

# 1. WO2009031621 - LIQUID AGROCHEMICAL COMPOSITION

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## Title

[EN] LIQUID AGROCHEMICAL COMPOSITION

[FR] COMPOSITION AGROCHIMIQUE LIQUIDE

[JA] 農薬液状組成物

## Abstract

[EN]

Disclosed is a liquid agrochemical composition which is reduced in skin irritation and pungent odor due to conventional aromatic solvents. A water diluted solution of this liquid agrochemical composition has good emulsion stability. Specifically disclosed is a liquid agrochemical composition containing an agrochemical active component, a surfactant, an ester solvent having a water solubility of not less than 2% by weight, and an ester solvent having a water solubility of less than 2% by weight [excluding methyl caprylate and methyl caprate]. This liquid agrochemical composition is reduced in skin irritation and pungent odor, and a water diluted solution thereof has good emulsion stability. This liquid agrochemical composition may contain 5-50% by weight of water for reducing inflammability.

[FR]

L'invention porte sur une composition agrochimique liquide qui présente une irritation de la peau et une odeur piquante réduites dues à des solvants aromatiques classiques. Une solution diluée dans l'eau de cette composition agrochimique liquide a une bonne stabilité d'émulsion. L'invention porte plus particulièrement sur une composition agrochimique liquide contenant un composant actif agrochimique, un agent tensio-actif, un solvant d'ester ayant une hydrosolubilité de plus de 2 % en poids, et un solvant à base d'ester ayant une hydrosolubilité inférieure à 2 % par poids [caprylate de méthyle et caprate de méthyle non inclus]. Cette composition agrochimique liquide présente une irritation de la peau et une odeur piquantes réduites, et une solution diluée dans l'eau de celle-ci a une bonne stabilité d'émulsion. Cette composition agrochimique liquide peut contenir de 5 à 50 % en poids d'eau pour réduire un caractère inflammable.

[JA]

【課題】 従来の芳香族溶剤による皮膚刺激性や刺激臭を軽減し、かつ水希釈液の乳化安定性が良好な農薬液状組成物を提供する。【解決手段】 農薬活性成分、界面活性剤、水溶解度が2重量%以上のエステル溶剤および水溶解度が2重量%未満のエステル溶剤（但し、カプリル酸メチルおよびカプリン酸メチルを除く。）を含有する、皮膚刺激性や刺激臭が軽減され、かつ水希釈液の乳化安定性が良好な農薬液状組成物。該農薬液状組成物は、引火性を低減するため、水を5～50重量%含有してもよい。

## Also published as

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## Specification

Title of invention Agricultural chemical liquid composition

## Technical field

0001

## Background technology

0002 0003

## Disclosure of invention

### Problems to be solved by the invention

0004

### Means to solve problems

0005 0006

### Effect of the invention

0007

## Best mode for carrying out the invention

0008 0009 0010 0011 0012 0013 0014 0015 0016 0017 0018 0019 0020 0021 0022 0023 0024 0025 0026  
0027 0028 0029 0030 0031 0032

## Example

0033 0034 0035 0036 0037 0038 0039 0040 0041 0042 0043 0044 0045 0046 0047 0048 0049 0050 0051  
0052 0053 0054 0055 0056 0057 0058 0059 0060 0061

## Industrial applicability

0062

## The scope of the claims

1. 2. 3. 4. 5. 6. 7. 8. 9. 10. 11. 12. 13. 14. 15

## Specification

Agricultural chemical liquid composition

## Technical field

[0001] It is characterized by containing a pesticide active ingredient, a surfactant, an ester solvent having a water solubility of 2% by weight or more, and an ester solvent having a water solubility of less than 2% by weight (excluding methyl caprylate and methyl caprate). The present invention relates to a pesticide liquid composition which reduces skin irritation and irritating odor caused by a conventional aromatic

## Background technology

- [0002] The pesticide liquid composition is often diluted with water and sprayed. If the emulsion stability of the aqueous diluent is poor, the pesticide active ingredient may precipitate in the diluent, causing phytotoxicity or a problem that a good biological effect cannot be obtained.
- Further, as a solvent for the pesticide liquid composition, xylene, methylnaphthalene and the like are generally used. Many of these aromatic solvents have skin irritation and irritating odors, which can be problematic.
- [0003] As a method for reducing skin irritation of a pesticide liquid composition, a method of blending a dibasic acid ester or the like as a solvent is known (see Patent Document 1). Further, as a method for reducing the eye irritation of the pesticide liquid composition, a method of blending an ester, a vegetable oil or the like as a solvent is known (see Patent Document 2). However, these documents do not describe the emulsion stability of the aqueous diluted solution of the pesticide liquid composition.
- Patent Document 1: Japanese Patent Application Laid-Open No. 2006-232709  
Patent Document 2: International Publication No. 96/091047 Pamphlet

## Disclosure of invention

### Problems to be solved by the invention

- [0004] The present invention solves the above problems, and an object of the present invention is to provide a pesticide liquid composition having good emulsion stability of a water-diluted solution while reducing skin irritation and irritating odor.

### Means to solve problems

- [0005] The present inventors use pesticide active ingredients, surfactants, ester solvents having a water solubility of 2% by weight or more, and ester solvents having a water solubility of less than 2% by weight (excluding methyl caprylate and methyl caprate). It has been found that the pesticide liquid composition contained therein is excellent in the emulsion stability of the aqueous diluted solution. Therefore, as a result of diligent research, the present inventors used one or more ester solvents having a water solubility of 2% by weight or more selected from dimethyl adipate, dimethyl glutarate, and dimethyl succinate, and had a water solubility of 2. It was found that the emulsion stability of the aqueous diluted solution was particularly excellent by using diisobutyl adipate as the ester solvent of less than 2% by weight.
- In addition, the present inventors have found that by adding water to the pesticide liquid composition, the composition is less likely to catch fire.
- [0006] That is, the present invention relates to the pesticide liquid composition according to the following [1] to [14] (hereinafter, referred to as the composition of the present invention).
- [1] Agricultural chemicals containing an active ingredient, a surfactant, an ester solvent having a water solubility of 2% by weight or more, and an ester solvent having a water solubility of less than 2% by weight (excluding methyl caprylate and methyl caprate). Liquid composition.
- [2] 0.1 to 50% by weight of the pesticide active ingredient, 0.5 to 20% by weight of the surfactant, 10 to 80% by weight of the ester solvent having a water solubility of 2% by weight or more, and 2% by weight of the water solubility. The pesticide liquid composition according to the above [1], which contains less than 10 to 50% by weight of an ester solvent (excluding methyl caprylate and methyl caprate).
- [3] The pesticide liquid composition according to any one of the above [1] to [2], wherein the ester solvent having a water solubility of 2% by weight or more is one or more selected from lactic acid ester and fatty acid ester.
- [4] The pesticide liquid composition according to any one of the above [1] to [2], wherein the ester solvent having a water solubility of 2% by weight or more is a fatty acid diester.
- [5] The item according to any one of the above [1] to [2], wherein the ester solvent having a water solubility of 2% by weight or more is at least one selected from dimethyl adipate, dimethyl glutarate and dimethyl succinate. Agricultural chemical liquid composition.
- [6] The item according to any one of the above [1] to [5], wherein the ester solvent having a water solubility of less than 2% by weight is at least one selected from a fatty acid ester, an aromatic carboxylic acid ester and a lactic acid ester. Pesticide liquid composition.
- [7] The pesticide liquid composition according to any one of the above [1] to [5], wherein the ester solvent having a water solubility of less than 2% by weight is a fatty acid diester.
- [8] Any of the above [1] to [5], wherein the ester solvent having a water solubility of less than 2% by weight is at least one selected from diisobutyl adipate, diisotridecyl phthalate, methyl oleate, and ethylhexyl lactate. The pesticide liquid composition according to item 1.
- [9] The pesticide liquid composition according to any one of the above [1] to [5], wherein the ester solvent having a water solubility of less than 2% by weight is diisobutyl adipate.
- [10] The pesticide liquid composition according to any one of the above [1] to [9], which further contains 5 to 50% by weight of water.
- [11] The pesticide liquid composition according to any one of the above [1] to [9], which further contains 15 to 30% by weight of water.
- [12] The pesticide liquid composition according to the above [10] to [11], which further contains one or more selected from polyhydric alcohols, lactams and lactones.
- [13] The pesticide liquid composition according to the above [10] to [11], which further contains one or more selected from glycol, glycerin, 5-membered ring lactam and 5-membered ring lactone.
- [14] The pesticide liquid composition according to the above [10] to [11], which further contains one or more selected from propylene glycol, ethylene glycol and N-methyl-2-pyrrolidone.
- [15] The pesticide liquid composition according to any one of the above [1] to [14], wherein the surfactant is one or more selected from polyoxyethylene styrylphenyl ether and alkylbenzene sulfonate.

### Effect of the invention

- [0007] The composition of the present invention has reduced skin irritation and irritating odor, and has good emulsion stability of the water-diluted solution. In addition, the composition of the present invention is excellent in storage stability at low temperatures.

### Best mode for carrying out the invention

dimethyl glutarate, and lactic acid esters such as ethyl lactate, methyl lactate and butyl lactate.

- [0009] The ester solvent having a water solubility of less than 2% by weight used in the present invention is not particularly limited as long as it is other than methyl caprylate and methyl caprate, but fatty acid ester, aromatic carboxylic acid ester or lactic acid ester is preferable. Examples thereof include fatty acid diesters such as diisobutyl adipate, fatty acid monoesters such as methyl oleate, aromatic dicarboxylic acid diesters such as diisotridecyl phthalate, and lactic acid esters such as ethylhexyl lactate.
- [0010] The contents of the ester solvent having a water solubility of 2% by weight or more and the ester solvent having a water solubility of less than 2% by weight in the composition of the present invention can be appropriately selected, but the water solubility is 2% by weight with respect to 100 parts by weight of the composition of the present invention. % Or more of the ester solvent is preferably in the range of 10.0 to 80.0 parts by weight, and the water solubility is preferably in the range of 10.0 to 50.0 parts by weight of the ester solvent of less than 2% by weight.  
The "water solubility" used in the present specification is a value at 25 ° C.
- [0011] The composition of the present invention can further contain 5 to 50% by weight of water. By containing 5 to 50% by weight of water, the composition of the present invention is less likely to catch fire and can be handled more safely. In particular, when the water content is 15% by weight or more, the composition of the present invention does not show a flash point and can be handled more safely. Further, when the water content in the composition of the present invention is 30% by weight or less, the storage stability of the composition of the present invention is good.
- [0012] The composition of the present invention containing the above water can further contain a polyhydric alcohol, lactam or lactone. By containing a polyhydric alcohol, lactam or lactone, the composition of the present invention becomes a clear and uniform microemulsion form, and the storage stability becomes very good. The total content of the polyhydric alcohol, lactam or lactone is usually 5 to 30% by weight, preferably 5 to 20% by weight, more preferably 10 to 15% by weight, based on the composition of the present invention.
- [0013] The polyhydric alcohol is preferably glycol or glycerin, and examples thereof include proylene glycol, ethylene glycol, diethylene glycol, triethylene glycol and glycerin. Examples of the lactam include  $\beta$ -propiolactam,  $\gamma$ -butyrolactam,  $\gamma$ -valerolactam, dimethylimidazolidinone, N-alkyl-2-pyrrolidone,  $\delta$ -valerolactam and  $\epsilon$ -caprolactam. Examples of the lactone include  $\beta$ -propiolactone,  $\gamma$ -butyrolactone,  $\gamma$ -valerolactone,  $\gamma$ -caprolactone,  $\gamma$ -caprolactone,  $\gamma$ -lauro lactone,  $\gamma$ -palmitolactone,  $\gamma$ -stearolactone, and  $\delta$ -valero. Examples thereof include lactone and  $\delta$ -caprolactone. Further, as the lactam and the lactone, a five-membered ring lactam or a lactone is preferable, and among them, N-alkylpyrrolidone, dimethylimidazolidino or  $\gamma$ -butyrolactone is more preferable. Examples of the N-alkylpyrrolidone include N-methyl-2-pyrrolidone, N-octyl-2-pyrrolidone and N-dodecyl-2-pyrrolidone, and N-methyl-2-pyrrolidone is particularly preferable.
- [0014] The pesticide active ingredient used in the present invention is not particularly limited, and the common names of the pesticide active ingredient used in the present invention are exemplified below.
- [0015] Herbicides: pyrazosulfuron ethyl, halo sulfuron methyl, bensulfuron methylmethyl, imazosulfuron, azimsulfuron, cinosulfuron, cyclosulfuron, ethoxysulfuron, pyraclonil, tefurylitron, tefurylitron, Pyrimisulfan, penoxsulfam, aminopyralid, bencazone, fluacetosulfuron, monosulfuron, monosulfuron-methyl, pinoxaden Carbazono sodium salt (propoxycarbazono-sodium), pyrasulfotole, pyroxasulfone, pyroxulam, tembotrione, thiencazone-methyl, topramezon, esprocarb (Esprocarb), benthicarb, molinate, dimepinate, pyributicarb, mefenacet, butachlor, pretilachlor, thienylchlor, bromobutide etobenzanid, dymron, cumyfluron, bentazone, bentazone salt, 2,4-D, 2,4-D salt, 2,4-DEster, MCP, MCP salt, MCP ester, MCPB, MCPB salt, MCPB ester, phenothiol (MCPA-thioethyl), chlomeprop, naproanilide, oxadiazon, pyrazolate (pyrazolate), Pyrazoxyfen, benzo fenap, oxadiargyl, dimethametryn, simetryn, piperophos, anilophos, butamifos, butamifos, bensulfide (dithiopyr), pyriminobac methyl, CNP, chlormethoxynil, cyhalofobutyl, bifenox, cafenstrolo, pentoxazone, indanofan, oxaziclonofone, fentrazamide, butenachlor, ACN, benzobicyclon, benzobicyclon). Dimethyltin, simazine, dichlobenil, diuron, chloroIPC (chlorpropham), atrazine, alachlor, isouron, chlorophthalim, cyanazine (Cyanazin), trifluralin, butamifos, propryzamide, prometryn, pendimethalin, metolachlor, metribuzin, linuron, fenacil), Propanil, MCPA, toxyloctanoate, asulam, quizalofop-ethyl, propaquizafop, quizalofop-terfuryl, sethoxydim, thifensulfuron-methyl), Fenoxaprop-ethyl, phenmedipham, fluzafop-butyl, bentazone, SAP (bensulfide), TGT (chlorthal-dimethyl), tetraclorothiophene, aminophosmethyl, ametryn, isoxaben, orbencarb, carbutilate, dithiopyr, siduron, thiazafuron, napropamide, Prodiamine, benefin, methyl dymron, 2,4-PA, MCPA, flazasulfuron, metsulfuron-methyl, imazaquin, imazapil (imazaquin) imazapyr, fluopropanate, tebuthiuron, bromacil, hexazinone, glyphosate-ammonium, glyphosate-isopropylammonium, glyphosate-iso-propylammonium-trimesium), glyphosate-sodium, glyphosate-potassium, bialaphos, glufosinate-ammonium, MCC.
- [0016] Fungicide: acibenzolar, ampropyfos, anilazine, azaconazole, azoxystrobin, benalaxyl, benodanil, benomyl, Benzamacyl, binapacryl, biphenyl, bitertanol, bethoxazine, Bordeaux mixture, blastocidin-S, bromoconazole, buflimide (Bupirimate), buthiobate, calcium polysulfide, castafol, captan, copper oxychloride (copper)Oxychloride), carpropamid, carbendazim, carboxin, chinomethionat, chlorbenzazole, chlorfenazol, chloroneb, chlorothalonil, chlorothalonil (Chlorozinolate), cufraneb, cymoxanil, cyproconazol, cyprodinil, cyproflum, debacarb, dichloroan, dichlorobutrazol, dichlorobutrazol Dichlorothiofluanid, dichloredine, dichloran, diethofencarb, diclosymet, difenoconazole, diflumetorin, diflumetorin, diflumetorin, dimethiormethyl, dimethirimol, dimethirimol Diniconazole-M, dinocap, diphenylamine, dipyrithione, ditalimfos, dithianol, dodemorph, dodine, drazoxolon, drazoxolon (Ed-fenfos), epoxyconazole (epoxiconazole), etaconazole (etaconazole), ethirimol (ethirimol), etridiazole (etr-diazole)), Famoxadone, fenarimol, febuconazole, fenfuram, fenpiclonil, fenpropimorph, fenpropimorph, fentin, fentin (fentin) ferbam, ferimzone, fluzazinam, fludioxonil, fluoroimide, fluquinonazole, flusilazole, flusulfamide, flutolanil, flutolanil (flutolanil) flutriafol, folpet, fosetyl-aluminium, fuberidazole, furaxyl, fenamidone, fenhexamid, guazatine, hexachlorobenzene, Hexaconazole, hymexazol, imazalil, imibenconazole, iminocladine, ipconazole, iprobenfos, iprobenfos, iprodione, isoprodione Iprevalicarb, kasugamycin, kresoxim-methyl, mancooper, mancozeb, maneb, mepanipyrim, mepronil, metalaxyl, metconazole, metiram, metaminostrobin, myclobutanil, nabam, nickel bis (dimethylidithiocarbamate) (nickel bis) (Dimethylidithiocarbamate)), nitrothal-isopropyl, nuarimol, oethilimone, ofurace, oxadixyl, oxycarboxin, oxoconazole fumarate, ofurzoate, penconazole, penicuron, pthalide, piperalin, polyoxins, probenazole, prochloraz, procymidone, propacal Salt (propamocarbhydrochloride, propiconazole, propineb, pyrazophos, pyrifenoxy, pyrimethanil, pyroquilon, quinoxifen, quintozene, sulfur), Spiroxamine, tebuconazole, teconazole, tetraconazole, thiazendazole, thifluzamide, thifluzamide-methyl, thiram, torquelophos-Methyl (tolclofos-methyl), tolyfluanid, triadimefon, triadimefon, triazimenol, triazoxide, tricyclazole, tridemorph, triflumizole, triflumizole, Trifluconazole, validamycin, vinclozolin, zineb, ziram, oxine-copper.
- [0017] Bactericidal agents: streptomycin, oxytetracycline, oxolinic acid.
- [0018] Nematodes: aldoxycarb, fosthiazate, fosthietan, oxamyl, fenamiphos.
- [0019] Acaricides: acrylonitrile compounds such as cyflumetofen, spiromesifen, spirodiclofen, pyridaben, amitraz, bromopropylate, chinamethionat, Chlorobenzilate, clofentazine, cyhexatine, dicofol, dienochlor, etoxazole, fenazaquin, fenbutatin oxide, fenproa Trin (fenpropathrin), fenproximate (fenproximate) halfenprox (halfenprox) hexythiazox (hexythiazox) milbepectin (milbepectin) propacite pyridifen

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