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(54) Title: WHIPPED COSMETIC COMPOSITION IN THE FORM OF A NANOEMULSION COMPRISING AT LEAST 20% OF FATTY SUBSTANCE, AT LEAST ONE CATIONIC SURFACTANT, A GAS AND WATER

(57) Abstract: The present invention relates to a whipped cosmetic composition in the form of an oil-in-water nanoemulsion comprising (i) one or more liquid fatty substances in a content ranging from 20% to 80% by weight relative to the total weight of the composition, (ii) one or more cationic surfactants, (iii) one or more gases and (iv) water. A subject of the invention is also a process for the cosmetic treatment of keratin materials, in particular keratin fibres, preferably human keratin fibres such as the hair, in which the composition is applied to said materials. Finally, the invention relates to the use of the composition as defined above for the cosmetic treatment of keratin materials, in particular keratin fibres, preferably human keratin fibres such as the hair.



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**Whipped cosmetic composition in the form of a nanoemulsion
comprising at least 20% of fatty substance, at least one cationic
surfactant, a gas and water**

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The present invention relates to a whipped cosmetic composition in the form of an oil-in-water nanoemulsion comprising (i) one or more liquid fatty substances in a content ranging from 20% to 80% by weight relative to the total weight of the composition, (ii) one or more cationic surfactants, (iii) one or more gases and (iv) water.

10

The present invention also relates to a process for the cosmetic treatment of keratin materials, in particular keratin fibres, preferably human keratin fibres such as the hair, in which the composition is applied to said materials.

15

Finally, the invention relates to the use of the composition for the cosmetic treatment of keratin materials, in particular keratin fibres, preferably human keratin fibres such as the hair.

20

Compositions in the form of nanoemulsions, in particular the oil-in-water type (O/W), are well known in the cosmetics and dermatology domain, in particular for preparing cosmetic products such as lotions, creams, tonics, serums or eau de toilette to be applied to the skin and/or hair.

25

Furthermore, US application US 2015/359728 discloses a pre-aerated concentrated hair care composition further comprising fatty substances, non-ionic emulsifiers, and water. These compositions do not consist of whipped oil-in-water nanoemulsions, but of dispersions of fatty alcohols in the presence of microemulsified silicone. However, these compositions do not give complete satisfaction in terms of cosmetic properties on keratin fibres, in particular in term of uniform and effective deposit of the composition on the skin and/or hair, and of conditioning properties.

30

Compositions in nanoemulsion form generally have a number-average oil drop (or oily globule) size less than 100 nanometers, said oil drops being stabilized by a layer of amphiphilic molecules that can

optionally form a liquid crystal phase of the lamellar type, located at the oil/aqueous phase interface.

5 The term "amphiphilic molecule" is intended to mean herein any molecule having a bipolar structure, i.e. including at least one hydrophobic part and at least one hydrophilic part and having the property of reducing the surface tension of water ($\gamma < 55\text{mN/m}$) and of reducing the interface tension between water and an oily phase. Amphiphilic molecules are for example surfactants, surface agents or emulsifiers.

10 Due to the small oil drop size, compositions in the form of a nanoemulsion offer a certain number of advantages from a cosmetic or dermatological point of view leading in particular to a uniform and effective deposit of the composition on the skin and/or hair; in particular for the hair, a uniform deposit from the root to the end, while allowing satisfactory oil penetration and persistence.

15 Furthermore, compositions in nanoemulsion form confer improved cosmetic properties on keratin materials. In particular, for keratin fibres such as the hair, compositions in nanoemulsion form confer good disentangling, softness, feel, rinsability and also suppleness properties and have a very good conditioning effect, which usually prove to be better than those obtained with the conventional emulsions and dispersions used in the cosmetics field.

20 Nevertheless, there is still a real need for compositions in nanoemulsion form which have new innovative textures having improved usage qualities, while at the same time retaining the advantages offered by compositions of this type.

25 It has now been discovered, surprisingly, that a whipped cosmetic composition in the form of a nanoemulsion comprising (i) at least 20% by weight relative to the total weight of the composition, of one or more fatty substances, (ii) one or more cationic surfactants, (iii) one or more gases and (iv) water makes it possible to meet the needs expressed above.

30

A subject of the invention is thus a whipped cosmetic composition in the form of an oil-in-water nanoemulsion comprising:

- (i) at least 20% by weight relative to the total weight of the composition, of one or more fatty substances,
- 5 (ii) one or more cationic surfactants,
- (iii) one or more gases, and
- (iv) water.

The cosmetic composition according to the invention is in the whipped form, that is to say in the form of an aerated composition, which brings about an improvement in the usage qualities, in particular during the application to keratin materials.

Indeed, the composition according to the invention has a light, creamy, luscious foam texture during its application to keratin fibres.

Thus, the composition according to the invention can in particular be applied more accurately to the keratin materials, in particular the keratin fibres, i.e. in a more targeted manner at the point of application, while at the same time minimizing the risks of running and/or splashing, in particular into the eyes.

In other words, such an whipped texture advantageously results in a better localization of the composition on the keratin materials, in particular the keratin fibres, during its application, and also in uniform distribution and spreading.

The cosmetic composition according to the invention differs from the foams generated at the time of use by specific equipment, such as aerosol devices or any other pressurized container system comprising one or more propellants, or non-pressurized devices equipped with a foam-generating dispensing system. Specifically, the whipped composition according to the invention remains in aerated form, in particular in the form of a foam, which is stable over time, contrary to the foams obtained with the introduction of a gas at the time of use, which collapse very rapidly.

Thus, the cosmetic composition according to the invention is not dispensed by a pressurized or non-pressurized foam-generating device, in the whipped state at the time of use on the keratin materials.

Moreover, the composition according to the invention is stable with respect to storage over time, both at ambient temperature (25°C) and at higher temperatures, in particular 45°C.

5 For the purposes of the present invention, the term "stable with respect to storage over time" is intended to mean that the following physical characteristics of the composition vary little, or even not at all, over time: appearance, pH, rheology (viscosity, consistency).

10 In particular, the composition does not give rise to any phase-separation or exudation phenomena over time, and at the intended storage temperature.

More specifically, the whipped composition has a density that is stable over time within the meaning of the present invention, that is to say that it does not change over time, either at ambient temperature (25°C) or at higher temperatures, in particular 45°C.

15 In other words, the texture in the form of a foam of the composition does not collapse over time, either at ambient temperature (25°C) or at higher temperatures, in particular 45°C. In particular, the whipped texture is preserved after 2 months of storage at 45°C.

20 Finally, the composition above confers improved cosmetic properties on the keratin materials. In particular for keratin fibres, preferably the hair, the composition according to the invention confers good rinsability properties, and good conditioning properties, in particular in terms of disentangling, softness, feel and suppleness.

25 In particular, the cosmetic composition according to the invention, on contact with the keratin materials, is converted into a bluish-coloured milk, which makes it very easy and quick to rinse off.

30 Another subject of the present invention also relates to a process for the cosmetic treatment of keratin materials, in particular keratin fibres, preferably human keratin fibres such as the hair, in which the composition above is applied to said materials.

Finally, the invention relates to the use of the composition above for the cosmetic treatment of keratin materials, in particular keratin fibres, preferably human keratin fibres such as the hair.

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

5 In the following text, and unless otherwise indicated, the limits of a range of values are included in that range, especially in the expressions "between" and "ranging from ... to ...".

Moreover, the expression "at least one" used in the present description is equivalent to the expression "one or more".

10 The cosmetic composition according to the invention is preferably a cosmetic composition for treating keratin materials, preferably keratin fibres, in particular human keratin fibres such as the hair.

For the purposes of the present invention, the term "whipped composition" is intended to mean a composition of which a portion of
15 the volume is occupied by one or more gases, in particular air or an inert gas.

Thus, the composition according to the invention generally has a lower density than the non-whipped conventional cosmetic compositions.

20 The term "gas" is intended to mean a compound that is gaseous at ambient temperature (25°C) and at atmospheric pressure (1.013×10^5 Pa).

The gases that can be used in the composition according to the invention are preferably air and/or an inert gas.

25 Preferably, the inert gas is chosen from nitrogen, argon, helium and/or mixtures thereof.

Thus, the gas(es) that can be used in the composition according to the invention are preferably chosen from atmospheric air, inert gases and a mixture of these gases; more preferentially, from nitrogen, argon,
30 helium, air, and a mixture of these gases; even more preferentially the gas is air.

The whipped compositions of the invention are stably formed in the form of a foam by means of a base composition and of one or more gases.

The gas(es) may represent in particular from 10% to 500% of the volume of the non-whipped composition, preferably from 30% to 200%, more preferentially from 35% to 150% and better still from 40% to 140%.

5 This volume may be calculated by comparing the density of the base composition and of the whipped composition.

This volume corresponds to the degree of expansion of the composition (or level of gas introduced into the composition), and may in particular be calculated by the following formula:

10

$$\text{Degree of expansion} = \frac{d_{\text{before expansion}} - d_{\text{foam}}}{d_{\text{foam}}} \times 100$$

Without limitation, this degree of expansion may in particular be measured on a composition which has already been whipped, using the following protocol:

- 15
- the whipped composition is introduced into a 100 ml beaker so as to occupy the total beaker volume, while avoiding formation of air bubbles during the filling of the jar;
 - it is left to stand for 10 minutes and then the volume V₁, corresponding to the volume of the whipped composition, is recorded;
 - 20 - a turbine is introduced, and the beaker and the turbine are placed under a vacuum bell jar;
 - the vacuum is actuated and the blade of the turbine is rotated at a slow speed (500 rpm) for 10 min;
 - 25 - the vacuum is disconnected and the volume V₂, corresponding to the volume of the non-whipped base composition, is recorded.

The degree of expansion is then calculated by the following formula:

30

$$\text{Degree of expansion} = \frac{V_1 - V_2}{V_2} \times 100$$

The amount of gas introduced into the base composition contributes to the adjustment in density of the whipped composition to the desired value.

Advantageously, the whipped composition of the invention may
5 have a density less than 0.95 g/cm^3 , preferably a density ranging from 0.20 to 0.95 g/cm^3 , more preferably the density is less than 0.90 g/cm^3 , even more preferentially a density ranging from 0.30 to 0.90 g/cm^3 , in particular the density is less than 0.85 g/cm^3 , better ranging from 0.40 to 0.85 g/cm^3 , better still the density is less than 0.80 g/cm^3 , even
10 better a density ranging from 0.50 to 0.80 g/cm^3 ; the density being measured at a temperature of 20°C and at atmospheric pressure ($1.013 \times 10^5 \text{ Pa}$), according to the following protocol.

The test is carried out on a composition volume of 25 ml , introduced into a 25 ml (V_1) smooth plexiglas® jar which defines a
15 cylindrical filling space with a height of 15 mm and a base with a diameter of 46 mm . The jar has a bottom wall 10 mm thick and a side wall 12 mm thick.

Prior to measurement, the composition to be characterized and the jar are maintained at a temperature of 20°C . The jar is tared and
20 the weight value is noted (M_1). The whipped composition is subsequently introduced into the jar so as to occupy its total volume, while avoiding the formation of air bubbles during the filling of the jar. The assembly is left to stand for 24 hours at 20°C . The top of the jar is then levelled before it is weighed (M_2). The density is evaluated
25 according to the convention $\rho = (M_2 - M_1)/25$.

The composition according to the invention comprises one or more gases, preferably in a content ranging from 1% to 70% , in particular from 20% to 60% , and more particularly from 25% to 40% , expressed by volume relative to the total volume of the whipped
30 composition.

The composition according to the invention does not come from an aerosol device or from any other pressurized container system, nor does it come from a non-pressurized device equipped with a foam-generating dispensing system, that is to say that the gas(es) present in

the composition according to the invention do not come from a gas or aerosol dispensing system, but are directly introduced into a base composition at ambient temperature and atmospheric pressure.

5 The base composition which serves to obtain the whipped composition according to the invention has a composition similar to the whipped composition, except for, on the one hand, its higher density since it is devoid of gas, in particular of air or inert gas, and on the other hand the higher fatty substance content.

10 The whipped composition according to the invention thus has the advantage of being very stable over time at ambient temperature and 45°C.

The composition according to the invention comprises at least 20% by weight, relative to the total weight of the composition, of one or more fatty substances.

15 The term “fatty substance” is intended to mean an organic compound that is insoluble in water at ambient temperature (25°C) and at atmospheric pressure (1.013×10^5 Pa), i.e. which has a solubility of less than 5% by weight, preferably less than 1% by weight. They are generally soluble, under the same temperature and pressure conditions, 20 in organic solvents such as chloroform, ethanol, benzene, liquid petroleum jelly or decamethylcyclopentasiloxane.

Preferably, the fatty substance(s) are chosen from fatty substances that are liquid at 30°C and at atmospheric pressure (1.013×10^5 Pa).

25 Preferably, the fatty substance(s) of the composition according to the invention are non-silicone.

30 The term “non-silicone fatty substance” is intended to mean a fatty substance of which the structure does not comprise any silicon atoms, and which therefore especially does not comprise any siloxane groups. They generally bear in their structure a hydrocarbon-based chain comprising at least 6 carbon atoms. Advantageously, they are not oxyalkylenated and do not contain any -COOH functions.

The fatty substances that can be used in the invention preferably have a viscosity of less than or equal to 2 Pa.s, better still

less than or equal to 1 Pa.s and even better still less than or equal to 0.1 Pa.s at a temperature of 30°C and at a shear rate of 1 s⁻¹ measured with a Rheomat RM1800 (generally with spindle 1 or 2).

5 The fatty substances that can be used in the composition according to the invention may be chosen especially from liquid hydrocarbons, liquid fatty alcohols, liquid fatty esters and liquid fatty acids, and mixtures of these compounds.

10 For the purposes of the present invention, the term “liquid hydrocarbon” is intended to mean a hydrocarbon composed solely of carbon and hydrogen atoms, which is liquid at a temperature of 30°C and at atmospheric pressure (760 mmHg, i.e. 1.013×10⁵ Pa).

More particularly, the liquid hydrocarbons are chosen from:

15 - linear or branched, optionally cyclic, C₆-C₁₆ alkanes. Examples that may be mentioned include hexane, undecane, dodecane, tridecane, and isoparaffins, for instance isohexadecane, isododecane and isodecane;

20 - linear or branched hydrocarbons of mineral, animal or synthetic origin with more than 16 carbon atoms, such as liquid paraffins and derivatives thereof, petroleum jelly, liquid petroleum jelly, polydecenes, hydrogenated polyisobutene such as the product sold under the brand name Parleam® by the company NOF Corporation, and squalane.

25 Preferably, the liquid hydrocarbon(s) are chosen from liquid paraffins, isoparaffins, liquid petroleum jelly, undecane, tridecane and isododecane, and mixtures thereof.

In a most particularly preferred variant, the liquid hydrocarbon(s) are chosen from liquid petroleum jelly, isoparaffins, isododecane and a mixture of undecane and tridecane.

30 For the purposes of the present invention, the term “liquid fatty alcohol” is intended to mean a non-glycerolated and non-oxyalkylenated fatty alcohol, which is liquid at a temperature of 30°C and at atmospheric pressure (760 mmHg, i.e. 1.013×10⁵ Pa). Preferably, the liquid fatty alcohols of the invention comprise from 8

to 30 carbon atoms, especially from 10 to 24 carbon atoms, and may be saturated or unsaturated.

The saturated liquid fatty alcohols are preferably branched. They may optionally comprise in their structure at least one aromatic or non-aromatic ring, which is preferably acyclic.

More particularly, the saturated liquid fatty alcohols of the invention are chosen from octyldodecanol, 2-decyltetradecanol, isostearyl alcohol and 2-hexyldecanol.

Octyldodecanol and 2-decyltetradecanol are most particularly preferred.

The unsaturated liquid fatty alcohols contain in their structure at least one double or triple bond, and preferably one or more double bonds. When several double bonds are present, there are preferably 2 or 3 of them, and they may be conjugated or unconjugated.

These unsaturated fatty alcohols may be linear or branched.

They may optionally comprise in their structure at least one aromatic or non-aromatic ring. They are preferably acyclic.

More particularly, the unsaturated liquid fatty alcohols that may be used in the invention are chosen from oleyl alcohol, linoleyl alcohol, linolenyl alcohol and undecylenyl alcohol.

Oleyl alcohol is most particularly preferred.

For the purposes of the present invention, the term "liquid fatty ester" is intended to mean an ester derived from a fatty acid and/or from a fatty alcohol, which is liquid at a temperature of 30°C and at atmospheric pressure (760 mmHg, i.e. 1.013×10^5 Pa).

More particularly, the liquid esters are chosen from esters of saturated or unsaturated, linear or branched C₁-C₂₆ aliphatic mono- or polyacids, which are optionally hydroxylated, and from saturated or unsaturated, linear or branched C₁-C₂₆ aliphatic mono- or polyalcohols, the total number of carbon atoms in the esters being greater than or equal to 10.

Preferably, for the esters of monoalcohols, at least one from among the alcohol and the acid from which the esters of the invention are derived is branched.

Among the monoesters of monoacids and of monoalcohols, mention may be made of alkyl palmitates, in particular of C₁-C₁₈, especially ethyl palmitate and isopropyl palmitate, alkyl myristates in particular of C₁-C₁₈, such as isopropyl myristate or ethyl myristate, 5 alkyl stearates, in particular of C₁-C₁₈, especially isocetyl stearate, 2-ethylhexyl isononanoate, isodecyl neopentanoate and isostearyl neopentanoate.

Esters of optionally hydroxylated C₃-C₂₂ dicarboxylic or tricarboxylic acids and of C₁-C₂₂ alcohols and esters of optionally 10 hydroxylated monocarboxylic, dicarboxylic or tricarboxylic acids and of C₄-C₂₆ dihydroxy, trihydroxy, tetrahydroxy or pentahydroxy non-sugar alcohols may also be used.

Mention may be made especially of diethyl sebacate, diisopropyl sebacate, diisopropyl adipate, di-n-propyl adipate, dioctyl 15 adipate, diisostearyl adipate, dioctyl maleate, glyceryl undecylenate, octyldodecyl stearyl stearate, pentaerythrityl monoricinoleate, pentaerythrityl tetraisononanoate, pentaerythrityl tetrapelargonate, pentaerythrityl tetraisostearate, pentaerythrityl tetraoctanoate, propylene glycol dicaprylate, propylene glycol dicaprinate, tridecyl 20 erucate, triisopropyl citrate, triisostearyl citrate, glyceryl trilactate, glyceryl trioctanoate, trioctyldodecyl citrate, trioleyl citrate, propylene glycol dioctanoate, neopentyl glycol diheptanoate, diethylene glycol diisononanoate, polyethylene glycol distearates, and alkyl malates, especially (C₆-C₁₈)alkyl malates, in particular bis(C₁₂- 25 C₁₃)alkyl malate. Among the esters mentioned above, use is preferentially made of ethyl, isopropyl, myristyl, cetyl or stearyl palmitate, 2-ethylhexyl palmitate, 2-octyldecyl palmitate, alkyl myristates such as isopropyl, butyl, cetyl or 2-octyldodecyl myristate, hexyl stearate, propylene glycol dicaprylate, butyl stearate, isobutyl 30 stearate; dioctyl malate, hexyl laurate, 2-hexyldecyl laurate, isononyl isononanoate, cetyl octanoate and bis(C₁₂-C₁₃)alkyl malate. Among the liquid fatty esters, use may be made of sugar esters and diesters of C₆-C₃₀ and preferably C₁₂-C₂₂ fatty acids.

The term "sugar" is intended to mean oxygen-bearing hydrocarbon-based compounds containing several alcohol functions, with or without aldehyde or ketone functions, and which comprise at least 4 carbon atoms. These sugars may be monosaccharides, oligosaccharides or polysaccharides.

Preferably, these said sugars are chosen from sucrose, glucose, galactose, ribose, fucose, maltose, fructose, mannose, arabinose, xylose and lactose, and derivatives thereof, especially alkyl derivatives, such as methyl derivatives, for instance methylglucose.

The sugar and fatty acid esters may be chosen especially from the group comprising the esters or mixtures of esters of sugars described previously and of linear or branched, saturated or unsaturated C₆-C₃₀ and preferably C₁₂-C₂₂ fatty acids.

If they are unsaturated, these compounds may comprise one to three conjugated or unconjugated carbon-carbon double bonds.

The esters according to this variant may also be chosen from mono-, di-, tri- and tetraesters, and polyesters, and mixtures thereof.

These esters may be, for example, oleates, laurates, palmitates, myristates, behenates, cocoates, stearates, linoleates, linolenates, caprates and arachidonates, and mixtures thereof, such as, especially, oleopalmitate, oleostearate or palmitostearate mixed esters.

More particularly, use is made of monoesters and diesters and especially of sucrose, glucose or methylglucose mono- or dioleates, stearates, behenates, oleopalmitates, linoleates, linolenates or oleostearates, or alternatively of methylglucose dioleate (Glucate® DO).

Among the sugar esters, use may be made of pentaerythrityl esters, preferably pentaerythrityl tetraistearate, pentaerythrityl tetraoctanoate, and caprylic and capric acid hexaesters as a mixture with dipentaerythritol.

Among the natural or synthetic monoacid, diacid or triacid esters with glycerol, use may be made of plant oils or synthetic oils.

More particularly, said plant oil(s) or synthetic oil(s) are chosen from triglyceride oils of plant or synthetic origin, such as liquid

fatty acid triglycerides containing from 6 to 30 carbon atoms, for instance heptanoic or octanoic acid triglycerides, or alternatively, for example, sesame oil, soybean oil, coffee oil, safflower oil, borage oil, sunflower oil, olive oil, apricot kernel oil, camellia oil, bambara pea
5 oil, avocado oil, mango oil, rice bran oil, cottonseed oil, rose oil, kiwi seed oil, sea buckthorn pulp oil, blueberry seed oil, poppy seed oil, orange pip oil, sweet almond oil, palm oil, coconut oil (copra), vernonia oil, marjoram oil, baobab oil, rapeseed oil, ximenia oil, pracaxi oil, caprylic/capric acid triglycerides such as those sold by the
10 company Stéarineries Dubois or those sold under the names Miglyol® 810, 812 and 818 by the company Dynamit Nobel, jojoba oil and shea butter oil.

As liquid esters that may be used according to the invention, use is preferably made of triglycerides of plant origin, in particular
15 oils chosen from avocado oil, olive oil, camellia oil and apricot kernel oil, and mixtures thereof, and C₄-C₂₂ dicarboxylic or tricarboxylic acid esters of C₁-C₂₂ alcohols, in particular 1,3-propanediol dicaprylate.

Particularly preferably, the composition according to the invention comprises at least one plant oil, as fatty substance.

20 The term "fatty acid" is intended to mean a non-salified fatty acid, i.e. the fatty acid must not be in the form of a generally soluble soap, i.e. it must not be salified with a base.

More particularly, the liquid fatty acids that may be used according to the invention are chosen from the acids of formula
25 RCOOH, in which R is a saturated or unsaturated, linear or branched radical preferably comprising from 7 to 39 carbon atoms.

Preferably, R is a C₇-C₂₉ alkyl or C₇-C₂₉ alkenyl group and better still a C₁₂-C₂₄ alkyl or C₁₂-C₂₄ alkenyl group. R may be substituted with one or more hydroxyl groups and/or one or more
30 carboxyl groups.

Preferentially, the liquid fatty acid(s) are chosen from oleic acid, linoleic acid and isostearic acid.

Particularly preferably, the composition according to the invention comprises one or more liquid fatty substances chosen from

liquid hydrocarbons, liquid fatty esters and mixtures of these compounds, in particular chosen from those mentioned above.

Most particularly preferably, the composition according to the invention comprises one or more fatty substances, more preferentially liquid fatty substances, chosen from linear or branched C₆-C₁₆ alkanes, plant oils, in particular triglyceride oils, and a mixture of these compounds, and in particular chosen from undecane, tridecane, sunflower oil, shea oil, olive oil, avocado oil, jojoba oil, soybean oil, coconut oil (copra), rapeseed oil, and a mixture of these compounds.

The composition according to the invention comprises one or more liquid fatty substances in a content ranging from 20% to 80% by weight, preferably from 25% to 70% by weight and more preferentially from 30% to 60% by weight, or even from 40% to 55% by weight, relative to the total weight of the composition.

Preferably, the composition according to the invention comprises one or more non-silicone liquid fatty substances in a content ranging from 20% to 80% by weight, more preferentially from 25% to 70% by weight, and even more preferentially from 30% to 60% by weight, or even from 40% to 55% by weight, relative to the total weight of the composition.

Preferably, the total content of fatty substances present in the composition according to the invention ranges from 20% to 80% by weight, more preferentially from 25% to 70% by weight, and even more preferentially from 30% to 60% by weight, or even from 40% to 55% by weight, relative to the total weight of the composition.

The composition according to the invention comprises one or more cationic surfactants.

The term "cationic surfactant" is intended to mean a surfactant that is positively charged when it is contained in the composition according to the invention. This surfactant may bear one or more positive permanent charges or may contain one or more cationizable functions in the composition according to the invention.

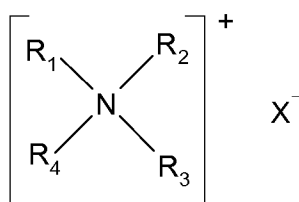
The cationic surfactant(s) are preferably chosen from primary, secondary or tertiary fatty amines, which are optionally polyoxyalkylenated, or salts thereof, and quaternary ammonium salts, and mixtures thereof.

5 The fatty amines generally comprise at least one C₈-C₃₀ hydrocarbon-based chain.

Examples of quaternary ammonium salts that may especially be mentioned include:

- those corresponding to general formula (I) below:

10



(I)

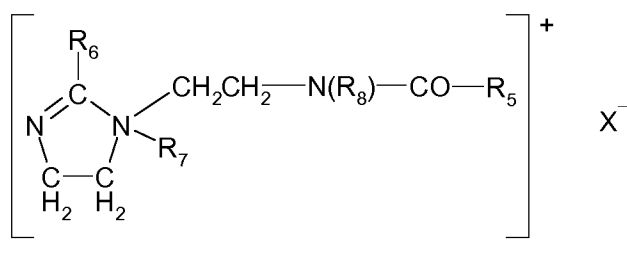
in which the groups R₁ to R₄, which may be identical or different, represent a linear or branched aliphatic group comprising from 1 to 30 carbon atoms, or an aromatic group such as aryl or alkylaryl, at least one of the groups R₁ to R₄ denoting a linear or branched aliphatic radical comprising from 8 to 30 carbon atoms, preferably from 12 to 24 carbon atoms. The aliphatic groups may comprise heteroatoms especially such as oxygen, nitrogen, sulfur and halogens. The aliphatic groups are chosen, for example, from C₁-C₃₀ alkyl, C₁-C₃₀ alkoxy, polyoxy(C₂-C₆)alkylene, C₁-C₃₀ alkylamide, (C₁₂-C₂₂)alkylamido(C₂-C₆)alkyl, (C₁₂-C₂₂)alkyl acetate and C₁-C₃₀ hydroxyalkyl groups; X⁻ is an anion chosen from the group of the halides, phosphates, acetates, lactates, (C₁-C₄)alkyl sulfates, (C₁-C₄)alkyl- or (C₁-C₄)alkylarylsulfonates.

25 Among the quaternary ammonium salts of formula (I), the ones that are preferred are, on the one hand, tetraalkylammonium salts, for instance dialkyldimethylammonium or alkyltrimethylammonium salts in which the alkyl group comprises approximately from 12 to 22 carbon atoms, in particular behenyltrimethylammonium, 30 distearyldimethylammonium, cetyltrimethylammonium or

benzyldimethylstearylammmonium salts, or, on the other hand, the palmitylamidopropyltrimethylammmonium salts, the stearamidopropyltrimethylammmonium salts, the stearamidopropyldimethylcetearylammmonium salts, or the stearamidopropyldimethyl(myristyl acetate)ammmonium salts sold under the name Ceraphyl® 70 by the company Van Dyk. It is preferred in particular to use the chloride salts of these compounds.

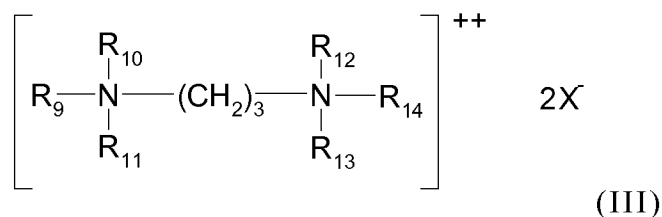
- quaternary ammonium salts of imidazoline, for instance those of formula (II) below:

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in which R₅ represents an alkenyl or alkyl group comprising from 8 to 30 carbon atoms, for example derived from tallow fatty acids, R₆ represents a hydrogen atom, a C₁-C₄ alkyl group or an alkenyl or alkyl group comprising from 8 to 30 carbon atoms, R₇ represents a C₁-C₄ alkyl group, R₈ represents a hydrogen atom or a C₁-C₄ alkyl group and X⁻ is an anion chosen from the group of the halides, phosphates, acetates, lactates, alkyl sulfates, alkylsulfonates or alkylarylsulfonates, the alkyl and aryl groups of which preferably comprise, respectively, from 1 to 20 carbon atoms and from 6 to 30 carbon atoms. Preferably, R₅ and R₆ denote a mixture of alkenyl or alkyl groups comprising from 12 to 21 carbon atoms, for example derived from tallow fatty acids, R₇ denotes a methyl group and R₈ denotes a hydrogen atom. Such a product is sold, for example, under the name Rewoquat® W 75 by the company Rewo;

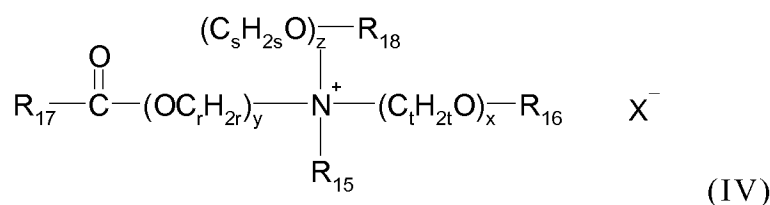
- di- or triquaternary ammonium salts, in particular of formula (III):



in which R₉ denotes an alkyl radical comprising approximately from 16 to 30 carbon atoms, which is optionally hydroxylated and/or optionally interrupted with one or more oxygen atoms, R₁₀ is chosen from hydrogen or an alkyl radical comprising from 1 to 4 carbon atoms or a group (R_{9a})(R_{10a})(R_{11a})N-(CH₂)₃,

R_{9a}, R_{10a}, R_{11a}, R₁₁, R₁₂, R₁₃ and R₁₄, which may be identical or different, are chosen from hydrogen or an alkyl radical comprising from 1 to 4 carbon atoms, and X⁻ is an anion chosen from the group of halides, acetates, phosphates, nitrates, (C₁-C₄)alkyl sulfates, (C₁-C₄)alkyl sulfonates and (C₁-C₄)alkylaryl sulfonates, and in particular methyl sulfate and ethyl sulfate. Such compounds are, for example, Finquat CT-P, sold by the company Finetex (Quaternium 89), and Finquat CT, sold by the company Finetex (Quaternium 75),

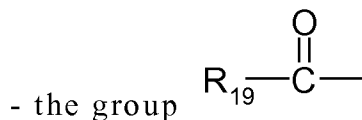
- quaternary ammonium salts containing at least one ester function, such as those of formula (IV) below:



in which:

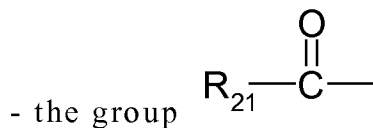
R₁₅ is chosen from C₁-C₆ alkyl groups and C₁-C₆ hydroxyalkyl or dihydroxyalkyl groups;

R₁₆ is chosen from:



- groups R₂₀, which are linear or branched, saturated or unsaturated C₁-C₂₂ hydrocarbon-based groups,

- a hydrogen atom,
 R_{18} is chosen from:



5 - groups R_{22} , which are linear or branched, saturated or unsaturated C_1-C_6 hydrocarbon-based groups,
 - a hydrogen atom,

R_{17} , R_{19} and R_{21} , which may be identical or different, are chosen from linear or branched, saturated or unsaturated C_7-C_{21}
 10 hydrocarbon-based groups;

r , s and t , which may be identical or different, are integers ranging from 2 to 6;

y is an integer ranging from 1 to 10;

15 x and z , which may be identical or different, are integers ranging from 0 to 10;

X^- is a simple or complex, organic or mineral anion;

with the proviso that the sum $x + y + z$ is from 1 to 15, that when x is 0 then R_{16} denotes R_{20} , and that when z is 0 then R_{18} denotes R_{22} .

20 The alkyl groups R_{15} may be linear or branched, and more particularly linear.

Preferably, R_{15} denotes a methyl, ethyl, hydroxyethyl or dihydroxypropyl group, and more particularly a methyl or ethyl group.

Advantageously, the sum $x + y + z$ is from 1 to 10.

25 When R_{16} is a hydrocarbon-based group R_{20} , it may be long and contain from 12 to 22 carbon atoms, or may be short and contain from 1 to 3 carbon atoms.

When R_{18} is a hydrocarbon-based group R_{22} , it preferably contains 1 to 3 carbon atoms.

30 Advantageously, R_{17} , R_{19} and R_{21} , which may be identical or different, are chosen from linear or branched, saturated or unsaturated

C₁₁-C₂₁ hydrocarbon-based groups, and more particularly from linear or branched, saturated or unsaturated C₁₁-C₂₁ alkyl and alkenyl groups.

Preferably, x and z, which may be identical or different, are equal to 0 or 1.

5 Advantageously, y is equal to 1.

Preferably, r, s and t, which may be identical or different, are equal to 2 or 3, and even more particularly are equal to 2.

10 The anion X⁻ is preferably a halide (chloride, bromide or iodide) or an alkyl sulfate, more particularly methyl sulfate. However, use may be made of methanesulfonate, phosphate, nitrate, tosylate, an anion derived from an organic acid, such as acetate or lactate, or any other anion that is compatible with the ammonium bearing an ester function.

15 The anion X⁻ is even more particularly chloride or methyl sulfate.

Use may be made more particularly in the composition according to the invention of the ammonium salts of formula (IV) in which:

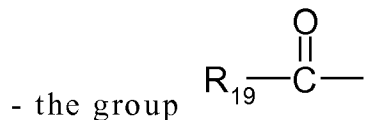
20 R₁₅ denotes a methyl or ethyl group,

x and y are equal to 1;

z is equal to 0 or 1;

r, s and t are equal to 2;

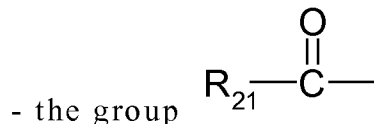
R₁₆ is chosen from:



25 - methyl, ethyl or C₁₄-C₂₂ hydrocarbon-based groups,

- a hydrogen atom;

R₁₈ is chosen from:



- a hydrogen atom;

30 R₁₇, R₁₉ and R₂₁, which may be identical or different, are chosen from linear or branched, saturated or unsaturated C₁₃-C₁₇

hydrocarbon-based groups, and preferably from linear or branched, saturated or unsaturated C₁₃-C₁₇ alkyl and alkenyl groups.

Advantageously, the hydrocarbon-based groups are linear.

5 Examples that may be mentioned include the compounds of formula (IV) such as the diacyloxyethyltrimethylammonium, diacyloxyethylhydroxyethylmethylammonium, monoacyloxyethyldihydroxyethylmethylammonium, triacyloxyethylmethylammonium and monoacyloxyethylhydroxyethyltrimethylammonium salts (chloride or methyl sulfate in particular), and mixtures thereof. The acyl groups preferably contain from 14 to 18 carbon atoms and are derived more particularly from a plant oil such as palm oil or sunflower oil. When the compound contains several acyl groups, these groups may be identical or different.

15 These products are obtained, for example, by direct esterification of triethanolamine, triisopropanolamine, an alkyldiethanolamine or an alkyldiisopropanolamine, which are optionally oxyalkylenated, with C₁₀-C₃₀ fatty acids or with mixtures of C₁₀-C₃₀ fatty acids of plant or animal origin, or by transesterification of the methyl esters thereof. This esterification is followed by a quaternization using an alkylating agent such as an alkyl halide (preferably a methyl or ethyl halide), a dialkyl sulfate (preferably a methyl or ethyl sulfate), methyl methanesulfonate, methyl para-

20 toluenesulfonate, glycol chlorohydrin or glycerol chlorohydrin. Such compounds are sold, for example, under the names Dehyquart® by the company Henkel, Stepanquat® by the company Stepan, Noxanium® by the company Ceca or Rewoquat® WE 18 by the company Rewo-Witco.

25 The composition according to the invention may contain, for example, a mixture of quaternary ammonium monoester, diester and triester salts with a weight majority of diester salts.

Use may also be made of the ammonium salts containing at least one ester function that are described in patents US-A-4 874 554 and US-A-4 137 180.

Use may be made of behenoylhydroxypropyltrimethylammonium chloride sold by KAO under the name Quatarmin BTC 131.

5 Preferably, the ammonium salts containing at least one ester function contain two ester functions.

Among the quaternary ammonium salts containing at least one ester function, which may be used, it is preferred to use dipalmitoylethyhydroxyethylmethylammonium salts.

10 The cationic surfactant(s) are preferably chosen from those of formula (I) and those of formula (IV) and even more preferentially from those of formula (I).

Most particularly preferably, the cationic surfactant(s) that may be used according to the invention are chosen from those of formula (I), more preferentially from behenyltrimethylammonium salts, 15 cetyltrimethylammonium salts, and a mixture of these compounds, and even more preferentially from behenyltrimethylammonium chloride, cetyltrimethylammonium chloride, and a mixture of these compounds.

20 Preferentially, the cationic surfactant(s) that can be used in the composition according to the invention are chosen from the cationic surfactants of formula (I).

The cationic surfactant(s) of the composition according to the invention advantageously represent from 0.01% to 10% by weight, preferably from 0.1% to 8% by weight and more preferentially from 1% to 5% by weight relative to the total weight of the composition.

25 The composition according to the invention may also comprise one or more polyols.

30 For the purposes of the present invention, the term "polyol" is intended to mean an organic compound constituted of a hydrocarbon-based chain optionally interrupted with one or more oxygen atoms and bearing at least two free hydroxyl groups (-OH) borne by different carbon atoms, this compound possibly being cyclic or acyclic, linear or branched, and saturated or unsaturated.

More particularly, the polyol(s) that may be used according to the invention comprise from 2 to 30 hydroxyl groups, more

preferentially from 2 to 10 hydroxyl groups and even more preferentially from 2 to 3 hydroxyl groups.

The polyol(s) that may be used according to the invention generally comprise at least three carbon atoms.

5 Preferably, said polyol(s) that may be used according to the invention are chosen from polyols comprising at least three carbon atoms and ethylene glycol, and are preferably chosen from 1,3-propanediol, 1,3-butylene glycol, 1,2-pentanediol, dipropylene glycol, hexylene glycol, pentylene glycol, glycerol, ethylene glycol and sorbitol, and a mixture of these compounds.

10 Most particularly preferably, the polyol(s) that can be used according to the invention are chosen from glycerol, sorbitol or a mixture of these compounds, and preferably the polyol is glycerol.

15 Advantageously, the composition according to the invention does not comprise propylene glycol.

When they are present, the polyol(s) represent from 0.5% to 20% by weight, better still from 1% to 15% by weight and more preferentially from 2% to 10% by weight, relative to the total weight of the composition.

20 The composition according to the invention comprises water.

Water advantageously represents from 5% to 60% by weight, preferably from 10% to 50% by weight and more preferentially from 15% to 40% by weight relative to the total weight of the composition.

25 The composition according to the invention may also comprise one or more organic solvents other than polyols.

Preferably, the organic solvent(s) other than polyols are chosen from non-aromatic C₁-C₆ alcohols such as ethyl alcohol or isopropyl alcohol, or aromatic alcohols such as benzyl alcohol and phenylethyl alcohol.

30 Particularly preferably, the composition according to the invention comprises one or more organic solvents other than polyols, the organic solvent preferably being ethanol.

When they are present in the composition according to the invention, the organic solvent(s) other than polyols generally represent

from 0.1% to 15% by weight and preferably from 0.5% to 10% by weight relative to the total weight of the composition.

5 The pH of the composition of the invention is generally between 3 and 8, preferably between 4 and 7, better still between 4.5 and 6.

The pH of the composition according to the invention may be adjusted to the desired value by means of acidifying or basifying agents usually used in cosmetic compositions, or alternatively using standard buffer systems.

10 Among the acidifying agents, examples that may be mentioned include mineral acids, for instance hydrochloric acid, (ortho)phosphoric acid, boric acid, nitric acid or sulfuric acid, or organic acids, for instance compounds comprising at least one carboxylic acid function such as acetic acid, tartaric acid, citric acid
15 or lactic acid, a sulfonic acid function, a phosphonic acid function or a phosphoric acid function.

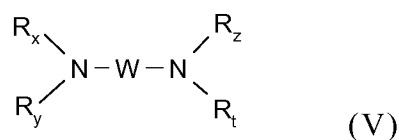
Preferably, phosphoric acid is used as acidifying agent.

The basifying agent(s) may be mineral, organic or hybrid.

20 The mineral alkaline agent(s) are preferably chosen from aqueous ammonia, alkali metal carbonates or bicarbonates such as sodium carbonate or bicarbonate, potassium carbonate or bicarbonate, sodium hydroxide or potassium hydroxide or mixtures thereof.

25 The organic alkaline agent(s) are preferably chosen from organic amines with a pK_b at 25°C of less than 12, preferably of less than 10 and even more advantageously of less than 6. It should be noted that it is the pK_b corresponding to the function of highest basicity. In addition, the organic amines do not comprise any alkyl or alkenyl fatty chain comprising more than ten carbon atoms.

30 The organic alkaline agent(s) are chosen, for example, from alkanolamines, oxyethylenated and/or oxypropylenated ethylenediamines, amino acids and the compounds of formula (V) below:



in which W is a divalent C₁ to C₆ alkylene radical optionally substituted with one or more hydroxyl groups or a C₁ to C₆ alkyl radical, and/or optionally interrupted with one or more heteroatoms such as O, or NR_u; R_x, R_y, R_z, R_t and R_u, which may be identical or different, represent a hydrogen atom or a C₁ to C₆ alkyl, C₁ to C₆ hydroxyalkyl or C₁ to C₆ aminoalkyl radical.

Examples of amines of formula (V) that may be mentioned include 1,3-diaminopropane, 1,3-diamino-2-propanol, spermine and spermidine.

The composition according to the invention may also comprise one or more additives.

As additives that may be used in accordance with the invention, mention may be made of antidandruff agents, anti-seborrhoea agents, agents for preventing hair loss and/or for promoting hair regrowth, vitamins and provitamins including panthenol, sunscreens, mineral or organic pigments, sequestrants, plasticizers, solubilizers, opacifiers or pearlescent agents, antioxidants, fragrances, preservatives and pigments.

Those skilled in the art will take care to select the optional additives and the amount thereof such that they do not harm the properties of the composition according to the invention.

These additives may be present in the composition according to the invention in an amount ranging from 0 to 50% by weight, relative to the total weight of the composition.

The composition according to the invention is in the form of an oil-in-water nanoemulsion of which the particles (or drops) of oil preferably have a volume-average size of less than 500 nm, preferentially of between 10 and 300 nm, and better still between 20 and 250 nm, and even better still between 25 and 200 nm.

The volume-average size of the particles (or oil drops) may be determined in particular according to the known laser diffraction method. By way of apparatus that can be used for this determination, mention may be made of the particle size analyser of the brand
5 Malvern, model Zetasizer Nano ZS, equipped with a standard laser having a power of 4 mW, and at a wavelength of 633 nm. This device is also equipped with a correlator (25 ns to 8000 s, 4000 channels maxi.).

In addition, the composition according to the invention has very
10 low polydispersity, i.e. the particles have a very homogeneous size. The particles present in the composition according to the invention are liquid oil (or oily phase) particles within the continuous aqueous phase.

The composition according to the invention is generally
15 prepared by means of a piece of equipment of whipping machine type which makes it possible to combine a stream of gas with that of a base composition in the form of a nanoemulsion through a dispersing tool. The whipped texture of the composition according to the invention is thus obtained.

20 For example, the composition according to the invention can be obtained in the following way:

- (i) by conventionally preparing an oil-in-water nanoemulsion containing at least one or more fatty substances in a content of greater than or equal to 20%
25 by weight and one or more surfactants as defined above, by dispersing the oily phase in the aqueous phase,
- (ii) by introducing at least one gas, as defined above, into the nanoemulsion obtained, with stirring ranging from 500 to 2000 rpm, at a temperature of from 20°C to 80°C and
30 under a gas-inlet pressure ranging from 2 to 8 bar (2×10^5 to 8×10^5 Pa) and preferably from 3 to 6 bar (3×10^5 to 6×10^5 Pa).

In other words, the process for preparing the whipped composition according to the invention comprises (i) at least one step of

preparing the base composition containing at least 20% by weight of fatty substance relative to the total weight of the composition and (ii) at least one step of introducing one or more gases into said composition by means of a piece of equipment of whipping machine type making it possible in particular to provide the abovementioned stirring and the gas inlet pressure.

Preferably, the gas can be introduced into the nanoemulsion by means of an equipment of whipping machine type comprising a mixing head comprising a rotor and a stator, for instance the Mondomixer device of Minimondo type supplied by the company Mondomix.

By "equipment of whipping machine type", it is generally meant equipment comprising as major element, a mixing chamber consisting of a static part, provided with a double envelope resistant to a pressure of up to 5 bar (*ie* $5 \cdot 10^5$ Pa), and a dynamic part (rotor type) which can have a speed ranging from 100 to 1500 revolutions / minute (rpm).

The nanoemulsion is transported by a pump into the whipping head, where the nanoemulsion and the gas are simultaneously injected and homogeneously mixed by virtue of the cutting action of the lugs of the rotor and of the stator of the device, which ensure an equal distribution of the gas in the product. The speed of the rotor of the device, the temperature of the tank and of the pipes and also the gas inlet pressure in the mixing head and the airflow rate are regulated appropriately.

The pressure of the mixing head is regulated by a pressure regulator.

The flow rate of the nanoemulsion at the outlet of the device depends on the frequency of the pump at the tank outlet.

In particular, in the equipment of whipping machine type, the stirring speed during the introduction of the gas may in particular be 1000 rpm, the temperature from 25°C to 50°C and the gas inlet pressure in the mixing chamber from 2 to 4 bars (*ie* of $2 \cdot 10^5$ to $4 \cdot 10^5$ Pa).

The composition according to the invention is advantageously in the form of a foam.

Preferably, the composition has a translucent to blueish colour, preferably a blueish colour, when spread in a thin layer.

5 The composition according to the invention may have a viscosity ranging for example from 1 to 500 mPa.s (1 to 500 cPoises), and preferably from 1 to 200 mPa.s (1 to 200 cPoises), the viscosity being measured at ambient temperature (25°C) with a Rheomat RM180 (generally using spindle 1 or 2).

10 The invention also relates to a process for the cosmetic treatment of keratin materials, in particular keratin fibres, preferably human keratin fibres such as the hair, in which the composition according to the invention is applied to said materials.

Thus, an effective quantity of the composition may be applied to the keratin materials, followed by an optional rinse after an optional leave-on time.

15 Preferably, the treatment process comprises a rinsing step after the application of the composition according to the invention.

20 The invention also relates to the use of the composition according to the invention for the cosmetic treatment of keratin materials, in particular keratin fibres, preferably human keratin fibres such as the hair.

The compositions according to the invention may be used, for example, as a cleaning composition, such as a pre-treatment or post-treatment composition for shampoos, dyes, permanent waves, bleaches and straighteners.

25 In a preferred manner, the composition according to the invention is a rinse-off or leave-on conditioner care product.

More preferentially, the composition according to the invention is a rinse-off conditioner care product.

30 The examples that follow illustrate the present invention, and should not in any way be considered as limiting the invention.

EXAMPLES

In the examples that follow, the amounts are indicated as weight percentages of compound active material (MA) relative to the total weight of the composition, and the densities of the compositions have been measured according to the method as defined in the description above.

The granulometries have been measured according to a standard method using the particle size analyser of the brand Malvern, model Zetasizer Nano ZS, equipped with a standard laser having a power of 4 mW, and at a wavelength of 633 nm. This device is also equipped with a correlator (25 ns to 8000 s, 4000 channels maxi.).

The composition A is prepared according to the conventional methods:

15

	A
Soybean oil	40
Mixture of undecane and tridecane (70/30)	10
Glycerol	3
Ethanol	8
Behenyltrimonium chloride	3
Cetrimonium chloride	2
Fragrance	0.6
Water	qs 100

70 ml of the composition A are mixed with 30 ml of compressed air by means of an equipment of whipping machine type, in particular the Mondomixer device of Minimondo type supplied by the company

Mondomix, to form the whipped composition B according to the invention.

5 The whipped composition B according to the invention has the appearance of a creamy, aerated composition (of chocolate mousse type).

The density of composition A is equal to 0.92, and the density of whipped composition B is equal to 0.69.

Stability of the composition

10 The stability of the composition B was evaluated visually: directly after its preparation (T_0) and after 2 months of storage at atmospheric pressure ($T_0 + 2$ months), at room temperature (25°C) and at 45°C .

		Visual aspect of composition B
Room temperature (25°C)	T_0	Foam White to blueish color, in thin layer granulometry :190 nm
	$T_0 + 2$ months	Foam White to blueish color, in thin layer granulometry :190 nm
Temperature of 45°C	T_0	Foam White to blueish color, in thin layer granulometry :190 nm
	$T_0 + 2$ months	Foam White to blueish color, in thin layer granulometry :190 nm

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The composition B according to the invention exhibits good stability over time, both at ambient temperature (25°C) and at a higher temperature of 45°C .

CLAIMS

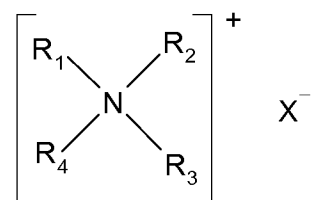
1. Whipped cosmetic composition in the form of an oil-in-water nanoemulsion comprising:
- 5 (i) at least 20% by weight relative to the total weight of the composition, of one or more fatty substances,
- (ii) one or more cationic surfactants,
- (iii) one or more gases, and
- (iv) water.
- 10 2. Composition according to Claim 1, characterized in that the density of the composition is less than 0.95 g/cm^3 , preferably a density ranging from 0.20 to 0.95 g/cm^3 , more preferably the density is less than 0.90 g/cm^3 , even more preferentially a density ranging from 0.30 to 0.90 g/cm^3 , in particular the density is less than 0.85 g/cm^3 , better ranging from 0.40 to 0.85 g/cm^3 , better still the density is less than 0.80 g/cm^3 ,
15 even better a density ranging from 0.50 to 0.80 g/cm^3 ; the density being measured at a temperature of 20°C and at atmospheric pressure ($1.013 \times 10^5 \text{ Pa}$).
- 20 3. Composition according to Claim 1 or 2, characterized in that the fatty substance(s) are chosen from liquid fatty substance(s) at a temperature of 30°C and at atmospheric pressure; preferably chosen from liquid hydrocarbons, liquid fatty alcohols, liquid fatty esters, liquid fatty acids, and mixtures of these compounds.
- 25 4. Composition according to any one of the preceding claims, characterized in that the fatty substance(s) are chosen from liquid hydrocarbons, liquid fatty esters, and mixtures of these compounds.
5. Composition according to any one of the preceding claims, characterized in that it comprises at least one plant oil, as fatty substances.
- 30 6. Composition according to any one of the preceding claims, characterized in that the fatty substance(s) are chosen from linear or branched C_6 - C_{16} alkanes, plant oils, in particular triglyceride oils, and a mixture of these compounds, and in particular chosen from undecane, tridecane, sunflower oil, shea oil, olive oil, avocado oil, jojoba oil,

soybean oil, coconut oil (copra), rapeseed oil, and a mixture of these compounds.

7. Composition according to any one of the preceding claims, characterized in that the fatty substance(s) are present in a total content ranging from 20% to 80% by weight, preferably 25% to 70% by weight, more preferentially from 30% to 60% by weight, or even from 40% to 55% by weight, relative to the total weight of the composition.

8. Composition according to any one of the preceding claims, characterized in that the cationic surfactant(s) are chosen from:

- those corresponding to general formula (I) below:

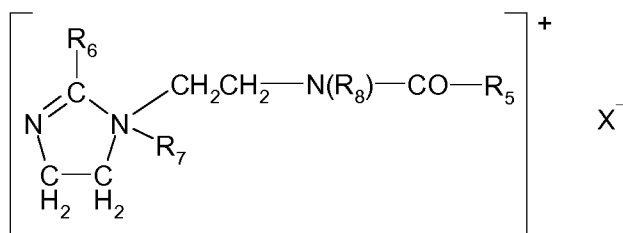


(I)

in which the groups R_1 to R_4 , which may be identical or different, represent a linear or branched aliphatic group comprising from 1 to 30 carbon atoms, or an aromatic group such as aryl or alkylaryl, at least one of the groups R_1 to R_4 denoting a linear or branched aliphatic radical comprising from 8 to 30 carbon atoms, preferably from 12 to 24 carbon atoms,

X^- is an anion chosen from the group of halides, phosphates, acetates, lactates, (C₁-C₄)alkyl sulfates, (C₁-C₄)alkylsulfonates or (C₁-C₄)alkylarylsulfonates,

- quaternary ammonium salts of imidazoline, for instance those of formula (II) below:

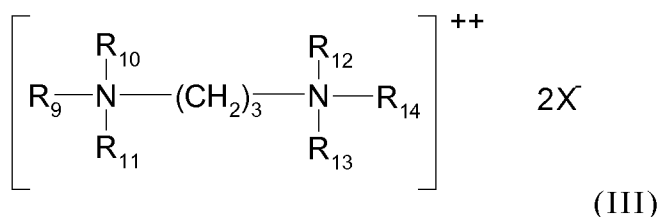


(II)

25

in which:

- R₅ represents an alkenyl or alkyl group comprising from 8 to 30 carbon atoms, for example derived from tallow fatty acids,
- R₆ represents a hydrogen atom, a C₁-C₄ alkyl group or an alkenyl or alkyl group comprising from 8 to 30 carbon atoms,
- 5 - R₇ represents a C₁-C₄ alkyl group,
- R₈ represents a hydrogen atom or a C₁-C₄ alkyl group,
- X⁻ is an anion chosen from the group of halides, phosphates, acetates, lactates, alkyl sulfates, alkyl- or alkylarylsulfonates in which the alkyl and aryl groups preferably comprise, respectively, from 1 to
- 10 20 carbon atoms and from 6 to 30 carbon atoms,
- di- or triquaternary ammonium salts, in particular of formula (III):



15

in which:

- R₉ denotes an alkyl radical comprising approximately from 16 to 30 carbon atoms, which is optionally hydroxylated and/or optionally interrupted with one or more oxygen atoms,
- 20 - R₁₀ is chosen from hydrogen or an alkyl radical comprising from 1 to 4 carbon atoms or a group (R_{9a})(R_{10a})(R_{11a})N-(CH₂)₃,
- R_{9a}, R_{10a}, R_{11a}, R₁₁, R₁₂, R₁₃ and R₁₄, which may be identical or different, are chosen from hydrogen or an alkyl radical comprising from 1 to 4 carbon atoms,
- 25 - X⁻ is an anion chosen especially from the group of halides, acetates, phosphates, nitrates, (C₁-C₄)alkyl sulfates, (C₁-C₄)alkylsulfonates and (C₁-C₄)alkylarylsulfonates, in particular methyl sulfate and ethyl sulfate,
- quaternary ammonium salts containing at least one ester
- 30 function, such as those of formula (IV) below:

from behenyltrimethylammonium salts, cetyltrimethylammonium salts, and a mixture of these compounds, and even more preferentially from behenyltrimethylammonium chloride, cetyltrimethylammonium chloride, and a mixture of these compounds.

5 10. Composition according to any one of the preceding claims, characterized in that the cationic surfactant(s) represent from 0.01% to 10% by weight, preferably from 0.1% to 8% by weight and more preferentially from 1% to 5% by weight relative to the total weight of the composition.

10 11. Composition according to any one of the preceding claims, characterized in that the gas(es) are chosen from inert gases, atmospheric air, and a mixture of these gases, and preferably chosen from argon, helium, air, nitrogen and a mixture of these gases, more preferentially air.

15 12. Composition according to any one of the preceding claims, characterized in that the gas(s) represent from 1% to 70%, preferably from 20% to 60%, and in particular from 25% to 40%, expressed by volume relative to the total volume of the whipped composition.

20 13. Process for the cosmetic treatment of keratin materials, in particular keratin fibres, preferably human keratin fibres such as the hair, in which the composition as defined in any one of the preceding claims is applied to said materials.

25 14. Use of the composition as defined in any one of Claims 1 to 12, for the cosmetic treatment of keratin materials, in particular keratin fibres, preferably human keratin fibres such as the hair.

INTERNATIONAL SEARCH REPORT

International application No
PCT/EP2018/086485

A. CLASSIFICATION OF SUBJECT MATTER
 INV. A61Q5/12 A61Q5/00 A61K8/04 A61K8/06 A61K8/31
 A61K8/34 A61K8/41 A61K8/92
 ADD.
 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)
 A61Q A61K

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)
 EPO-Internal, WPI Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

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Y	examples 3-5; table 1 examples 13, 14, 16, 17; table 3 claims 1, 10 paragraph [0116] - paragraph [0120]	4-6
Y	FR 2 760 970 A1 (OREAL [FR]) 25 September 1998 (1998-09-25) examples 2-4, 7 claims 1, 9-11, 14, 18, 19	1-14
Y	EP 1 129 684 A2 (OREAL [FR]) 5 September 2001 (2001-09-05) example 1 claims 1, 19-24, 26, 28-30	1-14
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Further documents are listed in the continuation of Box C. See patent family annex.

* Special categories of cited documents :

<p>"A" document defining the general state of the art which is not considered to be of particular relevance</p> <p>"E" earlier application or patent but published on or after the international filing date</p> <p>"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)</p> <p>"O" document referring to an oral disclosure, use, exhibition or other means</p> <p>"P" document published prior to the international filing date but later than the priority date claimed</p>	<p>"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</p> <p>"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</p> <p>"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</p> <p>"&" document member of the same patent family</p>
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Date of the actual completion of the international search 30 January 2019	Date of mailing of the international search report 12/02/2019
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Name and mailing address of the ISA/ European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Fax: (+31-70) 340-3016	Authorized officer Diebold, Alain
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INTERNATIONAL SEARCH REPORT

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C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
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