

OHIO EPA SURFACE WATER QUALITY CRITERION FACT SHEET

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Chemical Name: Fluorene Developed by: Chris J. SkalskiCAS # 86-73-7 Data Retrieval Date: 4-17-01Internal Code # 79 Fact Sheet Preparation Date: 3-01-06Reviewed by: Bob HeitzmanACUTE DATA

<u>SPECIES</u>	<u>EC₅₀/LC₅₀</u> <u>(µg/l)</u>	<u>TEST TYPE^a</u>	<u>DURATION</u> <u>(HOURS)</u>	<u>SMAV^b</u> <u>(µg/l)</u>	<u>GMAV^b</u> <u>(µg/l)</u>	<u>REFERENCE</u> <u>NUMBER</u>
Cladoceran <i>Daphnia magna</i>	430	S,U	48	430	302	1
Cladoceran <i>Daphnia pulex</i>	212	S,U	48	212		2
Midge <i>Chironomus riparius</i>	2,350	S,U	48	2,350	2,350	1
Mayfly <i>Hexagenia bilineata</i>	5,800	S,U	120	5,800	5,800	1
Amphipod <i>Gammarus pseudolimnaeus</i>	600	S,U	96	600	600	1
Snail <i>Mudalia potosensis</i>	5,600	S,U	96	5,600	5,600	1
Fathead Minnow <i>Pimephales promelas</i>	>100,000	F,U	96	>100,000	>100,000	1
Bluegill <i>Lepomis macrochirus</i>	910	F,U	96	910	910	1
Rainbow Trout <i>Oncorhynchus mykiss</i>	820	F,U	96	820	820	1

^a S = static; F= flow through; U = unmeasured.^b SMAV = Species Mean Acute Value; GMAV = Genus Mean Acute Value.CHRONIC DATA

<u>SPECIES</u>	<u>CHRONIC VALUE</u> <u>(µg/l)</u>	<u>METHOD</u>	<u>SMCV^a</u> <u>(µg/l)</u>	<u>GMCV^a</u> <u>(µg/l)</u>	<u>REFERENCE</u> <u>NUMBER</u>
Bluegill <i>Lepomis macrochirus</i>	120-250 173	Early Life Stage	173	173	1

^a SMCV = Species Mean Chronic Value; GMCV = Genus Mean Chronic Value.

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REFERENCES

1. Finger, S.E., E.F. Little, M.G. Henry, J.F. Fairchild and T.P. Boyle. 1985. Comparison of Laboratory and Field Assessment of Fluorene - Part I: Effects of Fluorene on the Survival, Growth, Reproduction, and Behavior of Aquatic Organisms in Laboratory Tests. In: T.P. Boyle (Ed.), Validation and Predictability of Laboratory Methods for Assessing the Fate and Effects of Contaminants in Aquatic Ecosystems, ASTM STP 865, Philadelphia, PA:120 p.
2. Smith, S.B., J.F. Savino and M.A. Blouin. 1988. Acute Toxicity to *Daphnia pulex* of Six Classes of Chemical Compounds Potentially Hazardous to Great Lakes Aquatic Biota. J. Great Lakes Res. 14(4):394-404.

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CALCULATION OF ACUTE AQUATIC CRITERION (AAC)^a

<u>Species</u>	<u>SMAV (µg/l)</u>	<u>Genus</u>	<u>GMAV (µg/l)</u>	<u>Data Set Requirement</u>
Fathead Minnow	>100,000	<i>Pimephales</i>	>100,000	c
Mayfly	5,800	<i>Hexagenia</i>	5,800	h
Snail	5,600	<i>Mudalia</i>	5,600	g
Midge	2,350	<i>Chironomus</i>	2,350	f
Bluegill	910	<i>Lepomis</i>	910	b
Rainbow Trout	820	<i>Oncorhynchus</i>	820	a
Amphipod	600	<i>Gammarus</i>	600	e
Cladoceran	430	<i>Daphnia</i>	302	d
Cladoceran	212	<i>Daphnia</i>		

<u>Genus</u>	<u>GMAV</u>	<u>ln(GMAV)</u>	<u>ln(GMAV)²</u>	<u>RANK</u>	<u>P=R/(N+1)</u>	<u>√P</u>
<i>Daphnia</i>	302	5.710	32.609	1	0.1111	0.3333
<i>Gammarus</i>	600	6.397	40.921	2	0.2222	0.4714
<i>Oncorhynchus</i>	820	6.709	45.015	3	0.3333	0.5774
<i>Lepomis</i>	910	6.813	46.423	4	0.4444	0.6667
TOTALS		25.630	164.967		1.1111	2.0488

$$S^2 = \frac{164.967 - (25.630)^2/4}{1.1111 - (2.0488)^2/4} = \frac{0.7419}{0.0618} = 12.01 \quad S = 3.4659$$

$$L = [25.630 - ((3.4659)(2.0488))/4] = 4.6323$$

$$A = 3.4659(\sqrt{0.05}) + (4.6324) = 5.4073$$

$$\text{Final Acute Value (FAV)} = e^{5.4073} = 223 = 220 \mu\text{g/l}$$

$$\text{AAC} = \text{FAV} \div 2 = 223 \mu\text{g/l} \div 2 = 112 = 110 \mu\text{g/l}$$

^aSee Ohio Administrative Code 3745-1-36 effective February 22, 2002.

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Chemical Name: Fluorene Developed by: Chris J. SkalskiCAS # 86-73-7 Data Retrieval Date: 4-17-01Internal Code # 79 Fact Sheet Preparation Date: 3-01-06Reviewed by: Bob HeitzmanCALCULATION OF CHRONIC AQUATIC VALUE (CAV)^a

Experimentally determined Acute-Chronic Ratios (ACRs):

<u>SPECIES</u>	<u>ACUTE VALUE</u> <u>(µg/l)</u>	<u>CHRONIC VALUE</u> <u>(µg/l)</u>	<u>ACUTE-CHRONIC</u> <u>RATIO</u>	<u>SPECIES MEAN</u> <u>ACR</u>
Bluegill <i>Lepomis macrochirus</i>	910	173	5.25	5.25

$$\text{Secondary Acute-Chronic Ratio (SACR)} = \sqrt[3]{(5.25)(18)(18)} = 11.9$$

$$\begin{aligned} \text{Chronic Aquatic Value (CAV)} &= \text{FAV} \div \text{SACR} \\ &= 223 \div 11.9 \\ &= 19 \mu\text{g/l} \end{aligned}$$

^aSee Ohio Administrative Code 3745-1-36 effective February 22, 2002.