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 FX-3104. (1-Octanesulfonic acid) (CAS # 2795-39-3).

Remarks: The 3M production lot number was not noted. The test sample is FX-3104, 6%. Current information indicates it is a mixture of 0.48% PFOS, 14.09% diethylene glycol butyl ether, 59% water, 17.6% ethylene glycol, 1.44% sodium octyl sulfate, 4% inhibitor, 2.0% polyoxyethylene monooctylphenyl ether, 1.25% propane sultone foamer, 0.03% sodium lauryl sulfate, and 0.1% benzotriazole.

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: Not given.
Type: Static acute
GLP: No
Year completed: 1985
Species: *Daphnia magna*
Supplier: In-house cultures. Originally obtained from U.S. EPA-ERL, Duluth, MN.
Analytical monitoring: Temperature, pH, and dissolved oxygen.
Exposure period: 48-hours
Test organism age: <24 hours old
Statistical methods: EC_{50} values calculated using logistic regression methods (probit analysis).
Test conditions:
Dilution water: Carbon-filtered well water.
Dilution water chemistry: Not given.

Lighting: Not given.
Stock and test solution preparation: A primary stock solution was prepared by dissolving 1000 mg of test substance in 500 mL water. Exposure concentrations were prepared by addition of stock solution to each vessel.
Exposure vessels: 250 mL glass beakers containing 200 mL exposure solution at a depth of 6 cm.
Number of replicates: 2
Number of daphnids per replicate: 10
Number of concentrations: five plus a blank control
Water chemistry during the study:

pH range (0-48 hours):
8.1 – 8.2 (control exposure)
7.7 – 8.1 (1000 mg/L exposure)
Temperature range (0-48 hours): 22 °C
Dissolved oxygen range (0-48 hours):
8.9 – 9.3 mg/L (control exposure)
7.5 – 9.3 mg/L (1000 mg/L exposure)

RESULTS

Nominal concentrations: Blank control, 100, 180, 320, 560, and 1000 mg/L.

Element values: 48-hour EC_{50} = >1000 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 48-hour EC_{50} was determined to be >1000 mg/L.

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

DATA QUALITY

Reliability: Klimisch ranking = 3. Study lacks description and records of method followed. The study lacks information on purity of the test substance and analytical confirmation of the amount of fluorochemical proportion in solution.

REFERENCES

This study was conducted by the 3M Company, Environmental Laboratory, St. Paul, MN, Lab Request number C1111-2, 1985.

OTHER

Last changed: 6/26/00.

ENVIRONMENTAL LABORATORY
AQUATIC TOXICITY DATA SHEET

LR CIIII-2

TEST TYPE: Ext. Acute Static CHEMICAL TESTED EX-3104 6% LOT _____

TEST ORGANISM Daphnia magna SOURCE USEPA-ERL Duluth, Mn. DATE REC'D 2/2/81

AGE OF TEST ORGANISMS: <24 hrs. old instars (neonates) NO. ORGANISMS PER TREATMENT 10

TEST VESSEL: 250ml Pyrex glass beaker TEST SOLUTION VOLUME: 200ml WATER DEPTH: 6cm

TIME STARTED 5:15 pm DATE STARTED 2/6/85 DATE COMPLETED 2/8/85

DILUTION WATER Carbon-filtered well water (Temp. 22 C, D.O. 9.3 ppm, pH 8.1)

ANALYST [illegible] EC_{50} (95% Confidence Limits) >1000 mg/l

TEST VESSEL NO.	Initial Conc. mg/l	Total Amount Added	24 Hours			48 Hours		
			Total No. Dead	pH	D.O. ppm	Total No. Dead	pH	D.O. ppm
I	Control	*ml	0			0	8.2	8.9
1-1	100	10	0			0	8.1	8.7
1-2	180	18	0			0	8.1	8.7
1-3	320	32	0			0	8.0	8.5
1-4	560	56	0			0	7.8	8.1
1-5	1000	100	0			0	7.7	4.5
Test Temp. °C			22°C			22°C		
Initials & Date			[illegible] 2/7/85			[illegible] 2/8/85		

COMMENTS: *Common stock solution: 1000mg/500ml. Each 1ml = 2mg. Light amber tinged, lightly. Soluble in water at ambient room temperature.

SECONDARY EFFECTS

TEST VESSEL NO.	Symptoms or Reactions	TOTAL NUMBER EFFECTED 24-Hr.	48-Hr.
Control			

ENVIRONMENTAL LABORATORY
AQUATIC TOXICITY DATA SHEET

LR CIII-2

TEST TYPE 48 hr Acute Static CHEMICAL TESTED EX-3104 6% LOT _____

TEST ORGANISM Daphnia magna SOURCE USEPA-EMSL Duluth, Minn. DATE REC'D 12/81

AGE OF TEST ORGANISMS: <24 hrs. old instars (neonates) NO. ORGANISMS PER TREATMENT 10

TEST VESSEL: 250ml Pyrex glass beaker TEST SOLUTION VOLUME: 200ml WATER DEPTH: 6cm

TIME STARTED 5:15 pm DATE STARTED 2/6/85 DATE COMPLETED 2/8/85

DILUTION WATER Carbon-filtered well water (Temp. 22 C, D.O. 9.3 ppm, pH 8.1)

ANALYST [illegible] EC_{50} (95% Confidence Limits) > 1000 mg/l

TEST VESSEL NO.	Initial Conc. mg/l	Total Amount Added	24 Hours Total No. Dead	pH	D.O. ppm	48 Hours Total No. Dead	pH	D.O. ppm
II	Control	*ml	0			0	8.2	8.9
2-1	100	10	0			0	8.1	8.7
2-2	180	18	0			0	8.1	8.6
2-3	320	32	0			0	8.0	8.5
2-4	560	56	0			0	7.8	8.2
2-5	1000	100	0			0	7.7	4.4
Test Temp. °C			22°C			22°C		
Initials & Date			[illegible] 2/7/85			[illegible] 2/8/85		

COMMENTS: *Common stock solution: 1000mg/500ml. Each 1ml = 2mg. Light amber, foamy liquid. Soluble in water at ambient room temperature.

SECONDARY EFFECTS

TEST VESSEL NO	Symptoms or Reactions	TOTAL NUMBER EFFECTED 24-Hr.	48-Hr.
Control			

C1111-2

ENVIRONMENTAL LABORATORY

TABLE I. SUMMARY OF ACUTE TOXICITY OF EX3104 6% (Light Water)

TO DAPHNIA MAGNA UNDER STATIC EXPOSURE CONDITIONS(1)

CHEMICAL CONCENTRATION (mg/l)	PERCENT MORTALITY 24-HR.	48-HR.
CONTROL	0	0
100	0	0
180	0	0
320	0	0
560	0	0
1000	0	0
EC_{50} (95% CONFIDENCE LIMITS)(2) mg/l	>1000	> 1000

(1) Data were averages of two replications for each concentration with ten (10) daphnids per replicate. A total of twenty daphnids were used per concentration.

(2) EC_{50} values were calculated using logistic regression methods (Probit Analysis).