JAH 5-7-90
Oxamyl
(file)

Shaughnessy No.: 103801

Date Out of EFGWB: MAY -7 1990

To: Mr. Frank Rubis
Product Manager # 50
Registration Division (TS-767)

From: Paul Mastradone, Ph.D., Chief
Environmental Chemistry Review Section #1
Environmental Fate & Ground Water Branch/EFED (H7507C)

Thru: Henry Jacoby, Chief
Environmental Fate & Ground Water Branch/EFED (H7507C)

Attached, please find the EFGWB review of...

Reg./File #: 103801-7

Chemical Name: Oxamyl

Type Product: Insecticide-Nematicide

Product Name: Vydate

Company Name: E.I. du Pont de Nemours

Purpose: Review of supplemental data for photolysis study

Action Code: 400 EFGWB #(s): 90543

Date Received: 4/10/89 Total Reviewing Time: 0.5 day

Deferrals to: ___ Ecological Effects Branch

___ Dietary Exposure Branch

___ Non-Dietary Exposure Branch

___ Toxicology Branch I

___ Toxicology Branch II

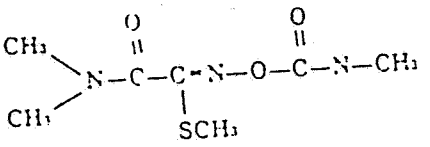
1.0 CHEMICAL:

chemical name: Methyl N'N'-dimethyl-N-[(methylcarbamoyl)oxyl]-1-thiooxaminidate

common name: Oxamyl

trade name: Vydate

structure:



CAS #:

Shaughnessy #:103801

2.0 TEST MATERIAL: N/A

3.0 STUDY/ACTION TYPE: Supplemental data for aqueous photolysis experiment

4.0 STUDY IDENTIFICATION:

NcNalley, Mary E. 1988. Photodegradation of [1-^{14}C] Oxamyl in Buffer Solution at pH 5 (Supplement #1). performed and sponsored E. I. du Pont Nemours and Co., Inc. Agricultural Products Department. Research and Development Division. Wilmington, DE. Received by EPA 4/10/89. (MRID# 40606515).

5.0 REVIEWED BY:

James A. Hetrick, Ph.D.
Chemist, ECRS # 1
EFGWB/EFED/OPP

Signature: James A. Hetrick
Date: 5/7/90

6.0 APPROVED BY:

Name: Paul Mastradone, Ph.D.
Section Chief, ECRS # 1
EFGWB/EFED/OPP

Signature: Paul J Mastradone
Date: MAY - 7 1990

7.0 CONCLUSIONS:

The supplemental light intensity data provides the necessary information to compare the Xenon lamp with natural light. The Xenon lamp simulates both the light energy distribution and the integrated light intensity of natural light over a 300-800 nm wavelength range. Therefore, EFGWB concludes that the supplemental light intensity data in conjunction with the submitted aqueous photolysis study (Acc.# 406065-15) fulfills the 161-2 data requirement. (Please see attached DER for review of aqueous photolysis study).

8.0 RECOMMENDATIONS:

Inform the registrant that the supplemental light intensity data provides a valid comparison between Xenon and natural light spectral properties. Therefore, the supplemental data in conjunction with the aqueous photolysis study (Acc.# 406065-15) satisfy the 161-2 data requirement.

9.0 BACKGROUND:

The registrant submitted an aqueous photolysis study (Accession # 406065-15) to satisfy the 161-2 data requirement. The photolysis study was not acceptable because the artificial light source was not compared to natural light. EFGWB requested supplemental data showing a spectral comparison between the Xenon lamp and natural light over the 300 to 800 nm wavelength range.

10.0 DISCUSSION OF INDIVIDUAL TESTS OR STUDIES:

The registrant responded to the EPA request (ie, submission of Xenon lamp spectra information) by submitting a spectral comparison between the Xenon lamp and natural light. The Xenon lamp, apparently tested on 12/31/87, had a maximum integrated light intensity greater than 2.8 $W/m^2/nm$ at an approximate wavelength of 480 nm (Figure 1). Similarly, natural light (representing June 17, 1986; 1.09 p.m.in Wilmington DE) had a maximum integrated light intensity of 1.4 $W/m^2/nm$ at an approximate wavelength of 480 nm (Figure 2). The cumulative light intensity, a sum of integrated light intensities over the 300 to 800 nm wavelength range, for natural and artificial light was 579.6 and 636.6 W/m^2, respectively. EFGWB recognizes the maximum light intensity of the Xenon lamp is greater than natural light; however, both light sources (ie, Xenon and natural light) have a similar distribution of light energy over the 300-800 nm spectral range.

EFGWB concludes that the Xenon lamp approximated the natural light energy intensity and spectral distribution over the 300 to 800 nm wavelength range.

11.0 COMPLETION OF ONE-LINER:
12.0 CBI APPENDIX: N/A

RIN 3755-96

Page____ is not included in this copy.

Pages 4 through 5 are not included.

The material not included contains the following type of information:

____ Identity of product inert ingredients.

____ Identity of product impurities.

____ Description of the product manufacturing process.

____ Description of quality control procedures.

____ Identity of the source of product ingredients.

____ Sales or other commercial/financial information.

____ A draft product label.

____ The product confidential statement of formula.

____ Information about a pending registration action.

✓ FIFRA registration data.

____ The document is a duplicate of page(s) _____.

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The information not included is generally considered confidential by product registrants. If you have any questions, please contact the individual who prepared the response to your request.

DATA EVALUATION RECORD

Oxamyl — Study 2 (Photodegradation in Water)

Photodegradation of [1-^{14}C] Oxamyl in Buffer Solution pH 5. Mary Ellen P. McNally and Julia R. Wheeler. March 30, 1988. Performed and Submitted By: E. I. du Pont de Nemours and Company, Inc., Wilmington, DE. Lab Project ID #AMR-960-87. Accession #406065-15.

Reviewed By: Patricia Ott — Signature: Pat Ott
Title: Chemist — Date: 8/11/88
Org: Environmental Chemistry Review Section #1

Approved By: Paul Mastradone — Signature: Paul J Mastradone
Title: Chemist — Date: AUG 18
Org: Environmental Chemistry Review Section #1

Conclusions:

This study can not be fully evaluated until the following points are addressed:

1. A UV-VIS spectrum (300-800 nm) for the xenon burner used in this study and a reference spectrum for sunlight should be provided.

Materials and Methods:

A photodegradation in water study at 20 ppm for ^{14}C-oxamyl (labelled in the #1 carbon position and 98% pure) was conducted at pH 5 (the pH of minimal hydrolysis).

Fortified, buffered, sterilized solutions were exposed to simulated sunlight continuously for 16 days. Identical sterilized control solutions were incubated in the dark, and all solutions were maintained at 25°C.

The photolysis vessels were water-jacketed beakers covered with glass plates. The radiation source was a xenon burner (Suntest) equipped with a filter to eliminate wavelengths less than 290 nm. Spectra for the xenon lamp and sunlight were provided only for the 300-384 nm part of the UV-VIS spectrum. The integrated light intensity of the xenon lamp for this spectral range was equal to 96% of the corresponding energy of sunlight at 1 ppm on June 17, 1986 in Wilmington, DE. The lamp was 9 and 1/4" above the sample.

Total radioactivity was determined by liquid scintillation counting. Individual compounds were analyzed by HPLC (UV detector) and the samples were monitored for 2 degradates: the oxime and 1,3-dimethylurea. GC-MS was used to confirm identity of compounds.

Solutions were sampled on day 0, 1, 3, 5, 7, 9, 14, and 16.

Reported Results:

The degradation of ^{14}C-oxamyl occurred more rapidly in the irradiated solutions than the non-irradiated solutions.

The estimated half-life (calculated from first-order rate constants) of ^{14}C-oxamyl at pH 5 was 7 days and >30 days for non-irradiated oxamyl.

The principle degradation product was the oxime (methyl 2-(dimethylamino)-N-hydroxy-2-oxo, methyl ester). After 16 days of continuous irradiation, the oxime accounted for 75% of the applied radioactivity. Mass balance throughout the study was $\geq$97% of the applied radioactivity.

RIN 3705-96

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