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EEE BRANCH REVIEW

DATE: IN 12/14/77 OUT 1/6/78 IN _____ OUT _____ IN _____ OUT _____

FISH & WILDLIFE ENVIRONMENTAL CHEMISTRY EFFICACY

FILE OR REG. NO. _____

PETITION OR EXP. PERMIT NO. 10182-EUP-7

DATE DIV. RECEIVED _____

DATE OF SUBMISSION _____

DATE SUBMISSION ACCEPTED _____

TYPE PRODUCTS(S): I, D, H, F, N, R, S Insecticide

DATA ACCESSION NO(S). _____

PRODUCT MGR. NO. D. Stubbs

PRODUCT NAME(S) Ectiban

COMPANY NAME ICI United States, Inc.

SUBMISSION PURPOSE Review EUP support data: Bluegill 96-hr Acute toxicity study.

CHEMICAL & FORMULATION Permethrin (active ingredient)
Formulated Product: 24% a.i.

ICI Americas, Inc. has repeated an acute toxicity test for Bluegill Sunfish with JFU5054 a permethrin formulation. The test has been submitted in support of EUP-10182-7 Ectiban Dusts (also relevant to Experimental Permit Nos. 10182-EUP-3, 10182-EUP-5, 10182-EUP-6, 10182-EUP-8).

100.0 Pesticidal Use

See previous reviews.

101.0 Chemical and Physical Properties

See previous reviews.

102.0 Behavior in the Environment

See previous reviews.

103.0 Toxicological Properties

See previous reviews.

104.0 Hazard Assessment

See previous reviews.

VALIDATION SHEET CRL # _____ PAGE ____ OF ____

FORMULATION:		
24 % a.i.	SC #	CHEMICAL NAME
JFU 5054 Formulated Product		Permethrin PP557

IA	IB	T	FW	EC	R		

Validator:	Date:
Richard Balcomb	1/5/78

Test Type:
Fish Acute 96-hr. LC_{50}: Warmwater

Test ID.# ES-I

CITATION: R.W. Hill et.al. Acute Toxicity of JFU 5054 to Bluegill Sunfish (Lepomis macrochirus). October 1977. BL/B/1832. ICI (Brixham Laboratory).

VALIDATION CATEGORY: Invalid

RESULTS: (1) 96 hr. LC_{50} = 0.0205 (0.019-0.022)mg/L Based on nominal concentrations.

(2) 96 hr. LC_{50} = 0.013 (0.011-0.016)mg/L Reviewer calculation - based on measured concentration.

Bluegill Sunfish were tested at 22°C in a flow-thru system. Twenty fish were used per level and concentration levels (7) ranged from 0.075 to 0.0075 mg/L.

No mortalities were observed at the 0.0155 to 0.0075 mg/L levels, however, toxic symptoms (jaw spasms/hyperactivity) were noted at the 0.0155 and 0.0135 mg/L levels.

The 96 hr-LC_{50} determined by the reviewer was calculated using a Finney Probit Analysis program on a Texas Instruments programable calculator.

VALIDATION CATEGORY RATIONALE: The experimenter has measured the concentration of pesticide at each test level but has used the nominal concentration in the calculation of the LC_{50} values. The experimenter claims that the emulsion properties of this formulation prevent adequate assay of the chemical in the test solutions. The reviewer has recalculated the 96-hr LC_{50} using the measured concentration values, this result (0.013; 0.011-0.016) is considerably less than the result obtained using the nominal concentrations (0.0205 mg/L). Given the high toxicity of this chemical to aquatic organisms the Environmental Safety Staff believes that the validity of the 96-hr LC_{50} estimate, provided by the registrant has not been adequately demonstrated.

TEST REPAIRABILITY: The study may be repaired by: (1) Providing addition data and/or references to support the contention that the nominal concentration values accurately indicate the exposure concentrations, or (2) Recalculating the LC_{50} estimates using the measured concentrations, or (3) Accepting the 96-hr. LC_{50} value calculated by the Environmental Safety Staff. This value was calculated by Finney Probit Analysis[1] and used the measured concentrations presented in Table 7 of the study.

[1]Finney, D.J. 1952. Probit Analysis, 2nd ed. Cambridge University.

107.0 Conclusions

The experimenter has measured the concentration of pesticide at each level but has used the nominal concentration in the calculation of the LC_{50} values. The experimenter claims that the emulsion properties of this formulation prevent adequate assay of the chemical in the test solutions. The reviewer has recalculated the 96-hr. LC_{50} using the measured concentration values, this result (13.0 ppb) is less than the result obtained using the nominal concentrations (20.5 ppb). Given the high toxicity of this chemical to aquatic organisms the Environmental Safety staff believes that the validity of the 96-hr. LC_{50} estimate provided by the registrant has not been adequately demonstrated. Furthermore, it is our opinion that in an aquatic flow-thru system if the measured concentrations are inherently inaccurate (here they ranged from 21.9 to 93.8% of the nominal concentrations) it is environmentally safer to underestimate the LC_{50} value, i.e. in this case by basing calculations on the measured concentrations.

The registrant may correct this study in <u>one</u> of the following ways:

(1) Providing additional data and/or references to support the contention that the nominal concentration values accurately indicate the exposure concentrations;

(2) Recalculating the LC_{50} estimates using the measured concentrations;

(3) Accepting the 96-hr LC_{50} value calculated by the Enviornmental Safety Section. This value was calculated by Finney Probit Analysis[1] and used the measured concentrations presented in Table 7 of the study. The 96-hr LC_{50} thus determined was: 0.013 (0.011-0.016) mg/L.

The registrant should contact the Environmental Safety Section if any questions arise concerning this matter.

107.6 Special Notes

The registrant is reminded that for future registration the <u>cis</u>, <u>trans</u> ratio of the technical material used in all Environmental Safety studies must be submitted.

References

1 Finney, D.J. 1952. Probit Analysis, 2nd Ed. Cambridge University.

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Environmental Safety Section
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