

## ACUTE TOXICITY TO FISH

### TEST SUBSTANCE

---

**Identity:** A mixture containing perfluorooctanesulfonate, which may also be referred to as PFOS, FC-95, or as a component of FC-201. (1-Octanesulfonic acid, perfluoroalkyl sulfonate salts (5) + (5140P)) (CAS # 2795-39-3)

**Remarks:** The 3M production lot number was Lot 1. The test sample is FC-201. Its purity was not sufficiently characterized, though current information indicates it is a mixture of 6% PFOS, 36% diethylene glycol butyl ether, 36.44% water, 12% Sultone foamer, 9% sodium octyl sulfate, 0.5% sodium lauryl sulfate, and 0.06% 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:** 1975

**Species:** *Pimephales promelas*

**Supplier:** Not given.

**Analytical monitoring:** Temperature, pH, and DO

**Exposure period:** 96-hours

**Statistical methods:** LC<sub>50</sub> values calculated using graphic interpolation, recalculated using probit analysis.

**Test fish age:** Juveniles

**Length and weight:** Average length = 2 in.  
Average weight = 1.5 g (wet)

**Loading:** Not given.

**Pretreatment:** None.

**Test conditions:**

**Dilution water:** Carbon filtered St. Paul city water, St. Paul, MN

**Dilution water chemistry:** Not given.

**Lighting:** Not given.

**Stock and test solution preparation:** Not given.

**Concentrations dosing rate:** Once

**Stability of the test chemical solutions:** Not noted

**Exposure vessels:** Not given.

**Number of replicates:** 1

**Number of fish per replicate:** Not given.

**Number of concentrations:** five plus a blank control

**Water chemistry during the study:**

**pH range (0-96 hours):**

7.0 – 7.0 (control exposure)

6.8 – 6.9 (750 mg/L exposure)\*

**Temperature range (0-96 hours):**

69 - 70 °F

**Dissolved oxygen range (0-96 hours):**

4.7 – 5.6 mg/L (control exposure)

4.0 – 5.0 mg/L (750 mg/L exposure)\*

\* 750 mg/L (second highest concentration) exposure values used because the highest concentration used resulted in total mortality by 72 hours.

## **RESULTS**

---

**Nominal concentrations:** Bk control, 100, 250, 500, 750, and 1,000 mg/L

**Element values:** 96-hour LC<sub>50</sub> = 526 (397 – 631) 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 96-hour LC<sub>50</sub> for fathead minnow was determined to be 526 mg/L with a 95% confidence interval of 397 to 631 mg/L.

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

## **DATA QUALITY**

---

**Reliability:** Klimisch ranking 3. Testing lacks record of methodology used. The sample purity was not properly characterized and the study lacks analytical confirmation of the amount of fluorochemical proportion in the solution.

## **REFERENCES**

---

The test was conducted by the 3M Company, Environmental Laboratory, St. Paul, MN, Lab Request number 2563, 1975.

## **OTHER**

---

**Last changed:** 6/26/00



740101

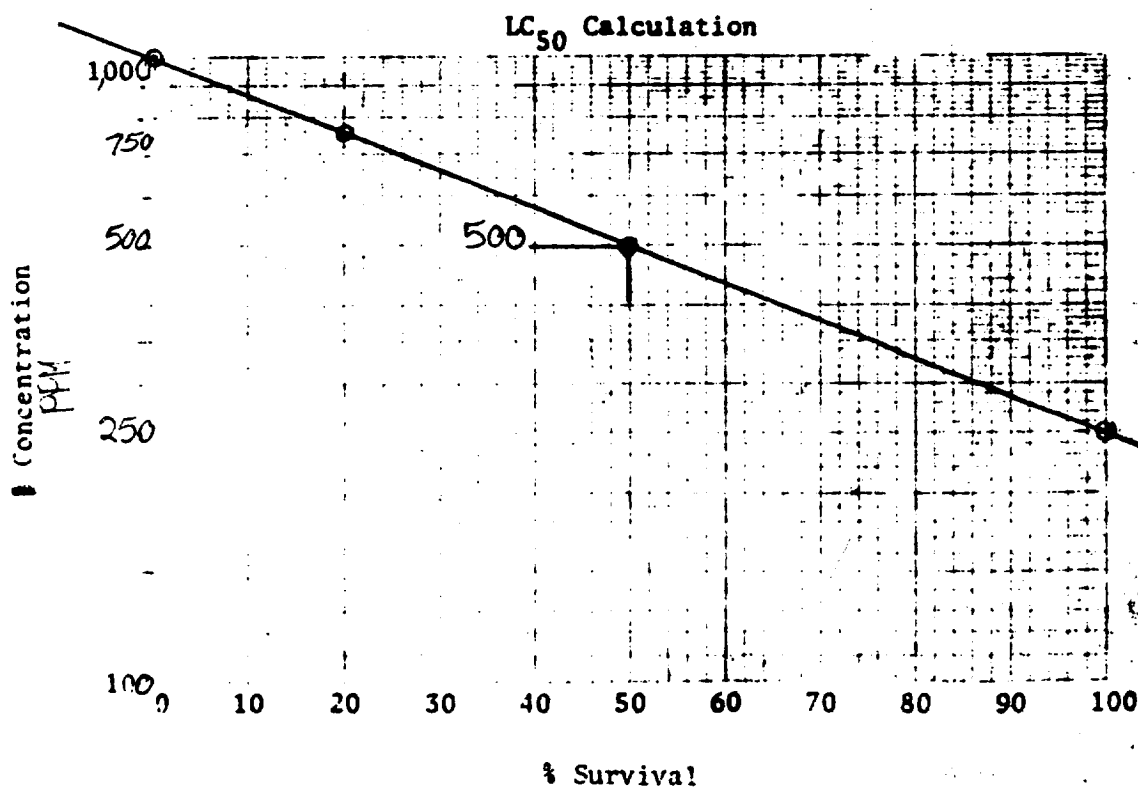
**ENVIRONMENTAL ENGINEERING LABORATORY  
AQUATIC TOXICITY WORK SHEET**

Type Test 96 Hours - StaticMaterial Tested FC-201Test Organism Fathead MinnowAvg. Weight 1.5g Avg. Size 2 InchesDate Started 1-7-75Date Completed 1-11-75Time Started 2:00 PMPlotted LC<sub>50</sub> 500 PPMDilution Water Carbon Filtered - St. Paul City Water

*Old probit* → 526 mg/L  
95 C.I. 397-631

| Conc.               | 24 hrs     |     |         | 48 hrs     |     |         | 72 hrs     |     |         | 96 hrs     |     |         |
|---------------------|------------|-----|---------|------------|-----|---------|------------|-----|---------|------------|-----|---------|
|                     | % Survival | pH  | D.O ppm | % Survival | pH  | D.O ppm | % Survival | pH  | D.O ppm | % Survival | pH  | D.O ppm |
| Control             | 100        | 7.0 | 5.6     | 100        | 7.0 | 5.3     | 100        | 7.0 | 5.0     | 100        | 7.0 | 4.7     |
| 100 PPM             | 100        | 7.0 | 5.3     | 100        | 7.0 | 5.1     | 100        | 7.0 | 5.0     | 100        | 7.0 | 4.6     |
| 250                 | 100        | 7.0 | 5.2     | 100        | 7.0 | 5.0     | 100        | 7.0 | 4.7     | 100        | 7.0 | 4.5     |
| 500                 | 100        | 7.0 | 5.0     | 100        | 6.9 | 4.9     | 70         | 6.9 | 4.5     | 50         | 6.9 | 4.2     |
| 750                 | 90         | 6.9 | 5.0     | 70         | 6.9 | 4.7     | 20         | 6.9 | 4.5     | 20         | 6.8 | 4.0     |
| 1000                | 50         | 6.9 | 5.0     | 20         | 6.9 | 4.5     | 0          | 6.8 | 4.0     | 0          | —   | —       |
| Average Temperature | 69         |     |         | 70         |     |         | 70         |     |         | 70         |     |         |

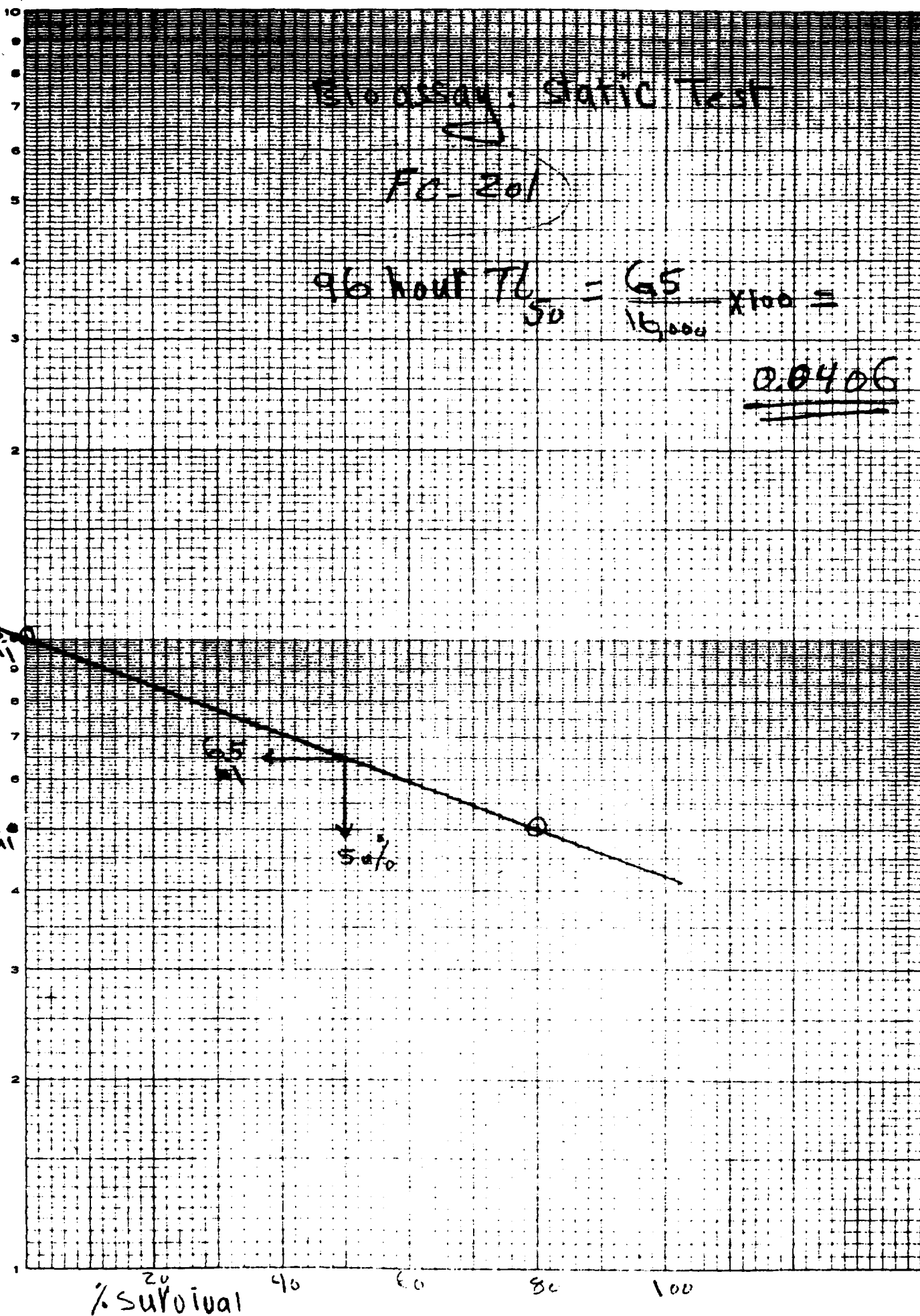
Comments:



EUGENE DIETZEN CO.  
MADE IN U. S. A.

NO. 140-1210 DIETZEN GRAPH PAPER  
SFM LOGARITHMIC  
2 CYCLES X 10 DIVISIONS PER INCH

CONC.



PROBIT ANALYSIS FOR BIDASSAY DATA

PROBIT ANALYSIS FOR BIDASSAY DATA

PROBIT ANALYSIS FOR BIDASSAY DATA

END OF BASIC AND

BASIC

READY

OLD PROBIT

READY

RUN

PROBIT 020

THURSDAY, AUGUST 23, 1979, 16:26:48

GM ENVIRONMENTAL LABORATORY

◆◆◆PROBIT ANALYSIS FOR BIDASSAY DATA◆◆◆

NO. OF CURVES: 1

NO. OF CONC. FOR CURVE 1: 4

INPUT DATA: CONC., NO. EXPOSED, NO. DEAD

250, 10, 0

500, 10, 5

750, 10, 8

1000, 10, 10

COMMENTS FOR CURVE 1

FE-201-1-7-75

| CONC.                     | LOG CONC. | FRACTION RESPONDING | FITTED FRACTION |
|---------------------------|-----------|---------------------|-----------------|
| 250                       | 2.39794   | 0                   | 0.009093976     |
| 500                       | 2.69897   | 0.5                 | 0.4354337       |
| 750                       | 2.87506   | 0.8                 | 0.8694722       |
| 1000                      | 3         | 1                   | 1.079791578     |
| HI-90 PROBABILITIES: 0.05 |           |                     |                 |

| NUMBER OF ITERATIONS | INTERCEPT (A) | SLOPE (B) | CHI-SQ. FOR LINEARITY | CHI-SQ. FOR PROBIT TRANSFORM |
|----------------------|---------------|-----------|-----------------------|------------------------------|
|----------------------|---------------|-----------|-----------------------|------------------------------|

|   |          |          |           |           |
|---|----------|----------|-----------|-----------|
| 7 | 0.005515 | 0.005515 | 0.8996463 | 0.6372403 |
|---|----------|----------|-----------|-----------|

|      |          |          |          |          |
|------|----------|----------|----------|----------|
| BIAS | 0.000000 | 0.000000 | 0.000000 | 0.000000 |
|------|----------|----------|----------|----------|

END

PROBIT ANALYSIS FOR BIDASSAY DATA

PROBIT ANALYSIS FOR BIDASSAY DATA

Date started; 2-27-73 BIOASSAY - FC-201 Lot-1 ((1% concentrate))

| CONC.        | 24 hrs<br>%<br>Survival | pH | D.O.<br>ppm | 48 hrs.<br>%<br>Survival | pH | D.O.<br>ppm | 72 hrs.<br>%<br>Survival | pH | D.O.<br>ppm | 96 hrs.<br>%<br>Survival | pH | D.O.<br>ppm |
|--------------|-------------------------|----|-------------|--------------------------|----|-------------|--------------------------|----|-------------|--------------------------|----|-------------|
| Control      | 100%                    |    | 6.5         | 100%                     |    | 5.0         | 100%                     |    | 4.8         | 100                      |    |             |
| 5.0ml<br>11  | 100%                    |    | 5.4         | 100%                     |    | 3.9         | 100%                     |    | 2.0         | 80%                      |    |             |
| 10.0ml<br>12 | 100%                    |    | 5.2         | 0%                       |    | 3.2         | 0%                       | —  | —           | 0%                       | —  | —           |
| 15.0ml<br>13 | 30%                     |    | 5.3         | 0%                       |    | 2.9         | 0%                       | —  | —           | 0%                       | —  | —           |
| 20.0ml<br>14 | 0%                      |    | 5.2         | 0%                       |    | 2.0         | 0%                       | —  | —           | 0%                       | —  | —           |
| 25.0ml<br>15 | 0%                      |    | 5.2         | 0%                       |    | 2.0         | 0%                       | —  | —           | 0%                       | —  | —           |

### Screening Test:

|       |          |          |
|-------|----------|----------|
| 1.0ml | one Dead | Two Dead |
| 4.0ml | ALL Dead | ALL Dead |
| 8.0ml | ALL Dead | ALL Dead |