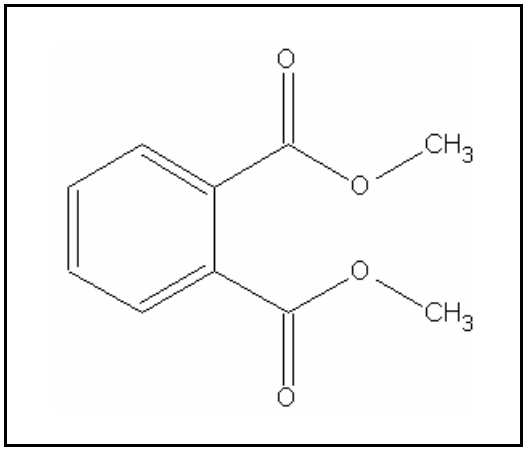
Indiana Department of Environmental Management
Office of Water - Water Quality Standards Section

TIER II ACUTE AND CHRONIC AQUATIC LIFE VALUES

DIMETHYL PHTHALATE

CAS RN: 131-11-3
Water Solubility: <0.1 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 dimethyl phthalate does not exceed 1,000 µg/L more than once every three (3) years on the average and if the one (1) hour average concentration does not exceed 2,800 µg/L more than once every three (3) years on the average.

Calculations

Acute Aquatic Life:

SAV = lowest GMAV/SAF

Lowest GMAV = 38,919 µg/L
SAF = 7.0

SAV = 38,919/7.0 = 5,560 µg/L

SMC = SAV/2 = 5,560/2 = **2,800 µg/L**

Chronic Aquatic Life:

SCV = SAV/SACR

SACR = 5.8 (geometric mean of 3.5, 3.1, and 18)

SCV = 5,560/5.8 = **1,000 µg/L**

Calculation of ACR's

Rainbow Trout

MATC = 16,000 µg/L

ACR = 56,000/16,000 = 3.5

Daphnia magna

MATC = 14,900 µg/L

ACR = 45,900/14,900 = 3.1

Data

Table 1. GMAVs and SMAVs for dimethyl phthalate

Genus Mean Acute Value (µg/L)	Species	Species Mean Acute Value (µg/L)	Acute-Chronic Ratio	Reference Number
39,000	Fathead Minnow *Pimephales promelas*	39,000		1
56,000	Rainbow Trout *Oncorhynchus mykiss*	56,000	3.5	1,4
50,000	Bluegill *Lepomis macrochirus*	50,000		1,2
38,919	Cladoceran *Daphnia magna*	45,900	3.1	1,4
	Cladoceran *Daphnia magna*	33,000		3

References:

1. Adams,W.J., G.R.Biddinger, K.A.Robillard, and J.W.Gorsuch 1995. A Summary of the Acute Toxicity of 14 Phthalate Esters to Representative Aquatic Organisms. Environ. Toxicol. Chem. 14(9):1569-1574.

2. 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. Rhodes, J.E., W.J. Adams, G.R. Biddinger, K.A. Robillards, and J.W. Gorsuch 1995. Chronic toxicity of 14 phthalate esters to Daphnia magna and rainbow trout (Oncorhynchus mykiss). Environ. Toxicol. Chem. 11: 1967-1976.

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

August 12, 1999 Values first developed
April 3, 2001 New search for data. One study added. New chronic value calculated.

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