

ACUTE TOXICITY TO FISH (FATHEAD MINNOW)

TEST SUBSTANCE

Identity: Mixture containing perfluorooctanesulfonate which may also be referred to as PFOS, FC-95, or as a component of FC-3003. (1-Octanesulfonic acid) (CAS # 2795-39-3).

Remarks: The 3M production lot number was not given. The test sample is FC-3003. Current information indicates it is a mixture of 1% PFOS, 15% diethylene glycol butyl ether, 79.39% water, 2% Sultone foamer, 1.5% sodium octyl sulfate, 1% sodium decyl sulfate, 0.06% sodium lauryl sulfate, and 0.05% benzotriazole.

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

METHOD:

Method: OECD Guideline.

Type: Acute static range-finding study

GLP: No

Year completed: 1997

Species: *Pimephales promelas*

Supplier: Aquatic Biosystems, Inc., Fort Collins, CO

Analytical monitoring: Temperature, pH, and DO.

Exposure period: 96-hours

Statistical methods: Not given.

Test fish age: Juveniles (128-132 days)

Length and weight: Average length = 23 mm
Average weight = 0.09786 g (wet)

Loading: 0.2936 g/L

Pretreatment: None

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: The test material was added directly to the dilution water on a weight/volume basis.

Concentrations dosing rate: Once.

Stability of the test chemical solutions: Not noted.

Exposure vessels: 1.2 L vessels containing 1.0 L test solution.

Number of replicates: One, Bk control duplicated

Number of fish per replicate: 3.

Number of concentrations: three plus 2 blank controls

Water chemistry during the study:

pH range (0-96 hours):

7.9 – 8.2 (control exposure)

7.7 – 7.9 (1000 mg/L exposure)

Temperature range (0-96 hours): 18.5 °C

Dissolved oxygen range (0-96 hours):

7.8 – 8.5 mg/L (control exposure)

4.5 – 8.6 mg/L (1000 mg/L exposure)

RESULTS

Nominal concentrations: Blank control, 10, 100, and 1000 mg/L

Element values: 96-hour LC₅₀ = <1000 mg/L but >100 mg/L

Element values based on nominal concentrations

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

CONCLUSIONS

The test sample 96-hour LC₅₀ for fathead minnow was determined to be <1000 mg/L. The 1000 mg/L exposure caused 66% mortality while the 100 mg/L exposure had no mortality.

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

DATA QUALITY

Reliability: Klimisch ranking = 3. The study is a range-finding, with limited exposure concentrations and test organisms. 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 R1331, 1997.

OTHER

Last changed: 6/27/00

ENVIRONMENTAL LABORATORY

LR R1331
PG 1 of 296-HR ACUTE TOXICITY TO FATHEAD MINNOW, *PIMEPHALES PROMELAS*TYPE TEST: STATIC X STATIC RENEWAL _____TEST SUBSTANCE: FC-3003 AFFF (Australia)RANGE
FINDERDILUTION WATER: CARBON-FILTERED WELL WATER (3M WELL #2, ST. PAUL, MN)
Temp. _____ °C, pH _____, D.O. _____ mg/LTEST FISH SOURCE: Aquatic Bio Systems DATE RECEIVED: 2-18-97FISH AGE: 128-132 AVG. WT.: 0.09786 ± 0.00469g AVG. SIZE: 2.3 ± 0.3 cmNO. OF FISH/TEST CHAMBER: 3 LOADING RATE: 0.2936TEST SOLUTION VOLUME: 1.0 L SIZE OF TEST VESSELS: 1.2 LDATE INITIATED: 4-14-97
1100 AM TKSDATE TERMINATED: 4-18-97 1130 TKS

TEST VESSEL	INITIAL CONC. mg/L	TOTAL AMOUNT mg ADDED	MORTALITY											
			24-HR	pH	D.O. mg/L	48-HR	pH	D.O. mg/L	72-HR	pH	D.O. mg/L	96-HR	pH	D.O. mg/L
1A	BLK	—	0	7.9	7.8	0	7.9	8.0	0	8.0	8.5	0	8.1	7.9
1B	CONTROL	—	0	7.9	8.1	0	7.9	8.0	0	8.1	8.5	0	8.2	8.4
2A	10	10	0	8.0	8.6	0	8.0	7.9	0	8.1	8.5	1	8.2	8.1
3A	100	100	0	7.9	7.9	0	7.9	7.0	0	8.0	7.6	0	8.1	7.0
4A	1000	1000	1	7.9	8.6	1	7.7	4.5	2	7.9	7.3	2	7.9	5.8
TEMP. °C 18.5°			18.5°C 1110AM			18.5°C 2:15PM			18.5°C 1130AM					
DATE / ANALYST 4-15-97 1100 TKS			4-16-97 TKS			4/17/97 SAB			4-18-97 TKS					

LC50 (95% C.I.)

4-21-97
1000 < 1000 mg/L

COMMENTS

Initial pH of highest conc tested 7.7 - sample dissolved readily in water with stirring. Conc. 4A (1000 mg/L) was remade on 4-16-97 due to low DO reading

SECONDARY EFFECTS: S = Surfacing; E = Loss of Equilibrium; Q = Quiescent; R = Erratic Swimming; H = Hemorrhaging

ANALYST:

TKS

Environmental Laboratory

LR: R1331
 Date: 4-18-97
 Initials: TWS
 Page 2 of 2

96-Hour Acute Toxicity To Fathead Minnow, *Pimephales Promelas*

Loading Rate Data Sheet

Test Substance: FC-3003 AFFF (AUSTRALIA)

Fish #	Weight, (g)	Length, (cm)
1	0.0916	2.4
2	0.0322	1.8
3	0.1233	2.5
4	0.1144	2.5
5	0.0872	2.0
6	0.0942	2.5
7	0.0661	2.2
8	0.0633	2.5
9	0.0964	2.2
10	0.2089	2.6
Average	0.09786	2.3

Loading Rate Calculation :

Avg. wt. (g.): 0.09786

Std. Dev: 0.0469

No. fish/vessel: 3

Vol./vessel: 1 L

0.29358g. fish 1 L

Loading rate: 0.2936