UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

OFFICE OF
PESTICIDES AND TOXIC SUBSTANCES

SUBJECT: Product Chemistry Review of Bifenthrin Technical Insecticide/Miticide (EPA Reg. No. 279-3055)

FROM: Alfred Smith, Chemist
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DEC 12 1991

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Registrant: FMC Corporation

EPA Reg. No: 279-3055

MRID Nos: 419685-01, 419685-02, 419685-03

Pesticide Chemical Code (PCC): 128825

CAS Nos: 82657-04-3 (cis-isomer); 83322-02-5 (trans-isomer)

Chemical Name: [2-Methyl(1,1'-biphenyl)-3-yl]methyl 3-(2-chloro-3,3,3-trifluoro-1-propenyl)-2,2-dimethylcyclopropanecarboxylate

Common Name: Bifenthrin

Trade Names: Brigade®; Capture®; Talstar®; Biflex®

Use: Insecticide/Miticide

INTRODUCTION

FMC Corporation is proposing to amend the registration for the product Bifenthrin Technical Insecticide/Miticide (TGAI) in order to make changes in the manufacturing process for the active ingredient bifenthrin (See letter of FMC, 7/31/91, Eunice M. Cuirle). The product chemistry information submitted in support of the proposed amended registration is discussed below.

PRODUCT IDENTITY AND COMPOSITION (MRID 419685-01)

61-1: Product Identity and Disclosure of Ingredients

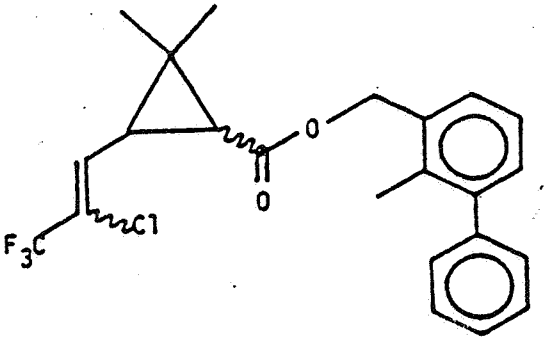
Bifenthrin is the active ingredient (ai) in the TGAI produced by FMC Corporation. Bifenthrin is:
[2-Methyl(1,1'-biphenyl)-3-yl]methyl 3-(2-chloro-3,3,3-trifluoro-1-propenyl)-2,2-dimethylcyclopropanecarboxylate

Cis isomers, 97 % minimum (CAS No. 82657-04-3)
Trans isomers, 3 % maximum (CAS No. 83322-02-5)

Molecular Formula: $C_{23}H_{22}O_2F_3Cl$

Molecular Weight: 422.88

Structural Formula:



The composition of the TGAI is contained in the Confidential Statement of Formula (CSF, EPA Form 8570-4) and is discussed in Confidential Appendix B.

The data satisfy the requirements of 40 CFR 158.155. No additional data are needed.

61-2: Beginning Materials and Manufacturing Process

See Confidential Appendix A for a discussion of the beginning materials and the manufacturing process.

The information submitted satisfies the requirements of 40 CFR 158.160 - 162. No additional information is needed.

61-3: Discussion of the Formation of Impurities

See Confidential Appendix A for a discussion of the formation of impurities.

The information submitted satisfies the requirements of 40 CFR 158.167. No additional information is needed.

ANALYSIS AND CERTIFICATION OF PRODUCT INGREDIENTS (MRID 419685-02)

62-1: Preliminary Analysis

Ten samples of the TGAI were examined for the ai, bifenthrin,

and its impurities. Gas Chromatography (GC) and High Performance Liquid Chromatography (HPLC) procedures were used to determine the components of the TGAI. For a discussion of the results of the analyses, see Confidential Appendix B.

The data satisfy the requirements of 40 CFR 158.170 for the TGAI. No additional data are needed.

62-2: Certified Limits

The certified limits are contained in the CSF and are discussed in Confidential Appendix B.

The information satisfies the requirements of 40 CFR 158.175 for the TGAI, Bifenthrin Technical. No additional information is needed.

62-3: Enforcement Analytical Methods

Adequate enforcement methods are available and are summarized in Confidential Appendix B. No additional information is needed.

PHYSICAL AND CHEMICAL CHARACTERISTICS (MRID 419685-03)

The physicochemical properties of Bifenthrin Technical are summarized below.

Guideline Reference Number(GRN)	Property	Description
63-2	Color	Off-white to pale tan
63-3	Physical State	Solid
63-4	Odor	Very weak, aromatic
63-5	Melting Point	68 - 70.6 °C
63-6	Boiling Point	Not applicable
63-7	True Particle Density	1.26 gm/ml at 24.2 °C
63-8	Solubility	Soluble in methylene chloride, chloroform, acetone, ether, toluene Acetone, 125g/100 ml. Slightly soluble in n-heptane (8.9g/100 ml) and methanol. Solubility in water, <0.1 ppb
63-9	Vapor Pressure	1.81x10(-7) torr at 25°C

63-10	Dissociation Constant	Not applicable due to low water solubility of ai.
63-11	Octanol/Water Partition Coefficient	> 1 x 10(6)
63-12	pH	5.4 - 6.0 at 25 °C
63-13	Stability	Thermal: no loss in ai after two years at either 25 °C or 50 °C.
63-14	Oxidizing or Reducing Action	No potential noted
63-15	Flammability	Not applicable
63-16	Explodability	Not explodable by impact
63-17	Storage Stability	No loss of ai after two years at 25 °C or 50 °C.
63-18	Viscosity	Not applicable
63-19	Miscibility	Miscible at all proportions when mixed with aromatic petroleum hydrocarbons or with refined vegetable oils.
63-20	Corrosion Characteristics	Compatible with specified containers (high density polyethylene or steel lined with Mobil 285-D118 phenoxy resin)
63-21	Dielectric Breakdown Voltage	Not applicable

The data satisfy the requirements of 40 CFR 158.190 for the Bifenthrin Technical product. No additional data are needed.

CONCLUSION

The submitted information satisfies the product chemistry requirements of 40 CFR 158.150 for the TGAI, Bifenthrin Technical.

Attachments: Confidential Appendices A and B

Page_____ is not included in this copy.

Pages 5 through 17 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) _____.

____ 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.