[illegible] #: 079401

[illegible] Date: 30 AUG 1983

[illegible]: RUM

To: George La Rocca

Product Manager # 15
Registration Division (TS-767)

From: Dr. Lionel Richardson

Review Section # 3
Environmental Fate Branch
Hazard Evaluation Division (TS-769)

Attached please find the EFB review of...

Reg./File No.: 8340-13

Chemical: Endosulfan

Type Product: Insecticide

Product Name: Thiodan

Company Name: American Hoechst

Submission Purpose: Registration Standard

[illegible] Code: ?

Date In: 6/16/83

Date Completed: 8/30/83

[illegible] Code: 655

[illegible] # 3421

[illegible] (Level II) 42

[illegible] 1.

Deferrals To:

_____ Ecological Effects Branch

_____ Residue Chemistry Branch

_____ Toxicology Branch

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Endosulfan

Environmental Fate Summary [1]
(Photolysis and Hydrolysis Studies)

Endosulfan does not appear to readily photolyze (half-life>200 days).

Endosulfan is stable to hydrolysis at pH5 (half-life > 1 year) It hydrolyzes fairly rapidly at pH 7 (half-life of 17-22 days) and rapidly at pH9 (half-life < 1 day).

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1. Registration standard submission by American Hoechst, Reg./File No: 8340-13, Acc. No. 250395, cover memo dated May 31, 1983.

Endosulfan

Hydrolysis Study

Reference:

Hydrolysis of Hoe 02671 (endosulfan), by Dr. Gorlitz and Ch. Klockner. Acc. No. 250395. Reg./File No. 8340-13. American Hoechst Corp., Tab J-1, cover letter dated May 31, 1983.

CONCLUSIONS:

This study partially fulfills the registration requirement for hydrolysis by providing the half-life for a- and B- endosulfan at pH 5,7 and 9 and identifying the degradation product, 1,4,5,6,7,7-hexachloro-bicyclo-(2,2,1)-hept-5-ene-2,3-dimethanol.

It does not fully satisfy the requirement because a material balance was not submitted.

Endosulfan is stable to hydrolysis at pH5 (half-life $>$ 1 year). It hydrolyzes fairly rapidly at pH 7 (half-life of 17-22 days) and rapidly at pH 9 (half-life $<$ 1 day).

MATERIALS AND METHODS:

Sterilized water was spiked with an acetone solution of a- or B-endosulfan at 0.151 ppm and 0.187 ppm, respectively, kept at constant pH (5, 7, or 9) and temperature (22° C). Samples were taken at 0 to 120 hours and for 0 to 72 hours for the a- and B-isomers, respectively.

Samples were extracted with methylene chloride with 98% recovery The analytical method used was HPLC with UV detection (lower limit of detection was 1 ppb).

REPORTED RESULTS:

HALF-LIFE

pH	a-endosulfan	B-endosulfan
5	>1 year	>1 year
7	22 days	17 days
9	7 hours	5.1 hours

DISCUSSION:

1. Purity of test substance not given.

2. Does not indicate if samples were kept in the dark, but since photolysis is negligible, this is not critical.

Endosulfan

Photolysis on Soil Study

Reference: Photolytic Degradation of the Insecticide Endosulfan on Soil Covered Thin Layer Plates under Simulated Sunlight (by Dr Gildemeister and H.J. Jordan). Acc. No. 250395. Reg./File No: 834013. American Hoechst Corp., Tab J-2, cover letter dated May 31, 1983.

CONCLUSIONS:

This study meets the registration requirement for photodegradation on soil. Endosulfan does not appear to readily photolyze (half-life >200 days).

MATERIALS AND METHODS:

14C-Radiolabelled a- and B-endosulfan (98% purity) were used. Soil TLC plates were prepared and spotted with 500 ug endosulfan and irradiated with a Suntest photoreactor for 4, 8, 16, 32, and 45 hours. A dark control was used.

Soil was scraped off and extracted with aceonitrile/toluene. The non-extractable radioactivity was measured by combustion followed by LSC. Extracts were analyzed by spotting on silica gel TLC plates followed by LSC.

REPORTED RESULTS:

The half-life of endosulfan is >200 days.

DISCUSSION:

1. Authors stated that 45 hours' exposure in the photoreactor was equivalent to 30 days' outside exposure but offered no evidence

2. Soil characteristics were not given.

3. Degradates were not reported.