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PATENT SPECIFICATION

NO DRAWINGS

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Int. Cl.:—C 07 d 41/06 // A 01 n

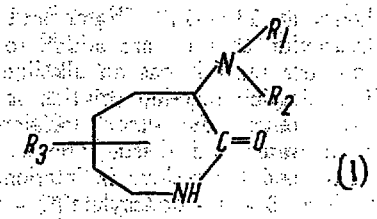
COMPLETE SPECIFICATION

New Amino Azacycloheptanones and process for their production

We, AGRIPAT S.A. a body corporate organised according to the laws of Switzerland, of 215, Schwarzwaldallee, Basle, Switzerland, (Assignee of KARL GAETZI), do hereby declare the invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—

The present invention concerns new amino azacycloheptanones and their salts, a process for the production thereof as well as fungicidal agents which contain these azacycloheptanones and/or their salts as active ingredients, also processes for combating phytopathogenic fungi using the new active ingredients and/or their salts or using agents which contain such substances as active ingredients, as well as processes for the production of these fungicidal agents.

It has been found that amino azacycloheptanones of the general formula I



(I)

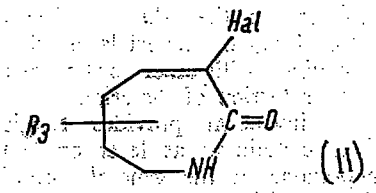
wherein R_1 represents an alkyl radical with from 4 to 16 carbon atoms, dialkylamino alkyl radical with at most 18 carbon atoms, an optionally halogenated phenyl radical, an aralkyl radical or the cyclohexyl radical,

R_2 represents hydrogen or an alkyl radical with from 1 to 4 carbon atoms, and

R_3 represents hydrogen or an alkyl radical with from 1 to 6 carbon atoms,

and their salts with inorganic and organic acids are suitable for the combating of fungi, particularly of phytopathogenic fungi, because of their excellent activity.

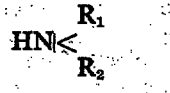
The new amino azacycloheptanones of general formula I are produced according to the invention by reacting a halogen azacycloheptanone of the general formula II



(II)

wherein R_3 has the meaning given in formula I and

Hal represents chlorine, bromine or iodine with an amine of the general formula III



(III)

wherein R_1 and R_2 have the meanings given in formula I, the reaction being performed in the presence of a proton acceptor.

This reaction is optionally performed in the presence of a solvent which is inert to the reaction partners such as an aliphatic or aromatic hydrocarbon, halogenated derivatives thereof, an ether, ketone or amide. Proton acceptors are, particularly, organic bases such as tertiary amines, e.g. pyridine, trialkylamines and dialkylanilines or inorganic bases such as alkali and alkaline earth hydroxides and oxides.

If desired, the amino azacycloheptanones

[*Price 4s. 6d.*]

of the general formula I produced by the process described above can be converted into their salts by reaction with organic or inorganic acids.

The new amino azacycloheptanones of general formula I are compounds which are stable in water and dissolve well in the common organic solvents.

The new active ingredients of general formula I are active against numerous phytopathogenic fungi. They are made up, optionally in the form of their salts, into fungicides which are suitable for the protection of plants and parts thereof such as blossom, seeds, fruit, roots, stalks and foliage, from attack by fungi. The new active substances are also systemic fungicides. Because of this property, plants treated with the active substances according to the invention are given an additional and more long lasting protection from attack by fungi. The new amino azacycloheptanones are not phytotoxic in the usual concentrations for use as 0.01 to 2% active ingredient.

The new fungicides of general formula I in the form of so-called seed dressings give seeds treated therewith a good protection, particularly from attack by *Tilletia tritici* and *Fusarium culmorum*. There is no inhibition of germination of the seeds treated.

In addition to the excellent fungicidal activity, the amino azacycloheptanones of the general formula I also have marked fungistatic properties so that they can be used for combating fungi on materials of all types alone or combined with other substances suitable for the protection of material.

Thus the invention provides fungicidal compositions containing at least one amino azacycloheptanone of the general formula I defined above and/or at least one salt thereof in admixture with suitable carriers and/or distributing agents. The compositions may be produced by mixing the amino azacycloheptanones or salts thereof with suitable carriers and/or distributing agents.

The invention also provides a process for combating fungi and for protecting organic materials and objects from attack by fungi which comprises contacting the fungi with amino azacycloheptanones of the general formula I, defined above, and/or their salts with inorganic and organic acids.

The following examples serve to illustrate the invention. Where not otherwise stated, "parts" are parts by weight; the temperatures are given in degrees Centigrade.

EXAMPLE 1

14.7 Parts of 3 - chloro - azacycloheptan - 2 - one and 20.2 parts of n - hexylamine are heated for 14 hours at 120°. 2N Sodium hydroxide solution is added to the reaction mixture while cooling until there is an alkaline reaction after which the mixture is extracted with ether several times. The combined ether extracts are washed with water. The ether is distilled off and the residue is distilled fractionally. The 3 - n - hexylamino - azacycloheptan - 2 - one boils at 128—132°/0.01 Torr. In the spore germination test given below, the new substance has a good fungicidal action and can be made up into fungicidal dusts, dressings and sprays by the prescriptions given after the test described.

EXAMPLE 2

19.2 Parts of 3 - bromo - azacycloheptan - 2 - one and 25.8 parts of n - octylamine are refluxed for 14 hours in 200 parts by volume of dioxan. The solvent is distilled off in vacuo and 150 parts by volume of 10% hydrochloric acid are added to the residue while stirring well. After standing for a short time at 0°, the hydrochloride of 3 - n - octylamino - azacycloheptan - 2 - one crystallises out. It is recrystallised from methanol/acetone (1:2) and melts at 241—243°. The hydrochloride is suspended in a little water and 2N sodium hydroxide solution is added until there is an alkaline reaction. The reaction mixture is extracted several times with ether, the combined ether extracts are washed with water and then dried. The solvent is distilled off and the residue is fractionated in vacuo. The 3 - n - octylamino - azacycloheptan - 2 - one boils at 130—132°/0.01 Torr. In the spore germination test described below it shows good fungicidal action and can be made up into fungicidal agents by the prescriptions given below.

EXAMPLE 3

14.8 Parts of 3 - chloro - azacycloheptan - 2 - one, 18.5 parts of n - dodecylamine and 14.6 parts of dimethyl aniline are heated for 14 hours at 130—140. Water and 2N sodium hydroxide solution are added to the reaction mixture until it has an alkaline reaction. The alkaline reaction solution is extracted with ether, the ether solution is washed with water and dried. The solvent is distilled off and the residue is fractionated in vacuo. The 3 - n - dodecylamino - azacycloheptan - 2 - one boils at 170—180°/0.01 Torr and then crystallises. After recrystallisation from acetone it melts at 54—56°. The fungicidal action of the substance can be seen from the spore germination test.

The compounds summarised in the following table can be produced in the way described in Examples 1—3 on using equivalent amounts of the corresponding starting materials:

Reaction product	Boiling point (B.P.) or melting point (M.P.) of the base	Melting point (M.P. of salt)
3-n-butylamino-azacyclo-heptan-2-one		HCl M.P. 243—236°
3-n-decylamino-azacyclo-heptan-2-one	M.P. 151—153°	
3-n-tetradecylamino-azacycloheptan-2-one	B.P. 180°/0.0001 Torr	HCl M.P. 250—253° (decomposition)
3-benzylamino-azacyclo-heptan-2-one	M.P. 76—77°	
3-(N-methyl-N-octylamio)-anza-cycloheptan-2-one	B.P. 140°/0.0001 Torr. M.P. 62—64°	
3-(N-methyl-N-dodecylamino)-aza-cycloheptan-2-one	M.P. 71—73°	
3-di-(n-butyl)-amino-aza-cycloheptan-2-one]	B.P. 147—150°/0.01 Torr.	
3-[β-(N'-methyl-N'-n-hexylamino)-ethyl-amino]-azacycloheptan-2-one	B.P. 175—180°/0.01 Torr	
3-phenylamino-azacycloheptan-2-one	M.P. 156—157°	
3-(p-chlorophenylamino)-azacycloheptan-2-one	M.P. 165—166°	
3-phenethylamino-aza-cycloheptan-2-one	M.P. 125—126°	
3-cyclohexylamino-aza-cycloheptan-2-one	M.P. 103—105°	
3-n-octlyamino-5-tert.butyl azacycloheptan-2-one	M.P. 83—85°	
3-n-dodecylamino-5-tert.butyl-azacycloheptan-2-one	M.P. 77—78°	

Spore Germination Test

The fungicidal activity of the active ingredients of the general formula I was determined by a spore germination test with spores of the following types of fungi:

Alternaria tenuis
Botrytis cinerea
Clasterosporium c.
Coniothyrium dipl.
Fusarium culmorum
Mucor spec.
Penicillium spec.
Stemphylium cons.

1 ccm of a 1%, and 0.1% acetone solution of the active ingredient is placed on 2 glass slides (26 × 76 mm) under the same conditions. The solvent is evaporated off and a uniform coating of active ingredient is obtained on the glass slides. The slides inoculated with fungi spores are then kept in dishes at room temperature in an atmosphere which is almost saturated with steam. After 2—3 and 4—6 days, the germinated spores are counted.

The concentrations of active ingredient are given in the following Table which inhibit at least 90% germination.

+ in the following Table shows an at least 90% inhibition of germination effected by the residue of 1 ccm of a 1% acetone solution of active ingredient,

+|+ shows the same effect attained by the residue of 1 ccm of a 0.1% actone solution of the active ingredient.

° shows that the residue of 1 ccm of a 1% acetone solution does not inhibit the germination.

active ingredient	*Alt. ten.*	*Bot. cin.*	*Clas. c.*	*Conio. dipl.*	*Fus. culm.*	*Muc. spec.*	*Penic. spec.*	*Stemph. cons.*
3-amino-azacycloheptan-2-one	0	0	0	0	0	0	0	0
3-(n-hexylamino)-azacycloheptan-2-one	+	+	+	+	+	+	+	+
3-(n-octylamino)-azacycloheptan-2-one	+	+	+	+	+	+	+	+
3-(n-decylamino)-azacycloheptan-2-one	+	+	+	+	+	+	0	0
3-(n-dodecylamino)-azacycloheptan-2-one	+	+	++	+	+	+	0	0

The fungicidal agents are produced by methods known per se by intimately mixing and milling the active substances of general formula I with suitable carriers optionally with the addition of adhesives, dispersing agents or solvents which are inert to the active substances. These agents can be used in the following forms:

Solid forms:

dusts, sprinkling agents, granulates, (coated granules, impregnated granules, homogeneous granules)

Water dispersible concentrates of active substances:

wettable powders, pastes, emulsions.

Liquid forms:

solutions and

Forms for the production of aerosols, fogs, and fumigants.

To produce the solid forms for use (dusts and sprinkling agents, granulates), the active substances are brought on to solid carriers such as talcum, kaolin, bole, loess, chalk, limestone, ground limestone, ataclay, dolomite, diatomaceous earth, precipitated silicic acid, alkaline earth silicates, sodium and potassium aluminium silicates (feldspar and mica), calcium and magnesium sulphates, milled plastics, fertilisers such as ammonium sulphate, ammonium phosphates, ammonium nitrates and urea, and also ground nutshells, cellulose powder, residues of plant extractions and active charcoal. These carriers can be used alone or admixed with each other.

The particle size of the carriers is, for dusts up to about 100 μ, for sprinkling agents from about 75 μ—0.2 mm and for granulates from 0.2 mm—1 mm (and coarser).

As a general rule, the concentration of active substances in the solid preparations is from 0.5—80% by weight.

To these mixtures can also be added additives which stabilise the active substances and/or commercially available non-ionic, anionic and cationic surface active substances which, for example, improve the adhesion of the active substances on parts of plants (glues, adhesives) and/or attain better wettability (wetting agents) and dispersibility of the active substances.

In some cases it is necessary to add to these forms for application, plant, animal and mineral oils as penetrating agents, i.e. agents which help and improve the penetration of the active substance into the plants or parts thereof.

The concentrates of active substance which can be dispersed in water: wettable powders, pastes and emulsion concentrates, are agents which can be diluted with water to any concentration desired for application to plants and parts thereof. They consist of active substance, carrier, additives which stabilise the active substance, surface active substances, protective colloids and anti-foam agents and, optionally, solvents. The concentration of active substances in these agents is 5—80% by weight.

Wettable powders and pastes are obtained by mixing and milling the active substances with surface active substances and pulverulent

carriers in suitable mixers and milling machines until homogeneity is attained. Carriers are, for example, those mentioned in the paragraph dealing with solid forms for application. In some cases it is advantageous to use mixtures of carriers. By surface active substances, glues or adhesives, wetting and dispersing agents and protective colloids are to be understood. Of the glues and adhesives already mentioned, because of their properties a number thereof can be used as so-called auxiliary dispersing agents. As dispersing agents and surfactants can be used commercially available surface active substances.

Examples of anti-foam agents are: silicones, and Anit-foam A.

The active substances are so mixed, milled, sieved and strained with the additives mentioned above that the solid particle size in wettable powders and in pastes is not more than 20—40 μ and 3 μ respectively. To produce emulsion concentrates and pastes, liquid dispersing agents, organic solvents and water are used. Examples of solvents are as follows: alcohols, benzene, toluene, xylenes, dimethyl sulphoxide, dimethyl formamide and mineral oil fractions boiling between 120 and 350°. The solvents must be almost without smell, not phytotoxic, inert to the active substances and not easily inflammable.

The forms for application which can be dispersed in water can also contain other additives to increase the stability to light, penetrating agents, anti-foam agents and also synergists.

The wettable powders, pastes and emulsion concentrates are diluted with water to the practical concentrations desired which are between 0.01 and 2% by weight, calculated on the active substance. In the composition and concentration for use described, these application forms have good suspendibility which can be further improved, e.g. by the addition of synthetic voluminous silicic acid. The emulsifiable property of the emulsion concentrate is also very good.

In addition, the agents according to the invention can be in the form of solutions or sprays. For this purpose an active substance of general formula I can be dissolved in suitable organic solvents, mixtures of solvents or in water. Higher aliphatic and aromatic hydrocarbons, chlorinated derivatives thereof, alkyl naphthalenes alone or mixed with each other or with water can be used as organic solvents. The solutions contain the active substance in a concentration from 1 to 20% by weight. They are used in the form of spray or mist with suitable spraying or mist blowing equipment.

Aerosols are produced from solutions of the active substances by the addition of propellants; aerosols are particularly suitable for use in the house and garden. Both the solutions and the aerosols can contain vegetable, animal and mineral oils to increase the adhesion and penetration and also additives to improve the resistance to rain and light.

Also, the active substances of general formula I can be worked up with a combustible substance, e.g. sawdust or paper and a source of oxygen such as potassium chlorate and potassium nitrate, to form a fumigant or fumigant paper.

The application forms described can be mixed very well with other biocidally active compounds or agents containing such compounds. Thus, to broaden the range of action, other fungicides, also insecticides, bactericides, fungistatics, bacteriostatics or nematocides can be present together with the active substances of general formula I. The active substances of general formula I can also be used with fertilisers and plant hormones.

The following examples describe the production of various ready-for-use forms of application containing the active substances of general formula I. Parts are given therein as parts by weight.

EXAMPLE 4

Dust

Components:

a) 10 parts of 3 - n - dodecylamino - azacycloheptan - 2 - one
5 parts of highly dispersed silicic acid
85 parts of talcum.

b) 2 parts of 3 - n - tetradecylamino - azacycloheptan - 2 - one hydrochloride
1 part of highly dispersed silicic acid
97 parts of talcum.

The active substances are intimately mixed and milled with the carriers. With components a) a 10% and with components b) a 2% dust is obtained which can be used for the treatment of seed beds of the dusting of plants.

EXAMPLE 5

Dressing

To produce a 10% pulverulent dressing, the following components are used:

a) 10 parts of 3 - n - butylamino - azacycloheptan - 2 - one hydrochloride
5 parts of kieselguhr
1 part of liquid paraffin
84 parts of talcum

To produce a 60% pulverulent dressing, the following components are used:

b) 60 parts of 3 - n - dodecylamino - azacycloheptan - 2 - one
15 parts of kieselguhr
1 part of liquid paraffin
24 parts of talcum.

The active ingredient is intimately mixed in a mixer, using the paraffin as distributing agent, with the carriers, and the whole is milled. The pulverulent dressings obtained serve for the treatment of seeds of all types.

EXAMPLE 6
Wettable powder

Components:

a) 50 parts of 3 - n - octylamino - azacycloheptan - 2 - one
15 parts of kieselguhr
2 parts of cetyl polyglycol ether
5 parts of tetramethyldecine - (5) - diol - (4,7) (Surfynol 104) (Surfynol is a registered Trade Mark)
1.5 parts of a condensation product of propylene oxide and ethylene oxide (Pluronic F 68) (Pluronic is a registered Trade Mark)
1.5 parts of a condensation product of propylene oxide and ethylene oxide (Pluronic L 61)
2 parts of silicone
23 parts of kaolin

b) 50 parts of 3 - (N - methyl - N - dodecylamino - azacycloheptan - 2 - one
10 parts of kieselguhr
5 parts of cetyl polyglycol ether
35 parts of kaolin.

The active ingredients are mixed with the carriers and distributing agents given and finely milled. 50% wettable powders are obtained the wettability and suspendability of which are excellent.

On diluting these wettable powders with water, suspensions are produced which are suitable for the treatment of fruit trees.

EXAMPLE 7
Granulate

Components:

a) 4 Parts of one of the 50% wettable powders given above under a) or b)
3.5 parts of Carbowax (Carbowax is a registered Trade Mark)
92 parts of ground limestone
0.5 parts of highly dispersed silicic acid

b) 2 parts of 3 - n - decylamino - azacycloheptan - 2 - one
2 parts of Carbowax
95.5 parts of ground limestone
0.5 parts of highly dispersed silicic acid

The ground limestone is evenly impregnated with the Carbowax. This is then mixed with the mixture consisting of active ingredient or the wettable powder and the highly dispersed silicic acid.

These granulates are excellently suitable for the disinfection of seed beds.

EXAMPLE 8
Pastes

Components:

50 Parts of 3 - β - phenylethylamino - azacycloheptan - 2 - one
14 parts of nonylphenol/ethylene oxide condensation product (having 8—10 ethylene groups per molecule)
3.5 parts of spindle oil
0.5 parts of soap powder and
32 parts of water

The active substance is intimately mixed and milled with the additives in a mixer. A 50% paste is obtained which before use as fungicide, can be diluted with water to any concentration desired.

EXAMPLE 9
Emulsion concentrate

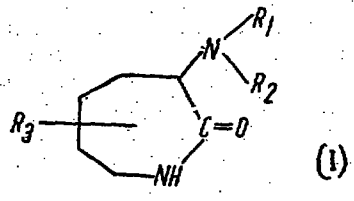
Components:

10 parts of 3 - n - dodecylamino - azacycloheptan - 2 - one
55 parts of xylene
32 parts of dimethyl formamide
3 parts of emulsifying mixture: alkylaryl polyethylene glycol/alkylaryl sulphonate/potassium salt.

The active substance is dissolved in the mixture of xylene and dimethyl formamide. This solution is then added to the emulsifying mixture. A 10% emulsifiable solution is obtained which can be diluted with water to form emulsions of any concentration desired.

WHAT WE CLAIM IS:—

1. Amino azacycloheptanones of the general formula I



(I)

wherein R_1 represents an alkyl radical with from 4 to 16 carbon atoms, dialkylamino alkyl radical with at most 18 carbon atoms, an optionally halogenated phenyl radical, an aralkyl radical or the cyclohexyl radical,

R_2 represents hydrogen or an alkyl radical with from 1 to 4 carbon atoms, and

R_3 represents hydrogen or an alkyl radical with from 1 to 6 carbon atoms,

The active ingredient is intimately mixed in a mixer, using the paraffin as distributing agent, with the carriers, and the whole is milled. The pulverulent dressings obtained serve for the treatment of seeds of all types.

EXAMPLE 6
Wettable powder

Components:

a) 50 parts of 3 - n - octylamino - azacycloheptan - 2 - one
15 parts of kieselguhr
2 parts of cetyl polyglycol ether
5 parts of tetramethyldecine - (5) - diol - (4,7) (Surfynol 104) (Surfynol is a registered Trade Mark)
1.5 parts of a condensation product of propylene oxide and ethylene oxide (Pluronic F 68) (Pluronic is a registered Trade Mark)
1.5 parts of a condensation product of propylene oxide and ethylene oxide (Pluronic L 61)
2 parts of silicone
23 parts of kaolin

b) 50 parts of 3 - (N - methyl - N - dodecylamino - azacycloheptan - 2 - one
10 parts of kieselguhr
5 parts of cetyl polyglycol ether
35 parts of kaolin.

The active ingredients are mixed with the carriers and distributing agents given and finely milled. 50% wettable powders are obtained the wettability and suspendability of which are excellent.

On diluting these wettable powders with water, suspensions are produced which are suitable for the treatment of fruit trees.

EXAMPLE 7
Granulate

Components:

a) 4 Parts of one of the 50% wettable powders given above under a) or b)
3.5 parts of Carbowax (Carbowax is a registered Trade Mark)
92 parts of ground limestone
0.5 parts of highly dispersed silicic acid

b) 2 parts of 3 - n - decylamino - azacycloheptan - 2 - one
2 parts of Carbowax
95.5 parts of ground limestone
0.5 parts of highly dispersed silicic acid

The ground limestone is evenly impregnated with the Carbowax. This is then mixed with the mixture consisting of active ingredient or the wettable powder and the highly dispersed silicic acid.

These granulates are excellently suitable for the disinfection of seed beds.

EXAMPLE 8
Pastes

Components:

50 Parts of 3 - β - phenylethylamino - azacycloheptan - 2 - one
14 parts of nonylphenol/ethylene oxide condensation product (having 8—10 ethylene groups per molecule)
3.5 parts of spindle oil
0.5 parts of soap powder and
32 parts of water

The active substance is intimately mixed and milled with the additives in a mixer. A 50% paste is obtained which before use as fungicide, can be diluted with water to any concentration desired.

EXAMPLE 9
Emulsion concentrate

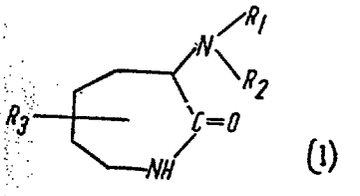
Components:

10 parts of 3 - n - dodecylamino - azacycloheptan - 2 - one
55 parts of xylene
32 parts of dimethyl formamide
3 parts of emulsifying mixture: alkylaryl polyethylene glycol/alkylaryl sulphonate/potassium salt.

The active substance is dissolved in the mixture of xylene and dimethyl formamide. This solution is then added to the emulsifying mixture. A 10% emulsifiable solution is obtained which can be diluted with water to form emulsions of any concentration desired.

WHAT WE CLAIM IS:—

1. Amino azacycloheptanones of the general formula I



(I)

wherein R_1 represents an alkyl radical with from 4 to 16 carbon atoms, dialkylamino alkyl radical with at most 18 carbon atoms, an optionally halogenated phenyl radical, an aralkyl radical or the cyclohexyl radical,

R_2 represents hydrogen or an alkyl radical with from 1 to 4 carbon atoms, and

R_3 represents hydrogen or an alkyl radical with from 1 to 6 carbon atoms,

and their salts with inorganic and organic acids.

2. The compound 3 - n - octylamino - azacycloheptan - 2 - one.

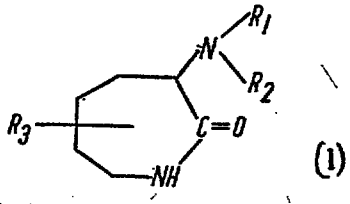
3. The compound 3 - laurylamino - azacycloheptan - 2 - one.

4. The compound 3 - n - tetradecylamino - azacycloheptan - 2 - one.

5. The compound 3 - n - octylamino - 5 - tert.butyl - azacycloheptan - 2 - one.

6. The compound 3 - laurylamino - 5 - tert.butyl - azacycloheptan - 2 - one.

7. Process for the production of amino azacycloheptanones of the general formula I



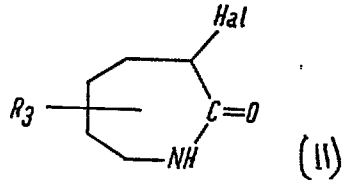
(I)

wherein R_1 represents an alkyl radical with from 4 to 16 carbon atoms, dialkylamino radical with at most 18 carbon atoms, an optionally halogenated phenyl radical, an aralkyl radical or the cyclohexyl radical.

R_2 represents hydrogen or an alkyl radical with from 1 to 4 carbon atoms, and

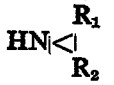
R_3 represents hydrogen or an alkyl radical with from 1 to 6 carbon atoms,

characterised by reacting a halogen azacycloheptanone of the general formula II:



(II)

wherein R_3 has the meaning given above and Hal is chlorine, bromine or iodine, with an amine of the general formula III



(III)

wherein R_1 and R_2 have the meanings given above, the reaction being performed in the presence of a proton acceptor, and if desired, converting the reaction product obtained into its salts by reaction with inorganic or organic acids.

8. A process according to claim 7 in which the reaction is carried out in a solvent which is inert to the reactants.

9. A process according to claim 8 wherein the solvent is an aliphatic or aromatic hydrocarbon, halogenated derivatives thereof, an ether, ketone or amide.

10. A process according to any of claims 7 to 9 wherein the proton acceptor is an inorganic or organic base.

11. A process according to any of claims 7 to 10 wherein the proton acceptor is an alkali metal or alkaline earth metal oxide or hydroxide, or a tertiary amine.

12. A process according to claim 11 wherein the tertiary amine is pyridine, a trialkylamine or a dialkylaniline.

13. Fungicidal composition characterised by a content of at least one amino azacycloheptanone of the general formula I defined in claim 1 and/or at least one salt of such derivatives in admixture with suitable carriers and/or distributing agents.

14. Process for the production of fungicidal compositions defined in claim 13, characterised by mixing amino azacycloheptanones of the general formula I defined in claim 1 or salts thereof with suitable carriers and/or distributing agents.

15. Process for the combating of fungi and for the protection of organic materials and objects from attack by fungi, which comprises contacting said fungi with amino azacycloheptanones of the general formula I defined in claim 1 and/or their salts with inorganic and organic acids.

16. A process as claimed in claim 7, substantially as hereinbefore described with reference to any one of Examples 1 to 3.

17. A composition as claimed in claim 13, substantially as hereinbefore described with reference to any one of Examples 4 to 9.

18. Compounds of the general formula I substantially as hereinbefore described with reference to any one of Examples 1 to 3.

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