



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

1-6-84

003585

OFFICE OF
PESTICIDES AND TOXIC SUBSTANCES

MEMORANDUM

SUBJECT: FMC 54800 (2EC formulation) Experimental Use Permit

TO: Timothy Gardner (PM-17)
Registration Division (TS-767)

FROM: *[Signature]* 1/6/84
Robert P. Zendzian Ph. D.
Toxicology Branch
HED (TS-769)

THROUGH: William Butler, Head
Review Section III

William Burnam, Chief
Toxicology Branch

Compound FMC 54800
3-(2-chloro-3,3,3-trifluoro-1-propenyl)-2,2-dimethyl-,
(2-methyl[1,1'-biphenyl]-3-yl) methyl ester

FMC 54800, 2EC a 2 lb/gal formulation of the above.

Registration # 279-EUP-RNR

Accession # 251726 & 251725

Tox Chem # 463F

Registrant FMC Corporation

Action

The Registrant requests an experimental use permit, with crop destruction, for the new insecticide, FMC 54800 and the 2EC formulation thereof.

Recommendation

Toxicology branch recommends that the permit be granted.

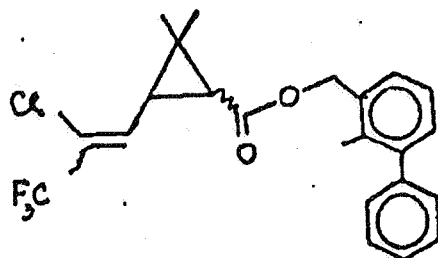
1-7-84

Bifenthrin

Compound

FMC 54800 is identified as;

3-(2-chloro-3,3,3-trifluoro-1-propenyl)-2,2-dimethyl-,
(2-methyl[1,1'-biphenyl]-3-yl) methyl ester



Physical state: Extremely viscous oil which hardens to a solid

Melting point: 51-66°C (technical)

Density: 1.212 g/ml at 25°C

Solubility: Soluble in, methylene chloride, chloroform, acetone,
ether and toluene

Slightly soluble in, heptane and methanol
Solubility in water, <0.1ppb

Vapor pressure: 1.81×10^{-7} at 25°C

Octanol/Water partition coefficient: $>1 \times 10^6$

Formulation (Confidential)

First formulation

FMC 54800 (89% purity) technical

28.15%

Second formulation

FMC 54800 89% purity) technical

28.17%

[REDACTED]

All inert materials for these formulations have been identified as cleared in 180.1001 except [REDACTED]. It is recommended that the registrant ask that the producer of this product supply the agency with a confidential statement of formulation.

Toxicology Data Submitted

1) Technical FMC 54800

Reports of acute oral, acute dermal, dermal irritation, eye irritation, skin sensitization and an Ames test have been submitted on FMC 54800 technical. DERs on these studies are attached. The toxicity of the compound is summarized as follows:

Acute oral rats.	LD50 70.1(+13.04)mg/kg males 53.8(±4.92)mg/kg females Tox category II
Acute dermal rabbits	LD50 >2000mg/kg males & females Tox category III minimal local effects
Dermal irritation rabbits	Not a dermal irritant Tox category IV
Eye irritation rabbits	Not an eye irritant Tox category IV
Dermal sensitization Guinea pigs	Not a sensitizer
Ames Test	Not mutagenic with or without activation

2) FMC 54800, 2EC (the formulation)

Reports of acute oral, acute dermal, dermal irritation, eye irritation and skin sensitization have been submitted on FMC 54800 2EC1. DERs on these studies are attached. The toxicity of the formulation is summarized as follows:

Acute oral rats	LD50 265(+26.2)mg/kg males 262(±39.9)mg/kg females Tox category II
Acute dermal rabbits	LD50 >2000mg/kg males & females Tox category III Moderate dermal irritation
Dermal irritation rabbits	Not a dermal irritant Tox category IV
Eye irritation rabbits	Moderate eye irritation Tox category III
Dermal sensitization Guinea pigs	Sensitizer

Discussion

The toxicology data submitted on FMC 54800 is sufficient to support an experimental use permit. There is a small discrepancy between the local effects seen in the acute dermal toxicity study (mild dermal irritation) and those seen in the dermal irritation study (no effects). This may be due to the fact that significantly more material was applied in the toxicity study (6-8ml vs 0.5ml). Based on the physical properties of FMC 54800, an acute inhalation study of the technical material is not required.

The toxicology data submitted on FMC 54800 2EC is sufficient to support an experimental use permit. There is a discrepancy between the local effects seen in the acute dermal toxicity study (moderate dermal irritation) and those seen in the dermal irritation study (no effects). This may be due to the fact that significantly more material was applied in the toxicity study (6-8ml vs 0.5ml). Unlike the technical material, the formulation produced dermal sensitization in the guinea pig. This effect is most probably due to the inert ingredients in the formulation. The label precautions concerning dermal exposure should be sufficient to negate the potential for these effects in man. Based on its physical properties, an acute inhalation study of the 2EC formulation is not required. The label for the 2EC formulation is satisfactory.

Chemically Related Pesticides

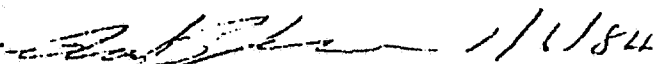
A computer search was run by RCB for pesticides chemically related to FMC 54800. Twelve compounds were identified of which four were considered to be of a high degree of similarity. The results of the search are attached and attention is directed to entries 5, 6, 10 and 11. If the registrant requests a tolerance(s) for FMC 54800 the toxicology of the four related compounds should be reviewed in order to determine if any of them has been identified as oncogenic. If so an oncogenic(s) study of FMC 54800 may be required.

Compound FMC 53800

Citation

Acute Oral Toxicity of FMC 54800 Technical in Rats C.
Freeman, M.J. Norvell & M.J. Fletcher, FMC Toxicology Laboratory,
Study No. A83-859 June 24, 1983

Reviewed by

 1/1/84
Robert P. Zendzian PhD
Pharmacologist

Core Classification guide line

Tox Catagory II

Conclusion

FMC 54800 displayed a nonspecific toxicity in rats by the oral route.

Materials

FMC 54800 Technical, FMC-T # 151A, E2425-145
Purity 91.4%
90% cis 10% trans

Young adult Sprague-Dawley rats (Tac:N[SD]f8R), Taconic Farms.

Methods

Rats were fasted overnight before dosing. Test material was administered orally by gavage in corn oil. Animals were observed 0.5, 1, 2, 3, 4 and 6 hours after dosing and twice daily for a total of 14 days. Rats were weighed on days 0, 7 and 14. Gross necropsy was performed on all animals that died on study and on all survivors which were sacrificed on day 14. Doses given are presented in the mortality table below.

Results

Clinical signs of toxicity included death, clonic convulsions, temors, ataxia, loss of muscle control, decreased activity, chromorhinorrhea, chromodacryorrhea and oral discharge. Signs were observed from 3 hours to 5 days after dosing .

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Dose mg/kg	Males deaths/dosed	Females deaths/dosed
100	10/10	10/10
90	5/10	----
80	4/10	9/10
60	6/10	6/10
40	3/10	2/10
20	0/10	----
LD ₅₀ (<u>±</u> SE)	70.1(<u>±</u> 13.04)mg/kg	53.8(<u>±</u> 4.92)mg/kg

Gross necropsy showed blood filled intestines in three females that did not appear to be dose related.

Surviving rats showed an increase in weight over the course of the study.

Data Evaluation Report

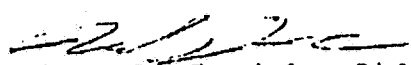
003585

Compound FMC 54800

Citation

Acute Dermal Toxicity of FMC 54800, Technical in Rabbits.
C. Freeman, J.R. DeProspo & M.J. Norvell FMC Toxicology
Laboratory, Study No A83-1032 Sept 19, 1983

Reviewed by


Robert P. Zendzian PhD
Pharmacologist

116184

Core Classification Guideline

Tox Category III

Conclusion

FMC 54800 was nontoxic dermally at 2000mg/kg and produced minimal local effects, erythema at 24 hours in all animals and desquamation in four animals on day 14.

Materials

FMC 54800 technical, Lot # E-2392-105, Purity 88.3%
FMC-T# 170C, 98% Cis

Young adult New Zealand White rabbits from Davidson's Mill Farm.

Methods

Approximately 10% of the surface areas (backs) of 5 male and 5 female rabbits were shaven with an electric clipper 24 hours prior to dosing. Test material was warmed in a water bath at 70-80°C until liquified and dosed at 2000mg/kg (specific gravity 1.22gm/ml). Test material was applied under a gauze pad and covered with a plastic sheet. Test material was removed 24 hours after dosing with a gauze pad moistened with acetone.

Animals were observed for clinical signs of toxicity 0.5, 1, 2, 3, 4 and 6 hours and twice daily for 14 days after dosing. The application site was examined on day 1, 3, 7 and 14 for local effects. Rabbits were weighed on days 0, 7 and 14. Rabbits were sacrificed on day 14 and necropsied.

Results

No compound related toxicity was observed. Erythema at the application site was observed at 24 hours in all rabbits and desquamation in four rabbits on day 14. Necropsy showed no compound related effects.

Data Evaluation Report

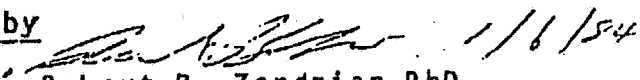
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Compound FMC 54800

Citation

Primary Skin Irritation of FMC 54800 Technical in Rabbits.
C. Freeman, J.R. DeProspo and M.J. Norvell, FMC Toxicology
Laboratory, Study No. A83-1033, Oct 6, 1983

Reviewed by

 1/6/84
Robert P. Zendzian PhD
Pharmacologist

Core Classification Guide line

Tox Catagory IV

Conclusion

The test compound is not a dermal irritant

Materials

FMC 54800 technical, 88.35%, Lot # E2392-105, FMC-T# 170A
98% cis

Young adult New Zealand White rabbits from Davidson's
Mill Farm.

Methods

On the day prior to testing the trunks of 3 male and 3 female rabbits were clipped free of hair. One test site on the right of the spine was abraded and the one on the left side was left intact. The test material was liquified in a hot water bath at 70-80°C. One-half milliliter of liquid test material was applied, under a gauze pad, to each test site and the pads covered with a semi-occlusive gauze bandage. Four hours after dosing the test material was removed with gauze pads moistened with acetone. The test sites were appraised according to the method of Draize, 30 minutes after cleaning and 24, 48 and 72 hours after dosing.

Results

Dermal irritation was not observed on any animal at any time after dosing.

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Data Evaluation Report

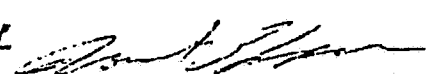
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Compound FMC 54800

Citation

Primary Eye Irritation of FMC 54800 Technical in the Rabbit
C. Freeman, J.R. DeProspero and M.J. Norvell, FMC Toxicology
Laboratory, Study No. A83-1034, Sept 16, 1983

Reviewed by


Robert P. Zendzian PhD
Pharmacologist

Core Classification Guideline

Tox Category IV

Conclusion

FMC 54800 technical is not an eye irritant.

Materials

FMC 54800 technical, Lot# E2392-105, 88.35% pure, FMC-
T# 170-C, 98% cis

Young adult New Zealand White rabbits from Davidson's
Mill Farm.

Methods

On the day prior to dosing the eyes of three male and
six female rabbits were examined for ocular defects with
visible light and fluorescein dye and ultraviolet light.
Test material was liquified in a water bath at 70-80°C and
0.1 ml applied into the right eye of each rabbit. The eyes of
three rabbits were washed with 100ml tap water 20-30 seconds
after dosing. The remaining six eyes remained unwashed.
Eyes were examined and scored according to the method of
Draize at 1, 24, 48 and 72 hours after dosing. Eyes were
examined with fluorescein dye at 24 hours and any which
showed dye retention were examined daily until retention no
longer occurred.

Results

At one hour after dosing a mild conjunctival redness was
observed in the three washed eyes and all 9 treated eyes showed
severe discharge. All eyes were normal at 24 hours and remained
normal at 72 hours.

Data Evaluation Report

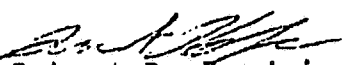
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Compound FMC 54800 technical

Citation

SKIN Sensitization of FMC 54800, Technical in Guinea Pigs. C. Freeman, J.R. DeProspero and M.J. Norvell, FMC Toxicology Laboratories, Study No. A83-1035, Oct 7, 1983

Reviewed by

 1/6/84
Robert P. Zendzian PhD
Pharmacologist

Core Classification Guideline

Tox Catagory N/A

Conclusion

FMC 54800 is not a dermal sensitizer in guinea pigs.

Materials

FMC 54800 technical, Lot# E2392-105, 88.35% pure, FMC-T# 170-C, 98% cis

DNCB (1-chloro-2,4-dinitrobenzene), Lot# D9E

Young adult Hartly guinea pigs from Davidson's Mill Farm.

Methods

On the day prior to dosing 20 male animals were selected and the left shoulder of each animal clipped free of hair with an electric clipper. The test material was liquified in a water bath at 70-80°C. The positive control, DNCB, was applied as a 0.15% solution in ethanol. One-half milliliter of test material was applied to the left shoulder of 10 animals via Hilltop Chambers® and 1/2 ml of 0.15% DNCB was applied to the left shoulder of 10 animals via Hilltop Chambers®. Chambers were secured with an occlusive elastic bandage for 6 hours. Bandage and chamber were removed and the test site washed with gauze moistened with acetone. Application was repeated three times weekly until the animals were dosed a total of ten times. Thirteen days after the last dose the hair was clipped from the right shoulder of the 20 animals and residual hair removed with depilator. On the 14th day the animals were challenged with the respective compounds as described above for the sensitization procedure. Skin reactions were scored, by the method of Draize, 24 hours after challenge.

Results

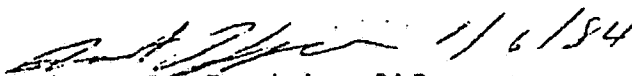
No response to challenge was observed in the test animals. Positive controls showed the expected response.

Compound FMC 54800 technical

Citation

Salmonella/Mammalian-Microsome Plate Incorporation
Mutagenicity Assay. (Ames Test) S.R. Haworth, J.K. Burke,
R.J. Plunkett, T.E. Lawlor, S.M. Olewine & S. Kott. Micro-
biological Associates Study No. T1913.501 Oct 4, 1983

Reviewed by

 11/6/84
Robert P. Zendzian PhD
Pharmacologist

Core Classification acceptable

Tox Catagory N/A

Conclusion

FMC 54800 was not mutagenic in Salmonella under the test conditions.

Materials

FMC 54800 technical, Lot# E2425-145

Salmonella strains TA98, TA100, TA1535, TA1537 and TA1538.

2-aminoanthracene, 2-nitrofluorene, sodium azide and 9-aminoacridine were utilized as positive controls.

S-9 homogenate. Liver microsomal enzymes were prepared from the liver of male Sprague-Dawley rats treated with Aroclor at 500mg/kg.

Methods

FMC 54800 was tested for toxicity against all strains of Salmonella at concentrations from 10ug up to 10mg/plate. The highest concentration which gave a detectable decrease in revertant colonies was used as the maximum concentration in the mutagenic assay. Concentrations used in the assay were 75, 375, 1875, 3750 and 7500 ug/plate. Each testor strain was tested with and without microsomal enzyme activation and with the appropriate active control. Three plates were made for each test configuration.

Results

The study was negative with all strains both with and without activation. Positive controls performed as expected.

Data Evaluation Report

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Compound FMC 53800 2EC

Citation

Acute Oral Toxicity of FMC 54800 2EC in Rats C. Freeman,
J.R. DeProspo & M.J. Norvell, FMC Toxicology Laboratory,
Study No. A83-1027 Sept 16, 1983

Reviewed by

 11/1/84
Robert P. Zendzian PhD
Pharmacologist

Core Classification Guideline

Tox Category II

Conclusion

FMC 54800, 2EC displayed a nonspecific toxicity in rats by the oral route.

Materials

FMC 54800, 2EC, FMC-T # 182A, Lot# PL-83-24
Purity 26.5% w/w a.i. (21b/gal a.i.)

Young adult Sprague-Dawley rats, Taconic Farms.

Methods

Rats were fasted overnight before dosing and test material was administered orally by gavage as a 10% solution (w/v) in corn oil. Animals were observed 0.5, 1, 2, 3, 4 and 6 hours after dosing and twice daily for a total of 14 days. Rats were weighed on days 0, 7 and 14. Gross necropsy was performed on all animals that died on study and on all survivors which were sacrificed on day 14. Doses given are presented in the mortality table below.

Results

Clinical signs of toxicity included death, clonic convulsions, temors, ataxia, decreased activity, chromo-rhinorrhea, chromodacryorrhea and oral discharge. Signs were observed from 3 hours after dosing and mainly during the first 24 hours.

Dose mg/kg	Males deaths/dosed	Females deaths/dosed
400	8/10	8/10
300	6/10	4/10
250	6/10	----
200	1/10	5/10
150	----	2/10
100	----	0/10
LD ₅₀ (<u>±</u> SE)mg/kg	265(<u>±</u> 26.2)	262(<u>±</u> 39.9)

Gross necropsy showed blood filled intestines in eight animals that died during the study. This finding appeared to be dose related in both sexes.

Surviving rats showed an increase in weight over the course of the study.

Data Evaluation Report

003585

Compound FMC 54800, 2EC

Citation

Acute Dermal Toxicity of FMC 54800, 2EC in Rabbits.
C. Freeman, J.R. DeProspo & M.J. Norvell FMC Toxicology
Laboratory, Study No A83-1028 Sept 16, 1983

Reviewed by

 11/6/84
Robert P. Zendzian PhD
Pharmacologist

Core Classification Guideline

Tox Catagory III

Conclusion

FMC 54800, 2EC was nontoxic dermally at 2000mg/kg but produced signs of moderate dermal irritation in all rabbits.

Materials

FMC 54800 2EC, Lot #PL-83-24, FMC-T# 182A,
Purity 26.5% w/w a.i. (2lb/gal a.i.)

Young adult New Zealand White rabbits from Davidson's
hill Farm.

Methods

Approximately 10% of the surface areas (backs) of 5 male and 5 female rabbits were shaven with an electric clipper 24 hours prior to dosing. Test material was dosed as received at 2000mg/kg (specific gravity 0.99gm/ml). Test material was applied under a gauze pad and covered with a plastic sheet. Test material was removed 24 hours after dosing with a gauze pad. Animals were observed for clinical signs of toxicity 0.5, 1, 2, 3, 4 and 6 hours and twice daily for 14 days after dosing. The application site was examined on day 1, 3, 7 and 14 for local effects. Rabbits were weighed on days 0, 7 and 14. Rabbits were sacrificed on day 14 and necropsied.

Results

No compound related toxicity was observed. Signs of dermal irritation were observed in the treated rabbits and included erythema, dehydration, fissuring, eschar and exfoliation. Eschar and exfoliation was present in all rabbits at 14 days.

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Data Evaluation Report

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Compound FMC 54800, 2EC

Citation

Primary Skin Irritation of FMC 54800 2EC in Rabbits.
C. Freeman, J.R. DeProspero and M.J. Norvell, FMC Toxicology
Laboratory, Study No. A83-1029, Sept 16, 1983

Reviewed by:

 1/6/84
Robert P. Zendzian PhD
Pharmacologist

Core Classification Guide line

Tox Category IV

Conclusion

The test material is not a dermal irritant

Materials

FMC 54800 2EC, Lot # PL-83-24, FMC-T# 182A
purity 26.5% w/w a.i. (2 lb/gal a.i.)

Young adult New Zealand White rabbits from Davidson's
Mill Farm.

Methods

On the day prior to testing the trunks of 3 male and 3
female rabbits were clipped free of hair. One test site on
the right of the spine was abraded and the one on the left
side was left intact. The test material was dosed as received.
One-half milliliter of test material was applied, under a
gauze pad, to each test site and the pads covered with a
non-occlusive gauze bandage. Four hours after dosing the
test material was removed with gauze pads. The test sites
were appraised according to the method of Draize, 30 minutes
after cleaning and 24, 48 and 72 hours after dosing.

Results

Dermal irritation was not observed on any animal at any
time after dosing.

Data Evaluation Report

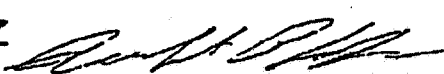
Compound FMC 54800, 2EC

003585

Citation

Primary Eye Irritation of FMC 54800 2EC in the Rabbit.
C. Freeman, J.R. DeProspero and M.J. Norvell, FMC Toxicology
Laboratory, Study No. A83-1030, Sept 20, 1983

Reviewed by

 1/6/84
Robert P. Zendzian PhD
Pharmacologist

Core Classification Guideline

Tox Category III

Conclusion

FMC 54800 2EC is moderate eye irritant.

Materials

FMC 54800 2EC, Lot# PL-83-24, FMC-T# 182A,
purity 26.5% w/w a.i. (2 lb/gal a.i.)

Young adult New Zealand White rabbits from Davidson's
Mill Farm.

Methods

On the day prior to dosing the eyes of nine female rabbits were examined for ocular defects with visible light and fluorescein dye and ultraviolet light. Test material was dosed as received with 0.1 ml applied into the right eye of each rabbit. The eyes of three rabbits were washed with 100ml tap water 20-30 seconds after dosing. The remaining six eyes remained unwashed. Eyes were examined and scored according to the method of Draize at 1, 24, 48 and 72 hours after dosing. Eyes were examined with fluorescein dye at 24 hours and any which showed dye retention were examined daily until retention no longer occurred.

Results

At one hour after dosing mild conjunctival redness appeared in all unwashed eyes, mild to moderate chemosis in all eyes and a severe discharge in all eyes. The redness persisted through 48 hours, the chemosis through 48 hours and the discharge through 24 hours. All eyes were normal at 48 hours.

Data Evaluation Report

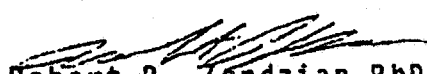
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Compound FMC 54800 2EC

Citation

SKIN Sensitization of FMC 54800, 2EC in Guinea Pigs. C.
Freeman, J.R. DeProspo and M.J. Norvell, FMC Toxicology
Laboratories, Study No. A83-1031, Oct 7, 1983

Reviewed by


Robert P. Zenzian PhD
Pharmacologist

Core Classification Guide line

Tox Catagory N/A

Conclusion

FMC 54800, 2EC is a dermal sensitizer in guinea pigs.

Materials

FMC 54800, 2EC, Reference# PL-83-24, FMCT# 182A
Purity 26.5% w/w a.i. (2 lb/gal a.i.)

DNCB (1-chloro-2,4-dinitrobenzene), Lot# D9E

Young adult Hartly guinea pigs from Davidson's Mill Farm.

Methods

On the day prior to dosing 20 male animals were selected and the left shoulder of each animal clipped free of hair with an electric clipper. The test material was applied as received. The positive control, DNCB, was applied as a 0.15% solution in ethanol. One-half milliliter of test material was applied to the left shoulder of 10 animals via Hilltop Chambers® and 1/2 ml of 0.15% DNCB was applied to the left shoulder of 10 animals via Hilltop Chambers®. Chambers were secured with an occlusive elastic bandage for 6 hours. Bandage and chamber were removed and the test site wiped with gauze. Application was repeated three times weekly until the animals were dosed a total of ten times. Thirteen days after the last dose the hair was clipped from the right shoulder of the 20 animals and residual hair removed with depilator. On the 14th day the animals were challenged with the respective compounds as described above for the sensitization procedure. Skin reactions were scored, by the method of Draize, 24 hours after challenge.

Results

At challenge, 7 animals had moderate to severe erythema which had progressed to necrosis in three. Positive controls exhibited the expected response.

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Pages _____ through _____ 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 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.

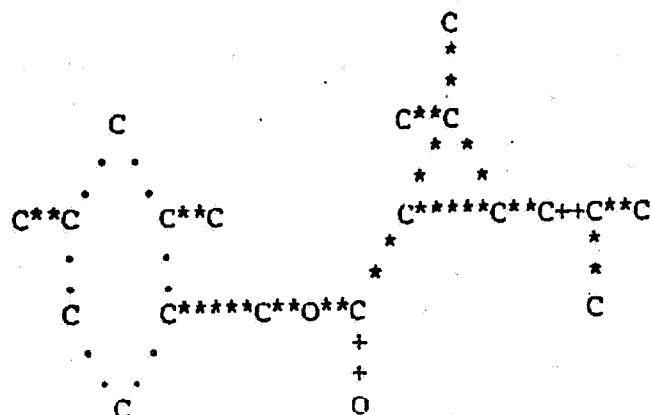
The information not included is generally considered confidential by product registrants. If you have any questions, please contact the individual who prepared the response to your request.

Entry

1 CAS RN 70-38-2

C19H26O2

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Cyclopropanecarboxylic acid, 2,2-dimethyl-3-(2-methyl-1-propenyl)-, (2,4-dimethylphenyl)methyl ester (VAN9CI)

Cyclopropanecarboxylic acid, 2,2-dimethyl-3-(2-methylpropenyl)-, 2,4-dimethylbenzyl ester (SCI)

(2,4-Dimethylphenyl)methyl 2,2-dimethyl-3-(2-methyl-1-propenyl)cyclopropanecarboxylate

Chrysanthemic acid 2,4-dimethylbenzyl ester

Dimethrin (ACN)

Dimetrin

ENT 21,170

WLN: L3TJ A1 A1 BVOLR R) D1& CIUY1&1

2,4-Dimethylbenzyl chrysanthemate

2,4-Dimethylbenzyl cis,trans-(+,-)-2,2-dimethyl-3-(2-methylpropenyl)cyclopropanecarboxylate

2,4-Dimethylbenzyl ester of cis,trans-chrysanthemic acid

2,4-Dimethylbenzyl 2,2-dimethyl-3-(2-methylpropenyl)cyclopropanecarboxylate

2,4-Dimethylbenzyl 2,2-dimethyl-3-(2-methylpropenyl)cyclopropanecarboxylate (ACN)

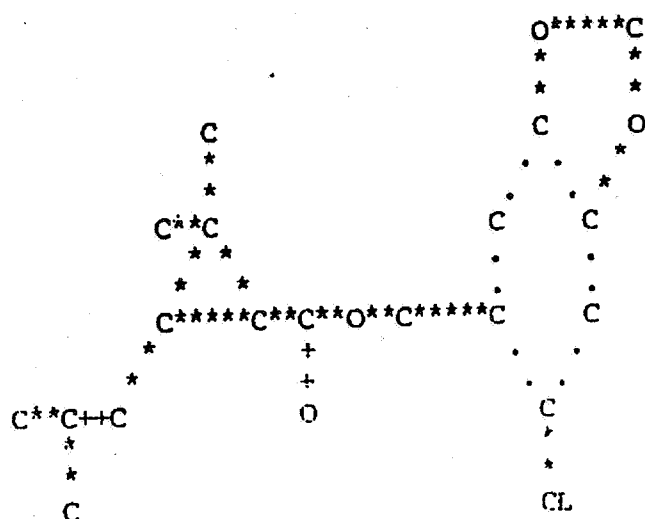
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Entry

2 CAS RN 70-43-9

C18H21ClO4



Cyclopropanecarboxylic acid, 2,2-dimethyl-3-(2-methyl-1-propenyl)-, (6-chloro-1,3-benzodioxol-5-yl)methyl ester (9CI)

Cyclopropanecarboxylic acid, 2,2-dimethyl-3-(2-methylpropenyl)-, 6-chloropiperonyl ester (8CI)

[2-Chloro-4,5-(methylenedioxy)phenyl]methyl 2,2-dimethyl-3-(2-methyl-1-propenyl) cyclopropanecarboxylate

Barthrin (ACN)

Chrysanthemumic acid 6-chloropiperonyl ester

Chrysanthemummonocarboxylic acid, 6-chloropiperonyl ester

Cyclopropanecarboxylic acid, 2,2-dimethyl-3-(2-methylpropenyl)-, 6-chloropiperonyl ester, (+-)-cis, trans-

ENT 21557

WLN: T56 BO DO CHJ GG ILOV- BL3TJ AI AI CIUY1&1

2-Chloro-4,5-(methylenedioxy)benzyl 2,2-dimethyl-3-(2-methylpropenyl) cyclopropanecarboxylate

2,2-Dimethyl-3-(2-methyl-1-propenyl)cyclopropanecarboxylic acid, (2-chloro-4,5-(methylenedioxy)phenyl)methyl ester of

2,2-Dimethyl-3-(2-methylpropenyl)cyclopropanecarboxylic acid, 6-chloropiperonyl ester

5 more names available

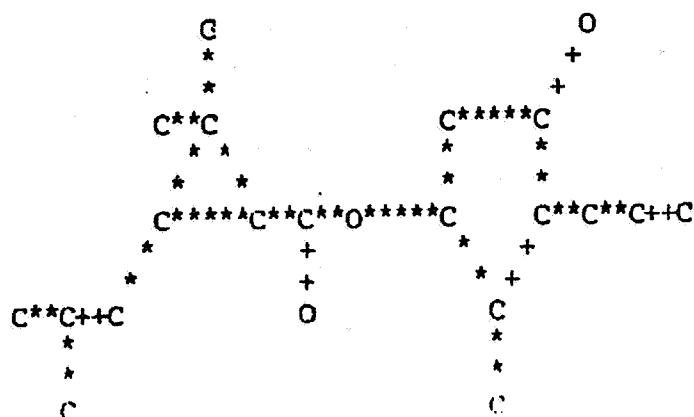
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Entry

3 CAS RN 584-79-2

C19H26O3

003585



Cyclopropanecarboxylic acid, 2,2-dimethyl-3-(2-methyl-1-propenyl)-, 2-methyl-4-oxo-3-(2-propenyl)-2-cyclopenten-1-yl ester (VAN9CI)

Cyclopropanecarboxylic acid, 2,2-dimethyl-3-(2-methylpropenyl)-, ester with 2-allyl-4-hydroxy-3-methyl-2-cyclopenten-1-one (VAN8CI)

(.+.)-Allethrethonyl (.+.-)-cis,trans-chrysantharate

(+)-trans-Ricallethrin

(+)-trans-Chrysanthemic acid ester of (.+.-)-allethrolone

(+)-Allethrethonyl (+)-cis,trans-chrysantharate
trans-Allethrin

Allethrin (VAN)

Allethrin (Allyl homolog of cinerin I) (ACN)

Allethrin racemic mixture

Allethrine

Allyl cinerin

32 more names available

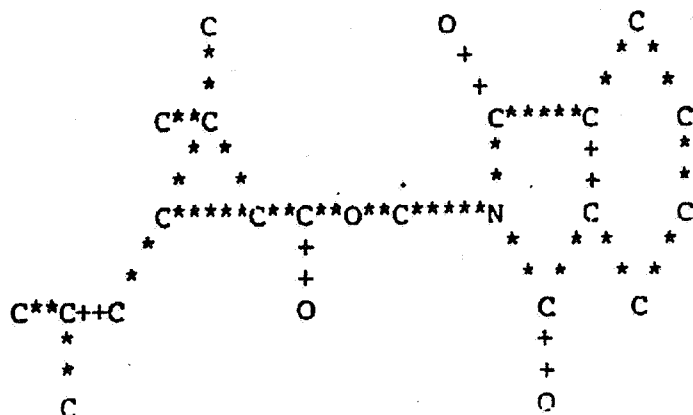
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Entry

4 CAS RN 7696-12-0

C19H25NO4

003585



Cyclopropanecarboxylic acid, 2,2-dimethyl-3-(2-methyl-1-propenyl)-, (1,3,4,5,6,7-hexahydro-1,3-dioxo-2H-isoindol-2-yl)methyl ester (9CI)

Cyclopropanecarboxylic acid, 2,2-dimethyl-3-(2-methylpropenyl)-, ester with N-(hydroxymethyl)-1-cyclohexene-1,2-dicarboximide (VAN8CI)

(1-Cyclohexene-1,2-dicarboximido)methyl chrysanthemumate

(1-Cyclohexene-1,2-dicarboximido)methyl chrysanthoxide

(1-Cyclohexene-1,2-dicarboximido)methyl chrysanthemate

(1-Cyclohexene-1,2-dicarboximido)methyl 2,2-dimethyl-3-(2-methylpropenyl)cyclopropanecarboxylate

(1,3,4,5,6,7-Hexahydro-1,3-dioxo-2H-isoindol-2-yl)methyl 2,2-dimethyl-3-(2-methyl-1-propenyl)cyclopropanecarboxylate

neo-Pyramin

Cyclopropanecarboxylic acid, 2,2-dimethyl-3-(2-methylpropenyl)-, ester with N-(hydroxymethyl)-1-cyclohexene-1,2-dicarboximide, cis mixed with trans-2,2-dimethyl-3-(2-methylpropenyl)cyclopropanecarboxylic acid ester with N-(hydroxymethyl)-1-cyclohexene-1,2-dicarboximide (1:4)

ENT 27339

FMC-9260

Multicide

17 more names available

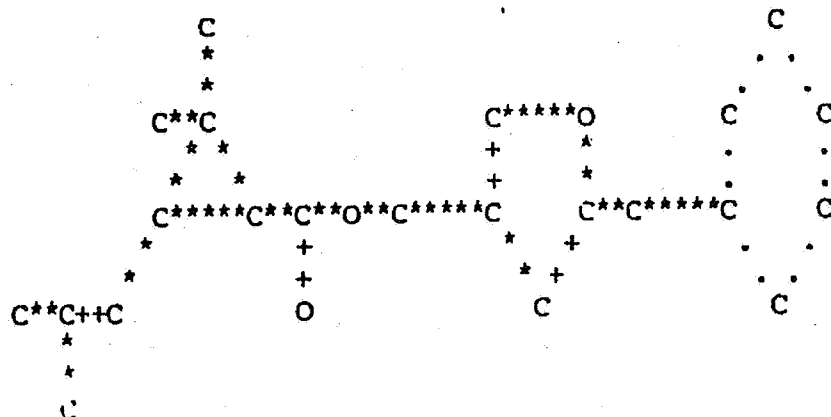
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Entry

5

CAS RN 10453-86-8

C22H26O3



Cyclopropanecarboxylic acid, 2,2-dimethyl-3-(2-methyl-1-propenyl)-, [5-(phenylmethyl)-3-furylmethyl ester (9CI)

Cyclopropanecarboxylic acid, 2,2-dimethyl-3-(2-methylpropenyl)-, (5-benzyl-3-furyl)methyl ester (8CI)

(+)-trans, cis-Resmethrin

(-)-cis-Resmethrin

(5-Benzyl-3-furyl)methyl chrysanthemate

(5-Benzyl-3-furyl)methyl cis,trans-(+,-)-2,2-dimethyl-3-(2-methylpropenyl)cyclopropanecarboxylate

(5-Benzyl-3-furyl)methyl 2,2-dimethyl-3-(2-methylpropenyl)cyclopropanecarboxylate

(5-Benzyl-3-furyl)methyl 2,2-dimethyl-3-(2-methylpropenyl)cyclopropanecarboxylate

(5-Benzyl-3-furyl)methyl 2,2-dimethyl-3-(2-methylpropenyl)cyclopropanecarboxylate (approx. 70% trans, 30% cis isomers)

(5-Benzyl-3-furyl)methyl-2,2-dimethyl-3-(2-methylpropenyl)cyclopropanecarboxylate

(5-Benzyl-3-furyl)methyl-2,2-dimethyl-3-(2-methylpropenyl)cyclopropanecarboxylate

d-trans-5-Phenylmethyl)-3-Furanyl methyl 2,3-dimethyl-3-(2-methyl-1-propenyl)cyclopropanecarboxylate

38 more names available

83 E

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24

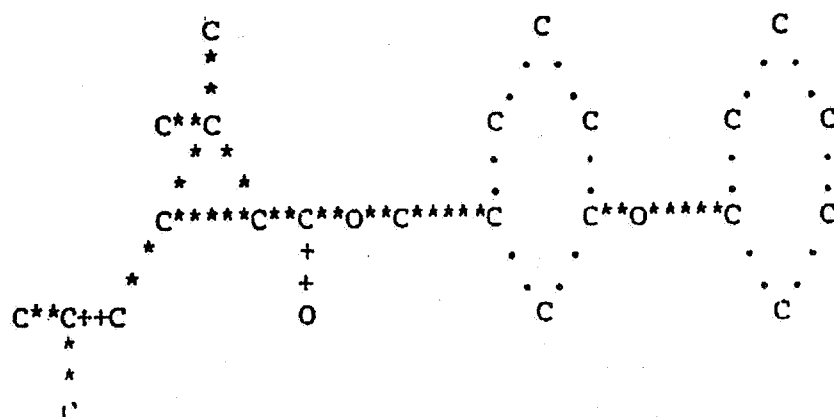
24

Entry

6

CAS RN 26002-80-2

C23H26O3



Cyclopropanecarboxylic acid, 2,2-dimethyl-3-(2-methyl-1-propenyl)-, (3-phenoxyphenyl)methyl ester (RCI)

Cyclopropanecarboxylic acid, 2,2-dimethyl-3-(2-methylpropenyl)-, m-phenoxybenzyl ester (RCI)

(+)-cis,trans-Phenothrin

(+)-trans,cis-Fenothrin

(3-Phenoxyphenyl)methyl 2,2-dimethyl-3-(2-methyl-1-propenyl)cyclopropylcarboxylate (VT)

(3-Phenoxyphenyl)methyl d-cis and trans 2,2-dimethyl-3-(2-methylpropenyl)cyclopropane carboxylate

Cyclopropanecarboxylic acid, 2,2-dimethyl-3-(2-methylpropenyl)-, m-phenoxybenzyl ester, (+)-(2,E)-

Phenothrin

Phenoxythrin

S 2539

S-2539 Forte

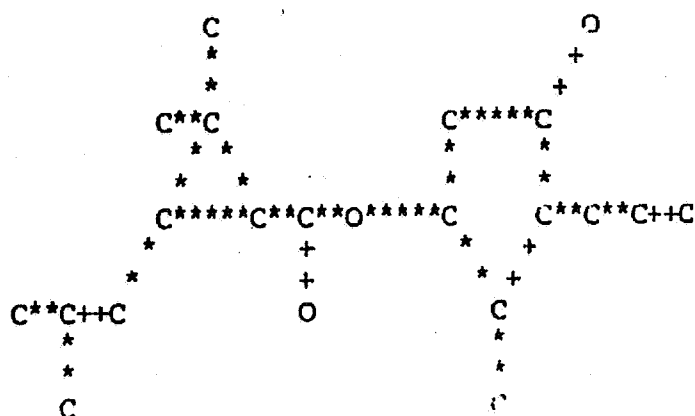
Sumithrin

7 more names available

652B

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75



Cyclopropanecarboxylic acid, 2,2-dimethyl-3-(2-methyl-1-propenyl)-, 2-methyl-4-oxo-3-(2-propenyl)-2-cyclopenten-1-yl ester, [1R-[1.alpha.(S*),3.beta.]]- (9CI)

Cyclopropanecarboxylic acid, 2,2-dimethyl-3-(2-methylpropenyl)-, trans-(+)-, ester with (+)-2-allyl-4-hydroxy-3-methyl-2-cyclopenten-1-one (8CI)

(+)-trans-Allethrin

(+)-Allethronyl (+)-trans-chrysanthemate

d-trans Allethrin

d-trans Allethrin (Allyl homolog of cinerin I) (2 CI)

d-trans-Allethrin

d-trans-Chrysanthemum monocarboxylic acid ester of d-2-allyl-4-hydroxy-3-methyl-2-cyclopenten-1-one (ACN)

d-trans-Chrysanthemum monocarboxylic ester of dl-2-allyl-4-hydroxy-3-methyl-2-cyclopenten-1-one

d-trans-Chrysanthemum monocarboxylic acid ester of d-2-allyl-4-hydroxy-3-methyl-2-cyclopenten-1-one

d-trans-Chrysanthemum monocarboxylic ester of d-2-allyl-4-hydroxy-3-methyl-2-cyclopenten-1-one

d-Allethrolone chrysanthemate

16 more names available

~~25~~

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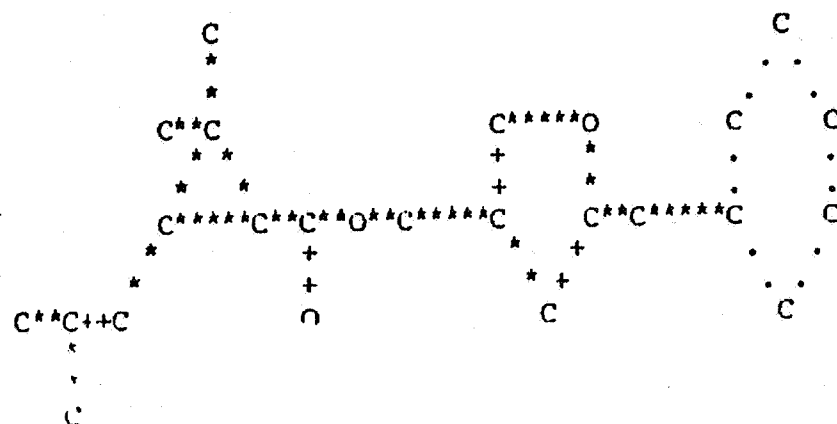
003585

Entry

8

CAS RN 28434-01-7

C22H26O3



Cyclopropanecarboxylic acid, 2,2-dimethyl-3-(2-methyl-1-propenyl)-, [5-(phenylmethyl)-3-furanyl]methyl ester, (1S-trans)- (ICI)

Cyclopropanecarboxylic acid, 2,2-dimethyl-3-(2-methylpropenyl)-, (5-benzyl-3-furyl)methyl ester, trans-(+)- (ICI)

(+)-trans-Bioresmethrin
d-trans(5-Benzyl-3-furyl)methyl 2,2-dimethyl-3-(2-methylpropenyl) cyclopropanecarboxylate

d-trans-Chrysom

d-trans-Bioresmethrin

d-trans-SBP 1382

[5-(phenylmethyl)-3-furanyl]methyl trans-(+)-2,2-dimethyl-3-(2-methyl-1-propenyl)cyclopropanecarboxylate

AI 3-27662

Bio NRDC 104

Biobenzylfuraline

Bioresmethrin

17 more names available

5 < 5

Cas 83 E

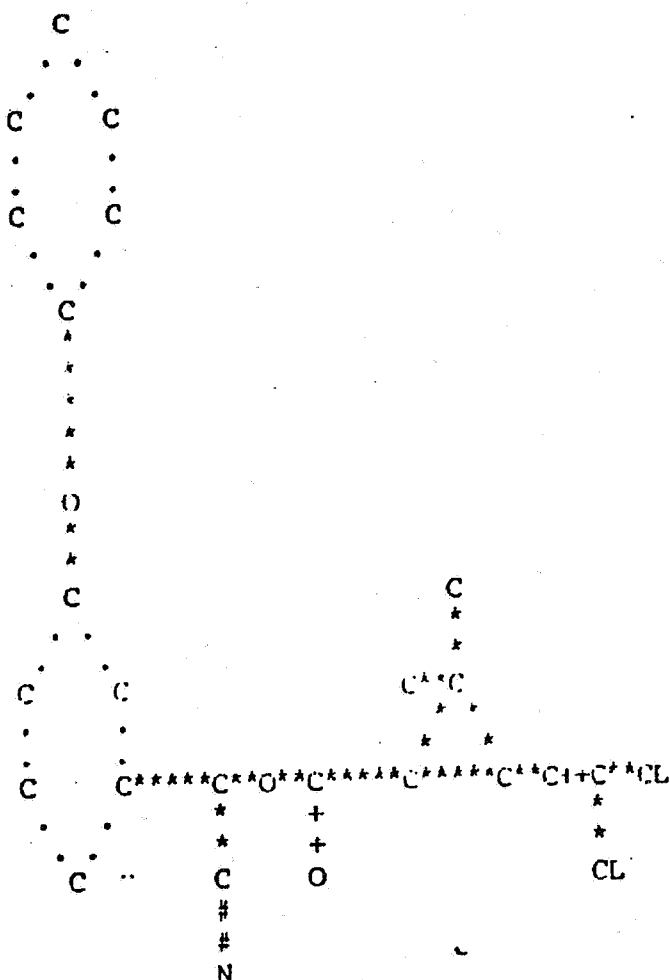
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003585

Entry

9 CAS RN 52315-07-8

C22H19Cl2NO3



Cyclopropanecarboxylic acid, 3-(2,2-dichloroethenyl)-2,2-dimethyl
-, cyano(3-phenoxyphenyl)methyl ester (9CI)

.alpha.-Cyano-3-phenoxybenzyl 2,2-dimethyl-3-(2,2-dichlorovinyl)
cyclopropane carboxylate

.alpha.-Cyano-3-phenoxybenzyl 3-(2,2-dichlorovinyl)-2,2-dimethyl
cyclopropanecarboxylate

(.+-.).alpha.-Cyano-(3-phenoxyphenyl)methyl (.+-.)-cis,trans-3-(2,
2-dichloroethenyl)-2,2-dimethylcyclopropanecarboxylate (ACN
)

Barricade

Cyano(3-phenoxyphenyl)methyl-3-(2,2-dichloroethenyl)-2,2-dimethyl
cyclopropanecarboxylate

Cyclopropanecarboxylic acid, 3-(2,2-dichloroethenyl)-2,2-dimethyl
-, cyano(3-phenoxyphenyl) methyl ester

Cymbush

Cypermethrin (ACN)

FMC Code 3765

FMC 30980

FMC 45806

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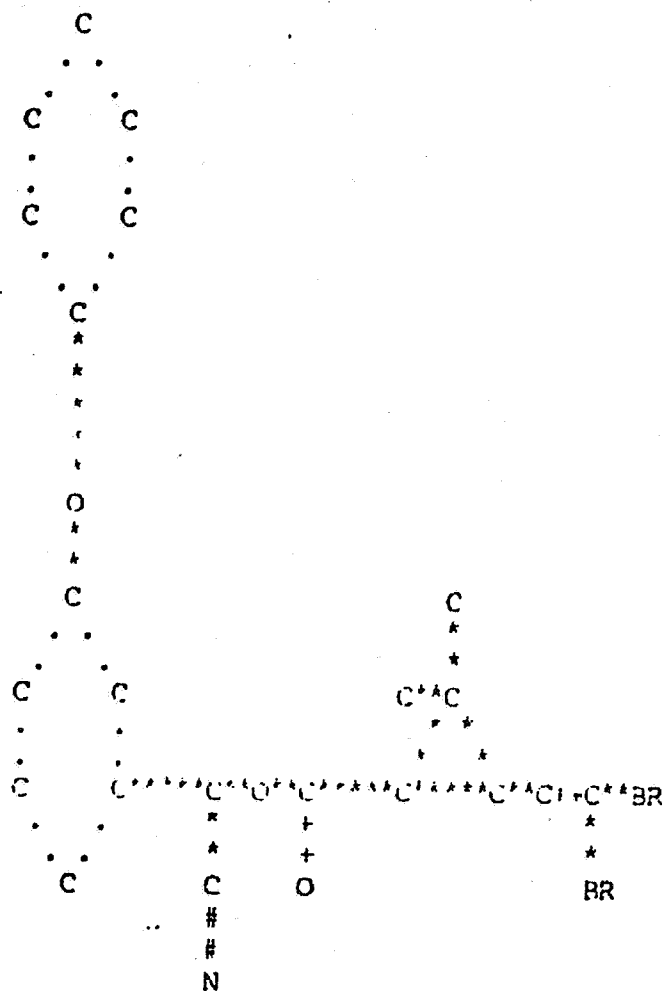
28

28

Entry 12 CAS RN 52912-63-5

003585

C₂₂H₁₉Br₂NO₃



Cyclopropanecarboxylic acid, 3-(2,2-dibromoethenyl)-2,2-dimethyl-, cyano(3-phenoxyphenyl)methyl ester, [1R-[1.alpha.(S*),3.alpha.pha.]]- (9CI)
.alpha.-Cyano-3-phenoxybenzyl cis-3-(2,2-dibromovinyl)-2,2-dimethylcyclopropanecarboxylate
.alpha.-Cyano-3-phenoxybenzyl-3-(2,2-dibromovinyl)-2,2-dimethylcyclopropanecarboxylate
Cyano(3-phenoxyphenyl)methyl-3-(2,2-dibromoethenyl)-2,2-dimethylcyclopropanecarboxylate
Cyclopropanecarboxylic acid, 3-(2,2-dibromoethenyl)-2,2-dimethyl-, cyano(3-phenoxyphenyl)methyl ester, [1P-[1.alpha.(S*),3.alpha.pha.]]-
Cyclopropanecarboxylic acid, 3-(2,2-dibromoethenyl)-2,2-dimethyl-, cyano(3-phenoxyphenyl)methyl ester, 1R-trans-
Decamethrin
Decamethrine
Decis
Decis EC-25
Deltamethrin