

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-602. (1-Octanesulfonic acid) (CAS # 2795-39-3).

Remarks: The 3M production lot number was 501. The test sample is FC-602. Current information indicates it is a mixture of 1% PFOS, 12% diethylene glycol butyl ether, 61.05% water, 20% ethylene glycol, 2% Sultone foamer, 1% sodium octyl sulfate, 1% sodium decyl sulfate, 1% magnesium sulfate, 0.7% xanthan gum, 0.1% starch, 0.1% n-(3-chloroallyl)hexaminium chloride, and 0.05% tolytriazole.

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: 1988

Species: *Photobacterium phosphoreum*

Analytical monitoring: pH and osmotic condition.

Exposure period: 15-minutes

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

Test organism source: Microbics' Reagent.

Test conditions:

Diluent: Microbic's 2% NaCl Reagent

Test temperature: Not noted.

Stock and test solution preparation: A 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 5.5 and adjusted to 6.7. An osmotic adjustment was made using 200 mg NaCl dissolved in 10 mL stock solution. Appearance of test solutions was noted as "apparently completely miscible in DI water, no color apparent". 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 EC_{50} = 210 (190 – 230) mg/L
15-minute EC_{50} = 220 (200 – 230) 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-602 15-minute EC_{50} for *Photobacterium phosphoreum* was determined to be 220 mg/L with a 95% confidence interval of 200 to 230 mg/L.

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

DATA QUALITY

Reliability: Klimisch ranking 2. Testing 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, Minnesota, Lab Request number F1151, 1988.

OTHER

Last changed: 6/26/00.

ENVIRONMENTAL LABORATORY
MICROBICS MICROTOX^R SYSTEM

RAW DATA

TEST SUBSTANCE: FC-602 Light Water ATC Plus (41-2600-8011-8 Lot 50)TEST DATE: 1-28-88ANALYST: Ausan A. Beach

SAMPLE CUVETTE	FINAL ASSAY CONCENTRATION mg/L	INITIAL READING I(0)	FINAL READINGS		
			5-MIN. I(5)	15-MIN. I(15)	30-MIN. I(30)
B1	BLANK CONTROL	90	76	73	
C1	DUPLICATE	100	83	80	
B2	125	82	43	42	
C2	Duplicate	102	50	49	
B3	250	97	40	39	
C3	Duplicate	102	37	38	
B4	500	94	24	22	
C4	Duplicate	99	27	26	
B5	1000	99	16	15	
C5	Duplicate	98	16	15	

Test Substance:
viscous brown liquid

Stock solution, 200 mg / 100 ml DI water. Each 1 ml = 2 mg
Apparently completely miscible in DI water, no color apparent.
Stock soln. pH = 5.5 Adjusted to 6.7 with dilute NaOH
Osmotic adjustment - added 200 mg NaCl to 10 ml stock soln.

Diluent:

Microbics 2% NaCl Solution

Initial Dilutions:

Initial concentrations were double the final assay concentration mentioned above. The initial dilutions were introduced into the top row (Row A) and were then transferred (50/50) into the middle and the lower row (Rows B & C)

DI Water:

Distilled 1-24-88

Aeration started 1-27-88 pH = 6.8

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MICROBICS MICROTOX^R SYSTEM

MICROTOX^R DATA REDUCTION

Date 1-28-89

Analyst SJB
Pg 2 of 2
41-2600-8011-8 Lot

FC-602 Light water ARC Plus

$$\text{BLANK RATIOS}^* = \frac{\text{Final}}{\text{Initial}}$$

BLANK CUVETTE	5-MIN.		15-MIN.		30-MIN.	
	BLANK RATIO	DIFFERENCE	BLANK RATIO	DIFFERENCE	BLANK RATIO	DIFFERENCE
B1	76/90 = 0.844		73/90 = 0.811			
C1	83/100 = 0.830	0.014	80/100 = 0.800	0.011		

*The blank ratios for B1 and C1 should agree within 0.02.

$$\text{MEAN BLANK RATIOS} = \frac{\text{B1 BK RATIO} + \text{C1 BK RATIO}}{2}$$

5-MIN.	15-MIN.	30-MIN.
0.837	0.806	

$$\text{NORMALIZED LIGHT LOSS (F EFFECT)} = \frac{\text{Mean Blank Ratio} \times \text{Initial Sample Reading}}{\text{Final Sample Reading}} - 1$$

SAMPLE CUVETTE	5-MIN. F	15-MIN. F	30-MIN. F
Test Concentration	0.596	0.574	
B2 125 mg/L	0.707	0.678	
B3 250	1.030	1.005	
B4 500	1.307	1.163	
B5 1000	2.278	2.444	
	2.069	2.069	
	4.179	4.320	
	4.127	4.266	

$$\text{LIGHT LOSS (\% \Delta)} = \frac{F}{1+F} \times 100$$

SAMPLE CUVETTE	5-MIN. % \Delta	15-MIN. % \Delta	30-MIN. % \Delta
Test Concentration	37	36	
B2 125 mg/L	41	40	
B3 250	51	50	
B4 500	57	54	
B5 1000	69	71	
	67	67	
	81	81	
	81	81	

EFFECTIVE CONCENTRATIONS (EC's) mg/L (Calculated using "F,C" data pairs.)

EC'S	5-MIN.	15-MIN.	30-MIN.
EC ₂₀ 45		50	
EC ₅₀ (95% Confid. Limits) 210 (190-230)		220 (200-230)	
EC ₈₀ 960		930	

See pg 1 for Stock + test saln prep.

002118