Shaughnessy #: 043401

EFB Logout Date: 10 MAY 1983

Init: RM

To: H. Jacoby
Product Manager #21
Registration Division (TS-767)

From: L.A. Richardson, Ph.D.
Review Section #3
Exposure Assessment Branch
Hazard Evaluation Division (TS-769c)

Attached please find the EAB review of...

Reg./File No.: 1023-55

Chemical: Cycloheximide

Type Product: Fungicide

Product Name: Powder Cycloheximide

Company Name: Upjohn

Submission Purpose: Request waiver of data for RS chemical

ZBB Code:

Date In: 3/10/83

Date Completed: 5/10/83

Deferrals To:

_____ Ecological Effects Branch

_____ Residue Chemistry Branch

_____ Toxicology Branch

ACTION CODE: 651

EFB #: 267

TAIS (level II)	Days
66	4

Response to waiver request for Powder Cycloheximide, 1023-55

Hydrolysis: References 1, 2 and 3 contain little relevant experimental data on the hydrolysis of cycloheximide in the PH range and at the temperature of interest. Material balance data are lacking as well as conclusive chemical analyses of hydrolysis products. Rapid hydrolysis to "cyclohexanone" and the 'glutarimide B-acetoldehyde' is proposed but no supporting data are presented. Waiver of hydrolysis data should be denied.

Photolysis: No data have been presented to show that cycloheximide does not absorb light of the wavelengths present in sunlight in aqueous solution. However, granted that parent cycloheximide may not undergo photolysis its hydrolysis products may photodegrade in water in the PH range 5 to 9. No data on the photodegradation of cycloheximide on soil have been found in the references submitted. Waiver of photolysis data in water and on soil should be denied.

Soil Metabolism: The rate, type and degree of metabolism of cycloheximide in soil under aerobic conditions are not demonstrated in references 5,6 and 7. Degradation products are not chemically identified, the bioassay method used being specific for parent compound only. Waiver of aerobic soil metabolism should be denied.

Leaching: Leaching data on two soil types including an aged soil leaching study indicate that cycloheximide residues are quite mobile in soil. However, degradation products in leachate and soil have not been chemically identified. Additional leaching data may be waived if satisfactory hydrolysis and aerobic soil metabolism data are submitted which include chemical identification of parent compound and degradation products.

Field dissipation studies: References 12 and 13 indicate rapid dissipation of parent cycloheximide in orchard soil. No data are presented however on the chemical identities and patterns of formation and decline of degradation products. Also, there are no data to support the major use on turf. Waiver of field dissipation data should be denied.

Data on the effects of microbes on pesticides, the effects of pesticides on microbes and activated sludge are no longer required.

Data on photodegradation in air and volatility data may still be required as indicated in Table III, A-2.

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References 1,8,11,15 and 16 have not been previously submitted. References 1,11 and 16 are concerned with analytical methodology and synthesis of cycloheximide and do not add significantly to the existing data base. Reference 8 deals with the efficacy of various fungicides including cycloheximide formulations. These matters are outside of the concern for environmental fate data. Reference,15 report on vapor pressure of cycloheximide, contributes to the data base for volatility studies.

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REFERENCES

1 Garrett, E.R. and R.E. Notari 1965. Determination of cycloheximide and its degradation products alone and in mixtures.

2 Garrett, E.R. and R.E. Notari 1966. Cycloheximide transformations. I. Kinetics and mechanisms in aqueous acid.

3 Garrett, E.R. and R.E. Notari. 1965. Cycloheximide transformations. II. Kinetics and stability in a pharmaceutically useful pH range.

4 Petzold, E.N., and D.D. Chapman. 1970. Evaluation of the analytical method for cycloheximide on Florida soil.

5 Petzold, E.N. and D.D. Chapman. 1970. The stability of cycloheximide in a controlled soil environment.

6 Petzold, E.N. and D.D. Chapman. 1971. Fate of cycloheximide when incorporated into sterile vs. nonsterile soil.

7 Petzold, E.N., A.W. Neff, and R.E. Gosline. 1971. Observation on the ecology of microflora in soil which was heavily contaminated with cycloheximide.

8 Meyer, W.A., M.P. Britton, L.E. Gray and J.B. Sinclair. 1971. Fungicide effects on fungal ecology in creeping bentgrass turf.

9 Staten, F.W., W.M. Wright, and A.M. Thornton. 1974. Soil leaching studies on cycloheximide.

10 Staten, F.W., A.M. Thornton, and W.M. Wright. 1974. Soil leaching studies on Florida soil fortified with ^{14}C-cycloheximide and aged 30 days.

11 Neff A.W., and E.N. Petzold. 1970. Sampling in the field for cycloheximide assay.

12 Petzold, E.N., A.W. Neff, and D.D. Chapman. 1971. Effect of repeated applications of water upon the migration and persistence of cycloheximide in a treated plot of Florida soil.

13 Petzold, E.N., and D.D. Chapman. 1971. Cycloheximide residues in a citrus orchard and adjoining soil and lake water after spraying by helicopter.

14 Petzold, E.N., and D.D. Chapman 1972. Residues of ^{14}C-cycloheximide in bluegills from exposure via water for a month (revised Report No. 120-9760-48)

15 Neff A.W., and Koshy K.T. 1982. Vapor pressure of cycloheximide

16 Vanek Z., J. Cudlin and M. Vrondracek. 1967. Cycloheximide and other glutarimide antibiotics.

Data Evaluation Record

Chem 043401 Cycloheximide

Neff A.W. and K.T. Koshy, 1982. Vapor Pressure of Cycloheximide. 226-9760 KTK-1

This is a report of the vapor pressure of cyclohexmide at 40°C and a pressure of 10^{-6} torr by the Knudsen effusion method. The determined value was less than 4×10^{-5} torr. This is claimed to be the lowest value that could be determined with confidence. Vapor pressure data per se are not an, environmental fate data requirement. If needed for volatility studies this information will be supplied by Residue Chemistry Branch.

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Data Evaluation Record

Chem 043401 Cycloheximide

Neff, A.W. and E.N. Petzold, 1970. Sampling in the field for cycloheximide assay. Report No. 120-9760-27 and 120-9760-56.

This paper is a report on sampling techniques and analytical methodology for the determination of cycloheximide in oranges. It does not contain significant environmental fate data.

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Data Evaluation Record

Chem 043401 Cycloheximide

Meyer, W.A., M.P. Britton, L.E. Gray, S.J.B. Sinclair, 1971. Fungicide effects on the fungal ecology in creeping bentgrass turf. Mycopathologia et mycologia applicata, Vol. 43, 3-4: 309-315.

This is an efficacy study on the effect of several fungicides including a cycloheximide formulation on the distribution of fungal genera in turf. It does not contain relevant environmental fate data.

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Data Evaluation Record

Chem 043401 Cycloheximide

Garrett, E.R. and R.E. Notari, 1965. Determination of Cycloheximide and its degradation products alone and in mixtures. J. Pharm. Sci. 54(4):561-564.

This paper describes methods for the determination of cycloheximide and some of its degradation products separately and in mixtures. It does not provide useful information on the hydrolysis of cycloheximide at the temperature and Ph range of interest.

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Data Evaluation Record

Chem 043401 Cycloheximide

Vanek, Z., J. Cudlin, and M. Vondracek, 1967. Cycloheximide and other glutarimide antibiotics. Antibiotics Vol. II, Biosynthesis, Springer Verlag, N.Y., 1967 222-227

This is a study on the biosynthesis of cycloheximide and related compounds. It does not contain data relevant to the environmental fate of cycloheximide.

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