641761

AUSTRALIA

The Patents Act 1952

CONVENTION APPLICATION FOR A PATENT

WE, RHONE-POULENC AGROCHIMIE, of 14-20 rue Pierre Baizet, 69009, LYON, France, hereby apply for the grant of a Patent for an invention entitled: **HERBICIDAL SOLUTIONS BASED ON N-PHOSPHONOMETHYLGLYCINE.**

which is described in the accompanying complete specification.

This application is a Convention application and is based on the Application Numbered 90 06543 for a patent or similar protection made in France on 21st May 1990.

Our address for service is: **CALLINAN LAWRIE**, Patent and Trade Mark Attorneys, of 278 High Street, Kew, Victoria 3101, Australia.

D A T E D this 20th day of May 1991

RHONE-POULENC AGROCHIMIE

By its Patent Attorneys:

CALLINAN LAWRIE

Jeffrey A. Ryder

To: The Commissioner of Patents

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CALLINAN LAWRIE
PRIVATE BAG 7, KEW,
VICTORIA 3101, AUSTRALIA

COMMONWEALTH OF AUSTRALIA
Patents Act 1952

PATENT

Declaration in Support of an Application for a Patent

*Strike out for non-convention

In support of the *Convention** application made for a patent ~~patent of addition~~ for an invention entitled

HERBICIDAL SOLUTIONS BASED ON N-PHOSPHONOMETHYLGLYCINE

Insert full name and address of declarant

I, CHARLES BRACHOTTE
of 14-20 rue Pierre Baizet, 69009, LYON, France

do solemnly and sincerely declare as follows:

~~1. I am / We are the applicant(s) for the patent / patent of addition (or in the case of an application by a body corporate).~~

1. I am authorised by RHONE-POULENC AGROCHIMIE, the nominated person and the applicant for the ~~patent of addition~~ patent to make this declaration on its behalf.

Strike out Para. 2 for non-convention

2. The basic application(x) as defined by section 141 of the Act ~~are~~ is —

Filing Date	Country	Applicant(s)
21 May 1990	France	RHONE-POULENC AGROCHIMIE

Insert details for the/or EACH basic application

Strike out Para. 3 for non-convention

3. The basic application(x) referred to in this Declaration ~~were~~ was the first application(x) made in a Convention country in respect of the invention the subject of the application.

~~4. I am / We are the actual inventor(s) of the invention. (or, where a person other than the inventor is the applicant:).~~

Insert full name(s) and address(es) of inventor(s)

4. François DARCHY, of 19 rue du Brulet
69110 STE FOY LES LYON, FRANCE
of
Jean-Claude ZOBEL, of 19 rue Alberic Pont,
69005 LYON FRANCE

~~is~~ are the actual inventor(s) of the invention and the facts upon which the applicant is entitled to make the application are as follows: The applicant would, if a patent were to be granted upon an application made by the said actual inventors, be entitled to have the patent assigned to it; the applicant is the nominated person.

See over for instructions

DECLARED AT LYON, FRANCE

No Legalization
No Corporate Seal

this 6th day of May 1991

CHARLES BRACHOTTE

RHÔNE-POULENC
AGROCHIMIE
Siège Social
14/20, Rue Pierre Baizet
69009 LYON
FRANCE

Signature of Declarant

To: The Commissioner of Patents.

AU9177131

(12) PATENT ABRIDGMENT (11) Document No. AU-B-77131/91
(19) AUSTRALIAN PATENT OFFICE (10) Acceptance No. 641761

(54) Title
HERBICIDAL SOLUTIONS BASED ON N-PHOSPHONOMETHYLGLYCINE

International Patent Classification(s)
(51)[5] **A01N 025/30**

(21) Application No. : **77131/91** (22) Application Date : **20.05.91**

(30) Priority Data

(31) Number	(32) Date	(33) Country
90 06543	**21.05.90**	**FR FRANCE**

(43) Publication Date : **21.11.91**

(44) Publication Date of Accepted Application : **30.09.93**

(71) Applicant(s)
RHONE-POULENC AGROCHIMIE

(72) Inventor(s)
FRANCOIS DARCHY; JEAN-CLAUDE ZOBEL

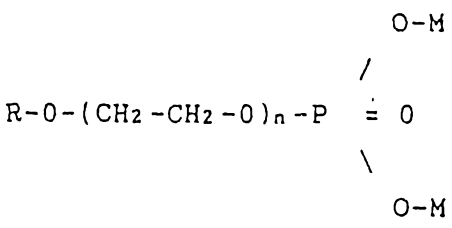
(74) Attorney or Agent
CALLINAN LAWRIE , Private Bag 7, KEW VIC 3101

(57) Claim

1. A liquid herbicidal composition, which consists of aqueous solutions containing:

a) N-phosphonomethylglycine and/or one of its derivatives, in the proportion of at least 40 g/l of glyphosate equivalent, and

b) a surfactant having activating character, of formula



in which

R represents an alkyl radical having 4 to 12 carbon atoms, preferably 4 to 10 carbon atoms,

n is an integer between 2 and 10, preferably from 3 to 6,

M represents a hydrogen atom or a sodium atom or an ammonium or alkylammonium group.

.../2

2. The composition according to claim 1, in which the weight ratio glyphosate equivalent

$$\frac{\text{glyphosate equivalent}}{\text{surfactant}}$$

is between 0.3 and 6.

12. The composition according to one of claims 1 to 11, which comprises from 5 to 40 % of herbicidal active substance, from 0.5 to 40 % of surfactant(s) having activating character, from 10 to 50 % of an ammonium salt (adjuvant), from 0.1 to 10 % of surfactant(s) having the character of a wetting agent, from 0 to 30 % of suitable additives.

AUSTRALIA

Form 10

PATENTS ACT 1952

COMPLETE SPECIFICATION 641761

(ORIGINAL)

FOR OFFICE USE

Short Title:

Int. Cl:

Application Number:
Lodged:

Complete Specification - Lodged:
Accepted:
Lapsed:
Published:

Priority:

Related Art:

TO BE COMPLETED BY APPLICANT

Name of Applicant: RHONE-POULENC AGROCHIMIE

Address of Applicant: 14-20 rue Pierre Baizet, 69009, LYON, France

Actual Inventors: François DARCHY
Jean-Claude ZOBEL

Address for Service: CALLINAN LAWRIE, Patent Attorneys, 278 High Street, Kew, Victoria 3101, Australia.

Complete Specification for the invention entitled: **HERBICIDAL SOLUTIONS BASED ON N-PHOSPHONOMETHYLGLYCINE.**

The following statement is a full description of this invention, including the best method of performing it known to me:-

HERBICIDAL SOLUTIONS BASED ON N-PHOSPHONOMETHYLGLYCINE

The present invention relates to new concentrated formulations based on N-phosphonomethylglycine or on compounds containing an N-phosphonomethylglycine group.

N-Phosphonomethylglycine (sometimes known as glyphosate), as well as analogous compounds, their herbicidal properties and formulations containing them, are described, in particular, in US Patent 3,799,758. Although many water-soluble or -insoluble glyphosate derivatives are known, it is very generally preferred, in fact, to use the water-soluble derivatives, and for this reason the salts of N-phosphonomethylglycine are the derivatives which have been generally developed or marketed, especially the isopropylammonium salt.

More recently, (European Patent Application No. 290,416), an effort has been made to develop concentrates based on N-phosphonomethylglycine salts, capable of containing N-phosphonomethylglycine in acid form but in any case containing this N-phosphonomethylglycine and/or its derivatives in soluble or solubilised forms, these concentrates being characterised by the presence of an alkoxylated amine of a particular type. This alkoxylated amine must have at most 12 alkoxy groups per molecule, and must have the character of a surfactant and must promote the herbicidal activity of the N-phosphonomethylglycine

derivatives. It can be used in smaller amounts than the known surfactants of the known formulations of N-phosphonomethylglycine, at least as regards the production of concentrates intended for outdoor application, in the form of dilute slurries, on the basis of 100 to 600 l/ha.

An object of the present invention is to provide compositions, or concentrated formulations (also referred to as concentrates), based on N-phosphonomethylglycine, and especially based on its water-soluble salts.

Another object of the present invention is to provide compositions based on N-phosphonomethylglycine which are more concentrated than the known compositions.

Another object of the present invention is to provide concentrated compositions based on N-phosphonomethylglycine which are in the form of solutions.

Another object of the present invention is to provide concentrates based on N-phosphonomethylglycine which are safer, as regards toxicity to fish, than the polycondensates of ethylene oxide with amines.

Another object of the invention is to provide concentrates based on N-phosphonomethylglycine salts employing surfactants which are compatible in concentrated solutions with certain inorganic salts, and especially with those having an activating role,

such as ammonium sulphate.

Another object of the invention is to provide concentrates based on N-phosphonomethylglycine (or its salts) comprising a high content of ammonium (NH_4^+) salt which has an activating role.

Another object of the present invention is to provide concentrated solutions based on N-phosphonomethylglycine which are in the form of ready-to-use compositions.

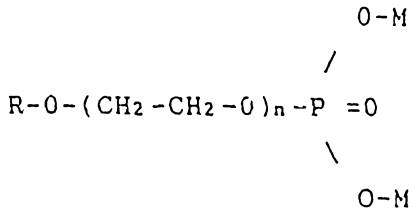
Another object of the present invention is to provide concentrated compositions based on N-phosphonomethylglycine which are especially suited to controlling annual and perennial weeds.

It has now been found that these objects could be achieved wholly or partially be means of the compositions according to the invention. In that which follows, except where specifically stated, the percentages are percentages by weight. Moreover, the term glyphosate equivalent is used to denote the corresponding amount of product if all the N-phosphonomethylglycine derivative were in the form of ordinary N-phosphonomethylglycine.

These compositions are liquid compositions consisting of aqueous solutions containing:

a) N-phosphonomethylglycine and/or one of its water-soluble derivatives, in the proportion of at least 40 g/l of glyphosate equivalent,

b) a surfactant of formula:



in which

R represents an alkyl radical having 4 to 12 carbon atoms, preferably 4 to 10 carbon atoms,

n is an integer between 2 and 10, preferably from 3 to 6

M represents a hydrogen atom or a sodium atom or an ammonium or alkylammonium group.

c) The weight ratio glyphosate equivalent

$$\frac{\text{glyphosate equivalent}}{\text{surfactant}}$$

is between 0.3 and 6, and preferably between 0.4 and 3.

d) The solvent is water.

Naturally, this single surfactant may be replaced by a mixture of surfactants in which, on average, R and n comply with the definitions given above.

Advantageously, the present invention relates to concentrated compositions such as are described above and comprising, in addition, one or more of the following features:

1) the N-phosphonomethylglycine is present in an amount not exceeding the solubility limit in the medium in question, preferably between 50 and 500 g/l

and still more preferably between 120 and 400 g/l.

2)The concentrated solution comprises an ammonium (NH_4^+) salt such as the nitrate, phosphate, sulphamate, thiocyanate or, preferably, sulphate, in the proportion of 50 to 400 g/l and preferably 100 to 300 g/l.

3) The concentrated compositions are intended for dilution by farmers in containers containing water so that these diluted slurries can be spread on the basis of 100 to 600 l/ha, the active substance, for its part, being applied on the basis of 0.125 to 4.5 kg/ha.

4) The pH of the aqueous solution is generally between 3 and 8, preferably between 5,5 and 7. Due to the acidity (or alcalinity) of other constituents, it might be advantageous to adapt the pH so that it is included in the indicated ranges. This is useful to avoid to have the N-phosphonomethylglycine precipitating. The presence of N-phosphonomethylglycine in the compositions of the invention is possible, but, due to the low solubility of N-phosphonomethylglycine in acid form, it might be difficult to get solutions with a high concentration as defined in the invention. The modification of the pH may be made by adding any kind of base, preferably isopropylamine.

The concentrated liquid compositions according to the invention are usually prepared by simply mixing the constituents.

Apart from the additives described above and used in relatively large amounts, the compositions according to the invention can contain all other kinds of components at lower doses, in particular surfactants having the character of a wetting agent, formulation agents, adhesives, antifoams, corrosion inhibitors, antifreezes.

By way of example, given without implied limitation, examples of solutions according to the invention, as well as examples of use of these solutions, are given below. In these examples, the active substance is N-phosphonomethylglycine in the form of the isopropylammonium salt.

EXAMPLE 1

N-phosphonomethylglycine in the form of the isopropylammonium salt		100 g/l
surfactant of formula $C_4H_9-O-(CH_2-CH_2-O)_3-P(=O)(OH)_2$		300 g/l
isopropylamine	q.s. to have pH between 6 and 7	
water	q.s.	1 litre

EXAMPLE 2

N-phosphonomethylglycine in the form of the isopropylammonium salt		100 g/l
ammonium sulphate		200 g/l
surfactant used in Example 1		200 g/l
isopropylamine	q.s. to have pH between 6 and 7	
water	q.s.	1 litre

EXAMPLE 3

N-phosphonomethylglycine in the form of the isopropylammonium salt		300 g/l
surfactant used in Example 1		250 g/l
isopropylamine	q.s. to have pH between 6 and 7	
water	q.s.	1 litre

EXAMPLE 4

N-phosphonomethylglycine in the form of the isopropylammonium salt		300 g/l
ammonium sulphate		125 g/l
surfactant used in Example 1		125 g/l
isopropylamine	q.s. to have pH between 6 and 7	
water	q.s.	1 litre.

Solutions identical to these compositions of examples 1 to 4 have been tested regarding the physicochemical stability in the two different following ways :

1) stability after staying one month at 50°C;

2) stability after staying one month with repetitive and cyclic variations of temperature (3 days at - 10°C, then 3 days at + 35°C). After both tests, no change has been observed neither in the chemical composition nor in the external and physical aspect.

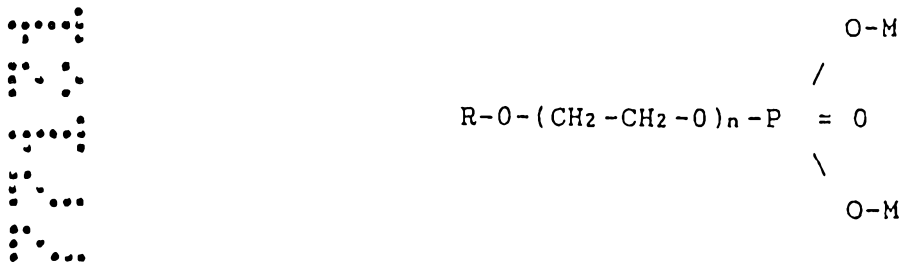
Other solutions identical to the compositions of these examples 1 to 4 are diluted in water in the proportion of 2.5 and 5 l in 300 l; the slurries thereby obtained are sprayed on various weed. The biological/herbicidal results obtained were of the same order of magnitude as those obtained with known compositions employing condensates of ethylene oxide with amines.

The claims defining the invention are as follows:

1. A liquid herbicidal composition, which consists of aqueous solutions containing:

a) N-phosphonomethylglycine and/or one of its derivatives, in the proportion of at least 40 g/l of glyphosate equivalent, and

b) a surfactant having activating character, of formula



in which

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n is an integer between 2 and 10, preferably from 3 to 6,

M represents a hydrogen atom or a sodium atom or an ammonium or alkylammonium group.

2. The composition according to claim 1, in which the weight ratio glyphosate equivalent

$$\frac{\text{glyphosate equivalent}}{\text{surfactant}}$$

is between 0.3 and 6.

3. The composition according to claims 1 and 2, in which the weight ratio is between 0.4 and 3.

4. The composition according to claim 1, in which the N-phosphonomethylglycine is in the form of the isopropylammonium salt.

5. The composition according to claims 1 to 4, in which the N-phosphonomethylglycine is present in an amount not exceeding the solubility limit in the medium in question, and is between 50 and 500 g/l.

6. The composition according to claims 1 to 4, in which the N-phosphonomethylglycine is present in an amount between 100 and 400 g/l.

7. The composition according to one of claims 1 to 6, ~~in which the concentrated solution~~ wherein the composition further comprises an ammonium salt such as the nitrate, phosphate, sulphamate, thiocyanate or, preferably, sulphate, in the proportion of 50 to 400 g/l.

8. The composition according to one of claims 1 to 7, ~~in which the concentrated solution~~ wherein the composition further comprises an ammonium salt in the proportion of 100 to 300 g/l.

9. The composition according to one of claims 1 to 8, which are intended for dilution in water so that these diluted slurries can be spread on the basis of 100 to 600 l/ha, the active substance, for its part, being applied on the basis of 0.125 to 4.5 kg/ha.

10. The composition according to one of claims 1 to 9, in which the solvent is water.

11. The composition according to one of claims 1 to 10, which comprises other surfactants having the character of a wetting agent and/or suitable additives such as antifoams, corrosion inhibitors, sequestering agents, stabilisers, penetrating agents,

adhesives.

12. The composition according to one of claims 1 to 11, which comprises from 5 to 40 % of herbicidal active substance, from 0.5 to 40 % of surfactant(s) having activating character, from 10 to 50 % of an ammonium salt (adjuvant) from 0.1 to 10 % of surfactant(s) having the character of a wetting agent, from 0 to 30 % of suitable additives.

13. The composition according to one of claims 1 to 12, which comprises from 10 to 30 % of herbicidal active substance, from 10 to 20 % of surfactant(s) having activating character, from 20 to 30 % of ammonium salt.

14. A process for controlling weeds, wherein a composition according to one of claims 1 to 13 is used.

15. The process according to claim 14, wherein the composition is diluted and applied on the basis of 100 to 600 l/ha, the active substance being applied on the basis of 0.125 to 4.5 kg/ha.

DATED this 20th day of May 1991

RHONE-POULENC AGROCHIMIE

By its Patent Attorneys

CALLINAN LAWRIE

Jeffrey A. Lawrie

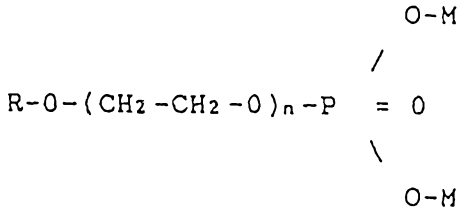
ABSTRACT

HERBICIDAL SOLUTIONS BASED ON N-PHOSPHONOMETHYLGLYCINE

Liquid herbicidal compositions consisting of aqueous solutions containing:

a) N-phosphonomethylglycine or one of its derivatives, in the proportion of at least 40 g/l of glyphosate equivalent, and

b) a surfactant having activating character, of formula



in which

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n is an integer between 2 and 10,

M represents a hydrogen atom or a sodium atom or an ammonium or alkylammonium group.