

ACUTE TOXICITY TO FISH

TEST SUBSTANCE

Identity: Perfluorodecanesulfonate, ammonium salt; may also be referred to as PFDS, FC-121-X, or 3M Sample E2112 and E2566-1. (1-Decanesulfonic acid, 1,1,2,2,3,3,4,4,5,5,6,6,7,7,8,8,9,9,10,10,10-heneicosafluoro-, ammonium salt, CAS # 67906-42-7)

Remarks: Test sample is a mixture of the test substance in water and 2-propanol, 1-(1,1-dimethylethoxy). This mixture contains approximately 22-26% test substance, 33-37% propanol, 1-(1,1-dimethylethoxy), 0.5-1.5% perfluorononanesulfonate, ammonium salt and 38-42% water). All values reported relate to this mixture. No calculations were made to adjust for the actual concentration of the test substance in the test sample. Test material was from 3M production lot 1.

Note: Only the summary pages of this report were available.

METHOD

Method: OECD 203

Type: Static acute

GLP: Not known

Year completed: 1988

Species: *Pimephales promelas*

Supplier: ABC Laboratories In-house cultures, Columbia, MO

Analytical monitoring: Dissolved oxygen, temperature and pH. Test substance concentration was not measured.

Exposure period: 96-hours

Statistical methods: Binomial method.

Length and weight: Average length = 18 mm.
Average weight = 0.087 g

Test conditions:**Dilution water chemistry:**

hardness:	44 mg/L
alkalinity:	30 mg/L
pH:	7.5

Stock and test solution preparation: Details not available. All test vessels containing FC-121 contained a thin layer of foam at 0-

hours. The amount of foam increased with the concentration. No foam or film was present after 24-hours.

Number of fish per concentration: ten

Number of concentrations: five plus a negative control

Water chemistry during the study: within acceptable limits throughout the study.

Temperature during the study: $22 \pm 1^{\circ}\text{C}$

RESULTS

Nominal concentrations: Bk control, 3.2, 5.6, 10, 18, and 32 mg/L

Element value: 24-hour LC_{50} = 26 (18-32) mg/L
48-hour LC_{50} = 24 (18-32) mg/L
96-hour LC_{50} = 13 (10-18) mg/L
96-hour NOEL = 3.2 mg/L

All element values based on nominal concentrations

Statistical Evaluation of Mortality:

Binomial method used to calculate LC_{50} values and corresponding confidence intervals.

CONCLUSIONS

The test sample 96-hour LC_{50} for fathead minnow was determined to be 13 mg/L with a 95% confidence interval of 10 – 18 mg/L.

Testing was conducted on the "as-sold" mixture of the subject material in water (~22-26% subject material. The values reported apply to that mixture and not directly to the subject material.

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

DATA QUALITY

Reliability: Klimisch ranking 4. A portion of the final report is missing. Because a mixture was tested, care must be taken when interpreting the results. The solvent in the mixture could have enhanced or restricted biological uptake and/or toxicity of the fluorochemical component. Characterization of the test substance purity and analytical measurement of tested concentrations was lacking.

REFERENCES

This study was conducted by ABC Laboratories, Columbia, MO on behalf of the 3M Company.

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OTHER

Last changed: 5/18/00

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SPONSOR

3M Company
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STUDY TITLE

Acute Toxicity of E2566-1
to Fathead Minnow (Pimephales promelas)

DATA REQUIREMENT

OECD Guideline #203

AUTHOR

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Biologist II

STUDY COMPLETED ON

January 15, 1988

PERFORMING LABORATORY

Analytical Bio-Chemistry Laboratories, Inc.
Aquatic Toxicology Division
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Columbia, Missouri 65205

ABC LABORATORY PROJECT ID

#36615

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ABC LABS #36615-2 of 62

FISH ACUTE TOXICITY COMPENDIUM

Subject: "Acute Toxicity of E2566-1 to Fathead Minnow (Pimephales promelas)," ABC Study Number 36615.

Sponsor: 3M Company

Testing Facility: Analytical Bio-Chemistry Laboratories, Inc.
Aquatic Toxicology Division
P.O. Box 1097
Columbia, Missouri 65205 (314-474-8579)

Location of Original Raw Data and Final Report:

3M Company
St. Paul, Minnesota 55106

Test Material: E2566-1

Test Concentrations: Control, 3.2, 5.6, 10, 18 and 32 mg/l

Dilution Water: 44 mg/l (hardness), 30 mg/l (alkalinity),
7.5 (pH)

Test Dates: Initiation - January 11, 1988

Termination - January 15, 1988

Length of Study: 96-hours

Results: 96-hour LC_{50} = 13 mg/l (95% C.I. = 10-18 mg/l)

96-hour NOEL = 3.2 mg/l

96-hour Slope of the Dose-Response Line was 32

Test Species: Fathead Minnow (Pimephales promelas)

Source of Organisms: ABC Laboratories in-house culture

Mean Weight: 0.087 g (± 0.027 g)

Mean Length: 18 mm (± 1.7 mm)

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SUMMARY

The acute toxicity of E2566-1 to fathead minnow (Pimephales promelas) was assessed using the methods outlined by the Committee on Methods for Toxicity Tests with Aquatic Organisms. Water quality parameters of temperature, dissolved oxygen and pH were measured throughout the test and were within acceptable limits. Culture and acclimation records indicated the fish were in good condition for testing.

The study was conducted at the following nominal concentrations of E2566-1: 3.2, 5.6, 10, 18 and 32 mg/l. A thin layer of foam was present in all chambers at 0-hour. The amount of foam increased with the concentration. No foam or film was present after 24 hours. Ten fish, with a mean weight of 0.087 (± 0.027) g and a mean standard length of 18 (± 1.1) mm, were exposed to each test concentration and control.

The results of the four day static fish toxicity study using E2566-1 are summarized below. The 24-, 48- and 72-hour LC_{50} values were also determined. The 96-hour slope of the dose response line was 32.

<u>Compound</u>	<u>96-hour LC_{50}</u> <u>(95% C.I.)</u>
E2566-1	13 mg/l (10-18 mg/l)

Also, the results indicated a 96-hour, no-observed effect concentration could be estimated at 3.2 mg/l, which was based on the lack of mortality and abnormal effects. Abnormal effects of mortality, loss of equilibrium, light discoloration and/or fish on the bottom of test chamber were observed during the 96-hour exposure period in the 5.6, 18 and 32 mg/l test concentrations.

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TABLE 2

Acute Toxicity of E2566-1 to Fathead Minnow
(Pimephales promelas)

Compound	LC ₅₀ in milligrams/liter (ppm)		
	24 hours	48 hours	96 hours
E2566-1 ^a	26 ⁽¹⁾ (18-32) ^b	24 ⁽¹⁾ (18-32) ^b	13 ⁽¹⁾ (10-18) ^b

N = 10 fish per concentration.

^aBioassay as conducted at 22°C (±1.0), mean fish weight and length, 0.087 (±0.027) g and 18 (±1.7) mm.

^b95% confidence limits.

The 96-hour no-observed effect concentration could be estimated at 3.2 mg/l, based on the lack of mortality and abnormal effects at the lowest concentration tested.

The slope of the 96-hour dose response curve as calculated by least squares regression analysis was 32.

All values were rounded to two significant figures following ABC S.O.P. #8.7.

LC₅₀ calculated using:

- (1) Binomial Method
- (2) Moving Average Method
- (3) Probit Method

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