

MICROBICS MICROTOX® TOXICITY TEST

TEST SUBSTANCE

Identity: Mixture containing perfluorooctanesulfonate which may also be referred to as PFOS, FC-95, or as a component of FC-203FC. (1-Octanesulfonic acid) (CAS # 2795-39-3).

Remarks: The 3M production lot number was not noted. The test sample is FC-203FC. Current information indicates it is a mixture of 0.85% PFOS, 17% diethylene glycol butyl ether, 74.46% water, 2.34% acrylic foamer, 1.7% alkyl ether sulfate, 2.55% sodium octyl sulfate, 0.12% sodium nitrite, 0.09% sodium molybdate, 0.85% triethanolamine, and 0.04% tolyltriazole.

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: Microbics Microtox® "BASIC" Procedure

GLP: No

Year Completed: 1997

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 2 g/L primary stock solution was prepared by dissolving 200 mg of test substance in 100 mL of Millipore Milli-Q™ water. The pH of the stock solution was 6.6. An osmotic adjustment was made using 200 mg NaCl dissolved in 10 mL of stock solution. Appearance of test solutions was noted as "clear". 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, 125, 250, 500, and 1000 mg/L

Element value: 5-minute EC₅₀ = 604 (572 – 637) mg/L
 15-minute EC₅₀ = 444 (423 – 466) mg/L
 30-minute EC₅₀ = 363 (349 – 376) 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 FC-203FC 30-minute EC₅₀ for *Photobacterium phosphoreum* was determined to be 360 mg/L with a 95% confidence interval of 350 to 380 mg/L.

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

DATA QUALITY

Reliability: Klimisch ranking = 2. This study meets all 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 Environmental Laboratory, St. Paul, MN, Lab Request number R1335, 1997.

OTHER

Last changed: 6/26/00.

ENVIRONMENTAL LABORATORY: MICROTOX PREP SHEET

LR: R1335
Date: 3-17-97
Analyst: TKS
Pg 1 of 7

TEST SUBSTANCE: FC-203FC AFFF

1. Preparation of Stock Solution

- * Mass/Vol. Test Substance: 200mg/100ml
- * Final Dilution Volume: 2g/L
- * Diluent: Milli-Q water
- * Final Concentration of Stock Solution: 2g/L

2. pH Adjustment of Stock Solution

- * Initial pH of Stock Solution: 6.6
- * pH Adjusted to: -
- * pH Adjusted with: -

3. Osmotic Adjustment of Stock Solution

- * Osmotic Adjuster: NaCl
- * Comments: 10ml of stock solution was added to 200mg NaCl

4. Appearance of pH and Osmotically Adjusted Stock Solution

* CLEAR or OPAQUE (circle one)

* Color: clear

* Comments: _____

5. Comments

MICROTOX DATA REPORT
Basic Test

FILE: R1335.K5

EC-203EC AFEF 3-17-97 TRS

Test Time: 5 minutes

Osmotic Adjustment: NaCl

NUMBER	IO/IT	CONC.	CR/GAMMA	% EFFECT	AV % α DIFF.
Control	95.31/ 84.83	0.0	0.8900 #		
Control	96.36/ 86.39	0.0	0.8965 #		
1	98.44/ 74.47	125.0000	0.181	15.3	
2	93.37/ 73.36	125.0000	0.143	12.5	13.9 α 1.4
3	93.44/ 63.62	250.0000	0.312	23.8	
4	97.31/ 63.69	250.0000	0.365 #	26.7	25.3 α 1.5
5	95.16/ 47.22	500.0000	0.800 #	44.5	
6	89.96/ 45.85	500.0000	0.753 #	42.9	43.7 α 0.8
7	94.42/ 30.05	1000.0000	1.807 #	64.4	
8	84.65/ 26.26	1000.0000	1.880 #	65.3	64.8 α 0.5

CR = CORRECTION FACTOR = 0.8933

Used for calculations

EC50 603.5 mg/L (95% CONFIDENCE RANGE: 571.5 TO 637.3)

Signature *Ludy Styfenberg* TEST DATE: 3-17-97
TIME: _____

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TKS
3-17-97

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ESTIMATING EQUATION: $\log C = 0.8450 \times \log b + 2.7807$
95% CONFIDENCE FACTOR: 1.05599 FOR EC50
COEFFICIENT OF DETERMINATION: $R^2 = 0.99676$

MICROTOX DATA REPORT
Basic Test

FILE: R1335.K15

EC-203FC AFFF 3-17-97 TKS

Test Time: 15 minutes

Osmotic Adjustment: NaCl

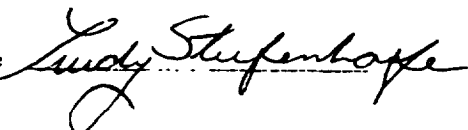
NUMBER	IO/IT	CONC.	CR/GAMMA	% EFFECT	AV % q DIFF.
Control	95.31/ 79.00	0.0	0.8289 #		
Control	96.36/ 79.87	0.0	0.8289 #		
1	98.44/ 65.75	125.0000	0.241	19.4	
2	93.87/ 65.77	125.0000	0.183	15.5	17.4 q 2.0
3	93.44/ 54.00	250.0000	0.434 #	30.3	
4	97.31/ 53.96	250.0000	0.495 #	33.1	31.7 q 1.4
5	95.16/ 35.55	500.0000	1.219 #	54.9	
6	89.96/ 35.23	500.0000	1.117 #	52.8	53.8 q 1.1
7	94.42/ 19.73	1000.0000	2.967 #	74.8	
8	84.65/ 17.36	1000.0000	3.042 #	75.3	75.0 q 0.2

CR = CoCORRECTION FACTOR = 0.8289

Used for calculations

EC50 443.7 mg/L (95% CONFIDENCE RANGE: 422.7 TO 465.7)

Signature



TEST

DATE: 3-17-97

TIME: _____

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ESTIMATING EQUATION: $\text{LOG } C = 0.7391 \times \text{LOG } b + 2.6471$
95% CONFIDENCE FACTOR: 1.04968 FOR EC50
COEFFICIENT OF DETERMINATION: $R^2 = 0.99635$

MICROTOX DATA REPORT Basic Test

FILE: R1335.K30

FC-203FC AFFF 3-17 97 TKS

Test Time: 30 minutes

Osmotic Adjustment: NaCl

NUMBER	IO/IT	CONC.	CR/GAMMA	% EFFECT	AV % q DIFF.
Control	95.31/ 73.01	0.0	0.7660 #		
Control	96.36/ 73.74	0.0	0.7653 #		
1	98.44/ 60.31	125.0000	0.250 #	20.0	
2	93.87/ 58.48	125.0000	0.229 #	18.6	19.3 q 0.7
3	93.44/ 45.74	250.0000	0.564 #	36.1	
4	97.31/ 47.30	250.0000	0.575 #	36.5	36.3 q 0.2
5	95.16/ 26.99	500.0000	1.699 #	63.0	
6	89.96/ 27.71	500.0000	1.486 #	59.8	61.4 q 1.6
7	94.42/ 14.33	1000.0000	4.045 #	80.2	
8	84.65/ 12.96	1000.0000	4.001 #	80.0	80.1 q 0.1

CR = CoCORRECTION FACTOR = 0.7656

Used for calculations

EC50 362.6 mg/L (95% CONFIDENCE RANGE: 349.1 TO 376.5)

Signature Ludy Shupenhan TEST DATE: 3-17-97
TIME: _____

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FILE:R1335.K30 PAGE 2

ESTIMATING EQUATION: $\text{LOG } C = 0.7283 \times \text{LOG } b + 2.5594$
95% CONFIDENCE FACTOR: 1.03851 FOR EC50
COEFFICIENT OF DETERMINATION: $R^2 = 0.99762$