

Fact Sheet Date: June 1998

**NEW YORK STATE
- AQUATIC FACT SHEET -**

**Ambient Water Quality Value
For Protection of Aquatic Life**

SUBSTANCE: 2-Methylnaphthalene

CAS REGISTRY NUMBER: 91-57-6

TYPE:	BASIS:	Ambient Water Quality Value, ug/L	
		FRESHWATER	SALTWATER
Chronic	Propagation	4.7	4.2
Acute	Survival	42	38

INTRODUCTION

These values apply to the water column and are derived to protect aquatic life from the effects of waterborne contaminants. Values for the protection of propagation of aquatic life are referred to as Aquatic (Chronic) or A(C) values. Values for the protection of survival of aquatic life are referred to as Aquatic (Acute) or A(A) values.

SUMMARY OF INFORMATION

The U.S. EPA AQUIRE (AQUatic toxicity Information Retrieval System)(U.S. EPA, 1993) was searched for toxicity data on 2-methylnaphthalene with EC₅₀ or LC₅₀ toxicity endpoints. The initial search identified 15 toxicity test records. From that original group, only data with a documentation code of C (Complete methods and results documentation), and 96 hour LC₅₀ or 48 hour EC₅₀ endpoints were selected. If both flow-through and static test toxicity data were available for the same species, only flow-through data was used. Static toxicity test data was used only if flow-through data was not available. This second screening resulted in a final acute toxicity database for 2-methylnaphthalene of one study with one freshwater species and two studies with three marine species. Species Mean Acute Values (SMAVs) were determined from the acceptable 2-methylnaphthalene toxicity studies obtained from the AQUIRE database. Ambient water quality guidance values were then calculated in accordance with 6NYCRR Part 706.1.

DERIVATION OF ACUTE VALUES

As shown in Table 1, data are available for one of the eight families necessary to derive a Tier 1 freshwater value. Consequently, the data from the one family are used to derive a Tier 2 freshwater value. Similarly, Table 2 shows that data are available for three of the eight families necessary to derive a Tier 1 saltwater value, so those data are used to derive a Tier 2 saltwater value.

Table 1. Freshwater toxicity data used to derive the 2-methylnaphthalene acute value. When only an SMAV is listed, the SMAV was the LC₅₀ of the test species indicated. NDA means no data was available.

Data Requirement	Species	SMAV, ug/L	References
Family Salmonidae	NDA		
A second Family in the Class Osteichthyes	NDA		
A third family from the phylum Chordata	NDA		
A planktonic crustacean	<u>Daphnia magna</u>	1848.6	11936
A benthic crustacean	NDA		
An insect	NDA		
A family in a phylum other than Arthropoda or Chordata	NDA		
A family in any order of insect or any other phylum not already represented	NDA		

The lowest SMAV was divided by the SAF to determine the secondary acute value (SAV). Because one data requirement was met, a secondary acute factor (SAF) of 21.9 is required. The Tier II guidance value was determined by dividing the SAV by two and rounding to two significant digits.

$$\text{SAV} = 1848.6 / 21.9 = 84.4110 \text{ ug/L}$$

$$\text{Freshwater Tier II A(A)} = 84.4110 \text{ ug/L} / 2 = 42.2055 \approx 42 \text{ ug/L}$$

Table 2. Saltwater toxicity data used to derive the 2-methylnaphthalene acute value. When only an SMAV is listed, the SMAV was the LC₅₀ of the test species indicated. NDA means no data was available.

Data Requirement	Species	SMAV, ug/L	References
A family from the phylum Chordata	NDA		
A second family from the Phylum Chordata	NDA		
A family in a phylum other than Arthropoda or Chordata	NDA		
Either the Mysidae or Penaeidae family	Brown shrimp	600	420
Three other families not in the family Chordata; may include Mysidae or Penaeidae, which ever was not used above	Dungeness crab	1300	5035
	Daggerblade grass shrimp	1100	420
	NDA		
Any other family	NDA		

Because three data requirements were met, a secondary acute factor (SAF) of 8.0 is required.

$$SAV = 600 \text{ ug/L} / 8.0 = 75 \text{ ug/L}$$

$$\text{Saltwater Tier II A(A)} = 75 \text{ ug/L} / 2 = 37.5 \approx 38 \text{ ug/L}$$

DERIVATION OF CHRONIC VALUES

The secondary chronic value (SCV) is determined by dividing the SAV by the secondary acute to chronic ratio (SACR). The Tier II A(C) value is equal to the SCV. A species acute to chronic ratio (ACR) is an acute LC₅₀ divided by a chronic value for the same species. The chronic value is the geometric mean of the NOEC (No Observed Effects Concentration) and LOEC (Lowest Observed Effects Concentration) values. A minimum of three species ACRs are required to derive a SACR. If three species ACRs are not available, 6NYCRR Part 706.1 requires that a species ACR value of 18 should be substituted for each missing species ACR. The SACR is equal to the cube root of the product of the three species ACRs. Both saltwater and freshwater species data are used to derive a common SACR. No studies could be found in the AQUIRE

database that provided adequate acute and chronic data to determine an acute to chronic ratio as required by 6NYCRR Part 706.1 so the SCV was determined by dividing the SAV by a SACR of 18:

The freshwater SCV = $84.4110 \text{ ug/L} / 18 = 4.6895 \text{ ug/L}$
Freshwater Tier II A(C) value = $4.6895 \text{ ug/L} \approx 4.7 \text{ ug/L}$

The saltwater SCV = $75 \text{ ug/L} / 18 = 4.1667 \approx 4 \text{ ug/L}$
Saltwater Tier II A(C) value = $4.1667 \approx 4.2 \text{ ug/L}$

REFERENCES

U.S. EPA 1993. AQUIRE, AQUatic toxicity Information Retrieval Database, Technical Support Document. U.S. EPA Environmental Research Laboratory, Office of Research and Development, Duluth, Minnesota, September, 1993.

AQUIRE DATA CITATIONS

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Caldwell, R.S., E.M. Caldarone, and M.H. Mallon, 1977. Effects of a Seawater-Soluble Fraction of Cook Inlet Crude Oil and its Major Aromatic Components on Larval Stages of the Dungeness Crab, Cancer ... In: D.A. Wolfe (Ed.) *Fate and Effects of Petroleum Hydrocarbons in Marine Ecosystems and Organisms*, Pergamon Press, NY:210-220

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