



TIER II ACUTE AND CHRONIC AQUATIC LIFE VALUES
--

BORON

CAS RN: 7440-42-8

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 boron does not exceed 360 µg/L more than once every three (3) years on the average and if the one (1) hour average concentration does not exceed 3200 µg/L more than once every three (3) years on the average.

Calculations

Acute Aquatic Life:

$$\text{SAV} = \text{lowest GMAV/SAF}$$

$$\begin{aligned}\text{Lowest GMAV} &= 141,000 \text{ } \mu\text{g/L} \\ \text{SAF} &= 21.9\end{aligned}$$

$$\text{SAV} = 141,000/21.9 = 6438 \text{ } \mu\text{g/L}$$

$$\text{SMC} = \text{SAV}/2 = 6438/2 = \mathbf{3,200 \text{ } \mu\text{g/L}}$$

Chronic Aquatic Life:

$$SCC = SAV/SACR$$

$$SACR = 18$$

$$SCC = 6438/18 = \mathbf{360 \mu g/L}$$

Data

Table 1. GMAVs and SMAVs for boron

<u>Genus Mean Acute Value ($\mu\text{g/L}$)</u>	<u>Species</u>	<u>Species Mean Acute Value ($\mu\text{g/L}$)</u>	<u>Acute- Chronic Ratio</u>	<u>Reference Number</u>
141,000	Cladoceran <u>Daphnia magna</u>	141,000		1

References

1. Maier, K.J. and A.W. Knight 1991. The toxicity of waterborne boron to *Daphnia magna* and *Chironomus decorus* and the effects of hardness and sulfate on boron toxicity. Arch. Environ. Contam. Toxicol. 20: 282-287.

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

May 28, 1997 Values first developed
August 23, 2000 New search for data. No new studies added.

Contact Information

David B. Kallander
Water Quality Standards Section
Indiana Department of Environmental Management
100 North Senate Ave., P.O. Box 6015
Indianapolis, IN 46206-6015
(317) 233-2472
Email: dkalland@dem.state.in.us