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(71) Applicant (for all designated States except US):  
L'OREAL [FR/FR]; 14, rue Royale, F-75008 Paris (FR).

(72) Inventors; and

(75) Inventors/Applicants (for US only): **BERNARD, Anne-Laure** [FR/FR]; 1 Avenue Coysevox, F-92160 Antony (FR). **MENA, Caroline** [FR/FR]; 34, rue Maurepas, 94320 Thiais, F-94320 Thiais (FR).

(74) Agents: **PREVEL, Estelle** et al.; L'Oréal, D.I.P.I., 25-29 Quai Aulagnier, F-92665 Asnières-sur-Seine Cedex (FR).

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(54) Title: TWO-PART COSMETIC PRODUCT

(57) Abstract: The invention relates to a cosmetic assembly comprising: a) a first aqueous composition comprising: - at least one active agent chosen from peroxides,  $\alpha$ -hydroxy acids,  $\beta$ -hydroxy acids and mixtures thereof, and - at least one polymer comprising at least one monomer containing a sulphonic group, and b) a second aqueous composition comprising: - an anionic foaming surfactant and an amphoteric foaming surfactant in an amphoteric surfactant/anionic surfactant ratio ranging from 0.9 to 80/20, - the total content of anionic and amphoteric surfactants being greater than or equal to 10% by weight relative to the total weight of the second composition, and - a gelling polymer.



## Two-part cosmetic product

The invention relates to a cosmetic assembly comprising a first aqueous composition comprising an acid active agent or a peroxide, and a foaming second aqueous composition.

It also relates to the use of this cosmetic assembly in the cosmetic or dermatological field or to a cosmetic method comprising the application of this assembly to the skin.

The acid active agents or the peroxides such as  $H_2O_2$ , used for their antibacterial properties on the skin or their hair lightening properties, are difficult to formulate in foaming compositions because maintaining an acid pH necessary for the stability of the active agent involves the use of surfactant bases that are stable at this pH, which limits the choice of possible (amphoteric, nonionic, sulphonate) surfactants.

Moreover, in order to exhibit an optimum activity, these active agents may need to be activated by a basic compound that is incompatible in the acid formulation.

For this, two-part foaming products have been proposed, one part of which comprises a composition based on an acid active agent and the other part of which comprises a foaming composition, for example document WO 2008/045174 proposes a two-part product comprising a composition A containing a foaming amphoteric surfactant and a composition B containing hydrogen peroxide, said compositions being mixed before application to the skin. However, the mixture obtained is liquid, not very thick and not very foaming.

Thus, the formulation of a two-part product involves the constraint that the two compositions each have a high viscosity, in gel form, in order to be readily handleable and mixable so that the final composition resulting from the mixture is homogeneous and cosmetically acceptable.

However the hydrophilic gelling agents that are widely used, such as polymers based on 2-acrylamido-2-methylpropanesulphonic acid or acrylate polymers, are sensitive to salts and bringing them into contact with a foaming composition rich in salts introduced by the foaming surfactants leads to a drop in the viscosity and therefore a significant fluidification of the mixture: the desired consistency is not therefore maintained.

It is therefore sought to formulate a two-part foaming product based on acid active agents or on peroxide, which has good foaming properties, the viscosity of which is maintained.

- 5 The applicant had been able to show that a cosmetic assembly combining a gelled composition based on acid active agents or on peroxide and a foaming composition comprising particular surfactants in a defined ratio makes it possible to satisfy the requirements specified above.
- 10 One subject of the invention is thus a cosmetic assembly comprising:
- a) a first aqueous composition comprising:
- at least one active agent chosen from peroxides,  $\alpha$ -hydroxy acids,  $\beta$ -hydroxy acids and mixtures thereof, and
  - at least one polymer comprising at least one monomer containing a sulphonic
  - 15 group,
  - and
- b) a second aqueous composition comprising:
- an anionic foaming surfactant and an amphoteric foaming surfactant in an amphoteric surfactant/anionic surfactant ratio ranging from 0.9 to 80/20,
  - 20 - the total content of anionic and amphoteric surfactants being greater than or equal to 10% by weight relative to the total weight of the second composition, and
  - a gelling polymer.

The use of the cosmetic assembly according to the invention makes it possible to

25 obtain, after mixing of the first and second compositions, a stable gelled foaming composition that has a satisfactory viscosity.

The cosmetic assembly according to the invention may be used for the cosmetic treatment of keratin materials such as the skin and keratin fibres such as the hair.

30 It may be used especially for the treatment of oily skin, seborrhea and dermatitides which are associated with seborrhea, especially acne and/or blackheads and/or comedones.

The cosmetic assembly according to the invention may also be used for lightening keratin materials.

Another subject of the invention is a method for the cosmetic treatment of keratin materials, comprising the application to the latter of the cosmetic assembly according to the invention, after mixing the compositions forming said assembly.

5 Another subject of the invention is thus a method for the cosmetic treatment of keratin materials consisting in applying to the keratin materials at least one layer of a mixture:

- of a first aqueous composition comprising:

- at least one active agent chosen from peroxides,  $\alpha$ -hydroxy acids,  $\beta$ -hydroxy acids, and
- 10 - at least one polymer comprising at least one monomer containing a sulphonic group,
- and

- of a second aqueous composition comprising:

- an anionic foaming surfactant and an amphoteric foaming surfactant in an
- 15 amphoteric surfactant/anionic surfactant ratio ranging from 0.9 to 80/20,
- the total content of anionic and amphoteric surfactants being greater than or equal to 10% by weight relative to the total weight of the second composition, and
- a gelling polymer.

20

According to one particular embodiment of the invention, the first and second compositions of the cosmetic assembly are mixed in a ratio, by weight, of between 100/50 and 80/100, preferably between 100/80 and 80/100.

25 According to one embodiment variant, the mixing of the compositions is carried out within said assembly just before use and therefore before application to at least one keratin material.

According to another embodiment, the mixing is carried out during the application to the keratin materials.

30 According to one embodiment, the mixture is applied to the keratin materials in the presence of water, followed by a massaging step to make it foam, then the foam formed and the soiling residues are removed by rinsing with water.

According to one embodiment, the mixture is used as a mask, i.e. it is applied to the keratin materials, and then is rinsed with water after a leave-on time of 1 to 10 minutes.

35

Another subject of the present invention is an assembly for packaging and dispensing compositions forming a product according to the invention, said assembly comprising at least two independent compartments comprising, respectively, each of said compositions and being adjusted for dispensing two compositions separately or as a mixture.

The first and second compositions each comprise a physiologically acceptable medium, i.e. a non-toxic medium that can be applied to human keratin materials and that has a pleasant appearance, odour and feel.

The compositions forming the cosmetic assembly according to the invention will now be described in detail.

Each first and second composition according to the invention preferably has a viscosity, at 20°C, greater than or equal to 2 Pa.s, preferably greater than or equal to 3 Pa.s. The viscosity is measured using a Rheomat 180 machine (from the company Lamy) equipped with an MS-R1, MS-R2, MS-R3, MS-R4 or MS-R5 spindle, chosen as a function of the consistency of the composition, rotating at a shear rate of 200 s<sup>-1</sup>.

Within the context of the invention, the expression "*at least one*" is equivalent to "one or more" and, unless otherwise indicated, the limits of a range of values are included in that range.

## **FIRST COMPOSITION**

The first composition of the cosmetic assembly according to the invention is therefore an aqueous composition comprising:

- at least one active agent chosen from peroxides,  $\alpha$ -hydroxy acids,  $\beta$ -hydroxy acids, and
- at least one polymer comprising at least one monomer containing a sulphonic group.

### **Active agent**

The active agent may be chosen from peroxides, acid active agents such as  $\alpha$ -hydroxy acids,  $\beta$ -hydroxy acids, and mixtures thereof.

### Peroxide

5

Within the context of the present invention, the term "peroxide" denotes any type of organic or inorganic peroxide. Preferably, the peroxide compound is inorganic, it is especially chosen from hydrogen peroxide  $H_2O_2$  and a metal peroxide, especially sodium peroxide, calcium peroxide, barium peroxide, magnesium peroxide, lithium

10

peroxide and zinc peroxide.  
Mention may especially be made, as organic peroxide, of urea peroxide.

Preferably, the peroxide used in the first composition is hydrogen peroxide (for example, CAS number 7722-84-1).

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By way of example, mention may be made of the 50% hydrogen peroxide solution sold by the company Sigma Aldrich Fine Chemicals.

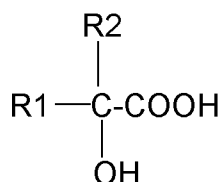
### $\alpha$ -hydroxy acids and $\beta$ -hydroxy acids

20

The  $\alpha$ -hydroxy acids that can be used in the composition of the invention are acids comprising at least one  $-C(OH)-COOH$  group, especially monoacids, diacids or triacids. Keto acids such as vitamin C are excluded from this definition.

These  $\alpha$ -hydroxy acids are compounds of formula (I):

25



in which R1 and R2, independently of one another, may be chosen from H,  $CH_3$ ,  $CHOHCOOH$ ,  $CH_2COOH$ ,  $COOH$ ,  $CH_2OH(CHOH)_x$  where x is an integer ranging from

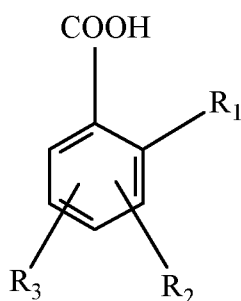
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1 to 6, and  $C_6H_5$ .

According to one preferred embodiment of the invention, the  $\alpha$ -hydroxy acids that can be used in the composition of the invention are chosen from citric acid, lactic acid, glycolic acid, gluconic acid, tartaric acid, malic acid, and mixtures thereof, and also the plant extracts containing same, especially fruit extracts.

5

As  $\beta$ -hydroxy acids that can be used in the composition of the invention, mention may be made, for example, of salicylic acid and its derivatives, in particular its alkoyl derivatives, i.e. its derivatives of formula (II):



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in which:

-  $R_1$  represents a hydroxyl radical or an ester of formula:

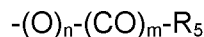
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in which  $R_4$  is a saturated or unsaturated, aliphatic radical comprising from 1 to 26 carbon atoms, and preferably from 1 to 18 carbon atoms, an amine or thiol function optionally substituted by an alkyl radical comprising from 1 to 18 carbon atoms, and preferably from 1 to 12 carbon atoms,

20

-  $R_2$  and  $R_3$ , independently of one another, are in position 3, 4, 5 or 6 on the benzene ring and represent, independently of one another, a hydrogen atom or a radical:



in which  $n$  and  $m$ , independently of one another, are each an integer equal to 0 or 1;

25

on condition that  $R_2$  and  $R_3$  are not simultaneously hydrogen atoms;

-  $R_5$  represents a hydrogen, a linear, branched or cyclized, saturated, aliphatic radical comprising from 1 to 18 carbon atoms, an unsaturated radical comprising from 3 to 18 carbon atoms, bearing one to nine conjugated or unconjugated double bonds, it being possible for the radicals to be substituted by at least one substituent chosen

from halogen atoms (fluorine, chlorine, bromine, iodine), trifluoromethyl radicals, hydroxyl radicals in free form or esterified with an acid comprising from 1 to 6 carbon atoms, or carboxyl radicals which are free or esterified with a lower alcohol comprising from 1 to 6 carbon atoms, or an aromatic radical comprising from 6 to 10 carbon atoms.

Preferred salicylic acid derivatives of formula (II) are those in which  $R_1$  represents a hydroxyl radical,  $R_2$  represents a hydrogen atom,  $R_3$  is in position 5 of the benzene ring, and  $R_5$  represents a saturated aliphatic radical comprising from 3 to 15 carbon atoms.

When the composition contains a salicylic acid derivative of formula (II), the derivative in question may be, in particular, 5-n-octanoylsalicylic acid, 5-n-decanoylsalicylic acid, 5-n-dodecanoylsalicylic acid, 5-n-octylsalicylic acid, 5-n-heptyloxysalicylic acid, 4-n-heptyloxysalicylic acid, 5-*tert*-octyl-salicylic acid, 3-*tert*-butyl-5-methylsalicylic acid, 3-*tert*-butyl-6-methylsalicylic acid, 3,5-diisopropylsalicylic acid, 5-butoxysalicylic acid, 5-octyloxysalicylic acid, 5-propanoylsalicylic acid, 5-n-hexadecanoylsalicylic acid, 5-n-oleoylsalicylic acid, 5 benzoylsalicylic acid, their monovalent and divalent salts, and mixtures thereof. The derivative in question is preferably 5-n-octanoylsalicylic acid (INCI name: Capryloyl Salicylic acid).

According to one preferred embodiment of the invention, when the first composition contains a  $\beta$ -hydroxy acid, this is preferably salicylic acid.

According to one preferred embodiment, the active agent present in the first composition is a peroxide, preferably an inorganic peroxide, preferably hydrogen peroxide.

The active agent chosen from peroxides,  $\alpha$ -hydroxy acids, and  $\beta$ -hydroxy acids may be present in the first composition according to the invention in a content ranging from 0.1% to 15% by weight, preferably ranging from 0.5% to 10% by weight and better still ranging from 1% to 8% by weight, relative to the total weight of the first composition.

**Polymer comprising at least one monomer containing a sulphonic group**



The polymers comprising at least one monomer containing a sulphonic group that are used in the composition of the invention are water-soluble or water-dispersible or water-swella-  
ble. The polymers used in accordance with the invention may be  
5 homopolymers or copolymers and can be obtained from at least one ethylenically unsaturated monomer containing a sulphonic group, which may be in free form or partially or completely neutralized form. These polymers may optionally comprise at least one hydrophobic group and then constitute an amphiphilic polymer (or hydrophobic modified polymer).

10

Preferentially, the polymers in accordance with the invention may be partially or completely neutralized with a mineral base (sodium hydroxide, potassium hydroxide or aqueous ammonia) or an organic base such as monoethanolamine, diethanolamine or triethanolamine, an aminomethylpropanediol, N-methylglucamine, basic amino acids,  
15 for instance arginine and lysine, and mixtures of these compounds. They are generally neutralized. In the present invention, the term "neutralized" means polymers that are completely or virtually completely neutralized, i.e. at least 90% neutralized.

20

The polymers used in the composition of the invention generally have a number-average molecular weight ranging from 1000 to 20 000 000 g/mol, preferably ranging from 20 000 to 5 000 000 g/mol and even more preferentially from 100 000 to 1 500 000 g/mol.

25

These polymers according to the invention may be crosslinked or uncrosslinked.

30

The monomers containing a sulphonic group of the polymer used in the composition of the invention are especially chosen from vinylsulphonic acid, styrenesulphonic acid, (meth)acrylamido(C<sub>1</sub>-C<sub>22</sub>)alkylsulphonic acids, N-(C<sub>1</sub>-C<sub>22</sub>)alkyl(meth)acrylamido(C<sub>1</sub>-C<sub>22</sub>)alkylsulphonic acids such as undecylacrylamidomethanesulphonic acid, and also  
partially or completely neutralized forms thereof, and mixtures thereof.

35

According to one preferred embodiment of the invention, the monomers containing a sulphonic group are chosen from (meth)acrylamido(C<sub>1</sub>-C<sub>22</sub>)alkylsulphonic acids, for instance acrylamidomethanesulphonic acid, acrylamidoethanesulphonic acid, acrylamidopropanesulphonic acid, 2-acrylamido-2-methylpropanesulphonic acid, 2-

methacrylamido-2-methylpropanesulphonic acid, 2-acrylamido-n-butanesulphonic acid, 2-acrylamido-2,4,4-trimethylpentanesulphonic acid, 2-methacrylamidododecylsulphonic acid and 2-acrylamido-2,6-dimethyl-3-heptanesulphonic acid, and also partially or completely neutralized forms thereof, and mixtures thereof.

5

More particularly, use is made of 2-acrylamido-2-methylpropanesulphonic acid (AMPS), and also partially or completely neutralized forms thereof.

When the polymers are crosslinked, the crosslinking agents may be chosen from the polyolefinically unsaturated compounds commonly used for crosslinking polymers obtained by radical polymerization.

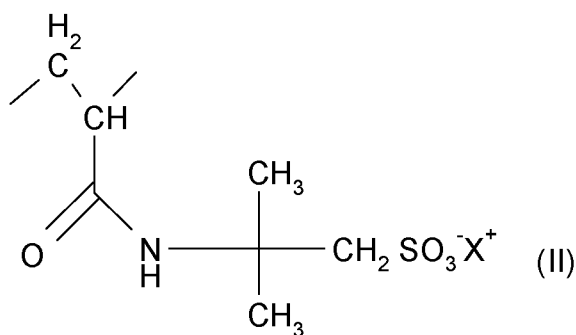
Examples of crosslinking agents that may be mentioned include divinylbenzene, diallyl ether, dipropylene glycol diallyl ether, polyglycol diallyl ethers, triethylene glycol divinyl ether, hydroquinone diallyl ether, ethylene glycol or tetraethylene glycol di(meth)acrylate, trimethylolpropane triacrylate, methylenebisacrylamide, methylenebismethacrylamide, triallylamine, triallyl cyanurate, diallyl maleate, tetraallylethylenediamine, tetraallyloxyethane, trimethylolpropane diallyl ether, allyl (meth)acrylate, allylic ethers of alcohols of the sugar series, or other allylic or vinyl ethers of polyfunctional alcohols, and also the allylic esters of phosphoric and/or vinylphosphonic acid derivatives, or mixtures of these compounds.

According to one preferred embodiment of the invention, the crosslinking agent is chosen from methylenebisacrylamide, allyl methacrylate and trimethylolpropane triacrylate (TMPTA). The degree of crosslinking generally ranges from 0.01 mol% to 10 mol% and more particularly from 0.2 mol% to 2 mol% relative to the polymer.

When the polymers used are homopolymers, they only comprise monomers containing a sulphonic group and, if they are crosslinked, one or more crosslinking agents.

The preferred AMPS homopolymers are generally characterized in that they comprise, randomly distributed:

a) from 90% to 99.9% by weight of units of general formula (III) below:



in which  $\text{X}^+$  denotes a proton, an alkali metal cation, an alkaline-earth metal cation or the ammonium ion, not more than 10 mol% of the cations  $\text{X}^+$  possibly being protons  $\text{H}^+$ ;

- 5 b) from 0.01% to 10% by weight of crosslinking units originating from at least one monomer containing at least two olefinic double bonds; the weight proportions being defined relative to the total weight of the polymer.

The homopolymers according to the invention that are more particularly preferred  
 10 comprise from 98% to 99.5% by weight of units of formula (III) and from 0.2% to 2% by weight of crosslinking units.

A polymer of this type that may especially be mentioned is the crosslinked and neutralized 2-acrylamido-2-methylpropanesulphonic acid homopolymer sold by the  
 15 company Clariant under the trade name Hostacerin AMPS (CTFA name: ammonium polyacryldimethyltauramide).

The polymer may also be an amphiphilic homopolymer (or hydrophobic modified homopolymer) selected from random amphiphilic AMPS polymers modified by reaction  
 20 with a  $\text{C}_6$ - $\text{C}_{22}$  n-monoalkylamine or di-n-alkylamine, such as those described in document WO A 00/31154, which are graft homopolymers.

When the polymers used are copolymers they can be obtained from ethylenically unsaturated monomers containing a sulphonic group and other ethylenically  
 25 unsaturated monomers, i.e. ethylenically unsaturated monomers without a sulphonic group.

The ethylenically unsaturated monomers containing a sulphonic group are chosen from those described above.

The ethylenically unsaturated monomers without a sulphonic group may be chosen from ethylenically unsaturated hydrophilic monomers, ethylenically unsaturated hydrophobic monomers and mixtures thereof. When the polymer contains hydrophobic  
5 monomers it constitutes an amphiphilic polymer (also referred to as hydrophobic modified polymer).

The ethylenically unsaturated hydrophilic monomers may be selected for example from (meth)acrylic acids,  $\beta$ -substituted alkyl derivatives thereof or esters thereof obtained  
10 with monoalcohols or monoalkylene or polyalkylene glycols, (meth)acrylamides, vinylpyrrolidone, vinylformamide, maleic anhydride, itaconic acid, maleic acid or mixtures of these compounds.

When the polymer of the composition according to the invention is a copolymer that  
15 can be obtained from ethylenically unsaturated monomers containing a sulphonic group and ethylenically unsaturated hydrophilic monomers, it may be selected in particular from:

(1) crosslinked anionic copolymers of acrylamide or methacrylamide and of 2-acrylamido-2-methyl-propanesulphonic acid, especially those in the form of a W/O  
20 emulsion, such as those sold under the name Sepigel 305 by the company Seppic (CTFA name: Polyacrylamide/C13-14 Isoparaffin/Laureth-7), under the name Simulgel 600 by the company SEPPIC (CTFA name: Acrylamide/Sodium acryloyldimethyltaurate copolymer/Isohexadecane/Polysorbate 80);

(2) copolymers of (meth)acrylic acid or (meth)acrylate and of 2-acrylamido-2-methylpropanesulphonic acid, in particular the optionally salified copolymers of 2-acrylamido-2-methylpropanesulphonic acid and of hydroxylated C<sub>2</sub>-C<sub>4</sub> alkyl  
25 (meth)acrylate.

The hydroxylated C<sub>2</sub>-C<sub>4</sub> alkyl (meth)acrylate monomer may be chosen from 2-hydroxyethyl acrylate, 2-hydroxyethyl methacrylate, 2,3-dihydroxypropyl acrylate and  
30 2,3-dihydroxypropyl methacrylate.

Said copolymer may be salified, in particular in the form of an alkali metal salt such as, for example, the sodium or potassium salt, or in the form of an ammonium salt, or in the form of a salt of an amino alcohol, such as, for example, the monoethanolamine  
35 salt, or in the form of an amino acid salt, such as, for example, the lysine salt.

Advantageously, the copolymer is salified in sodium salt form.

Preferably, the composition comprises the copolymer of 2-acrylamido-2-methylpropanesulphonic acid and of 2-hydroxyethyl acrylate, in particular in sodium salt form, for instance those sold under the trade names Sepinov<sup>®</sup> EMT 10 or Simulgel<sup>®</sup> NS (sodium 2-acrylamido-2-methylpropanesulphonate/hydroxyethyl acrylate copolymer as a 40% inverse emulsion in Polysorbate 60 and squalane) (CTFA name: hydroxyethyl acrylate/sodium acryloyldimethyl taurate copolymer/squalane/polysorbate 60) by the company SEPPIC (INCI name: Hydroxyethyl acrylate/sodium acryloyldimethyl taurate copolymer) .

Such polymers are described in application FR-A-2856691.

Mention may also be made of Simulgel EG sold by the company SEPPIC (copolymer of acrylic acid/acrylamido-2-methyl-propanesulphonic acid in sodium salt form, as a 45% inverse emulsion in isohexadecane/water) (CTFA name: Sodium acrylate/Sodium acryloyldimethyl taurate copolymer/Isohexadecane/Polysorbate 80), and (3) copolymers of 2-acrylamido-2-methylpropanesulphonic acid and of vinylpyrrolidone or vinylformamide, such as the products sold under the name Aristoflex AVC by the company Clariant.

When the monomers containing a sulphonic group are copolymerized with ethylenically unsaturated hydrophobic monomers comprising a hydrophobic chain, also referred to as a fatty chain (C6-C50 chain), the polymer obtained is amphiphile, i.e. it comprises both a hydrophilic portion and a hydrophobic portion. Such polymers are also referred to as hydrophobic modified polymers.

These hydrophobic modified polymers may also contain one or more monomers comprising neither a sulphonic group nor a fatty chain, such as (meth)acrylic acids,  $\beta$ -substituted alkyl derivatives thereof or esters thereof obtained with monoalcohols or monoalkylene or polyalkylene glycols, (meth)acrylamides, vinylpyrrolidone, vinylformamide, maleic anhydride, itaconic acid or maleic acid, or mixtures of these compounds.

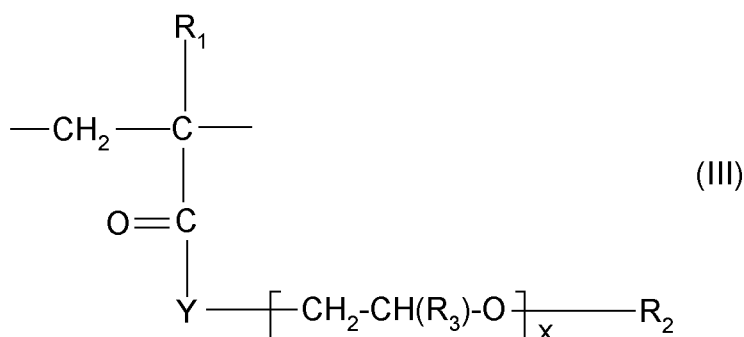
As hydrophobic modified polymers, use may be made in particular of those capable of being obtained from 2-acrylamido-2-methylpropanesulphonic acid (AMPS) and at least one ethylenically unsaturated hydrophobic monomer comprising at least one group containing from 6 to 50 carbon atoms, more preferably from 6 to 22 carbon atoms,

more preferably still from 6 to 18 carbon atoms and more particularly 12 to 18 carbon atoms.

These polymers are described especially in documents EP-A-750 899, US-A-5 089 578 and WO-A-2002/43689, and in the following publications from Yotaro Morishima:

- Self-assembling amphiphilic polyelectrolytes and their nanostructures, Chinese Journal of Polymer Science, Vol. 18, No. 40, (2000), 323-336;
- Micelle formation of random copolymers of sodium 2-(acrylamido)-2-methylpropanesulphonate and a nonionic surfactant macromonomer in water as studied by fluorescence and dynamic light scattering, Macromolecules, 2000, Vol. 33, No. 10 - 3694-3704;
- Solution properties of micelle networks formed by nonionic moieties covalently bound to a polyelectrolyte: salt effects on rheological behavior - Langmuir, 2000, Vol. 16, No. 12, 5324-5332;
- Stimuli responsive amphiphilic copolymers of sodium 2-(acrylamido)-2-methylpropanesulphonate and associative macromonomers - Polym. Preprint, Div. Polym. Chem. 1999, 40(2), 220-221.

The hydrophobic monomers of these particular polymers are preferably selected from the acrylates, alkylacrylates, acrylamides or alkylacrylamides of formula (IV) below:



in which R<sub>1</sub> and R<sub>3</sub>, which may be identical or different, denote a hydrogen atom or a substantially linear or branched C<sub>1</sub>-C<sub>6</sub> alkyl radical (preferably methyl); Y denotes O or NH; R<sub>2</sub> denotes a hydrocarbon-based radical containing from 6 to 50 carbon atoms, more preferably from 6 to 22 carbon atoms, more preferably still from 6 to 18 carbon atoms and more particularly from 12 to 18 carbon atoms; x denotes a number of moles of alkylene oxide and ranges from 0 to 100.

The  $R_2$  radical is preferably selected from substantially linear  $C_6$ - $C_{18}$  alkyl radicals (for example n-hexyl, n-octyl, n-decyl, n-hexadecyl, n-dodecyl or lauryl, or n-octadecyl or stearyl radicals); branched  $C_6$ - $C_{18}$  alkyl radicals; cyclic  $C_6$ - $C_{18}$  alkyl radicals (for example cyclododecane ( $C_{12}$ ) or adamantane ( $C_{10}$ ) radicals);  $C_6$ - $C_{18}$  alkylperfluorinated radicals (for example the group of formula  $-(CH_2)_2-(CF_2)_9-CF_3$ ); the cholesteryl ( $C_{27}$ ) radical or a cholesterol ester residue, such as the cholesteryl oxyhexanoate group; or polycyclic aromatic groups, such as naphthalene or pyrene. Among these radicals, the ones that are more particularly preferred are substantially linear alkyl radicals and more particularly the n-dodecyl, n-hexadecyl or n-octadecyl radical, and mixtures thereof.

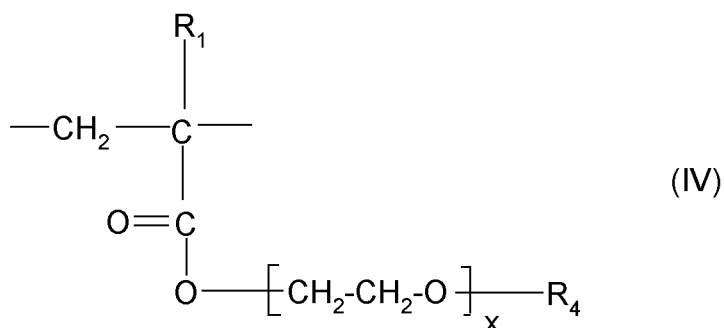
According to one particularly preferred form of the invention, the monomer of formula (IV) comprises at least one alkylene oxide unit ( $x \geq 1$ ) and preferably several alkylene oxide units ( $x > 1$ ) forming a polyoxyalkylene chain. The polyoxyalkylene chain is preferentially formed from ethylene oxide units and/or propylene oxide units and even more particularly formed from ethylene oxide units. The number of oxyalkylene units (or number of moles of alkylene oxide) generally ranges from 3 to 100, more preferably from 3 to 50 and more preferably still from 7 to 25.

Among these polymers, mention may be made of:

- copolymers, which may or may not be crosslinked and which may or may not be neutralized, comprising from 15 to 60% by weight of AMPS units and from 40 to 85% by weight of ( $C_8$ - $C_{16}$ )alkyl(meth)acrylamide units or of ( $C_8$ - $C_{16}$ )alkyl (meth)acrylate units relative to the polymer, such as those described in document EP-A-750 899;
- terpolymers comprising from 10 mol% to 90 mol% of acrylamide units, from 0.1 mol% to 10 mol% of AMPS units and from 5 mol% to 80 mol% of n-( $C_6$ - $C_{18}$ )alkylacrylamide units relative to the polymer, such as those described in document US-A-5,089,578;
- uncrosslinked copolymers of partially or completely neutralized AMPS and of n-dodecyl methacrylate, n-hexadecyl methacrylate or n-octadecyl methacrylate, such as those described in the Morishima articles mentioned above;
- crosslinked or uncrosslinked copolymers of partially or completely neutralized AMPS and of n-dodecylmethacrylamide, such as those described in the Morishima articles mentioned above.

As hydrophobic modified polymers, mention may be made more particularly of the copolymers constituted of (i) 2-acrylamido-2-methylpropanesulphonic acid (AMPS) units of formula (III) indicated above, in which  $X^+$  is a proton, an alkali metal cation, an alkaline-earth metal cation or the ammonium ion, and (ii) units of formula (V) below:

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in which x denotes an integer varying from 3 to 100, preferably from 3 to 50, and more preferably from 7 to 25;  $R_1$  has the same meaning as that indicated above in formula (IV) and  $R_4$  denotes a linear or branched alkyl radical comprising from 6 to 22 carbon atoms and preferably from 10 to 22 carbon atoms.

The hydrophobic modified polymers of this type are especially those described in the Morishima articles mentioned above, for which  $x = 25$ ,  $R_1$  denotes methyl and  $R_4$  represents n-dodecyl; or those described in document WO-A-02/43689, for which  $x = 8$  or 25,  $R_1$  denotes methyl and  $R_4$  represents n-hexadecyl ( $C_{16}$ ), n-octadecyl ( $C_{18}$ ), or n-dodecyl ( $C_{12}$ ), or mixtures thereof. The polymers for which  $X^+$  denotes sodium or ammonium are more particularly preferred.

The preferred hydrophobic modified polymers that may be used in the composition in accordance with the invention may be obtained according to conventional radical polymerization processes in the presence of one or more initiators such as, for example, azobisisobutyronitrile (AIBN), azobisdimethylvaleronitrile, 2,2-azobis[2-amidinopropane] hydrochloride (ABAH), organic peroxides such as dilauryl peroxide, benzoyl peroxide, *tert*-butyl hydroperoxide, etc., mineral peroxide compounds such as potassium persulfate or ammonium persulfate, or  $H_2O_2$  optionally in the presence of reducing agents.



These hydrophobic modified polymers may be obtained especially by radical polymerization in a *tert*-butanol medium, in which they precipitate. By using precipitation polymerization in *tert*-butanol, it is possible to obtain a size distribution of the polymer particles that is particularly favorable for its uses.

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The reaction may be performed at a temperature of between 0 and 150°C and preferably between 10 and 100°C, either at atmospheric pressure or under reduced pressure. It may also be performed under inert atmosphere, and preferably under nitrogen.

10

These preferred hydrophobic modified polymers are in particular those described in document EP-1,069,142, and especially those obtained by polymerization of 2-acrylamido-2-methylpropanesulphonic acid (AMPS) or a sodium or ammonium salt thereof with a (meth)acrylic acid ester and

- 15 - of a C<sub>10</sub>-C<sub>18</sub> alcohol oxyethylenated with 8 mol of ethylene oxide (Genapol® C-080 from the company Clariant),
- of a C<sub>11</sub> oxo alcohol oxyethylenated with 8 mol of ethylene oxide (Genapol® UD-080 from the company Clariant),
- of a C<sub>11</sub> oxo alcohol oxyethylenated with 7 mol of ethylene oxide (Genapol® UD-070
- 20 from the company Clariant),
- of a C<sub>12</sub>-C<sub>14</sub> alcohol oxyethylenated with 7 mol of ethylene oxide (Genapol® LA-070 from the company Clariant),
- of a C<sub>12</sub>-C<sub>14</sub> alcohol oxyethylenated with 9 mol of ethylene oxide (Genapol® LA-090 from the company Clariant),
- 25 - of a C<sub>12</sub>-C<sub>14</sub> alcohol oxyethylenated with 11 mol of ethylene oxide (Genapol® LA-110 from the company Clariant),
- of a C<sub>16</sub>-C<sub>18</sub> alcohol oxyethylenated with 8 mol of ethylene oxide (Genapol® T-080 from the company Clariant),
- of a C<sub>16</sub>-C<sub>18</sub> alcohol oxyethylenated with 15 mol of ethylene oxide (Genapol® T-150
- 30 from the company Clariant),
- of a C<sub>16</sub>-C<sub>18</sub> alcohol oxyethylenated with 11 mol of ethylene oxide (Genapol® T-110 from the company Clariant),
- of a C<sub>16</sub>-C<sub>18</sub> alcohol oxyethylenated with 20 mol of ethylene oxide (Genapol® T-200 from the company Clariant),

- of a C<sub>16</sub>-C<sub>18</sub> alcohol oxyethylenated with 25 mol of ethylene oxide (Genapol® T-250 from the company Clariant),
- of a C<sub>18</sub>-C<sub>22</sub> alcohol oxyethylenated with 25 mol of ethylene oxide and/or of a C<sub>16</sub>-C<sub>18</sub> iso alcohol oxyethylenated with 25 mol of ethylene oxide.

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The molar percentage concentration of units of formula (III) and of units of formula (V) in the polymers according to the invention varies as a function of the desired cosmetic application and of the rheological properties sought for the formulation. It can range between 0.1 and 99.9 mol%.

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Preferably, for the most hydrophobic polymers, the molar proportion of units of formula (III) or (V) varies from 50.1% to 99.9%, more particularly from 70% to 95% and more particularly still from 80% to 90%.

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Preferably, for the polymers that are not very hydrophobic, the molar proportion of units of formula (III) or (V) varies from 0.1% to 50%, more particularly from 5% to 25% and more particularly still from 10% to 20%.

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The distribution of the monomers in the polymers of the invention may be, for example, alternate, block (including multiblock) or random.

25

As hydrophobic modified polymers of this type, mention may be made especially of the copolymer of AMPS and of ethoxylated C12-C14 alcohol methacrylate (uncrosslinked copolymer obtained from Genapol LA-070 and AMPS) (CTFA name: ammonium acryloyldimethyltaurate/Laureth-7 methacrylate copolymer) sold under the name Aristoflex LNC by the company Clariant, and the copolymer of AMPS and of ethoxylated (25 EO) stearyl methacrylate (copolymer crosslinked with trimethylolpropane triacrylate, obtained from Genapol T-250 and AMPS) (CTFA name: ammonium acryloyldimethyltaurate/Stearth-25 methacrylate crosspolymer) sold under the name Aristoflex HMS by the company Clariant.

30

Preferably, the polymer containing a sulphonic group is chosen from copolymers of AMPS, preferably chosen from the copolymers of (meth)acrylic acid or (meth)acrylate, and of 2-acrylamido-2-methylpropanesulphonic acid, as described above, in particular

the optionally salified copolymers of 2-acrylamido-2-methylpropanesulphonic acid and of hydroxylated C<sub>2</sub>-C<sub>4</sub> alkyl (meth)acrylate.

According to one advantageous embodiment, the polymer containing a sulphonic group is chosen from copolymers of 2-acrylamido-2-methylpropanesulphonic acid and 2-hydroxyethyl acrylate, especially in salt form, hydrophobic modified polymers obtained by polymerization of AMPS or a sodium or ammonium salt thereof with a (meth)acrylic acid ester and of a C<sub>16</sub>-C<sub>18</sub> alcohol oxyethylenated with 25 mol of ethylene oxide, and a mixture thereof.

The polymer comprising at least one monomer containing a sulphonic group according to the invention may represent, as active material, from 0.1% to 15% by weight, preferably from 0.5% to 10% by weight and better still from 1% to 7% by weight relative to the total weight of the first composition.

## **SECOND COMPOSITION**

The second composition of the cosmetic assembly comprises:

- an anionic foaming surfactant and an amphoteric foaming surfactant in an amphoteric surfactant/anionic surfactant ratio ranging from 0.9 to 80/20,
- the total content of anionic and amphoteric surfactants being greater than or equal to 10% by weight relative to the total weight of the second composition, and
- a gelling polymer.

### **Anionic and amphoteric foaming surfactants**

The anionic and amphoteric (or zwitterionic) surfactants present in the composition according to the invention are foaming surfactants capable of cleansing the skin.

Foaming surfactants are detergents and differ from emulsifiers in the value of their HLB (Hydrophilic-Lipophilic Balance), the HLB being the ratio of the hydrophilic part to the lipophilic part in the molecule. The term "HLB" is well known to a person skilled in the art and is described, for example, in "The HLB system. A time-saving guide to

Emulsifier Selection" (published by ICI Americas Inc., 1984). For emulsifiers, the HLB generally ranges from 3 to 8 for the preparation of W/O emulsions and from 8 to 18 for the preparation of O/W emulsions, whereas foaming surfactants generally have an HLB of greater than 20.

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The total amount (of active material) of anionic and amphoteric foaming surfactants present in the second composition is greater than or equal to 10% by weight relative to the total weight of the second composition, for example ranging from 10% to 40% by weight, preferably greater than or equal to 15% by weight, for example from 15% to 35% by weight.

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The anionic and amphoteric foaming surfactants are present in the second composition in an amphoteric surfactant/anionic surfactant ratio ranging from 0.9 to 80/20, better still from 1 to 75/25, in particular from 1 to 71/29.

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#### Anionic surfactants

The anionic foaming surfactants may be chosen in particular from anionic derivatives of proteins of plant origin or of silk proteins, phosphates and alkyl phosphates, carboxylates, sulposuccinates, amino acid derivatives, alkyl sulphates, alkyl ether sulphates, sulphonates, isethionates, taurates, alkyl sulphoacetates, polypeptides, anionic derivatives of alkyl polyglucoside, and mixtures thereof.

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Anionic derivatives of proteins of plant origin are protein hydrolysates containing a hydrophobic group, it being possible for said hydrophobic group to be naturally present in the protein or to be added by reaction of the protein and/or of the protein hydrolysate with a hydrophobic compound. The proteins are of plant origin or are derived from silk, and the hydrophobic group may in particular be a fatty chain, for example an alkyl chain comprising from 10 to 22 carbon atoms. As anionic derivatives of proteins of plant origin, mention may more particularly be made of apple, wheat, soybean or oat protein hydrolysates comprising an alkyl chain having from 10 to 22 carbon atoms, and salts thereof. The alkyl chain may especially be a lauryl chain and the salt may be a sodium, potassium and/or ammonium salt.

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- Thus, as protein hydrolysates comprising a hydrophobic group, mention may be made, for example, of salts of protein hydrolysates where the protein is a silk protein modified by lauric acid, such as the product sold under the name Kawa Silk by Kawaken; salts of protein hydrolysates where the protein is a wheat protein modified by lauric acid, such as the potassium salt sold under the name Aminofoam W OR by Croda (CTFA name: potassium lauroyl wheat amino acids) and the sodium salt sold under the name Proteol LW 30 by SEPPIC (CTFA name: sodium lauroyl wheat amino acids); salts of protein hydrolysates where the protein is an oat protein comprising an alkyl chain having from 10 to 22 carbon atoms and more especially salts of protein hydrolysates where the protein is an oat protein modified by lauric acid, such as the sodium salt sold under the name Proteol OAT (30% aqueous solution) by SEPPIC (CTFA name: sodium lauroyl oat amino acids); or salts of apple protein hydrolysates comprising an alkyl chain having from 10 to 22 carbon atoms, such as the sodium salt sold under the name Proteol APL (30% aqueous glycol solution) by SEPPIC (CTFA name: sodium cocoyl apple amino acids). Mention may also be made of the mixture of lauroyl amino acids (aspartic acid, glutamic acid, glycine, alanine) neutralized with sodium N-methylglycinate sold under the name Proteol SAV 50 S by SEPPIC (CTFA name: sodium cocoyl amino acids).
- Examples of phosphates and alkyl phosphates that may be mentioned include monoalkyl phosphates and dialkyl phosphates, such as the lauryl monophosphate sold under the name MAP 20® by the company Kao Chemicals, the potassium salt of dodecylphosphoric acid, mixture of monoester and diester (predominantly diester) sold under the name Crafol AP-31® by the company Cognis, the mixture of octylphosphoric acid monoester and diester sold under the name Crafol AP-20® by the company Cognis, the mixture of ethoxylated (7 mol of EO) phosphoric acid monoester and diester of 2-butyloctanol, sold under the name Isofol 12 7 EO-Phosphate Ester® by the company Condea, the potassium or triethanolamine salt of mono(C<sub>12</sub>-C<sub>13</sub>)alkyl phosphate sold under the references Arlatone MAP 230K-40® and Arlatone MAP 230T-60® by the company Uniqema, the potassium lauryl phosphate sold under the name Dermalcare MAP XC-99/09® by the company Rhodia Chimie, and the potassium cetyl phosphate sold under the name Arlatone MAP 160K by the company Uniqema.

As carboxylates, mention may be made of:

- amido ether carboxylates (AEC), such as sodium lauryl amido ether carboxylate (3 EO), sold under the name Akypo Foam 30® by Kao Chemicals;
- 5     • polyoxyethylenated carboxylic acid salts, such as oxyethylenated (6 EO) sodium lauryl ether carboxylate (65/25/10 C<sub>12</sub>-C<sub>14</sub>-C<sub>16</sub>), sold under the name Akypo Soft 45 NV® by Kao Chemicals, polyoxyethylenated and carboxymethylated fatty acids originating from olive oil, sold under the name Olivem 400® by Biologia E Tecnologia, or oxyethylenated (6 EO) sodium tridecyl ether carboxylate, sold under the name Nikkol ECTD-6NEX® by Nikkol;
- 10    • salts of fatty acids (soaps) having a C6 to C22 alkyl chain which are neutralized with an organic or inorganic base, such as potassium hydroxide, sodium hydroxide, triethanolamine, N-methylglucamine, lysine and arginine.

15    Amino acid derivatives that may especially be mentioned include alkali metal salts of amino acids, such as:

- sarcosinates, for instance the sodium lauroyl sarcosinate sold under the name Sarkosyl NL 97® by the company Ciba or sold under the name Oramix L30® by the company SEPPIC, sodium myristoyl sarcosinate sold under the name Nikkol Sarcosinate MN® by the company Nikkol, and sodium palmitoyl sarcosinate sold under the name Nikkol Sarcosinate PN® by the company Nikkol;
- 20     • alaninates, for instance sodium N-lauroyl N-methyl amidopropionate sold under the name Sodium Nikkol Alaninate LN30® by the company Nikkol, or sold under the name Alanone ALE® by the company Kawaken, and triethanolamine N-lauroyl N-methyl alanine sold under the name Alanone Alta® by the company Kawaken;
- 25     • glutamates, for instance triethanolamine monococoyl glutamate sold under the name Acylglutamate CT-12® by the company Ajinomoto, or triethanolamine lauroyl glutamate sold under the name Acylglutamate LT-12® by the company Ajinomoto;
- 30     • glutamates, for instance triethanolamine monococoyl glutamate sold under the name Acylglutamate CT-12® by the company Ajinomoto, or triethanolamine lauroyl glutamate sold under the name Acylglutamate LT-12® by the company Ajinomoto;

- aspartates, for instance the mixture of triethanolamine N-lauroyl aspartate and of triethanolamine N-myristoyl aspartate, sold under the name Asparack® by the company Mitsubishi;
- 5     • glycine derivatives (glycinates), for instance the sodium N-cocoyl glycinate sold under the names Amilite GCS-12® and Amilite GCK 12 by the company Ajinomoto;
- 10    • citrates, such as the oxyethylenated (9 mol) citric monoester of coco alcohols sold under the name Witconol EC 1129 by the company Goldschmidt;
- galacturonates, such as the sodium dodecyl-D-galactoside uronate sold by the company Soliance.

15    Examples of sulphosuccinates that may be mentioned include the oxyethylenated (3 EO) lauryl alcohol monosulphosuccinate (70/30 C<sub>12</sub>/C<sub>14</sub>) sold under the names Setacin 103 Special® and Rewopol SB-FA 30 K 4® by the company Witco, the disodium salt of a hemisulphosuccinate of C<sub>12</sub>-C<sub>14</sub> alcohols, sold under the name Setacin F Special Paste® by the company Zschimmer Schwarz, the oxyethylenated (2 EO) disodium

20    oleamidodisulphosuccinate sold under the name Standapol SH 135® by the company Cognis, the oxyethylenated (5 EO) laurylamide monosulphosuccinate sold under the name Lebon A-5000® by the company Sanyo, the oxyethylenated (10 EO) disodium salt of lauryl citrate monosulphosuccinate sold under the name Rewopol SB CS 50® by the company Witco, and the ricinoleic monoethanolamide monosulphosuccinate sold

25    under the name Rewoder S 1333® by the company Witco. Polydimethylsiloxane sulphosuccinates may also be used, such as disodium PEG-12 dimethicone sulphosuccinate sold under the name Mackanate-DC30 by the company MacIntyre.

Mention may be made, as alkyl sulphates, for example, of triethanolamine lauryl

30    sulphate (CTFA name: TEA lauryl sulphate), such as the product sold by Huntsman under the name Empicol TL40 FL or the product sold by Cognis under the name Texapon T42, which products are at 40% in aqueous solution. Mention may also be made of ammonium lauryl sulphate (CTFA name: ammonium lauryl sulphate), such as the product sold by Huntsman under the name Empicol AL 30FL, which is at 30% in

35    aqueous solution.

Mention may be made, as alkyl ether sulphates, for example, of sodium lauryl ether sulphate (CTFA name: sodium laureth sulphate), such as that sold under the names Texapon N40 and Texapon AOS 225 UP by Cognis, or ammonium lauryl ether sulphate (CTFA name: ammonium laureth sulphate), such as that sold under the name Standapol EA-2 by Cognis.

Mention may be made, as sulphonates, for example, of  $\alpha$ -olefinsulphonates, such as the sodium  $\alpha$ -olefinsulphonate (C14-C16), sold under the name Bio-Terge AS-40® by Stepan, sold under the names Witconate AOS Protégé® and Sulframinate AOS PH 12® by Witco or sold under the name Bio-Terge AS-40 CG® by Stepan, secondary sodium olefinsulphonate, sold under the name Hostapur SAS 30® by Clariant; or linear alkylarylsulphonates, such as sodium xylenesulphonate, sold under the names Manrosol SXS30®, Manrosol SXS40® and Manrosol SXS93® by Manro.

Mention may be made, as isethionates, of acylisethionates, such as sodium cocoylisethionate, such as the product sold under the name Jordapon CI P® by the company Jordan.

Mention may be made, as taurates, of the sodium salt of palm kernel oil methyltaurate, sold under the name Hostapon CT Pate® by the company Clariant; N-acyl N-methyltaurates, for instance the sodium N-cocoyl N-methyltaurate sold under the name Hostapon LT-SF® by the company Clariant or sold under the name Nikkol CMT-30-T® by the company Nikkol, and the sodium palmitoyl methyltaurate sold under the name Nikkol PMT® by the company Nikkol.

The anionic derivatives of alkyl polyglucosides can in particular be citrates, tartrates, sulphosuccinates, carbonates and glycerol ethers obtained from alkyl polyglucosides. Mention may be made, for example, of the sodium salt of cocoylpolyglucoside (1,4) tartaric ester, sold under the name Eucarol AGE-ET by Cesalpinia, the disodium salt of cocoylpolyglucoside (1,4) sulphosuccinic ester, sold under the name Essai 512 MP by Seppic, or the sodium salt of cocoylpolyglucoside (1,4) citric ester, sold under the name Eucarol AGE-EC by Cesalpinia.

Amphoteric and zwitterionic foaming surfactants



The amphoteric and zwitterionic surfactants can be chosen, for example, from betaines, N-alkylamidobetaines and derivatives thereof, sultaines, alkyl polyaminocarboxylates, alkylamphoacetates, and mixtures thereof.

- 5 Mention may in particular be made, as betaines, of alkyl betaines, such as, for example, coco betaine, such as the product sold under the name Dehyton AB-30® by Cognis, lauryl betaine, such as the product sold under the name Genagen KB® by Clariant, oxyethylenated (10 EO) lauryl betaine, such as the product sold under the name Lauryl Ether (10 EO) Betaine® by Shin Nihon Rica, or oxyethylenated (10 EO)  
10 stearyl betaine, such as the product sold under the name Stearyl Ether (10 EO) Betaine® by Shin Nihon Rica.

- Mention may be made, among N-alkylamidobetaines and their derivatives, for example, of cocamidopropyl betaine, sold under the name Lebon 2000 HG® by Sanyo or sold  
15 under the name Empigen BB® by Albright & Wilson, or lauramidopropyl betaine, sold under the name Rewoteric AMB12P® by Witco.

- Mention may be made, as sultaines, of hydroxysultaines, such as cocamidopropyl hydroxysultaine, for instance the product sold under the name Rewoteric AM CAS by  
20 Goldschmidt-Degussa or the product sold under the name Crosultaine C-50® by Croda.

- Mention may be made, as alkyl polyaminocarboxylates (APACs), of sodium cocoilpolyaminocarboxylate, sold under the names Ampholak 7 CX/C® and Ampholak  
25 7 CX® by Akzo Nobel, sodium stearyl polyamidocarboxylate, sold under the name Ampholak 7 TX/C by Akzo Nobel, or sodium carboxymethyloleypolypropylamine, sold under the name Ampholak XO7/C® by Akzo Nobel.

- Mention may be made, as alkylamphoacetates, for example, of N-disodium N-cocoyl-N-carboxymethoxyethyl-N-(carboxymethyl)ethylenediamine (CTFA name: disodium  
30 cocoamphodiacetate), such as the product sold under the name Miranol C2M Concentré NP® by Rhodia, N-sodium N-cocoyl-N-hydroxyethyl-N-(carboxymethyl)-ethylenediamine (CTFA name: sodium cocamphoacetate) or sodium cocoamphohydroxypropylsulphonate, sold under the name Miranol CSE by Rhodia.

According to one advantageous embodiment, use is made of anionic surfactants containing no methyl side chain.

Surfactants comprising a methyl side chain are for example methyl taurates such as sodium methyl cocoyl taurate and sodium methyl cocoyl isethionate.

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As anionic surfactants, use may preferably be made of amino acid derivatives, in particular glycine derivatives such as N-cocoyl glycinate, isethionates, in particular acyl isethionates such as sodium cocoyl isethionate, alkyl sulphates such as sodium lauryl sulphate, alkyl ether sulphates such as sodium lauryl ether sulphate, and mixtures thereof.

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The amphoteric surfactant is preferably chosen from betaine, especially alkylbetaines such as sodium cocobetaine, N-alkylamidobetaines such as sodium cocamidopropyl betaine, alkylamphoacetates such as sodium cocoamphodiacetate, and mixtures thereof.

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The second composition may comprise, besides the aforementioned anionic and amphoteric surfactants, nonionic foaming surfactants.

Preferably, these nonionic surfactants are present in an amount less than or equal to 5% by weight relative to the total weight of the composition.

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As nonionic surfactants, mention may be made of alkyl polyglucosides (APGs), maltose esters, sucrose esters, hydrophobic gums, polyglycerolated fatty alcohols, fatty acid glycerol esters, oxyalkylenated glycerol esters, oxyalkylenated sugar esters, fatty acid polyethylene glycol esters, fatty acid sorbitan esters, glucamine derivatives such as 2-ethylhexyloxycarbonyl n-methylglucamine, and mixtures thereof.

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#### Gelling polymer

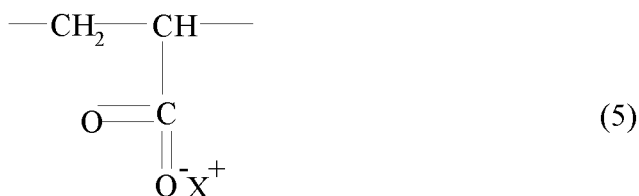
The gelling polymer may be present in the second composition according to the invention in an active material content ranging from 0.1% to 15% by weight, preferably from 0.5% to 10% by weight and better still from 1% to 5% by weight relative to the total weight of the second composition.

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These gelling polymers are advantageously amphiphilic polymers preferably chosen from polymers derived from acrylic acids, in particular polymers comprising:

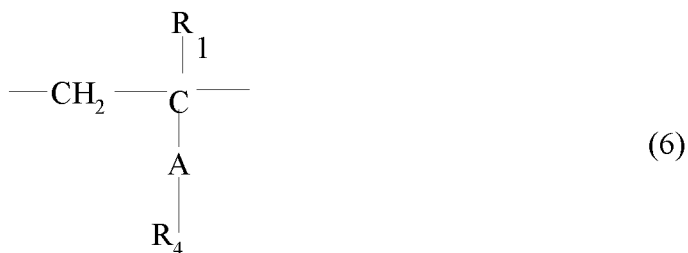
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- from 80 mol% to 99 mol% of acrylic acid (AA) units of formula (5) below:



in which  $\text{X}^+$  is a proton, an alkali metal cation, an alkaline-earth metal cation or an ammonium ion; and

- from 1 mol% to 20 mol% and preferably from 1 mol% to 15 mol% of units of formula (6) below:



in which  $\text{R}_1$  denotes a hydrogen atom or a linear or branched  $\text{C}_1\text{-C}_6$  alkyl radical (preferably methyl), A denotes an ester or amide group or an oxygen atom and  $\text{R}_4$  denotes a linear or branched alkyl comprising m carbon atoms with m ranging from 6 to 30 and preferably from 10 to 25.

These polymers are preferably crosslinked.

As acrylic acid-derived amphiphilic polymers that are preferred according to the present invention, mention may be made of:

- the uncrosslinked copolymer obtained from (meth)acrylic acid and steareth-20 methacrylate, sold under the name Aculyn 22<sup>®</sup> by the company Rohm & Haas,
- the uncrosslinked copolymer obtained from (meth)acrylic acid and laureth-25 methacrylate, sold under the name Aculyn 25<sup>®</sup> by the company Rohm & Haas,
- the uncrosslinked copolymer obtained from (meth)acrylic acid and beheneth-25 methacrylate, sold under the name Aculyn 28<sup>®</sup> by the company Rohm & Haas,

- the crosslinked copolymer obtained from (meth)acrylic acid and vinyl neodecanoate, sold under the name Aculyn 38<sup>®</sup> by the company Rohm & Haas,
- the crosslinked copolymer obtained from (meth)acrylic acid and steareth-20 methacrylate, sold under the name Aculyn 88<sup>®</sup> by the company Rohm & Haas,
- crosslinked copolymers of C<sub>10</sub>-C<sub>30</sub> alkyl acrylate and of (meth)acrylic acid, for instance Pemulen TR1<sup>®</sup> and TR2<sup>®</sup> sold by the company Novéon,
- the crosslinked copolymer of acrylic acid and of vinyl isodecanoate, sold under the name Stabylen 30<sup>®</sup> by the company 3V,
- crosslinked copolymers obtained from (meth)acrylic acid and from C<sub>10</sub>-C<sub>30</sub> alkyl acrylate, sold under the names Carbopol ETD 2020<sup>®</sup> and Carbopol 1382<sup>®</sup> by the company Novéon.

Mention may also be made of the crosslinked copolymers obtained from (meth)acrylic acid and from C<sub>10</sub>-C<sub>30</sub> alkyl acrylate, sold under the name Carbopol Carbopol Aqua SF-1 by the company Novéon, or else the uncrosslinked copolymer with the INCI name acrylate/beheneth-25 methacrylate, sold under the name Novethix L-10 by the company Lubrizol.

Preferably, the second composition contains no gelling polymer chosen from polyether-derived polymers, such polymers are, for example, water-soluble polyurethanes and especially polyethylene glycol compounds (for example having from 45 to 160 ethylene oxide units) bearing a C<sub>8</sub>-C<sub>20</sub> alkyl chain at the ends via a urethane bond; fatty acid polyethylene glycol esters comprising at least 100 ethylene glycol units such as PEG 50 distearate, or copolymers containing ethylene oxide and propylene oxide blocks such as those bearing the INCI name poloxamer.

Preferably, the second composition contains no gelling polymer chosen from polymers comprising at least one monomer containing a sulphonic group as described above that are present in the first composition.

According to one advantageous embodiment, the second composition comprises a structuring agent chosen from the saturated or unsaturated, linear or branched fatty acids comprising from 8 to 20 carbon atoms, preferably from 10 to 18 carbon atoms, triesters such as trideceth sulphate or polyglycerol triesters, for instance polyglyceryl-10 trilaurate (SUNSOFT Q-123Y from Taiyo Kagaku) or polyglyceryl-10 tricaprilate

(SUNSOFT Q-83H), fatty alcohols comprising from 10 to 18 carbon atoms, better still from 10 to 16 carbon atoms and mixtures thereof.

The fatty acids may be chosen from oleic acid, lauric acid, palmitic acid, myristic acid, stearic acid, linoleic acid, capric acid, caprylic acid or mixtures thereof.

- 5 The structuring agent may be present in a content ranging from 0.1% to 15% by weight, preferably from 0.5% to 10% by weight and better still from 1% to 5% by weight, relative to the total weight of the composition.

- 10 According to one particular embodiment, when the active agent present in the first composition is a peroxide, this advantageously comprises an activator promoting the decomposition of  $H_2O_2$ . The expression "activator promoting the decomposition of  $H_2O_2$ " encompasses any molecule or composition that may lead to the decomposition of  $H_2O_2$  to give water and oxygen.

- This expression therefore encompasses a large number of compounds known to those skilled in the art. As activators, mention may in particular be made of basic compounds, especially sodium hydroxide or potassium hydroxide, ammonia or triethanolamine, sodium (or ammonium) bicarbonate, sodium carbonate, manganese gluconate, sodium borate, calcium peroxide, calcium hydroxide, basic amino acids and salts thereof, such as lysine, arginine and salts thereof; guanidine; potassium carbonate, urea, aminomethylpropanol, aminopropanol, monoethanolamine (MEA), aminopropyltriethoxysilane (APTES), sodium or magnesium silicate derivatives, especially laponite (in particular the Laponite XLG sold by the company Rockwood), smectite, sodium metasilicate, hectorite, basic zeolites, especially the zeolite sold by the company Zeochem under the reference X-MOL, or a mixture thereof.
- 20 Advantagously, the activators are selected from sodium bicarbonate, laponite, zeolites, calcium peroxide, sodium hydroxide (preferably at 10% in water), sodium metasilicate and a mixture thereof.

- The activator can preferably be selected from the compounds or compositions capable of generating a pH of greater than or equal to 6, preferably greater than or equal to 7, when they are mixed with the first composition comprising  $H_2O_2$ .
- 30

- The preferred activators are selected from laponite XLG from Rockwood, zeolite X-MOL sold by Zeochem, calcium peroxide, sodium hydroxide, sodium metasilicate and a mixture thereof.
- 35

The amount of activators in the second composition depends on the components of the first and second compositions of the assembly according to the invention, on their respective amounts and on their galenic forms. In particular, a person skilled in the art will take care to choose the amount of activators so that, when the compositions of the cosmetic assembly according to the invention are mixed, the mixture resulting therefrom can express a pH of greater than or equal to 6, preferably greater than 7.

### Aqueous phase

10

The first and second compositions of the assembly according to the invention are aqueous compositions comprising an aqueous phase composed of water and/or of water-soluble solvents.

The aqueous phase may represent from 30% to 90% by weight, preferably from 35% to 85% by weight and better still from 45% to 80% by weight relative to the total weight of each first and second composition the first composition.

The water used may be demineralized pure water, but also mineral water and/or spring water and/or seawater, i.e. the water of the composition may be partially or totally constituted of water chosen from mineral waters, spring waters, seawaters and mixtures thereof. In general, a mineral water is suitable for consumption, which is not always the case with a spring water. Each of these waters contains, *inter alia*, dissolved minerals and/or trace elements. These waters are known to be employed for specific treatment purposes according to the particular trace elements and minerals that they contain, such as the moisturization and desensitization of the skin. The terms "mineral water" and "spring water" will denote not only natural mineral or spring waters but also natural mineral or spring waters enriched in additional mineral constituents and/or trace elements, and also aqueous mineral solutions and/or solutions containing trace elements prepared from purified water (demineralized or distilled water).

30

A natural spring water or mineral water used according to the invention may, for example, be chosen from Vittel water, Vichy basin water, Uriage water, Roche Posay water, Bourboule water, Enghien-les-Bains water, Saint Gervais-les-Bains water, Néris-les-Bains water, Allevar-les-Bains water, Digne water, Maizières water, Neyrac-les-

Bains water, Lons-le-Saunier water, Eaux Bonnes water, Rochefort water, Saint Christau water, Fumades water, Tercis-les-bains water and Avene water.

It is also possible to use seawaters such as Dead Sea water or seabed water.

5

The aqueous phase may also comprise organic solvents that are miscible with water (at 25°C) such as, for example, primary alcohols (C<sub>1</sub>-C<sub>3</sub> monohydric alcohol), such as ethanol and isopropanol, polyols, such as propylene glycol, butylene glycol, glycerine, hexylene glycol, polyethylene glycols such as PEG-8 or dipropylene glycol, and mixtures thereof. The amount of polyol(s) in the composition generally ranges from 10 0.05% to 20% by weight, preferably from 0.1% to 15% by weight and better still from 0.5% to 10% by weight relative to the total weight of each composition.

It is also possible to use, in the compositions of the assembly according to the invention, exfoliating particles, fillers or mixtures thereof.

Exfoliant particles that may be used include exfoliant or scrubbing particles of mineral, plant or organic origin. Thus, it is possible to use, for example, polyethylene beads or powder, such as those sold under the name Microthene MN 727 or Microthene MN 20 710-20 by the company Equistar or such as the powder sold under the name Gotalene 120 Incolore 2 by the company Dupont; Nylon particles, such as those sold by the company Arkema under the name Orgasol 2002 Exd Nat Cos; fibres such as polyamide fibres, such as those sold by the company Utebel under the name Pulpe Polyamide 12185 Taille 0.3 mm; polyvinyl chloride powder; pumice (INCI name) such as pumice 3/B from Eyraud; ground shells of fruit kernels, such as ground apricot 25 kernels or walnut shells; sawdust; glass beads; alumina (aluminium oxide) (INCI name: alumina), for instance the product sold under the name Dermagrain 900 by the company Marketech International; sugar crystals; beads that melt when applied to the skin, for instance the spheres based on mannitol and cellulose sold under the name 30 Unispheres by the company Induchem, agar-based capsules sold under the name Primasponge by the company Cognis, and spheres based on jojoba esters sold under the name Floraspheres by the company Floratech; and mixtures thereof.

The compositions of the assembly according to the invention can also comprise other fillers, such as, for example, talc or modified or unmodified starch, in particular starches 35

esterified with octenylsuccinic anhydride and more particularly "Aluminium Starch Octenylsuccinate", such as the product sold by the company National Starch under the name Dry-Flo.

- 5 According to one advantageous embodiment, the compositions of the assembly according to the invention comprise at least one filler.

The following compounds may be given as examples of fillers:

- porous silica microparticles, such as, for example, the Silica Beads<sup>®</sup> SB 150 and SB 700 from Myochi, with a mean size of 5  $\mu\text{m}$ , and the Sunspheres<sup>®</sup> series H from Asahi
- 10 Glass, such as H33 and H51, with a size respectively of 3.5 and 5  $\mu\text{m}$ ;
- hollow hemispherical silicone resin particles such as NLK 500<sup>®</sup>, NLK 506<sup>®</sup> and NLK 510<sup>®</sup> from Takemoto Oil and Fat, especially described in EP-A-1 579 849;
- silicone resin powders, for instance the Tospearl<sup>®</sup> 145 A silicone resin from GE Silicone, with a mean size of 4.5  $\mu\text{m}$ ;
- 15 - powders formed of acrylic copolymers, in particular of polymethyl (meth)acrylate, such as, for example, the Jurimer MBI<sup>®</sup> PMMA particles from Nihon Junyoki, with a mean size of 8  $\mu\text{m}$ , the hollow PMMA spheres sold under the name Covabead<sup>®</sup> LH 85 by Wackherr and the expanded vinylidene/acrylonitrile/methylene methacrylate microspheres sold under the name Expancel<sup>®</sup>;
- 20 - wax powders, such as the Paraffin Wax Microloase<sup>®</sup> 114S particles from Micropowders, with a mean size of 7  $\mu\text{m}$ ;
- polyethylene powders, in particular comprising at least one ethylene/acrylic acid copolymer, such as, for example, Flobeads<sup>®</sup> EA 209 E from Sumimoto, with a mean size of 10  $\mu\text{m}$ ;
- 25 - crosslinked elastomeric organopolysiloxane powders coated with silicone resin, in particular with silsesquioxane resin, sold under the name KSP 100<sup>®</sup>, KSP 101<sup>®</sup>, KSP 102<sup>®</sup>, KSP 103<sup>®</sup>, KSP 104<sup>®</sup> and KSP 105<sup>®</sup> by the company Shin Etsu;
- composite talc/dioxide or titanium/alumina/silica powders, such as, for example, Coverleaf AR 80<sup>®</sup> from the company Catalyst & Chemical;
- 30 - talc, mica, kaolin, lauryl glycine, starch powders crosslinked with octenyl succinate anhydride, boron nitride, polytetrafluoroethylene powders, precipitated calcium carbonate, magnesium hydrogen carbonate, barium sulphate, hydroxyapatite, calcium silicate, cerium dioxide and glass or ceramic microcapsules;
- hydrophilic or hydrophobic, synthetic or natural, mineral or organic fibres such as silk
- 35 fibres, cotton fibres, wool fibres, flax fibres, cellulose fibres extracted especially from



- wood, vegetables or algae, polyamide (Nylon<sup>®</sup>) fibres, modified cellulose fibres, poly-p-phenyleneterephthamide fibres, acrylic fibres, polyolefin fibres, glass fibres, silica fibres, aramid fibres, carbon fibres, polytetrafluoroethylene (Teflon<sup>®</sup>) fibres, insoluble collagen fibres, polyester fibres, polyvinyl chloride fibres, polyvinylidene chloride fibres, polyvinyl alcohol fibres, polyacrylonitrile fibres, chitosan fibres, polyurethane fibres, polyethylene phthalate fibres, fibres formed from a mixture of polymers, resorbable synthetic fibres, and mixtures thereof described in patent application EP 1 151 742;
- 5 - spherical elastomeric crosslinked silicones, for instance Trefil E-505C<sup>®</sup> or E-506 C<sup>®</sup> from Dow Corning;
- 10 - abrasive fillers, which, via a mechanical effect, smooth out the skin microrelief, such as abrasive silica, for instance Abrasif SP<sup>®</sup> from Semanez or nut or shell powders (for example of apricot or walnut, from Cosmetochem).

The filler may be a soft-focus filler. The term "soft-focus" filler means a filler which in addition gives the complexion transparency and a hazy effect. Preferably, the soft-focus fillers have a mean particle size of less than or equal to 15 microns. These particles may be in any form and in particular may be spherical or non-spherical. These fillers are more preferably non-spherical.

15

The soft-focus fillers may be chosen from silica and silicate powders, especially alumina powder, powders of polymethyl methacrylate (PMMA) type, talc, silica/TiO<sub>2</sub> or silica/zinc oxide composites, polyethylene powders, starch powders, polyamide powders, styrene/acrylic copolymer powders and silicone elastomers, and mixtures thereof.

20

Mention may be made in particular of talc with a number-average size of less than or equal to 3 microns, for example talc with a number-average size of 1.8 microns and especially the product sold under the trade name Talc P3<sup>®</sup> by the company Nippon Talc, Nylon<sup>®</sup> 12 powder, especially the product sold under the name Orgasol 2002 Extra D Nat Cos<sup>®</sup> by the company Atochem, silica particles 1% to 2% surface-treated with a mineral wax (INCI name: hydrated silica (and) paraffin) such as the products sold by the company Degussa, amorphous silica microspheres, such as the products sold under the name Sunsphere, for example of reference H-53<sup>®</sup> by the company Asahi Glass, and silica microbeads such as those sold under the name SB-700<sup>®</sup> or SB-150<sup>®</sup> by the company Miyoshi, this list not being limiting.

25

30

These exfoliating particles and fillers may be present in an amount ranging, for example, from 0.5% to 20% by weight, preferably from 1% to 15% by weight, better still

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from 1% to 10% by weight and even better still from 2% to 5% by weight relative to the total weight of each composition.

According to one embodiment, the second composition comprises at least one filler in a content of greater than or equal to 5% by weight relative to its total weight, preferably  
5 greater than or equal to 10% by weight.

The compositions of the assembly according to the invention may also comprise all the constituents normally employed in the application envisaged. In particular, advantageously, use may be made, in the compositions, of at least one additional  
10 ingredient and/or active agent for skin care (different from the acid active agent and the peroxide), in particular for oily skin.

It will be possible in particular to combine the additional active agents and ingredients described in patent application EP 1 847 247, incorporated here by reference, including  
15 depigmenting agents, preservatives, antimicrobial agents, antiperspirant agents, seborregulators, metal-chelating agents, UV screening agents, hydrolyzed proteins, antioxidants, vitamins, anti-inflammatory agents, soothing or anti-irritant agents, moisturizing agents, plant extracts, cosmetic adjuvants, and mixtures thereof.

20 Needless to say, a person skilled in the art will take care to select this or these optional additional compound(s), and/or the amount thereof, such that the advantageous properties of the assembly according to the invention are not, or are not substantially, adversely affected by the envisaged addition.

25 These active agents will generally be present in the compositions of the assembly according to the invention in a content ranging from 0.01% to 20% by weight and preferably from 0.1% to 10% by weight relative to the total weight of each composition.

A person skilled in the art will take care to select, from among these active agents,  
30 those which may have an activity under the conditions of use of the compositions according to the invention. A person skilled in the art will also take care to ensure that the active principles used in their amounts do not interfere with the advantageous properties of the compositions forming the cosmetic assembly according to the invention, especially in terms of pH.

Preferably, the additional active agents will be incorporated into the second composition of the cosmetic assembly, or into an additional composition of the cosmetic assembly.

- 5 The compositions of the assembly according to the invention can be provided in any galenic form normally used in the cosmetic or dermatological fields which is compatible with the characteristics of said compositions.

In particular, they are present in the form of a foaming gel.

- 10 According to the invention, the two compositions of the cosmetic assembly may be presented in various forms of cosmetic products, with various containers, compartments, closing members, applicators, packagings, etc.

The invention also relates to a packaging assembly comprising:

- 15 i. a first compartment containing a first aqueous composition containing at least one active agent chosen from peroxides,  $\alpha$ -hydroxy acids,  $\beta$ -hydroxy acids and mixtures thereof and at least one polymer comprising at least one monomer containing a sulphonic group;
- ii. a second compartment containing a second aqueous composition  
20 containing an anionic foaming surfactant and an amphoteric foaming surfactant in an amphoteric surfactant/anionic surfactant ratio ranging from 0.9 to 80/20, the total content of anionic and amphoteric surfactants being greater than or equal to 10% by weight relative to the total weight of the second composition, and a gelling polymer, said second compartment being isolated in a leaktight manner from the first, and  
25 iii. means for making it possible to bring the two compositions into contact, in particular at the time of use.

The first and the second composition of the packaging assembly are as defined above.

- 30 Such an assembly advantageously makes it possible to bring its two compositions, packaged separately in respectively the first compartment and the second compartment forming said assembly, into contact at the time of use.

This assembly can also be provided with means which make it possible to bring the first compartment and the second compartment, and thus their respective contents, into contact.

- 5 The assembly is also advantageously provided with a means suitable for the dispensing of the mixture of the two compositions.

More specifically, the first and second compositions, for the implementation of the invention, are packaged separately inside two compartments, formed either by two  
10 separate containers, or inside a single device.

The container(s) can have any appropriate form. It (they) can in particular be in the form of a bottle, a tube, a jar, a case, a box, a sachet or a casing.

- 15 The closing member of the container(s) can be in the form of a removable stopper, of a lid, of a seal, of a tear-off strip or of a bottle cap, in particular of the type comprising a body attached to the container and a cover cap hinged to the body. It may also be in the form of a member for selectively closing the container, especially a pump, a valve or a flap.

20

- The container may be combined with an applicator. The applicator may be in the form of a fine brush, as described, for example, in patent FR 2 722 380. The applicator can be in the form of a foam or elastomer pad, of a felt-tipped pen or of a spatula. The applicator may be free (powder puff or sponge) or securely fastened to a shaft borne by  
25 the closing member, as described, for example, in patent US 5 492 426. The applicator may be securely fastened to the container, as described, for example, in patent FR 2 761 959.

- The compositions may be contained directly in the container, or indirectly. By way of  
30 example, the compositions may be arranged on an impregnated support, especially in the form of a wipe or a pad, and arranged (single unit or several) in a box or in a sachet. Such a support incorporating the product is described, for example, in patent application WO 01/03538.

The closing member may be coupled to the container by screwing. Alternatively, the coupling between the closing member and the container is done other than by screwing, especially via a bayonet mechanism, by click-fastening, clamping, welding, adhesive bonding or by magnetic attraction. The term "click-fastening" in particular  
5 means any system involving the passing of a rim or bead of material by elastic deformation of a portion, especially of the closing member, followed by return to the elastically unstressed position of said portion after the rim or bead has been passed.

The container may be at least partially made of thermoplastic material. Examples of  
10 thermoplastic materials that may be mentioned include polypropylene or polyethylene. Alternatively, the container is made of non-thermoplastic material, especially glass or metal (or alloy).

The container may have rigid walls or deformable walls, especially in the form of a  
15 double tube or a double tube bottle.

The container may comprise means intended to bring about or facilitate the dispensing of the composition. By way of example, the container may have deformable walls so as to cause the composition to exit in response to excess pressurization inside the container, which excess pressurization is brought about by the elastic (or nonelastic)  
20 crushing of the walls of the container

The container may be formed from a case with a base delimiting at least one housing containing the composition, and a lid, especially hinged to the base, capable of at least partially covering said base. Such a case is described, for example, in patent  
25 application WO 03/018423 or in patent FR 2 791 042.

The container may be equipped with a wiping element positioned in the vicinity of the opening of the container. Such a wiping element makes it possible to wipe the applicator and, optionally, the shaft to which it may be securely fastened. Such a wiping  
30 element is described, for example, in patent FR 2 792 618.

According to one particular embodiment of the invention, the container is in the form of a bottle or a flexible sachet.

The term "single device" is understood to mean a device via which the two compartments or containers are integrally attached to one another. Such a device can be obtained by a process of molding the two compartments, in particular made of a thermoplastic material, as a single component. It may also result from any form of assembling, in particular by adhesive bonding, welding or other click-fastening.

According to a first embodiment, the two containers are separate, independent of one another. Such containers may be in various forms. They may especially be tubes, bottles or cans.

10

One and/or the other of the containers may be surmounted by a manually actuated pump surmounted by a pushbutton for actuating the pump and dispensing the composition via at least one dispensing orifice.

Alternatively, one and/or the other of the containers is pressurized, especially by means of a propellant, in particular a propellant gas. In this case, the container(s) is (are) equipped with a valve surmounted by a pushbutton equipped with a nozzle or any other diffusion means for dispensing the product.

The propellant may be in a mixture with at least one of the compositions to be dispensed or may be separated, in particular via a piston capable of sliding inside the container, or via the flexible walls of a pocket inside which the composition is placed.

The containers may be made of various materials: plastic, glass or metal.

25

According to one preferred embodiment, the two compositions are contained inside a single device.

According to one particular embodiment, the first and second compositions of the invention are packaged inside two compartments (51, 52) delimited by a single device (1) of pump bottle type as represented in Figure 1 of patent US 6 672 483.

In particular, each of the compartments is equipped with a pump (41, 42), preferably manually actuated, connected to at least one actuating and dispensing means (3) which makes it possible to deliver, separately or as a mixture, said first and second compositions.

According to one preferred embodiment, the actuating and dispensing means (3) is common to the two pumps.

According to one alternative, each of the compartments is pressurized, in particular using a propellant, and is equipped with a valve connected to at least one actuating  
5 and dispensing means which makes it possible to deliver, separately or as a mixture, said compositions.

In particular, the actuating and dispensing means is common to the two valves.

The packaging device presented in Figure 1 of patent US 6 672 483 is composed of  
10 two compartments 51, 52 positioned side by side and formed inside a component 5 obtained by moulding a thermoplastic material. Each of the containers 51, 52 comprises a neck 53 delimiting an opening. A pump 41, 42, which may or may not have an air uptake, is mounted inside the neck of each of the containers.

15 During the mounting, component 5 delimiting the two compartments 51, 52 is positioned inside a housing element 10.

A pump shaft 21a, 22a of each of the pumps 41, 42 is inserted forcibly inside a corresponding duct provided in a single pushbutton 3 configured so as to allow the  
20 simultaneous actuating of the two pumps in response to a pressure exerted axially on a surface 35 of pushbutton 3.

The ducts of the pushbutton connected to each of the pumps emerge at two orifices 31a, 32a positioned in the vicinity of one another on an external surface of the  
25 pushbutton 3. The two compositions exit separately in response to an actuation of the pumps 41, 42, either onto the finger of the user or onto an applicator pad or cotton wool ball. The mixing of the two compositions then takes place during application to the surface to be treated.

30 Use may be made, for example, of devices as described in the documents US 5 833 121, US 4 773 562 and US 6 672 483.

According to another particular embodiment, the two compartments are formed inside the same flexible sachet, and are separated by a weak weld or tearing region which  
35 can be broken during use, in particular in response to a pressure exerted at a precise

point of the sachet, at one of the two compartments. Examples of two-compartment flexible sachets which can be used in the present invention are described in particular in patent applications JP2000272674, WO99/51509, EP 2 437 30 or FR 2 876 356. The compartments can be produced using at least one sheet, for example a sheet of a flexible thermoplastic material, and can be bonded to one another via a common edge of weak weld type. According to one particular embodiment, the common edge of weak weld type is over the entire width of the sachet or over a lesser width forming a leaktight channel between the two sachets.

10 Preferably, the sachet is produced with films impermeable to oxygen from the air, such as aluminium.

Use may also be made of films that are impermeable to water, in the form of a polyethylene terephthalate/silicone/polyethylene (PET/SiOx/PE) triple layer.

Alternatively also, the two compartments are formed from two concentric compartments formed inside a tube, and are surmounted by a pump without air uptake equipped with a pushbutton having one or two dispensing orifices. Provided inside the tube is a piston that rises in the direction of the pump as and when the compositions are withdrawn from inside the containers. Such dispensing modes are especially used for dispensing toothpastes.

20

According to one advantageous embodiment, the first and second compositions are packaged in a double tube having two concentric compartments.

The contents of the patents or patent applications mentioned previously are incorporated by reference into the present patent application.

25

Yet other devices can be used for the implementation of the present invention, the essential point being that they can make possible the separate packaging of the two compositions of the cosmetic assembly of the present invention and the dispensing thereof separately or as a mixture.

30

The cosmetic assembly according to the invention has in particular a lightening effect and a positive effect on the radiance of the complexion, it makes it possible to tone down age spots and/or it has a positive effect on the appearance of oily skin, in particular by promoting the mattness of the skin.

35



The cosmetic assembly according to the invention also makes it possible to lighten the skin, to promote the radiance of the complexion, to render the complexion uniform, to reduce spots, in particular age spots, or to improve the hold of the makeup.

5 The cosmetic assembly according to the invention also has the advantage of enabling the lightening of the integuments, in particular head hair or body hair or downy hair, on the forearms, on the face, in particular at the moustache, etc.

The assembly according to the invention can be applied in any way which can be envisaged by a person skilled in the art in a skin care method.

10

In particular, it may be envisaged to mix the compositions of said assembly before application to the skin. The viscosities of the compositions enable an easy application of the assembly according to the invention, after mixing the compositions constituting them, the mixture not running, or barely running, on the skin after application.

15

Alternatively, it is possible to envisage the prior application of one of the compositions to the skin, and then the application of the other composition to the thus prepared skin. According to one preferred embodiment, said method according to the invention also comprises a rinsing step after application of the cosmetic assembly to the skin or its  
20 integuments.

According to one preferred embodiment, said cosmetic method also comprises a rinsing step after application of the compositions of the cosmetic assembly to the skin, as described previously.

25 According to one particular embodiment, the skin may be wetted, prior to the application of the cosmetic assembly according to the invention.

According to one preferred embodiment, after application to the skin, the mixture of the compositions of the cosmetic assembly is rinsed off, after a leave-on time ranging from  
30 1 to 20 minutes, preferably from 1 to 10 minutes.

The examples that follow illustrate the invention without limiting its scope. The compounds are, depending on the case, cited as the chemical names or as the CTFA names (International Cosmetic Ingredient Dictionary and Handbook).

35

**Example 1: cosmetic product****a) First compositions A1 and A2: peroxide-based aqueous gels**

|                                                                                       | <b>PART A1<br/>(invention)</b> | <b>PART A2<br/>(invention)</b> |
|---------------------------------------------------------------------------------------|--------------------------------|--------------------------------|
| Hydrogen peroxide (50%)                                                               | 9.3                            | 9.3                            |
| Phosphoric acid (qs pH)                                                               | ~0.1                           | ~0.1                           |
| Tetrasodium etidronate                                                                | 0.2                            | 0.2                            |
| Tetrasodium pyrophosphate                                                             | 0.04                           | 0.04                           |
| Sodium salicylate                                                                     | 0.035                          | 0.035                          |
| Hydroxyethyl acrylate/sodium acryloyldimethyl taurate copolymer (1)                   | 5                              |                                |
| Ammonium acryloyldimethyl taurate/steareth-25 methacrylate crosspolymer copolymer (2) |                                | 2                              |
| Water                                                                                 | 85.325                         | 88.425                         |
| pH                                                                                    | 3                              | 3                              |

- 5 (1) Sepinov EMT 10 Seppic  
 (2) Aristoflex HMS Clariant

Procedure: disperse the Sepinov EMT 10 or Aristoflex HMS in water and then introduce the tetrasodium etidronate, tetrasodium pyrophosphate, sodium salicylate  
 10 and then the hydrogen peroxide at 50% in water and finally the phosphoric acid in order to adjust the pH.

**b) Second compositions B1 to B4: foaming compositions**

|                                                             | <b>example B1<br/>(invention)</b> | <b>example B2<br/>(comparative)</b> | <b>example B3<br/>(invention)</b> | <b>Example B4<br/>(invention)</b> |
|-------------------------------------------------------------|-----------------------------------|-------------------------------------|-----------------------------------|-----------------------------------|
| Phenoxyethanol                                              | 0.7                               | 0.7                                 | 0.7                               | 0.7                               |
| Sodium N-cocoyl glycinate (AMILITE GCS-12® from Ajinomoto). | 16.69                             | 33.33                               | 25                                | 16.69                             |
| Coco betaine in aqueous                                     | 33.33                             | 16.69                               | 25                                | 16.69                             |

|                                                                                                           |       |       |       |       |
|-----------------------------------------------------------------------------------------------------------|-------|-------|-------|-------|
| solution at 30% as AM<br>(DEHYTON AB-30® from<br>Cognis)                                                  |       |       |       |       |
| Cocamidopropyl betaine<br>(TEGO BETAIN F 50<br>Evonik Goldschmidt)                                        |       |       |       | 17.43 |
| Lauric acid                                                                                               | 3.31  | 3.31  | 3.31  | 3.31  |
| (Meth)acrylic acid/vinyl<br>neodecanoate copolymer,<br>at 29% as AM (Aculyn<br>38® from Rohm and<br>Haas) | 6.68  | 6.68  | 6.68  | 6.68  |
| Sodium hydroxide (10%<br>in water)                                                                        | 4.38  | 3.22  | 4.39  |       |
| KOH (50% in water)                                                                                        | -     | -     | -     | 2.1   |
| glycerol                                                                                                  | -     | -     | -     | 5     |
| PEG14000                                                                                                  |       |       |       | 0.25  |
| POLYQUATERNIUM-39<br>(MERQUAT 3330PR Nalco )<br>9.25% in water                                            | -     | -     | -     | 1     |
| Polyquaternium-6<br>(MERQUAT 100 Nalco)<br>40% in water                                                   | -     | -     | -     | 0.75  |
| Water                                                                                                     | 34.91 | 36.07 | 34.92 | 28.65 |
| Amphoteric<br>surfactants/anionic<br>surfactants ratio                                                    | 2     | 0.5   | 1     | 2.3   |
| pH                                                                                                        | 6.7   | 6.7   | 6.9   | 7.0   |

Procedure: Disperse the Aculyn 38 in water using a Rayneri mixer at room temperature then neutralize using sodium hydroxide in order to obtain a homogeneous gel, add the preheated surfactant base (lauric acid + Amilite + coco betaine) sodium chloride.

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For composition B4, the PEG 14000 is first dispersed in the glycerol, and then water then the polyquaternium are added.

Add the preheated surfactant base (lauric acid + amilite + coco betaine) then the sodium hydroxide in order to adjust the pH.

- 5 The viscosity of the first and second compositions and of each composition resulting from the mixing thereof were then measured.

The viscosity is measured using a Rheomat 180 (from the company Lamy), equipped with an MS-R4 spindle rotating at a shear rate of  $200 \text{ s}^{-1}$ .

| Viscosity (at 20°C in Pa.s) | example B1<br>(invention) | example B2<br>(comparative) | example B3<br>(invention) | example B4<br>(invention) |
|-----------------------------|---------------------------|-----------------------------|---------------------------|---------------------------|
| First composition A1        | 5                         | 5                           | 5                         | -                         |
| First composition A2        | -                         | -                           | -                         | 5.2                       |
| Second composition B        | 8.8                       | 9.5                         | 9.2                       | 9.5                       |
| Mixture A + B               | 7.1                       | 4.5                         | 7.8                       | 9.5                       |
| pH mixture A + B            | 6.7                       | 6.7                         | 6.8                       | 7                         |
| Conclusion                  | Satisfactory              | Not viscous enough          | Satisfactory              | Satisfactory              |

- 10 The composition from Example B2, which has an amphoteric surfactants/anionic surfactants ratio outside of the invention, does not make it possible to obtain a homogeneous final mixture of the first + second compositions that is sufficiently viscous for a satisfactory application to keratin materials.

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#### **Example 2: Foaming second compositions B5 and B6**

|                                                                         | example B5<br>(invention) | example B6<br>(comparative) |
|-------------------------------------------------------------------------|---------------------------|-----------------------------|
| Phenoxyethanol                                                          | 0.7                       | 0.7                         |
| Sodium laureth sulphate at 70% in water<br>(TEXAPON AOS 225 UP /COGNIS) | 8.81                      | 14.1                        |
| Lauryl betaine in solution (EMPIGEN BB / LS /<br>HUNTSMAN AB-30®)       | 20.56                     | 8.22                        |

|                                                                                               |       |       |
|-----------------------------------------------------------------------------------------------|-------|-------|
| butylene glycol                                                                               | 26.88 | 26.88 |
| (Meth)acrylic acid/vinyl neodecanoate copolymer, at 29% as AM (Aculyn 38® from Rohm and Haas) | 6     | 6     |
| HYDROXYPROPYL STARCH PHOSPHATE                                                                | 4     | 4     |
| Polyquaternium-6 (MERQUAT 100 Nalco) 40% in water                                             | 0.75  | 0.75  |
| Zeolite (X-MOL/ ZEOCHEM)                                                                      | 10    | 10    |
| Sodium hydroxide (10% in water)                                                               | 3     | 3     |
| Water                                                                                         | 19.3  | 26.35 |
| Amphoteric surfactants/anionic surfactants ratio                                              | 1     | 0.25  |
| pH                                                                                            | 7.5   | 7.3   |

#### Procedure:

- Disperse the Aculyn 38 in water using a Rayneri mixer at room temperature then neutralize using sodium hydroxide (2.81 g of sodium hydroxide at 10% in water in order to neutralize 16 g of Aculyn 38) in order to obtain a homogeneous gel.
- 5 Add the preheated surfactant base (lauric acid + amilite + coco betaine) then the sodium hydroxide in order to adjust the pH.
- Finally, add the hydroxypropyl starch, PQ6 and zeolite.
- 10 The viscosity of compositions B5 and B6 and of each composition resulting from the mixing thereof with the first composition A1 from Example 1 were then measured.

| Viscosity (200 s <sup>-1</sup> , at 20°C in Pa.s) | <b>example<br/>A1+ B5<br/>(invention)</b> | <b>example<br/>A1+ B6<br/>(comparative)</b> |
|---------------------------------------------------|-------------------------------------------|---------------------------------------------|
| First composition A                               | 5                                         | 5                                           |
| Second composition B                              | 7.3                                       | 3                                           |
| Mixture A + B                                     | 5.2                                       | 1.15                                        |
| pH mixture A + B                                  | 7.5                                       | 7.3                                         |
| Conclusion                                        | Satisfactory                              | Not viscous                                 |

|  |  |        |
|--|--|--------|
|  |  | enough |
|--|--|--------|

The composition from Example B6, which has an amphoteric surfactants/anionic surfactants ratio outside of the invention, does not make it possible to obtain a homogeneous final mixture of the first + second compositions that is sufficiently viscous for an easy application.

Each first composition and second composition from the above examples may be packaged in the same amount in two separate compartments of a double-compartment packaging of tube type such as, for example, the Dual tube 35-25 from Alcan Packaging, or of double pump bottle type. The compositions are mixed on leaving the tube or bottle and then the corresponding mixture is applied to the skin.

## CLAIMS

1. Cosmetic assembly comprising:
  - a) a first aqueous composition comprising:
    - 5           - at least one active agent chosen from peroxides,  $\alpha$ -hydroxy acids,  $\beta$ -hydroxy acids and mixtures thereof, and
    - at least one polymer comprising at least one monomer containing a sulphonic group,
    - and
  - 10       b) a second aqueous composition comprising:
    - an anionic foaming surfactant and an amphoteric foaming surfactant in an amphoteric surfactant/anionic surfactant ratio ranging from 0.9 to 80/20,
    - the total content of anionic and amphoteric surfactants being greater than or equal to 10% by weight relative to the total weight of the second composition,
    - 15       and
    - a gelling polymer.
2. Assembly according to Claim 1, characterized in that the active agent is hydrogen peroxide.
- 20       3. Assembly according to either of the preceding claims, characterized in that the active agent is present in a content ranging from 0.1% to 15% by weight, preferably ranging from 0.5% to 10% by weight and better still ranging from 1% to 8% by weight, relative to the total weight of the first composition.
- 25       4. Assembly according to one of the preceding claims, characterized in that the monomer containing a sulphonic group is 2-acrylamido-2-methylpropanesulphonic acid.
- 30       5. Assembly according to one of the preceding claims, characterized in that the polymer comprising at least one monomer containing a sulphonic group is chosen from copolymers of (meth)acrylic acid or of (meth)acrylate and of 2-acrylamido-2-methylpropanesulphonic acid, in particular the optionally salified copolymers of 2-acrylamido-2-methylpropanesulphonic acid and of hydroxylated C<sub>2</sub>-C<sub>4</sub> alkyl
- 35       (meth)acrylate.

6. Assembly according to one of the preceding claims, characterized in that the polymer comprising at least one monomer containing a sulphonic group is a copolymer of 2-acrylamido-2-methylpropanesulphonic acid and of 2-hydroxyethyl acrylate.

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7. Assembly according to any one of the preceding claims, characterized in that the polymer comprising at least one monomer containing a sulphonic group is chosen from the hydrophobic modified polymers obtained by polymerization of 2-acrylamido-2-methylpropanesulphonic acid (AMPS) or a sodium or ammonium salt thereof with a (meth)acrylic acid ester and

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- of a C<sub>10</sub>-C<sub>18</sub> alcohol oxyethylenated with 8 mol of ethylene oxide,
  - of a C<sub>11</sub> oxo alcohol oxyethylenated with 8 mol of ethylene oxide,
  - of a C<sub>11</sub> oxo alcohol oxyethylenated with 7 mol of ethylene oxide,
  - of a C<sub>12</sub>-C<sub>14</sub> alcohol oxyethylenated with 7 mol of ethylene oxide,
  - 15 - of a C<sub>12</sub>-C<sub>14</sub> alcohol oxyethylenated with 9 mol of ethylene oxide,
  - of a C<sub>12</sub>-C<sub>14</sub> alcohol oxyethylenated with 11 mol of ethylene oxide,
  - of a C<sub>16</sub>-C<sub>18</sub> alcohol oxyethylenated with 8 mol of ethylene oxide,
  - of a C<sub>16</sub>-C<sub>18</sub> alcohol oxyethylenated with 15 mol of ethylene oxide,
  - of a C<sub>16</sub>-C<sub>18</sub> alcohol oxyethylenated with 11 mol of ethylene oxide,
  - 20 - of a C<sub>16</sub>-C<sub>18</sub> alcohol oxyethylenated with 20 mol of ethylene oxide,
  - of a C<sub>16</sub>-C<sub>18</sub> alcohol oxyethylenated with 25 mol of ethylene oxide,
  - of a C<sub>18</sub>-C<sub>22</sub> alcohol oxyethylenated with 25 mol of ethylene oxide and/or of a C<sub>16</sub>-C<sub>18</sub> iso alcohol oxyethylenated with 25 mol of ethylene oxide,
- and mixtures thereof.

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8. Assembly according to any one of the preceding claims, characterized in that the polymer comprising at least one monomer containing a sulphonic group is present in an active material content ranging from 0.1% to 15% by weight, preferably from 0.5% to 10% by weight and better still from 1% to 7% by weight relative to the total weight of

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9. Assembly according to any one of the preceding claims, characterized in that the total amount (of active material) of anionic and amphoteric foaming surfactants is greater than or equal to 10% by weight relative to the total weight of the second



composition, for example ranging from 10% to 40% by weight, preferably greater than or equal to 15% by weight, for example from 15% to 35% by weight.

10. Assembly according to any one of the preceding claims, characterized in that the  
5 anionic and amphoteric foaming surfactants are present in an amphoteric surfactant/anionic surfactant ratio ranging from 1 to 75/25, in particular from 1 to 71/29.

11. Assembly according to any one of the preceding claims, characterized in that the  
10 anionic foaming surfactants are chosen from amino acid derivatives, in particular glycine derivatives such as N-cocoyl glycinate, isethionates, in particular acyl isethionates such as sodium cocoyl isethionate, alkyl sulphates such as sodium lauryl sulphate, alkyl ether sulphates such as sodium lauryl ether sulphate and mixtures thereof.

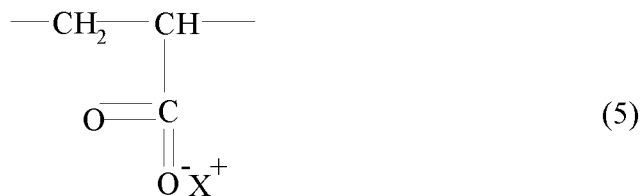
12. Assembly according to any one of the preceding claims, characterized in that the  
15 anionic foaming surfactants are chosen from amino acid derivatives, in particular glycine derivatives such as N-cocoyl glycinate.

13. Assembly according to any one of the preceding claims, characterized in that the  
20 amphoteric surfactants are chosen from betaines, especially alkylbetaines such as sodium cocobetaine, N-alkylamidobetaines such as sodium cocamidopropyl betaine, alkylamphoacetates such as sodium cocoamphodiacetate, and mixtures thereof.

14. Assembly according to any one of the preceding claims, characterized in that the  
25 gelling polymer is present in an active material content ranging from 0.1% to 15% by weight, preferably from 0.5% to 10% by weight and better still from 1% to 5% by weight relative to the total weight of the second composition.

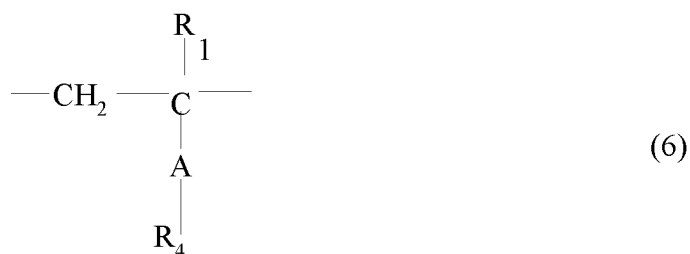
15. Assembly according to any one of the preceding claims, characterized in that the  
30 gelling polymer is chosen from polymers derived from acrylic acids, preferably crosslinked polymers, in particular polymers comprising:

- from 80 mol% to 99 mol% of acrylic acid (AA) units of formula (5) below:



in which  $\text{X}^+$  is a proton, an alkali metal cation, an alkaline-earth metal cation or an ammonium ion; and

- from 1 mol% to 20 mol% and preferably from 1 mol% to 15 mol% of  
 5 units of formula (6) below:



in which  $\text{R}_1$  denotes a hydrogen atom or a linear or branched  $\text{C}_1\text{--C}_6$  alkyl radical (preferably methyl), A denotes an ester or amide group or an oxygen atom and  $\text{R}_4$  denotes a linear or branched alkyl comprising m carbon atoms with m ranging from 6 to  
 10 30 and preferably from 10 to 25.

16. Assembly according to any one of the preceding claims, characterized in that the second composition comprises a structuring agent chosen from the saturated or unsaturated, linear or branched fatty acids comprising from 8 to 20 carbon atoms,  
 15 triesters, fatty alcohols comprising from 10 to 18 carbon atoms and mixtures thereof.

17. Method for the cosmetic treatment of keratin materials consisting in applying to the keratin materials at least one layer of a mixture:

- of a first aqueous composition comprising:
  - 20 - at least one active agent chosen from peroxides,  $\alpha$ -hydroxy acids,  $\beta$ -hydroxy acids, and
  - at least one polymer comprising at least one monomer containing a sulphonic group,
- and
- 25 - of a second aqueous composition comprising:

- an anionic foaming surfactant and an amphoteric foaming surfactant in an amphoteric surfactant/anionic surfactant ratio ranging from 0.9 to 80/20,
- 5       - the total content of anionic and amphoteric surfactants being greater than or equal to 10% by weight relative to the total weight of the second composition, and
- a gelling polymer.

18. Cosmetic treatment method according to Claim 17, in which the first and second  
10       compositions are mixed in a ratio, by weight, of between 100/50 and 80/100, preferably between 100/80 and 80/100.