

ACUTE TOXICITY TO AQUATIC INVERTEBRATES (DAPHNIA MAGNA)

TEST SUBSTANCE

Identity: A mixture containing perfluorooctanesulfonate, which may also be referred to as PFOS, FC-95, or as a component of FC-600. (1-Octanesulfonic acid, 1,1,2,2,3,3,4,4,5,5,6,6,7,7,8,8,8-heptadecafluoro-, potassium salt, CAS # 2795-39-3)

Remarks: The 3M production lot number was not noted. The test sample is FC-600 (SCAS Treated Effluent*). Current information indicates FC-600 is a mixture of 1.0% PFOS, 81.20% water, 12.00% diethylene glycol butyl ether, 1.00% sodium octyl sulfate, 2.00% propane Sultone foamer, 1.00% sodium decyl sulfate, 0.85% xanthan gum, 0.1% N-(3-chloroallyl) hexaminium chloride, 0.80% starch, and 0.05 % benzotriazole.

The following summary applies to a mixture with incompletely characterized concentration of impurities that was treated in a SCAS reactor. Data may not accurately reflect the toxicity of the fluorochemical component of the test sample.

This study is the third of 3 daphnia studies conducted to determine the toxicity of FC-600 after being treated through a SCAS reactor. This study is the control for the FC-600 SCAS Treated Effluent study. It used the supernatant of a mixed microbial culture that initially contained no FC-600. The effluent was collected after 4 hours of treatment in a SCAS reactor. The inoculum used came from the Metro Wastewater Treatment Plant, St. Paul, MN.

METHOD:

Method: Not noted.

Type: Static acute

GLP: No

Year completed: 1977

Species: *Daphnia magna*

Supplier: Not noted.

Analytical monitoring: Dissolved oxygen

Exposure period: 48-hours

Test organism age: Not noted.

Statistical method: EC₅₀ calculated by graphing data and by probit analysis.

Test conditions:

Dilution water: Carbon-filtered well water, aerated.

Dilution water chemistry:

Dissolved oxygen: 9.4 mg/L

Lighting: Not noted.

Stock and test solution preparation: Volume/volume direct addition to test vessels.

Exposure vessels: Not noted.

Number of replicates: two

Number of daphnids per replicate: 10

Number of concentrations: six

Water chemistry during the study:

Dissolved oxygen (final):

7.5 mg/L (5.6% exposure)

6.5 mg/L (100% exposure)

RESULTS

Nominal concentrations: 5.6%, 10%, 18%, 32%, 56%, and 100%

Element values: 48-hour EC₅₀ = 15 (13 – 18) %

Element values based on nominal concentrations

Remarks: Testing was conducted on the supernatant created from a SCAS study as described in the Test Substance Remarks field. The values reported apply to that solution and not the test substance.

CONCLUSIONS

The SCAS treated effluent 48-hour EC₅₀ was determined to be 15% with a 95% confidence interval of 13 to 18%.

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DATA QUALITY

Reliability: Klimisch ranking = 3. This study lacks description of the methodology used, reporting of test conditions, and information on characteristics of the effluent after SCAS treatment.

REFERENCES

This study was conducted by 3M Company, Environmental Laboratory, St. Paul, MN, 1977.

OTHER

Last changed: 6/28/00

ENVIRONMENTAL ENGINEERING LABORATORY
 AQUATIC TOXICITY WORK SHEET
Type Test 48 96 Hours - TOLERANCE STUDY

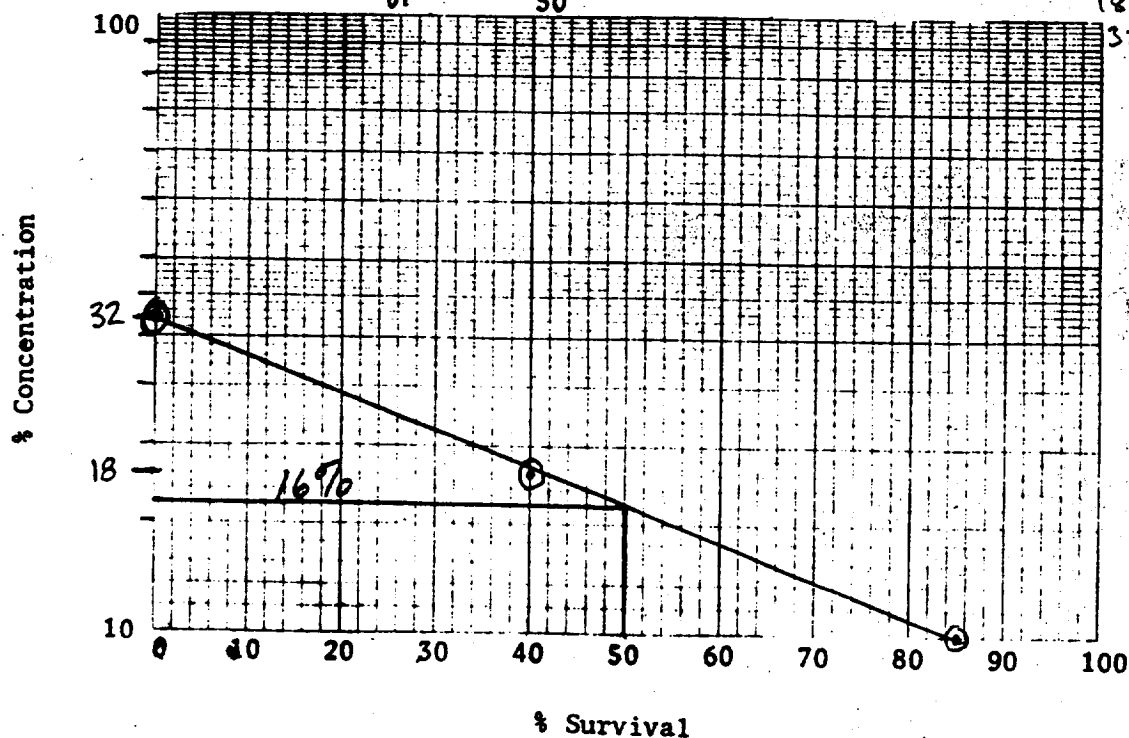
FC 600

Material Tested SCAS CONTROL (SUPERNATANT)Test Organism DAPHNIA MAGNA
Rathead Minnow

Avg. Weight _____ Avg. Size _____

Date Started 8/8/77Date Completed 8/10/77Time Started 1:30 pmPlotted LC₅₀ 16.9%Dilution Water Carbon Filtered - Well Water (ARE AERATED TO 9.4 mg/l)

	24 hrs				48 hrs				72 hrs				96 hrs			
	Conc.	Survival	pH	D.O. ppm	Survival	pH	D.O. ppm	Survival	pH	D.O. ppm	Survival	pH	D.O. ppm			
#1	5.6%	100			100			100			7.5					
#2	Control	100			100			100			7.2					
2-1	* 10%	100			100			85			7.2					
2-2	18	65			45			40			7.0					
2-3	32	20			5			0			7.2					
2-4	56	0			0			0			7.2					
2-5	100	0			0			0			7.5					
											6.5					
Average Temperature				69	69				68							

 Comments: * 10% - 100% by volume
 INITIAL D.O. 9.0 mg/l
LC₅₀ Calculation

	LOG CONC.	FRACTION RESPONDING	FITTED FRACTION
26	0.748188	0.00	0.00248802
10	1.000000	0.15	0.1152764
18	1.255273	0.6	0.6674335
32	1.505151	1.0	0.9788281

CHI-SQ PROBABILITY IS > 0.05

NO OF ITERATIONS	INTERCEPT (A)	SLOPE (B)	CHI-SQ FOR LINEARITY	CHI-SQ FOR PROBABILITY
6	7.591235	6.392296	1.128667	0.5687392

HETEROGENEITY FACTOR (H) = 1

LB-50 = 15.40139

95 PCT LOWER CONF. LIMIT =

95 PCT UPPER CONF. LIMIT =

G = 0.1425519

13.10521

18.10328

FC-600
SCAS CONTROL
(SUPERNATANT)

REPORT TO BE ON FILE