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Emulsifiable composition for the control of insects

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(71) Applicant(s)
Rhone-Poulenc Agrochimie

(72) Inventor(s)
Takaaki Mizutani; Michihiko Ikeda; Hiroshi Kodama; Masakazu Shibayama

(74) Agent/Attorney
DAVIES COLLISON CAVE, 1 Little Collins Street, MELBOURNE VIC 3000

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<p>(21) International Application Number: PCT/EP95/04684 (22) International Filing Date: 29 November 1995 (29.11.95) SEARCH QUALITY ASSURANCE (30) Priority Data: 94/321645 30 November 1994 (30.11.94) JP 06/321645 (71) Applicant (for all designated States except US): RHONE-POULENC AGROCHIMIE [FR/FR]; 14/20, rue Pierre-Baizet, F-69009 Lyon (FR). (72) Inventors; and (75) Inventors/Applicants (for US only): MIZUTANI, Takaaki [JP/JP]; 1-4-6 Higashinaru-cho, Nishinomiya City, Hyogo (JP). IKEDA, Michihiko [JP/JP]; 744 Taji Mihara-cho, Minamikawachi-gun, Osaka (JP). KODAMA, Hiroshi [JP/JP]; 3-3-21 404 Nankadai, Kawachinagano City, Osaka (JP). SHIBAYAMA, Masakazu [JP/JP]; 5-51-8 Ankoji-cho, Takatsuki City, Osaka (JP). (74) Agent: BRACHOTTE, Charles; Rhône-Poulenc Agrochimie, Dépt. Propriété Industrielle, 14/20, rue Pierre-Baizet, F-69009 Lyon (FR).</p>		<p>(81) Designated States: AL, AM, AU, BB, BG, BR, BY, CA, CN, CZ, EE, FI, GE, HU, IS, JP, KG, KP, KR, KZ, LK, LR, LS, LT, LV, MD, MG, MK, MN, MX, NO, NZ, PL, RO, RU, SG, SI, SK, TJ, TM, TT, UA, US, UZ, VN, European patent (AT, BE, CH, DE, DK, ES, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, ML, MR, NE, SN, TD, TG), ARIPO patent (KE, LS, MW, SD, SZ, UG). Published <i>Without international search report and to be republished upon receipt of that report.</i></p>
<p>(54) Title: EMULSIFIABLE COMPOSITION FOR THE CONTROL OF INSECTS (57) Abstract An emulsifiable composition for the control of insects, especially of termites, comprising as active ingredients a 1-substituted phenyl 3-CN pyrazole, and a pyrethroid, and a weakly polar solvent, and an emulsifying agent, and a water-soluble solvent. These compositions avoid the formation of crystals.</p> <div data-bbox="459 1592 612 1749" style="text-align: center;"></div>		

EMULSIFIABLE COMPOSITION FOR THE CONTROL OF INSECTS.

5 The present invention relates to an emulsifiable composition for the control of insects and a method of use thereof. The emulsifiable compositions of the present invention derive from 1- substituted phenyl pyrazoles insecticides and they do not favour the formation of crystals.

10 The 1- substituted phenyl pyrazoles insecticides can be liable to generate some crystallizations within the compositions during storage or use. When using such compounds for various applications, there may be problems of crystallisation or recrystallisation which prohibit a proper and easy application. This may happen in a quite different number of practical applications such as spray applications through a nozzle which may be clogged; dilution in a tank whereby the active
15 ingredient may thus crystallize and fall at the bottom of the tank; application to animal's hair whereby the quality of the hair may be damaged by deposit of crystals thereon. For companion animals a most important requirement is to have a high quality hair, which is nice and pleasant when touching or petting.

20 Furthermore it is frequent that specialists in the control of insects, especially of termites, prepare a diluted pesticidal liquid the day before the application and utilize the remaining liquid the day after. These liquids, since they contain crystalline active ingredients, are poorly emulsified and are liable to crystallize in several hours after preparation of spraying emulsion, resulting in a great volume of liquid of no use or causing the clogging of pump nozzles employed for foam
25 application.

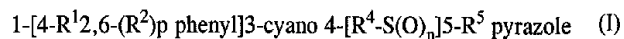
30 In the particular situation of methods of control of insects, especially of termites, these methods may generally be divided into two main groups. On one side is the wood treatment according to which wooden parts of a house are subjected to pesticidal treatment and the other is called the soil treatment according to which a liquid pesticide is sprayed onto the underfloor area of a house. The application of a flowable formulation in which the active ingredient is suspended in water is becoming predominant, considering the health of the workers on an application within the limited space under the floor. However such dilution of water has the tendency to generate crystals. The conventional flowable formulation
35 are not satisfactory.

Japanese Patent Publication No. 2-7282 has proposed to prevent the crystallization of some active ingredients which are not 1-substituted phenyl pyrazoles insecticides. Japanese Patent Application No. 50-69230 has described a liquid herbicidal composition containing as active ingredients thereof a dinitroaniline herbicide and a N-allyl-N'-alkoxy urea herbicide. It 5 discloses also the use of an emulsifying agent and a solvent consisting of an alicyclic ketone in order to give to the composition the physical stability under the conditions of transportation, storage and end use.

The present invention advantageously provides improved emulsifiable compositions which 10 reduce the odor of the solvent(s) and/or prevent the crystallization of the 1-substituted phenyl pyrazoles insecticides upon dilution and/or are generally superior to the conventional flowable formulations.

The present invention also advantageously provides improved emulsifiable compositions 15 which are suitable for use in combination with a foaming agent to treat the underfloor area of a house by mean of a foam.

Accordingly the invention provides an emulsifiable composition for the control of insects comprising as active ingredient thereof a compound of formula (I) and a pyrethroid and 20 further comprising a weakly polar solvent which has a dipolar moment high than 1 and a water solubility of less than 10% and an emulsifying agent, and a water-soluble solvent which has the general formula $RO(CH_2CH_2O)_qH$ in which, R represents a C-1 to C-6 alkyl and q is an integer of 1 to 8, wherein the formula (I) is



25 wherein:

R^1 is halogen, lower haloalkyl, lower haloalkoxy or SF_5 (lower being an integer from 1 to 4),

R^2 is halogen, the various R^2 being identical or different,

R^4 is halogen, lower alkyl or haloalkyl,

R^5 is halogen, lower alkyl or amino,

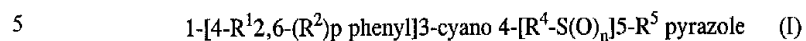
n is 0 or 1 or 2; p is 0 or 1 or 2.



- 2A -

The compositions optionally contain a foam stabilizer and/or a foaming agent, and/or a polar solvent and/or an aromatic solvent and/or other additives.

Formula (I) for compounds used as active ingredient in the invention is



wherein:

R¹ is halogen, lower haloalkyl, lower haloalkoxy or SF₅ (lower being an integer from 1 to 4, preferably one),

R² is halogen, the various R² being identical or different,

10 R⁴ is halogen, lower alkyl or haloalkyl,

R⁵ is halogen, lower alkyl or amino,

n is 0 or 1 or 2; p is 0 or 1 or 2, preferably 2.

Halo before the name of a radical means that this radical may be substituted by one or more halogen atoms.

15



A preferred compound of formula (I) is compound 5-amino-3-cyano-1-(2,6-dichloro-4-trifluoromethylphenyl)-4-trifluoromethylsulfanylpyrazole, hereinafter referred to as compound (A).

The compounds of formula (I) employed in the emulsifiable composition for the control of insects, especially of termites, of the present invention are known and described in the European patent application No. 295117 as well as in international patent applications WO 93/6089 and 94/21606. They are effective for the control of arthropods, plant nematodes, protozoan pests, insects, especially of termites, farm pests and the like, and arachnids such as ticks.

Examples of compounds of pyrethroid series which may be used in the present invention include :

1. Allethrin [dl-3-allyl-2-methyl-4-oxo-2-cyclopentenyl-dl- cis, trans-chrysanthemate]
2. Ethofenprox [2-(4-ethoxyphenyl)-2-methylpropyl-3- phenoxybenzyl ether]
- 15 3. Cycloprothrin [(RS)- α -cyano-3-phenoxybenzyl (RS)-2,2- dichloro-1-(4-ethoxyphenyl)-cyclopropane carboxylate]
4. Cyhalothrin [(RS)- α -cyano-3-phenoxybenzyl (Z)-(1RS, 3RS) 3-(2-chloro-3,3,3-trifluoropropenyl)-2,2-dimethyl- cyclopropanecarboxylate]
5. Cyfluthrin [(RS)- α -cyano-4-fluoro-3-phenoxybenzyl (1RS, 3RS)-(1RS, 3RS)-
- 20 3-(2,2-dichlorovinyl)-2,2-dimethyl cyclopropane carboxylate]
6. Cypermethrin [(RS)- α -cyano-3-phenoxybenzyl (1RS, 3RS)- (1RS, 3SR)-3-(2,2-dichlorovinyl)-2,2-dimethylcyclopropane carboxylate]
7. Pyrethrin
8. Tralomethrin [(S)- α -cyano-3-phenoxybenzyl (1R, 3S)-2,2- dimethyl-3-
- 25 (1,2,2,2-tetrabromoethyl)-cyclopropanecarboxylate]
9. Fenvalerate [(RS)- α -cyano-3-phenoxybenzyl (RS)-2-(4- chlorophenyl)-3-methylbutanoate]
10. Fenpropathrin [(RS)- α -cyano-3-phenoxybenzyl-2,2,3,3- tetramethyl- cyclopropanecarboxylate]
- 30 11. Flucythrinate [(RS)- α -cyano-3-phenoxybenzyl-(S)-2-(4- difluoromethoxyphenyl)-3-methylbutylate]
12. Permethrin [3-phenoxybenzyl (1RS, 3RS)-(1RS, 3RS)-(2,2- dichlorovinyl)-2,2-dimethylcyclopropanecarboxylate]
13. Bifenthrin [2-methylbiphenyl-3-yl-methyl (Z)-(1RS, 3RS)-3-(2-chloro-3,3,3-
- 35 trifluoroprop-1-enyl)-2,2-dimethyl cyclopropanecarboxylate]

14. Silafluofen [4-ethoxyphenyl-[3-(3-phenoxy-4-fluorophenyl)propyl](dimethyl) silane]
15. Resmethrin [5-benzyl-3-furylmethyl di-cis, transchrysanthemate]
16. Tefluthrin [2,3,5,6-tetrafluoro-4-methylbenzyl-(1RS)-cis-3-(Z-2-chloro-3,3,3-trifluoroprop-1-enyl)-2,2-dimethyl cyclopropanecarboxylate]
17. Acrinathrin [(S)- α -cyano-3-phenoxybenzyl (Z)-(1R, 3S)-2,2-dimethyl-3-[2-(2,2,2-trifluoro-1-trifluoromethyl ethoxycarbonyl) vinyl] cyclopropanecarboxylate]
18. Prarethrin [(RS)-2-methyl-4-oxo-3-prop-2-enylcyclopent-2-enyl (1RS)-cis-trans-2,2-dimethyl-3-(2-methylprop-1-enyl) cyclopropanecarboxylate]
19. Cismethrin [5-benzyl-3-furylmethyl (1R)-trans-2,2-dimethyl-3-(2-methylprop-1-enyl) cyclopropanecarboxylate]
20. d-Phenothrin [3-phenoxybenzyl (1RS)-cis-trans-2,2-dimethyl-3-(2-methylprop-1-enyl) cyclopropanecarboxylate]
21. Deltamethrin [(S)- α -cyano-3-phenoxybenzyl (1R)-cis-3-(2,2-dibromovinyl)-2,2-dimethylcyclopropanecarboxylate]
22. Tetramethrin [cyclohex-1-ene-1,2-dicarboximido-methyl-(1RS, 3RS, 1RS, 3SR)-2,2-dimethyl-3-(2-methyl prop-1-enyl) cyclopropanecarboxylate]
23. Fluvalinate [(RS) α -cyano-3-phenoxybenzyl N-(2-chloro- α,α,α -trifluoro-p-tolyl)-DL-valinate].

Eventhough the proportions of each component of the compositions of the invention may vary in a broad range of values, the advantageous compositions which are further preferred are those which comprise (the proportions are indicated as percentage by weight, which are the same as weight parts per 100 weight parts of the compositions) :

- 25 0.2 to 10 % of compound of formula (I), preferably 0.5 to 5%
(more preferably 1 to 5 %), and/or
- 0.1 to 10 % of pyrethroid(s), and/or
- 1 to 15 % of weakly polar solvent(s) (more particularly 1 to 10 %
and preferably 2 to 10 %), and/or
- 30 5 to 20 % of emulsifying agent(s), and/or
- optionally 1 to 5 % of foam stabilizer(s), and/or
- at least one water soluble solvent as a complement up to 100 %;
- the proportion of this (these) solvent(s) in the composition of the invention is generally more than 40 %, preferably more than 60 %, and
- 35 optionally 0 to 15 % of polar solvent(s) and
- optionally 0 to 20 % of aromatic solvent(s) and

optionally other additives.

Weakly polar solvents which may be used in the invention are generally those which have a dipolar moment positive, preferably higher than 1 (the unit is the debye), and a solubility in water (at 20°C) of less than 10 %. These weakly polar solvent(s) are preferably selected among the cyclic amides and the glycolic ether solvents.

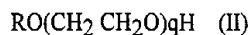
Examples of cyclic amides which may be used are N-octyl-2-pyrrolidone, N-dodecyl-2-pyrrolidone and N-dodecyl-caprolactam.

Examples of weakly polar solvent(s) of the glycolic ether type are : ethylene glycol monophenyl ether, ethylene glycol monoethyl ether, ethylene glycol mono-2-ethylhexyl ether, ethylene glycol dibutyl ether, diethylene glycol dibutyl ether, propylene glycol monophenyl ether, dipropylene glycol monopropyl ether, ethylene glycol monobenzyl ether and the like. Preferred glycol solvent is diethylene glycol mono-2-ethylhexyl ether.

Emulsifying agents which may be used are one or more of those selected from nonionic or anionic emulsifying agents. Examples of nonionic emulsifying agents which may be mentioned include polyoxyethylenealkylphenylether, polyoxyethylenealkylether, polyethyleneglycol fatty ester, sorbitan fatty ester, polyoxyethylene sorbitan fatty ester, polyoxyethylenesorbitan fatty ester, polyoxyethylenepolyoxy-propylenealkylether, polyoxyethylene castor oil. Examples of anionic emulsifying agents which may be mentioned include alkyl sulphates, polyoxyethylenealkylether sulphates, sulfosuccinates, taurine derivatives, sarcosine derivatives, phosphoric esters, alkylbenzenesulfonates and the like. A three-component mixture consisting of polyoxyethylenestyrylphenylether, polyoxyethylene castor oil and calcium alkylbenzenesulfonate as well ammonium salt of polyoxyethylenenonylphenylether sulphate are particularly preferred.

Foam stabilizers may be used as additive for keeping the composition in a stable foaming state at the time of foam application. Examples of foam stabilizers which may be used are one or more of higher alcohols, preferably a fatty alcohol, and more preferably an alcohol selected from the group consisting of decyl alcohol, dodecyl alcohol, tetradecyl alcohol, hexadecyl alcohol and the like.

Water-soluble solvents which may be used are one or more of the glycol ethers selected from those having the general formula (II) :



in which, R represents a C-1 to C-6 alkyl and q is an integer of 1 to 8. Examples of these glycol ethers include diethyleneglycolmonomethylether, diethyleneglycolmonoethylether, diethyleneglycolmonopropylether, diethyleneglycolmonobutylether, triethyleneglycolmonomethylether, triethyleneglycolmonoethylether, triethyleneglycolmonopropylether, triethyleneglycolmonobutylether, polyethyleneglycol (q=4 to 6) monomethylether.

Polar solvents and/or aromatic solvents may also be used as desired in the composition of the present invention. Polar solvents which are not weakly polar solvents are generally those which have a dipolar moment positive, preferably higher than 1 (the unit is the debye) while having a solubility in water higher than 10 %. Such polar solvents include cyclic amides or lactones such as N-methyl-2-pyrrolidone, N-cyclohexyl-2-pyrrolidone, caprolactone, butyrolactone; and glycol ethers such as tripropyleneglycolmonomethylether, diethyleneglycoldimethylether.

Suitable aromatic solvents are those being in liquid state at normal temperature and having a boiling point of at least 200 °C. They may be selected from petroleum fraction, catalytic cracked oil fraction or synthetic oil and the like. Examples which may be mentioned include: mono- or poly-alkylbenzenes such as alkylbenzene or trimethylbenzene; naphthalenes such as methylnaphthalene, dimethylnaphthalene, dimethylmonopropyl naphthalene, dimethyldipropyl naphthalene or phenylxylylnaphthalene; alkyl diphenylalkanes such as 1-phenyl-1-xylylethane or alkyl diphenylethane; indene derivatives; triallyldialkanes such as triallyldiethane; dibenzylethers; diester phthalates and the like.

Foaming agents which may be admixed into the emulsifiable composition diluted with water at the time of application may comprise a surface active agent and a foam stabilizer as well as a solvent or water as desired. The amounts of these foaming agents may vary in a large range according to the amount of foam which is desired for the particular application. Suitable surface active agents may be for example such as sodium salts of polyoxyethylenealkylphenylether sulphate, ammonium salts of polyoxyethylenealkylphenylether sulphate, amine salts of polyoxyethylenealkylphenylether sulphate, sodium salts of alkylsulphate, amine salts of alkyl sulphate, ammonium salts of alkylsulphate and the like. Foam stabilizers and solvents may be the same chemical compounds as those which were used in the composition of the present invention. When used together with a foaming agent, the composition of the present invention can be diluted with water to give a foamy emulsion of required concentration and the obtained emulsion can

be applied to limited space under the floor by means of a pump-driven spraying nozzle.

Emulsifiable compositions of the present invention may be prepared by any of conventional procedures suitable for emulsifiable concentrates.

5 Emulsifiable compositions for the control of termites according to the present invention exhibit a remarkable effect against house damage from insects, especially of insects, especially of termites, including Coptotermes formosanus (Shiraki), Reticulitermes speratus (Kolbe), Odontotermes formosanus (Shiraki) and Coptotermes domesticus (Haviland). When a house is treated with foam
10 application, insects, especially termites, can be exterminated completely and the treated wooden parts can be protected against boring by insects.

The invention relates also to insecticidal compositions as hereinbefore described which are useful to treat the house and especially the underfloor area of the house, particularly against termites, and which further comprise a foaming
15 agent. The corresponding method of treatment using such compositions is also part of the invention.

The invention still further relates to a method of control of insects, especially of termites whereby an effective amount of a composition as hereinbefore described is applied to the locus (which may be a cropping area) which is infested
20 or expected to be infested by said pests, the applied dosis of the active ingredients being preferably in the range from 0.01 to 15.0 mg/m², and more preferably in the range from 0.1 to 5.0 mg/m².

The compositions of the invention are useful for the treatment of many insects, especially termites, fleas, and more generally insects or arachnids such as
25 ticks which are infesting or expected to infest dogs or cats or other companion animals, as well as other insects as cited in European patent application 295117 which is herein incorporated by reference.

The invention still further relates to a method of control of fleas or ticks or insects from dogs and cats whereby an effective amount of a composition as
30 hereinbefore described is applied to the animal which is infested or expected to be infested by said pests.

The present invention is illustrated by the following examples, comparative examples and experimental examples, but is not limited to the details thereof. Unless otherwise specified, parts are by weight.

35

Example 1

1 part of the compound (A), 1 part of bifenthrin, 3 parts of N-octyl-2-pyrrolidone, 7 parts of dimethyldipropylnaphthalene, 5 parts of lauryl alcohol, 10 parts of mixture of polyoxyethylenealkylphenylether, polyoxyethylene castor oil and calcium alkyl benzene sulfonate ("Hymal 1071", available from Matsumoto Yushi Seiyaky Inc.), 2 parts of ammonium salt of polyoxyethylenenonylphenylether sulphate ("Hytenol N-08", available from Daiichi Kogyo Seiyaku Inc.) and 71 parts of polyoxyethyleneglycolmonomethylether were homogeneously dissolved to obtain an emulsifiable composition of the present invention.

10

Example 2 to 28

In each of these examples, an emulsifiable composition of the present invention was prepared in a similar manner to Example 1 according to the corresponding formulation shown in the Tables 1 to 6 .

15

Table 1

EXAMPLE N°	1	2	3	4	5	6
Compound (A)	1.0	1.0	5.0	5.0	1.0	1.0
Bifenthrin	1.0	1.0	1.0	5.0	1.0	1.0
N-Octyl-2-pyrrolidone	3.0	5.0	10.0	10.0	3.0	3.0
Dimethyldipropyl-naphthalene	7.0	10.0	20.0	20.0	20.0	7.0
Hymal 1071	10.0	10.0	10.0	10.0	10.0	10.0
Hytenol N-08	2.0	2.0	2.0	2.0	2.0	2.0
Dodecylalcohol	5.0	5.0	5.0	5.0	5.0	1.0
Polyoxyethylene-monomethylether	71.0	66.0	47.0	43.0	58.0	75.0
TOTAL	100.0	100.0	100.0	100.0	100.0	100.0

Table 2

EXAMPLE N°	7	8	9	10	11
Compound (A)	1.0	1.0	1.0	1.0	1.0
Bifenthrin	5.0	1.0	5.0		
Fenvalerate				1.0	
Cypermethrin					1.0
N-Octyl-2-pyrrolidone	3.0			3.0	3.0
N-dodecyl-2-pyrrolidone		3.0			
N-dodecyl-caprolacam			3.0		
Dimethyldipropylnaphthalene	10.0	7.0	7.0	7.0	7.0
Hymal 1071	10.0	10.0	10.0	10.0	10.0
Hytanol N-08	2.0	2.0	2.0	2.0	2.0
Dodecylalcohol	5.0	5.0	5.0	5.0	5.0
Polyoxyethylenomonomethyl- ether	64.0	71.0	67.0	71.0	71.0
TOTAL	100.0	100.0	100.0	100.0	100.0

Table 3

EXAMPLE N°	12	13	14	15	16
Compound (A)	1.0	1.0	1.0	1.0	1.0
Permethrin	1.0				
Tralomethrin		1.0			
Fluvalinate			1.0		
Cyfluthrin				1.0	
Ethofenprox					1.0
N-Octyl-2-pyrrolidone	3.0	3.0	3.0	3.0	3.0
Dimethyldipropylnaphthalene	7.0	7.0	7.0	7.0	7.0
Hymal 1071	10.0	10.0	10.0	10.0	10.0
Hytanol N-08	2.0	2.0	2.0	2.0	2.0
Dodecylalcohol	5.0	5.0	5.0	5.0	5.0
Polyoxyethylenomonomethylether	71.0	71.0	71.0	71.0	71.0
TOTAL	100.0	100.0	100.0	100.0	100.0

SUBSTITUTE SHEET (RULE 26)

Table 4

EXAMPLE N°	17	18	19	20	21
Compound (A)	1.0	1.0	1.0	1.0	1.0
Bifenthrin		1.0	1.0	1.0	1.0
Silafluorfen	1.0				
N-Octyl-2-pyrrolidone	3.0	2.0	2.0	2.0	3.0
N-methyl-2-pyrrolidone		0.5			
Cyclohexanone			0.5		
N,N-dimethylformamide				0.5	
Dimethyldipropylnaphthalene	7.0	7.5	7.5	7.5	
Dimethylmonopropylnaphthalene					7.0
Hymal 1071	10.0	10.0	10.0	10.0	10.0
Hytenol N-08	2.0	2.0	2.0	2.0	2.0
Dodecylalcohol	5.0	5.0	5.0	5.0	5.0
Polyoxyethylenomonomethylether	71.0	71.0	71.0	71.0	71.0
TOTAL	100.0	100.0	100.0	100.0	100.0

Table 5

EXAMPLE N°	22	23	24
Compound (A)	1.0	1.0	1.0
Bifenthrin	1.0	1.0	1.0
N-Octyl-2-pyrrolidone	3.0	3.0	2.0
N-methyl-2-pyrrolidone	0.5		0.5
Dimethyldipropylnaphthalene		5.0	5.0
Dimethylmonopropylnaphthalene	7.5	5.0	5.0
Hymal 1071	10.0	10.0	10.0
Hytenol N-08	2.0	2.0	2.0
Dodecylalcohol	5.0	5.0	5.0
Polyoxyethylenomonomethylether	70.0	68.0	68.5
TOTAL	100.0	100.0	100.0

SUBSTITUTE SHEET (RULE 26)

Table 6

EXAMPLE N°	25	26	27	28
Compound (A)	1.0	1.0	1.0	1.0
Bifenthrin	1.0	1.0	1.0	1.0
ethylene glycol mono 2-ethylhexyl ether	20.0			18.0
ethylene glycol mono hexyl ether		20.0		
ethylene glycol mono benzyl ether			20.0	
N-methyl-2-pyrrolidone				2.0
Hymal 1071	10.0	10.0	10.0	10.0
Hytenol N-08	2.0	2.0	2.0	2.0
Dodecylalcohol	5.0	5.0	5.0	5.0
Polyoxyethylenomonomethylether	61.0	61.0	61.0	61.0
TOTAL	100.0	100.0	100.0	100.0

Comparative Examples 1 to 2

In each of these examples, an emulsifiable composition was prepared in a similar manner to Example 1 according to the corresponding formulation shown in the Table 7.

5

Table 7

COMPARATIVE EXAMPLES N°	1	2
Compound (A)	1.0	1.0
Bifenthrin	1.0	1.0
N-methyl-2-pyrrolidone	3.0	
Dimethyldipropylnaphthalene	7.0	
Hymal 1071	10.0	
Hytenol N-08	2.0	
Solpol 355X		10.0
Dodecylalcohol	5.0	
Polyoxyethylenomonomethylether	71.0	
Xylene		88.0
TOTAL	100.0	100.0

Solpol 355X (mixture of polyoxyalkyleneallylphenylether, polyoxyalkylene allylphenyether condensate and alkybenzene calcium sulfonate, available from Matsumoto Yushi Seiyaku Inc.)

Experimental example 1 : Crystallization test in emulsion

5 To a 100 milliliter beaker, 100 ml of 3° hard water was introduced, 1.0 g of an emulsifiable composition prepared according to each of the above examples and comparative examples was added thereto, then stirred and mixed well. After left to stand at 5°C for 24 hours, the obtained emulsion was passed through a sieve of
10 45mm opening, then the amount of crystal remained on the sieve was evaluated according to the following criterion by visual observation. The results are shown in Table 7.

No crystal or crystallization was observed for any of the examples 1 to 28. On the contrary, large amounts of crystals and crystallisation was observed for Comparative example 1, and small amounts of crystals and crystallisation was
15 observed for Comparative example 2.

Experimental example 2 : Foaming test

An emulsifiable composition prepared according to each of the examples and comparative examples was diluted in water to the predetermined dilution and then 3 % of an ordinary commercial foaming agent ("Dolfoam", available from Nihon
20 Noyaku Inc.) was added thereto. The obtained mixture was made to foam by means of a foam spraying machine. The foaming property was evaluated by visual observation. No foaming was observed in comparative example 2. A foaming equal to that of "Dolfoam" was observed for Examples 1 and 18 and comparative example 1.

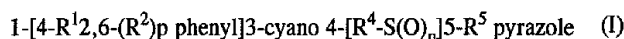
25 The emulsifiable compositions for the control of insects, especially of insects, especially of termites, of the present invention, when diluted in water to give a spraying emulsion proper to application, were observed not to occur any crystallization and thus was found to be useful as foaming preparations for the control of insects, especially of termites,.

Throughout this specification and the claims which follow, unless the context requires otherwise, the word "comprise", and variations such as "comprises" and "comprising", will be understood to imply the inclusion of a stated integer or step or group of integers or steps but not the exclusion of any other integer or step or group of integers or steps.



THE CLAIMS DEFINING THE INVENTION ARE AS FOLLOWS:

1. An emulsifiable composition for the control of insects comprising as active ingredient thereof a compound of formula (I) and a pyrethroid and further comprising a weakly polar solvent which has a dipolar moment higher than 1 and a water solubility of less than 10% and an emulsifying agent, and a water-soluble solvent which has the general formula $RO(CH_2CH_2O)_q H$ in which, R represents a C-1 to C-6 alkyl and q is an integer of 1 to 8, wherein the formula (I) is



10 wherein:

R^1 is halogen, lower haloalkyl, lower haloalkoxy or SF_5 (lower being an integer from 1 to 4),

R^2 is halogen, the various R^2 being identical or different,

R^4 is halogen, lower alkyl or haloalkyl,

15 R^5 is halogen, lower alkyl or amino,

n is 0 or 1 or 2; p is 0 or 1 or 2.

2. A composition according to claim 1 where the solvent is a glycol ether selected from the group consisting of the diethyleneglycolmonomethylether, the diethyleneglycolmonoethylether, the diethyleneglycolmonopropylether, the diethyleneglycolmonobutylether, the triethyleneglycolmonomethylether, the triethyleneglycolmonoethylether, the triethyleneglycolmonopropylether, the triethyleneglycolmonobutylether and the polyethyleneglycolmonomethylether.

- 25 3. A composition according to claim 1 or claim 2 wherein lower is 1.

4. A composition according to any one of claims 1 to 3 wherein p is 2.

5. A composition according to any one of claims 1 to 4 wherein the compound of formula (I) is 5-amino-3-cyano-1-(2,6-dichloro-4-trifluoromethylphenyl)-4-trifluoromethylsulfinylpyrazole.



6. A composition according to any one of claims 1 to 5 wherein the pyrethroid is selected in the group consisting of Allethrin, Ethofenprox, Cycloprothrin, Cyhalothrin, Cyfluthrin, Cypermethrin, Pyrethrin, Tralomethrin, Fenvalerate, Fenpropathrin, Flucythrinate, Permethrin, Bifenthrin, Silafluofen, Resmethrin, Tefluthrin, Acrinathrin, Prarethrin, 5 Cismethrin, Phenothrin, Deltamethrin, Tetramethrin and Fluvalinate.

7. A composition according to any one of claims 1 to 6 comprising a weakly polar solvent selected from the group consisting of N-octyl-2-pyrrolidone, N-dodecyl-2-pyrrolidone and N-dodecylcaprolactam, and glycolic ethers.

10

8. A composition according to any one of claims 1 to 7 comprising a nonionic or anionic emulsifying agent.

9. A composition according to any one of claims 1 to 8 comprising a foam stabilizer 15 which is a higher alcohol.

10. A composition according to claim 9 wherein the higher alcohol is a fatty alcohol.

11. A composition according to claim 9 wherein the alcohol is selected from the group 20 consisting of decyl alcohol, dodecyl alcohol, tetradecyl alcohol, hexadecyl alcohol and the like.

12. A composition according to any one of claims 1 to 11 further comprising a polar solvent which have a dipolar moment positive higher than 1 and a solubility in water higher 25 than 10%.

13. A composition according to claim 12 wherein the polar solvent is selected from the group consisting of N-methyl-2-pyrrolidone, N-cyclohexyl-2-pyrrolidone, caprolactone, butyrolactone, tripropyleneglycolmonomethylether and diethyleneglycoldimethylether.



A composition according to any one of claims 1 to 13 comprising an aromatic solvent

which is in liquid state at some temperature below 30°C and/or has a boiling point of at least 200°C.

15. A composition according to any one of claims 1 to 14 wherein the weight ratio of
5 compound of formula (I) to the pyrethroid is in the range of 1 to 10.

16. A composition according to any one of claims 1 to 15 further comprising a foaming
agent and/or a foam stabilizer.

10 17. A composition according to any one of claims 1 to 16 comprising
0.2 to 10% of compound of formula (I), and/or
0.1 to 10% of pyrethroid(s), and/or
1 to 15% of weakly polar solvent(s), and/or
5 to 20% of emulsifying agent(s), and/or
15 optionally 1 to 5% of foam stabilizer(s), and/or
optionally 0 to 15% of polar solvent(s), and/or
optionally 0 to 20% of aromatic solvent(s) and
at least one water soluble solvent as a complement up to 100%.

20 18. A composition of claim 17 comprising 0.5 to 5% of said compound of formula (I).

19. A composition of claim 17 comprising 1 to 5% of said compound of formula (I).

20. A composition of claim 17 comprising 1 to 10% of said weakly polar solvent(s).

25

21. A composition of claim 17 comprising 2 to 10% of said weakly polar solvent(s).

22. A composition of claim 17 wherein the proportion of said at least one water soluble
solvent in the composition is more than 40%.



A composition of claim 17 wherein the proportion of said at least one water soluble

solvent in the composition is more than 60%

24. A composition according to any of claims 1 to 23 is useful to treat the underfloor area of a house, particularly against termites, further comprising a foaming agent.

5

25. A method of control of insects or arachnids whereby an effective amount of a composition according to any one of claims 1 to 24 is applied to the locus which is infested or expected to be infested by said insects or arachnids.

10 26. A method according to claim 25 wherein the applied dose of the active ingredients is in the range from 0.01 to 15.0 mg/m².

27. A method according to claim 25 wherein the applied dose of the active ingredients is in the range from 0.1mg to 5.0 mg/m².

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28. A method according to any one of claims 25 to 27 wherein the insects are termites.

29. A method of treatment of a house which is infested or expected to be infested by insects whereby an emulsifiable composition according to any one of claims 1 to 24 and
20 comprising a foaming agent is applied to the underfloor area of the house.

30. A method according to claim 29 wherein the insects are termites.

31. A method of control of insects or arachnids which are infesting or expected to infest
25 animals whereby an effective amount of a composition according to any one of claims 1 to 24 is applied to the animal which is infested or expected to be infested by said insects or arachnids.

32. A method according to claim 31 wherein the insects or arachnids are fleas or ticks.



33. A method according to claim 31 or 32 wherein the animal is a dog or a cat.

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34. A method of control of insects according to claim 29 or 30 wherein the applied dose of the active ingredients is 0.1 to 100 mg per kilogram of body weight of the animal.

35. A method accordingly to claim 34 wherein the applied dose of the active ingredients is 2 to 20mg per kilogram of body weight of the animal.

36. A composition according to claim 1 substantially as hereinbefore described with reference to the Examples.

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Rhone-Poulenc Agrochimie

by **DAVIES COLLISON CAVE**
Patent Attorneys for the applicant(s)

