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(71) Applicant (for all designated States except AL): L'OREAL

[FR/FR]; 14, rue Royale, F-75008 Paris (FR).

(72) Inventors; and

(71) Applicants (for AL only): ZHAO, Yici [CN/CN]; 550 Jinyu

Road, Pudong New Area, Shanghai 201206 (CN). ZANG,

Shanshan [CN/CN]; 550 Jinyu Road, Pudong New Area,

Shanghai 201206 (CN).

(74) Agent: CHINA PATENT AGENT (H.K.) LTD.; 22/F.,

Great Eagle Centre, 23 Harbour Road, Wanchai, Hong

Kong (CN).

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(54) Title: COSMETIC COMPOSITION FOR CARING KERATIN MATERIAL

(57) Abstract: A composition for caring keratin material, especially an anti-aging and anti-glycation composition, preferably in the form of an oil-in-water emulsion, comprises (a) silicone elastomers, including (a1) at least one emulsifying silicone elastomer, and (a2) at least one non-emulsifying silicone elastomer; (b) at least one silicone oil; and (c) at least one active, which preferably includes water-soluble active ingredients, wherein the weight ratio of the emulsifying silicone elastomer to the non-emulsifying silicone elastomer ranges from 1:35 to 1:10, preferably from 1:30 to 1:15, or from 1:28 to 1:20.



## COSMETIC COMPOSITION FOR CARING KERATIN MATERIAL

**TECHNICAL FIELD**

The present invention relates to a cosmetic composition for caring keratin material,  
5 and especially an anti-aging and anti-glycation composition.

**BACKGROUND ART**

Anti-glycation means resisting the glycation reaction which is one of the factors of  
human aging and dull skin, and means preventing and/or reducing the glycation of skin  
10 proteins, in particular of dermal proteins, such as collagen. Collagen glycation will cause  
protein hardening, fiber breakage, loss of elasticity of the skin, and finally wrinkles,  
resulting in sagging of the skin; keratin glycation will make the skin rough and dull and  
lose moisture.

In the aging process, various signs appear on the skin resulting from a modification  
15 of skin structure and of cutaneous function. One of the clinical signs of aging is, among  
others, the appearance of fine wrinkles and deep wrinkles. These signs of aging increase  
with age. A disorganization of skin “texture” is more particularly observed, meaning that  
micro-contours are less regular and show an anisotropic character.

It is known to treat these signs of aging using cosmetic or dermatological  
20 compositions containing actives adapted to fight against such signs of aging, such as  
proplylene glycol, hyaluronic acid, and vitamin C derivatives. Such actives act on wrinkles primarily  
by eliminating dead skin cells and accelerating the cell renewal process.

However, the actives, especially the water-soluble actives, often bring stickiness  
and/or unpleasant sensation during application, and leave an unsmooth, not soft or not  
25 moisture film on the skin. Thus, there is need to improve the sensation on skin during and  
after applying the cosmetics comprising said actives.

The inventor discovers that, when the cosmetics, e.g. oil-in-water emulsions  
comprise silicone elastomers, the improved sensation on skin can be achieved by  
adjusting the ratio of the emulsifying elastomer to the non-emulsifying elastomer and  
30 adding one or more specific silicone oils.

By means of the specific ratio of the emulsifying elastomer to the non-emulsifying  
elastomer and the addition of silicone oils, the cosmetics comprising anti-aging and anti-  
glycation actives, especially the water-soluble actives, have a good sensory of non-sticky

feeling during and after the application, and more moisture skin finish, and leaving a soft film on the skin.

### **SUMMARY OF THE INVENTION**

5 According to the first aspect, the present invention relates to a composition for caring keratin material, especially to an anti-aging and anti-glycation composition, preferably in the form of an oil-in-water emulsion, comprising (a) silicone elastomers, including (a1) at least one emulsifying silicone elastomer, and (a2) at least one non-emulsifying silicone elastomer; (b) at least one silicone oil; and (c) at least one active.

10 In one embodiment, the active includes water-soluble active ingredients, or consisting substantially of water-soluble active ingredients, or even consisting of water-soluble active ingredients. In one embodiment, the active includes an amount of about 1 wt.%, or even lower of non-water-soluble active ingredients, relative to the total weight of the composition.

15 In one embodiment, the composition substantially does not include oil-soluble active ingredients, or even does not include any oil-soluble active ingredients.

In one embodiment, said at least one silicone oil includes a first silicone oil and/or a second silicone oil, and the non-emulsifying silicone elastomer is existed as a mixture with the first silicone oil before being added into the composition and/or the emulsifying  
20 silicone elastomer is existed as a mixture with the second silicone oil before being added into the composition, wherein the first silicone oil is the same as the second silicone oil or different from the second silicone oil.

Preferably, said at least one silicone oil further includes a third silicone oil, and the third silicone oil is the same as the first and/or second silicone oil or different from both  
25 of them.

In one embodiment, the weight ratio of the emulsifying silicone elastomer to the non-emulsifying silicone elastomer ranges from about 1 : 35 to about 1 : 10, preferably from about 1 : 30 to about 1 : 15, or from about 1 : 28 to about 1 : 20.

The emulsifying silicone elastomer is chosen from silicone elastomers comprising at  
30 least one oxyalkylenated chain and/or at least one glycerylated chain.

The non-emulsifying silicone elastomer includes Dimethicone Crosspolymer, Vinyl Dimethicone Crosspolymer, Dimethicone/Vinyl Dimethicone Crosspolymer, Dimethicone Crosspolymer-3, or mixtures thereof.

The silicone oil is chosen from linear, branched, or cyclic silicones, optionally modified with at least one organo-functional moiety or group, including polyether-modified silicones. The active is chosen from C-Glycoside compounds, plant extracts, peptides, flavonoids, Vitamin C and derivatives thereof, hyaluronic acid and salts thereof, or mixtures thereof.

By means of the specific ratio of the emulsifying elastomer to the non-emulsifying elastomer and the addition of said silicone oils, the compositions comprising said actives have a good sensory of non-sticky feeling during and after the application, and a soft moisture finish film on skin.

In one embodiment, the composition of the present invention further comprises water, and the water is present in an amount ranging from about 25 wt. % to about 90 wt. %, preferably from about 30 wt. % to about 85 wt. %, or from about 40 wt. % to about 80 wt. %, relative to the total weight of the composition.

According to the second aspect, the present invention relates to a combination for improving sensation on skin during and after applying a cosmetic, comprising, consisting substantially of, or even consisting of (a) silicone elastomers, including (a1) at least one emulsifying silicone elastomer, and (a2) at least one non-emulsifying silicone elastomer, and (b) at least one silicone oil.

In one embodiment, the weight ratio of the emulsifying elastomer to the non-emulsifying elastomer ranges from about 1 : 35 to about 1 : 10, preferably from about 1 : 30 to about 1 : 15, or from about 1 : 28 to about 1 : 20.

In one embodiment, the active preferably includes, or consisting substantially of water-soluble active ingredients, or even consisting of water-soluble active ingredients, and includes C-Glycoside compounds, plant extracts, peptides, flavonoids, Vitamin C and derivatives thereof, or mixtures thereof.

According to the third aspect, the present invention relates to a process for caring keratin material, e.g. skins, in particular the skins around eyes, by applying the composition of the present invention on the skin, and optionally massaging the skin.

According to the fourth aspect, the present invention relates to use of a combination for improving sensation on skin during and after applying a cosmetic, wherein the combination is defined as above.

Other subjects and characteristics, aspects and advantages of the present invention will emerge even more clearly on reading the detailed description and the examples that follow.

**DETAILED DESCRIPTION OF THE INVENTION**

In that which follows and unless otherwise indicated, the limits of a range of values are included within this range, in particular in the expressions "of between" and "ranging from ... to ...".

5       The articles "a" and "an", as used herein, mean one or more when applied to any feature in embodiments of the present invention described in the specification and claims. The use of "a" and "an" does not limit the meaning to a single feature unless such a limit is specifically stated. Moreover, the expression "at least one" used in the present description is equivalent to the expression "one or more".

10       Throughout the present application, the expression "comprising" is to be interpreted as encompassing all specifically mentioned features as well optional, additional, unspecified ones. As used herein, the use of the term "comprising" also discloses the embodiment wherein no material features or even no features other than the specifically mentioned features are present (such as "consisting substantially of" and "consisting of").

15       In the case of "consisting substantially of," any additional compositions, materials, and/or components that materially affect the basic and novel characteristics are excluded from such an embodiment, but any compositions, materials and/or components that do not materially affect the basic and novel characteristics can be included in the embodiment.

20       The term "about" denoting a certain value is intended to denote a range within  $\pm 5\%$  of the value. As one example, the phrase "about 100" denotes a range of  $100 \pm 5$ , i.e. the range from 95 to 105. Generally, when the term "about" is used, it can be expected that similar results or effects according to the disclosure can be obtained within a range of  $\pm 5\%$  of the indicated value.

25       As used herein, the term "keratin material" is understood to mean the skin, the nails, or the mucous membranes, and, in at least one embodiment, refers to the skin.

**Silicone Elastomers**

30       The composition of the present invention comprises organopolysiloxane elastomers, also referred to as "silicone elastomers" in the remainder of the description, preferably that is at least partially crosslinked.

      The term "elastomer" is understood to mean a flexible and deformable solid material having viscoelastic properties and in particular the consistency of a sponge or of a flexible sphere. Its modulus of elasticity is such that this material withstands deformation and has a limited ability to expand and to contract. This material is capable

of returning to its original shape after it has been stretched. This elastomer is formed of high molecular weight polymer chains, the mobility of which is limited by a uniform network of crosslinking points.

The organopolysiloxane elastomers used in the composition of the present invention are preferably partially or totally crosslinked. They are in the form of particles.

These particles may have any shape, for example they may be spherical, flat or amorphous. When they are included in an oily phase, these organopolysiloxane elastomers become transformed, depending on the content of oily phase used, into a product of spongy appearance when they are used in the presence of small amounts of oily phase, or into a homogeneous gel in the presence of larger amounts of oily phase. The gelation of the oily phase with these elastomers may be total or partial.

Thus, the elastomers of the present invention may be conveyed in the form of an anhydrous gel consisting of an organopolysiloxane elastomer and of an oily phase. The oily phase used in the manufacture of the anhydrous gel of organopolysiloxane elastomer contains one or more oils that are liquid at room temperature (25 °C) chosen from hydrocarbon-based oils and/or silicone oils.

Advantageously, the oily phase is a silicone liquid phase, containing one or more oils chosen from polydimethylsiloxanes containing a linear or cyclic chain, which are liquid at room temperature, optionally comprising an alkyl or aryl chain that is pendent or at the end of the chain.

The silicone elastomers used according to the present invention may be chosen from the crosslinked polymers described in patent application EP-A-0 295 886 and from those described in patent US-A-5 266 321.

### **Non-emulsifying Silicone Elastomers**

The term “non-emulsifying silicone elastomers” or “non-emulsifying organopolysiloxane elastomers” defines organopolysiloxane elastomers that do not contain a hydrophilic chain such as polyoxyalkylene or polyglycerolated units.

Preferably, the organopolysiloxane elastomer is a crosslinked organopolysiloxane elastomer which may be obtained:

- by crosslinking addition reaction of a diorganosiloxane containing at least one hydrogen bonded to the silicon and of a polyoxyalkylene having at least two ethylenically unsaturated groups;

- by crosslinking addition reaction of a diorganopolysiloxane containing at least one hydrogen bonded to the silicon and of a diorganopolysiloxane having ethylenically unsaturated groups bonded to the silicon, especially in the presence of a platinum catalyst;

- by crosslinking addition reaction of a diorganosiloxane containing at least one hydrogen bonded to the silicon and of a diorganopolysiloxane having ethylenically unsaturated groups bonded to the silicon, especially in the presence of an organotin compound;

- by dehydrogenation crosslinking condensation reaction between a diorganopolysiloxane having hydroxyl end groups and a diorganopolysiloxane containing at least one hydrogen bonded to the silicon, especially in the presence of an organotin compound;

- by crosslinking condensation reaction of a diorganopolysiloxane having hydroxyl end groups and of a hydrolysable organopolysilane;

- by thermal crosslinking of an organopolysiloxane, especially in the presence of an organoperoxide catalyst; and

- by crosslinking of an organopolysiloxane by high-energy radiation such as gamma rays, ultraviolet rays or an electron beam.

Preferably, the crosslinked organopolysiloxane elastomer is obtained by crosslinking addition reaction:

compound (A) of a diorganopolysiloxane containing at least two hydrogen atoms each bonded to a different silicon atom, and

compound (B) of a diorganopolysiloxane having at least two ethylenically unsaturated groups bonded to the silicon, especially in the presence of a platinum catalyst (C), as described, for example, in Application EP-A-295 886.

In particular, the organopolysiloxane may be obtained by reaction of a dimethylpolysiloxane having dimethylvinylsiloxy end groups and of a methylhydrogenpolysiloxane having trimethylsiloxy end groups, in the presence of a platinum catalyst.

The compound (A) is the base reactant for the formation of an organopolysiloxane elastomer and the crosslinking is carried out by an addition reaction of the compound (A) with the compound (B) in the presence of the catalyst (C).

The compound (A) is advantageously a diorganopolysiloxane having at least two lower (for example C<sub>2</sub>-C<sub>4</sub>) alkenyl groups; the lower alkenyl group may be chosen from vinyl, allyl and propenyl groups.

These lower alkenyl groups may be located at any position on the organopolysiloxane molecule but are preferably located at the ends of the organopolysiloxane molecule. The organopolysiloxane (A) may have a branched chain, linear chain, cyclic or network structure but the linear chain structure is preferred. The compound (A) may have a viscosity ranging from the liquid state to the gum state.

Preferably, the compound (A) has a viscosity of at least 100 centistokes at 25 °C.

The organopolysiloxanes (A) may be chosen from methylvinylsiloxanes, methylvinylsiloxane/dimethylsiloxane copolymers, dimethylpolysiloxanes having dimethylvinylsiloxyl end groups, dimethylsiloxane/methylphenylsiloxane copolymers having dimethylvinylsiloxyl end groups, dimethylsiloxane/diphenylsiloxane/methylvinylsiloxane copolymers having dimethylvinylsiloxyl end groups, dimethylsiloxane/methylvinylsiloxane copolymers having trimethylsiloxyl end groups, dimethylsiloxane/methylphenylsiloxane/methylvinylsiloxane copolymers having trimethylsiloxyl end groups, methyl (3,3,3-trifluoropropyl) polysiloxanes having dimethylvinylsiloxyl end groups and dimethylsiloxane/methyl (3,3,3-trifluoropropyl) siloxane copolymers having dimethylvinylsiloxyl end groups.

The compound (B) is, in particular, an organopolysiloxane having at least two hydrogens bonded to the silicon in each molecule and is therefore the crosslinking agent of the compound (A).

Advantageously, the sum of the number of ethylenic groups per molecule of the compound (A) and the number of hydrogen atoms bonded to the silicon per molecule of the compound (B) is at least 4.

The compound (B) may have any molecular structure, in particular a linear chain or branched chain structure or a cyclic structure.

The compound (B) may have a viscosity, at 25 °C, ranging from 1 to 50 000 centistokes, especially in order to be highly miscible with the compound (A).

It is advantageous for the compound (B) to be added in an amount such that the molecular ratio between the total amount of hydrogen atoms bonded to the silicon in the compound (B) and the total amount of all the ethylenically unsaturated groups in the compound (A) is within the range of 1/1 to 20/1.

The compound (B) may be chosen from methylhydrogenpolysiloxanes having trimethylsiloxyl end groups, dimethylsiloxane/methylhydrogensiloxane copolymers having trimethylsiloxyl end groups and cyclic dimethylsiloxane/methylhydrogensiloxane copolymers.

The compound (C) is the catalyst of the crosslinking reaction, and is especially chloroplatinic acid, chloroplatinic acid/olefin complexes, chloroplatinic acid/alkenylsiloxane complexes, chloroplatinic acid/diketone complexes, platinum black and platinum-on-support.

5 Other organic groups may be bonded to the silicon in the organopolysiloxanes (A) and (B) described previously, such as for example alkyl groups such as methyl, ethyl, propyl, butyl or octyl groups; substituted alkyl groups such as 2-phenylethyl, 2-phenylpropyl or 3,3,3-trifluoropropyl groups; aryl groups such as phenyl, tolyl or xylyl groups; substituted aryl groups such as a phenylethyl group; and substituted monovalent  
10 hydrocarbon-based groups such as an epoxy group, a carboxylate ester group or a mercapto group.

In particular, the non-emulsifying silicone elastomer used in the present invention is chosen from Dimethicone Crosspolymer (INCI name), Vinyl Dimethicone Crosspolymer (INCI name), Dimethicone/Vinyl Dimethicone Crosspolymer (INCI name),  
15 Dimethicone Crosspolymer-3 (INCI name), and mixtures thereof.

The organopolysiloxane elastomer particles may be conveyed in the form of a gel formed from an elastomeric organopolysiloxane included in at least one hydrocarbon-based oil and/or one silicone oil. In these gels, the organopolysiloxane particles are often non-spherical particles.

20 Non-emulsifying elastomers are especially described in patents EP 242 219, EP 285 886 and EP 765 656.

The silicone elastomer is generally provided in the form of a gel, a paste or a powder but advantageously in the form of a gel in which the silicone elastomer is dispersed in a linear silicone oil (dimethicone) or cyclic silicone oil (e.g.:  
25 cyclopentasiloxane), advantageously in a linear silicone oil.

Non-emulsifying elastomers that may more particularly be used include those sold under the names KSG-6, KSG-15, KSG-16, KSG-18, KSG-41, KSG-42, KSG-43 and KSG-44 by the company Shin-Etsu, DC9040 and DC9041 by Dow Coming and SFE 839 by the company General Electric.

30 According to a particular mode, use is made of a gel of silicone elastomer dispersed in a silicone oil chosen from a non-exhaustive list comprising cyclopentadimethylsiloxane, dimethicones, dimethylsiloxanes, methyl trimethicone, phenyl methicone, phenyl dimethicone, phenyl trimethicone and cyclomethicone, preferably a linear silicone oil chosen from polydimethylsiloxanes (PDMS) or

dimethicones with a viscosity at 25° C ranging from 1 to 500 cSt, optionally modified with optionally fluorinated aliphatic groups, or with functional groups such as hydroxyl, thiol and/or amine groups.

Mention may be made especially of the compounds having the following INCI names: dimethicone/vinyl dimethicone crosspolymer, such as USG-105 and USG-107A from the company Shin-Etsu; DC9506 and DC9701 from the company Dow Coming; dimethicone/vinyl dimethicone crosspolymer (and) dimethicone, such as KSG-6 and KSG-16 from the company Shin-Etsu; dimethicone/vinyl dimethicone crosspolymer (and) cyclopentasiloxane, such as KSG-15; cyclopentasiloxane (and) dimethicone crosspolymer, such as DC9040, DC9045 and DC5930 from the company Dow Coming; dimethicone (and) dimethicone crosspolymer, such as DC9041 from the company Dow Coming. dimethicone (and) dimethicone crosspolymer, such as Dow Coming EL-9240 Silicone Elastomer Blend from the company Dow Coming (mixture of polydimethylsiloxane crosslinked with hexadiene/polydimethylsiloxane (2 cSt));

C<sub>4-24</sub> alkyl dimethicone/divinyl dimethicone crosspolymer, such as NuLastic Silk MA from the company Alzo.

Mention may in particular be made, as examples of silicone elastomers dispersed in a linear silicone oil which can advantageously be used according to the present invention, of the following references: dimethicone/vinyl dimethicone crosspolymer (and) dimethicone, such as KSG-6 and KSG-16 from the company Shin-Etsu; dimethicone (and) dimethicone crosspolymer, such as DC9041, Dow Coming EL-9240 Silicone Elastomer Blend from the company Dow Coming.

The organopolysiloxane elastomer particles may also be used in powder form: mention may be made especially of the powders sold under the names Dow Coming 9505 Powder and Dow Coming 9506 Powder by the company Dow Coming, these powders having the INCI name: dimethicone/vinyl dimethicone crosspolymer.

The organopolysiloxane powder may also be coated with silsesquioxane resin, as described, for example, in U.S. Pat. No. 5,538,793. Such elastomeric powders are sold under the names KSP-100, KSP-101, KSP-102, KSP-103, KSP-104 and KSP-105 by the company Shin-Etsu, and have the INCI name: vinyl dimethicone/methicone silsesquioxane crosspolymer.

As examples of organopolysiloxane powders coated with silsesquioxane resin that may advantageously be used according to the present invention, mention may be made especially of the reference KSP-100 from the company Shin-Etsu.

As preferred lipophilic gelling agent of organopolysiloxane elastomer type, mention may be made especially of crosslinked organopolysiloxane elastomers chosen from Dimethicone Crosspolymer (INCI name), Dimethicone (and) Dimethicone Crosspolymer (INCI name), Vinyl Dimethicone Crosspolymer (INCI name), DimethiconeNinyl  
5 Dimethicone Crosspolymer (INCI name), Dimethicone Crosspolymer-3 (INCI name).

It is preferable that the non-emulsifying silicone elastomers may be selected from dimethicone/vinyldimethicone crosspolymer, dimethicone crosspolymer and mixtures thereof. According to one preferred embodiment, silicone elastomers bearing the INCI name dimethicone/vinyldimethicone copolymer (or polysilicone-11) are used as a mixture  
10 with linear or cyclic silicone oil.

According to the present invention, the non-emulsifying silicone elastomer is present in an amount ranging from about 0.01 wt. % to about 40 wt. %, preferably from about 1 wt. % to about 30 wt.%, or from about 5 wt. % to about 25 wt.%, relative to the total weight of the composition.

### **Emulsifying Silicone Elastomers**

The term “emulsifying” of “emulsifying silicone elastomer” means that the silicone elastomer is capable of emulsifying, or has a function as an emulsifier.

The emulsifying silicone elastomer of the present invention may be a crosslinked  
20 elastomeric organopolysiloxane comprising at least one hydrophilic chain, it being possible for this chain to be in particular oxyalkylenated or glycerylated. The emulsifying silicone elastomer can therefore be chosen from silicone elastomers comprising at least one oxyalkylenated chain and/or at least one glycerylated chain.

It is preferable that the emulsifying silicone elastomer comprises at least one  
25 crosslinked silicone polymer with at least one hydrophilic moiety. The hydrophilic moiety may comprise at least one poly oxyalkylene chain and/or at least one poly glyceryl chain.

The silicone elastomer comprising at least one oxyalkylenated chain can be obtained in particular by addition reaction and crosslinking of a diorganopolysiloxane  
30 containing at least two hydrogens each linked to a silicon (A1), and of a poly oxyalkylene having at least two ethylenically unsaturated groups (B1), in particular in the presence of a catalyst (C1), in particular a platinum catalyst, as described, for example, in documents U.S. Pat. No. 5,236,986 and U.S. Pat. No. 5,412,004.

Compound (A1) is the base compound for the formation of elastomeric organopolysiloxane, and the crosslinking takes place via an addition reaction of compound (A1) with compound (B1) in the presence of catalyst (C1).

Compound (B1) is advantageously an oxyethylenated and/or oxypropylenated compound containing at least two vinyl groups in the  $\alpha$ - $\omega$  position of the silicone chain, which will react with Si-H bonds of compound (A1). Compound (B1) may in particular be a polyoxyalkylene (in particular polyoxyethylene and/or polyoxypropylene) containing dimethylvinylsiloxyl end groups.

The organic groups linked to the silicon atoms of compound (A1) may be alkyl groups containing from 1 to 18 carbon atoms, such as methyl, ethyl, propyl, butyl, octyl, decyl, dodecyl (or lauryl), myristyl, cetyl or stearyl; substituted alkyl groups such as 2-phenylethyl, 2-phenylpropyl or 3,3,3-trifluoropropyl; aryl groups such as phenyl, tolyl or xylyl; substituted aryl groups such as phenylethyl; and substituted monovalent hydrocarbon-based groups such as an epoxy group, a carboxylate ester group or a mercapto group.

Compound (A1) may thus be chosen from methylhydrogenopolysiloxanes containing trimethylsiloxyl end groups, dimethylsiloxane-methylhydrogenosiloxane copolymers containing trimethylsiloxyl end groups, cyclic dimethylsiloxane-methylhydrogenosiloxane copolymers and di-methylsiloxane-methylhydrogenosiloxanelaurylmethyl-siloxane copolymers containing trimethylsiloxyl end groups.

Compound (C1) is the crosslinking reaction catalyst, and is in particular chosen from chloroplatinic acid, chloroplatinic acid-olefin complexes, chloroplatinic acid-alkenylsiloxane complexes, chloroplatinic acid-diketone complexes, platinum black and platinum on a support.

In particular, the silicone elastomer comprising at least one oxyalkylenated chain can be obtained by reaction of polyoxyalkylene (in particular polyoxyethylene and/or polyoxypropylene) containing dimethylvinylsiloxyl end groups and of methylhydrogenopolysiloxane containing trimethylsiloxyl end groups, in the presence of platinum catalyst.

The silicone elastomer comprising at least one oxyalkylenated chain, used according to the present invention, is preferably a silicone elastomer comprising at least one oxyethylenated chain.

In addition, the silicone elastomer comprising at least one oxyalkylenated chain is preferably carried in the form of a gel in at least one hydrocarbon-based oil and/or one silicone oil.

Thus, the emulsifying silicone elastomer can be in the form of a gel. In these gels, the elastomer comprising at least one oxyalkylenated chain is commonly in the form of non-spherical particles.

Polyoxyalkylenated silicone elastomers were in particular described in documents U.S. Pat. No. 5,236,986, U.S. Pat. No. 5,412,004, U.S. Pat. No. 5,837,793 and U.S. Pat. No. 5,811,487, the content of which is incorporated by way of reference.

As silicone elastomers comprising at least one oxyethylenated chain, use may in particular be made of those sold by the company Shin Etsu under the names of

Dimethicone/PEG-10 Dimethicone vinyl dimethicone crosspolymer, such as that sold under the name of KSG-21 (at 27% in terms of active material),

PEG-10 Dimethicone Crosspolymer, such as that sold under the name of KSG-20 (at 100% in terms of active material),

Dimethicone/PEG-10/15 crosspolymer, such as that sold under the name of KSG-210 (at 25% in terms of active material of silicone elastomer in silicone oil),

Cyclopentasiloxane (and) Dimethicone/PEG-10/15 crosspolymer, such as that sold under the name of KSG-240,

Mineral oil (and) PEG-15/lauryl dimethicone crosspolymer, such as that sold under the name of KSG-310,

Isododecane (and) PEG-15/lauryl dimethicone crosspolymer, such as that sold under the name of KSG-320,

Isododecane (and) PEG-15/lauryl polydimethylsiloxylethyl dimethicone crosspolymer, such as that sold under the name of KSG-320Z,

Cyclopentasiloxane (and) PEG-15/lauryl polydimethylsiloxylethyl dimethicone crosspolymer, such as that sold under the name of KSG-350Z,

Dimethicone (and) PEG-15/lauryl polydimethylsiloxylethyl dimethicone crosspolymer, such as those sold under the names of KSG-360Z, and KSG-380Z (25-45% in terms of active material of silicone elastomer in silicone oil), or those sold by the company Dow Coming under the names of

PEG-12 dimethicone crosspolymer, such as that sold under the name of DC9010 (at 11% in terms of active material), and

Cyclopentasiloxane (and) PEG-12 Dimethicone crosspolymer, such as that sold under the name of DC9011 (at 91% in terms of active material).

These products are generally in the form of oily gels containing the particles of silicone elastomer.

5        Use is preferably made of Dimethicone/PEG-10/15 crosspolymer, such as that sold under the name of KSG-210, PEG/15 lauryl dimethicone crosspolymer, such as that sold under the name of KSG-320, and PEG-15/lauryl polydimethylsiloxylethyl dimethicone crosspolymer, such as that sold under the name of KSG-380Z.

10        The emulsifying silicone elastomer may also be chosen from silicone elastomers comprising at least one glycerylated chain.

      The silicone elastomer comprising at least one glycerylated chain can be obtained in particular by addition reaction and crosslinking of a diorganopolysiloxane containing at least one hydrogen linked to the silicon (A2) and of a polyglycerylated compound having ethylenically unsaturated groups (B2), in particular in the presence of a catalyst  
15        (C2), in particular a platinum catalyst.

      In particular, the organopolysiloxane may be obtained by reaction of a polyglycerylated compound containing dimethylvinylsiloxylethyl end groups and of methylhydrogenopolysiloxane containing trimethylsiloxylethyl end groups, in the presence of a platinum catalyst.

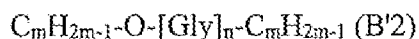
20        Compound (A2) is the base compound for the formation of elastomeric organopolysiloxane, and the crosslinking takes place via an addition reaction of compound (A) with compound (B2) in the presence of catalyst (C2).

      Compound (A2) is in particular an organopolysiloxane having at least two hydrogen atoms linked to distinct silicon atoms in each molecule. Compound (A2) may  
25        have a viscosity at 25 °C, ranging from 1 to 50 000 centistokes, in particular so as to be readily miscible with compound (B2).

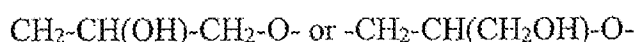
      The organic groups linked to the silicon atoms of compound (A2) may be alkyl groups containing from 1 to 18 carbon atoms, such as methyl, ethyl, propyl, butyl, octyl, decyl, dodecyl (or lauryl), myristyl, cetyl or stearyl; substituted alkyl groups such as 2-phenylethyl, 2-phenylpropyl or 3,3,3-trifluoropropyl; aryl groups such as phenyl, tolyl or  
30        xylyl; substituted aryl groups such as phenylethyl; and substituted monovalent hydrocarbon-based groups such as an epoxy group, a carboxylate ester group or a mercapto group. Preferably, said organic group is chosen from methyl, phenyl and lauryl groups.

Compound (A2) may thus be chosen from methylhydrogenopolysiloxanes containing trimethylsiloxy end groups, dimethylsiloxane-methylhydrogenosiloxane copolymers containing trimethylsiloxy end groups, cyclic dimethylsiloxane-methylhydrogenosiloxane copolymers, and dimethylsiloxane-methylhydrogenosiloxane-  
 5 laurylmethyl-siloxane copolymers containing trimethylsiloxy end groups.

Compound (B2) may be a polyglycerylated compound corresponding to formula (B'2) below:



in which m is an integer ranging from 2 to 6, n is an integer ranging from 2 to 200,  
 10 preferably from 2 to 100, preferentially from 2 to 50, better still from 2 to 20, even better still from 2 to 10, and even better still from 2 to 5, and in particular n is equal to 3; and Gly denotes:



Advantageously, the sum of the number of ethylenic groups per molecule of  
 15 compound (B2) and of the number of hydrogen atoms linked to silicon atoms per molecule of compound (A2) is at least 4.

It is advantageous for compound (A2) to be added in an amount such that the molecular ratio of the total amount of hydrogen atoms linked to silicon atoms in compound (A2) to the total amount of all the ethylenically unsaturated groups in  
 20 compound (B2) is within the range of from 1/1 to 20/1.

Compound (C2) is the crosslinking reaction catalyst, and is in particular chosen from chloroplatinic acid, chloroplatinic acid-olefin complexes, chloroplatinic acid-alkenylsiloxane complexes, chloroplatinic acid-diketone complexes, platinum black and platinum on a support.

25 The catalyst (C2) is preferably added in an amount of from 0.1 to 1,000 parts by weight, better still from 1 to 100 parts by weight, as clean platinum metal, per 1,000 parts by weight of the total amount of compounds (A2) and (B2).

The silicone elastomer comprising at least one glycerylated chain, used according to the present invention, is generally in the form of a gel as a mixture with at least one  
 30 hydrocarbonbased oil and/or one silicone oil. In these gels, the elastomer comprising at least one glycerylated chain is commonly in the form of non-spherical particles.

Such elastomers are in particular described in document WO-A-2004/024798.

As the silicone elastomer comprising at least one glycerylated chain, use may be made of those sold by the company Shin Etsu under the names of

Dimethicone/Polyglycerin-3 Crosspolymer, such as that sold under the name of KSG-710 (containing 25% active material),

5 Mineral oil (and) Lauryl dimethicone/polyglycerin-3 crosspolymer, such as that sold under the name of KSG-810,

Isododecane (and) Lauryl dimethicone/polyglycerin-3 crosspolymer, such as that sold under the name of KSG-820,

10 Triethylhexanoin (and) Lauryl dimethicone/polyglycerin-3 crosspolymer, such as that sold under the name of KSG-830, and

Squalane (and) Lauryl dimethicone/polyglycerin-3 crosspolymer, such as that sold under the name of KSG-840.

15 It is preferable that the emulsifying silicone elastomer be selected from silicone elastomers comprising at least one oxyalkylenated chain and/or at least one glycerylated chain, and more preferably silicone elastomer comprising at least one oxyethylenated chain.

According to the present invention, the emulsifying silicone elastomer is present in an amount ranging from about 0.01 wt. % to about 5 wt. %, preferably from about 0.1 wt. % to about 3 wt. %, or from about 0.2 wt. % to about 2 wt. %, relative to the total  
20 weight of the composition.

### **Silicone Oils**

Here, "silicone oil" means a silicone compound or substance which is in the form of a liquid or a paste at room temperature (25 °C) under atmospheric pressure (760 mmHg).  
25 As the silicone oils, those generally used in cosmetics may be used alone or in combination thereof.

The silicone oil(s) may be selected from volatile silicones, non-volatile silicones and mixtures thereof.

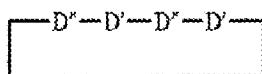
Thus, the silicone oil may comprise either at least one volatile silicone oil or at  
30 least one nonvolatile silicone oil, or both at least one volatile silicone oil and at least one non-volatile silicone oil.

The volatile or non-volatile silicone may be selected from linear, branched, or cyclic silicones, optionally modified with at least one organo-functional moiety or group.

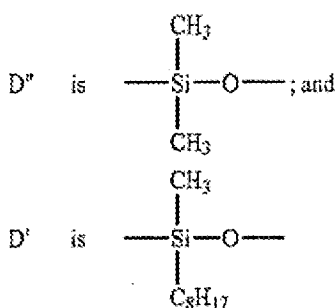
For example, the silicone oil may be selected from the group consisting of polydialkylsiloxanes such as polydimethylsiloxanes (PDMS), polyalkylarylsiloxanes such as phenyltrimethicone, polydiarylsiloxanes, and organo-modified polysiloxanes comprising at least one organo-functional moiety or group chosen from poly(oxyalkylene) moieties or groups, alkoxy or alkoxyalkyl moieties or groups, hydroxyl or hydroxylated moieties or groups, acyloxy or acyloxyalkyl moieties or groups, carboxylic acid or carboxylate moieties or groups, acrylic moieties or groups, and oxazoline moieties.

If the silicone oil(s) is/are volatile, the silicone oil(s) may be chosen from those having a boiling point ranging from 60 °C to 260 °C, for example:

(i) cyclic silicones such as polydialkylsiloxanes comprising from 3 to 7, for instance, from 4 to 5 silicon atoms. Non-limiting examples of such siloxanes include octamethylcyclotetrasiloxane marketed, for instance, under the trade name VOLATILE SILICONE® 7207 by UNION CARBIDE and SILBIONE® 70045 V2 by RHODIA, decamethylcyclopentasiloxane marketed under the trade name VOLATILE SILICONE® 7158 by UNION CARBIDE, and SILBIONE® 70045 V5 by RHODIA, KF-995 by SHIN ETSU, as well as mixtures thereof. Cyclomethicones may also be used, for example, those marketed under the references DC 244, DC 245, DC 344, DC 345, and DC 246 by DOW CORNING. Cyclocopolymers of the dimethylsiloxane/methylalkylsiloxane type may also be used, such as SILICONE VOLATILE® FZ 3109 marketed by UNION CARBIDE, of formula



wherein:



Combinations of cyclic silicones such as polydialkylsiloxanes with silicon derived organic compounds may also be used, such as an octamethylcyclotetrasiloxane and tetratrimethylsilylpentaerythritol (50/50) mixture, and an octamethylcyclotetrasiloxane and oxy-1,1'-(hexa-2,2',2',3,3'-trimethylsilyloxy) bisneopentane mixture; and

(ii) linear volatile polydialkylsiloxanes comprising from 2 to 9 silicon atoms. A nonlimiting example of such a compound is decamethyltetrasiloxane marketed, for instance, under the trade name "SH-200" by TORAY SILICONE.

On the other hand, the silicone oil(s) may be chosen from non-volatile silicones, such as polydialkylsiloxanes, polyalkylarylsiloxanes, polydiarylsiloxanes, and organo-modified poly siloxanes.

The molecular weight of the silicone, preferably polydimethylsiloxanes with trimethylsilyl end groups, has a weight-average molecular weight ( $M_w$ ) of 300,000 or more, preferably 350,000 or more, more preferably 400,000 or more, and preferably 3,000,000 or less, more preferably 2,000,000 or less, even more preferably 1,000,000 or less.

According to one embodiment, the silicone oil may be chosen from non-volatile polydialkylsiloxanes, for example, polydimethylsiloxanes with trimethylsilyl end groups known under the trade name dimethicone.

The silicone oil that are preferred in accordance with the present invention may be the polydimethylsiloxanes with trimethylsilyl end groups, such as the oils having a viscosity at 25 °C greater than 1,000,000 cSt ( $\text{mm}^2/\text{s}$ ), even more preferentially a viscosity greater than 2,000,000 cSt, and even more particularly greater than 5,000,000 cSt, better still greater than 10,000,000 cSt and preferably less than 50,000,000 cSt, better still less than 30,000,000 cSt, even better still less than 15,000,000 cSt.

According to the present invention, all the polydimethylsiloxanes can be used as they are or in the form of solutions, emulsions, nanoemulsions or microemulsions.

Non-limiting examples of commercial products corresponding to such polydialkylsiloxanes include BY22-029 (product of Dow Coming Toray, Co., Ltd.; nonionic emulsion of dimethicone oil), BY22-060 (product of Dow Corning Toray, Co., Ltd.; cationic emulsion containing a solution obtained by diluting highly polymerized dimethicone with a low viscosity silicone), BY22-019 (product of Dow Coming Toray, Co., Ltd.; nonionic and cationic emulsion containing a solution obtained by diluting highly polymerized dimethicone with cyclic silicone), BY22-020 (product of Dow Coming Toray, Co., Ltd.; cationic emulsion containing a solution obtained by diluting a highly polymerized dimethicone with light liquid isoparaffin), KM902 (product of Shin-Etsu Chemical Co., Ltd.; nonionic emulsion of highly polymerized dimethicone), KM903 (product of Shin-Etsu Chemical Co., Ltd.; cationic emulsion containing a solution obtained by diluting a highly polymerized dimethicone with a low viscosity silicone), X-

52-2127 (product of Shin-Etsu Chemical Co., Ltd.; cationic emulsion containing a solution obtained by diluting a highly polymerized dimethicone with low viscosity silicone), X-52-2162 (product of Shin-Etsu Chemical Co., Ltd.; nonionic emulsion containing a solution obtained by diluting a highly polymerized dimethicone with low viscosity silicone), EMU101 (product of Momentive Performance Materials, Inc.; nonionic emulsion containing a solution obtained by diluting highly polymerized dimethicone with low viscosity silicone), XS65-B3803 (product of Momentive Performance Materials, Inc.; nonionic emulsion containing a solution obtained by diluting highly polymerized dimethicone with low viscosity silicone), DC 7-3100 (product of Dow Corning Toray Silicone, Co., Ltd.).

Polyalkylarylsiloxanes may be chosen from polydimethyl/methylphenylsiloxanes, linear and/or branched polydimethyl/diphenyl siloxanes.

Non-limiting examples of such polyalkylarylsiloxanes include the products marketed under the following trade names:

15 SILBIONE® fluids of the 70 641 series from RHODIA; RHODORSIL® fluids of the 70 633 and 763 series from RHODIA; phenyltrimethicone fluid marketed under the reference DOW CORNING 556 COSMETIC GRADE FLUID by DOW CORNING;

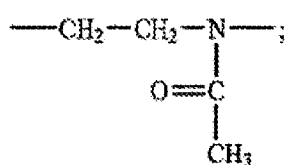
PK series silicones from BAYER, for example, the PK20 product;

PN, PH series silicones from BAYER, for example, the PN1000 and PH 1000 products; and some SF series fluids from GENERAL ELECTRIC, such as SF 1023, SF 1154, SF 1250, and SF 1265.

Organo-modified silicones which may be used according to the present invention include, but are not limited to, silicones such as those previously defined and comprising within their structure at least one organo-functional moiety or group linked directly or by means of a hydrocarbon group.

Organo-modified silicones may include, for example, polyorganosiloxanes comprising: polyethyleneoxy and/or polypropyleneoxy moieties optionally comprising C<sub>6</sub>-C<sub>24</sub> alkyl moieties, such as products called dimethicone copolyols marketed by DOW CORNING under the trade name DC 1248 and under the trade name DC Q2-5220 and SILWET® L 722, L 7500, L 77, and L 711 fluids marketed by UNION CARBIDE and (Ci<sub>2</sub>)alkyl-methicone copolyol marketed by DOW CORNING under the trade name Q2 5200; alkoxyated moieties, such as the product marketed under the trade name "SILICONE COPOLYMER F-755" by SWS SILICONES and ABIL WAX® 2428, 2434, and 2440 by GOLDSCHMIDT; hydroxylated moieties, such as hydroxyalkyl function-

containing polyorganosiloxanes described; acyloxyalkyl moieties, for example, the polyorganosiloxanes described in U.S. Pat. No. 4,957,732; anionic moieties of the carboxylic acid type, for example, the products described in European Patent No. 0 186 507, marketed by CHISSO CORPORATION, and carboxylic alkyl anionic moieties, such as those present in the X-22-3701E product marketed by SHIN-ETSU; 2-hydroxyalkyl sulfonate; and 2-hydroxyalkyl thiosulfate such as the products marketed by GOLDSCHMIDT under the trade names "ABIL® S201" and "ABIL® S255"; acrylic moieties, such as the products marketed under the names VS80 and VS70 by 3M; and oxazoline moieties



silicones that may be used according to the present invention may comprise 1 or 2 oxazoline groups; for example, poly(2-methyl oxazoline-b-dimethyl siloxane-b-2-methyl oxazoline) and poly(2-ethyl-2-oxazoline-dimethyl siloxane). The products marketed by KAO under the references OX-40, OS-51, OS-96, and OS-88 may also be used.

Polydimethylsiloxanes with dimethylsilanol end groups may also be used, for example, those sold under the trade name dimethiconol (CTFA), such as fluids of the 48 series marketed by RHODIA.

If the silicone oil(s) is/are non-volatile, the silicone oil(s) may be chosen from polydimethylsiloxanes and organo-modified polydimethylsiloxanes.

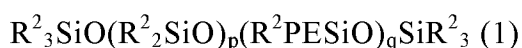
It is preferable that the silicone oil be selected from volatile or non-volatile silicone oils, such as volatile or non-volatile polydimethylsiloxanes (PDMS) containing a linear or cyclic silicone chain, that are liquid or pasty at ambient temperature, in particular cyclopolydimethylsiloxanes (cyclomethicones) such as cyclopentasiloxane and cyclohexasiloxane; polydimethylsiloxanes containing alkyl, alkoxy, or phenyl groups that are pendent and/or at the end(s) of the silicone chain, which groups have from 2 to 24 carbon atoms; phenyl silicones such as phenyltrimethicones, phenyldimethicones, phenyltrimethylsiloxydiphenylsiloxanes, diphenyldimethicones, diphenylmethyldiphenyltrisiloxanes, 2-phenylethyltrimethyl siloxysilicates, and polymethylphenylsiloxanes; and organo-modified silicones such as dimethiconol.

It is possible to use a combination of the silicone oils. Non-limiting examples of such combinations include a mixture of cyclopentasiloxane and dimethiconol, marketed,

for instance, under the trade name Xiameter PMX-1501 Fluid by Dow Coming, and a mixture of dimethicone and dimethiconol, for instance, under the trade name MIRASIL D-DML LV A2 by Elkem Silicones.

On the other hand, the silicone oil(s) may be chosen from polysiloxanes comprising at least one terminal or pendant monovalent polyoxyalkylene group, which may be categorized as polyoxyalkylene-modified silicones or polyether-modified silicones. The polysiloxanes may be polydimethylsiloxane.

The polyoxyalkylene-modified silicones or polyether-modified silicones may be represented by formula (1):



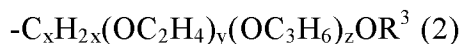
in which:

the  $R^2$  radicals, which are identical or different, denote a monovalent hydrocarbon radical chosen from alkyl, aryl and aralkyl radicals having at most 10 carbon atoms;

p varies from 0 to 150, preferably from 0 to 100 and more preferably from 0 to 30;

q varies from 1 to 12, preferably from 1 to 10 and more preferably from 1 to 8;

the poly ether group PE has the following formula (2):



in which:

x varies from 1 to 8 and preferably varies from 2 to 4 and is more preferably equal to 3;

y is greater than 0;

z is greater than or equal to 0; the values of y and z being such that the total molecular weight of the polyoxyalkylene portion of the polyether group PE varies from 200 to 10000 and more preferably from 350 to 4000;

$R^3$  denotes hydrogen, a  $C_1$ - $C_8$  alkyl group or a  $C_2$ - $C_8$  acyl group.

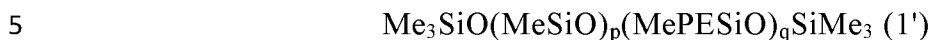
It should be noted that, when z is other than 0, the polyoxyethylene and polyoxypropylene units can be distributed randomly along the polyether chain PE or distributed in blocks or else distributed both in blocks and randomly.

Preferably, the  $R^2$  radicals are chosen from  $C_1$ - $C_4$  alkyl groups and hexyl, phenyl and benzyl groups. More particularly, the  $R^2$  radicals are chosen from alkyl groups, such as methyl, ethyl or butyl groups. More particularly still, they denote the methyl radical.

Preferably, the  $R^3$  radicals are chosen from  $C_1$ - $C_4$  alkyl groups and more particularly still denote the methyl radical.

The polyether-modified silicones of formula (1) can be obtained according to the process described in the document U.S. Pat. No. 4,847,398.

Use is preferably made, among the polyether-modified silicones of formula (1), of those of the following formula (1'):



in which

p and q have the same values as indicated above for formula (1),

Me denotes the methyl radical, and

PE denotes:



where

y and z have the same values as indicated above for formula (2), and

$\text{R}^3$  denotes hydrogen or a  $\text{C}_1$ - $\text{C}_4$  alkyl group and more particularly the methyl radical.

Mention may be made, as other families of polyether-modified silicones which can be used according to the present invention, of the branched silicones of the following formula (3):



where p and q have the same values as indicated above in formula (1), Me signifies

methyl and PE denotes the group of the following formula (4):



where

y and z have the same values as indicated above in formula (2), and

$\text{R}^3$  denotes a  $\text{C}_1$ - $\text{C}_4$  alkyl group and more particularly the methyl radical.

It is possible, of course, to use a mixture of the silicones of formula (1) and of formula (3).

Such polyether-modified silicones are sold, for example, by OSI under the trade names Silwet L-7210® (INCI name: Dimethicone Copolyol), Silwet L-7220® (INCI name: Dimethicone Copolyol); Silwet L-7002®, Silwet L-7600® (INCI name: Dimethicone Copolyol), Silwet L-7604® (INCI name: PEG-8 Dimethicone), Silwet L-7605®, Silwet L-7607®, Silwet 1614, Silwet L-7657®, Silwet L-7200® (INCI name: Dimethicone Copolyol), Silwet L-7230®, Silsoft 305® (INCI name: Dimethicone Copolyol), Silsoft 820® (INCI name: Dimethicone Copolyol), Silsoft 880® (INCI name: PEG-12 Dimethicone), XIAMETER OFX-0193 (INCI name: PEG-12 Dimethicone)

available from Dow Corning, FLUID Tego Wet 260®, Tego Wet 500®, Tego Wet 505® and Tego Wet 510®.

As examples of the polyether-modified silicones, mention may be made of PEG-10 methyl ether dimethicone, PEG-11 methyl ether dimethicone, PEG-32 methyl ether dimethicone, PEG/PPG-18/18 dimethicone, PEG/PPG-19/19 dimethicone, PEG/PPG-20/20 dimethicone, PEG/PPG-20/22 butyl ether dimethicone, PEG/PPG-30/10 dimethicone, PEG-9 dimethicone, PEG-10 dimethicone, PEG-12 dimethicone, and mixtures thereof. In one embodiment, PEG-11 methyl ether dimethicone is combined with PPG-5-buteth-5, for example, under the trade name KF 351 A from Shin Etsu.

In one embodiment, the silicone oils may be selected from the derivatives of polyether-modified silicones.

The derivative of water-soluble silicone may be a water-soluble silicone in which at least one substituent is bonded at the polysiloxane backbone of the water-soluble silicone, preferably instead of a methyl group on the polydimethylsiloxane backbone.

As the substituent, mention may be made of, for example, an alkyl group, an alkenyl group, an alkoxyl group, an amino group, and a hydroxyl group.

The alkyl group may be a linear, branched or cyclic alkyl group. The alkyl group may be a linear or branched C<sub>1</sub>-C<sub>6</sub> alkyl group, preferably C<sub>1</sub>-C<sub>4</sub> alkyl group, such as a methyl group, an ethyl group, a propyl group, an i-propyl group and a butyl group. On the other hand, the alkyl group may be a cyclic C<sub>3</sub>-C<sub>6</sub> alkyl group, such as a cyclopentyl group and a cyclohexyl group.

The alkenyl group may be a C<sub>2</sub>-C<sub>6</sub> alkenyl group such as a vinyl group, an allyl group, a butylene group, a pentenyl group and a hexenyl group.

The alkoxy group may be a C<sub>1</sub>-C<sub>6</sub> alkoxy group such as a methoxy group, an ethoxy group and a propoxy group.

The above substituent may be further substituted with at least one group such as a halogen atom, an amino group, a nitro group, a cyano group, a hydroxyl group and an aromatic group such as a phenyl group.

As examples of the derivatives of polyether-modified silicones, mention may be made of cetyl PEG/PPG-10/1 dimethicone, lauryl PEG/PPG-18/18 methicone, and mixtures thereof.

In one embodiment, the composition of the present invention comprises more than one silicone oils, and one of the silicone oils is chosen from polyether-modified silicones.

In one embodiment, the composition of the present invention comprises Dimethicones, Dimethiconols, and polyether-modified silicones as the silicone oils.

According to the present invention, the silicone oil is present in an amount ranging from about 5 wt. % to about 50 wt. %, preferably from about 15 wt. % to about 40 wt. %, or from about 18 wt. % to about 30 wt. %, relative to the total weight of the composition.

### **Actives**

The composition of the present invention comprises at least one active, which preferably includes water-soluble active ingredients, consisting substantially of or even consists of water-soluble active ingredients. The actives are chosen from C-Glycoside compounds, plant extracts, peptides, flavonoids, Vitamin C and derivatives thereof, hyaluronic acid and salts thereof, or mixtures thereof.

### **C-Glycoside Compounds**

In particular, the composition of the present invention may comprise at least one C-glycoside compound, in particular of the following general formula:



- R represents a saturated C<sub>1</sub> to C<sub>10</sub>, in particular C<sub>1</sub> to C<sub>4</sub>, alkyl radical which can optionally be substituted by at least one radical selected from OH, COOH or COOR"<sub>2</sub>, with R"<sub>2</sub> being a saturated C<sub>1</sub>-C<sub>4</sub> alkyl radical,

- S represents a monosaccharide or a polysaccharide comprising up to 20 sugar units, in particular up to 6 sugar units, in pyranose and/or furanose form and of the L and/or D series, it being possible for the said monosaccharide or polysaccharide to be substituted by a hydroxyl group which is necessarily free and optionally one or more optionally protected amine functional group(s), and

- X represents a radical selected from the -CO-, -CH(OH)-, -CH(NH<sub>2</sub>)-, -CH(NHCH<sub>2</sub>CH<sub>2</sub>CH<sub>2</sub>OH)-, -CH(NHPh)- and -CH(CH<sub>3</sub>)- groups and in particular a -CO-, -CH(OH)- or -CH(NH<sub>2</sub>)- radical and more particularly a -CH(OH)- radical,

the S-CH<sub>2</sub>-X bond represents a bond of C-anomeric nature, which can be α or β, and also their physiologically acceptable salts, their solvates, such as the hydrates, and their optical and geometrical isomers.

The C-glycoside of use for the implementation of the invention are in particular those for which R denotes a saturated linear C<sub>1</sub> to C<sub>6</sub>, in particular C<sub>1</sub> to C<sub>4</sub>, preferentially C<sub>1</sub> to C<sub>2</sub>, alkyl radical and more preferably a methyl radical.

Mention may in particular be made, among the alkyl groups suitable for the implementation of the invention, of the methyl, ethyl, isopropyl, n-propyl, n-butyl, t-butyl, isobutyl, sec-butyl, pentyl, n-hexyl, cyclopropyl, cyclopentyl or cyclohexyl groups.

According to one embodiment of the invention, use may be made of a C-glycoside corresponding to the formula (I) for which S can represent a monosaccharide or a polysaccharide comprising up to 6 sugar units, in pyranose and/or furanose form and of L and/or D series, the said mono- or polysaccharide exhibiting at least one necessarily free hydroxyl functional group and/or optionally one or more necessarily protected amine functional groups, X and R otherwise retaining all of the definitions given above.

Advantageously, a monosaccharide of the invention can be selected from D-glucose, D-galactose, D-mannose, D-xylose, D-lyxose or L-fucose, L-arabinose, L-rhamnose, D-glucuronic acid, D-galacturonic acid, D-iduronic acid, N-acetyl-D-glucosamine or N-acetyl-D-galactosamine and advantageously denotes D-glucose, D-xylose, N-acetyl-D-glucosamine or L-fucose and in particular D-xylose.

More particularly, a polysaccharide of the invention comprising up to 6 sugar units can be selected from D-maltose, D-lactose, D-cellobiose, D-maltotriose, a disaccharide combining a uronic acid selected from D-iduronic acid or D-glucuronic acid with a hexosamine selected from D-galactosamine, D-glucosamine, N-acetyl-D-galactosamine or N-acetyl-D-glucosamine, an oligosaccharide comprising at least one xylose which can advantageously be selected from xylobiose, methyl- $\beta$ -xylobioside, xylotriose, xyloetraose, xylopentaose and xylohexaose and in particular xylobiose, which is composed of two xylose molecules linked via a 1-4 bond.

More particularly, S can represent a monosaccharide selected from D-glucose, D-xylose, L-fucose, D-galactose or D-maltose and in particular D-xylose.

Preferably, use is made of a C-glycoside of formula (I) for which:

- R denotes an unsubstituted linear C<sub>1</sub>-C<sub>4</sub>, in particular C<sub>1</sub>-C<sub>2</sub>, alkyl radical, especially a methyl radical;

- S represents a monosaccharide as described above and selected in particular from D-glucose, D-xylose, N-acetyl-D-glucosamine or L-fucose, and in particular D-xylose;

- X represents a group selected from -CO-, -CH(OH)- or -CH(NH<sub>2</sub>)- and preferably a -CH(OH)- group.

The acceptable salts of the compounds described in the present invention comprise conventional non-toxic salts of the said compounds, such as those formed from organic or inorganic acids. Mention may be made, by way of example, of the salts of inorganic acids, such as sulfuric acid, hydrochloric acid. Mention may also be made of the salts of organic acids, which can comprise one or more carboxylic, sulfonic or phosphonic acid groups. Mention may in particular be made of propionic acid, acetic acid, terephthalic acid, citric acid and tartaric acid.

When the compound of formula (I) comprises an acid group, neutralization of the acid group(s) can be carried out with an inorganic base, such as LiOH, NaOH, KOH, Ca(OH)<sub>2</sub>, NH<sub>4</sub>OH, Mg(OH)<sub>2</sub> or Zn(OH)<sub>2</sub>, or with an organic base, such as a primary, secondary or tertiary alkylamine, for example triethylamine or butylamine. This primary, secondary or tertiary alkylamine can comprise one or more nitrogen and/or oxygen atoms and can thus comprise, for example, one or more alcohol functional groups; mention may in particular be made of 2-amino-2-methylpropanol, triethanolamine, 2-(dimethylamino)propanol or 2-amino-2-(hydroxymethyl)-1,3-propanediol. Mention may also be made of lysine or 3-(dimethylamino)propylamine.

The solvates which are acceptable for the compounds described in the present invention comprise conventional solvates, such as those formed during the final stage of preparation of the said compounds due to the presence of solvents. Mention may be made, by way of example, of the solvates due to the presence of water or of linear or branched alcohols, such as ethanol or isopropanol.

Of course, according to the invention, a C-glycoside corresponding to the formula (I) can be used alone or as a mixture with other C-glycoside and in any proportion.

A C-glycoside which is suitable for the invention can in particular be obtained by the synthetic method described in the document WO 02/051828.

Mention may in particular be made, by way of non-limiting illustration of the C-glycoside compounds which are particularly suitable for the invention, of the following compounds:

- C-β-D-xylopyranoside-n-propane-2-one,
- C-α-D-xylopyranoside-n-propan-2-one,
- C-β-D-xylopyranoside-2-hydroxypropane,
- C-α-D-xylopyranoside-2-hydroxypropane,
- 1-(C-β-D-fucopyranoside)propan-2-one,
- 1-(C-α-D-fucopyranoside)propan-2-one,

- 1-(C- $\beta$ -L-fucopyranoside)propan-2-one,
- 1-(C- $\alpha$ -L-fucopyranoside)propan-2-one,
- 1-(C- $\beta$ -D-fucopyranoside)-2-hydroxypropane,
- 1-(C- $\alpha$ -D-fucopyranoside)-2-hydroxypropane,
- 5 - 1-(C- $\beta$ -L-fucopyranoside)-2-hydroxypropane,
- 1-(C- $\alpha$ -L-fucopyranoside)-2-hydroxypropane,
- 1-(C- $\beta$ -D-glucopyranosyl)-2-hydroxypropane,
- 1-(C- $\alpha$ -D-glucopyranosyl)-2-hydroxypropane,
- 1-(C- $\beta$ -D-galactopyranosyl)-2-hydroxypropane,
- 10 - 1-(C- $\alpha$ -D-galactopyranosyl)-2-hydroxypropane,
- 1-(C- $\beta$ -D-fucofuranosyl)propan-2-one,
- 1-(C- $\alpha$ -D-fucofuranosyl)propan-2-one,
- 1-(C- $\beta$ -L-fucofuranosyl)propan-2-one,
- 1-(C- $\alpha$ -L-fucofuranosyl)propan-2-one,
- 15 - C- $\beta$ -D-maltopyranoside-n-propane-2-one,
- C- $\alpha$ -D-maltopyranoside-n-propan-2-one,
- C- $\beta$ -D-maltopyranoside-2-hydroxypropane,
- C- $\alpha$ -D-maltopyranoside-2-hydroxypropane, their isomers and their mixtures.

According to one embodiment, C- $\beta$ -D-xylopyranoside-2-hydroxypropane or C- $\alpha$ -D-xylopyranoside-2-hydroxypropane and better still C- $\beta$ -D-xylopyranoside-2-hydroxypropane can advantageously be used for the preparation of a composition according to the invention.

According to a specific embodiment, the C-glycoside can be C- $\beta$ -D-xylopyranoside-2-hydroxypropane (or hydroxypropyl tetrahydropyrantriol) provided in the form of a solution containing 75% by weight of active material in water and propylene glycol.

25 In one embodiment, the composition of the present invention comprises hydroxypropyl tetrahydropyrantriol under the name MEXORYL SDL available from NOVEAL.

### **Plant extracts**

30 The plant extracts that may be comprised in the composition of the present invention may include TUBER AESTIVUM EXTRACT, LEONTOPODIUM ALPINUM CALLUS CULTURE EXTRACT, VITIS VINIFERA (GRAPE) SEED EXTRACT, PTEROCARPUS MARSUPIUM BARK EXTRACT, WINE EXTRACT, PYRUS MALUS

(APPLE) SEED EXTRACT, FAGUS SYLVATICA BUD EXTRACT, HYDROLYZED ADANSONIA DIGITATA EXTRACT, ARTEMIA EXTRACT, IRIS FLORENTINA ROOT EXTRACT, SALVIA MILTIORRHIZA EXTRACT, COFFEA ARABICA EXTRACT, or mixtures thereof.

5 The plant extracts may also include an extract of Helianthus annulus extract like Antiglyskin® from Silab, wine extracts such as the powdery white wine extract on a maltodextrin support sold under the name of “Dehydrated white wine 2F” by Givaudan, a mixture of bearberry extract and marine glycogen like Aglycal LS 8777® from Laboratoires Seriobiologiques, a black tea extract such as Kombuchka® from Sederma, or  
10 mixtures thereof.

The plant extracts may also include a leaf extract of Cassia alata sold under the name DN-Age™ and/or an extract of lychees sold under the name Litchiderm™, a combination of an extract of Salvia miltiorrhiza and of niacinamide, sold under the name CollRepair™, an extract of Cichorium intybus sold under the name Lox-Age™, an extract  
15 of Achillea millefolium sold under the name Neurobiox™, an extract of Polygonum bistorta sold under the name Perlaura™, an extract of Alpinia galanga sold under the name Hyalufix™, an extract of corn sold under the name Deliner™, an extract of Voandzeia subterranea sold under the name Epigenist™, or mixtures thereof.

In one embodiment, the composition of the present invention comprises a  
20 combination of niacinamide and Salvia miltiorrhiza leaf extract, under the trade name of COLLREPAIR DG BC10036, available from BASF BEAUTY CARE SOLUTION.

### **Peptides**

The peptides that may be comprised in the composition of the present invention  
25 may include the palmitoyl of glycine-histidine-lysine tripeptide such as that sold under the name “Biopeptide CL” by the company Sederma; the palmitoyl of valine-glycine-valine-alanine-proline-glycine hexapeptide such as that sold under the name “Biopeptide EL” by the company Sederma; the hexapeptide glutamic acid- glutamic acid-methionine-glutamic acid-arginine-argine, the first (N-terminal) being acetylated and the last (C-  
30 terminal) being amidated, as sold under the name Argireline by the company Lipotec; the palmitoyl of lysine-threonine-threonine-lysine-serine pentapeptide sold in particular under the name “Matrixyl” by the company Sederma; the N-β-alanine-L-histidine dipeptide such as that sold under the name “Carnosine” by the company Carlbiotech;

carcinine hydrochloride (sold by Exsymol under the name “Austin”); the palmitoyl of glycine-glutamine-proline-arginine tetrapeptide, as sold under the name “Rigin” by the company Sederma; N-acetyl-tyrosine-arginine hexadecyl ester such as that sold under the name “Calmosensine” by the company Sederma; the palmitoyl of lysine-threonine-threonine-lysine-serine pentapeptide, such as that sold under the name “Palmitoyl-KTTKS” by the company Sederma; the hexapeptide lysine-leucine-aspartic acid-alanine-proline-threonine, such as that sold under the name “Peptide Vinci 02” by the company Vincience; the hexapeptide glycine-proline-glutamine-glycine-proline-glutamine, such as that sold under the name “Collaxyl” by the company Vincience; the arginine and lysine polypeptides such as that sold under the name “Amadorine” by the company Solabia; N-acetyl-tyrosine-arginine hexadecyl ester, such as that sold under the name “Sensicalmine” by the company Sederma; the glycine-histidine-lysine tripeptide in the form of a cupric complex, such as that sold under the name “Hyamin” by the company Procyte; or mixtures thereof.

In one embodiment, the composition of the present invention comprises palmitoyl tripeptides, palmitoyl tetrapeptides, carnosines or mixtures thereof.

### **Flavonoids**

The flavonoid that may be comprised in the composition of the present invention may be a flavanone (derivative of 2,3-dihydro-2-phenylchromen-4-one). Flavones include: Butin, Eriodictyol, Hesperetin, Hesperidin, Homoeriodictyol, Isosakuranetin, Naringenin, Naringin, Pinocembrin, Poncirin, Sakuranetin, Sakuranin, and Sterubin. The flavonoid may be a flavanonol (derivative of 3-hydroxy-2,3-dihydro-2-phenylchromen-4-one). Flavanols include: Taxifolin, Aromadectrin, Chrysandroside A, Chrysandroside B, Xeractinol, Astilbin, and Fustin. The flavonoid may be a flavone (derivative of 2-phenylchromen-4-one). Flavones include: Apigenin, Luteolin, Tangeritin, Chrysin, Baicalein, Scutellarein, Wogonin, Synthetic Flavones: Diosmin, and Flavoxate. The flavonoid may be a flavonol (derivative of 3-hydroxy-2-phenylchromen-4-one). Flavonols include: 3-Hydroxyflavone, Azaleatin, Fisetin, Galangin, Gossypetin, Kaempferide, Kaempferol, Isorhamnetin, Morin, Myricetin, Natsudaaidain, Pachypodol, Quercetin, Rhamnazin, Rhamnetin, Azalein, Hyperoside, Isoquercetin, Kaempferitrin, Myricitrin, Quercitrin, Robinin, Rutin, Spiraeoside, Xanthorhamnin, Amurensin, Icariin, and Troxerutin. The flavonoid may be a flavan-3-ol (derivatives of 2-phenyl-3,4-dihydro-2H-chromen-3-ol). Flavan-3-ols include: Catechin, Epicatechin, Epigallocatechin,

Epicatechin gallate, Epigallocatechin gallate, Epiafzelechin, Fisetinidol, Guibourtinidol, Mesquitol, and Robinetinidol. The flavonoid may be a flavan-4-ol (derivative of 2-phenylchroman-4-ol). Flavan-4-ols include: Apiforol and Luteoforol. The flavonoid may be an isoflavone (derivative of 3-phenylchromen-4-one). Isoflavones include: Genistein, Daidzein, Biochanin A, Formononetin, and the Equol metabolite from Daidzein.

In one embodiment, the composition of the present invention comprises a combination of N-hydroxysuccinimide, Palmitoyl Tripeptide-1, Chrysin, Palmitoyl Tetrapeptide-7 and Biotin, under the trade name of HALOXYL, available from SEDERMA (CRODA).

### **Vitamin C and derivatives thereof**

Vitamin C that may be comprised in the composition of the present invention may have a D-configuration or L-configuration, and the L-configuration one is preferably employed. Vitamin C is also referred to as ascorbic acid, and has effects of inhibiting the production of melanin due to the strong reduction effects of ascorbic acid. The derivatives of ascorbic acid may be salts of ascorbic acid, and the salts of ascorbic acid are preferably selected from sodium ascorbate, magnesium ascorbyl phosphate, and sodium ascorbyl phosphate. The derivatives of ascorbic acids may be glycosides of ascorbic acid or esters of ascorbic acid. As an example of glycosides of ascorbic acid, mention may be made of, for example, ascorbyl glucoside. As examples of esters of ascorbic acid, mention may be made of, for example, silyl ascorbate, tocopheryl ascorbate, and alkyl ascorbate. As the alkyl ascorbate, methyl ascorbate or ethyl ascorbate is preferably used. In particular, ascorbyl glucoside is preferable. Ascorbic acid or derivatives thereof can be used alone or in combination with two or more types thereof.

As detailed examples of derivatives of ascorbic acid, mention may be made of, for example, 5,6-di-O-dimethylsilyl ascorbate, which is commercially available as PRO-AA from Exsymol SAM; dl-alpha-tocopheryl-2-l-ascorbyl phosphate which is commercially available as SEPIVITAL EPC from Senju Pharmaceutical Co., Ltd.; sodium ascorbyl phosphate which is commercially available as Stay-C 50 from Roche; ascorbyl glucoside which is commercially available from Hayashibara Biochemical Labs., Inc.; 3-O-ethyl ascorbic acid; and the like.

In one embodiment, the composition of the present invention comprises 3-O-ethyl ascorbic acid, under the trade name of SPECWHITE VCE, available from SPECICHEM INDUSTRY.

**Hyaluronic acid and salts thereof**

The composition of the present invention may comprise hyaluronic acid, and/or one of its salts.

Hyaluronic acid is a non-sulfated linear glycosaminoglycan composed by repetitive  
5 units of D-glucuronic acid and N-acetyl-D-glucosamine.

According to the invention, the hyaluronic acid preferably has a number average molecular weight ranging from 500 Da to 10 MDa, and more particularly ranging from 2 KDa to 2 MDa.

As examples of a hyaluronic acid that is suitable for the present invention, mention  
10 may be made in particular of animal-based hyaluronic acids, whether cross-linked or not, such as those marketed under the name Hylaform® by the company Genzyme, or genetic-based hyaluronic acids including those intended for superficial, periorbital or perioral wrinkles, such as those marketed under the name Restylane Fine Lines® by the laboratory Q-Med, or intended for deep wrinkles, lip-chin and oval depressions of the  
15 face, such as those marketed under the names Perlane® and Restylane Sub-Q® by the laboratory Q- Med. Preferably, as examples of a hyaluronic acid that is suitable for the present invention, mention may be made of those marketed under the name Restylane® by the laboratory Q- Med and under the name Surgiderm® by the laboratory Corneal.

Mention may also be made of the low molecular weight (50 kDa) hyaluronic acid  
20 provided by Evonik under the name Hyacare 50®, and sodium hyaluronate by GIVAUDAN under the trade name RENOVHYAL LO (Mw=20 to 50 kDa).

Among the hyaluronic acid salts, mention may be made in particular of sodium salts, potassium salts, zinc salts, silver salts, and mixtures thereof. More particularly, as examples of hyaluronic acid salts, mention may be made of potassium hyaluronate and  
25 sodium hyaluronate, preferably sodium hyaluronate.

Preferably, the hyaluronic acid of the composition according to the invention is present in salified form, preferably in the form of sodium hyaluronate.

In one embodiment, the actives comprised in the composition of the present invention include PRO-XYLANE™ and/or HALOXYL™, and preferably include PRO-  
30 XYLANE™, e.g. the hydroxypropyl tetrahydropyrantriol under the name MEXORYL SDL available from NOVEAL.

According to the present invention, the actives are present in an amount ranging from about 0.01 wt. % to about 40 wt. %, preferably from about 0.1 wt. % to about 20

wt.%, or from about 1 wt. % to about 10 wt.%, relative to the total weight of the composition.

### **Solvents**

5 Generally, the composition of the present invention comprises at least one solvent. Hereinafter, the term “solvent” in the present application does not include the above silicone oils.

The solvent comprised in the composition of the present invention comprises one or more water-miscible or at least partially water-miscible compounds, especially pure water.

10 In one embodiment, the composition of the present invention does not comprise any oil-soluble solvents or organic solvents other than the above silicone oils. In one embodiment, the solvent comprised in the composition of the present invention is consisting of water.

Advantageously, the solvent is present in an amount ranging from about 25 wt. % to about 90 wt. %, preferably from about 30 wt. % to about 85 wt.%, or from about 40 wt. % to about 80 wt.%, relative to the total weight of the composition.

### **Other ingredients**

20 The composition of the present invention may also comprise conventional cosmetic adjuvants or additives, for instance fragrances, preserving agents (for example, chlorphenesin and phenoxyethanol) and bactericides, pH regulators (for example citric acid), thickeners such as xanthan gum, and mixtures thereof.

The skilled in the art can select the amount of the additional adjuvants or additive so as not to adversely impact the final use of the composition according to the present invention.

### **Compositions**

30 In one embodiment, the composition of the present invention is preferably in the form of oil-in-water emulsion. In one embodiment, the composition according to the present invention is a cosmetic composition for skin care, and especially for caring the skin around eyes. Preferably, the composition of the present invention is an anti-aging and anti-glycation composition.

In one embodiment, the present invention relates to an anti-aging and anti-glycation composition, comprising silicone elastomers, including at least one emulsifying silicone

elastomer, and at least one non-emulsifying silicone elastomer; at least one silicone oil; and more than one actives including water-soluble active ingredients, wherein the weight ratio of the emulsifying silicone elastomer to the non-emulsifying silicone elastomer ranges from about 1 : 35 to about 1 : 10, preferably from about 1 : 30 to about 1 : 15, or  
5 from about 1 : 28 to about 1 : 20. The silicone elastomers, the silicone oils and the actives are defined above.

In one embodiment, the present invention relates to an oil-in-water emulsion for caring the skin around eyes, comprising silicone elastomers, including at least one emulsifying silicone elastomer, and at least one non-emulsifying silicone elastomer; at  
10 least one silicone oil; and more than one anti-aging and anti-glycation actives including water-soluble active ingredients, wherein the weight ratio of the emulsifying silicone elastomer to the non-emulsifying silicone elastomer ranges from about 1 : 35 to about 1 : 10, preferably from about 1 : 30 to about 1 : 15, or from about 1 : 28 to about 1 : 20. The silicone elastomers, the silicone oils and the actives are defined above.

In one embodiment, the present invention relates to an oil-in-water emulsion for caring the skin around eyes, comprising silicone elastomers, including at least one emulsifying silicone elastomer, and at least one non-emulsifying silicone elastomer; at  
15 least one silicone oil; and more than one anti-aging and anti-glycation actives including water-soluble active ingredients, wherein the weight ratio of the emulsifying silicone elastomer to the non-emulsifying silicone elastomer ranges from about 1 : 30 to about 1 : 15, or from about 1 : 28 to about 1 : 20, wherein the oil-in-water emulsion further comprises an amount from about 40 wt. % to about 80 wt.% of water, relative to the total weight of the composition, and the actives include PRO-XYLANE™. The silicone elastomers, the silicone oils and the actives are defined above.

According to the above embodiments, preferably, said at least one silicone oil includes a first silicone oil and/or a second silicone oil, and the non-emulsifying silicone elastomer is existed as a mixture with the first silicone oil before being added into the composition and/or the emulsifying silicone elastomer is existed as a mixture with the  
25 second silicone oil before being added into the composition. More preferably, the silicone oil further includes a third silicone oil, wherein the third silicone oil is the same as the first and/or second silicone oil or different from both of them. In one embodiment, the third silicone oil includes one or more polyether-modified silicones and/or neither of the first and second silicone oil includes polyether-modified silicones. All of the first, second and third silicone oils are defined as those mentioned in the "silicone oils" section.

Still preferably, the third silicone oil is present in an amount ranging from about 0.1 wt. % to about 20 wt. %, preferably from about 1 wt. % to about 15 wt.%, or from about 2 wt. % to about 10 wt.%, e.g. about 5 wt%, relative to the total weight of the composition.

5

### **Combinations**

According to another aspect, the present invention relates to a combination for improving sensation on skin during and after applying a cosmetic, especially the cosmetic comprising anti-aging and anti-glycation actives, comprising, consisting  
10 substantially of, or even consisting of silicone elastomers, including at least one emulsifying silicone elastomer, and at least one non-emulsifying silicone elastomer; and at least one silicone oil, wherein the weight ratio of the emulsifying elastomer to the non-emulsifying elastomer ranges from about 1 : 35 to about 1 : 10, preferably from about 1 : 30 to about 1 : 15, or from about 1 : 28 to about 1 : 20, and the actives are anti-aging and  
15 anti-glycation actives including, consisting substantially of or even consisting of water-soluble active ingredients. The silicone elastomers, the silicone oils and the actives are defined above.

### **Method and use**

20 According to another aspect, the present invention relates to a process for caring the skin, in particular for skin around eyes, by applying the composition of the present invention on the skin.

In one embodiment, the process comprises the following steps in order, washing the skin, wiping the skin, and applying the composition of the present invention on the skin,  
25 and optionally massaging the skin for about 2 seconds to about 20 seconds.

In one embodiment, before or after applying the composition of the present invention on the skin, one or more compositions, e.g. those for skin-care, skin-whitening, and sunscreen, may also be applied.

According to still another aspect, the present invention relates to use of a  
30 combination for improving sensation on skin during and after applying a cosmetic, especially the cosmetic comprising anti-aging and anti-glycation actives, wherein the combination comprises, consists substantially of, or even consists of silicone elastomers, including at least one emulsifying silicone elastomer, and at least one non-emulsifying silicone elastomer; and at least one silicone oil, and wherein the weight ratio of the

emulsifying elastomer to the non-emulsifying elastomer ranges from about 1 : 35 to about 1 : 10, preferably from about 1 : 30 to about 1 : 15, or from about 1 : 28 to about 1 : 20, and the actives are anti-aging and anti-glycation actives including, consisting substantially of, or even consisting of water-soluble active ingredients. The silicone elastomers, the silicone oils and the actives are defined above.

The present invention is illustrated in greater detail by the examples described below, which are given as non-limiting illustrations.

### **EXAMPLES**

Main raw materials used, trade names and supplier thereof were listed in Table 1.

Table 1

| INCI Name                                                | Trade Name                 | Supplier                      |
|----------------------------------------------------------|----------------------------|-------------------------------|
| AMMONIUM POLYACRYLOYLDIMETHYL<br>TAURATE                 | HOSTACERIN AMPS            | CLARIANT                      |
| PEG-11 METHYL ETHER DIMETHICONE (and)<br>PPG-5-BUTETH-5  | KF 351 A                   | SHIN ETSU                     |
| PEG-12 DIMETHICONE                                       | XIAMETER OFX-0193<br>FLUID | DOW CORNING<br>(DOW CHEMICAL) |
| DIMETHICONE (and) POLYSILICONE-11                        | GRANSIL DMG-6LC            | GRANT INDUSTRIES              |
| DIMETHICONE (and) DIMETHICONE/PEG-<br>10/15 CROSSPOLYMER | KSG-210                    | SHIN ETSU                     |
| DIMETHICONE (and) DIMETHICONOL                           | MIRASIL D-DML LV<br>A2     | ELKEM SILICONES               |
| HYDROXYPROPYL<br>TETRAHYDROPYRANTRIOL                    | MEXORYL SDL                | NOVEAL                        |
| 3-O-ETHYL ASCORBIC ACID                                  | SPECWHITE VCE              | SPECICHEM<br>INDUSTRY         |

### **Inventive Example A and Comparative Examples B-D**

The compositions according to inventive formula Ex.A and comparative formulas CE. B-D were prepared with the ingredients listed in Table 2 (the contents were expressed as weight percentages of ingredients with regard to the total weight of each

composition, unless otherwise indicated, and Table 2 only listed the main components of the compositions, and thus the compositions might further comprise other minor components):

Table 2

| Phase                                                                                | Component                                            | Ingredient                            | Ex.A      | CE.B      | CE.C      | CE.D      | CE.E      | CE.F      |
|--------------------------------------------------------------------------------------|------------------------------------------------------|---------------------------------------|-----------|-----------|-----------|-----------|-----------|-----------|
| A                                                                                    | WATER                                                |                                       | QS to 100 | QS to 100 | QS to 100 | QS to 100 | QS to 100 | QS to 100 |
| B                                                                                    | AMMONIUM POLYACRYLOYLDIMETHYL TAURATE                | AMMONIUM POLYACRYLOYLDIMETHYL TAURATE | 0.75      | 0.75      | 0.75      | 0.75      | 0.75      | 0.75      |
| C                                                                                    | PEG-11 METHYL ETHER DIMETHICONE (and) PPG-5-BUTETH-5 | PEG-11 METHYL ETHER DIMETHICONE       | 0.54      | 0.54      | /         | 0.54      | 0.54      | 0.54      |
|                                                                                      |                                                      | PPG-5-BUTETH-5                        | 0.06      | 0.06      | /         | 0.06      | 0.06      | 0.06      |
|                                                                                      | PEG-12 DIMETHICONE                                   | PEG-12 DIMETHICONE                    | 0.6       | 0.6       | /         | 0.6       | 0.6       | 0.6       |
|                                                                                      | DIMETHICONE (and) DIMETHICONOL                       | DIMETHICONE                           | 2.64      | 2.64      | /         | 2.64      | 2.64      | 2.64      |
|                                                                                      |                                                      | DIMETHICONOL                          | 0.36      | 0.36      | /         | 0.36      | 0.36      | 0.36      |
|                                                                                      |                                                      |                                       |           |           |           |           |           |           |
| D                                                                                    | DIMETHICONE (and) POLYSILICONE-11                    | DIMETHICONE                           | 17.64     | 17.64     | 17.64     | 8.4       | 17.64     | 25.2      |
|                                                                                      |                                                      | POLYSILICONE-11                       | 3.36      | 3.36      | 3.36      | 1.6       | 3.36      | 4.8       |
|                                                                                      | DIMETHICONE (and) DIMETHICONE/PEG-10/15 CROSSPOLYMER | DIMETHICONE                           | 0.37      | /         | 0.37      | 0.37      | 1.11      | 0.37      |
|                                                                                      |                                                      | DIMETHICONE/PEG-10/15 CROSSPOLYMER    | 0.125     | /         | 0.125     | 0.125     | 0.375     | 0.125     |
| F                                                                                    | HYDROXYPROPYL TETRAHYDROPYRANTRIOL                   | HYDROXYPROPYL TETRAHYDROPYRANTRIOL    | 2.5       | 2.5       | 2.5       | 2.5       | 2.5       | 2.5       |
|                                                                                      | 3-O-ETHYL ASCORBIC ACID                              | 3-O-ETHYL ASCORBIC ACID               | 0.105     | 0.105     | 0.105     | 0.105     | 0.105     | 0.105     |
| Weight Ratio of POLYSILICONE-11 to DIMETHICONE/PEG-10/15 CROSSPOLYMER by calculation |                                                      |                                       | 26.88     | /         | 26.88     | 12.8      | 8.96      | 38.4      |

5 Note: PEG-11 METHYL ETHER DIMETHICONE (and) PPG-5-BUTETH-5: 90% peg-11 methyl ether dimethicone; 10% ppg-5-buteth-5

DIMETHICONE (and) DIMETHICONOL: 88% dimethicone; 12% dimethiconol

DIMETHICONE (and) POLYSILICONE-11: 84% dimethicone, 16% polysilicone-11

DIMETHICONE (and) DIMETHICONE/PEG-10/15 CROSSPOLYMER: 25% dimethicone/peg-10/15 crosspolymer, 74.28% dimethicone, 0.5% dipropylene glycol, 0.2% sodium citrate, 0.02% tocopherol.

#### Preparation procedure:

- 5 The compositions were prepared as follows:
- 1). adding Phase A into the main kettle, keeping mixing it under 75 °C until all the raw materials solved to a clear liquid phase;
  - 2). adding Phase B into the main kettle and using turbine to disperse it;
  - 3). pre-mixing Phases C+D to be a continuous fluid paste;
  - 10 4). adding Phases C+D into the main kettle and mixing the materials;
  - 5). adding Phase F and mixing the materials.

#### Performance of the compositions

- 16 women consumers at the age of 25-40 with all types of skins were recruited.
- 15 They stayed at room temperature (about 25 °C), and applied the test samples on their eye areas, then answered questionnaires to give scores of skin stickiness, moisturization, and soft film.

Table 3. 1<sup>st</sup> sensory comparison test:

|            | Ex. A | CE. B |
|------------|-------|-------|
| Stickiness | 2     | 14    |
| Moisture   | 13    | 3     |
| Soft film  | 15    | 1     |

- 20 From the data in Table 3, it could be seen that the composition of CE. B did not comprise any emulsifying elastomers, wherein 14 people felt that CE. B had a more sticky skin sensation than Ex. A while 13 people felt that Ex. A provided more moisture skin finish and 15 people felt Ex. A provided soft film. Therefore, it could be seen that the composition of Ex. A efficiently improved skin sensation on less stickiness, more
- 25 moisturization, and soft film property of the compositions, relative to the compositions which did not comprise emulsifying elastomers.

Table 4. 2<sup>nd</sup> sensory comparison test:

|            | Ex. A | CE. C |
|------------|-------|-------|
| Stickiness | 4     | 12    |
| Moisture   | 11    | 5     |
| Soft film  | 10    | 6     |

From the data in Table 4, it could be seen that the composition of CE. C did not comprise extra silicone oils other than those in the mixture with the elastomers, wherein 12 people felt that CE. C had a more sticky skin sensation than Ex. A while 11 people felt that Ex. A provided more moisture skin finish and 10 people felt Ex. A provided soft film. Therefore, it could be seen that the composition of Ex. A efficiently improved skin sensation on less stickiness, more moisturization, and soft film property of the compositions, relative to the compositions which did not comprise extra silicone oils.

Table 5. 3<sup>rd</sup> sensory comparison test:

|            | Ex. A | CE. D |
|------------|-------|-------|
| Stickiness | 1     | 15    |
| Moisture   | 13    | 3     |
| Soft film  | 12    | 4     |

From the data in Table 5, it could be seen that the composition of CE. D comprised a less amount of non-emulsifying elastomer than that in Ex. A, wherein 15 people felt that CE. D had a more sticky skin sensation than Ex. A while 13 people felt that Ex. A provided more moisture skin finish and 12 people felt Ex. A provided soft film. Therefore, it could be seen that the composition of Ex. A efficiently improved skin sensation on less stickiness, more moisturization, and soft film property of the compositions, relative to the compositions which did not comprise the specific ratio of non-emulsifying elastomer to emulsifying elastomer of the present invention.

Table 6. 4<sup>th</sup> sensory comparison test:

|            | Ex. A | CE. E |
|------------|-------|-------|
| Stickiness | 4     | 12    |
| Moisture   | 12    | 4     |
| Soft film  | 13    | 3     |

From the data in Table 6, it could be seen that the composition of CE. E comprised a higher amount of emulsifying elastomer than that in Ex. A, wherein 12 people felt that CE. E had a more sticky skin sensation than Ex. A while 12 people felt that Ex. A provided more moisture skin finish and 13 people felt Ex. A provided soft film. Therefore, it could be seen that the composition of Ex. A efficiently improved skin sensation on less stickiness, more moisturization, and soft film property of the compositions, relative to the compositions which did not comprise the specific ratio of non-emulsifying elastomer to emulsifying elastomer of the present invention.

Table 7. 5<sup>th</sup> sensory comparison test:

|            | Ex. A | CE. F |
|------------|-------|-------|
| Stickiness | 6     | 10    |
| Moisture   | 10    | 6     |
| Soft film  | 12    | 4     |

From the data in Table 7, it could be seen that the composition of CE. F comprised a higher amount of non-emulsifying elastomer than that in Ex. A, wherein 10 people felt that CE. F had a more sticky skin sensation than Ex. A while 10 people felt that Ex. A provided more moisture skin finish and 12 people felt Ex. A provided soft film. Therefore, it could be seen that the composition of Ex. A efficiently improved skin sensation on less stickiness, more moisturization, and soft film property of the compositions, relative to the compositions which did not comprise the specific ratio of non-emulsifying elastomer to emulsifying elastomer of the present invention.

Further, when formulating the composition of CE. F, it was found that this composition even brought thicker bulk and thus it was hard to spread this composition.

## CLAIMS

1. A composition for caring keratin material, especially an anti-aging and anti-glycation composition, preferably in the form of an oil-in-water emulsion, comprising

5 (a) silicone elastomers, including

(a1) at least one emulsifying silicone elastomer, and

(a2) at least one non-emulsifying silicone elastomer;

(b) at least one silicone oil; and

10 (c) at least one active, which preferably includes water-soluble active ingredients,

wherein the weight ratio of the emulsifying silicone elastomer to the non-emulsifying silicone elastomer ranges from 1 : 35 to 1 : 10, preferably from 1 : 30 to 1 : 15, or from 1 : 28 to 1 : 20.

15 2. The composition according to claim 1, wherein said at least one silicone oil includes a first silicone oil and/or a second silicone oil, and the non-emulsifying silicone elastomer is existed as a mixture with the first silicone oil before being added into the composition and/or the emulsifying silicone elastomer is existed as a mixture with the second silicone oil before being added into the composition; preferably, said at least one  
20 silicone oil further includes a third silicone oil, and the third silicone oil is the same as the first and/or second silicone oil or different from both of them.

3. The composition according to claim 1 or 2, wherein the emulsifying silicone elastomer is chosen from silicone elastomers comprising at least one oxyalkylenated  
25 chain and/or at least one glycerylated chain; preferably is selected from the group consisting of Dimethicone/PEG-10 Dimethicone vinyl dimethicone crosspolymer, PEG-10 Dimethicone Crosspolymer, Dimethicone/PEG-10/15 crosspolymer, PEG-15/lauryl dimethicone crosspolymer, PEG-15/lauryl polydimethylsiloxylethyl dimethicone crosspolymer, PEG-12 dimethicone crosspolymer, Dimethicone/Polyglycerin-3  
30 Crosspolymer, Lauryl dimethicone/polyglycerin-3 crosspolymer, and mixtures thereof.

4. The composition according to any one of the preceding claims, wherein the non-emulsifying silicone elastomer is selected from the group consisting of Dimethicone

Crosspolymer, Vinyl Dimethicone Crosspolymer, Dimethicone/Vinyl Dimethicone Crosspolymer, Dimethicone Crosspolymer-3, and mixtures thereof.

5        5. The composition according to any one of the preceding claims, wherein all of the first, second and third silicone oil are chosen from linear, branched, or cyclic silicones, optionally modified with at least one organo-functional moiety or group, including polyether-modified silicones; preferably, are selected from the group consisting of Dimethicones, Dimethiconols, PEG-10 methyl ether dimethicone, PEG-11 methyl ether dimethicone, PEG-32 methyl ether dimethicone, PEG/PPG-18/18 dimethicone, 10 PEG/PPG-19/19 dimethicone, PEG/PPG-20/20 dimethicone, PEG/PPG-20/22 butyl ether dimethicone, PEG/PPG-30/10 dimethicone, PEG-9 dimethicone, PEG-10 dimethicone, PEG-12 dimethicone, and mixtures thereof.

15        6. The composition according to any one of the preceding claims, wherein the active is selected from the group consisting of C-Glycoside compounds, plant extracts, peptides, flavonoids, Vitamin C and derivatives thereof, hyaluronic acid and salts thereof, and mixtures thereof; preferably, is selected from the group consisting of Tuber Aestivum Extract, Leontopodium Alpinum Callus Culture Extract, carnosines, Salvia Miltiorrhiza Leaf Extract, polypeptides or oligopeptides, niacinamides, chrysins, biotins, 20 hydroxypropyl tetrahydropyrantriols, ascorbic acids, hyaluronic acid and/or sodium hyaluronate, and mixtures thereof.

25        7. The composition according to any one of the preceding claims, wherein the emulsifying silicone elastomer is present in an amount ranging from 0.01 wt. % to 5 wt. %, preferably from 0.1 wt. % to 3 wt.%, or from 0.2 wt. % to 2 wt.%, relative to the total weight of the composition.

30        8. The composition according to any one of the preceding claims, wherein the non-emulsifying silicone elastomer is present in an amount ranging from 0.01 wt. % to 40 wt. %, preferably from 1 wt. % to 30 wt.%, or from 5 wt. % to 25 wt.%, relative to the total weight of the composition.

9. The composition according to any one of the preceding claims, wherein the third silicone oil is present in an amount ranging from 0.1 wt. % to 20 wt. %, preferably from 1

wt. % to 15 wt.%, or from 2 wt. % to 10 wt.%, relative to the total weight of the composition.

10. The composition according to any one of the preceding claims, wherein the  
5 actives are anti-aging and anti-glycation actives consisting substantially of, or even consisting of water-soluble active ingredients, and the active is present in an amount ranging from 0.01 wt. % to 40 wt. %, preferably from 0.1 wt. % to 20 wt.%, or from 1 wt. % to 10 wt.%, relative to the total weight of the composition.

10 11. The composition according to any one of the preceding claims, wherein the composition further comprises water, and the water is present in an amount ranging from 25 wt. % to 90 wt. %, preferably from 30 wt. % to 85 wt.%, or from 40 wt. % to 80 wt.%, relative to the total weight of the composition.

15 12. A combination for improving sensation on skin during and after applying a cosmetic, comprising, consisting substantially of, or even consisting of

(a) silicone elastomers, including

(a1) at least one emulsifying silicone elastomer, and

(a2) at least one non-emulsifying silicone elastomer, and

20 (b) at least one silicone oil, and

wherein the weight ratio of the emulsifying elastomer to the non-emulsifying elastomer ranges from 1 : 35 to 1 : 10, preferably from 1 : 30 to 1 : 15, or from 1 : 28 to 1 : 20, and the active preferably includes water-soluble active ingredients.

25 13. The combination according to claim 12, wherein the emulsifying silicone elastomer is chosen from silicone elastomers comprising at least one oxyalkylenated chain and/or at least one glycerylated chain; preferably is selected from the group consisting of Dimethicone/PEG-10 Dimethicone vinyl dimethicone crosspolymer, PEG-10 Dimethicone Crosspolymer, Dimethicone/PEG-10/15 crosspolymer, PEG-15/lauryl dimethicone crosspolymer, PEG-15/lauryl polydimethylsiloxylethyl dimethicone crosspolymer, PEG-12 dimethicone crosspolymer, Dimethicone/Polyglycerin-3 Crosspolymer, Lauryl dimethicone/polyglycerin-3 crosspolymer, and mixtures thereof, and/or the non-emulsifying silicone elastomer is selected from the group consisting of

Dimethicone Crosspolymer, Vinyl Dimethicone Crosspolymer, Dimethicone/Vinyl Dimethicone Crosspolymer, Dimethicone Crosspolymer-3, and mixtures thereof.

14. The combination according to claim 12 or 13, wherein the silicone oil is chosen  
5 from linear, branched, or cyclic silicones, optionally modified with at least one organo-  
functional moiety or group, including polyether-modified silicones; preferably, is  
selected from the group consisting of Dimethicones, Dimethiconols, PEG-10 methyl ether  
dimethicone, PEG-11 methyl ether dimethicone, PEG-32 methyl ether dimethicone,  
PEG/PPG-18/18 dimethicone, PEG/PPG-19/19 dimethicone, PEG/PPG-20/20  
10 dimethicone, PEG/PPG-20/22 butyl ether dimethicone, PEG/PPG-30/10 dimethicone,  
PEG-9 dimethicone, PEG-10 dimethicone, PEG-12 dimethicone, and mixtures thereof.

## INTERNATIONAL SEARCH REPORT

International application No.

PCT/CN2022/123084

**A. CLASSIFICATION OF SUBJECT MATTER**

A61K8/894(2006.01)i; A61K8/891(2006.01)i; A61K8/89(2006.01)i; A61Q19/08(2006.01)i; A61Q19/00(2006.01)i

According to International Patent Classification (IPC) or to both national classification and IPC

**B. FIELDS SEARCHED**

Minimum documentation searched (classification system followed by classification symbols)

IPC:A61K,A61Q

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

CNTEXT;WPABSC;WPABS;ENTXT;DWPI;ENTXTC;VEN;TWMED;AUABS;TWTXT;EPTXT;USTXT;WOTXT;emulsion, emulsifying,non-emulsifying,silicone elastomer,dimethicone,crosspolymer,vinyldimethicone crosspolymer,dimethicone/vinyldimethicone,dimethicone, polysilicone-11,dmg-6lc,ksg-6,ksg-15,ksg-18,ksg-41,ksg-42,ksg-43,ksg-44,9040,9041,9506, 9045,ksg6,ksg15,ksg18,ksg41,ksg42,ksg43,ksg44,dimethicone/PEG-10 dimethicone vinyl dimethicone,PEG-10 dimethicone crosspolymer,dimethicone/PEG-10/15 crosspolymer,PEG-15/lauryl dimethicone,PEG-15/laurylpolydimethylsiloxymethylmethacrylate,PEG-12 dimethicone,dimethicone/polyglycerin-3,lauryl dimethicone/polyglycerin-3,ksg-21,ksg-20,ksg-240,ksg-710

**C. DOCUMENTS CONSIDERED TO BE RELEVANT**

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Further documents are listed in the continuation of Box C.



See patent family annex.

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“P” document published prior to the international filing date but later than the priority date claimed

“T” later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

“X” document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

“Y” document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

“&amp;” document member of the same patent family

Date of the actual completion of the international search

17 June 2023

Date of mailing of the international search report

29 June 2023

Name and mailing address of the ISA/CN

CHINA NATIONAL INTELLECTUAL PROPERTY  
ADMINISTRATION  
6, Xitucheng Rd., Jimen Bridge, Haidian District, Beijing  
100088, China

Authorized officer

LIN,HanYun

Telephone No. (+86) 010-62412202

**INTERNATIONAL SEARCH REPORT**

International application No.

**PCT/CN2022/123084****C. DOCUMENTS CONSIDERED TO BE RELEVANT**

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Information on patent family members

International application No.

**PCT/CN2022/123084**

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