

ACUTE TOXICITY TO AQUATIC INVERTEBRATES (DAPHNIA MAGNA)

TEST SUBSTANCE

Identity: Perfluorooctanoic acid, ammonium salt; may also be referred to as PFOA ammonium salt, Ammonium perfluorooctanoate, FC-116, FC-126, FC-169, or FC-143. (Octanoic acid, pentadecafluoro-, ammonium salt, CAS # 3825-26-1)

Remarks: 3M production lot number 390.

The test sample is FC-126, a white powdery solid. It's purity was not sufficiently characterized, though current information indicates it is a mixture of 78 - 93% test substance and 7 - 22% C₅, C₆, and C₇ perfluoro analogue compounds.

METHOD:

Method: Not stated.

Type: Static acute

GLP: No

Year completed: 1987

Species: *Daphnia magna*

Source: 3M Environmental Lab in-house cultures

Analytical monitoring: Temperature, pH and DO

Exposure period: 48-hours

Statistical methods: Probit analysis

Test organism age: <24 hours old neonates

Pretreatment: Not noted.

Test conditions:

Dilution water: Carbon-filtered well water.

Dilution water chemistry (initial):

Temperature: 21°C

Dissolved Oxygen: 9.4 ppm

pH: 7.9

Stock and test solution preparation: Test solutions were created by direct weights addition.

Concentrations dosing rate: Once

Stability of the test chemical solutions: Not noted

Exposure vessels: 250 mL Pyrex® glass beakers containing 200 test solution (6 cm depth).

Number of replicates: two

Number of daphnids per replicate: 10

Number of concentrations: five plus a blank control

Water chemistry during the study:

Dissolved oxygen (final):

9.0 mg/L (control exposure)
8.8 mg/L (1000 mg/L exposure)
pH range (final):
8.0 (control exposure)
8.1 (1000 mg/L exposure)
Test temperature (24 – 48 hours): 21°C

RESULTS

Nominal concentrations: Bk control, 100, 180, 320, 560, and 1000 mg/L
Element value: 48-hour EC₅₀ = 221 (186 - 261) mg/L

Element value based on nominal concentrations

CONCLUSIONS

The test sample 48-hour EC₅₀ for *Daphnia magna* was determined to be 221 mg/L with a 95% Confidence Interval of 186 to 261 mg/L.

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

DATA QUALITY

Reliability: Klimisch ranking 2. Testing meets the criteria for quality testing. However, sample purity was not properly characterized and it lacks analytical confirmation of test substance concentrations.

REFERENCES

This study was conducted by the 3M Company, Environmental Laboratory, St. Paul, MN, Lab Request Number E1282-1, completed on April 30, 1987.

OTHER

Last changed: 5/24/00

ENVIRONMENTAL LABORATORY
DAPHNIA TOXICITY DATA SHEET

LR E1282-1

TEST TYPE 48HR, ACUTE STATIC CHEMICAL TESTED EC-1210 LOT 390

TEST ORGANISM Daphnia magna SOURCE USEPA-ERL DATE REC'D 8/14/86
Duluth, Minn.

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 4-28-87 DATE COMPLETED 4-30-87

DILUTION WATER Carbon-filtered well water (Temp. 21 C, D.O. 9.4 ppm, pH 7.9)

ANALYST [Signature] EC₅₀ (95% Confidence Limits) 215 (166-276) mg/L Probit Analysis
48HR EC₅₀ combined 221 (186-261) 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
<u>III</u>	<u>Control</u>	<u>*mg</u>	<u>0</u>			<u>0</u>	<u>8.0</u>	<u>9.0</u>
<u>1-1</u>	<u>100</u>	<u>20</u>	<u>0</u>			<u>0</u>	<u>8.0</u>	<u>9.0</u>
<u>1-2</u>	<u>180</u>	<u>36</u>	<u>0</u>			<u>4</u>	<u>8.0</u>	<u>9.0</u>
<u>1-3</u>	<u>320</u>	<u>64</u>	<u>2</u>			<u>8</u>	<u>8.0</u>	<u>9.0</u>
<u>1-4</u>	<u>560</u>	<u>112</u>	<u>4</u>			<u>10</u>	<u>8.1</u>	<u>8.9</u>
<u>1-5</u>	<u>1000</u>	<u>200</u>	<u>10</u>			<u>10</u>	<u>8.1</u>	<u>8.8</u>
Test Temp. °C			<u>21</u>			<u>21</u>		
Initials & Date			<u>JS 4-29-87</u>			<u>JS 4-30-87</u>		

COMMENTS: * Direct weights. Initial pH of highest concentration tested, 1000 mg/L,
7.9. Test material white powder. Appears soluble in water
at ambient conditions.

ENVIRONMENTAL LABORATORY
DAPHNIA TOXICITY DATA SHEET

LR E1282-1

TEST TYPE 48HR, ACUTE STATIC CHEMICAL TESTED EC-126 LOT 390

TEST ORGANISM Daphnia magna SOURCE USEPA-ERL DATE REC'D 8/14/86
Duluth, Mn.

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

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

TIME STARTED 5:15pm DATE STARTED 4-28-87 DATE COMPLETED 4-30-87

DILUTION WATER Carbon-filtered well water (Temp. 21 C, D.O. 9.4 ppm, pH 7.9)

ANALYST [Signature] EC₅₀ (95% Confidence Limits) 227 (173-294) mg/L Probit Analysis
48HR EC₅₀ combined 221 (186-261) mg/L

TEST VESSEL NO.	Initial Conc. mg/l	Total Amount Added *mg	24 Hours			48 Hours		
			Total No. Dead	pH	D.O. ppm	Total No. Dead	pH	D.O. ppm
<u>IV</u>	<u>Control</u>	<u>—</u>	<u>0</u>			<u>0</u>	<u>8.0</u>	<u>9.0</u>
<u>2-1</u>	<u>100</u>	<u>20</u>	<u>0</u>			<u>0</u>	<u>8.0</u>	<u>9.0</u>
<u>2-2</u>	<u>180</u>	<u>36</u>	<u>0</u>			<u>4</u>	<u>8.0</u>	<u>9.0</u>
<u>2-3</u>	<u>320</u>	<u>64</u>	<u>2</u>			<u>4</u>	<u>8.0</u>	<u>9.0</u>
<u>2-4</u>	<u>560</u>	<u>112</u>	<u>4</u>			<u>10</u>	<u>8.1</u>	<u>9.0</u>
<u>2-5</u>	<u>1000</u>	<u>200</u>	<u>10</u>			<u>10</u>	<u>8.1</u>	<u>8.8</u>
Test Temp. °C			<u>21</u>			<u>21</u>		
Initials & Date			<u>[Signature] 4-29-87</u>			<u>[Signature] 4-30-87</u>		

COMMENTS: * Direct weights. Initial pH of highest concentration tested, 1000 mg/l, 7.9. Test material white powder. Appears soluble in water at ambient conditions.