(3) 7/12/89

Shaughnessy No.: 056502
Date Out of EFGWB: JUL 12 1989

To: H. Toma
Product Manager PM #21
Registration Division (H7505C)

From: Emil Regelman, Supervisory Chemist
Environmental Chemistry Review Section #2
Environmental Fate & Ground Water Branch/EFED (H7507C)

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

Attached, please find the EFGWB review of...

Reg./File # : 5481-197

Chemical Name: PCNB

Type Product : fungicide

Product Name : n.a.

Company Name : AMVAC

Purpose : Review photodegradation on soil study submitted in in response to the 1987 Registration Standard.

Action Code: 660 EFGWB #(s): 90630

Date Received: 2/23/89 Total Reviewing Time: 3 days

Date Completed: 7/7/89

Deferrals to: ___ Ecological Effects Branch

___ Dietary Exposure Branch

___ Non-Dietary Exposure Branch

___ Toxicology Branch I

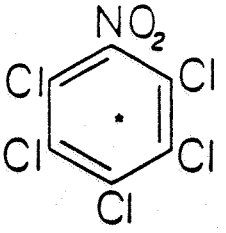
___ Toxicology Branch II

1. CHEMICAL:

chemical name: pentachloronitrobenzene

common name: PCNB

structure:



2. TEST MATERIAL:

^{14}C-PCNB, radiochemical purity: 99.0%, specific activity: 46.4 mCi/mmole.

3. STUDY/ACTION TYPE:

Review a photodegradation on soil study submitted in response to the 1987 PCNB Registration Standard.

4. STUDY IDENTIFICATION:

Bowman, Brian R. "Photodegradation Study of ^{14}C-PCNB on Soil Surface." Performed by ABC Laboratories. Submitted by AMVAC Chemical Corporation. Received by EPA on February 23, 1989. MRID # 410048-01.

5. REVIEWED BY:

Dana Spatz
Chemist, ECRS #2
EFGWB/EFED/OPP

Date: JUL 11 1989

6. APPROVED BY:

Emil Regelman
Supervisory Chemist, ECRS #2
EFGWB/EFED/OPP

Date: JUL 12 1989

7. CONCLUSIONS:

This study is acceptable in fulfilling the Photodegradation on Soil data requirement.

PCNB photodegrades slowly on the surface of sandy loam soil exposed to a filtered Xenon Arc light system. The half-life was 80 days based on 30 days of exposure. Photoproducts were not identified as no degradate accounted for more than 4% of the activity in the test samples. There was no detectable degradation in the dark samples. The total activity recovered was 98% of the applied in the exposed samples and 104% of the applied in the dark samples.

8. RECOMMENDATIONS:

This study is acceptable and fulfills the Photodegradation on Soil data requirement.

9. BACKGROUND:

The PCNB Registration Standard was issued in January 1987. The Photodegradation on Soil study was required by the Registration Standard.

10. DISCUSSION OF INDIVIDUAL TESTS OR STUDIES:

See attached DER.

11. COMPLETION OF ONE-LINER:

One-liner is attached.

12. CBI APPENDIX:

Not applicable.

DATA EVALUATION RECORD

CASE GS — PCNB | STUDY 1 | CHEM 056502

PCNB

BRANCH EFGWB

FORMULATION 00 - ACTIVE INGREDIENT

Bowman, Brian R. "Photodegradation Study of ^{14}C-PCNB on Soil Surface." Performed by ABC Laboratories. Submitted by AMVAC Chemical Corporation. Received by EPA on February 23, 1989. MRID # 410048-01.

DIRECT RVW TIME = 3

REVIEWED BY: Dana Spatz
TITLE: Chemist
ORG: EFGWB/EFED/OPP

JUL 11 1989

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MATERIALS AND METHODS:

The primary stock solution consisted of ^{14}C-PCNB in hexane at a concentration of 384 ug/ml. The test soil was Blue Sandy Loam soil (54% sand, 36% silt, 10% clay; OM: 0.8%; CEC: 4.7 meq/100 g; pH 6.5).

The test samples were prepared in flame-sealed vials. This test system was chosen because PCNB is known to be subject to loss by volatilization.

The light source was an Atlas Xenon Arc Light System. The xenon light was equipped with dual borosilicate glass filters to eliminate radiation below 290 nm. The total irradiation received by the study samples was comparable to natural sunlight and the EPA mean solar data.

Thirty-six 1.0 g soil samples were weighed into cubic flame-sealed containers. The soil was moistened with water and dried at 110°C to form a soil "cake". These samples were then dosed with 26 ul (10 ug) of the primary stock solution. The samples were cooled in a dry ice-acetone bath to inhibit degradation or loss of compound, then flame-sealed. Four samples were reserved as time zero samples. Sixteen samples were wrapped in aluminum foil and placed into a box in the 25°C environmental chamber. The other sixteen samples were placed in the 25°C environmental chamber with the lamp positioned directly above the soil surface.

During the 30-day photolysis period, duplicate exposed and duplicate dark condition soil samples were removed sequentially at day 0, 1, 2, 3, 7, 10, 14, and 30 days. The soil samples were extracted twice with 4 ml portions of MeOH:1N acetic acid (80:20) and once with a 2 ml portion of the same solvent. Each combined extract was analyzed for ^{14}C-activity using duplicate 50 ul aliquots for LSC and single 50 ul aliquots for TLC. The TLC method consisted of reverse phase (C_{18}) as the stationary phase, and acetonitrile:water:acetic acid (89:8:3) as the eluent.

The concentration of ^{14}C-PCNB in the extracts was determined by multiplying the total ^{14}C-activity found in the extracts, expressed as ^{14}C-parent equivalents in ug/g by the fraction that was determined to be ^{14}C-PCNB by TLC.

REPORTED RESULTS:

Half-Life Determination of PCNB on Soil - Exposed System

Exposure Time in Days	ug as Parent Equivalents	% Parent By TLC	ug as Parent Compound	% of Time Zero	ln % Time Zero
0	11.35	98.2	11.15	100	4.61
0.97	10.52	95.6	10.06	90.2	4.50
1.91	10.99	97.0	10.66	95.6	4.56
2.93	10.84	95.8	10.38	93.2	4.53
6.94	11.50	94.4	10.86	97.4	4.58
9.97	11.33	94.4	10.70	96.0	4.56
14.3	9.891	91.3	9.030	81.0	4.39
30.3	10.34	80.5	8.324	74.7	4.31

Regression Output:

Constant	4.58
Std. Err of Y Est.	0.0548
R Squared	0.7489
No. of Observations	8
Degrees of Freedom	6
X Coefficient(s)	-0.00866
Std. Err of Coef.	0.00205
Half-life	80 days

PCNB science review

Page _____ is not included in this copy.

Pages 6 through 10 are not included in this copy.

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 product 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

X FIFRA registration data

___ The document is a duplicate of page(s) _____

___ The document is not responsive to the request

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.

EXPOSURE ASSESSMENT BRANCH 05/24/88
PESTICIDE ENVIRONMENTAL FATE ONE-LINER

PENTACHLORONITROBENZENE

File No.: 56502 CAS No.: 82-68-8
Type Pesticide FUNGICIDE
Chemical Name: PENTACHLORONITROBENZENE

Empirical Form.: C6C15N02
Uses: SOIL FUNGICIDE, SEED DRESSING
Form. Type:

Mole Wt.	Sol. @20C (ppm)	Vap.Pres.(torr)	Log Kow	Henry
295.3	0.44	1.13E-4	0.00	1.0E-4

Hydrolysis (161-1)
pH 5:
pH 7: 2.8E-5 (Kn 1/hr)
pH 9:

Photolysis (161-2, -3, -4)
Air:
Soil: Sandy loam - 1/2 life: 80 days
Water:

Mobility Studies (163-1)
Soil Partition (Kd)
1 Koc 1.4E4
2
3
4
5

Rf Factors

Soil Metabolism Studies - Terrestrial
Aerobic (162-1)
1
2
3
4
5
6
7

Anaerobic (162-2)

Soil Metabolism Studies - Aquatic
Aerobic (162-4)
1
2
3
4

Anaerobic (162-3)

Field Dissipation Studies
Terrestrial (164-1)
1
2
3
4
5
6

Aquatic 164-2)

** EPA Acceptable Study
# Supplemental (Scientifically Sound) Information

PENTACHLORONITROBENZENE

Field Dissipation Studies
Forest (164-3)
1
2

Other (164-5)

Ground Water Findings
1
2
3

Rotational Crop Restrictions (165-1, -2)
1
2

Fish Accumulation Studies (165-4)
1 BCF 6.3 TO 79
2

Degradation Products
1
2
3
4
5

Notes

References
ODW HA,

Writer
R. HOLST