

Fact Sheet Date: June 1998

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

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

**SUBSTANCE:** Isopropylbenzene

**CAS REGISTRY NUMBER:** 98-82-8

<b>TYPE:</b>	<b>BASIS:</b>	<b>Freshwater Ambient Water Quality Value, ug/L:</b>
Chronic	Propagation	2.6
Acute	Survival	23

**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 isopropylbenzene with EC<sub>50</sub> or LC<sub>50</sub> 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 LC<sub>50</sub> or 48 hour EC<sub>50</sub> 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 isopropylbenzene of two studies with two freshwater species. No acceptable studies for marine species were found. Species Mean Acute Values (SMAVs) were determined from the acceptable isopropylbenzene 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 two of the eight families necessary to derive a Tier 1 freshwater value. Consequently, the data from the two families are used to derive a Tier 2 freshwater value. No suitable marine data was found, so saltwater values for isopropylbenzene could not be determined.

Table 1. Freshwater toxicity data used to derive the isopropylbenzene acute value. When only an SMAV is listed, the SMAV was the LC<sub>50</sub> 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	Fathead minnow	6320	12858
A third family from the phylum Chordata	NDA		
A planktonic crustacean	<u>Daphnia magna</u>	601	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 two data requirements were met, a secondary acute factor (SAF) of 13.0 was selected. The Tier II guidance value was determined by dividing the SAV by two and rounding to two significant digits.

$$\text{SAV} = 601 / 13.0 = 46.2308 \text{ ug/L}$$

$$\text{Freshwater Tier II A(A) value} = 46.2308 \text{ ug/L} / 2 = 23.1154 \approx 23 \text{ ug/L}$$

## 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 LC<sub>50</sub> 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 =  $46.2308 \text{ ug/L} / 18 = 2.5684 \text{ ug/L}$

Freshwater Tier II A(C) value =  $2.5684 \text{ ug/L} \approx 2.6 \text{ ug/L}$

## 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

REFERENCE NUMBER: 11936

Bobra, A.M., W.Y. Shiu, and D. MacKay, 1983. A Predictive Correlation for the Acute Toxicity of Hydrocarbons and Chlorinated Hydrocarbons to the Water Flea (*Daphnia magna*). *Chemosphere* 12(9-10):1121-1129

REFERENCE NUMBER: 12858

Geiger, D.L., S.H. Poirier, L.T. Brooke, and D.J. Call, 1986. Acute Toxicities of Organic Chemicals to Fathead Minnows (*Pimephales promelas*), Vol. 3. Center for Lake Superior Environmental Studies, University of Wisconsin, Superior, WI:328 p.

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