

US EPA ARCHIVE DOCUMENT

5-4-87

DATA EVALUATION RECORD

MRID #s need correcting in TOA and Junc

CASE: 238

DIAZINON

CONT-CAT: 01 GUIDELINES: 72-2

MRID: 121283

Agchem (1982) Daphnia Magna Toxicity--Knox Out 2FM Insecticide Concentrations in Water Used for Union Carbide Environmental Service Report 11506-41-08. (Unpublished Study Received December 15, 1982 under 4581-335; CDL:249076-D)

REVIEW RESULTS:

VALID INVALID INCOMPLETE

GUIDELINE: SATISFIED PARTIALLY SATISFIED NOT SATISFIED

DIRECT RVW TIME = 30 Minutes START DATE: 06/13/86 END DATE: 06/13/86

REVIEWED BY: Margaret Rostker
TITLE: Ecologist
ORG: EEB/HED
LOC/TEL: 557-1741
SIGNATURE:

H. T. Craven
5/4/82

DATE: 06/13/86

APPROVED BY: Harry Craven
TITLE: Supervisory Biologist
ORG: EEB/HED
LOC/TEL: 557-1741
SIGNATURE:

H. T. Craven

DATE: 5/4/87

Core study showing Daphnia 48-hour LC₅₀ = 0.522 ppb nominal active ingredient.

See attachments from W. Fratz

9. Materials and Methods:

The test material is the formulated product Knox Out 2FM (23% diazinon) since this test using the formulation is required for registration.

Daphnia magna (first instar) were assigned 5 to a group with 4 replicates in standard, reconstituted water at 20 °C. Spacing of doses was at 75 to 80 percent increments.

10. Statistic Analysis

Since there was only one partial mortality (70%), 0, and 100 percent mortalities, the LC₅₀ was verified on log-probit paper.

11. Results/Discussion:

There was only 5 percent control mortality during the test. There was no effect on pH noted even though it was initially at 8.4, and DO levels were within acceptable levels.

12. Reviewer's Evaluation:

a. Test Procedure: The test procedure generally complies with recommended protocol. The spacing of doses of 75 to 80 percent increments is greater than recommended, but 70 percent partial mortality enable an adequate verification of the reported LC₅₀. Test levels were in terms of nominal concentrations and not measured.

b. Results/Discussion: The nominal 48-hr LC₅₀ is 0.522 (0.459 to 0.585) ppb total test material.

c. Validation: Supplemental

- Reconsideration upon receipt of actual measured concentrations for all test levels.

DATA EVALUATION RECORD

1. Chemical: Diazinon 2FM Microencapsulated

2. Formulation: Formulated Product

O,O-Diethyl O-(2-isopropyl-6-methyl-4-pyrimidinyl)
phosphorothioate 23%
Inert Ingredients 77%

3. Citation: Application for Registration of Knox Out®
Fire Ant Control Section IX.
Fish and Wildlife Safety October 1982.
Submitted by Agchem Division Pennwalt Corporation.
Accession No. 248821, Registration No. 4581-GLR.

4. Reviewed by: Wayne C. Faatz, Ph.D.
Wildlife Biologist

5. Date Reviewed: January 5, 1983

6. Test Type: Daphnia magna

Toxicity - Knox Out 2FM Insecticide Concentrations in Water.

Union Carbide Environmental Report 11506-41-08.

This report is a supplement to the data evaluation record by J. Leitzke September 11, 1980 on "The acute toxicity of Knox Out 2FM to the water flea, Daphnia magna Straus, UCES Proj. No. 11506-41-08; prepared by Union Carbide Environ. Serv; submitted by Pennwalt Corp. (Accession No. 240993).

The LC₅₀ was determined using nominal ppm active ingredient. Microencapsulated diazinon is a time release insecticide so actual measured concentrations are necessary for the test to be meaningful. The measured concentrations of the toxicant in the original test was not initially available. EEB is willing to upgrade the aquatic study to acceptable if the toxicant concentrations of the original solutions were available or measurements of new prepared solutions are determined (Faatz, August 24, 1981). The registrant chose the latter.

7. Reported Results:

Concentration - 10 micrograms/liter Knox Out 2FM

<u>Sampling Time (hr)</u>	<u>Added ug/L ai</u>	<u>Found ug/L Total</u>	<u>Released ug/L</u>	<u>% of Total</u>
0	2.32	1.76	0.37	21.0
24	2.32	1.69	0.76	45.0
48	2.32	1.71	0.75	43.9

The amount of total diazinon found in the water was 73 percent to 76 percent of what was added so these results fall within the efficiency of the method at this low concentration. At 24 and 48 hours, about 45 percent of the total diazinon found had been released from the capsules.

8. Reviewer's Conclusion

The registrants conclusions are reasonable based on the data. EEB requested measurement of solution diazinon at all test levels. The registrant provided measurements at only the highest test level. A complete series could better characterize the release of diazinon in water, however, the limited data is sufficient to complete a hazard assessment for aquatic invertebrates.

In J. Leitzke's original data evaluation the 48-hour LC₅₀ for the formulated product 23 percent active material was 5.03 (4.45 to 5.67) ppb. The adjusted LC₅₀ for nominal active ingredient is 1.16 (1.02 to 1.30) ppb. Further adjustment is necessary because the submitted data indicates that only 45 percent of the available diazinon is in solution. The LC₅₀ should be 0.522 (0.459 to 0.585) ppb. This indicates that diazinon is very highly toxic to aquatic invertebrates. Also, at the end of 48 hours there has been no degradation of the total amount of diazinon. This could have serious consequences if diazinon contaminated viable waters.

9. Materials and Methods:

Fifteen liters of water (hardness 250 mg/L as CaCO₃, pH 8.23) was placed in a five gallon polyethylene bucket at a room temperature of 21° to 22 °C. Knox Out 2FM was added at 10 ug/L. Only one rate was used because the concentration was so low the sensitivity of the method would not permit lower rates. One hundred mL samples were taken at intervals of 0, 24, and 48 hours and the concentration determined for total and released diazinon. Quantitation was done using a Hewlett-Packard gas chromatograph equipped with a photometric detector. For the released diazinon, the water samples were filtered through a 0.45 micron Millipore filter to remove all the capsules, then the filtered was extracted.

No statistical analysis of the data was done.

10. Reviewer's Evaluation:

- a. Test Procedure: The test procedure is adequate for the purposed intended.
- b. Statistical Analysis: None is needed.
- c. Discussion/Results: The original Daphnia study was unacceptable because the amount of diazinon available in solution was unknown. This study can now be considered acceptable but with a revised LC₅₀ of 0.522 (0.459 to 0.585) ppb which reflects the amount of active ingredient available to the test organism.
- d. Conclusions
 1. Category: Core with the acceptance of a revised LC₅₀ 0.522 (0.459 to 0.585) ppb.
 2. Rationale: The assay measured the amount of diazinon in solution available to the test organisms.
 3. Repairability: N/A.