

ACUTE TOXICITY TO FISH

TEST SUBSTANCE

Identity: A mixture containing perfluorooctanesulfonate, which may also be referred to as PFOS, FC-95, or as a component of FC-206CE. (1-Octanesulfonic acid) (CAS # 2795-39-3).

Remarks: The 3M production lot number was 502. The test sample is FC-206CE (2/16/89). Current information indicates it is a mixture of 0.92% PFOS, 15% diethylene glycol butyl ether, 76.09% water, 4% urea, 1.28% Sultone foamer, 1.55% sodium octyl sulfate, 1.05% polyoxyethylene monoethylphenyl ether, 0.06% sodium lauryl sulfate, 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 Method 203 and U.S. EPA Method EG-9

Type: Acute static-renewal

GLP: No

Year completed: 1989

Species: *Pimephales promelas*

Supplier: Aquatic Bio Systems, Inc., Fort Collins, CO

Analytical monitoring: Temperature, pH, and DO

Exposure period: 96-hours

Statistical methods: Not given.

Test fish age: Juveniles

Length and weight: Average length = 19.9 mm
Average weight = 0.06 g (wet)

Loading: 0.20 g fish/L

Pretreatment: None

Test conditions:

Dilution water: Carbon-filtered well water

Dilution water chemistry:

Temperature: 20 °C

DO: 9.6 mg/L

pH: 8.0

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: Daily

Stability of the test chemical solutions: Not noted

Exposure vessels: 4 L Pyrex glass cylindrical tanks containing 3 L of solution.

Number of replicates: 2

Number of fish per replicate: 10
Number of concentrations: one plus a blank control
Water chemistry during the study:
 pH range (0-96 hours):
 7.9 – 8.0 (control exposure)
 7.9 – 8.0 (1000 mg/L exposure)
 Temperature range (0-96 hours): 20-21 °C
 Dissolved oxygen range (0-96 hours):
 7.8 – 9.6 mg/L (control exposure)
 3.6 – 9.6 mg/L (1000 mg/L exposure)

RESULTS

Nominal concentrations: Bk control and 1000 mg/L

Element values: 96-hour LC50 = >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-206CE 96-hour LC₅₀ for fathead minnow was determined to be >1000 mg/L.

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

DATA QUALITY

Reliability: Klimisch ranking 2. Testing 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 G1358-2, 1989.

OTHER

Last changed: 6/26/00

ENVIRONMENTAL LABORATORY
FISH TOXICITY DATA SHEET
DEFINITIVE (FULL-SCALE TEST)

EAR

LR 41358-2

TYPE TEST 96 Hr. Acute Static CHEMICAL TESTED EC 2016 CE 2/16/89 LOT 502
TEST ORGANISM Fathead minnow SOURCE Aquatic Biosystems, Inc. DATE REC'D. 3/15/89 BATCH NO. 5/89
AVG. WT. 0.040 ± 0.015 grams AVG. SIZE 1.99 ± 0.16 cm NO. OF ORGANISMS PER TREATMENT 10
LOADING FACTOR 0.20 g/L FISH DISEASE TREATMENT NONE
TEST VESSEL: 4 Liter Pyrex^R glass cylindrical tank TEST SOLUTION VOLUME 3 L
TIME STARTED 9:30am DATE STARTED 5/11/89 DATE COMPLETED 5/15/89
DILUTION WATER Carbon-filtered well water (Temp. 20 °C, D.O. 9.6 mg/L, pH 8.0)
ANALYST Schelle Fabideau LC₅₀ (95% Confidence Limits) >1000 mg/L

Tank No.	Initial Conc. mg/L	Total Amount Added mg	24 Hours			48 Hours			72 Hours			96 Hours		
			Total No. Dead	pH	D.O. mg/L	Total No. Dead	pH	D.O. mg/L	Total No. Dead	pH	D.O. mg/L	Total No. Dead	pH	D.O. mg/L
I	Control	—	0	7.9	8.2	0	7.9	8.1	0	8.0	7.8	0	7.9	8.3
II	Control	—	0	7.9	8.2	0	7.9	8.1	0	8.0	7.7	0	7.9	8.4
1	1000	3000 *	0	7.9	5.0	0	7.9	5.1	0	8.0	3.9	0	7.9	4.9
2	1000	3000	0	7.9	5.8	0	7.9	5.2	0	8.0	3.6	0	7.9	4.5
Test Temp. °C			20			20			21			20		
Initials & Date			R ³ 5/12/89			R ³ 5/13/89			R ³ 5/14/89			R ³ 5/15/89		

COMMENTS: * Individual weights. Test material appearance; clear yellow, foamy liquid; miscible with water. Initial pH of 1000 mg/L, 7.9.
SECONDARY EFFECTS (OTHER THAN MORTALITY)

Tank No.	Symptoms or Reactions	Total Number Affected			
		24-Hr.	48-Hr.	72-Hr.	96-Hr.
I		NONE	NONE	NONE	NONE
II					
1					
2					

Test methodology conforms with the following two test protocols:

- (1) OECD #203 "Fish, Acute Toxicity Test".
- (2) US-EPA #EG-9 "Fish Acute Toxicity Test".

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