114501

Date Out: EFB APR 30 1981

TO: Product Manager 12 (Ellenberger)
TS-767

FROM: Dr. Willa Garner
Chief, Review Section No. 1
Environmental Fate Branch

Attached please find the environmental fate review of:

Reg./File No.: 264-GUG

Chemical: Thiodicarb

Type Product: Insecticide

Product Name: LARVIN Thiodicarb Insecticide 95% Technical

Company Name: Union Carbide

Submission Purpose: New chemical-formulating use only, technical product.

ZBB Code: 3(c)(5)

ACTION CODE: 115

Date in: 9/22/80

EFB # 638

Date Completed APR 30 1981

TAIS (level II)	Days
61	2

Deferrals To:

_____ Ecological Effects Branch

_____ Residue Chemistry Branch

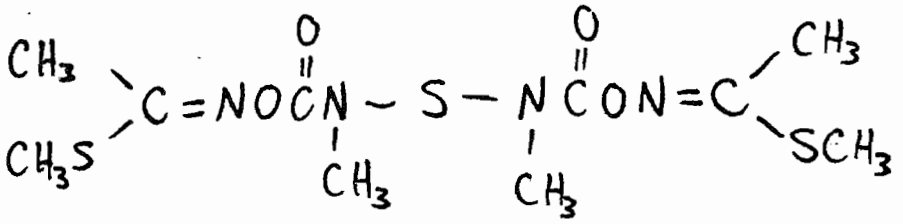
_____ Toxicology Branch

1. INTRODUCTION

1.1 This is an application for registration of the product LARVIN Thiodicarb Insecticide 95% Technical. The product is for formulating use only.

1.2 Weight per gallon = 1.442 gm/cc.

1.3 Structural formula and chemical name



Ethanimidothioic acid, N, N'- [thiobis[(methylimino) carbonyloxy]] bis, -dimethyl ester

1.4 Physical and chemical properties of thiodicarb

color: white tan
State: cystalline powder at 20°C
odor: Slightly sulfurous
MP: 173-174°C
BP: N/A
solubility: xylene - 0.1% at 50°C
acetone - 0.8% at 25°C
methanol - 0.3% at 25°C
water (distilled) - 35 ppm at 25°C
vapor pressure: 4.3×10^{-5} mmHg at ~~20~~ 25°C

2. DISCUSSION OF DATA

2.1 Hydrolysis of UC 51762 in Aqueous Buffer Solutions

This study has been reviewed with the thiodicarb submission on cotton and soybeans. (See the evaluation of EFB #622 and 623). The study is acceptable.

2.2 Investigation of the Metabolism of UC 51762 by Activated Sludge.

This study has been reviewed with the thiodicarb submission on cotton and soybeans. (See the evaluation EFB #622 and 623).

It is concluded that the activated sludge process was affected by the continuous feeding of thiodicarb at 10 ppm. Whether

thiodicarb was degraded in the system or discharged with the effluent was not addressed.

The study provided was a preliminary report. The registrant provided a summary of the fate of thiodicarb in activated sludge without the supporting data. A copy of their summary which, in the absence of supporting data was not evaluated by this reviewer, is attached.

3. RECOMMENDATIONS

3.1 We concur with registration of the thiodicarb technical product if the following conditions will be met within 12 months:

3.1.1 Provided a final activated sludge study. The submitted study is noted to be a preliminary report. Provide raw data, tables and figures indicating the fate of thiodicarb in activated sludge in addition to the summary initially provided. Indicate the site of radiolabeling.

With regard to table 3, provide an explanation for the use of the superscripts.

Samuel M. Creeger
April 30, 1981
Section #1/EFB
Hazard Evaluation Division

SUMMARY

In Part A of this study the effect of UC 51762 on the operating parameters of an activated sludge process (ASP) were determined. In this study (Part B) the effects of activated sludge on the compound UC 51762 were investigated in shake flask assays using ^{14}C-labeled UC 51762 added to mixed liquors from both control (unacclimated) and continuously treated (acclimated) activated sludge reactors.

With unacclimated sludge the ^{14}C was found principally in the liquid phase (effluent) over 48 hours; ^{14}C in the biomass amounted to less than 5% of the total. ^{14}C evolved as CO_2 amounted to less than 10% of the total. The principal component in the effluent appeared from TLC results to be the degradation product, Methomyl.

With acclimated sludge, previously exposed continuously to 10 ppm UC 51762, the ^{14}C was initially present (zero time) all in the liquid phase but this decreased continuously with time to 14-22% of the total by 48 hours. The biomass continuously accumulated ^{14}C to 20-26% of the total ^{14}C by 48 hours. Marked metabolism of UC 51762 to CO_2 occurred; over 48 hours. 56-57% of the total ^{14}C was converted to CO_2. The principal component in the effluent appeared from TLC to be Methomyl during early periods of incubation. With time up to 48 hours the Methomyl decreased in absolute amount with appearance of Methomyl Sulfoxide and formation of $^{14}CO_2$. After 48 hours the principal component in the effluent was Methomyl Sulfoxide.

There was no significant effect of concentration (1 ppm and 10 ppm) on distribution of ^{14}C or products formed. The biomass ^{14}C was not removed by aqueous washing and only slightly (<5%) by methanol extraction. Extracted biomass components did not match by TLC any known UC 51762 metabolites.