

ACUTE TOXICITY TO AQUATIC INVERTEBRATES (DAPHNIA MAGNA)

TEST SUBSTANCE

Identity: Mixture containing perfluorooctanesulfonate; may also be referred to as PFOS, FC-95, or as a component of FC-3072. (1-Octanesulfonic acid) (CAS # 2795-39-3).

Remarks: The 3M production lot number was not noted. The test sample is FC-3072. Current information indicates it is a mixture of 1.67% test substance, 33.33% diethylene glycol butyl ether, 29.23% water, 20.83% urea, 5% sodium octyl sulfate, 3.33% sulfonated alkyl ether sulfate salts, 4.60% acrylic foamer, 1.67% triethanolamine, and 0.33% tolyl triazole.

The following summary applies to the test sample as a mixture of the test substance in water solution with incompletely characterized concentrations of impurities. Data may not accurately relate toxicity of the test sample with that of the fluorochemical component.

METHOD:

Method: OECD Guideline 202

Type: Acute static

GLP: No

Year completed: 1995

Species: *Daphnia magna*

Supplier: In-house cultures. Originally obtained from U.S. EPA-ERL, Duluth, MN.

Analytical monitoring: Temperature, pH, and dissolved oxygen.

Exposure period: 48-hours

Test organism age: <24 hours old

Statistical methods: Not applicable due to study results.

Test conditions:

Dilution water: Carbon-filtered well water (3M Well #2, St. Paul, MN).

Dilution water chemistry: Not given.

Lighting: Not given.

Stock and test solution preparation: A primary stock solution was prepared by dissolving 1000 mg of test substance in 1 L water. Exposure concentrations were prepared by addition of stock solution to each vessel.

Exposure vessels: 100 mL vessels containing 50 mL test solution.

Number of replicates: 4

Number of daphnids per replicate: 5

Number of concentrations: six plus a blank control

Water chemistry during the study:

pH range (0-48 hours):

8.3– 8.3 (control exposure)

8.1 – 8.3 (1000 mg/L exposure)
Temperature range (0-48 hours): 20.2 – 21.6 °C
Dissolved oxygen range (0-48 hours):
8.1 – 8.4 mg/L (control exposure)
4.0 – 8.1 mg/L (1000 mg/L exposure)

RESULTS

Nominal concentrations: Blank control, 56, 100, 180, 320, 560, and 1000 mg/L.

Element values: 48-hour EC₅₀ = >1000 mg/L

Element values based on nominal concentrations.

Remarks: Testing was conducted on the mixture of the test substance as described in the test substance remarks field. The values reported apply to that mixture and not the fluorochemical proportion alone.

CONCLUSIONS

The test substance 48-hour EC₅₀ was determined to be >1000 mg/L, the highest concentration tested. No mortality or sublethal effects were observed.

Submitter: 3M Company, Environmental Laboratory, P.O. Box 33331, St. Paul, Minnesota, 55133

DATA QUALITY

Reliability: Klimisch ranking = 2. This study meets the criteria for quality testing. However, sample purity was not properly characterized and the study lacks analytical confirmation of the amount of fluorochemical proportion in solution.

REFERENCES

This study was conducted by the 3M Company, Environmental Laboratory, St. Paul, MN, Lab Request number M3597, 1995.

OTHER

Last changed: 6/25/00.

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ENVIRONMENTAL LABORATORY

LR M3597

48-HR ACUTE TOXICITY TO DAPHNIA, DAPHNIA MAGNA

TYPE TEST: STATIC X STATIC RENEWAL _____

TEST SUBSTANCE: FC-3072 AFFF Base

DILUTION WATER: CARBON-FILTERED WELL WATER (3M WELL #2, ST. PAUL, MN)
 TEMP. 21.6 °C, pH 8.3, D.O. 8.1 mg/L

TEST DAPHNID SOURCE: USEPA-ERL, DULUTH, MN DATE RECEIVED: 6/28/90

DAPHNID AGE: <24 HR OLD NEONATES NO. OF DAPHNIDS/TEST CHAMBER: 5

TEST SOLUTION VOLUME: 50 mL SIZE OF TEST CHAMBER: 100 mL

DATE INITIATED: 3/21/95 12:00 pm
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DATE TERMINATED: 3/23/95 12:15 pm
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TEST VESSEL	INITIAL CONC. mg/L	TOTAL AMOUNT ADDED*	MORTALITY			
			24-HR	48-HR	pH	D.O. mg/L
BK1	CONTROL	-	0	0	8.3	8.4
BK2	CONTROL	-	0	0	↓	↓
BK3	CONTROL	-	0	0	↓	↓
BK4	CONTROL	-	0	0	↓	↓
mL						
0-1	56	2.8	0	0	8.4	8.1
0-2	56	2.8	0	0	↓	↓
0-3	56	2.8	0	0	↓	↓
0-4	56	2.8	0	0	↓	↓
1-1	100	5.0	0	0	8.4	8.0
1-2	100	5.0	0	0	↓	↓
1-3	100	5.0	0	0	↓	↓
1-4	100	5.0	0	0	↓	↓
2-1	180	9.0	0	0	8.4	7.5
2-2	180	9.0	0	0	↓	↓
2-3	180	9.0	0	0	↓	↓
2-4	180	9.0	0	0	↓	↓
3-1	320	16	2	2	8.7	7.2
3-2	320	16	0	0	↓	↓
3-3	320	16	0	0	↓	↓
3-4	320	16	0	0	↓	↓
4-1	560	28	0	0	8.2	5.1
4-2	560	28	0	0	↓	↓
4-3	560	28	0	0	↓	↓
4-4	560	28	0	1	↓	↓
5-1	1000	50	0	0	8.1	4.0
5-2	1000	50	0	0	↓	↓
5-3	1000	50	0	0	↓	↓
5-4	1000	50	0	0	↓	↓

TEMP. °C

DATE / ANALYST

EC50 (95% C.I.) mg/L

20.2

3/21/95/SB

> 1000 mg/L

20.2

3/23/95/SB

> 1000 mg/L

COMMENTS

*Stock solution = 1000 mg/L. Each 1.0 mL = 1.0 mg.

Stock solution pH = 8.3

Initial Stock D.O. = 8.2 mg/L

ANALYST

Ava C. Beach

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