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Date Out EFB: 17 MAY 1984

TO: Bill Miller
Product Manager 16
Registration Division
TS-767

006A

FROM: Samuel Creeger, Chief 
Review Section No. 1
Exposure Assessment Branch
Hazard Evaluation Division

Attached please find the environmental fate review of:

Reg./File No.: 2724-314

Chemical: Propetamphos

Type Product: Insecticide

Product Name: Safrotin EC

Company Name: Zoecon Co.

Submission Purpose: Response to previous review of hydrolysis study.

ZBB Code: ?

ACTION CODE: 311

Date in: 5/3/84

EFB # 4349

Date Completed: 5/17/84

TAIS (level II) Days

63

0.5

Deferrals To:

----- Ecological Effects Branch

----- Residue Chemistry Branch

----- Toxicology Branch

1.0 INTRODUCTION

Zoecon Industries has submitted a response to questions raised in a previous EAB review of an hydrolysis study submitted in support of (then Sandoz, Inc.) registration of Safrotin (Propetamphos, as a. i.) as an outdoor perimeter spray for control of cockroaches and other pests.

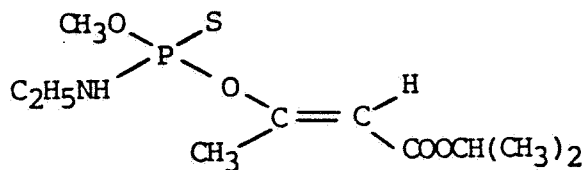
Previous EAB reviews for this use are dated 12/21/82 and 8/18/83.

1.1 Chemical

Common name: Propetamphos

Chemical name: (E)-1-methylethyl-3-[[[(ethylamino)methoxyphosphinothioyl]oxy]-2-butenate or (E)-O-2-isopropoxyxarbonyl-1-methylvinyl O-methyl ethyl phosphoramidothioate

Chemical structure:



2.0 DISCUSSION OF DATA

EAB's original conclusion and questions will be given followed by Zoecon's reply then the EAB response:

EAB conclusion

Even though the submitted hydrolysis study has many of the deficiencies as the originally submitted hydrolysis study, EAB can conditionally accept the study provided the registrant submits the following additional information:

2.1 How were the buffer solutions made up and what was the final concentration of the solutions?

Zoecon reply: Buffer solutions were prepared from (commercially available) "Buffer Tritrisol" at pH 3, 6, 7 and 9. Final concentrations of 5 and 50 ppm were both studied as indicated in the study report.

2.2 Were the samples maintained in the dark?

Zoecon reply: Yes. The samples were maintained in the dark from preparation until analysis.

- 2.3 Clarification is needed as to why the analytical procedure which qualitatively and quantitatively measured the concentration of the degradation product, isopropyl acetoacetate was not routinely used throughout the study. The data then would represent the material balance.

Zoecon reply: Isopropyl acetoacetate is known to be highly reactive and tends to rapidly decompose to simple products difficult to analyze for, such as isopropanol, acetone and carbon dioxide. The rate of propetamphos decomposition was of primary interest and the fact that some isopropyl acetoacetate was detected was considered sufficient. The material balance of both propetamphos and isopropyl acetoacetate is given at one time frame for each temperature at each pH studied in Table 7.

EAB response:

The Zoecon replies to EAB questions are adequate to complete the review of this hydrolysis study.

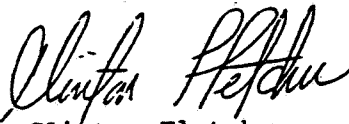
3.0 CONCLUSION

This information resolves the deficiencies for this hydrolysis study. From results of the study, EAB concludes that propetamphos is stable to hydrolysis at environmental pH 6 and 25°C temperature with a half-life of 365 days. Propetamphos hydrolyzes slowly in very acidic (pH 3) and in alkaline solutions (pH 9) maintained at 25°C with half-lives of 11 days and 41 days, respectively.

Data for pH 7 solution maintained at 25°C were not reported. However, at pH 7 the half-life was 17 days in solution maintained at elevated temperature of 45°C. Thus, hydrolysis would be considered to occur slowly at pH 7 and 25°C, with a half-life between 365 and 41 days.)

Isopropyl acetoacetate was an intermediate degradation product which further degraded to simple compounds of isopropanol, acetone and carbon dioxide.

Zoecon misinterpreted the question concerning the concentration of the buffer solution (by reporting the fortification level of propetamphos added which was known). However, this is a minor deficiency which can be disregarded since the commercial buffer solutions are not available at excessively high molar concentrations.



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