 | |
| | Cladoceran Daphnia magna | 7,400 | | 4 |
| | Cladoceran | 4,200 | | 4 |

Daphnia magna

## References


1. Broderius, S. and M. Kahl 1985. Acute toxicity of organic chemical mixtures to the fathead minnow. Aquatic Toxicol. 6: 307-322.

   Buccafusco, R.J., S.J. Ells, and G.A. LeBlanc 1981. Acute toxicity of priority pollutants to bluegill (Lepomis macrochirus). Bull. Environ. Contam. Toxicol. 24(5): 446-452.

3. LeBlanc, G.A. 1980. Acute toxicity of priority pollutants to Daphnia magna. Bull. Environ. Contam. Toxicol. 24(5): 684-691.

4. Richter, J.E., S.F. Peterson, and C.F. Kleiner 1983. Acute and chronic toxicity of some chlorinated benzenes, chlorinated ethanes, and tetrachloroethylene to Daphnia magna. Arch. Environ. Contam. Toxicol. 12: 679-684.

5. Veith, G.D., D.J. Call and L.T. Brooke 1983. Estimating the acute toxicity of narcotic industrial chemicals to fathead minnows. In: Aquatic Toxicology and Hazard Assessment: Sixth Symposium. ASTM STP 802, W.E. Bishop, R.D. Cardwell and B.B. Heidolph (Eds.). American Society of Testing and Materials. Philadelphia, PA.


## Acronyms/Abbreviations

| | |
|---|---|
| CAS RN | Chemical Abstract Service Registry Number |
| $K_{ow}$ | Octanol-Water Partition Coefficient |
| P (superscript) | Predicted value |
| | |

| | |
|---|---|
| SAV | Secondary Acute Value |
| GMAV | Genus Mean Acute Value |
| SAF | Secondary Acute Factor |
| SMC | Secondary Maximum Concentration |
| SCC | Secondary Continuous Concentration |
| SACR | Secondary Acute-Chronic Ratio |
| FT | Flow-through |
| S | Static |
| U | Unmeasured |
| M | Measured |
| EVISTRA | Evaluation and Interpretation of Suitable Test Results in AQUIRE (EPA quality checking method/database) |

## Revision History

December 30, 1998 Values first developed
April 25, 2001 New search for data. No new studies added.

## Contact Information

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