

MICROBICS MICROTOX® TOXICITY TEST

TEST SUBSTANCE

Identity: A mixture containing perfluorooctanesulfonate, which may also be referred to as PFOS, FC-95 or as a component of FC-201AF. (1-Octanesulfonic acid) (CAS # 2795-39-3).

Remarks: The 3M production lot number was not noted. The test sample is FC-201AF. Current information indicates it is a mixture of 3% PFOS, 18.59% diethylene glycol butyl ether, 37.81% water, 14% ethylene glycol, 8.25% Acrylic foamer, 9% sodium octyl sulfate, 0.3% sodium lauryl sulfate, 3% triethanolamine, 6% sulfonated alkyl ether salts, 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: Microbics Microtox® "BASIC" Procedure

Test type: Acute static

GLP: No

Year Completed: 1995

Species: *Photobacterium phosphoreum*

Analytical monitoring: pH and osmotic condition.

Exposure period: 30-minutes

Statistical methods: EC50 values calculated by statistical linear regression program provided for Microtox®

Test organism source: Microbics' Reagent.

Test conditions:

Diluent: Millipore Milli-Q™ water

Test temperature: Not noted.

Stock and test solution preparation: A 1000 mg/L primary stock solution was prepared in Millipore Milli-Q™ water. The pH of the stock solution was 6.8. An osmotic adjustment was made using 200 mg NaCl dissolved in 10 mL stock solution. Appearance of test solutions was noted as "clear and colorless". All test solutions were made by proportional dilutions.

Exposure vessels: 4 mL cuvettes.

Number of replicates: two

Number of concentrations: Four plus a blank control

Element basis: Percent light loss

RESULTS

Nominal concentrations: Blank control, 62.5, 125, 250, and 500 mg/L

Element value: 5-minute EC₅₀ = 154 (141 – 167) mg/L
 15-minute EC₅₀ = 88 (87 - 88) mg/L
 30-minute EC₅₀ = 63 (61 – 64) 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 test substance 30-minute EC₅₀ for *Photobacterium phosphoreum* was determined to be 63 mg/L, with a 95% confidence interval of 61 to 64 mg/L.

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

DATA QUALITY

Reliability: Klimisch ranking 3. Data sheets for the 30-minute exposure could not be located. 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 Environmental Laboratory, St. Paul, Minnesota, Lab Request number N2964 1995.

OTHER

Last changed: 6/26/00.

06/25/2000

ENVIRONMENTAL LABORATORY
ARCHIVED FINAL REPORT

1

LAB REQUEST NO. N2964
REQUESTOR NAME: SBS/SHARILYN LOUSHIN
DEPARTMENT: 3058
PROJECT NO: BILTWENVIR
DATE RECEIVED: 08/24/1995
DESC: FC-201AF (L-13652)

CONTRACT LAB(S):
EXP COMP DATE: 11/03/1995
DATE COMPLETED: 12/02/1995
PROJECT LEAD: TL HATFIELD
PHONE NO: 651-778-7863
3M FAX NO: 651-778-6176

07-2573-9.

Results From Activated Sludge Respiration Inhibition Test:

Test Conc. mg/l	Percent Inhibition in Respiration Rate 30-min Exp.	3-hr Exp.
1000	0	0
1000 (dup)	0	0
EC50	> 1000	> 1000

sab 9/20/95

BOD and COD will be on a separate lab request.
sab 9/20/95

Results from 48-hour Daphnia magna Toxicity Test:
No immobilization was seen after 48-hour exposure to 1000 mg/L.
sab 9/28/95

Toxicity to the freshwater green algae, *Selenastrum capricornutum* can be found on lab request N3281.
sab 10/3/95

Results from Microtox Test:

Test Conc. mg/L	Percent Light Loss 5-Min Exp.	15-Min Exp.	30-Min Exp.
62.5	24	37	50
125	46	64	76
250	64	78	86
500	76	86	92
EC50	154	88	63
95% CI	(141-167)	(87-88)	(61-64)

GWJ 12/01/95

Results from 96-hr Fathead Minnow Toxicity Test:

Test was run as a static-renewal. Beakers were renewed at 48 and 72-hrs of exposure. This was done because the dissolved oxygen levels dropped below the required 60% of saturation. GWJ 12/01/95.

Test Conc. mg/L	Percent Mortality 24-hrs exp.	48-hrs exp.	72-hrs exp.	96-hrs exp.
100	0	0	5	5
180	0	5	5	10
320	5	30	35	45
560	100	100	100	100
1000	100	100	100	100
LC50	410	350	345	310
95% CI	(390-435)	(305-395)	(300-400)	(270-370)
% Trim	0	0	5	5

Trimmed Spearman-Kärber Statistical Program was used to calculate LC50's.

GWJ 12/01/95.

SAMPLE	DATE	CODE	DESCRIPTION	RESULT	MDL or (95% C.I.)
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06/25/2000			ENVIRONMENTAL LABORATORY ARCHIVED FINAL REPORT		2
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LAB REQUEST NO. N2964 CONTINUED

SAMPLE	DATE	CODE	DESCRIPTION	RESULT	MDL or (95% C.I.)
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1		FC-201AF	Dr Green liq		
48-HR-EC50		DAPHNIA ACUTE TEST	>1000 MG/L	(-)	
96-HR-LC50		FISH ACUTE TEST - 96 HOUR	310 MG/L	(270 - 370)	
MICROTOX		MICROTOX - EC50	63 MG/L	(61 - 64)	
SLUDG-RESP		SLUDGE RESPIRATION - EC50	>1000 MG/L	(-)	

3RD RUN

ENVIRONMENTAL LABORATORY: MICROTOX PREP SHEET

LR: 112964
Date: 10/17/95
Analyst: GWJ

TEST SUBSTANCE: FC-201AF

1. Preparation of Stock Solution

- * Mass/Vol. Test Substance: 100mg/100mL
- * Final Dilution Volume: 1g/L
- * Diluent: NH₄OH
- * Final Concentration of Stock Solution: 1g/L

2. pH Adjustment of Stock Solution

- * Initial pH of Stock Solution: 6.8
- * pH Adjusted to: —
- * pH Adjusted with: —

3. Osmotic Adjustment of Stock Solution

- * Osmotic Adjuster: N₂O
- * Comments: Added 10 mL of 1g/L stock soln to 200mg NaCl

4. Appearance of pH and Osmotically Adjusted Stock Solution

* CLEAR or OPAQUE (circle one)

* Color: —

* Comments: —

5. Comments

—
—
—

MICROTOX DATA REPORT
Basic Test

FILE N2964-3.K5
FC-201AF

Test Time: 5 minutes

Osmotic Adjustment: NaCl

NUMBER	IG/IT	CONC.	CR/GAMMA	<u>Light</u> <u>Loss</u>	<u>Mean %</u> <u>Light Loss</u>
Control	95.33/ 64.70	0.0	0.6787 #	—	—
Control	89.00/ 62.54	0.0	0.7027 #	—	—
1	90.93/ 48.27	62.5000	0.301	23	24
2	89.09/ 46.65	62.5000	0.319 #	24	
3	89.17/ 34.01	125.0000	0.611 #	45	46
4	88.06/ 33.07	125.0000	0.636 #	46	
5	87.57/ 21.50	250.0000	1.813 #	64	64
6	82.89/ 21.36	250.0000	1.680 #	63	
7	85.15/ 14.23	500.0000	3.133	76	76
8	82.78/ 13.53	500.0000	3.226	76	

CR = CORRECTION FACTOR = 0.6907
* Used for calculations

EC50 153.6973 MG/L (95% CONFIDENCE RANGE: 141.3419 TO 167.1328)

Signature

TEST DATE: 10/17/95
TIME: 11:00 AM

[illegible]

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1 > zzzzzzzzzzzzzzzzzzzzzzzzzzzzzzz

103

ESTIMATING ABILITY: $\rho = 0.954$ $\rho_{G1} = 0.986$
 G1: NON-DEGREE MAJOR: $\rho = 0.992$ $\rho_{G1} = 0.950$
 G2: DEGREE OF NONDEGREE MAJOR: $\rho = 0.992$

MICROTOX DATA REPORT
Basic Test

FILE N2964-3.K15
FD-201AF

Test Time: 15 minutes

Osmotic Adjustment: NaCl

NUMBER	IO/IT	CONC.	CR/GAMMA	SLUG	WATER
Control	95.33/ 57.01	0.0	0.5380 #	—	—
Control	89.60/ 56.07	0.0	0.5360 #	—	—
1	90.93/ 35.37	62.5000	0.579 #	37	37
2	89.69/ 34.60	62.5000	0.581 #	37	37
3	89.17/ 19.88	125.0000	1.754 #	64	64
4	88.06/ 19.33	125.0000	1.797	64	64
5	87.57/ 11.63	250.0000	3.648	77	73
6	82.89/ 11.45	250.0000	3.445	78	73
7	85.15/ 7.58	500.0000	5.895	82	74
8	82.78/ 7.30	500.0000	5.923	82	74

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CR = COCORRECTION FACTOR = 0.6140
# Used for calculations
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8056 87.9242 MG/L (95% CONFIDENCE RANGE: 87.3617 TO 88.4901)

Signature _____

TEST DATE: 10/17/95
TIME: 11:00 AM

TIME: 11:00 AM

[illegible]

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SSLOPE = 1.5972
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G
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M
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1 > ZZZZZZZZZZZZZZZZZZZ

EC50

ESTIMATING ROTATION LOG C= 0.8261 101 2 252420

95% CONFIDENCE FACTOR: 0.0674 (13.0) (13.5%)

COEFFICIENT OF DETERMINATION R^2 0.9999