

ACUTE TOXICITY TO FISH

TEST SUBSTANCE

Identity: Perfluorooctanesulfonyl fluoride; may also be referred to as POSF, or FX-8. (1-Octanesulfonyl fluoride, 1,1,2,2,3,3,4,4,5,5,6,6,7,7,8,8,8-heptafluoro-, CAS # 307-35-7).

Remarks: The test substance is a clear liquid of uncharacterized purity. It is described as FX-8 (cc842-2) Lot 1 F-10101, L-1407 washed sample.

METHOD

Method: Not given

Type: Static acute

GLP: No

Year completed: 1984

Species: *Pimphales promelas*

Supplier: Dale Fattig, Brady, Nebraska.

Analytical monitoring: Temperature, pH and dissolved oxygen. Test substance concentration not measured.

Exposure period: 96-hours

Statistical methods: Not needed.

Test fish age: Not noted.

Length and weight: Average length = 3.88 cm.
Average weight = 0.366 g

Loading: 0.61 g fish / L

Pretreatment: None

Test conditions:

Dilution water: Carbon-filtered well water, 3M well #2, St. Paul, MN

Dilution water chemistry:

Dissolved Oxygen: 9.2 mg/L

hardness: 240 mg/L as CaCO₃

pH: 8.2

Stock and test solution preparation: The test concentrations were prepared by transferring appropriate weights of the test substance directly to the test chambers.

Concentrations dosing rate: Once

Stability of the test chemical solutions: Not noted

Exposure vessels: One gallon wide-mouth glass jars containing 3L of test solution.

Number of replicates: Two

Number of fish per replicate: Five

Number of concentrations: Four plus a negative control

Water chemistry during the study:

Dissolved oxygen range (0 – 96 hours):

6.6 – 9.2 mg/L (control exposure)

5.2 – 9.2 mg/L (1000 mg/L exposure)

pH range (0 – 96 hours)

8.0 - 8.2 (control exposure)

7.8 - 8.2 (1000 mg/L exposure)

Test temperature: ranged 21-22°C

RESULTS

Nominal concentrations: Bk control, 10, 100, 500, 1000 mg/L

Element value: 24-hour LC₅₀ = > 1000 mg/L

48-hour LC₅₀ = > 1000 mg/L

96-hour LC₅₀ = > 1000 mg/L

All element values based on nominal concentrations

Statistical evaluation of mortality: Not applicable. No mortality seen in the any concentration tested.

Sublethal effects: After 48, 72, and 96-hours of exposure, some fish were surfacing at each concentration tested, but not in the controls.

CONCLUSIONS

The test sample 96-hour LC₅₀ for fathead minnow 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 2. This study lacks analytical data for determination of the test substance concentration in the test solutions and determination of the sample purity. It is estimated that this study was run in excess of water solubility.

REFERENCES

This study was conducted by the 3M Environmental Laboratory, St Paul, MN, Lab Request Number B1229-2

OTHER

Last changed: 5/18/00

ENVIRONMENTAL LABORATORY
CHEMICAL ENVIRONMENTAL EFFECTS EVALUATION
TOXICITY TEST: SUMMARY REPORT

Chemical Tested EX 8 (K842-2) LOT 1 F-1010 Test Type: RANGE FINDER (EXPLORATOR)
L-1407 WASHED SAMPLE

LC50/EC50/IC50/GR50 (95% C.L.): 96HR LC50 GREATER THAN 1000 mg/l

Test Species: FATHEAD MINNOW (PIMEPHALES PROMELAS)

Test Date: 4-2-84 / 4-6-84 L.R. #: FB1229-2

Analyst(s): [Signature]

(Exposure/Test Conditions)

Exposure Type:

Static ✓ Acute Static/Continuous
Orbital Shaking _____

Static Recirculatory _____ Static Renewal _____ Flow-Through _____

Diluent:

Aerated Well Water (Initial D.O. 9.2 mg/l; pH 8.2; Temp. 20°C (68°F))

Water Hardness: 270 ppm Hardness Classification: HARD

Dissolved Oxygen & Saturation:

	<u>48-hr</u>	<u>96-hr</u>	<u>Extended Exposure</u>
Control(s)	<u>80</u>	<u>77</u>	_____
Lowest Experimental Dose <u>10 mg/l</u>	<u>48</u>	<u>76</u>	_____
Highest Experimental Dose <u>1000 mg/l</u>	<u>69</u>	<u>64</u>	_____

pH Levels:

	<u>48-hr</u>	<u>96-hr</u>	<u>Extended Exposure</u>
Control(s)	<u>8.1</u>	<u>8.0</u>	_____
Lowest Experimental Dose <u>10 mg/l</u>	<u>8.1</u>	<u>7.9</u>	_____
Highest Experimental Dose <u>1000 mg/l</u>	<u>8.0</u>	<u>7.9</u>	_____

Test Temperature °C (°F):

<u>48-hr</u>	<u>96-hr</u>	<u>Extended Exposure</u>
<u>22°C (72)</u>	<u>22°C (72)</u>	<u>°C ()</u>

Photoperiod: Sixteen hours light with a 15-30 minute transition period.

ENVIRONMENTAL LABORATORY
AQUATIC TOXICITY DATA SHEET
EXPLORATORY (RANGE-FINDING TEST)

LR B1229-2

Type Test ACUTE STATIC Material Tested EX-8 (ACENZ-2) Lot 1 (F-10101)
F-1009 washed sample

Test Organism FATHEAD MINNOW Source READY, NGS Date Rec'd 3/4/84 Batch No. 3-84

Avg. Wt. 0.3466 grams Avg. Size 3.88 CM No. Organisms per dose 5

Test Solution Volume 3 Liters/All-Glass Tank Tank Dimensions: WIDE-MOUTH 1 GALLON GLASS JAR

Time Started 1:00 PM Date Started 4/12/84 Date Completed 4/16/84

Dilution Water Carbon-filtered well water (Temp. 20 °C., D.O. 9.2 ppm, pH 8.2)

Investigator [Signature] LC₅₀ (95% Confidence Limits) >1000 mg/l
(Full Signature)

Tank No.	Init. Conc. mg/l	Total Amount Added	24 Hours			48 Hours			72 Hours			96 Hours		
			Total No. Dead	pH	D.O. ppm	Total No. Dead	pH	D.O. ppm	Total No. Dead	pH	D.O. ppm	Total No. Dead	pH	D.O. ppm
I	Control	* mg	0	8.2	7.1	0	8.1	6.9	0	8.0	6.7	0	8.0	6.6
1	10	30	0	8.1	6.9	0	8.1	6.8	0	8.0	6.8	0	7.9	6.7
2	100	300	0	8.1	6.7	0	8.0	6.6	0	7.9	6.6	0	8.0	6.6
3	500	1500	0	8.1	6.6	0	8.0	6.4	0	7.9	6.2	0	8.0	6.2
4	1000	3000	0	8.1	6.3	0	8.0	5.9	0	7.8	5.2	0	7.9	5.1

Test Temp. °C. 21°C 22°C 22°C 22°C

Initials & Date [Signature] 4/13/84 [Signature] 4/14/84 [Signature] 4/15/84 [Signature] 4/16/84

Comments: * INDIVIDUAL WEIGHTS. CLEAR LIQUID.

Effects other than Mortality

EC₅₀

Tank No.	Symptoms or Reactions	Total No. Affected			
		24-Hr.	48 Hr.	72-Hr.	96-Hr.
Control	I		NONE	NONE	NONE
1	(SWELLING)	NONE	2	2	2
2			2	2	2
3			2	3	3
4			3	5	3

Comments:

ENVIRONMENTAL LABORATORY
AQUATIC TOXICITY DATA SHEET
EXPLORATORY (RANGE-FINDING TEST)

LR B1229-2

Type Test 96HR ACUTE STATIC Material Tested FX-8 (PC842-2) Lot 1 (F-10101)

Test Organism FATHEAD MINNOW Source TEXAS, AFB Date Rec'd. 3/6/84 Batch No. 3-84

Avg. Wt. 0.3164 grams Avg. Size 3.88CM No. Organisms per dose 5

Test Solution Volume 3 Liters/All-Glass Tank Tank Dimensions: WIDE-MOUTH 1 GALLON GLASS JAR

Time Started 1:00 pm Date Started 4/2/84 Date Completed 4/16/84

Dilution Water Carbon-filtered well water (Temp. 20 °C., D.O. 9.2 ppm, pH 8.2)

Investigator [Signature] LC₅₀ (95% Confidence Limits) > 1000 mg/l

Tank No.	Init. Conc. mg/l	Total Amount Added	24 Hours			48 Hours			72 Hours			96 Hours		
			Total No. Dead	pH	D.O. ppm	Total No. Dead	pH	D.O. ppm	Total No. Dead	pH	D.O. ppm	Total No. Dead	pH	D.O. ppm
II	Control	*mg	0	8.1	7.1	0	8.1	7.0	0	8.0	6.8	0	8.0	6.8
1A	10	30	0	8.1	6.8	0	8.1	6.7	0	8.0	6.6	0	7.9	6.6
2A	100	300	0	8.1	6.8	0	8.1	6.7	0	7.9	6.6	0	8.0	6.5
3A	500	1500	0	8.1	6.7	0	8.0	6.5	0	7.9	6.3	0	8.0	6.3
4A	1000	3000	0	8.1	6.2	0	8.0	6.1	0	7.8	5.3	0	7.9	5.7

Test Temp. °C. 21°C 22°C 22°C 22°C

Initials & Date 34/3/84 34/4/84 34/5/84

Comments: * INDIVIDUAL WEIGHTS. CLEAR LIQUID.

Effects other than Mortality

EC₅₀

Tank No.	Symptoms or Reactions	Total No. Affected			
		24-Hr.	48 Hr.	72-Hr.	96-Hr.
Control	II	1	NONE	NONE	NONE
1A	SUCKERING	NONE	2	2	1
2A		NONE	2	3	3
3A		NONE	2	3	3
4A		NONE	2	5	4

Comments:

4-12-84

ENVIRONMENTAL LABORATORY STATUS REPORT
ALL RESULTS TENTATIVE

LAB REQUEST NO. B1229

REQUESTER NAME: ANW/EAR
DEPT: 0535
PROJECT NO: 9970012600
DATE RECEIVED: 2-21-84
DESC: FX-8 (CC 842-2)

CONTRACT LAB:
CONTRACT LAB COST: 0
3M E-L HOURS: 46
EST CMPLT DATE: 5-01-84
DATE COMPLETED:

SAMPLE NUMBER TWO WILL BE GENERATED FROM TWO EQUAL VOLUME WASHES OF SAMPLE
NUMBER ONE.

SAMPLE	DATE	CODE	DESCRIPTION	TEST	RESULT
1		FX-8		SMPL-PREP	COMPLETE
2		WASHED	SAMPLE	96-HR-LC50	#>1000 MG/L
				C-BOD-05	SEE REPORT
				C-BOD-10	SEE REPORT
				C-BOD-20	SEE REPORT
				SOLUBILITY	
				BIOSORP	
				SLUDGE-TOX	

= UPDATED DATA
* = CONTRACT LAB