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(54) Title: COSMETIC COMPOSITION COMPRISING A PARTICULAR COMBINATION OF SURFACTANTS, A POLYOL, A CATIONIC OR AMPHOTERIC POLYMER AND OPTIONALLY A SILICONE.

(57) Abstract: Cosmetic composition comprising a particular combination of surfactants, a polyol, a cationic or amphoteric polymer and optionally a silicone. The present invention relates to a cosmetic composition useful for washing and conditioning keratin fibres. Such composition comprises: -one or more anionic surfactants, -one or more amphoteric or zwitterionic surfactants, -one or more non ionic surfactants chosen from polyethoxylated esters of fatty acids, -one or more polyols, -one or more cationic and/or amphoteric polymers, and -optionally, one or more silicones. The invention also relates to a cosmetic process for washing and/or conditioning keratin fibres using this composition.



**Cosmetic composition comprising a particular combination of
surfactants, a polyol, a cationic or amphoteric polymer and
optionally a silicone**

5 The present invention relates to a cosmetic composition for washing and/or conditioning keratin fibres, and in particular human keratin fibres such as hair, which comprises a particular combination of surfactants, one or more polyols, one or more polymers of cationic and/or amphoteric nature, and, optionally, one or more silicones.

10 The invention also relates to a cosmetic method for washing and/or conditioning keratin fibres using this composition.

 Finally, the invention relates to the use of such a composition for washing and/or conditioning keratin fibres.

15 It is common practice to use detergent cosmetic compositions such as shampoos, based essentially on surfactants, for washing keratin fibers especially such as the hair. These compositions are applied to the keratin fiber, which are preferably wet, and the lather generated by massaging or rubbing with the hands makes it possible, after rinsing with water, to remove the diverse types of soiling
20 initially present on the hair and the scalp.

 These compositions contain substantial contents of "detergent" surfactants, which, are generally of anionic, non ionic and/or amphoteric type, and particularly of anionic type.

25 Admittedly these compositions have a good washing power, but the intrinsic cosmetic properties associated with them nevertheless remain fairly poor, owing in particular to the fact that the relatively aggressive nature of such a cleaning treatment can, in the long run, lead to more or less pronounced damage to the hair fibre, this damage being associated in particular with the gradual removal of the lipids or
30 proteins contained in or on the surface of the fibres.

 Thus, in order to improve the cosmetic properties of the above detergent compositions, and more particularly those which are to be

applied to sensitized hair (i.e. hair which has been damaged or made brittle, in particular under the chemical action of atmospheric agents and/or hair treatments such as permanent-waving, dyeing or bleaching), it is now common to introduce additional conditioning agents such as mineral or plant oils into these compositions. These conditioners are intended mainly to repair or limit the harmful or undesirable effects induced by the various treatments or aggressions to which the hair fibres are subjected more or less repeatedly. These conditioners may, of course, also improve the cosmetic behaviour of natural hair.

However, the compositions containing such conditioners are generally presented in the form of emulsions or dispersions having varying degrees of thickness and they often have an opaque appearance that is not very attractive. More and more, consumers seek cosmetic products that have an original visual appearance.

Moreover, these products may cause some drawbacks, due in particular to the presence of oils.

In particular, these compositions rich in fatty substances may be difficult to apply to the hair and may be difficult to remove, in particular may require long rinsing.

Accordingly, there is a real need to make available compositions, in particular washing compositions for human keratin fibres such as hair, not presenting the drawbacks mentioned hereinabove, i.e. that present an attractive visual appearance and that can be applied easily to said fibres, and be rinsed quickly while leading to enhanced cosmetic properties.

The composition should also have good detergent properties, and present a good tolerance especially with respect to the skin, mucous membranes, the scalp and the eyes.

The Applicant has now discovered that a cosmetic composition comprising a particular combination of surfactants, one or more polyols, one or more polymers of cationic and/or amphoteric nature, and optionally one or more silicones, makes it possible to achieve the objectives outlined above.

Thus, the subject of the invention is especially a cosmetic composition comprising:

- one or more anionic surfactants,
- one or more amphoteric or zwitterionic surfactants,
- 5 - one or more non ionic surfactants chosen from polyethoxylated esters of fatty acids,
- one or more polyols,
- one or more cationic and/or amphoteric polymers, and
- optionally, one or more silicones.

10 The composition according to the invention has very good cleaning properties. It provides a homogeneous foam that spreads easily and uniformly on keratin fibres and cleanses the keratinous substrate such as the hair and the scalp in a very gentle way. The composition has the further advantages of being applied easily and of
15 being rinsed off quickly.

 The composition according to the invention furthermore exhibits high cosmetic properties, and especially affords a good conditioning of keratin fibres such as the hair, including when these fibres are sensitized. Indeed, the composition of the invention
20 provides, for instance, excellent smoothness, softness and disentangling to the hair. The composition further provides a good manageability of the keratin fibres, and a good control of frizz and volume.

 In addition, the composition according to the invention has an
25 attractive and original visual appearance. It touches, feels and behaves like an oil. It is a clear and transparent composition, which is very pleasant to the consumers.

 The composition has an oil-like texture during application, but cleans the hair like a shampoo

30 The invention also relates to a cosmetic method for washing and conditioning keratin fibres using this composition.

 Finally, the invention relates to the use of such a composition for washing and conditioning keratin fibres.

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

5 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 ...".

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

Anionic surfactants

10 The composition according to the present invention comprises one or more anionic surfactants.

The term "anionic surfactant" means a surfactant comprising, as ionic or ionizable groups, only anionic groups.

15 In the present description, a species is termed as being "anionic" when it bears at least one permanent negative charge or when it can be ionized as a negatively charged species, under the conditions of use of the composition of the invention (for example the medium or the pH) and not comprising any cationic charge.

20 The anionic surfactants may be sulfate, sulfonate and/or carboxylic (or carboxylate) surfactants. Needless to say, a mixture of these surfactants may be used.

It is understood in the present description that:

- 25 - carboxylate anionic surfactants comprise at least one carboxylic or carboxylate function ($-\text{COOH}$ or $-\text{COO}^-$) and may optionally also comprise one or more sulfate and/or sulfonate functions;
- the sulfonate anionic surfactants comprise at least one sulfonate function ($-\text{SO}_3\text{H}$ or $-\text{SO}_3^-$) and may optionally also comprise one or more sulfate functions, but do not comprise any carboxylate functions; and
- 30 - the sulfate anionic surfactants comprise at least one sulfate function but do not comprise any carboxylate or sulfonate functions.

The carboxylic anionic surfactants that may be used thus comprise at least one carboxylic or carboxylate function ($-\text{COOH}$ or $-\text{COO}^-$).

They may be chosen from the following compounds: acylglycinates, acyllactylates, acylsarcosinates, acylglutamates; alkyl-D-galactosideuronic acids, alkyl ether carboxylic acids, alkyl(C₆₋₃₀ aryl) ether carboxylic acids, alkylamido ether carboxylic acids; and
 5 also the salts of these compounds.

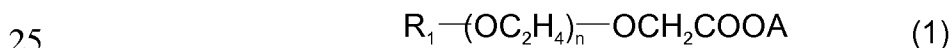
The alkyl and/or acyl groups of these compounds comprise from 6 to 30 carbon atoms, especially from 12 to 28, better still from 14 to 24 or even from 16 to 22 carbon atoms; the aryl group preferably denotes a phenyl or benzyl group.

10 These compounds are possibly polyoxyalkylenated, especially polyoxyethylenated, and then preferably comprising from 1 to 50 ethylene oxide units and better still from 2 to 10 ethylene oxide units.

Use may also be made of the C₆-C₂₄ alkyl monoesters of polyglycoside-polycarboxylic acids, such as C₆-C₂₄ alkyl
 15 polyglycoside-citrates, C₆-C₂₄ alkyl polyglycoside-tartrates and C₆-C₂₄ alkyl polyglycoside-sulfosuccinates, and salts thereof.

Among the above carboxylic surfactants, mention may be made most particularly of polyoxyalkylenated alkyl(amido) ether carboxylic acids and salts thereof, in particular those comprising from 2 to 50
 20 alkylene oxide and in particular ethylene oxide groups, such as the compounds sold by the company Kao under the name Akypo,

The polyoxyalkylenated alkyl (amido) ether carboxylic acids that may be used are preferably chosen from those of formula (1):



wherein,

- R₁ represents a linear or branched C₆-C₂₄ alkyl or alkenyl radical, an alkyl(C₈-C₉)phenyl radical, a radical R₂CONH-CH₂-CH₂- with R₂
 30 denoting a linear or branched C₉-C₂₁ alkyl or alkenyl radical, preferably, R₁ is a C₈-C₂₀ and preferably C₈-C₁₈ alkyl radical, and aryl preferably denotes phenyl,
- n is an integer or decimal number (average value) ranging from 2 to 24 and preferably from 2 to 10,

- A denotes H, ammonium, Na, K, Li, Mg or a monoethanolamine or triethanolamine residue.

It is also possible to use mixtures of compounds of formula (1), in particular mixtures of compounds containing different groups R_1 .

5 The polyoxyalkylenated alkyl(amido) ether carboxylic acids that are particularly preferred are those of formula (1) in which:

- R_1 denotes a C_{12} - C_{14} alkyl, cocoyl, oleyl, nonylphenyl or octylphenyl radical,

- A denotes a hydrogen or sodium atom, and

10 - n varies from 2 to 20 and preferably from 2 to 10.

Even more preferentially, use is made of compounds of formula (1) in which R denotes a C_{12} alkyl radical, A denotes a hydrogen or sodium atom and n ranges from 2 to 10.

15 Preferentially, the carboxylic anionic surfactants are chosen, alone or as a mixture, from:

- acylglutamates, especially of C_6 - C_{24} or even C_{12} - C_{20} , such as stearylglutamates, and in particular disodium stearylglutamate;

20 - acylsarcosinates, especially of C_6 - C_{24} or even C_{12} - C_{20} , such as palmitoylsarcosinates, and in particular sodium palmitoylsarcosinate;

- acyllactylates, especially of C_{12} - C_{28} or even C_{14} - C_{24} , such as behenoyllactylates, and in particular sodium behenoyllactylate;

- C_6 - C_{24} and especially C_{12} - C_{20} acylglycinates;

25 - (C_6 - C_{24})alkyl ether carboxylates and especially (C_{12} - C_{20})alkyl ether carboxylates;

- polyoxyalkylenated (C_6 - C_{24})alkyl(amido) ether carboxylic acids, in particular those comprising from 2 to 50 ethylene oxide groups;

30 in particular in the form of alkali metal or alkaline-earth metal, ammonium or amino alcohol salts.

The sulfonate anionic surfactants that may be used comprise at least one sulfonate function ($-SO_3H$ or $-SO_3^-$).

They may be chosen from the following compounds: alkylsulfonates, alkylamidesulfonates, alkylarylsulfonates, α -

olefinsulfonates, paraffin sulfonates, alkylsulfosuccinates, alkyl ether sulfosuccinates, alkylamidesulfosuccinates, alkylsulfoacetates, N-acyltaurates, acylisethionates; alkylsulfolaurates; and also the salts of these compounds. The alkyl groups of these compounds comprise from 6 to 30 carbon atoms, especially from 12 to 28, better still from 14 to 24 or even from 16 to 22 carbon atoms; the aryl group preferably denotes a phenyl or benzyl group.

These compounds are possibly polyoxyalkylenated, especially polyoxyethylenated, and then preferably comprising from 1 to 50 ethylene oxide units and better still from 2 to 10 ethylene oxide units.

Preferentially, the sulfonate anionic surfactants are chosen, alone or as a mixture, from:

- C₆-C₂₄ and especially C₁₂-C₂₀ alkylsulfosuccinates, especially laurylsulfosuccinates;
- C₆-C₂₄ and especially C₁₂-C₂₀ alkyl ether sulfosuccinates;
- (C₆-C₂₄)acylisethionates and preferably (C₁₂-C₁₈)acylisethionates,

in particular in the form of alkali metal or alkaline-earth metal, ammonium or amino alcohol salts.

The sulfate anionic surfactants that may be used comprise at least one sulfate function (-OSO₃H or -OSO₃⁻).

They may be chosen from the following compounds: alkyl sulfates, alkyl ether sulfates, alkylamido ether sulfates, alkylaryl polyether sulfates, monoglyceride sulfates; and also the salts of these compounds.

The alkyl groups of these compounds comprise from 6 to 30 carbon atoms, especially from 12 to 28, better still from 14 to 24 or even from 16 to 22 carbon atoms; the aryl group preferably denotes a phenyl or benzyl group.

These compounds are possibly polyoxyalkylenated, especially polyoxyethylenated, and then preferably comprising from 1 to 50 ethylene oxide units and better still from 2 to 10 ethylene oxide units.

Preferentially, the sulfate anionic surfactants are chosen, alone or as a mixture, from:

- alkyl sulphates having a C₆-C₂₄ or even a C₁₂-C₂₀ alkyl group,
 - alkyl ether sulphates having a C₆-C₂₄ or even a C₁₂-C₂₀ alkyl group and preferably comprising from 1 to 20 ethylene oxide units, and more preferably from 2 to 20 ethylene oxide units;
- 5 in particular in the form of alkali metal or alkaline-earth metal, ammonium or amino alcohol salts.

When the anionic surfactant is in salt form, the said salt may be chosen from alkali metal salts, such as the sodium or potassium salt, ammonium salts, amine salts and in particular amino alcohol salts, and alkaline-earth metal salts, such as the magnesium salt.

10

Examples of amino alcohol salts that may be mentioned include monoethanolamine, diethanolamine and triethanolamine salts, monoisopropanolamine, diisopropanolamine or triisopropanolamine salts, 2-amino-2-methyl-1-propanol salts, 2-amino-2-methyl-1,3-propanediol salts and tris(hydroxymethyl)aminomethane salts.

15

Alkali metal or alkaline-earth metal salts and in particular the sodium or magnesium salts are preferably used.

Preferentially, the anionic surfactants are chosen, alone or as a mixture, from:

- C₆-C₂₄ and especially C₁₂-C₂₀ alkyl sulfates;
 - C₆-C₂₄ and especially C₁₂-C₂₀ alkyl ether sulfates comprising from 1 to 20 ethylene oxide units, preferably from 2 to 20 ethylene oxide units;
 - C₆-C₂₄ and especially C₁₂-C₂₀ alkylsulfosuccinates, especially laurylsulfosuccinates;
 - C₆-C₂₄ and especially C₁₂-C₂₀ alkyl ether sulfosuccinates, especially laureth sulfosuccinates;
 - (C₆-C₂₄)acylisethionates and preferably (C₁₂-C₁₈)acylisethionates;
 - C₆-C₂₄ and especially C₁₂-C₂₀ acylsarcosinates; especially palmitoylsarcosinates;
 - (C₆-C₂₄)alkyl ether carboxylates, preferably (C₁₂-C₂₀)alkyl ether carboxylates;
- 20
- 25
- 30

- polyoxyalkylenated (C₆-C₂₄)alkyl(amido) ether carboxylic acids and salts thereof, in particular those comprising from 2 to 50 alkylene oxide and in particular ethylene oxide groups;

- C₆-C₂₄ and especially C₁₂-C₂₀ acylglutamates;

5 - C₆-C₂₄ and especially C₁₂-C₂₀ acylglycinates;

in particular in the form of alkali metal or alkaline-earth metal, ammonium or amino alcohol salts.

10 The anionic surfactants suitable in the composition of the present invention can be oxyethylenated and then preferably comprise from 1 to 50 ethylene oxide units.

The anionic surfactants used in the composition of the present invention are preferably chosen from sulphate and sulfonate anionic surfactants.

15 The anionic surfactants are most preferably chosen from sulfosuccinates such as in particular C₁₂-C₂₀ alkylsulfosuccinates and C₁₂-C₂₀ alkyl ether sulfosuccinates, and alkyl ether sulphates having a C₁₂-C₂₀ alkyl group and comprising from 1 to 20 ethylene oxide units, and mixtures thereof. Such compounds are preferably used under the form of salts.

20 The amount of anionic surfactants present in the composition of the present invention advantageously ranges from 0.1 to 15% by weight, more preferentially from 0.3 to 10% by weight, and even more preferably from 0.5 to 8% by weight, relative to the total weight of the composition.

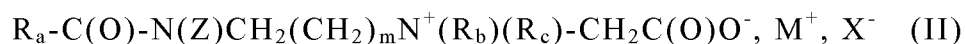
25 Amphoteric or zwitterionic surfactants

The composition according to the present invention further comprises one or more amphoteric or zwitterionic surfactant(s).

30 The amphoteric or zwitterionic surfactant(s) that may be used in the present invention may especially be secondary or tertiary aliphatic amine derivatives, optionally quaternized, in which the aliphatic group is a linear or branched chain containing from 8 to 22 carbon atoms, the said amine derivatives containing at least one anionic group, for instance a carboxylate, sulfonate, sulphate, phosphate or phosphonate group. Mention may be made in particular of

(C₈-C₂₀)alkylbetaines, sulfobetaines, (C₈-C₂₀alkyl)amido(C₃-C₈alkyl)betaines or (C₈-C₂₀alkyl)amido(C₆-C₈alkyl)sulfobetaines.

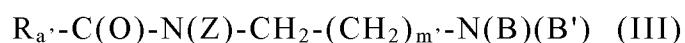
Among the secondary or tertiary aliphatic amine derivatives, optionally quaternized, that may be used, as defined above, mention
 5 may also be made of the compounds of respective structures (II) and (III) below:



10 wherein,

- R_a represents a C₆-C₃₀ alkyl or alkenyl group derived from an acid R_aCOOH preferably present in hydrolysed coconut oil, or a heptyl, nonyl or undecyl group;
- R_b represents a beta-hydroxyethyl group;
- 15 - R_c represents a carboxymethyl group;
- M⁺ represents a cationic counterion derived from an alkali metal or alkaline-earth metal, such as sodium, an ammonium ion or an ion derived from an organic amine; and
- X⁻ represents an organic or mineral anionic counterion, preferably
 20 chosen from halides, acetates, phosphates, nitrates, (C₁-C₄)alkyl sulphates, (C₁-C₄)alkyl or (C₁-C₄)alkylaryl sulfonates, in particular methyl sulphate and ethyl sulphate;
- m is equal to 0, 1 or 2; and
- Z represents a hydrogen atom or a hydroxyethyl or carboxymethyl
 25 group.

Or alternatively M⁺ and X⁻ are absent;



30 wherein

- B represents the group -CH₂-CH₂-O-X';
- B' represents the group -(CH₂)_zY', with z = 1 or 2;
- X' represents the group -CH₂-C(O)OH, -CH₂-C(O)OZ', -CH₂-CH₂-C(O)OH, -CH₂-CH₂-C(O)OZ', or a hydrogen atom;

- Y' represents the group $-\text{C}(\text{O})\text{OH}$, $-\text{C}(\text{O})\text{OZ}'$, $-\text{CH}_2-\text{CH}(\text{OH})-\text{SO}_3\text{H}$ or the group $-\text{CH}_2-\text{CH}(\text{OH})-\text{SO}_3-\text{Z}'$;
- Z' represents a cationic counterion derived from an alkali metal or alkaline-earth metal, such as sodium, an ammonium ion or an ion derived from an organic amine;
- $\text{R}_{a'}$ represents a C_6-C_{30} alkyl or C_6-C_{30} alkenyl group of an acid $\text{R}_{a'}-\text{COOH}$, which is preferably present in coconut oil or in hydrolysed linseed oil, or an alkyl group, especially a C_{17} alkyl group and its iso form, or an unsaturated C_{17} group;
- m' is equal to 0, 1 or 2; and
- Z represents a hydrogen atom or a hydroxyethyl or carboxymethyl group.

The compounds of this type are classified in the CTFA dictionary, 5th edition, 1993, under the names disodium cocoamphodiacetate, disodium lauroamphodiacetate, disodium caprylamphodiacetate, disodium capryloamphodiacetate, disodium cocoamphodipropionate, disodium lauroamphodipropionate, disodium caprylamphodipropionate, disodium capryloamphodipropionate, lauroamphodipropionic acid, cocoamphodipropionic acid and hydroxyethylcarboxymethylcocamidopropylamine.

Examples that may be mentioned include the cocoamphodiacetate sold by the company Rhodia under the trade name Miranol[®] C2M Concentrate or under the trade name Miranol Ultra C 32 and the product sold by the company Chimex under the trade name Chimexane HA.

Use may also be made of compounds of formula (III'):



wherein,

- Y''' represents the group $-\text{C}(\text{O})\text{OH}$, $-\text{C}(\text{O})\text{OZ}''$, $-\text{CH}_2-\text{CH}(\text{OH})-\text{SO}_3\text{H}$ or the group $\text{CH}_2-\text{CH}(\text{OH})-\text{SO}_3-\text{Z}''$;
- R_d and R_e , independently of each other, represent a C_1-C_4 alkyl or hydroxyalkyl radical;

- Z" represents a cationic counterion derived from an alkali metal or alkaline-earth metal, such as sodium, an ammonium ion or an ion derived from an organic amine;
- R_a" represents a C₆-C₃₀ alkyl or alkenyl group of an acid R_a"-C(O)OH which is preferably present in coconut oil or in hydrolysed linseed oil; and
- n and n' denote, independently of each other, an integer ranging from 1 to 3.

Among the compounds of formula (III'), mention may be made of the compound classified in the CTFA dictionary under the name sodium diethylaminopropyl cocoaspartamide and sold by the company Chimex under the name Chimexane HB.

Among the abovementioned amphoteric or zwitterionic surfactants, it is preferred to use (C₈-C₂₀ alkyl)betaines such as cocoylbetaine, (C₈-C₂₀ alkyl)amido(C₂-C₈ alkyl)betaines such as cocoylamidopropylbetaine, and mixtures thereof.

More preferentially, the amphoteric or zwitterionic surfactant(s) are chosen from (C₈-C₂₀ alkyl)betaines, and even more preferably cocoylbetaine.

The amount of the amphoteric or zwitterionic surfactant(s) advantageously ranges from 0.1% to 15% by weight, more preferentially from 1% to 10% by weight, and even more preferably from 2 to 5% by weight, relative to the total weight of the composition.

Non ionic surfactants:

As previously mentioned, the composition of the present invention also comprises at least one non ionic surfactant chosen from polyethoxylated esters of fatty acids.

The fatty acids typically have a number of carbon atoms ranging from 8 to 30, preferably from 10 to 22. Among these fatty acids, coco fatty acids are particularly preferred. Coco fatty acids are made of a mixture of fatty acids containing from 8 to 18 carbon atoms.

The number of ethylene oxide units is preferably higher than 3, for example from 4 to 50, more preferably from 5 to 30, and even more preferably from 6 to 25.

5 Preferably, the non ionic surfactants are chosen from polyethoxylated glyceryl esters of fatty acids, polyethoxylated sorbitan esters of fatty acids, and mixture thereof.

Thus, preferred non ionic surfactants are chosen from ethoxylated esters of C₈-C₃₀ fatty acid and sorbitan, preferably containing from 2 to 40 mol of ethylene oxide.

10 Further preferred non ionic surfactants are chosen from ethoxylated esters of C₈-C₃₀ fatty acid and glycerol, preferably containing from 4 to 50 mol of ethylene oxide, preferably 5 to 30, and more preferably from 6 to 25 mol of ethylene oxide.

Such surfactants are preferably chosen from those having a HLB higher than 8, and preferably a HLB ranging from 9 to 15. The term "HLB" means the hydrophilic-lipophilic balance at 25°C as defined by Griffin.

The HLB value according to Griffin is defined in J. Soc. Cosm. Chem. 1954 (volume 5), pp. 249-256.

20 As examples of preferred non ionic surfactants mention may be made of polyethylene glycol-7 (PEG-7) glyceryl cocoate (HLB = 10) and polyethylene glycol-6 caprylic capric triglyceride (HLB = 13.2). Polyethylene glycol-7 glyceryl cocoate is particularly preferred.

The non ionic surfactant chosen from polyethoxylated esters of fatty acids is preferably present in an amount ranging from 1 to 25% by weight, better still from 2 to 20% by weight, even better from 5 to 15% by weight, relative to the total weight of the composition.

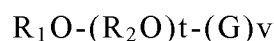
30 According to a preferred embodiment, the non ionic surfactant chosen from polyethoxylated glyceryl esters of fatty acids, polyethoxylated sorbitan esters of fatty acids, and mixture thereof, is preferably present in an amount ranging from 1 to 25% by weight, better still from 2 to 20% by weight, even better from 5 to 15% by weight, relative to the total weight of the composition.

The composition of the invention can also contain additional non ionic surfactants, different from the polyethoxylated esters of fatty acids.

Such contain additional non ionic surfactants can be chosen from alcohols, α -diols and (C1-20)alkylphenols, these compounds being polyethoxylated and/or polypropoxylated and/or polyglycerolated, the number of ethylene oxide and/or propylene oxide groups possibly ranging from 1 to 100, and the number of glycerol groups possibly ranging from 2 to 30; these compounds may contain at least one fatty chain comprising from 8 to 30 carbon atoms and especially from 16 to 30 carbon atoms.

Mention may also be made of condensates of ethylene oxide and of propylene oxide with fatty alcohols; polyethoxylated fatty amides preferably having from 2 to 30 ethylene oxide units, polyglycerolated fatty amides comprising on average from 1 to 5, and in particular from 1.5 to 4, glycerol groups; N-(C6-24 alkyl)glucamine derivatives, amine oxides such as (C10-14 alkyl)amine oxides or N-(C10-14 acyl)aminopropylmorpholine oxides.

Mention may also be made of non ionic surfactants of alkyl(poly)glycoside type, represented especially by the following general formula:



in which:

- R_1 represents a linear or branched alkyl or alkenyl radical comprising 6 to 24 carbon atoms and especially 8 to 18 carbon atoms, or an alkylphenyl radical whose linear or branched alkyl radical comprises 6 to 24 carbon atoms and especially 8 to 18 carbon atoms;

- R_2 represents an alkylene radical comprising 2 to 4 carbon atoms,

- G represents a sugar unit comprising 5 to 6 carbon atoms,

- t denotes a value ranging from 0 to 10 and preferably 0 to 4,

- v denotes a value ranging from 1 to 15 and preferably 1 to 4.

Preferably, the alkylpolyglycoside surfactants are compounds of the formula described above in which:

- R₁ denotes a linear or branched, saturated or unsaturated alkyl radical comprising from 8 to 18 carbon atoms,

- R₂ represents an alkylene radical comprising 2 to 4 carbon atoms,

5 - t denotes a value ranging from 0 to 3 and preferably equal to 0,

- G denotes glucose, fructose or galactose, preferably glucose;

10 - the degree of polymerization, i.e. the value of v, possibly ranging from 1 to 15 and preferably from 1 to 4; the mean degree of polymerization more particularly being between 1 and 2.

The glucoside bonds between the sugar units are generally of 1-6 or 1-4 type and preferably of 1-4 type. Preferably, the alkyl(poly)glycoside surfactant is an alkyl(poly)glucoside surfactant. C₈-C₁₆ alkyl(poly)glycosides 1,4, and especially decyl glucosides and caprylyl/capryl glucosides, are most particularly preferred.

15 Among the commercial products, mention may be made of the products sold by the company COGNIS under the names PLANTAREN® (600 CS/U, 1200 and 2000) or PLANTACARE® (818, 1200 and 2000); the products sold by the company SEPPIC under the names ORAMIX CG 110 and ORAMIX NS 10; the products sold by the company BASF under the name LUTENSOL GD 70, or else the products sold by the company CHEM Y under the name AG10 LK.

20 Preferably, use is made of C₈-C₁₆-alkyl(poly)glycosides 1,4, especially as an aqueous 53% solution, such as those sold by Cognis under the reference Plantacare® 818 UP.

25 Preferentially, the additional nonionic surfactants are chosen from (C₆-C₂₄ alkyl)polyglycosides and more particularly (C₈-C₁₈ alkyl)(poly)glycosides; polyethoxylated C₈-C₃₀ fatty alcohols preferably containing from 2 to 150 mol of ethylene oxide, more preferably from 2 to 40 mol of ethylene oxide; and mixtures thereof.

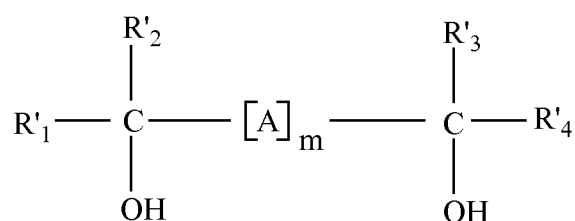
30 When present, said additional surfactant is preferably present in an amount ranging from 0.1 to 10% by weight, preferably from 0.2 to 8% by weight, more preferably from 0.5 to 5% by weight, most

preferably from 1 to 3% by weight, relative to the total weight of the composition.

Polyols:

The polyols used in the composition of the invention are preferably liquid at 25°C and atmospheric pressure (1 atm.).

Preferably, the polyols used have the corresponding formula (IV):



(IV)

in which R'₁, R'₂, R'₃ and R'₄ denote, independently of each other, a hydrogen atom, a C₁-C₆ alkyl radical or a C₁-C₆ mono- or polyhydroxyalkyl radical,

A denotes a linear or branched alkylene radical containing from 1 to 18 carbon atoms, this radical comprising from 0 to 9 oxygen atoms,

m denotes 0 or 1.

A first group of preferred polyols consists of the polyols of formula (IV) for which m = 0, such as propylene glycol, glycerol, 1,2,3-propanetriol, pinacol (2,3-dimethyl-2,3-butanediol), 1,2,3-butanetriol, 2,3-butanediol and sorbitol.

A second group of preferred polyols consists of the polyols of formula (IV) for which m = 1 and R'₁, R'₂, R'₃ and R'₄ denote, independently of each other, a hydrogen atom or a C₁-C₆ alkyl radical. Among these polyols, polyethylene glycols, for instance the product known as PEG-8 or PEG-400 in the CTFA publication (International Cosmetic Ingredient Dictionary, 7th edition), are particularly preferred.

A third group of preferred polyols consists of the polyols of formula (IV) for which m = 1 and R'₁, R'₂, R'₃ and R'₄ denote,

independently of each other, a hydrogen atom or a C₁-C₆ alkyl radical, and whose molecular weight is less than 200. Among these polyols, 3-methyl-1,3,5-pentanetriol, 1,2,4-butanetriol, 1,5-pentanediol, 2-methyl-1,3-propanediol, 1,3-butanediol, 3-methyl-1,5-pentanediol, 5 neopentyl glycol (2,2-dimethyl-1,3-propanediol), isoprene glycol (3-methyl-1,3-butanediol) and hexylene glycol (2-methyl-2,4-pentanediol) are preferably used, and even more preferably hexylene glycol, neopentyl glycol and 3-methyl-1,5-pentanediol.

10 Preferably, the polyols are chosen from the compounds of formula (IV) above for which m = 0, more preferably from propylene glycol, glycerol, 1,2,3-propanetriol, pinacol (2,3-dimethyl-2,3-butanediol), 1,2,3-butanetriol, 2,3-butanediol and sorbitol and mixtures thereof, and even more preferably from propylene glycol, glycerol, sorbitol and mixtures thereof.

15 According to a preferred embodiment of the invention, the composition contains a mixture of at least two polyols disclosed above, and most preferably a mixture of at least two polyols chosen from propylene glycol, glycerol and sorbitol.

20 The polyol(s) may be present in the composition in a total amount preferably ranging from 5% to 50% by weight, more preferably from 10% to 40% by weight, even more preferably from 15% to 30% by weight relative to the total weight of the composition.

Cationic and/or amphoteric polymers

25 The composition of the invention further comprises one or more polymers chosen from cationic and amphoteric polymers, and also mixtures thereof.

30 The term "cationic polymer" means in the present invention any polymer comprising cationic groups and/or groups that can be ionized to cationic groups, that do not comprise anionic groups and/or groups that can be ionized to anionic groups

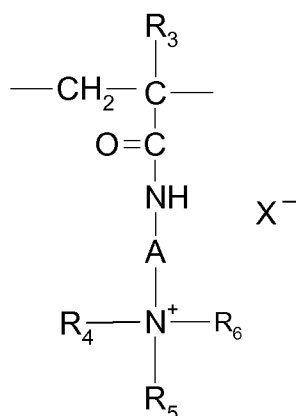
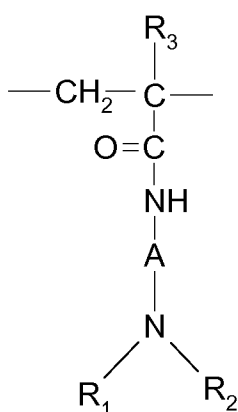
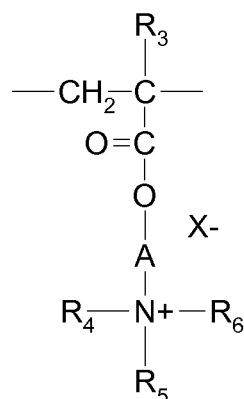
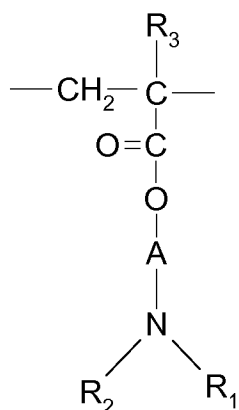
Preferably, the cationic polymer is hydrophilic or amphiphilic. The preferred cationic polymers are chosen from those that contain units comprising primary, secondary, tertiary and/or quaternary amine

groups that may either form part of the main polymer chain or may be borne by a side substituent directly connected thereto.

The cationic polymers that may be used preferably have a weight-average molar mass (M_w) of between 500 and 5×10^6 approximately and preferably between 10^3 and 3×10^6 approximately.

Among the cationic polymers, mention may be made more particularly of:

(1) homopolymers or copolymers derived from acrylic or methacrylic esters or amides and comprising at least one of the units of the following formulae:



in which:

- R_3 , which may be identical or different, denote a hydrogen atom or a CH_3 group;
- A, which may be identical or different, represent a linear or branched divalent alkyl group of 1 to 6 carbon atoms, preferably 2 or 3 carbon

atoms, or a hydroxyalkyl group of 1 to 4 carbon atoms;

- R₄, R₅ and R₆, which may be identical or different, represent an alkyl group containing from 1 to 18 carbon atoms or a benzyl group, and preferably an alkyl group containing from 1 to 6 carbon atoms;

5 - R₁ and R₂, which may be identical or different, represent a hydrogen atom or an alkyl group containing from 1 to 6 carbon atoms, and preferably methyl or ethyl;

- X denotes an anion derived from a mineral or organic acid, such as a methosulfate anion or a halide such as chloride or bromide.

10 The copolymers of family (1) may also contain one or more units derived from comonomers which may be chosen from the family of acrylamides, methacrylamides, diacetone acrylamides, acrylamides and methacrylamides substituted on the nitrogen with C₁-C₄ alkyls, acrylic or methacrylic esters thereof, vinyl lactams such as vinylpyrrolidone or
15 vinylcaprolactam, and vinyl esters.

Among these copolymers of family (1), mention may be made of:

- copolymers of acrylamide and of dimethylaminoethyl methacrylate quaternized with dimethyl sulfate or with a dimethyl halide, such as the product sold under the name Hercofloc by the company Hercules,

20 - copolymers of acrylamide and of methacryloyloxyethyl-trimethylammonium chloride, such as those sold under the name Bina Quat P 100 by the company Ciba Geigy,

- the copolymer of acrylamide and of methacryloyloxyethyl-trimethylammonium methosulfate, such as the product sold under the
25 name Reten by the company Hercules,

- quaternized or non-quaternized vinylpyrrolidone/dialkylaminoalkyl acrylate or methacrylate copolymers, such as the products sold under the name Gafquat by the company ISP, for instance Gafquat 734 or Gafquat 755, or alternatively the products known as Copolymer 845, 958
30 and 937. These polymers are described in detail in French patents 2 077 143 and 2 393 573,

- dimethylaminoethyl methacrylate/vinylcaprolactam/vinylpyrrolidone terpolymers, such as the product sold under the name Gaffix VC 713 by the company ISP,

- vinylpyrrolidone/methacrylamidopropyldimethylamine copolymers, such as those sold under the name Styleze CC 10 by ISP;
- quaternized vinylpyrrolidone/dimethylaminopropylmethacrylamide copolymers such as the product sold under the name Gafquat HS 100 by the company ISP,
- preferably crosslinked polymers of methacryloyloxy(C₁-C₄)alkyl tri(C₁-C₄)alkylammonium salts, such as the polymers obtained by homopolymerization of dimethylaminoethyl methacrylate quaternized with methyl chloride, or by copolymerization of acrylamide with dimethylaminoethyl methacrylate quaternized with methyl chloride, the homo- or copolymerization being followed by crosslinking with an olefinically unsaturated compound, more particularly methylenebisacrylamide. A crosslinked acrylamide/methacryloyloxyethyltrimethylammonium chloride copolymer (20/80 by weight) in the form of a dispersion comprising 50% by weight of the said copolymer in mineral oil may be used more particularly. This dispersion is sold under the name Salcare® SC 92 by the company Ciba. A crosslinked methacryloyloxyethyltrimethylammonium chloride homopolymer comprising about 50% by weight of the homopolymer in mineral oil or in a liquid ester can also be used. These dispersions are sold under the names Salcare® SC 95 and Salcare® SC 96 by the company Ciba.

(2) Cationic polysaccharides, especially cationic celluloses and cationic galactomannan gums. Among the cationic polysaccharides, mention may be made more particularly of cellulose ether derivatives comprising quaternary ammonium groups, cationic cellulose copolymers or cellulose derivatives grafted with a water-soluble quaternary ammonium monomer and cationic galactomannan gums.

The cellulose ether derivatives comprising quaternary ammonium groups are especially described in FR 1 492 597, and mention may be made of the polymers sold under the name Ucare Polymer "JR" (JR 400 LT, JR 125 and JR 30M) or "LR" (LR 400 or LR 30M) by the company Amerchol. These polymers are also defined in the CTFA dictionary as quaternary ammoniums of hydroxyethyl cellulose that have reacted with

an epoxide substituted with a trimethylammonium group.

Cationic cellulose copolymers or cellulose derivatives grafted with a water-soluble quaternary ammonium monomer are described especially in US patent 4 131 576, and mention may be made of
5 hydroxyalkyl celluloses, for instance hydroxymethyl-, hydroxyethyl- or hydroxypropylcelluloses grafted, in particular, with a methacryloylethyltrimethylammonium, methacrylamidopropyltrimethylammonium or dimethyldiallylammonium salt. The commercial products corresponding to this definition are more particularly the products sold
10 under the names Celquat L 200 and Celquat H 100 by the company National Starch.

The cationic galactomannan gums are described more particularly in US patents 3 589 578 and 4 031 307, and mention may be made of guar gums comprising cationic trialkylammonium groups. Use
15 is made, for example, of guar gums modified with a 2,3-epoxypropyltrimethylammonium salt (for example, a chloride). Such products are especially sold under the names Jaguar C13 S, Jaguar C 15, Jaguar C 17 or Jaguar C162 by the company Rhodia.

(3) Polymers composed of piperaziny units and of divalent alkylene or
20 hydroxyalkylene groups containing linear or branched chains, optionally interrupted by oxygen, sulfur or nitrogen atoms or by aromatic or heterocyclic rings, and also the oxidation and/or quaternization products of these polymers.

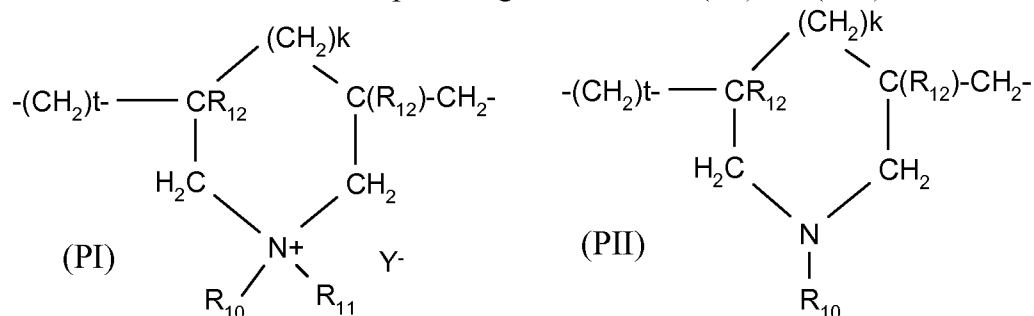
(4) Water-soluble polyaminoamides prepared in particular by
25 polycondensation of an acidic compound with a polyamine; these polyaminoamides can be crosslinked with an epihalohydrin, a diepoxide, a dianhydride, an unsaturated dianhydride, a bis-unsaturated derivative, a bis-halohydrin, a bis-azetidinium, a bis-haloacyldiamine, a bis-alkyl halide or alternatively with an oligomer resulting from the reaction of a
30 difunctional compound which is reactive with a bis-halohydrin, a bis-azetidinium, a bis-haloacyldiamine, a bis-alkyl halide, an epihalohydrin, a diepoxide or a bis-unsaturated derivative; the crosslinking agent being used in proportions ranging from 0.025 to 0.35 mol per amine group of the polyaminoamide; these polyaminoamides can be alkylated or, if they

comprise one or more tertiary amine functions, they can be quaternized.

(5) Polyaminoamide derivatives resulting from the condensation of polyalkylene polyamines with polycarboxylic acids followed by alkylation with difunctional agents. Mention may be made, for example, of adipic acid/dialkylaminohydroxyalkyldialkylenetriamine polymers in which the alkyl group comprises from 1 to 4 carbon atoms and preferably denotes methyl, ethyl or propyl. Among these derivatives, mention may be made more particularly of the adipic acid/dimethylaminohydroxypropyl/diethylenetriamine polymers sold under the name Cartaretine F, F4 or F8 by the company Sandoz.

(6) Polymers obtained by reacting a polyalkylene polyamine comprising two primary amine groups and at least one secondary amine group with a dicarboxylic acid chosen from diglycolic acid and saturated aliphatic dicarboxylic acids containing from 3 to 8 carbon atoms; the mole ratio between the polyalkylene polyamine and the dicarboxylic acid preferably being between 0.8:1 and 1.4:1; the resulting polyamino amide being reacted with epichlorohydrin in a mole ratio of epichlorohydrin relative to the secondary amine group of the polyamino amide preferably of between 0.5:1 and 1.8:1. Polymers of this type are sold in particular under the name Hercosett 57 by the company Hercules Inc. or alternatively under the name PD 170 or Delsette 101 by the company Hercules in the case of the adipic acid/epoxypropyl/diethylenetriamine copolymer.

(7) Cyclopolymers of alkyldiallylamine or of dialkyldiallylammonium, such as the homopolymers or copolymers containing, as main constituent of the chain, units corresponding to formula (PI) or (PII):



in which

- k and t are equal to 0 or 1, the sum k + t being equal to 1;

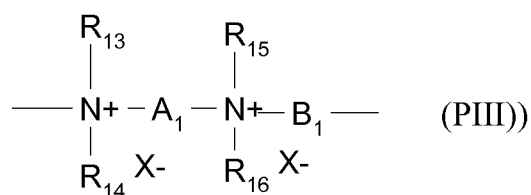
- R₁₂ denotes a hydrogen atom or a methyl group;

5 - R₁₀ and R₁₁, independently of each other, denote an alkyl group containing from 1 to 6 carbon atoms, a hydroxyalkyl group in which the alkyl group contains 1 to 5 carbon atoms, a C₁-C₄ amidoalkyl group; or alternatively R₁₀ and R₁₁ may denote, together with the nitrogen atom to which they are attached, heterocyclic groups such as piperidyl or morpholinyl; R₁₀ and R₁₁, independently of each other, preferably
10 denote an alkyl group containing from 1 to 4 carbon atoms.

- Y⁻ is an anion such as bromide, chloride, acetate, borate, citrate, tartrate, bisulfate, bisulfite, sulfate or phosphate.

Mention may be made more particularly of the dimethyldiallylammonium salt (for example chloride) homopolymer for
15 example sold under the name Merquat 100 by the company Nalco (and homologues thereof of low weight-average molar masses) and the copolymers of diallyldimethylammonium salts (for example chloride) and of acrylamide, sold especially under the name Merquat 550 or Merquat 7SPR.

20 (8) quaternary diammonium polymers comprising repeating units of formula:



in which:

- R₁₃, R₁₄, R₁₅ and R₁₆, which may be identical or different, represent
25 aliphatic, alicyclic or arylaliphatic groups comprising from 1 to 20 carbon atoms or C₁-C₄ hydroxyalkylaliphatic groups, or alternatively R₁₃, R₁₄, R₁₅ and R₁₆, together or separately, constitute, with the nitrogen atoms to which they are attached, heterocycles optionally comprising a second heteroatom other than nitrogen, or alternatively
30 R₁₃, R₁₄, R₁₅ and R₁₆ represent a linear or branched C₁-C₆ alkyl group substituted with a nitrile, ester, acyl or amide group or a group -CO-O-

R_{17} -D or -CO-NH- R_{17} -D where R_{17} is an alkylene and D is a quaternary ammonium group;

- A_1 and B_1 represent divalent polymethylene groups comprising from 2 to 20 carbon atoms which may be linear or branched, and saturated or unsaturated, and which may contain, linked to or inserted in the main chain, one or more aromatic rings, or one or more oxygen or sulfur atoms or sulfoxide, sulfone, disulfide, amino, alkylamino, hydroxyl, quaternary ammonium, ureido, amide or ester groups, and

- X^- denotes an anion derived from a mineral or organic acid;

it being understood that A_1 , R_{13} and R_{15} can form, with the two nitrogen atoms to which they are attached, a piperazine ring.

In addition, if A_1 denotes a linear or branched, saturated or unsaturated alkylene or hydroxyalkylene group, B_1 can also denote a group $(CH_2)_n$ -CO-D-OC- $(CH_2)_n$ - in which D denotes:

a) a glycol residue of formula -O-Z-O-, in which Z denotes a linear or branched hydrocarbon-based group, or a group corresponding to one of the following formulae: $-(CH_2-CH_2-O)_x-CH_2-CH_2-$ and $-[CH_2-CH(CH_3)-O]_y-CH_2-CH(CH_3)-$, where x and y denote an integer from 1 to 4, representing a defined and unique degree of polymerization or any number from 1 to 4 representing an average degree of polymerization;

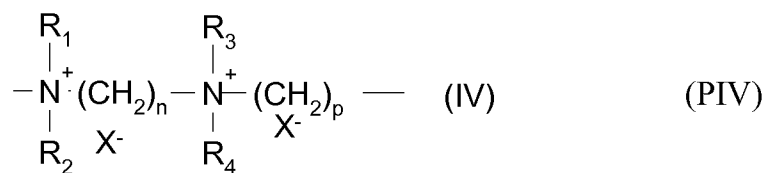
b) a bis-secondary diamine residue such as a piperazine derivative;

c) a bis-primary diamine residue of formula: -NH-Y-NH-, in which Y denotes a linear or branched hydrocarbon group, or alternatively the divalent group -CH₂-CH₂-S-S-CH₂-CH₂-;

d) a ureylene group of formula: -NH-CO-NH-.

Preferably, X^- is an anion such as chloride or bromide. These polymers have a number-average molar mass (M_n) generally of between 1000 and 100 000.

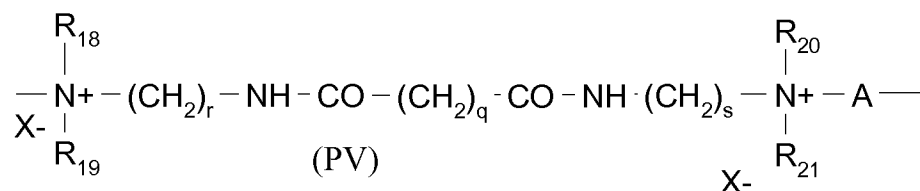
Mention may be made more particularly of polymers that are composed of repeating units corresponding to the formula:



in which R₁, R₂, R₃ and R₄, which may be identical or different, denote an alkyl or hydroxyalkyl group containing from 1 to 4 carbon atoms approximately, n and p are integers ranging from 2 to 20 approximately, and X⁻ is an anion derived from a mineral or organic acid.

A compound of formula (PIV) that is particularly preferred is the one for which R₁, R₂, R₃ and R₄ represent a methyl group and n = 3, p = 6 and X = Cl, which is known as Hexadimethrine chloride according to the INCI (CTFA) nomenclature.

(9) Polyquaternary ammonium polymers comprising units of formula (PV):



in which:

- R₁₈, R₁₉, R₂₀ and R₂₁, which may be identical or different, represent a hydrogen atom or a methyl, ethyl, propyl, β-hydroxyethyl, β-hydroxypropyl or -CH₂CH₂(OCH₂CH₂)_pOH group, where p is equal to 0 or to an integer between 1 and 6, with the proviso that R₁₈, R₁₉, R₂₀ and R₂₁ do not simultaneously represent a hydrogen atom,
- r and s, which may be identical or different, are integers between 1 and 6,
- q is equal to 0 or to an integer between 1 and 34,
- X⁻ denotes an anion such as a halide,
- A denotes a radical of a dihalide or preferably represents -CH₂-CH₂-O-CH₂-CH₂-.

Examples that may be mentioned include the products Mirapol® A 15, Mirapol® AD1, Mirapol® AZ1 and Mirapol® 175 sold by the

company Miranol.

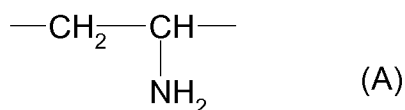
(10) Quaternary polymers of vinylpyrrolidone and of vinylimidazole, for instance the products sold under the names Luviquat® FC 905, FC 550 and FC 370 by the company BASF.

5 (11) Polyamines such as Polyquart® H sold by Cognis, referred to under the name Polyethylene glycol (15) tallow polyamine in the CTFA dictionary.

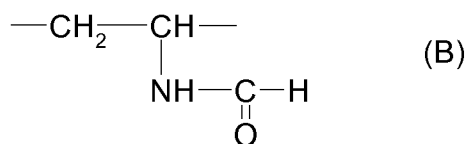
(12) Polymers comprising in their structure:

(a) one or more units corresponding to formula (A) below:

10



(b) optionally, one or more units corresponding to formula (B) below:



15

In other words, these polymers may be chosen especially from homopolymers or copolymers comprising one or more units derived from vinylamine and optionally one or more units derived from vinylformamide.

20

Preferably, these cationic polymers are chosen from polymers comprising, in their structure, from 5 mol% to 100 mol% of units corresponding to formula (A) and from 0 to 95 mol% of units corresponding to formula (B), preferentially from 10 mol% to 100 mol% of units corresponding to formula (A) and from 0 to 90 mol% of units corresponding to formula (B).

25

These polymers may be obtained, for example, by partial hydrolysis of polyvinylformamide. This hydrolysis may be performed in an acidic or basic medium.

30

The weight-average molecular mass of the said polymer, measured by light scattering, may range from 1000 to 3 000 000 g/mol, preferably from 10 000 to 1 000 000 g/mol and more particularly from

100 000 to 500 000 g/mol.

The cationic charge density of these polymers may range from 2 to 20 meq/g, preferably from 2.5 to 15 meq/g and more particularly from 3.5 to 10 meq/g.

5 The polymers comprising units of formula (A) and optionally units of formula (B) are sold especially under the name Lupamin by the company BASF, for instance, in a non-limiting manner, the products sold under the names Lupamin 9095, Lupamin 5095, Lupamin 1095, Lupamin 9030 (or Luviquat 9030) and Lupamin 9010.

10 Other cationic polymers that may be used in the context of the invention are cationic proteins or cationic protein hydrolysates, polyalkyleneimines, in particular polyethyleneimines, polymers comprising vinylpyridine or vinylpyridinium units, condensates of polyamines and of epichlorohydrin, quaternary polyureylenes and chitin
15 derivatives.

Preferably, the cationic polymers are chosen from the polymers of families (1), (2), (7) and (10) mentioned above.

Among the cationic polymers mentioned above, the ones that may preferably be used are cationic polysaccharides, especially cationic
20 celluloses and cationic galactomannan gums, and in particular quaternary cellulose ether derivatives such as the products sold under the name JR 400 by the company Amerchol, cationic cyclopolymers, in particular dimethyldiallylammonium salt (for example chloride) homopolymers or copolymers, sold under the names Merquat 100,
25 Merquat 550 and Merquat S by the company Nalco, and homologues thereof of low weight-average molecular weights, quaternary polymers of vinylpyrrolidone and of vinylimidazole, optionally crosslinked homopolymers or copolymers of methacryloyloxy(C₁-C₄)alkyltri(C₁-C₄)alkylammonium salts; and mixtures thereof.

30 It is also possible to use amphoteric polymers.

The amphoteric (or zwitterionic) polymers that may be used in accordance with the invention may be chosen from polymers comprising units B and C statistically distributed in the polymer chain, where B denotes a unit derived from a monomer comprising at least

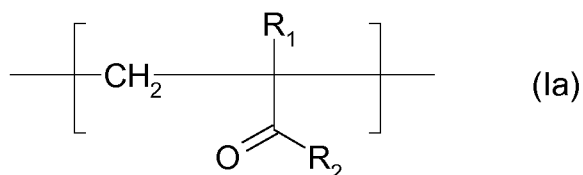
one basic nitrogen atom and C denotes a unit derived from an acid monomer comprising one or more carboxylic or sulfonic groups, or alternatively B and C may denote groups derived from carboxybetaine or sulfobetaine zwitterionic monomers;

5 B and C may also denote a cationic polymer chain comprising primary, secondary, tertiary or quaternary amine groups, in which at least one of the amine groups bears a carboxylic or sulfonic group connected via a hydrocarbon-based radical, or alternatively B and C form part of a chain of a polymer comprising and α,β -dicarboxylic
10 ethylene unit in which one of the carboxylic groups has been made to react with a polyamine comprising one or more primary or secondary amine groups.

The amphoteric polymers can in particular be chosen from amphoteric polymers comprising a repetition of:

15 (i) one or more units derived from a monomer of (meth)acrylamide type,
(ii) one or more units derived from a monomer of (meth)acrylamidoalkyltrialkylammonium type, and
(iii) one or more units derived from an acidic monomer of (meth)acrylic acid type.

20 Preferably, the units derived from a monomer of (meth)acrylamide type (i) are units of structure (Ia) below:



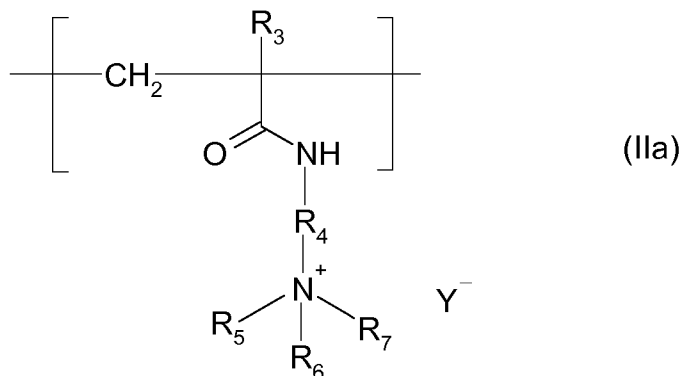
in which R_1 denotes H or CH_3 and R_2 is chosen from an amino, dimethylamino, tert-butylamino, dodecylamino or $-\text{NH}-\text{CH}_2\text{OH}$ group.

25 Preferably, the said amphoteric polymer comprises a repetition of only one unit of formula (Ia).

The unit derived from a monomer of (meth)acrylamide type of formula (Ia) in which R_1 denotes H and R_2 is an amino group (NH_2) is particularly preferred. It corresponds to the acrylamide monomer per se.

30 Preferably, the units derived from a monomer of (meth)acrylamidoalkyltrialkylammonium type (ii) are units of structure

(IIa) below:



in which:

- R₃ denotes H or CH₃,
- 5 - R₄ denotes a group (CH₂)_k with k being an integer ranging from 1 to 6 and preferably from 2 to 4;
- R₅, R₆ and R₇, which may be identical or different, each denote an alkyl group containing from 1 to 4 carbon atoms;
- Y⁻ is an anion such as bromide, chloride, acetate, borate, citrate, tartrate, bisulfate, bisulfite, sulfate or phosphate.

10

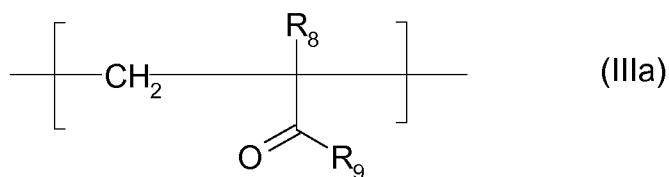
Preferably, the said amphoteric polymer comprises a repetition of only one unit of formula (IIa).

15

Among these units derived from a monomer of (meth)acrylamidoalkyltrialkylammonium type of formula (IIa), the ones that are preferred are those derived from the methacrylamidopropyltrimethylammonium chloride monomer, for which R₃ denotes a methyl group, k is equal to 3, R₅, R₆ and R₇ denote a methyl group, and Y⁻ denotes a chloride anion.

20

Preferably, the units derived from a monomer of (meth)acrylic acid type (iii) are units of formula (IIIa):



in which R₈ denotes H or CH₃ and R₉ denotes a hydroxyl group or a -NH-C(CH₃)₂-CH₂-SO₃H group.

The preferred units of formula (IIIa) correspond to the acrylic acid, methacrylic acid and 2-acrylamino-2-methylpropanesulfonic acid monomers.

5 Preferably, the unit derived from a monomer of (meth)acrylic acid type of formula (IIIa) is that derived from acrylic acid, for which R_8 denotes a hydrogen atom and R_9 denotes a hydroxyl group.

The acidic monomer(s) of (meth)acrylic acid type may be non-neutralized or partially or totally neutralized with an organic or mineral base.

10 Preferably, the said amphoteric polymer comprises a repetition of only one unit of formula (IIIa).

According to a preferred embodiment of the invention, the amphoteric polymer(s) of this type comprise at least 30 mol% of units derived from a monomer of (meth)acrylamide type (i). Preferably, they
15 comprise from 30 mol% to 70 mol% and more preferably from 40 mol% to 60 mol% of units derived from a monomer of (meth)acrylamide type.

The content of units derived from a monomer of (meth)acrylamidoalkyltrialkylammonium type (ii) may advantageously be from 10 mol% to 60 mol% and preferentially from 20 mol% to 55
20 mol%.

The content of units derived from an acidic monomer of (meth)acrylic acid type (iii) may advantageously be from 1 mol% to 20 mol% and preferentially from 5 mol% to 15 mol%.

25 According to a particularly preferred embodiment of the invention, the amphoteric polymer of this type comprises:

- from 30 mol% to 70 mol% and more preferably from 40 mol% to 60 mol% of units derived from a monomer of (meth)acrylamide type (i),
- from 10 mol% to 60 mol% and preferentially from 20 mol% to 55 mol% of units derived from a monomer of
30 (meth)acrylamidoalkyltrialkylammonium type (ii), and
- from 1 mol% to 20 mol% and preferentially from 5 mol% to 15 mol% of units derived from a monomer of (meth)acrylic acid type (iii).

Amphoteric polymers of this type may also comprise additional units, other than the units derived from a monomer of (meth)acrylamide

type, of (meth)acrylamidoalkyltrialkylammonium type and of (meth)acrylic acid type as described above.

However, according to a preferred embodiment of the invention, the said amphoteric polymers consist solely of units derived from monomers of (meth)acrylamide type (i), of (meth)acrylamidoalkyl-
5 trialkylammonium type (ii) and of (meth)acrylic acid type (iii).

As particularly preferred examples of such amphoteric polymers, mention may be made of acrylamide/methylacrylamidopropyl-trimethylammonium chloride/acrylic acid terpolymers. Such polymers
10 are listed in the CTFA International Cosmetic Ingredient Dictionary, 10th edition 2004, under the name Polyquaternium 53. Corresponding products are especially sold under the names Merquat 2003 and Merquat 2003 PR by the company Nalco.

Another preferred type of amphoteric polymers is the polymers comprising a repetition of:

- 15 (i) one or more non ionic units derived from a monomer of (meth)acrylate type,
(ii) one or more units derived from a monomer of (meth)acrylamidoalkyltrialkylammonium type, and
20 (iii) one or more units derived from an acidic monomer of (meth)acrylic acid type.

The monomers of (meth)acrylamidoalkyltrialkylammonium type and the acidic monomers of (meth)acrylic acid type (monomers (ii) and (iii) respectively) are as described above.

25 The non ionic monomers (i) of (meth)acrylate type are preferably chosen from C₁-C₄ alkyl acrylates and methacrylates. A preferred monomer is methyl acrylate.

As particularly preferred examples of such amphoteric polymers, mention may be made of acrylic acid /methylacrylamidopropyl-trimethylammonium chloride/ methyl acrylate terpolymers. Such
30 polymers are listed in the CTFA International Cosmetic Ingredient Dictionary under the name Polyquaternium 47. Corresponding products are especially sold under the names Merquat 2001 and Merquat 2001N by the company Nalco.

As another type of preferred amphoteric polymer that may be used, mention may also be made of copolymers based on (meth) acrylic acid and on a dialkyldiallylammonium salt, such as copolymers of (meth) acrylic acid and of dimethyldiallylammonium chloride.

5 Such polymers are listed in the CTFA International Cosmetic Ingredient Dictionary, under the name Polyquaternium 22. An example of corresponding product is sold under the name Merquat 280 by the company Nalco.

10 Among the cationic and amphoteric polymers described above, those having a cationic charge density ranging from 0.2 to 5 meq/g are preferred.

Among these polymers, the amphoteric polymers are particularly preferred. Thus, according to a preferred embodiment, the composition of the invention comprises one or more amphoteric polymer(s).

15 Most preferred are Polyquaternium 22, Polyquaternium 47, Polyquaternium 53, and mixtures thereof.

20 According to a preferred embodiment, the composition of the invention contains at least two different polymers chosen from cationic and amphoteric polymers, such as two different polymers, preferably two different amphoteric polymers; or three different polymers, preferably three different amphoteric polymers.

25 The total amount of cationic and amphoteric polymer(s) advantageously ranges from 0.05 to 10% by weight, more preferably from 0.1 to 5% by weight, and most preferably from 0.4 to 3% by weight, with regard to the total weight of the composition.

Silicones

30 The composition according to the present invention may further contain one or more silicones. Such silicones can be chosen in particular from non-amino silicones, amino silicones and mixtures thereof.

In the present invention, the term "silicone" is intended to denote, in accordance with what is generally accepted, any organosilicon polymer or oligomer of linear or cyclic, branched or crosslinked structure, of variable molecular weight, obtained by

polymerization and/or polycondensation of suitably functionalized silanes, and consisting essentially of a repetition of main units in which the silicon atoms are linked together via oxygen atoms (siloxane bond -Si-O-Si-), optionally substituted hydrocarbon-based radicals being directly linked via a carbon atom to the said silicon atoms. The hydrocarbon-based radicals that are the most common are alkyl radicals, especially C₁-C₁₀ alkyl radicals, and in particular methyl, fluoroalkyl radicals, the alkyl part of which is C₁-C₁₀, and aryl radicals and in particular phenyl.

According to the present invention, the term “non-amino silicone” denotes any silicone not containing at least one primary, secondary or tertiary amine, or a quaternary ammonium group.

The non-amino silicones, which can be used in the composition according to the invention, are, in particular, polyorganosiloxanes that may be in the form of oils, waxes, resins or gums.

Organopolysiloxanes are defined in greater detail in Walter Noll's *Chemistry and Technology of Silicones* (1968), Academic Press.

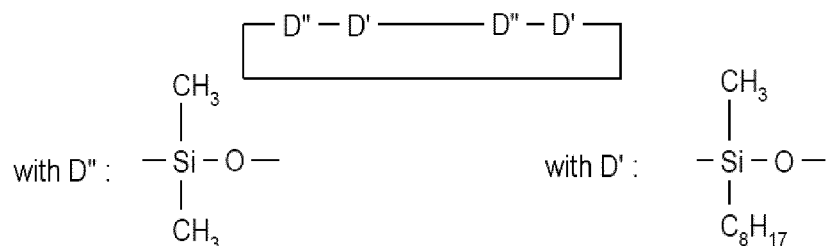
The silicones may be volatile or non-volatile.

When they are volatile, the silicones are more particularly chosen from those with a boiling point of between 60°C and 260°C, and even more particularly from:

(i) cyclic silicones comprising from 3 to 7 and preferably 4 to 5 silicon atoms.

These are, for example, octamethylcyclotetrasiloxane sold especially under the name Volatile Silicone 7207 by the company Union Carbide or Silbione 70045 V 2 by the company Rhodia, decamethylcyclopentasiloxane sold under the name Volatile Silicone 7158 by the company Union Carbide, and Silbione 70045 V 5 by the company Rhodia, and mixtures thereof.

Mention may also be made of cyclocopolymers of the dimethylsiloxane/methylalkylsiloxane type, such as Volatile Silicone FZ 3109 sold by the company Union Carbide, of chemical structure:



Mention may also be made of mixtures of cyclic silicones with organosilicon compounds, such as the mixture of octamethyl-cyclotetrasiloxane and tetrakis(trimethylsilyl)-pentaerythritol (50/50) and the mixture of octamethylcyclotetrasiloxane and oxy-1,1'-bis(2,2,2',2'',3,3'-hexatrimethylsilyloxy)neopentane;

(ii) linear volatile silicones containing 2 to 9 silicon atoms and having a viscosity of less than or equal to $5 \times 10^{-6} \text{ m}^2/\text{s}$ at 25°C . An example is decamethyltetrasiloxane sold in particular under the name SH 200 by the company Toray Silicone. Silicones belonging to this category are also described in the article published in *Cosmetics and Toiletries*, Vol. 91, Jan. 76, pp. 27-32, Todd & Byers *Volatile Silicone Fluids for Cosmetics*.

When the silicones are non-volatile, use is preferably made of polyalkylsiloxanes, polyarylsiloxanes, polyalkylarylsiloxanes, silicone gums and resins, and polyorganosiloxanes modified with organofunctional groups, and mixtures thereof.

These silicones are more particularly chosen from polyalkylsiloxanes, among which mention may be made mainly of polydimethylsiloxanes containing trimethylsilyl end groups (Dimethicone according to the CTFA name) having a viscosity of from 5×10^{-6} to $2.5 \text{ m}^2/\text{s}$ at 25°C and preferably 1×10^{-5} to $1 \text{ m}^2/\text{s}$. The viscosity of the silicones is measured, for example, at 25°C according to standard ASTM 445 Appendix C.

Among these polyalkylsiloxanes, mention may be made, in a non-limiting manner, of the following commercial products:

- the Silbione oils of the 47 and 70 047 series or the Mirasil oils sold by the company Rhodia, for instance the oil 70 047 V 500 000,

- 5 - the oils of the Mirasil series sold by the company Rhodia,
 - the oils of the 200 series from the company Dow Corning, such as, more particularly, DC200 with a viscosity of 60 000 cSt,
 - the Viscasil oils from the company General Electric and certain oils of the SF series (SF 96, SF 18) from the company General Electric.

10 Mention may also be made of polydimethylsiloxanes containing dimethylsilanol end groups (Dimethiconol according to the CTFA name) such as the oils of the 48 series from the company Rhodia.

 Mention could be made of dimethiconol emulsions, for example with anionic surfactants, preferably having a low particle size such as
15 less than 500nm, preferably less than 200 nm.

 Mention may also be made of polydimethylsiloxanes containing α,ω -silanol groups.

 In this category of polyalkylsiloxanes, mention may also be made of the products sold under the names Abil Wax 9800 and 9801
20 by the company Goldschmidt, which are poly(C₁-C₂₀)alkylsiloxanes.

 The polyalkylarylsiloxanes are particularly chosen from linear and/or branched polydimethylmethylphenylsiloxanes and polydimethyldiphenylsiloxanes with a viscosity of from 1×10^{-5} to $5 \times 10^{-2} \text{ m}^2/\text{s}$ at 25°C.

25 Among these polyalkylarylsiloxanes, examples that may be mentioned include the products sold under the following names:

- Silbione oils of the 70 641 series from the company Rhodia,
 - the oils of the Rhodorsil 70 633 and 763 series from the company Rhodia,
30 - the oil Dow Corning 556 Cosmetic Grade Fluid from the company Dow Corning,
 - silicones of the PK series from the company Bayer, such as the product PK20,

- the silicones of the PN and PH series from the company Bayer, such as the products PN1000 and PH1000,

- certain oils of the SF series from the company General Electric, such as SF 1023, SF 1154, SF 1250 and SF 1265.

5 The silicone gums that may be present in the composition according to the invention are especially polydiorganosiloxanes having high number-average molecular masses of between 200 000 and 1 000 000, used alone or as a mixture in a solvent. This solvent can be chosen from volatile silicones, polydimethylsiloxane (PDMS) oils,
10 polyphenylmethylsiloxane (PPMS) oils, isoparaffins, polyisobutylenes, methylene chloride, pentane, dodecane and tridecane, or mixtures thereof.

Mention may be made more particularly of the following products:

- 15 - polydimethylsiloxane gums,
 - polydimethylsiloxane/methylvinylsiloxane gums,
 - polydimethylsiloxane/diphenylsiloxane gums,
 - polydimethylsiloxane/phenylmethylsiloxane gums,
 - polydimethylsiloxane/diphenylsiloxane/methylvinylsiloxane gums.

20 Products that may be used more particularly are the following mixtures:

 - mixtures formed from a polydimethylsiloxane hydroxylated at the end of the chain (known as dimethiconol according to the nomenclature of the CTFA dictionary) and from a cyclic
25 polydimethylsiloxane (known as cyclomethicone according to the nomenclature of the CTFA dictionary), such as the product Q2 1401 sold by the company Dow Corning,

 - mixtures formed from a polydimethylsiloxane gum with a cyclic silicone, such as the product SF 1214 Silicone Fluid from the
30 company General Electric, this product being an SF 30 gum corresponding to a dimethicone, having a number-average molecular weight of 500 000, dissolved in the oil SF 1202 Silicone Fluid corresponding to decamethylcyclopentasiloxane,

- mixtures of two PDMSs with different viscosities, and more particularly of a PDMS gum and a PDMS oil, such as the product SF 1236 from the company General Electric. The product SF 1236 is a mixture of a gum SE 30 defined above, with a viscosity of 20 m²/s and
5 of an oil SF 96 with a viscosity of 5×10^{-6} m²/s. This product preferably comprises 15% of gum SE 30 and 85% of an oil SF 96.

The organopolysiloxane resins that may be present in the composition according to the invention are crosslinked siloxane systems containing the following units: R₂SiO_{2/2}, R₃SiO_{1/2}, RSiO_{3/2}
10 and SiO_{4/2} in which R represents a hydrocarbon group containing 1 to 16 carbon atoms or a phenyl group. Among these products, the ones that are particularly preferred are those in which R denotes a C₁-C₄ alkyl group, more particularly methyl, or a phenyl group.

Among these resins, mention may be made of the product sold
15 under the name Dow Corning 593 or those sold under the names Silicone Fluid SS 4230 and SS 4267 by the company General Electric, which are silicones of dimethyl/trimethylsiloxane structure.

Mention may also be made of the trimethyl siloxysilicate type resins sold in particular under the names X22-4914, X21-5034 and
20 X21-5037 by the company Shin-Etsu.

The organomodified silicones that may be present in the composition according to the invention are silicones as defined above and comprising in their structure one or more organofunctional groups attached via a hydrocarbon-based group.

25 Among the organomodified silicones, mention may be made of polyorganosiloxanes comprising:

- polyethyleneoxy and/or polypropyleneoxy groups optionally comprising C₆-C₂₄ alkyl groups, such as the products known as dimethicone copolyol sold by the company Dow Corning under the
30 name DC 1248 or the oils Silwet L 722, L 7500, L 77 and L 711 by the company Union Carbide, and the (C₁₂)alkylmethicone copolyol sold by the company Dow Corning under the name Q2 5200, or in particular the silicone of INCI name PEG-12 dimethicone such as the product XIAMETER OFX-0193 FLUID sold by Dow Corning.

- thiol groups, such as the products sold under the names GP 72 A and GP 71 from the company Genesee,

- alkoxyated groups, such as the product sold under the name Silicone Copolymer F-755 by SWS Silicones and Abil Wax 2428, 2434 and 2440 by the company Goldschmidt,

- hydroxylated groups, such as the polyorganosiloxanes containing a hydroxyalkyl function, described in French patent application FR 2 589 476,

- acyloxyalkyl groups, for instance the polyorganosiloxanes described in patent US-A-4 957 732,

- anionic groups of the carboxylic acid type, for instance in the products described in patent EP 186 507 from the company Chisso Corporation, or of the alkylcarboxylic type, such as those present in the product X-22-3701E from the company Shin-Etsu; 2-hydroxyalkyl sulfonate; 2-hydroxyalkyl thiosulphate such as the products sold by the company Goldschmidt under the names Abil S201 and Abil S255.

According to the invention, silicones comprising a polysiloxane portion and a non-silicone organic chain portion, one of the two portions constituting the main chain of the polymer and the other being grafted onto the said main chain, can also be used. These polymers are described, for example, in patent applications EP-A-412,704, ep-a-412,707, ep-a-640,105 and WO95/00578, ep-a-582,152 and WO93/23009 and U.S. Pat. Nos. 4,693,935, 4,728,571 and 4,972,037, the disclosures of which are specifically incorporated by reference herein. These polymers are preferably anionic or non-ionic.

Such polymers are, for example, copolymers, which may be obtained by radical polymerization from a monomer mixture comprising:

a) 50 to 90% by weight of tert-butyl acrylate;

b) 0 to 40% by weight of acrylic acid; 5 to 40% by weight of silicone macromer of formula:

wherein,

V is a number ranging from 5 to 700; the weight percentages being calculated relative to the total weight of the monomers.

Other examples of grafted silicone polymers are, in particular, polydimethylsiloxane (PDMSs) onto which are grafted, via a connecting chain of thiopropylene type, mixed polymer units of the poly(meth)acrylic acid type and of the polyalkyl(methyl)acrylate type and polydimethylsiloxanes (PDMSs) on which are grafted, via a connecting chain of thiopropylene type, polymer units of the polyisobutyl(meth)acrylate type.

Preferably, the non amino silicones are chosen from polyalkylsiloxanes and polyorganosiloxanes comprising polyethyleneoxy and/or polypropyleneoxy groups, and more preferentially from polydimethylsiloxanes, ethoxylated polydimethylsiloxanes and mixtures thereof.

The non-amino silicones, which can be used in the present invention preferably have a viscosity equals to 60 000 cst at 25°C and shear rate 1s^{-1} .

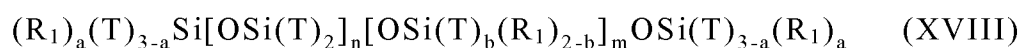
The viscosity may be measured at 25°C with viscosimeters or rheometers preferably with cone-plan geometry.

The silicones used in the composition of the invention may also be chosen from amino silicones.

For the purposes of the present invention, the term “amino silicone” means any silicone comprising at least one primary, secondary or tertiary amine function or a quaternary ammonium group.

The amino silicones that may be used in the cosmetic composition according to the present invention are chosen from:

(a) the compounds corresponding to formula (XVIII) below:

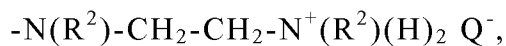
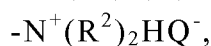
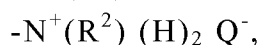
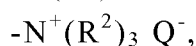
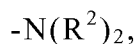
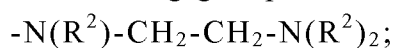


wherein,

- T is a hydrogen atom or a phenyl, hydroxyl (-OH) or C_1 - C_8 alkyl group, and preferably methyl, or a C_1 - C_8 alkoxy, preferably methoxy,
- a denotes the number 0 or an integer from 1 to 3, and preferably 0,
- b denotes 0 or 1, and in particular 1,

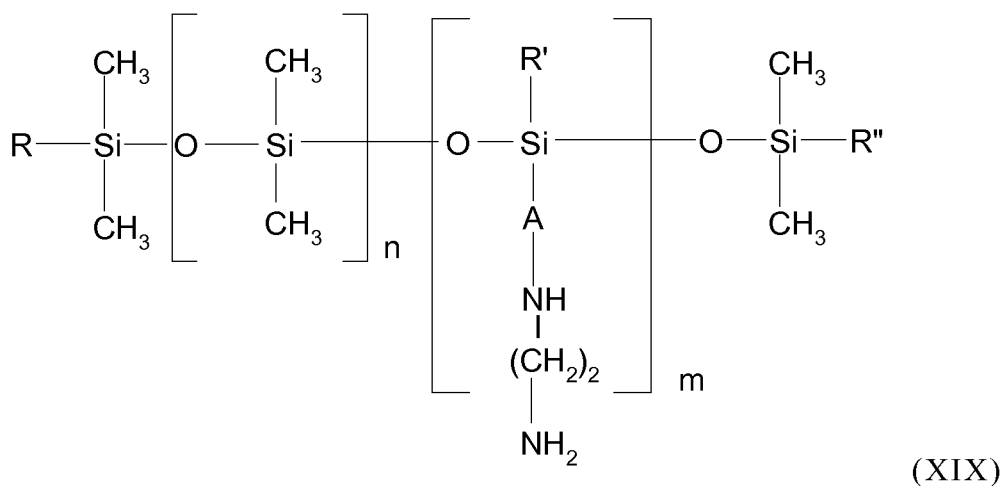
- m and n are numbers such that the sum (n + m) can range especially from 1 to 2000 and in particular from 50 to 150, it being possible for n to denote a number from 0 to 1999 and in particular from 49 to 149, and for m to denote a number from 1 to 2000 and in particular from 1 to 10, and

- R₁ is a monovalent group of formula -C_qH_{2q}L in which q is a number from 2 to 8 and L is an optionally quaternized amino group chosen from the following groups:



wherein, R² may denote a hydrogen atom, a phenyl, a benzyl or a saturated monovalent hydrocarbon-based group, for example a C₁-C₂₀ alkyl group, and Q⁻ represents a halide ion, for instance fluoride, chloride, bromide or iodide.

In particular, the amino silicones corresponding to the definition of formula (XVIII) are chosen from the compounds corresponding to formula (XIX) below:



wherein, R, R' and R'', which may be identical or different, denote a C₁-C₄ alkyl group, preferably CH₃; a C₁-C₄ alkoxy group, preferably methoxy; or OH; A represents a linear or branched, C₃-C₈ and preferably C₃-C₆ alkylene group; m and n are integers dependent on the molecular weight and whose sum is between 1 and 2000.

According to a first possibility, R, R' and R'', which may be identical or different, represent a C₁-C₄ alkyl or hydroxyl group, A represents a C₃ alkylene group and m and n are such that the weight-average molecular mass of the compound is between 5000 and 500 000 approximately. Compounds of this type are referred to in the CTFA dictionary as "amodimethicones".

According to a second possibility, R, R' and R'', which may be identical or different, each represent a C₁-C₄ alkoxy or hydroxyl group, at least one of the groups R or R'' is an alkoxy group and A represents a C₃ alkylene group. The hydroxy/alkoxy mole ratio is preferably between 0.2/1 and 0.4/1 and advantageously equal to 0.3/1. Moreover, m and n are such that the weight-average molecular mass of the compound is between 2000 and 10⁶. More particularly, n is between 0 and 999 and m is between 1 and 1000, the sum of n and m being between 1 and 1000.

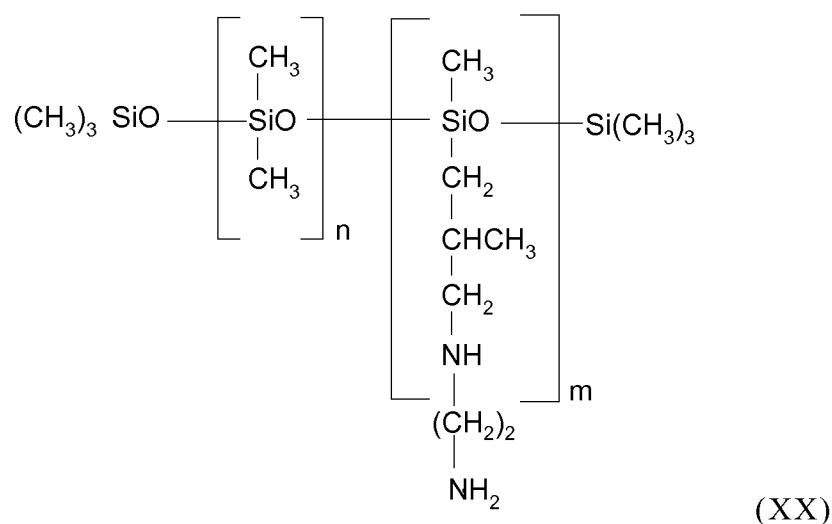
In this category of compounds, mention may be made, inter alia, of the product Belsil[®] ADM 652 sold by the company Wacker.

According to a third possibility, R and R'', which are different, each represent a C₁-C₄ alkoxy or hydroxyl group, at least one of the groups R or R'' being an alkoxy group, R' representing a methyl group and A representing a C₃ alkylene group. The hydroxy/alkoxy mole ratio is preferably between 1/0.8 and 1/1.1 and advantageously equal to 1/0.95. Moreover, m and n are such that the weight-average molecular mass of the compound is between 2000 and 200 000. More particularly, n is between 0 and 999 and m is between 1 and 1000, the sum of n and m being between 1 and 1000.

More particularly, mention may be made of the product Fluid WR[®] 1300 sold by the company Wacker.

Note that the molecular mass of these silicones is determined by gel permeation chromatography (ambient temperature, polystyrene standard; μ styragem columns; eluent THF; flow rate 1 mm/minute; 200 μ l of a solution containing 0.5% by weight of silicone in THF are injected, and detection is performed by refractometry and UV-metry).

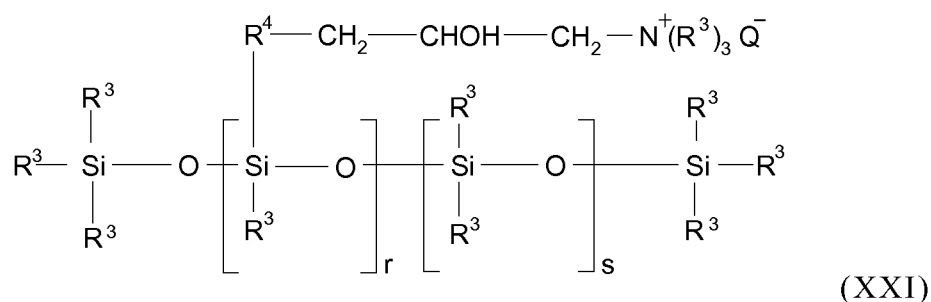
A product corresponding to the definition of formula (XIX) is in particular the polymer known in the CTFA dictionary as Trimethylsilyl Amodimethicone, corresponding to formula (XX) below:



wherein, n and m have the meanings given above in accordance with formula (XVIII).

Such compounds are described, for example, in patent EP 95238. A compound of formula (XX) is sold, for example, under the name Q2-8220 by the company OSI.

(b) the compounds corresponding to formula (XXI) below:



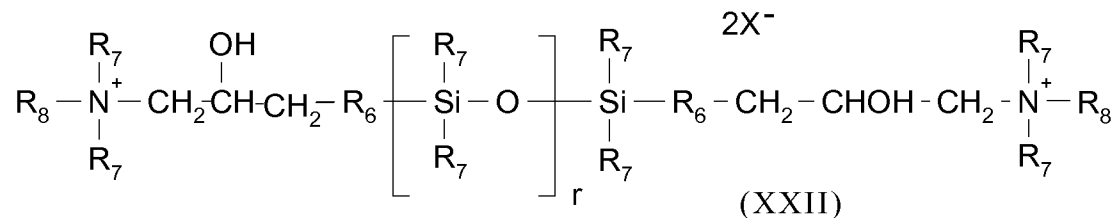
wherein,

- R^3 represents a C_1 - C_{18} monovalent hydrocarbon-based group, and in particular a C_1 - C_{18} alkyl or C_2 - C_{18} alkenyl group, for example methyl,
- R^4 represents a divalent hydrocarbon-based group, especially a C_1 - C_{18} alkylene group or a divalent C_1 - C_{18} , and for example C_1 - C_8 , alkyleneoxy group,
- Q^- is a halide ion, in particular chloride;
- r represents a mean statistical value from 2 to 20 and in particular from 2 to 8, and
- s represents a mean statistical value from 20 to 200 and in particular from 20 to 50.

Such compounds are described more particularly in patent US-4 185 087.

A compound falling within this class is the product sold by the company Union Carbide under the name Ucar Silicone ALE 56.

(c) quaternary ammonium silicones especially of formula (XXII):



wherein,

- R_7 , which may be identical or different, represent a monovalent hydrocarbon-based group containing from 1 to 18 carbon atoms, and in

particular a C₁-C₁₈ alkyl group, a C₂-C₁₈ alkenyl group or a ring comprising 5 or 6 carbon atoms, for example methyl,

- R₆ represents a divalent hydrocarbon-based group, especially a C₁-C₁₈ alkylene group or a divalent C₁-C₁₈, and for example C₁-C₈, alkyleneoxy group linked to the Si via an SiC bond,

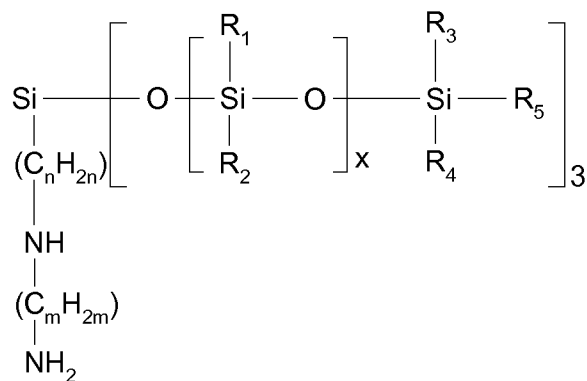
- R₈, which may be identical or different, represent a hydrogen atom, a monovalent hydrocarbon-based group containing from 1 to 18 carbon atoms, and in particular a C₁-C₁₈ alkyl group, a C₂-C₁₈ alkenyl group or a group -R₆-NHCOR₇;

- X⁻ is an anion such as a halide ion, especially chloride, or an organic acid salt (acetate, etc.); and

- r represents a mean statistical value from 2 to 200 and in particular from 5 to 100.

These silicones are described, for example, in patent application EP-A-0 530 974.

d) the amino silicones of formula (XXIII) below:



(XXIII)

wherein,

- R₁, R₂, R₃ and R₄, which may be identical or different, denote a C₁-C₄ alkyl group or a phenyl group,

- R₅ denotes a C₁-C₄ alkyl group or a hydroxyl group,

- n is an integer ranging from 1 to 5,

- m is an integer ranging from 1 to 5, and

- x is chosen such that the amine number is between 0.01 and 1 meq/g.

When these compounds are used, one particularly advantageous embodiment involves their combined use with cationic and/or nonionic surfactants.

5 By way of example, use may be made of the product sold under the name Cationic Emulsion DC939 by the company Dow Corning, a cationic surfactant, namely trimethylcetylammonium chloride and a nonionic surfactant of formula $C_{13}H_{27}-(OC_2H_4)_{12}-OH$, known under the CTFA name Trideceth-12.

10 Another commercial product that may be used according to the invention is the product sold under the name Dow Corning Q2 7224 by the company Dow Corning, comprising, in combination, trimethylsilyl amodimethicone of formula (XX) described above, a nonionic surfactant of formula $C_8H_{17}-C_6H_4-(OCH_2CH_2)_{40}-OH$, known under the CTFA name Octoxynol-40, a second nonionic surfactant of formula
15 $C_{12}H_{25}-(OCH_2-CH_2)_6-OH$, known under the CTFA name Isolaureth-6, and propylene glycol.

The silicones of the invention may also be silicones grafted with anionic groups, such as the compounds VS 80 or VS 70 sold by the company 3M.

20 Preferentially, the amino silicones used in the present invention are the products sold under the names DC 8194, DC 8299, DC 1689, DC 5-7113, DC 8500, DC 8566, DC8170 and DC 8401 by the company Dow Corning.

25 According to the invention, the silicones can be used in the form of emulsions, typically having particle size ranging from 50 nm to 10 μm , more preferably from 100 nm to 1 μm , and even more preferably from 200 to 500 nm.

Indeed, silicon deposition remains high, irrespective to the molecular weight, when the particle size is preferably ranging from
30 100 nm to 10 μm .

According to a preferred embodiment of the invention, the composition contains one or more non-amino silicones as described above.

In a more preferred embodiment, the composition contains one or more non-amino silicones comprising polyethyleneoxy and/or polypropyleneoxy groups, still better polyethyleneoxy groups.

5 In another more preferred embodiment, the composition contains one or more polydimethylsiloxanes containing dimethylsilanol end groups (also known as dimethiconol), preferably in emulsion form, more preferably having a low particle size such as less than 500 nm, preferably from 50 nm to 500 nm.

10 The amount of silicone(s) advantageously ranges from 0.1 to 15% by weight, more preferentially from 0.5 to 10% by weight, and even more preferably from 0.7 to 5% by weight relative to the total weight of the composition.

Fatty alcohols

15 The composition, according to the present invention, may further contain one or more fatty alcohols, containing at least 8 carbon atoms.

Indeed, the particular combination of surfactants and polyols of the composition makes it possible to solubilise fatty alcohols in said composition while keeping an optically clear appearance thereof.

20 For the purposes of the present invention, the term "fatty alcohol" means any saturated or unsaturated, linear or branched alcohol comprising at least 8 carbon atoms and which is not oxyalkylenated.

25 Preferably, the fatty alcohols are solid at room temperature (25°C) and at atmospheric pressure ($1.013 \cdot 10^5$ Pa).

The fatty alcohols are preferably chosen from the compounds of general formula (I)



30

wherein R denotes a saturated or unsaturated, linear or branched radical containing from 8 to 30, preferably from 10 to 28 carbon atoms, more preferentially from 12 to 18 carbon atoms.

R preferably denotes a linear or branched C₈-C₃₀, more preferentially C₁₂-C₁₈ alkyl or a linear or branched C₈-C₃₀, more preferentially C₁₂-C₁₈ alkenyl group, and better still linear. R may be substituted with one or more hydroxyl groups.

5 Examples of fatty alcohols that may be mentioned include cetyl alcohol, stearyl alcohol, oleyl alcohol, behenyl alcohol, linoleyl alcohol, palmitoleyl alcohol, arachidonyl alcohol and myristyl alcohol, and mixtures thereof.

10 The fatty alcohol may represent a mixture of fatty alcohols, which means that several species of fatty alcohol may coexist, in the form of a mixture, in a commercial product.

Fatty alcohol mixtures that may be mentioned include cetylstearyl (or cetearyl) alcohol.

15 Among all the fatty alcohols that may be used according to the invention, use is preferably made of one or more fatty alcohols chosen from cetyl alcohol, stearyl alcohol, myristyl alcohol, and mixtures thereof such as cetearyl alcohol.

20 The amount of fatty alcohols, in the composition of the present invention, advantageously ranges from 0.05 to 15% by weight, preferably from 0.1 to 10% by weight, and more preferentially from 0.5 to 5% by weight, relative to the total weight of the composition.

Cosmetically acceptable medium

The composition according to the present invention, advantageously comprises a cosmetically acceptable medium.

25 The term “cosmetically acceptable medium” means a medium that is compatible with human keratin fibres, such as the hair.

30 The cosmetically acceptable medium can be formed from water or from a mixture of water and one or more cosmetically acceptable solvents chosen from C₁-C₄ lower alcohols, such as ethanol and isopropanol; and polyol ethers, for instance propylene glycol monomethyl ether, diethylene glycol monoethyl ether and monomethyl ether, and mixtures thereof.

The cosmetic composition, according to the present invention, advantageously comprises water in an amount preferably ranging from

30 to 98% by weight, more preferentially from 40 to 95% by weight, and better still from 50 to 90% by weight, relative to the total weight of the composition.

Additives

5 The cosmetic composition according to the present invention may further comprise one or more additive(s) other than the compounds of the invention.

10 As additives that may be used in accordance with the invention, mention may be made of cationic surfactants, anionic or non ionic polymers or mixtures thereof, 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, acidifying agents, opacifiers or nacreous agents, antioxidants, hydroxy
15 acids, fragrances and preserving agents.

 Needless to say, a person skilled in the art will take care to select this or these optional additional compound(s) such that the advantageous properties intrinsically associated with the composition according to the invention are not, or are not substantially, adversely
20 affected by the envisaged addition(s).

 The above additives may generally be present in an amount, for each of them, of between 0.001% and 20% by weight, relative to the total weight of the composition.

25 The composition of the invention is advantageously transparent. The transparency of the composition may be characterized by measuring its turbidity according to the NTU method using a 2100P model turbidimeter from the company Hach, at room temperature. The turbidity of the compositions of the invention is preferably less than 200 NTU units, more preferably less than 100 NTU units, even more
30 preferably less than 50 NTU, most preferably less than 20 NTU and better still less than 10 NTU units.

 According to a particularly preferred embodiment, the present invention concerns a composition containing:

- from 0.5 to 8% by weight of one or more anionic surfactants,

- from 2 to 5% by weight of one or more amphoteric or zwitterionic surfactants,

- from 5 to 15% by weight of one or more non ionic surfactants chosen from polyethoxylated glyceryl esters of fatty acids, polyethoxylated sorbitan esters of fatty acids, and mixture thereof,

5

- from 15% to 30% by weight of one or more polyols,

- from 0.4 to 3% by weight of one or more amphoteric polymers, and

- from 0.7 to 5% by weight of one or more silicones, preferably chosen from non-amino silicones comprising polyethyleneoxy groups, polydimethylsiloxanes containing dimethylsilanol end groups, and mixtures thereof,

10

all percentages being expressed with regard to the total weight of the composition.

15

The present invention also relates to a method for washing and/or conditioning keratin fibres, such as hair, which consists in applying to the said keratin fibres a composition as described above, and after an optional leave-on time, optionally removing it by rinsing.

The leave-on time of the composition on the keratin fibres may range from a few seconds to 15 minutes, better still from 5 seconds to 10 minutes and even better still from 10 seconds to 5 minutes.

20

The composition may be applied to wet or dry keratin fibres, preferably to wet keratin fibres.

Finally, the present invention relates to the use of a composition as described above for washing and/or conditioning keratin fibres.

25

In the present invention, the term “keratin fibres” denotes human keratin fibres, and in particular human hair.

The examples that follow serve to illustrate the invention without, however, being limiting in nature.

30

EXAMPLES

In the examples that follow and unless otherwise indicated, all amounts are given as mass percentages of active material relative to the total weight of the composition (% AM = % active matter).

The following compositions were prepared using the ingredients indicated in the table below.

Ingredients	Amounts (% wt AM)	
	Composition 1	Composition 2
DISODIUM LAURETH SULFOSUCCINATE	1	1
COCO-BETAINE	3	3
PEG-7 GLYCERYL COCOATE	13	13
POLYSORBATE 20	1.2	2
SORBITOL	10.5	10.5
PROPYLENE GLYCOL	10	10
CAPRYLYL GLYCOL	-	1
POLYQUATERNIUM-22	0.4	0.4
POLYQUATERNIUM-53	0.1	0.1
POLYQUATERNIUM-47	0.2	0.2
MYRISTYL ALCOHOL	1	-
PEG-12 DIMETHICONE	1	1
DIMETHICONOL	-	2

SODIUM CHLORIDE	Qs	Qs
WATER	Qsp 100	Qsp 100

These two compositions were tested for different hair types, and exhibited very good performances. Composition 2 is more substantive on the hair and provided better dry hair performances.

CLAIMS

1. Cosmetic composition comprising:
- one or more anionic surfactants,
 - one or more amphoteric or zwitterionic surfactants,
 - 5 - one or more non ionic surfactants chosen from polyethoxylated esters of fatty acids,
 - one or more polyols,
 - one or more cationic and/or amphoteric polymers, and
 - optionally, one or more silicones.
- 10 2. Composition according to claim 1, wherein the anionic surfactants are chosen, alone or as a mixture, from:
- C₆-C₂₄ and especially C₁₂-C₂₀ alkyl sulfates;
 - C₆-C₂₄ and especially C₁₂-C₂₀ alkyl ether sulfates comprising from 1 to 20 ethylene oxide units;
 - 15 - C₆-C₂₄ and especially C₁₂-C₂₀ alkylsulfosuccinates, especially laurylsulfosuccinates;
 - C₆-C₂₄ and especially C₁₂-C₂₀ alkyl ether sulfosuccinates, especially laureth sulfosuccinates;
 - (C₆-C₂₄)acylisethionates and preferably (C₁₂-C₁₈)acylisethionates;
 - 20 - C₆-C₂₄ and especially C₁₂-C₂₀ acylsarcosinates; especially palmitoylsarcosinates;
 - (C₆-C₂₄)alkyl ether carboxylates, preferably (C₁₂-C₂₀)alkyl ether carboxylates;
 - 25 - polyoxyalkylenated (C₆-C₂₄)alkyl(amido) ether carboxylic acids, in particular those comprising from 2 to 50 alkylene oxide and in particular ethylene oxide groups;
 - C₆-C₂₄ and especially C₁₂-C₂₀ acylglutamates;
 - C₆-C₂₄ and especially C₁₂-C₂₀ acylglycinates;
 - 30 in particular in the form of alkali metal or alkaline-earth metal, ammonium or amino alcohol salts.
3. Composition according to anyone of the preceding claims, wherein the amount of anionic surfactants ranges from 0.1 to 15% by

weight, preferably from 0.3 to 10% by weight, even better from 0.5 to 8% by weight, relative to the total weight of the composition.

4. Composition according to anyone of the preceding claims, wherein the amphoteric or zwitterionic surfactants are chosen from secondary or tertiary aliphatic amine derivatives, optionally quaternized, in which the aliphatic group is a linear or branched chain containing from 8 to 22 carbon atoms, the said amine derivatives containing at least one anionic group, for instance a carboxylate, sulfonate, sulphate, phosphate or phosphonate group, and preferably the amphoteric or zwitterionic surfactants are chosen from (C₈-C₂₀ alkyl)betaines such as cocoylbetaine, (C₈-C₂₀ alkyl)amido(C₂-C₈ alkyl)betaines such as cocoamidopropylbetaine, and mixtures thereof.

5. Composition according to anyone of the preceding claims, wherein the amount of the amphoteric or zwitterionic surfactant(s) ranges from 0.1% to 15% by weight, preferably from 1% to 10% by weight, and even more preferably from 2 to 5% by weight, relative to the total weight of the composition.

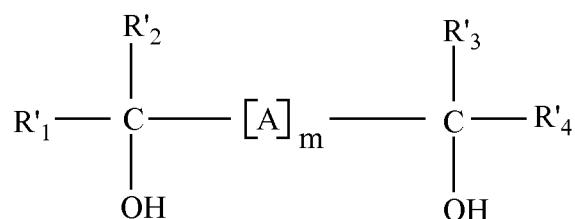
6. Composition according to anyone of the preceding claims, wherein the non ionic surfactants chosen from polyethoxylated esters of fatty acids have a HLB higher than 8, and preferably a HLB ranging from 9 to 15.

7. Composition according to anyone of the preceding claims, wherein the non ionic surfactants chosen from polyethoxylated esters of fatty acids are chosen from polyethoxylated glyceryl esters of fatty acids, polyethoxylated sorbitan esters of fatty acids, and mixture thereof, and preferably from:

- ethoxylated esters of C₈-C₃₀ fatty acid and sorbitan, preferably containing from 2 to 40 mol of ethylene oxide,
- ethoxylated esters of C₈-C₃₀ fatty acid and glycerol, preferably containing from 4 to 50 mol of ethylene oxide, preferably 5 to 30 mol of ethylene oxide, and more preferably from 6 to 25 mol of ethylene oxide,
- and mixtures thereof.

8. Composition according to anyone of the preceding claims, wherein the amount of non ionic surfactant(s) chosen from polyethoxylated esters of fatty acids ranges from 1 to 25% by weight, better still from 2 to 20% by weight, even better from 5 to 15% by weight relative to the total weight of the composition.

9. Composition according to anyone of the preceding claims, wherein the polyols have the corresponding formula (IV):



(IV)

in which R'_1 , R'_2 , R'_3 and R'_4 denote, independently of each other, a hydrogen atom, a C_1 - C_6 alkyl radical or a C_1 - C_6 mono- or polyhydroxyalkyl radical,

A denotes a linear or branched alkylene radical containing from 1 to 18 carbon atoms, this radical comprising from 0 to 9 oxygen atoms, and

m denotes 0 or 1.

10. Composition according to the preceding claim, wherein the polyols are chosen from the compounds of formula (IV) for which $m = 0$, more preferably from propylene glycol, glycerol, 1,2,3-propanetriol, 2,3-dimethyl-2,3-butanediol, 1,2,3-butanetriol, 2,3-butanediol, sorbitol and mixtures thereof, and even more preferably from propylene glycol, glycerol, sorbitol and mixtures thereof.

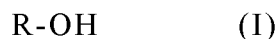
11. Composition according to anyone of the preceding claims, wherein the polyol(s) are present in an amount ranging from 5% to 50% by weight, preferably from 10% to 40% by weight, even more preferably from 15% to 30% by weight, relative to the total weight of the composition.

12. Composition according to anyone of the preceding claims, wherein the cationic and amphoteric polymers are chosen from those having a cationic charge density ranging from 0.2 to 5 meq/g.

5 13. Composition according to anyone of the preceding claims, wherein it comprises one or more amphoteric polymer(s), preferably chosen from Polyquaternium 22, Polyquaternium 47, Polyquaternium 53, and mixtures thereof.

10 14. Composition according to anyone of the preceding claims, wherein the total amount of cationic and amphoteric polymer(s) ranges from 0.05 to 10% by weight, more preferably from 0.1 to 5% by weight, and most preferably from 0.4 to 3% by weight, with regard to the total weight of the composition.

15 15. Composition according to anyone of the preceding claims, further containing one or more fatty alcohols chosen from the compounds of formula (I):



wherein R denotes a saturated or unsaturated, linear or branched radical containing from 8 to 30, preferably from 10 to 28 carbon atoms, more preferentially from 12 to 18 carbon atoms.

20 16. Composition according to the preceding claim, wherein the amount of fatty alcohols ranges from 0.05 to 15% by weight, preferably from 0.1 to 10% by weight, and more preferably from 0.5 to 5% by weight, relative to the total weight of the composition.

25 17. Composition according to anyone of the preceding claims, further containing one or more silicone(s), preferably one or more non-amino silicone(s), in an amount ranging from 0.1 to 15% by weight, preferably from 0.5 to 10% by weight, and more preferably from 0.7 to 5% by weight, relative to the total weight of the composition.

30 18. Composition according to the preceding claim, containing one or more non-amino silicones comprising polyethyleneoxy and/or polypropyleneoxy groups, preferably polyethyleneoxy groups.

19. Composition according to claim 17, containing one or more polydimethylsiloxanes containing dimethylsilanol end groups (also known as dimethiconol), preferably in emulsion form having a particle size of less than 500 nm.

5 20. Composition according to anyone of the preceding claims, further containing one or more additional non ionic surfactants different from said polyethoxylated esters of fatty acids, preferably chosen from (C₆-C₂₄ alkyl)polyglycosides; polyethoxylated C₈-C₃₀ fatty alcohols containing from 2 to 150 mol of ethylene oxide, 10 preferably from 2 to 40 mol of ethylene oxide; and mixtures thereof.

 21. Composition according to the preceding claim, wherein said additional non ionic surfactant is present in an amount ranging from 0.1 to 10% by weight, preferably from 0.2 to 8% by weight, better still from 0.5 to 5% by weight, most preferably from 1 to 3% by 15 weight, relative to the total weight of the composition.

 22. Method for washing and/or conditioning keratin fibres such as hair, which consists in applying to the said keratin fibres a composition as defined in anyone of the preceding claims, and after an optional leave-on time, optionally removing it by rinsing.

INTERNATIONAL SEARCH REPORT

International application No
PCT/EP2017/059033

A. CLASSIFICATION OF SUBJECT MATTER

INV. A61K8/34 A61K8/39 A61K8/44 A61K8/46 A61Q5/02
A61Q5/12 A61K8/81

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)

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)

EPO-Internal, WPI Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	DATABASE GNPD [Online] MINTEL; April 2013 (2013-04), "Restoring shampoo", XP002771327, Database accession no. 2037424	1,2,4,6, 7,9,10, 12,13,22
Y	ingredients -----	1-22
X	DATABASE GNPD [Online] MINTEL; June 2011 (2011-06), "Shampoo", XP002771328, Database accession no. 1553340	1,2,4,6, 7,9,10, 12,13,22
Y	ingredients ----- -/-	1-22



Further documents are listed in the continuation of Box C.



See patent family annex.

* Special categories of cited documents :

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"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

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"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

"&" document member of the same patent family

Date of the actual completion of the international search

23 June 2017

Date of mailing of the international search report

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INTERNATIONAL SEARCH REPORT

International application No

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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.
X	EP 2 873 414 A1 (DSM IP ASSETS BV [NL]) 20 May 2015 (2015-05-20)	1-10,12, 14, 17-19,22
Y	example 5 -----	1-22
Y	US 2014/161755 A1 (ARORA SHILPA [US] ET AL) 12 June 2014 (2014-06-12) paragraphs [0001], [0005], [0006] claim 17 examples 1-6 -----	1-22

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

PCT/EP2017/059033

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			WO 2014090713 A1 19-06-2014
