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(54) Titre : COMPOSITION PESTICIDE
(54) Title: PESTICIDAL COMPOSITION

(57) **Abrégé/Abstract:**

The present invention relates to an aqueous pesticidal composition having excellent pesticidal activity, particularly a pesticidal composition comprising a pesticidal active ingredient, a carboxy-modified methyl methacrylate-butadiene copolymer, a surfactant and water, wherein the amount of the carboxy-modified methyl methacrylate-butadiene copolymer is 20 - 100 parts by weight relative to 100 parts by weight of the pesticidal active ingredient and the amount of the surfactant is 0.1 - 50 parts by weight relative to 100 parts by weight of the pesticidal active ingredient.

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(54) **Title:** PESTICIDAL COMPOSITION

(57) **Abstract:** The present invention relates to an aqueous pesticidal composition having excellent pesticidal activity, particularly a pesticidal composition comprising a pesticidal active ingredient, a carboxy-modified methyl methacrylate-butadiene copolymer, a surfactant and water, wherein the amount of the carboxy-modified methyl methacrylate-butadiene copolymer is 20 - 100 parts by weight relative to 100 parts by weight of the pesticidal active ingredient and the amount of the surfactant is 0.1 - 50 parts by weight relative to 100 parts by weight of the pesticidal active ingredient.



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PESTICIDAL COMPOSITION

Technical Field

[0001]

5 The present disclosure relates to a pesticidal composition, more particularly an aqueous pesticidal composition containing a pesticidal active ingredient dispersed therein.

10 Background Art

[0002]

 Heretofore, various aqueous pesticidal compositions containing a pesticidal active ingredient are known (see, for example, JP 51-151334 A, JP 9-143001 A and JP 11-35408
15 A).

Summary

[0003]

 An object of the present disclosure is to provide an
20 aqueous pesticidal composition having improved pesticidal activity.

[0004]

 The present inventors have intensively studied for aqueous pesticidal compositions and finally found that an
25 aqueous pesticidal composition containing a certain amount

of a surfactant and a certain amount of a certain copolymer has improved pesticidal activity, and thus the present disclosure has been completed.

[0005]

5 Namely, the present disclosure includes the following:

[1] A pesticidal composition comprising a pesticidal active ingredient, a carboxy-modified methyl methacrylate-butadiene copolymer, a surfactant and water,

10 wherein the amount of the carboxy-modified methyl methacrylate-butadiene copolymer is 20 - 100 parts by weight relative to 100 parts by weight of the pesticidal active ingredient and the amount of the surfactant is 0.1 - 50 parts by weight relative to 100 parts by weight of
15 the pesticidal active ingredient (hereinafter referred to as "the present inventive composition").

[2] The pesticidal composition according to the above [1], comprising 1 - 50% by weight of the pesticidal active ingredient; 0.2 - 50% by weight of the carboxy-modified
20 methyl methacrylate-butadiene copolymer; 0.1 - 10% by weight of the surfactant; and 20 - 80% by weight of water.

[3] The pesticidal composition according to the above [2], comprising 5 - 20% by weight of the carboxy-modified methyl methacrylate-butadiene copolymer.

[4] The pesticidal composition according to the above [2] or [3], comprising 4 - 6% by weight of the surfactant.

[5] The pesticidal composition according to any one of the above [1] - [4], wherein the surfactant is at least one
5 selected from polyoxyethylene tristyrylphenyl ether phosphate esters and ligninsulfonates.

[6] The pesticidal composition according to any one of the above [1] - [5], comprising 15 - 25% by weight of the pesticidal active ingredient.

10 [7] The pesticidal composition according to any one of the above [1] - [6], wherein the pesticidal active ingredient is at least one selected from fenpyrazamine and 2-[(2,5-dimethylphenoxy)methyl]- α (alpha)-methoxy-N-methyl-benzeneacetamide.

15 [8] The pesticidal composition according to any one of the above [1] - [7], wherein the mean particle diameter of the carboxy-modified methyl methacrylate-butadiene copolymer is 0.1 - 0.3 μm ; the gel content of the copolymer is not less than 80% by weight; and the glass-transition
20 temperature of the copolymer is not more than -10°C .

[9] A method for applying the pesticidal composition according to any one of the above [1] - [8], which comprises diluting the pesticidal composition according to any one of the above [1] - [8] with water, and applying

the resultant water-diluted liquid to a plant by foliage spraying.

[10] A method for producing the pesticidal composition according to any one of the above [1] - [8], which comprises producing a dispersion comprising a pesticidal active ingredient, a surfactant and water, adding a carboxy-modified methyl methacrylate-butadiene copolymer to the dispersion, and uniformly dispersing the copolymer in the mixture.

[11] A method for producing the pesticidal composition according to any one of the above [1] - [8], which comprises producing a dispersion comprising a pesticidal active ingredient, a surfactant and water, adding a latex comprising a carboxy-modified methyl methacrylate-butadiene copolymer to the dispersion, and uniformly dispersing the copolymer in the mixture.

[0006]

The present inventive composition is an aqueous pesticidal composition having excellent pesticidal activity. In addition, the present inventive composition is rainfall resistant, i.e., when it is applied to a plant, the pesticidal active ingredient is hardly washed out from the plant by rainfall or watering. Therefore, the present inventive composition can sufficiently exert the

pesticidal activity without being largely affected by rainfall or watering.

Description of Embodiments

5 [0007]

The present inventive composition comprises at least one pesticidal active ingredient.

The pesticidal active ingredient to be used in the present invention is not particularly limited and may be
10 liquid or solid at room temperature (25°C). The pesticidal active ingredient is preferably water-dispersible but not water-soluble.

The present inventive composition is an aqueous suspension composition when the pesticidal active
15 ingredient is solid, an aqueous emulsion composition when the pesticidal active ingredient is liquid, or an aqueous emulsion-suspension composition when the pesticidal active ingredient is solid and liquid, respectively.

Examples of the pesticidal active ingredient include
20 compounds such as insecticidal active ingredients, fungicidal active ingredients and herbicidal active ingredients, specifically the following compounds:

[0008]

Insecticidal active ingredients: cypermethrin,
25 deltamethrin, fenpropathrin, tralomethrin, acrinathrin,

bifenthrin, resmethrin, tetramethrin, permethrin,
 isoprocarb, xylylcarb, XMC, carbaryl, carbofuran,
 fenoxycarb, alanycarb, fenobucarb, bendiocarb,
 tetrachlorvinphos, dimethylvinphos, phosalone,
 5 chlorpyrifos, chlorpyrifos-methyl, pyridafenthion,
 quinalphos, methidathion, azinphos-ethyl, azinphos-methyl,
 salithion, cyanophos, EPN, cyanofenphos, diflubenzuron,
 chlorfluazuron, lufenuron, hexaflumuron, flufenoxuron,
 flucycloxuron, diafenthion, hexythiazox, novaluron,
 10 teflubenzuron, triflumuron, bensultap, fenazaquin,
 fenpyroximate, pyridaben, hydramethylnon, thiodicarb,
 chlorphenapyr, pymetrozine, pyrimidifen, tebufenozide,
 tebufenpyrad, triazamate, sulfluramid, milbemectin,
 pyridalyl, buprofezin, clofentezine, fipronil, ethiprole,
 15 clothianidin, imidacloprid, thiacloprid.

[0009]

Fungicidal active ingredients: S-allyl 5-amino-2,3-
 dihydro-2-isopropyl-3-oxo-4-(o-tolyl)pyrazol-1-
 carbothioate (fenpyrazamine), 2-[(2,5-
 20 dimethylphenoxy)methyl]- α (alpha)-methoxy-N-methyl-
 benzeneacetamide, benomyl, carbendazim, thiophanate-methyl,
 diethofencarb, procymidone, iprodione, vinclozolin,
 diniconazole, tebuconazole, difenoconazole, cyproconazole,
 flusilazole, triadimefon, furametpyr, mepronil, flutolanil,
 25 tolclofos-methyl, pyrazophos, pyrimethanil, mepanipyrim,

cyprodinil, fludioxonil, fenpiclonil, azoxystrobin,
kresoxim-methyl, metominostrobin, chlorothalonil, manzeb,
captan, folpet, probenazole, dimethomorph, famoxadone,
oxolinic acid, fluazinam, ferimzone, thiuram,
5 techlofthalam, carpropamid, diclocymet, tricyclazole,
fthalide, trifloxystrobin, triazine, flusulfamide,
diclomezine, hexaconazole.

[0010]

Herbicidal active ingredients: fenoxaprop-P-ethyl,
10 cyhalofop-butyl, bensulfuron-methyl, nicosulfuron,
cyclosulfamuron, triflusulfuron-methyl, imazaquin,
flumetsulam, atrazine, metribuzin, fluometuron,
isoproturon, propanil, bromoxynil, ioxynil, bentazon,
flumioxazin, fluthiacet-methyl, azafenidin, sulfentrazone,
15 norflurazon, diflufenican, isoxaflutole, pendimethalin,
trifluralin, mefenacet, mecoprop, fluroxypyr, simetryn,
daimuron, fentrazamide, etobenzanid, swep, oxaziclomefone,
oxadiazolone, pyrazolate, prodiamine, cafenstrole,
pentoxazone, clomeprop, pyriftalid, benzobicyclon,
20 bromobutide, pyraclonil, imazosulfuron, sulfosulfuron,
propyrisulfuron.

[0011]

The present inventive composition comprises the
pesticidal active ingredient(s) in a total amount of
25 generally 1 - 50% by weight, preferably 15 - 25% by weight.

[0012]

The present inventive composition comprises at least one carboxy-modified methyl methacrylate-butadiene copolymer.

5 The carboxy-modified methyl methacrylate-butadiene copolymer is a methyl methacrylate-butadiene copolymer containing carboxyl group (-COOH). For the production of the present inventive composition, a latex comprising fine particles of the carboxy-modified methyl methacrylate-
10 butadiene copolymer dispersed in water can be used. In the latex, the mean particle diameter of the fine particles of the carboxy-modified methyl methacrylate-butadiene copolymer is preferably 0.1 - 0.3 μm ; the gel content of the copolymer is preferably not less than 80%
15 by weight; and the glass-transition temperature of the copolymer is preferably not more than -10°C .

The "mean particle diameter" as used herein refers to a volume median diameter measured by a laser diffraction particle diameter analyzer.

20 The "gel content" as used herein refers to a fraction by weight of a polymer (i.e., the carboxy-modified methyl methacrylate-butadiene copolymer) insoluble in a solvent such as toluene or methyl ethyl ketone. The bigger the value is, the bigger the molecular weight of the polymer
25 is.

The "glass-transition temperature" as used herein refers to a temperature when the polymer begins to change from a glassy to a rubbery state, which is measured by DSC (differential scanning calorimeter).

5 The carboxy-modified methyl methacrylate-butadiene copolymer is commercially available. Examples of the latex include NALSTARTM MR-174 (trademark, manufactured by NIPPON A&L INC.).

[0013]

10 The amount of the carboxy-modified methyl methacrylate-butadiene copolymer is 20 - 100 parts by weight relative to 100 parts by weight of the pesticidal active ingredient. The present inventive composition comprises the carboxy-modified methyl methacrylate-
15 butadiene copolymer in an amount of generally 0.2 - 50% by weight, preferably 5 - 20% by weight.

[0014]

The present inventive composition comprises at least one surfactant.

20 The surfactant to be used in the present disclosure may be an anionic surfactant or a nonionic surfactant.

[0015]

Examples of the anionic surfactant include ligninsulfonates, alkyl naphthalene sulfonates, alkyl
25 benzene sulfonates, dialkyl succinates, alkyl sulfate

esters, polyoxyalkylene alkyl ether sulfate esters,
polyoxyalkylene aryl phenyl ether sulfate esters,
polyoxyalkylene alkyl ether phosphate esters, and
polyoxyalkylene aryl phenyl ether phosphate esters, and
5 examples of the salt thereof include alkali metal salts,
ammonium salts and amine salts.

[0016]

Examples of the nonionic surfactant include
polyoxyalkylene alkyl ethers, polyoxyethylene alkyl aryl
10 ethers, polyoxyalkylene aryl phenyl ethers,
polyoxyethylene sorbitan fatty acid esters,
polyoxyethylene polyoxypropylene glycols, and polyacrylate
graft copolymers.

[0017]

15 Among the surfactants, preferred are ligninsulfonates
such as sodium ligninsulfonate; polyoxyethylene
tristyrylphenyl ether phosphate esters such as potassium
salts of polyoxyethylene tristyrylphenyl ether phosphate
esters and amine salts of polyoxyethylene tristyrylphenyl
20 ether phosphate esters; polyoxyalkylene aryl phenyl
ethers; and polyacrylate graft copolymers.

[0018]

The total amount of the surfactant(s) is 0.1 - 50
parts by weight, preferably 15 - 30 parts by weight,
25 relative to 100 parts by weight of the pesticidal active

ingredient. The present inventive composition comprises the surfactant(s) in a total amount of generally 0.1 - 10% by weight, preferably 4 - 6% by weight.

[0019]

5 The present inventive composition comprises water.

The water to be used in the present inventive composition is not particularly limited, but includes those as used in a common pesticidal aqueous emulsion composition or a common pesticidal aqueous suspension
10 composition, such as tap water, well water and ion-exchanged water.

[0020]

The present inventive composition comprises water in an amount of generally 20 - 80% by weight, preferably 25 -
15 55% by weight.

[0021]

The present inventive composition may further comprise a thickening agent, an antifoaming agent, a preservative, an anti-freezing agent, and the like.

20 [0022]

Examples of the thickening agent include organic thickening agents and inorganic thickening agents, such as xanthan gum, guar gum, gum arabic, casein, dextrin, carboxymethyl cellulose, sodium salt of carboxymethyl
25 cellulose, sodium alginate, hydroxyethyl cellulose,

carboxyethyl cellulose, methyl cellulose, hydroxypropyl cellulose, hydroxyethyl cellulose, polyvinyl alcohol, polyacrylic acid or a derivative thereof, hydrous aluminum silicate, hydrous magnesium silicate, hydrous magnesium aluminum silicate, and silica. These thickening agents may be used alone or in a mixture of two or more kinds thereof.

When the present inventive composition comprises the thickening agent(s), the total amount thereof is generally 0.1 - 5% by weight, preferably 0.4 - 0.8% by weight.

[0023]

Examples of the antifoaming agent include silicone type antifoaming agents and fatty acid-type antifoaming agents.

When the present inventive composition comprises the antifoaming agent, the amount thereof is generally 0.01 - 3% by weight.

[0024]

Examples of the preservative include butylparaben (n-butyl para-hydroxybenzoate), 5-chloro-2-methyl-4-isothiazolin-3-one (CMT), sorbic acid, potassium sorbate, p-chloro-m-xyleneol, 1,2-benzisothiazolin-3-one (BIT), 2-bromo-2-nitropropane-1,3-diol (BNP), and 2-methyl-4-isothiazolin-3-one (MT).

When the present inventive composition comprises the preservative, the amount thereof is generally 0.005 - 1% by weight.

[0025]

5 Examples of the anti-freezing agent include ethylene glycol, diethylene glycol, glycerin, and propylene glycol.

When the present inventive composition comprises the anti-freezing agent, the amount thereof is generally 1 - 20% by weight.

10 [0026]

The present inventive composition can be produced by using the pesticidal active ingredient, the carboxy-modified methyl methacrylate-butadiene copolymer, the surfactant and water, and, if necessary, the thickening agent, the antifoaming agent, the preservative, the anti-freezing agent and the like. The production method is not particularly limited.

[0027]

For example, the present inventive composition may be produced by producing a dispersion comprising the pesticidal active ingredient, the surfactant and water, wherein the pesticidal active ingredient is emulsified or suspended in the dispersion (first step), and uniformly dispersing the carboxy-modified methyl methacrylate-butadiene copolymer in the dispersion (second step).

Examples of the first step include a step of adding the pesticidal active ingredient and the surfactant, and, if necessary, the antifoaming agent and the anti-freezing agent to water; dispersing the resultant mixture by using DispermillTM and the like; and then fine grinding and dispersing the pesticidal active ingredient by using beads mill and the like to the mean particle diameter of the pesticidal active ingredient of not more than 10 μm , preferably not more than 5 μm .

Examples of the second step include a step of adding the carboxy-modified methyl methacrylate-butadiene copolymer, and, if necessary, the thickening agent, the preservative and the like to the dispersion obtained in the first step, and uniformly mixing the resultant mixture. In the second step, the latex comprising a carboxy-modified methyl methacrylate-butadiene copolymer may be used in addition to a carboxy-modified methyl methacrylate-butadiene copolymer itself.

[0028]

The present inventive composition is applicable to places such as a paddy field, a field, an orchard, a lawn, and a non-agricultural land by using the same method as in the case of a common pesticidal aqueous emulsion composition or a common pesticidal aqueous suspension composition for controlling pests such as fungi, insects

and weeds. The present inventive composition may be diluted with water, if necessary, and the resultant water-diluted liquid may be applied to a plant grown or in the soil in the above-mentioned places by spraying and the like. Examples of the spraying method for the water-diluted liquid include soil surface spraying and foliage spraying by using a known sprayer and the like.

In addition, the water-diluted liquid may be used in seed treatment, seedling raising box treatment, and the like.

[0029]

The present inventive composition may be applied as it is without diluting with water, for example, by spraying from the ridge of a flooded paddy field and the like along the ridge. Before spraying, a container containing the present inventive composition is generally stirred gently to mix the present inventive composition.

Examples

[0030]

Hereinafter, the present disclosure will be explained in more detail with reference to Production Examples and Test Examples.

[0031]

Firstly, Production Examples will be described below.
In the Production Examples, the following trademarks are used.

5 NALSTAR MR-174:

Content of carboxy-modified methyl methacrylate-
butadiene copolymer: 50% by weight, water content: 50% by
weight, mean particle diameter of the copolymer: 170 nm,
gel content of the copolymer: 95% by weight, glass-
10 transition temperature of the copolymer: -30°C,
manufactured by NIPPON A&L INC.

ReaxTM 83A:

Sodium ligninsulfonate, manufactured by MeadWestvaco

Reax 85A:

15 Sodium ligninsulfonate, manufactured by MeadWestvaco

SoprophorTM FLK:

Potassium salt of polyoxyethylene tristyrylphenyl
ether phosphate ester, manufactured by Rhodia

Step-FlowTM 1500:

20 Polyoxyalkylene tristyrylphenyl ether, manufactured
by Stepan

DispersogenTM TP160T:

Amine salt of polyoxyethylene tristyrylphenyl ether
phosphate ester, manufactured by Clariant

25 Dispersogen PSL100:

Polyacrylate graft copolymer, manufactured by
Clariant

KelzanTM S:

Xanthane gum, manufactured by CP Kelco

5 VeegumTM Granules:

Magnesium aluminum silicate, manufactured by
Vanderbilt

KunipiaTM-F:

Hydrous aluminum silicate, manufactured by Kunimine
10 Industries Co., Ltd.

CE Antifoam Emulsion:

Silicone type antifoaming agent, manufactured by Dow
Corning

Antifoam C Emulsion:

15 Silicone type antifoaming agent, manufactured by Dow
Corning

KS-538

Silicone type antifoaming agent, manufactured by
Shin-Etsu Chemical Co., Ltd.

20 ProxelTM GXL:

Preservative, manufactured by Arch Chemicals

Proxel GXL(S):

Preservative, manufactured by Arch Chemicals

DYNO-MILLTM KDL:

Horizontal bead mill, manufactured by SHINMARU
ENTERPRISES CORPORATION

[0032]

Production Example 1

5 Firstly, 20 parts by weight of fenpyrazamine, 6 parts
by weight of Reax 85A, 0.4 parts by weight of Kunipia-F,
0.1 parts by weight of Antifoam C Emulsion, 5 parts by
weight of propylene glycol and 28.3 parts by weight of
ion-exchanged water were mixed. Then, the resultant
10 mixture was wet-ground by using DYNO-MILL KDL to obtain a
suspension. To the resultant suspension were added and
uniformly dispersed 0.2 parts by weight of Proxel GXL and
40 parts by weight of NALSTAR MR-174 to obtain the present
inventive composition (1).

15 [0033]

Production Example 2

Firstly, 20 parts by weight of fenpyrazamine, 6 parts
by weight of Reax 83A, 0.4 parts by weight of Kunipia-F,
0.1 parts by weight of Antifoam C Emulsion, 5 parts by
20 weight of propylene glycol and 28.3 parts by weight of
ion-exchanged water were mixed. Then, the resultant
mixture was wet-ground by using DYNO-MILL KDL to obtain a
suspension. To the resultant suspension were added and
uniformly dispersed 0.2 parts by weight of Proxel GXL and

40 parts by weight of NALSTAR MR-174 to obtain the present inventive composition (2).

[0034]

Production Example 3

5 Firstly, 25 parts by weight of 2-[(2,5-dimethylphenoxy)methyl]- α (alpha)-methoxy-N-methyl-benzeneacetamide, 4 parts by weight of Soprophor FLK, 0.25 parts by weight of Antifoam C Emulsion, 6.25 parts by weight of propylene glycol and 27.83 parts by weight of
10 ion-exchanged water were mixed. Then, the resultant mixture was wet-ground by using DYNO-MILL KDL to obtain a suspension.

 In addition, 0.2 parts by weight of Proxel GXL(S), 0.2 parts by weight of Kelzan S and 0.3 parts by weight of
15 Veegum Granules were added to 25.97 parts by weight of ion-exchanged water, and the resultant mixture was stirred for 2 hours to obtain a uniform dispersion.

 The dispersion was mixed with the above suspension. To the resultant mixture was added and uniformly dispersed
20 10 parts by weight of NALSTAR MR-174 to obtain the present inventive composition (3).

[0035]

Production Example 4

 Firstly, 20 parts by weight of 2-[(2,5-dimethylphenoxy)methyl]- α (alpha)-methoxy-N-methyl-
25

benzeneacetamide, 2 parts by weight of Soprophor FLK, 2 parts by weight of Step-Flow 1500, 0.2 parts by weight of Antifoam C Emulsion, 5 parts by weight of propylene glycol and 24.13 parts by weight of ion-exchanged water were
5 mixed. Then, the resultant mixture was wet-ground by using DYNO-MILL KDL to obtain a suspension.

In addition, 0.2 parts by weight of Proxel GXL(S), 0.2 parts by weight of Kelzan S and 0.5 parts by weight of Veegum Granules were added to 25.77 parts by weight of
10 ion-exchanged water, and the resultant mixture was stirred for 2 hours to obtain a uniform dispersion.

The dispersion was mixed with the above suspension. To the resultant mixture was added and uniformly dispersed
20 parts by weight of NALSTAR MR-174 to obtain the present
15 inventive composition (4).

[0036]

Production Example 5

Firstly, 25 parts by weight of 2-[(2,5-dimethylphenoxy)methyl]- α (alpha)-methoxy-N-methyl-
20 benzeneacetamide, 2 parts by weight of Soprophor FLK, 2 parts by weight of Step-Flow 1500, 0.2 parts by weight of Antifoam C Emulsion, 5 parts by weight of propylene glycol and 12.47 parts by weight of ion-exchanged water were
mixed. Then, the resultant mixture was wet-ground by
25 using DYNO-MILL KDL to obtain a suspension.

In addition, 0.2 parts by weight of Proxel GXL(S),
0.25 parts by weight of Kelzan S and 0.4 parts by weight
of Veegum Granules were added to 32.48 parts by weight of
ion-exchanged water, and the resultant mixture was stirred
5 for 2 hours to obtain a uniform dispersion.

The dispersion was mixed with the above suspension.
To the resultant mixture was added and uniformly dispersed
20 parts by weight of NALSTAR MR-174 to obtain the present
inventive composition (5).

10 [0037]

Production Example 6

Firstly, 15 parts by weight of 2-[(2,5-
dimethylphenoxy)methyl]- α (alpha)-methoxy-N-methyl-
benzeneacetamide, 4 parts by weight of Soprophor FLK, 0.2
15 parts by weight of CE Antifoam Emulsion (manufactured by
Dow Corning), 5 parts by weight of propylene glycol and
5.8 parts by weight of ion-exchanged water were mixed.
Then, the resultant mixture was wet-ground by using DYNOMILL KDL to obtain a suspension.

20 In addition, 0.2 parts by weight of Proxel GXL(S),
0.3 parts by weight of Kelzan S and 0.5 parts by weight of
Veegum Granules were added to 39 parts by weight of ion-
exchanged water, and the resultant mixture was stirred for
2 hours to obtain a uniform dispersion.

The dispersion was mixed with the above suspension. To the resultant mixture was added and uniformly dispersed 30 parts by weight of NALSTAR MR-174 to obtain the present inventive composition (6).

5 [0038]

Production Example 7

Firstly, 25 parts by weight of 2-[(2,5-dimethylphenoxy)methyl]- α (alpha)-methoxy-N-methyl-benzeneacetamide, 4 parts by weight of Dispersogen TP160T, 10 1 part by weight of Dispersogen PSL100, 0.2 parts by weight of Antifoam C Emulsion, 5 parts by weight of propylene glycol and 32.13 parts by weight of ion-exchanged water were mixed. Then, the resultant mixture was wet-ground by using DYNO-MILL KDL to obtain a 15 suspension.

In addition, 0.2 parts by weight of Proxel GXL, 0.14 parts by weight of Kelzan S and 0.3 parts by weight of Veegum Granules were added to 18.03 parts by weight of ion-exchanged water, and the resultant mixture was stirred 20 for 2 hours to obtain a uniform dispersion.

The dispersion was mixed with the above suspension. To the resultant mixture was added and uniformly dispersed 20 parts by weight of NALSTAR MR-174 to obtain the present inventive composition (7).

[0039]

Production Example 8

Firstly, 25 parts by weight of 2-[(2,5-dimethylphenoxy)methyl]- α (alpha)-methoxy-N-methyl-benzeneacetamide, 4 parts by weight of Dispersogen TP160T, 1 part by weight of Dispersogen PSL100, 0.2 parts by weight of KS-538, 5 parts by weight of propylene glycol and 28.47 parts by weight of ion-exchanged water were mixed. Then, the resultant mixture was wet-ground by using DYNO-MILL KDL to obtain a suspension.

In addition, 0.2 parts by weight of Proxel GXL, 0.16 parts by weight of Kelzan S and 0.32 parts by weight of Veegum Granules were added to 20.65 parts by weight of ion-exchanged water, and the resultant mixture was stirred for 2 hours to obtain a uniform dispersion.

The dispersion was mixed with the above suspension. To the resultant mixture was added and uniformly dispersed 20 parts by weight of NALSTAR MR-174 to obtain the present inventive composition (8).

[0040]

Comparative Production Example 1

Firstly, 20 parts by weight of fenpyrazamine, 6 parts by weight of Reax 85A, 0.1 parts by weight of Antifoam C Emulsion, 5 parts by weight of propylene glycol and 55.57 parts by weight of ion-exchanged water were mixed. Then,

the resultant mixture was wet-ground by using DYNO-MILL KDL to obtain a suspension.

In addition, 0.2 parts by weight of Proxel GXL, 0.1 parts by weight of Kelzan S and 0.2 parts by weight of
5 Veegum Granules were added to 12.83 parts by weight of ion-exchanged water, and the resultant mixture was stirred for 2 hours to obtain a uniform dispersion.

The dispersion was mixed with the above suspension to obtain the comparative composition (1).

10 [0041]

Comparative Production Example 2

Firstly, 30 parts by weight of 2-[(2,5-dimethylphenoxy)methyl]- α (alpha)-methoxy-N-methyl-benzeneacetamide, 2 parts by weight of Soprophor FLK, 2
15 parts by weight of Step-Flow 1500, 0.2 parts by weight of Antifoam C Emulsion, 5 parts by weight of propylene glycol and 34.13 parts by weight of ion-exchanged water were mixed. Then, the resultant mixture was wet-ground by using DYNO-MILL KDL to obtain a suspension.

20 In addition, 0.2 parts by weight of Proxel GXL(S), 0.2 parts by weight of Kelzan S and 0.4 parts by weight of Veegum Granules were added to 25.87 parts by weight of ion-exchanged water, and the resultant mixture was stirred for 2 hours to obtain a uniform dispersion.

The dispersion was mixed with the above suspension to obtain the comparative composition (2).

[0042]

Comparative Production Example 3

5 Firstly, 30 parts by weight of 2-[(2,5-dimethylphenoxy)methyl]- α (alpha)-methoxy-N-methyl-benzeneacetamide, 4 parts by weight of Soprophor FLK, 0.2 parts by weight of CE Antifoam Emulsion, 5 parts by weight of propylene glycol and 34.13 parts by weight of ion-
10 exchanged water were mixed. Then, the resultant mixture was wet-ground by using DYNOMILL KDL to obtain a suspension.

In addition, 0.2 parts by weight of Proxel GXL(S), 0.2 parts by weight of Kelzan S and 0.4 parts by weight of
15 Veegum Granules were added to 25.87 parts by weight of ion-exchanged water, and the resultant mixture was stirred for 2 hours to obtain a uniform dispersion.

The dispersion was mixed with the above suspension to obtain the comparative composition (3).

20 [0043]

Comparative Production Example 4

Firstly, 25 parts by weight of 2-[(2,5-dimethylphenoxy)methyl]- α (alpha)-methoxy-N-methyl-benzeneacetamide, 2 parts by weight of Soprophor FLK, 2
25 parts by weight of Step-Flow 1500, 0.2 parts by weight of

Antifoam C Emulsion, 5 parts by weight of propylene glycol and 19.55 parts by weight of ion-exchanged water were mixed. Then, the resultant mixture was wet-ground by using DYNO-MILL KDL to obtain a suspension.

5 In addition, 0.2 parts by weight of Proxel GXL(S), 0.3 parts by weight of Kelzan S and 0.3 parts by weight of Veegum Granules were added to 39.2 parts by weight of ion-exchanged water, and the resultant mixture was stirred for 2 hours to obtain a uniform dispersion.

10 The dispersion was mixed with the above suspension. To the resultant mixture was added and uniformly dispersed 6.25 parts by weight of NALSTAR MR-174 to obtain the comparative composition (4).

[0044]

15 Test Examples will be described below.

Test Example 1

A soil was put in a plastic pot, and then seeds of rape (*Brassica napus*) were sown on the soil and grown in a glasshouse.

20 The present inventive compositions (3), (4) and (6) and the comparative composition (3) were diluted with water, respectively. Each water-diluted liquid was sprayed on the surface of the leaves of rape (application dosage of pesticidal active ingredient: 200 g/10000 m², and

application volume of water-diluted liquid: 250 L/10000 m²).
After that, the surface of the leaves was dried.

Then, artificial rainfall on the rape plants was
conducted by using an artificial raindrop generator
5 manufactured by Daiki (the total amount of rainfall was
60 mm). After that, the surface of the leaves was dried.
Then, a PDA medium containing the hyphae of fungus of
sclerotinia rot of rape plant (*Sclerotinia sclerotiorum*)
was inoculated on the surface of the leaves. Then, the
10 rape plants were placed at 18°C for 4 days under high
humidity condition, and the diameter of lesions on the
surface of the leaves was measured.

As a result, the diameters of lesions on the surface
of the leaves sprayed with the present inventive
15 compositions (3), (4) and (6) were 32%, 24% and 24% of
that on the surface of the leaves sprayed with the
comparative composition (3), respectively.

[0045]

Test Example 2

20 The present inventive composition (5) and the
comparative compositions (2) and (4) were diluted with
water, respectively. Each water-diluted liquid was
sprayed on the surface of the leaves of rape plants
(*Brassica napus*) grown in the outside (application dosage
25 of pesticidal active ingredient: 200 g/10000 m², and

application volume of water-diluted liquid: 250 L/10000 m²).
Seven (7) days after the application, the treated leaves
were cut and then a PDA medium containing the hyphae of
fungus of sclerotinia rot of rape plant (*Sclerotinia*
5 *sclerotiorum*) was inoculated on the surface of the leaves.
Then, the leaves were placed at 20-25°C for 3 days under
high humidity condition, and the diameter of lesions on
the surface of the leaves was measured.

As a result, the diameter of lesions on the surface
10 of the leaves sprayed with the present inventive
composition (5) was 50% of that on the surface of the
leaves sprayed with the comparative composition (2) or 44%
of that on the surface of the leaves sprayed with the
comparative composition (4).

15 [0046]

Test Example 3

A soil was put in a plastic pot, and then seeds of
rape (*Brassica napus*) were sown on the soil and grown in a
glasshouse.

20 The present inventive compositions (1) and (2) and
the comparative composition (1) were diluted with water,
respectively. Each water-diluted liquid was sprayed on
the surface of the leaves of rape (application dosage of
pesticidal active ingredient: 200 g/10000 m², and

application volume of water-diluted liquid: 250 L/10000 m²).

After that, the surface of the leaves was dried.

Then, artificial rainfall on the rape plants was conducted by using an artificial raindrop generator manufactured by Daiki (the total amount of rainfall was 30 mm). After that, the surface of the leaves was dried. Then, a PDA medium containing the hyphae of fungus of sclerotinia rot of rape plant (*Sclerotinia sclerotiorum*) was inoculated on the surface of the leaves. Then, the rape plants were placed at 18°C for 3 days under high humidity condition, and the diameter of lesions on the surface of the leaves was measured.

As a result, the diameters of lesion on the surface of the leaves sprayed with the present inventive compositions (1) and (2) were 9% and 7% of that on the surface of the leaves sprayed with the comparative composition (1), respectively.

CLAIMS

1. A pesticidal composition comprising a pesticidal active ingredient, a methyl methacrylate-butadiene copolymer containing carboxyl group, a surfactant and water, wherein the amount of the methyl methacrylate-butadiene copolymer containing carboxyl group is 20 - 100 parts by weight relative to 100 parts by weight of the pesticidal active ingredient and the amount of the surfactant is 0.1 - 50 parts by weight relative to 100 parts by weight of the pesticidal active ingredient.
2. The pesticidal composition according to claim 1, comprising 1 - 50% by weight of the pesticidal active ingredient; 0.2 - 50% by weight of the methyl methacrylate-butadiene copolymer containing carboxyl group; 0.1 - 10% by weight of the surfactant; and 20 - 80% by weight of water.
3. The pesticidal composition according to claim 2, comprising 5 - 20% by weight of the methyl methacrylate-butadiene copolymer containing carboxyl group.

4. The pesticidal composition according to claim 2 or 3, comprising 4 - 6% by weight of the surfactant.

5. The pesticidal composition according to any one of
5 claims 1 to 4, wherein the surfactant is at least one selected from the group consisting of polyoxyethylene tristyrylphenyl ether phosphate esters and ligninsulfonates.

10 6. The pesticidal composition according to any one of claims 1 to 5, comprising 15 - 25% by weight of the pesticidal active ingredient.

15 7. The pesticidal composition according to any one of claims 1 to 6, wherein the pesticidal active ingredient is at least one selected from the group consisting of fenpyrazamine and 2-[(2,5-dimethylphenoxy)methyl]- α (alpha)-methoxy-N-methyl-benzeneacetamide.

20 8. The pesticidal composition according to any one of claims 1 to 7, wherein the mean particle diameter of the methyl methacrylate-butadiene copolymer containing carboxyl group is 0.1 - 0.3 μ m; the gel content of the copolymer is not less than 80% by weight; and the glass-

transition temperature of the copolymer is not more than -10°C.

9. A method for applying the pesticidal composition as
5 defined in any one of claims 1 to 8, which comprises
diluting the pesticidal composition with water, and
applying the resultant water-diluted liquid to a plant by
foliage spraying.

10 10. A method for producing the pesticidal composition as
defined in any one of claims 1 to 8, which comprises
producing a dispersion comprising the pesticidal active
ingredient, the surfactant and water, adding the methyl
methacrylate-butadiene copolymer containing carboxyl group
15 to the dispersion, and uniformly dispersing the copolymer
in the mixture.

11. A method for producing the pesticidal composition as
defined in any one of claims 1 to 8, which comprises
20 producing a dispersion comprising the pesticidal active
ingredient, the surfactant and water, adding a latex
comprising the methyl methacrylate-butadiene copolymer
containing carboxyl group to the dispersion, and uniformly
dispersing the copolymer in the mixture.