MICROBICS MICROTOX® TOXICITY TEST

TEST SUBSTANCE

Identity: Perfluorooctanesulfonylamido(ethyl)acetate; may also be referred to as PFOSAA, FC-128 or as the major component of FC-127, FC-129, FC-109, or FC-109-X. (Glycine, N-ethyl-N-[(heptadecafluorooctyl)sulfonyl]-, potassium salt, CAS # 2991-51-7)

Remarks: The test sample is FC-109-X. Current information indicates it is a mixture of 19-23% test substance, 61% water, 12% 2-methoxymethylethoxypropanol, 2% ethanol, and 2-6% C_4-C_7 fluoroalkyl carboxylate compounds. Test sample was from 3M production lot 2.

The following summary is abbreviated because the test sample is a mixture of the test substance in a water/organic solvent solution. Data may not accurately relate toxicity of the test sample with that of the test substance.

METHOD:

Method: Microbics Microtox® "BASIC" Procedure
Test type: Static acute
GLP: No
Year Completed: 1987
Species: *Photobacterium phosphoreum*
Analytical monitoring: None
Statistical methods: EC_{20}, EC_{50}, and EC_{80} values calculated by statistical linear regression program provided for Microbics Microtox® system.
Test organism source: Microbics Microtox® reagent
Test conditions: As per Microbics Microtox method
Replicates: Two

RESULTS

Nominal concentrations: Blank control, 125, 250, 500, 1000 mg/L
Element value:
5-minute EC_{20} = 170 mg/L
5-minute EC_{50} = 650 (560-750) mg/L
5-minute EC_{80} = >1000 mg/L
15-minute EC_{20} = 140 mg/L
15-minute EC_{50} = 410 (320-530) mg/L
15-minute EC_{80} = >1000 mg/L

All element values based on nominal concentrations.

Remarks: Testing was conducted on the mixture of the test substance as described in the test substance remarks field. The value reported applies to that mixture and not the test substance. No attempt was made to determine the impact of the presence of the organic solvents or what portion of the toxicity can be contributed to the Perfluorooctanesulfonylamido(ethyl)acetate.

CONCLUSIONS

The FC-109-X 15-minute EC_{50} for *Photobacterium phosphoreum* was determined to be 410 mg/L with a 95% Confidence Interval of 320-530 mg/L.

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

DATA QUALITY

Reliability: Klimisch ranking 2. Testing meets all criteria for quality testing, but lacks analytical confirmation of test substance concentrations. There is a lack of characterization of the test sample.

REFERENCES

This study was conducted by the 3M Company Environmental Laboratory, St Paul, MN, Lab Request number E2113.

OTHER

Last changed: 5/18/00

E2113

Toxicity of FC-109X (41-2601-0414-0 Lot 2) SAB

To Microbial Systems

Microtox®

Test Conc. mg/L	Percent Light Loss 5-MIN Exp	15-MIN Exp
125	19	25
250	25	28
500	41	48
1000	63	79
EC_{20}	170	140
EC_{50} (95% CI)	650 (560-750)	410 (320-530)
EC_{80}	>1000	>1000

OECD Activated Sludge Respiration Inhibition Test (#209)

Test Conc. mg/L	Percent Inhibition 30-MIN Exp	3-HR Exp
100	—	5.9
180	—	12
320	—	6.1
560	2.1	3.2
1000	—	5.9
EC_{50} (95% CI)	>1000	>1000

LR E 2113

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ENVIRONMENTAL LABORATORY

MICROBICS MICROTOX^{R} SYSTEM

RAW DATA

TEST SUBSTANCE: FC-109-X (41-2661-0414-0 Lot 2) FC Surfactant

TEST DATE: 10-15-87

ANALYST: Susan 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	68	55	
C1	DUPLICATE	99	76	61	
B2	125	99	62	46	
C2	Duplicate	100	62	46	
B3	250	97	57	44	
C3	Duplicate	96	54	41	
B4	500	94	43	31	
C4	Duplicate	100	44	31	
B5	1000	94	27	12	
C5	Duplicate	99	28	13	

Test Substance: (Yellow Liquid) Stock Solution, 500 mg/250 ml DI water. Each 1 ml = 2 mg. Apparently miscible with water. Stock solution has faint color, color not apparent at highest conc. tested, 1000 mg/L. Initial pH = 9.3, adjusted to pH 6.7 with 1N H_2SO_4. After 24 Hrs, pH = 6.7 Osmotic adjustment: Added 200 mg NaCl to 10 ml pH adjusted Sample.

Diluent: Microbics 2% NaCl Solution

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

DI water used: Distilled 10-9-87, aeration started 10-11-87, pH: 6.6

LR E 2113
Date 10-15-87
Analyst SLB
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MICROBICS MICROTOX® SYSTEM

MICROTOX® DATA REDUCTION

FC-109-X (41-2601-0414-0 Lot 2)
FC Surfactant

See pg 1 for stock solution Prep.

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

BLANK CUVETTE	5-MIN. BLANK RATIO	5-MIN. DIFFERENCE	15-MIN. BLANK RATIO	15-MIN. DIFFERENCE	30-MIN. BLANK RATIO	30-MIN. DIFFERENCE
B1	68/90=0.756	0.012	55/90=0.611	0.005		
C1	76/99=0.768		61/99=0.616			

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

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

5-MIN.	15-MIN.	30-MIN.
0.762	0.614	

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

SAMPLE CUVETTE	5-MIN. Γ	15-MIN. Γ	30-MIN. Γ
Test Concentration	0.217	0.321	
B2 C2 125 mg/L	0.229	0.335	
B3 C3 250	0.297 0.355	0.354 0.438	
B4 C4 500	0.666 0.732	0.862 0.981	
B5 C5 1000	1.653 1.694	3.810 3.676	

% LIGHT LOSS (%Δ) = $\frac{\Gamma}{1+\Gamma} \times 100$

SAMPLE CUVETTE	5-MIN. %Δ	15-MIN. %Δ	30-MIN. %Δ
Test Concentration	18	24	
B2 C2 125 mg/L	19	25	
B3 C3 250	23 26	26 30	
B4 C4 500	40 42	46 50	
B5 C5 1000	62 63	79 79	

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

EC's	5-MIN.	15-MIN.	30-MIN.
EC_{20}	166	144	
EC_{50} (95% Confid. Limits)	649 (562-750)	413 (321-532)	
EC_{80}	>1000	>1000	