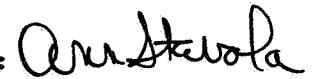


US EPA ARCHIVE DOCUMENT


DATA EVALUATION RECORD

1. Chemical: Lindane
2. Test Material: Lindane 20% EC
3. Study/Action Type: Fish Static Acute Toxicity Test
(Salmo gairdneri)
4. Study Identification: Acute Toxicity of Lindane 20% EC
to Rainbow Trout (Salmo gairdneri).
Analytical Bio-Chemistry Labs, Inc.,
July 7, 1986. Submitted by
Rhone-Poulenc, Inc. for CIEL. EPA
Accession No. 263948.

5. Reviewed by: Ann Stavola
Aquatic Biologist
EEB/HED

Signature: 
Date: 9 Dec 86

6. Approved by: Doug Urban
Supervisory Biologist
EEB/HED

Signature: 
Date: 12/31/86

7. Conclusion:

The study is scientifically sound and meets EPA Guidelines requirements for acute toxicity testing with a coldwater fish. With an LC₅₀ value of 120 (80-150) ug/L Lindane 20% EC is highly toxic to coldwater fish.

8. Recommendations: N/A

9. Background:

This study was submitted in response to the data requirements of the Lindane Registration Standard.

10. Materials and Methods:

a. Test Animals: Rainbow trout (Salmo gairdneri) obtained from Mt. Lassen Trout Farm, Red Bluff, California.

Mean weight = 0.68 + 0.23 g.
 Mean standard length = 37 + 3.8 mm.

b. Dosage: Lindane 20% EC. The dilution water was soft reconstituted water. Concentrations were measured by GLC.

c. Study Design: The test was conducted in 5-gallon glass vessels containing 15 liters of test solutions. There were two vessels per test concentration, and 10 fish per vessel. The biological loading was 0.45 g fish/liter. The study was conducted at 12 °C with a 16-hour day.

d. Statistics: The data were analyzed by a computerized version of Stephan's program.

11. Report Results:

| Nominal Conc. (ug/L) | Measured Conc. (ug/L) | | % Mortality | | | |
|-------------------------|--------------------------|------------|-------------|-------|-------|-------|
| | as formulation | as lindane | 24 hr | 48 hr | 72 hr | 96 hr |
| 320 | 280 | 56 | 95 | 100 | 100 | 100 |
| 180 | 150 | 30 | 20 | 65 | 75 | 85 |
| 100 | 80 | 16 | 0 | 0 | 0 | 0 |
| 56 | 47 | 9.4 | 0 | 0 | 0 | 0 |
| 32 | 27 | 5.4 | 0 | 0 | 0 | 0 |
| Control | - | - | 0 | 0 | 0 | 0 |

| Time | LC ₅₀ and 95% CI (ug/L) | |
|-------|------------------------------------|------------|
| | as formulation | as lindane |
| 24 hr | 190 (160-220) | 37 (32-43) |
| 48 hr | 130 (80-280) | 27 (16-56) |
| 72 hr | 127 (90-150) | 25 (16-30) |
| 96 hr | 120 (80-150) | 24 (16-30) |

D.O. levels were 9.4 mg/L at 0 hour and 7.7 to 8.3 mg/L at 96-hour and pH values were 7.4 at 0 hour and 6.8 at 96 hours. Toxicity symptoms includes surfacing, loss of equilibrium, excitability and fish on the bottom.

12. Author's Conclusion/QA Measures

The 96-hour LC₅₀ values of Lindane 20% EC to rainbow trout was 120 (80-150) ug/L as measured formulation and 24 (16-30) ug/L as lindane.

QA Statement: "In accordance with ABC Laboratories' intent that all studies conducted at our facilities are designed and function in conformance with good laboratory practice regulations and the protocols for individual laboratory studies, an inspection of the final report for Lindane 20% EC was conducted and found to be in an acceptable form by a member of our Quality Assurance Unit... A procedure audit for rainbow trout was conducted on June 16, 1986. No deviations were noted. A final inspection of all data and records on July 3, 1986 indicated that the report submitted to you is an accurate reflection of the study as it was conducted by ABC Laboratories."

13. Reviewer's Evaluation

- a. Test Procedures: The protocol is acceptable since it follows Methods for Acute Toxicity Tests with Fish, Macroinvertebrates, and Amphibians EPA-660/3-75-009. The test material was a formulated product as required in the Standard.
- b. Statistics: The data were analyzed by EEB's Toxanal program. The 96-hour LC₅₀ value was 120.3 (80-150) ug/L as measured formulation and 24 (16-30) ug/L as lindane.
- c. Discussion/Results: With an LC₅₀ value of 120 (80-150) ug/L, Lindane 20% EC is highly toxic to coldwater fish.
- d. Conclusion
 1. Category: Core.
 2. Rational: Testing with a formulated product was required in the Registration Standard.

STAVOLA FISH ACUTE TOXICITY *Lindane 20EC*

| CONC. | NUMBER EXPOSED | NUMBER DEAD | PERCENT DEAD | BINOMIAL PROB. (PERCENT) |
|-------|----------------|-------------|--------------|--------------------------|
| 280 | 20 | 20 | 100 | 9.53674E-05 |
| 150 | 20 | 17 | 85 | .128841 |
| 80 | 20 | 0 | 0 | 9.53674E-05 |
| 47 | 20 | 0 | 0 | 9.53674E-05 |
| 27 | 20 | 0 | 0 | 9.53674E-05 |

THE BINOMIAL TEST SHOWS THAT 80 AND 150 CAN BE USED AS STATISTICALLY SOUND CONSERVATIVE 95 PERCENT CONFIDENCE LIMITS, BECAUSE THE ACTUAL CONFIDENCE LEVEL ASSOCIATED WITH THESE LIMITS IS GREATER THAN 95 PERCENT.

AN APPROXIMATE LC50 FOR THIS SET OF DATA IS 120.277

WHEN THERE ARE LESS THAN TWO CONCENTRATIONS AT WHICH THE PERCENT DEAD IS BETWEEN 0 AND 100, NEITHER THE MOVING AVERAGE NOR THE PROBIT METHOD CAN GIVE ANY STATISTICALLY SOUND RESULTS.

STAVOLA FISH ACUTE TOXICITY *Lindane 20 EC*

| CONC. | NUMBER EXPOSED | NUMBER DEAD | PERCENT DEAD | BINOMIAL PROB. (PERCENT) |
|-------|----------------|-------------|--------------|--------------------------|
| 56 | 20 | 20 | 100 | 9.53674E-05 |
| 30 | 20 | 17 | 85 | .128841 |
| 16 | 20 | 0 | 0 | 9.53674E-05 |
| 9.4 | 20 | 0 | 0 | 9.53674E-05 |
| 5.4 | 20 | 0 | 0 | 9.53674E-05 |

THE BINOMIAL TEST SHOWS THAT 16 AND 30 CAN BE USED AS STATISTICALLY SOUND CONSERVATIVE 95 PERCENT CONFIDENCE LIMITS, BECAUSE THE ACTUAL CONFIDENCE LEVEL ASSOCIATED WITH THESE LIMITS IS GREATER THAN 95 PERCENT.

AN APPROXIMATE LC50 FOR THIS SET OF DATA IS 24.0554

WHEN THERE ARE LESS THAN TWO CONCENTRATIONS AT WHICH THE PERCENT DEAD IS BETWEEN 0 AND 100, NEITHER THE MOVING AVERAGE NOR THE PROBIT METHOD CAN GIVE ANY STATISTICALLY SOUND RESULTS.
