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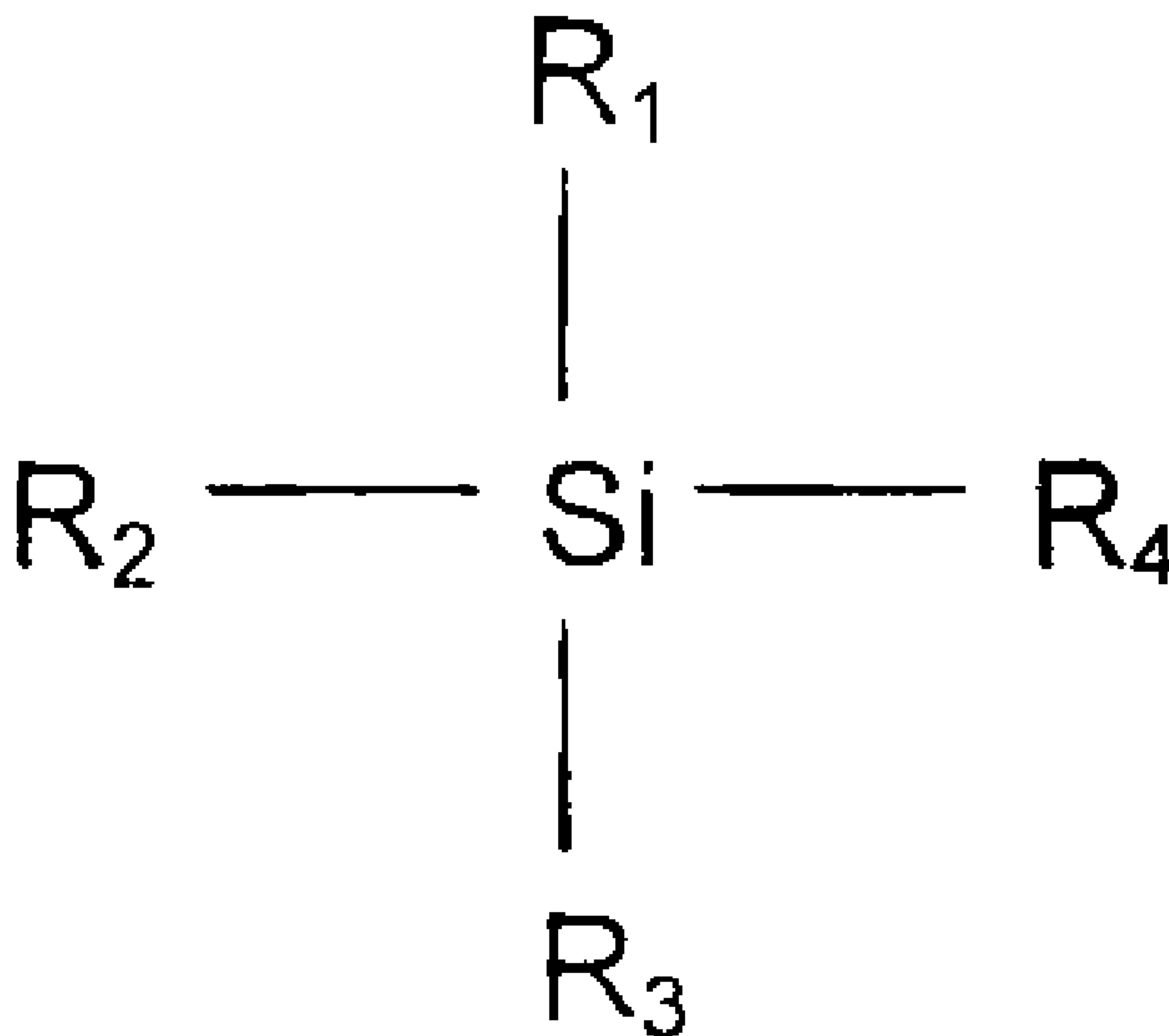
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(54) Titre : VERNIS A ONGLE BRILLANT ET RESISTANT AUX ERAFLURES AU MOYEN DE L'AJOUT DE SYSTEMES SOL-GEL

(54) Title: LUSTROUS AND SCRATCH-RESISTANT NAIL VARNISH THROUGH ADDITION OF SOL-GEL SYSTEMS



(57) Abrégé/Abstract:

The present invention relates to a nail varnish additive which has a) at least one reaction product a1) of at least of one silane of the general formula (see above formula) where the radicals R_1 , R_2 , R_3 , R_4 are identical or different having 1 to 40 carbon atoms and are non -crosslinking, and a2) of a silane of the general formula $Si(OR')_4$, where the radical R' has 1 to 40 carbon atoms and is a non-crosslinking alkoxy group, and b) at least one solvent, and c) water, and d) a catalyst, and to a process for producing the nail varnish additive according to the invention and its use in a nail varnish.

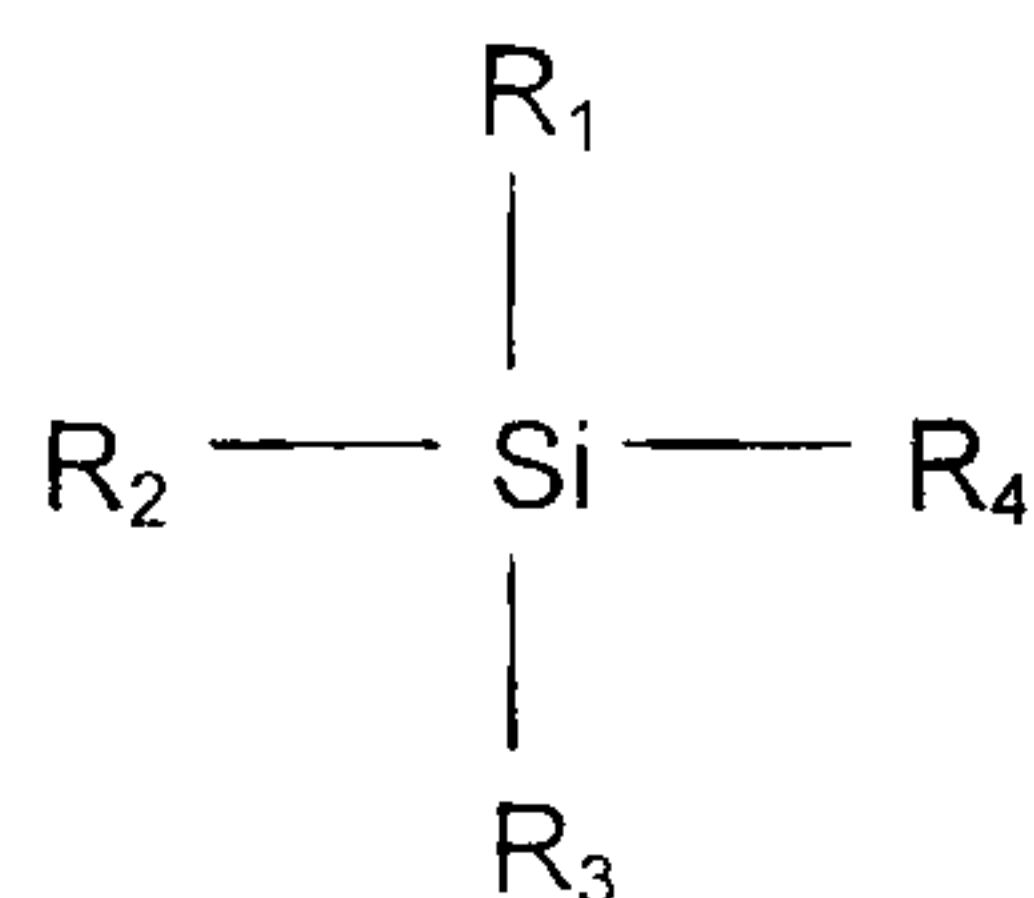
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Abstract:

The present invention relates to a nail varnish additive which has

- a) at least one reaction product
 - a1) of at least of one silane of the general formula



where the radicals R_1 , R_2 , R_3 , R_4 are identical or different having 1 to 40 carbon atoms and are non-crosslinking, and

- a2) of a silane of the general formula



where the radical R' has 1 to 40 carbon atoms and is a non-crosslinking alkoxy group, and

- b) at least one solvent, and
- c) water, and
- d) a catalyst,

and to a process for producing the nail varnish additive according to the invention and its use in a nail varnish.

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Lustrous and scratch-resistant nail varnish through addition of sol-gel systems

The present invention relates to the provision of an additive in the shape of sol-gel systems for improving the properties of nail varnishes, to a process for producing such sol-gel systems, and to their use in nail varnishes.

A modern nail varnish serves to maintain and convey a pleasing shape and colouration of fingernails and toenails. Additionally, the nail is protected against environmental influences and gains high hardness. Special efforts are undertaken to make applied nail varnishes long-lasting, scratch-resistant, splinterproof, in an attractive colour and pleasing lustre.

Current nail varnishes comprise a large number of ingredients. The most important representatives of these include the film formers, adhesion promoters, plasticizers, solvents and pigments. Fumed silicas are used for modifying the rheology and thixotropy. Despite this wide possibility of formulating very good varnishes, the shelf-life, hardness and scratch resistance are still unsatisfactory.

Even nowadays the primary film former used is still primarily nitrocellulose, which essentially ensures good hardness and toughness of the varnish surface. However, as is disclosed in DE 32 43 291 A1, further resins generally have to be added in order to reduce fracture and chipping.

US 4873077, GB 1177420 and DE 69111621 disclose various additives for improving the wear resistance, combating splitting of the nail, avoiding cracking, chipping and fracture in the form of synthetic, natural and mineral fibres.

In the specification DE 4334938 A1, alkyl-branched and polyglycol-ether-containing fatty acid esters are recommended for rapid drying with hard and more scratch-resistant films.

For improving the external appearance, the application DE 198 22 722 A1 discloses inorganic-organic hybrid polymers which can be added to a nail varnish formulation. These

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are organofunctional silanes which carry three condensable and hydrolysable functions on the silicon atom, and also have a crosslinkable organic radical in the molecule. 40 to 50°C are specified as particularly preferred drying temperatures. The drying time should be 2 to 20 min.

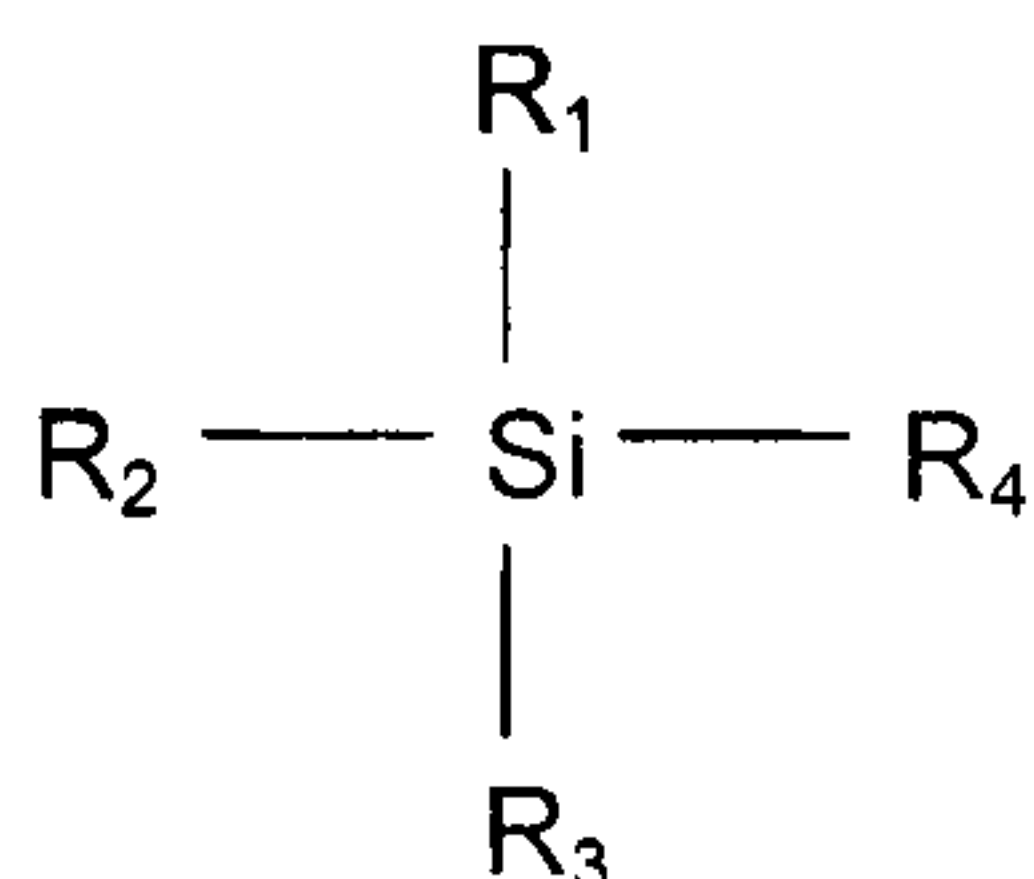
Copolymers of acrylates and methacrylates, disclosed in FR 7614430, and copolymers with polar functions, disclosed in DE 31 12 888 C2 are said to reduce brittleness of the dried nail varnish and improve its adhesion to the nail.

It is common to all these specifications that, to improve the properties of nail varnishes, a large number of substances is added to them which are admixed to the finished cosmetic product in an expensive process. In view of the sensitivity of the consumer towards side-effects, which has been increasing for a long time, it must also be observed that the customer will refrain completely from the use of nail varnishes if he has to reckon with allergy-triggering effects due to the admixed acrylate monomers in accordance with the prior art.

It was therefore an object of the present invention to provide an additive which can be admixed easily into the nail varnish and which overcomes the disadvantages of the prior art.

Surprisingly, it has been found that nail varnish is improved through the simple addition of a nail varnish additive which has

- a) at least one reaction product
 - a1) of at least of one silane of the general formula



where the radicals R₁, R₂, R₃, R₄ are identical or different having 1 to 40 carbon atoms and are non-crosslinking, and

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a2) of a silane of the general formula



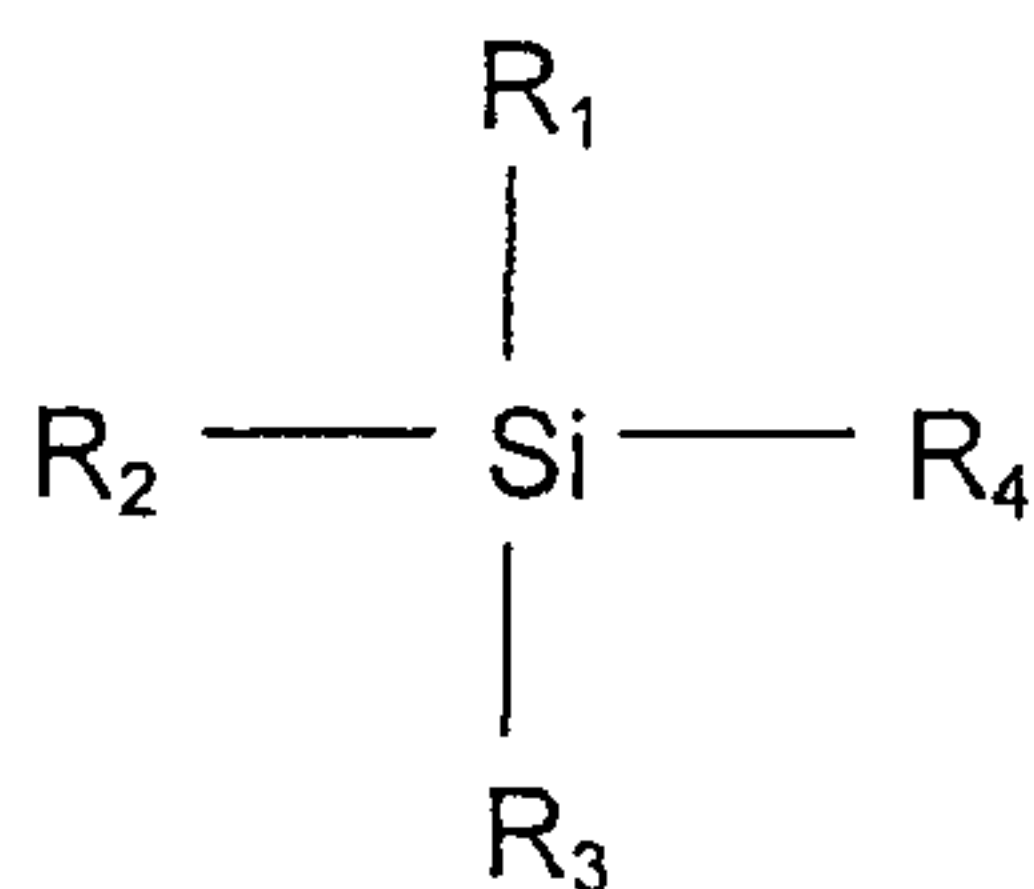
where the radical R' has 1 to 40 carbon atoms and is a non-crosslinking alkoxy group, and

- b) at least one solvent, and
- c) water, and
- d) a catalyst.

The present invention therefore provides a nail varnish additive which is characterized in that the nail varnish additive has

- a) at least one reaction product

a1) of at least of one silane of the general formula



where the radicals R₁, R₂, R₃, R₄ are identical or different having 1 to 40 carbon atoms and are non-crosslinking, and

a2) of a silane of the general formula



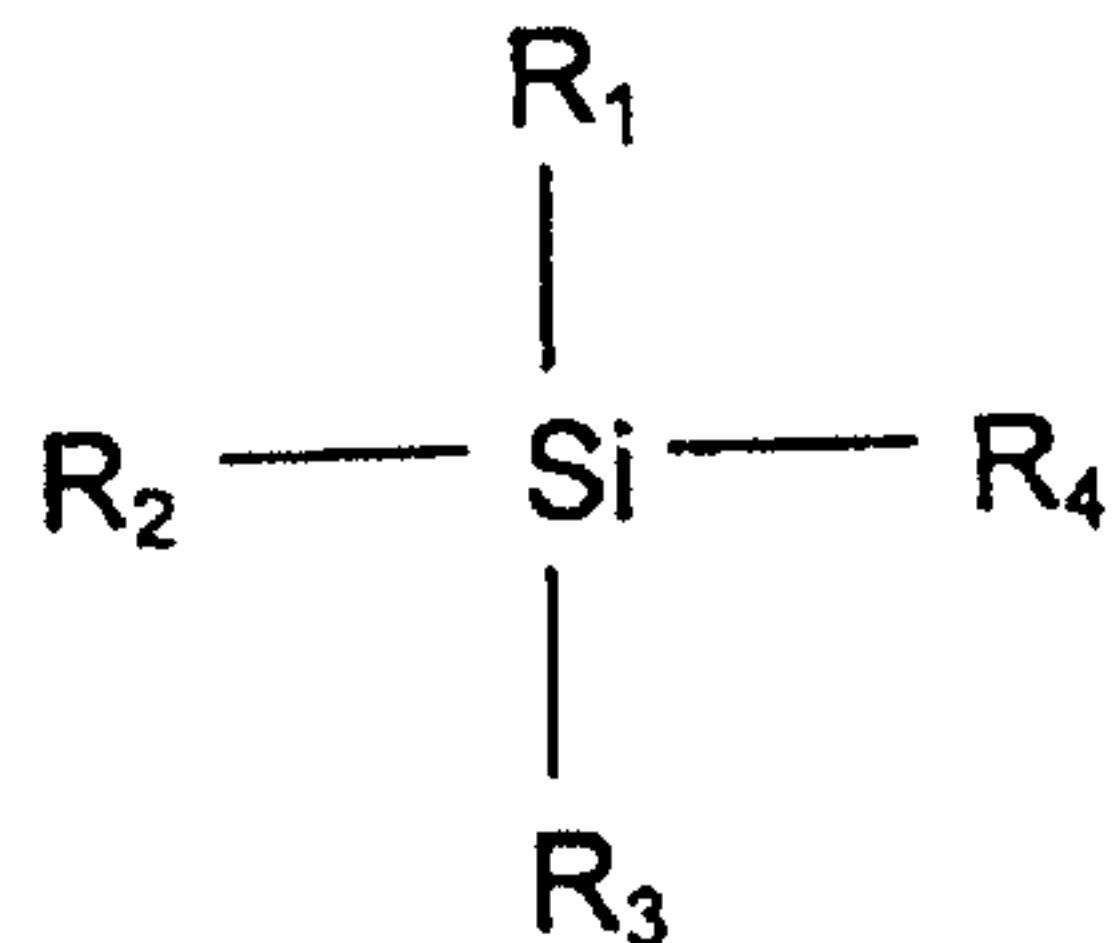
where the radical R' has 1 to 40 carbon atoms and is a non-crosslinking alkoxy group, and

- b) at least one solvent, and
- c) water, and
- d) a catalyst.

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In a particular aspect, the present invention relates to a nail varnish additive composition comprising

a) a1) 10 to 50% by weight of at least one silane of the general formula



5 wherein three of the radicals R_1 , R_2 , R_3 , R_4 are identical or different alkoxy groups having 1 to 40 carbon atoms and are non-crosslinking, and the fourth of the radicals R_1 , R_2 , R_3 , R_4 is an alkyl group having 1 to 40 carbon atoms, and

a2) 10 to 50% by weight of a silane of the general formula



10 wherein the radical OR' has 1 to 40 carbon atoms and is a non-crosslinking alkoxy group,

b) 10 to 50% by weight of at least one solvent,

c) 0.1 to 15% by weight of water,

d) 0.1 to 5% by weight of a catalyst, and

e) at least one reaction product arising from the combination of elements a1) - d).

15 The present invention likewise provides a process for producing a nail varnish additive which is characterized in that a composition is produced which contains component

a1) in an amount from 0 to 75% by weight, and

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- a2) in an amount from 0 to 75% by weight, and
- b) in an amount from 10 to 50% by weight, and
- c) in an amount from 0 to 15% by weight, and
- d) in an amount from 0 to 5% by weight,

the quantitative data being based in each case on the composition, and with the proviso that the sum of the parts by weight is 100%, or comprises these components.

The present invention likewise provides a nail varnish additive which is obtained by the process according to the invention.

The present invention has the advantage that the nail varnish admixed with the nail varnish additive according to the invention dries to give a highly lustrous and brilliant coating on the nail. The drying time of the nail varnish admixed with the nail varnish additive according to the invention is comparable with the drying time of the prior art nail varnishes. The nail varnish additive according to the invention has the advantage that, during hardening, the silanes following application to the nail surface react with the moisture available in the air with hydrolysis and condensation. For the user there is the further advantage that the nail varnish with the nail varnish additive according to the invention can be applied to the nails without its user being required to readapt, for example in the sense of longer waiting times or special application techniques out of the ordinary.

Besides rapid drying, adhesion to the nail and the ability to be removed from the nail surface is a critical product property. Comparative tests with nail varnish according to the prior art have surprisingly shown that the varnish provided with the nail varnish additive according to the invention adheres just as well as or better to the surface and nevertheless can be removed using conventional nail varnish remover just as easily and rapidly as dried nail varnish according to the prior art.

A particular advantage of the nail varnish additive according to the invention is to be regarded as the fact that the nail varnishes admixed therewith have higher hardness and better scratch resistance than nail varnish according to the prior art. Furthermore, besides the high hardness,

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a certain flexibility of the varnished nail surface is also important in order to allow movements of the nail with it and thereby to have the lowest possible tendency for chipping and fracture. Nail varnish admixed with nail varnish additive according to the invention has the advantage that the dried nail varnish, compared with the prior art, chips or fractures less, if at all.

The present invention therefore also provides the use of the nail varnish additive according to the invention in a nail varnish.

Furthermore, an advantage of the present invention is that the proportion of film-forming components such as nitrocellulose and/or polyacrylates, which can have an allergic sensitizing effect, in the nail varnish can be reduced as a result of adding the silane or the silanes. If the performance profile even of a conventional nail varnish is significantly improved as a result of adding the nail varnish additive according to the invention, one advantage of the present invention being that no undesired competing reactions of any kind with the components according to the prior art arise, it is a very particular advantage of the present invention that the proportion of these components with which hardness, lustre, flexibility and scratch resistance of the conventional nail varnish are usually achieved in the art can be reduced. Hardness, lustre, brilliance, flexibility and scratch resistance are achieved merely as a result of adding the nail varnish additive according to the invention in the nail varnish provided therewith and even improved compared with the features of conventional nail varnishes.

The present invention therefore likewise provides a nail varnish which contains or is the nail varnish additive according to the invention which hardens following application to the nail as a result of reaction with atmospheric moisture. The present invention therefore also further provides the use of the nail varnish according to the invention for cosmetics and/or nail care.

The nail varnish according to the invention has the advantage of better protecting the nail against impacts and environmental influences as result of the simultaneously improved flexibility and hardness. Fracture and chipping of the nails are likewise advantageously reduced.

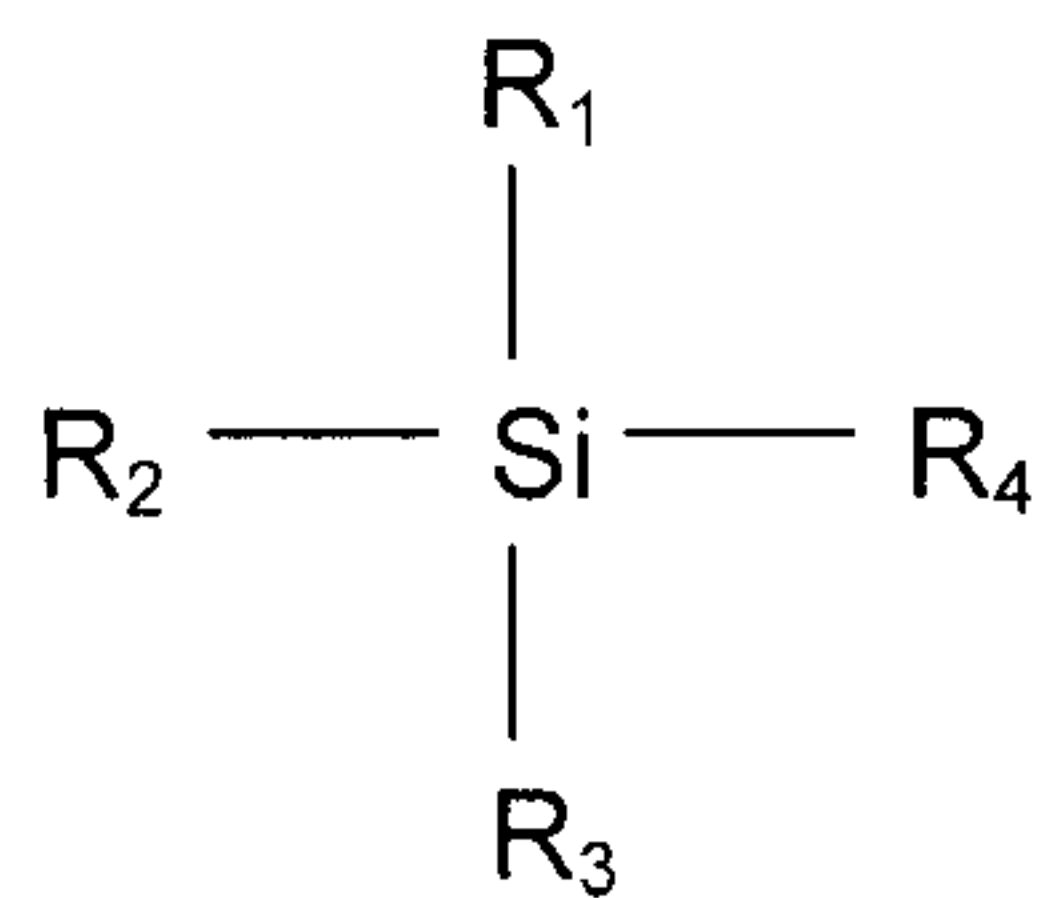
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The present invention is described below by reference to an example without any intention to restrict the invention, the protective scope of which arises from the claims and the description, thereto. The claims themselves also belong to the disclosure content of the present invention. Where the text below states ranges or preferred ranges, then all theoretically possible part ranges within these ranges should also belong to the disclosure content of the present invention without these having been explicitly specified for reasons of better clarity.

The present invention provides a nail varnish additive, characterized in that the nail varnish additive has

- a) at least one reaction product
 - a1) of at least of one silane of the general formula



where the radicals R_1 , R_2 , R_3 , R_4 are identical or different having 1 to 40 carbon atoms and are non-crosslinking, and

- a2) of a silane of the general formula



where the radical R' has 1 to 40 carbon atoms and is a non-crosslinking alkoxy group, and

- b) at least one solvent, and
- c) water, and
- d) a catalyst.

It may be advantageous if the radicals R_1 , R_2 , R_3 , R_4 of component a1) of the nail varnish additive according to the invention are selected from straight-chain, branched or alicyclic alkyl, fluoroalkyl, aryl, alkoxy groups, or a combination of these groups. Particular preference

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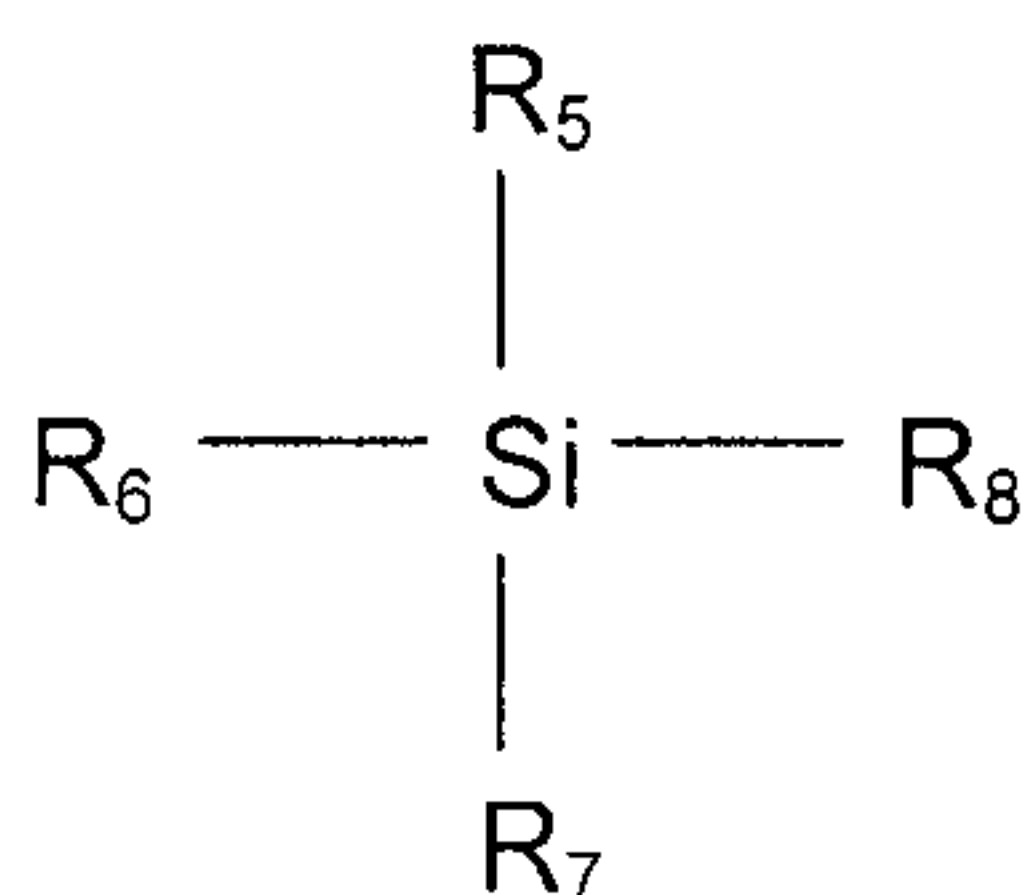
is given to selecting alkoxy groups. Preferably, the alkoxy groups of the nail varnish additive according to the invention can be selected from methoxy, ethoxy, propoxy, butoxy, particularly preferably selected from ethoxy, methoxy, propoxy, very particularly preferably ethoxy, methoxy, or a combination of these groups.

Furthermore, it may be advantageous if in component a2) the radical R' of the nail varnish additive according to the invention is selected from methoxy, ethoxy, propoxy, or butoxy, particularly preferably selected from ethoxy, methoxy, propoxy, very particularly preferably ethoxy, methoxy, or a combination of these groups.

Preferably, component b) of the nail varnish additive according to the invention can be selected from the series of alcohols of the general formula $C_nH_{2n+1}OH$, where $n = 1$ to 4, particularly preferably $n = 2$ or 3, from the series of polyhydric alcohols, from ketones, acetates, glycol ethers, toluene, xylene, or from a mixture of these solvents. This component can particularly preferably be selected from glycols, acetone, methyl ethyl ketone, ethyl acetate, butyl acetate, ethylene glycol monomethyl ether, or a mixture of these solvents.

Preferably, component d) of the nail varnish additive according to the invention can be selected from hydrochloric acid, nitric acid, phosphoric acid, sulphuric acid, formic acid, propionic acid, acetic acid, citric acid, or a mixture of these acids. This component can particularly preferably be selected from hydrochloric acid, nitric acid, or phosphoric acid, very particularly preferably from phosphoric acid, nitric acid, or a mixture of these acids.

It may be advantageous if the nail varnish additive according to the invention has at least one reaction product a3) at least of a further silane of the general formula



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where the radicals R_5 , R_6 , R_7 , R_8 are identical or different having 1 to 40 carbon atoms, straight-chain, branched or alicyclic fluoroalkyl, alkylurethano fluoroalkyl groups, and are noncrosslinking. Preferably, the radicals R_5 , R_6 , R_7 , R_8 of component a3) can be selected from a combination of these groups. Component a3) can particularly preferably be selected from Dynasilan F8261, available from Degussa GmbH, Paul-Baumann-Strasse 1, 45764 Marl.

The present invention likewise provides a process for producing a nail varnish additive, characterized in that a composition is produced which contains component

- a1) in an amount from 0.1 to 75% by weight, and
- a2) in an amount from 0.1 to 75% by weight, and
- b) in an amount from 10 to 50% by weight, and
- c) in an amount from 0.1 to 15% by weight, and
- d) in an amount from 0.1 to 5% by weight,

the quantitative data being based in each case on the composition, and with the proviso that the sum of the parts by weight is 100%, or comprises these components.

Preferably, in the process according to the invention, component a1) can be used in an amount from 0.15 to 74.9% by weight, preferably from 0.5 to 60% by weight, more preferably from 1 to 50% by weight, further preferably from 5 to 50% by weight, particularly preferably from 10 to 40% by weight, very particularly preferably from 20 to 30% by weight, and a2) can preferably be used in an amount from 0.15 to 74.9% by weight, preferably from 0.5 to 60% by weight, more preferably from 1 to 50% by weight, further preferably from 5 to 50% by weight, particularly preferably from 10 to 40% by weight, very particularly preferably from 20 to 30% by weight, and b) can preferably be used in an amount from 12 to 48% by weight, particularly preferably from 15 to 40% by weight, very particularly preferably from 18 to 35% by weight, and c) can preferably be used in an amount from 0.15 to 11.9% by weight, preferably from 0.2 to 12% by weight, more preferably from 0.5 to 10% by weight, particularly preferably from 1 to 8% by weight, very particularly preferably from 2 to 5% by weight, and d) can preferably be used in an amount from 0.15 to 4.9% by weight, preferably from 0.2 to 4.5% by weight, more preferably from 0.5 to 4% by weight, particularly preferably from 1 to 3% by weight, very particularly preferably from 1.5 to 2% by weight, the

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quantitative data being based in each case on the composition, and with the proviso that the sum of the weight fractions is 100%.

In the process according to the invention, a dilute or concentrated acid, preferably from 0.5 to 10% strength, particularly preferably from 1 to 7% strength, very particularly preferably from 1.5 to 5% strength acid can preferably be used as component d).

It may be advantageous if, in the process according to the invention, components a1), a2), b), c) and d) are mixed by stirring. Preferably, in the process according to the invention, a silane, particularly preferably component a1), can be initially introduced, and then components b), c), d), finally a2), further preferably firstly component a2), then b), c), d) and finally a1), are added. Preferably, each component can be initially introduced and the other components be added in any desired order, very particularly preferably b) is initially introduced, then c), a1), a2) and d) are added.

In the process according to the invention, it may furthermore be advantageous if a composition is produced which contains the further component a3) in an amount from 0 to 2% by weight, preferably in an amount from 0.1 to 1.9% by weight, particularly preferably in an amount from 0.2 to 1.5% by weight, very particularly preferably in an amount from 0.5 to 1.5% by weight, the quantitative data being based in each case on the composition, and with the proviso that the sum of the weight fractions of components a1), a2), a3), b), c), and d) is 100%.

In the process according to the invention, the components can be particularly preferably mixed together by stirring in a propeller stirrer, oblique-blade stirrer, disc stirrer, impeller stirrer, cross-blade stirrer, anchor stirrer, blade stirrer, gate stirrer, helical stirrer, toothed-disc stirrer, turbine stirrer, half-moon stirrer, or fan stirrer. It may be advantageous if, in the process according to the invention, stirring techniques are used which introduce little or no ambient gas into the composition and/or in which little heat energy is introduced into the composition. In the process according to the invention, propeller stirrers, oblique-blade stirrers, disc stirrers, impeller stirrers, cross-blade stirrers, anchor stirrers, blade stirrers, gate

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stirrers, helical stirrers, or toothed-disc stirrers can be used very particularly preferably, furthermore propeller stirrers, disc stirrers or impeller stirrers can be used very particularly preferably.

Preferably, in the process according to the invention, components a1), b), c), d) and a2), particularly preferably components a1), a2), b), c), d) and a3) with low shear rates can be mixed together over a period of from 1 to 120 min, preferably from 15 to 100 min, particularly preferably from 30 to 90 min, very particularly preferably from 45 to 75 min, extraordinarily particularly preferably from 55 to 65 min. It may be advantageous if, in the process according to the invention, the components of the composition are mixed together for a sufficiently long period for the amount of component c) to drop to a fraction from 0.01 to 10% by weight, preferably to a fraction from 0.05 to 8% by weight, particularly preferably to a fraction from 0.1 to 5% by weight, further particularly preferably from 0.2 to 3% by weight, very particularly preferably from 0.3 to 2% by weight, extraordinarily particularly preferably from 0.5 to 1.9% by weight.

Preferably, in the process according to the invention, the components of the nail varnish additive according to the invention can be mixed at a temperature from 1 to 30°C, particularly preferably from 5 to 28°C, further particularly preferably from 10 to 25°C, very particularly preferably from 18 to 21.5°C, extraordinarily preferably at room temperature by stirring.

The present invention likewise provides the use of the nail varnish additive according to the invention in a nail varnish.

It may be advantageous if the nail varnish additive according to the invention is used in a concentration from 1 to 13% by weight, preferably from 1.5 to 12% by weight, particularly preferably from 2 to 11% by weight, very particularly preferably from 2.5 to 10% by weight, in the nail varnish. For the purposes of the present invention, the weight data are based on the weight of the nail varnish ready for the user and prepared for application to the nails. In one advantageous embodiment of the use according to the invention, the nail varnish additive according to the invention can be incorporated into this nail varnish by stirring or shaking

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with the nail varnish, which may be a conventional nail varnish or a nail varnish without film-forming components. The use according to the invention has the advantage that the dried nail varnish applied to the nail simultaneously has lustre, brilliance, hardness, wear resistance and flexibility. If preferably as component a1) and/or a2) Dynasylan A, Dynasylan TEOS, Dynasylan MTES, trimethylethoxysilane, phenylethyltriethoxysilane, and/or for component a3) Dynasylan F8261, all of these silanes available from Degussa GmbH, Paul-Baumann-Strasse 1, 45764 Marl, or a mixture of these silanes is used, the use according to the invention furthermore has the advantage that the resulting nail varnish retains the cosmetically intended shade, compared with the shade of conventional nail varnish, meaning that reformulation with regard to the colour design is not necessary.

The nail varnish additive according to the invention is illustrated in more detail below by reference to a number of examples, without intending to restrict the invention to these embodiments.

Example 1: Preparation of a nail varnish additive

10% by weight of Dynasylan TEOS, 50% by weight of Dynasylan MTES, 12% by weight of nitric acid in a concentration of 1%, 12% by weight of 2-propanol and 16% by weight of butyl acetate were mixed together with stirring at room temperature with low shear rates over a period of 60 min. After this time, the water content was reduced to 1.95% by weight.

10% by weight of the nail varnish additive obtained in this way were then added to 90% by weight of standard commercial nail varnish. The nail varnish additive was mixed thoroughly with the nail varnish by stirring at room temperature until a homogeneous distribution was achieved.

Drying of the nail varnish was accompanied by crosslinking and condensation of the silanes following application of the nail varnish to the nail surface as a result of the reaction with atmospheric moisture.

Example 2:

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As Example 1, but using 50% by weight of Dynasylan TEOS, 15% by weight of Dynasylan MTES, 1% by weight of Dynasylan F8261, 12% by weight of phosphoric acid in a concentration of 1%, and 22% by weight of 2-propanol as nail varnish additive.

Example 3:

As Example 2, but mixing 5% by weight of nail varnish additive with 95% by weight of standard commercial nail varnish.

Example 4:

As Example 2, but mixing 2.5% by weight of nail varnish additive with 97.5% by weight of standard commercial nail varnish.

Example 5:

As Example 1, but mixing the nail varnish additive with a nonconventional nail varnish. The nonconventional nail varnish had the composition according to Table 1.

16 g	Nitrocellulose (Wolff Cellulosics GmbH & Co. KG)
10 g	Arylsulphonamide
6 g	Acetyl tributylcitrate, camphor
1.5 g	Stearalkonium bentonite
1.5 g	Pigments
65 g	Butyl acetate

Table 1.**Example 6:**

As Example 1, but mixing the nail varnish additive with a nonconventional nail varnish. The nonconventional nail varnish had the composition according to Table 2.

16.5 g	Nitrocellulose (Wolff Cellulosics GmbH & Co. KG)
10.3 g	Arylsulphonamide
6.2 g	Acetyl tributylcitrate, camphor
67 g	Butyl acetate

Table 2.

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Example 7:

As Example 1, but mixing the nail varnish additive with a nonconventional nail varnish. The nonconventional nail varnish had the composition according to Table 3.

10 g	Nitrocellulose (Wolff Cellulosics GmbH & Co. KG)
6 g	Styrene/acrylate copolymer
10 g	Sol-gel mixture from Example 1
6 g	Acetyl tributylcitrate, camphor
1.5 g	Stearalkonium bentonite
1.5 g	Pigments
40 g	Butyl acetate
25 g	Ethyl acetate

Table 3.**Example 8:**

As Example 1, but mixing the nail varnish additive with a nonconventional nail varnish. The nonconventional nail varnish had the composition according to Table 4.

15 g	Nitrocellulose (Wolff Cellulosics GmbH & Co. KG)
10 g	Styrene/acrylate copolymer
10.3 g	Sol-gel mixture from Example 2
6.2 g	Acetyl tributylcitrate, camphor
27 g	Butyl acetate
31.5 g	Ethyl acetate

Table 4.

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Example 9:

As Example 1, but mixing the nail varnish additive with a nonconventional nail varnish. The nonconventional nail varnish had the composition according to Table 5.

16 g	Nitrocellulose (Wolff Cellulosics GmbH & Co. KG)
3 g	Sol-gel mixture from Example 1
6 g	Acetyl tributylcitrate, camphor
1.5 g	Stearalkonium bentonite
1.5 g	Pigments
40 g	Butyl acetate
32 g	Ethyl acetate

Table 5.**Example 10:**

As Example 1, but mixing the nail varnish additive with a nonconventional nail varnish. The nonconventional nail varnish had the composition according to Table 6.

16.5 g	Nitrocellulose (Wolff Cellulosics GmbH & Co. KG)
3.0 g	Sol-gel mixture from Example 2
6.2 g	Acetyl tributylcitrate, camphor
40 g	Butyl acetate
34.3 g	Ethyl acetate

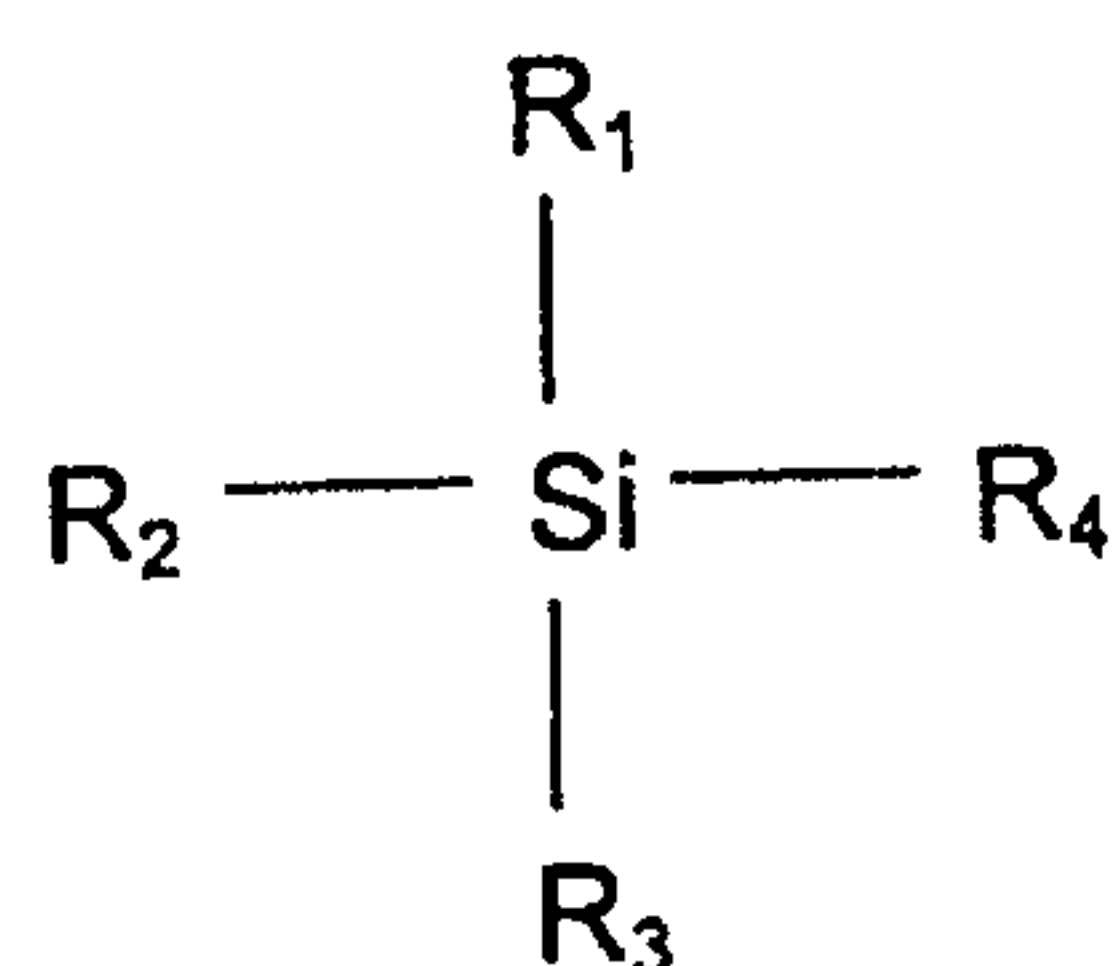
Table 6.

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CLAIMS:

1. A nail varnish additive composition comprising

a) a1) 10 to 50% by weight of at least one silane of the general formula



5 wherein three of the radicals R_1 , R_2 , R_3 , R_4 are identical or different alkoxy groups having 1 to 40 carbon atoms and are non-crosslinking, and the fourth of the radicals R_1 , R_2 , R_3 , R_4 is an alkyl group having 1 to 40 carbon atoms, and

a2) 10 to 50% by weight of a silane of the general formula



10 wherein the radical OR' has 1 to 40 carbon atoms and is a non-crosslinking alkoxy group,

b) 10 to 50% by weight of at least one solvent,

c) 0.1 to 15% by weight of water,

d) 0.1 to 5% by weight of a catalyst, and

e) at least one reaction product arising from the combination of elements a1) - d).

15 2. The nail varnish additive composition of claim 1, wherein three of the radicals R_1 , R_2 , R_3 , R_4 are identical or different and are selected from the group consisting of methoxy, ethoxy, propoxy, and butoxy, the fourth of the radicals R_1 , R_2 , R_3 , R_4 is a methyl group.

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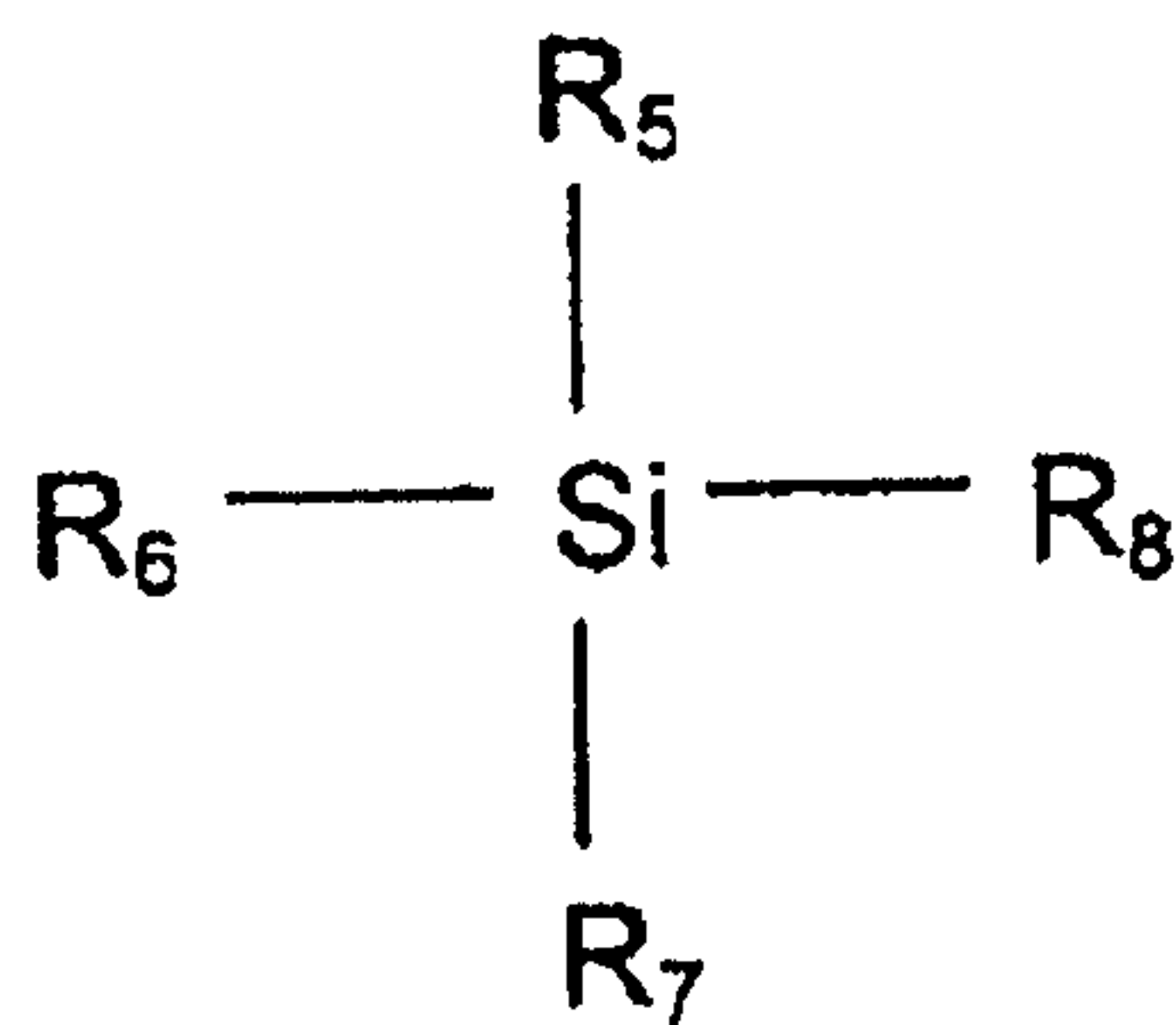
3. The nail varnish additive composition of claim 1, wherein the radical OR' is selected from the group consisting of methoxy, ethoxy, propoxy, and butoxy.

4. The nail varnish additive composition of claim 1, wherein component b) is selected from the group consisting of an alcohol of the general formula $C_nH_{2n+1}OH$, wherein

5 n=1 to 4, a mixture of these alcohols, a polyhydric alcohol, a ketone, an acetate, a glycol ether, toluene, xylene, and a mixture of these solvents.

5. The nail varnish additive composition of claim 1, wherein component d) is selected from the group consisting of hydrochloric acid, nitric acid, phosphoric acid, sulphuric acid, formic acid, propionic acid, acetic acid, citric acid, and a mixture of these acids.

10 6. The nail varnish additive composition of claim 1, which further comprises a3) at least one silane of the general formula



wherein the radicals R_5 , R_6 , R_7 , R_8 are identical or different, have 1 to 40 carbon atoms, and are each selected from the group consisting of a straight-chain fluoroalkyl group, a straight-
15 chain alkylurethanofluoroalkyl group, a branched-chain fluororalkyl group, a branched-chain alkylurethanofluoroalkyl group, an alicyclic fluoroalkyl group, and an alicyclic alkylurethanofluoroalkyl group; wherein the radicals are non-crosslinking.

7. A process for producing the nail varnish additive composition of claim 1, comprising combining

20 a1) in an amount from 10 to 50% by weight,

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a2) in an amount from 10 to 50% by weight,

b) in an amount from 10 to 50% by weight,

c) in an amount from 0.1 to 15% by weight, and

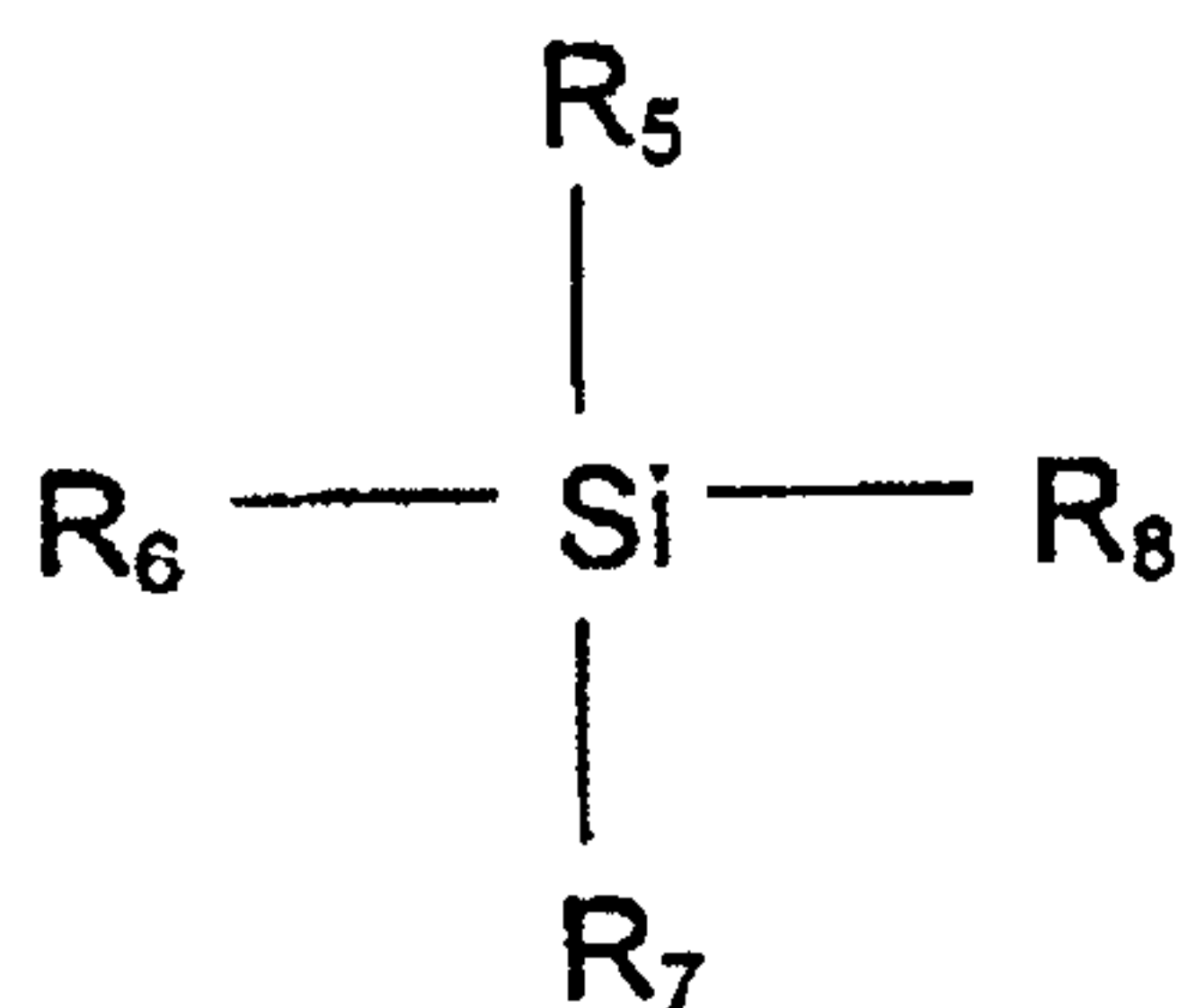
d) in an amount from 0.1 to 5% by weight,

- 5 the amounts being based in each case on a total amount of the composition, with the proviso that the sum of the parts by weight of all components in the composition is 100%, thereby obtaining said nail varnish additive composition, wherein the composition further comprises at least one reaction product arising from the combination of ingredients a1) - d).

8. The process according to claim 7,

- 10 further comprising combining a component

a3) at least one silane of the general formula



- 15 wherein the radicals R_5 , R_6 , R_7 , R_8 are identical or different, have 1 to 40 carbon atoms, and are each selected from the group consisting of a straight-chain fluoroalkyl group, a straight-chain alkylurethanofluoroalkyl group, a branched-chain fluororalkyl group, a branched-chain alkylurethanofluoroalkyl group, an alicyclic fluoroalkyl group, and an alicyclic alkylurethanofluoroalkyl group; wherein the radicals are non-crosslinking, in an amount from 0.2 to 2% by weight,

- 20 the amounts being based in each case on the composition, and with the proviso that the sum of the weight fractions is 100%.

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9. The process of claim 7, wherein the components are combined by stirring.
10. A nail varnish additive composition obtained by the process of claim 7.
11. A method of making a nail varnish comprising a nail varnish additive composition, the method comprising
- 5 combining a nail varnish with the nail varnish additive composition of claim 1 to form the nail varnish comprising the nail varnish additive composition.
12. A nail varnish which comprises the nail varnish additive composition of claim 1.
13. Use of the nail varnish of claim 12 for nail care.
- 10 14. The nail varnish additive composition of claim 1, wherein a1) is present in an amount of 20 to 30% by weight and a2) is present in an amount of 20 to 30% by weight.
15. The process according claim 7, wherein a1) is present in an amount of 20 to 30% by weight and a2) is present in an amount of 20 to 30% by weight.
16. The nail varnish additive composition of claim 1, wherein a1) is
- 15 methyltriethoxysilane and a2) is tetraethoxysilane.
17. A method of making a nail varnish comprising a nail varnish additive composition, the method comprising
- combining a nail varnish with the nail varnish additive composition of claim 16 to form the nail varnish comprising the nail varnish additive composition.
- 20 18. A nail varnish which comprises the nail varnish additive composition of claim 16.
19. A method of caring for a nail, comprising applying the nail varnish of claim 18 to the nail.

R_1



R_2



Si



R_4



R_3