

ACUTE TOXICITY TO AQUATIC INVERTEBRATES (DAPHNIA MAGNA)

TEST SUBSTANCE

Identity: A mixture containing perfluorooctanesulfonate, which may also be referred to as PFOS, FC-95, or as a component of FC-603F. (1-Octanesulfonic acid) (CAS # 2795-39-3).

Remarks: The 3M production lot number was 501. The test sample is FC-603F. Current information indicates it is a mixture of 0.5% PFOS, 7% diethylene glycol butyl ether, 82.95% water, 2% acrylic foamer, 4% Alkylether sulfate, 1.45% Xanthan gum, 1.4% calcium acetate, 0.07% N-(3-Chloroallyl)hexaminium chloride, 0.5% triethanolamine, 0.05% sodium hydroxide, 0.03% cis-1-(3-Chloroallyl)-3,5,7-triaza-1-azoniaadamantane chloride, and 0.05% tolyltriazole.

The following summary applies to a mixture with incompletely characterized concentrations of impurities. Data may not accurately reflect the toxicity of the fluorochemical component of the test sample.

METHOD:

Method: OECD Guideline 202.

Type: Acute static

GLP: No

Year completed: 1994

Species: *Daphnia magna*

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

Analytical monitoring: Temperature, pH, and dissolved oxygen.

Exposure period: 48-hours

Test organism age: <24 hours old

Statistical methods: Not applicable.

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 of 2000 mg/L was prepared, diluted to 200 mL and divided into 4 -50 mL replicates.

Aliquots of the primary stock solution were used to prepare the remaining concentrations.

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

Number of replicates: 4

Number of daphnids per replicate: 5

Number of concentrations: five plus a blank control

Water chemistry during the study:

pH range (0-48 hours):

8.4 – 8.4 (control exposure)

8.4 – 8.4 (1000 mg/L exposure)

Temperature range (0-48 hours): 20 - 22 °C

Dissolved oxygen range (0-48 hours):

8.3 – 8.3 mg/L (control exposure)

6.4 – 8.3 mg/L (1000 mg/L exposure)

RESULTS

Nominal concentrations: Blank control, 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 a mixture as described in the Test Substance Remarks field. The values reported apply to that mixture and not the fluorochemical proportion alone.

CONCLUSIONS

The FC-603F 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 the solution.

REFERENCES

This study was conducted by the 3M Company, Environmental Laboratory, St. Paul, MN, Lab Request number M1655, 1994.

OTHER

Last changed: 6/26/00.

3M ENVIRONMENTAL LABORATORY

LR: M1655

Date: 5/27/94

Analyst: JBD

Daphnia magna
48-hour Toxicity Test Data Summary

SAMPLE: FC-603F (Lot #501)

Sample Conc. (mg/L)	No. Organisms Exposed	% Immobilized @	
		24 hours	48 hours
100	20	0	0
180	20	0	0
320	20	0	0
560	20	0	0
1000	20	0	0

24 h EC50 (95% C.I.) = > 1000 mg/L
48 h EC50 (95% C.I.) = > 1000 mg/L

EC50 Estimation Method: N/A

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ENVIRONMENTAL LABORATORY

LR M1655

48-HR ACUTE TOXICITY TO DAPHNIA, DAPHNIA MAGNA

TYPE TEST: STATIC X STATIC RENEWAL _____

TEST SUBSTANCE: FL-603F (Lot # 501)

DILUTION WATER: CARBON-FILTERED WELL WATER (3M WELL #2, ST. PAUL, MN)
TEMP. 22 °C, pH 8.4 D.O. 8.3 mg/L

TEST DAPHNID SOURCE: U.S.EPA-NETAC, Duluth, Mn DATE RECEIVED: 6-23-90

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

LOADING RATE: 10 µg / 10 mL soln. TEST SOLUTION VOLUME: 50 mL SIZE OF TEST VESSELS: 100 mL

DATE INITIATED: 5-25-94 DATE TERMINATED: 5-27-94

TEST VESSEL	INITIAL CONC. mg/L	TOTAL AMOUNT ADDED*	MORTALITY -			
			24-HR	48-HR	pH	D.O. mg/L
BK1	CONTROL	-	C	C	8.4	8.3
BK2	CONTROL	-	C	C	8.4	8.3
BK3	CONTROL	-	C	C	8.4	8.3
BK4	CONTROL	-	C	C	8.4	8.3
1.1	100	20	C	C	8.4	8.3
1.2			C	C	8.4	8.3
1.3			C	C	8.4	8.3
1.4			C	C	8.4	8.3
2.1	180	36	C	C	8.4	8.2
2.2			C	C	8.4	8.2
2.3			C	C	8.4	8.2
2.4			C	C	8.4	8.2
3.1	300	60	C	C	8.4	8.0
3.2			C	C	8.4	8.0
3.3			C	C	8.4	8.0
3.4			C	C	8.4	8.0
4.1	560	112	C	C	8.4	7.6
4.2			C	C	8.4	7.4
4.3			C	C	8.4	7.6
4.4			C	C	8.4	7.5
5.1	1000	200	C	C	8.4	6.6
5.2			C	C	8.4	6.7
5.3			C	C	8.4	6.7
5.4			C	C	8.4	6.4

TEMP. °C 20 DATE 5-26-94 ANALYST JBS
EC50 (95% C.I.) mg/L > 1000 mg/L

COMMENTS

100 µL (mL) of 2000 mg/L stock soln. diluted to 200 mL & divided into 100 µL aliquots
Initial pH higher than tested (1000 mg/L) = 8.4

ANALYST:

JBS

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