Title: DYEING COMPOSITION EMPLOYING A SPECIFIC HYDROTROPIC COMPOUND IN A MEDIUM RICH IN FATTY SUBSTANCES, METHODS AND DEVICE

Abstract: A subject-matter of the present invention is a composition for dyeing keratinous fibres, comprising: * at least one fatty substance; * at least one surfactant; * at least one dye for keratinous fibres; * at least one basifying agent; * at least one chemico-oxidizing agent; * at least one cationic compound of following formula (i); where \( R_1, R_2, R_3 \) and \( R_4 \), which are identical or different, represent an optionally substituted \( \text{C}_1-\text{C}_8 \) alkyl or \( \text{C}_7-\text{C}_8 \) alkenyl radical which is optionally interrupted by one or more heteroatoms; or an optionally substituted benzyl radical; \( X \) represents a cosmetically acceptable cation or mixture of cosmetically acceptable cations, providing the electrical neutrality of the formula (i); * the content of fatty substances representing, in total, at least 25% by weight, with respect to the total weight of the composition. The present invention also relates to a method employing this composition and to multicompartment devices which are suitable for the implementation of the invention.
DYEING COMPOSITION EMPLOYING A SPECIFIC HYDROTROPIC COMPOUND IN A MEDIUM RICH IN FATTY SUBSTANCES, METHODS AND DEVICE

A subject-matter of the present invention is a composition for dyeing keratinous fibres, comprising one or more fatty substances and one or more surfactants, one or more specific hair dyes, one or more specific cationic compounds, one or more basifying agents and one or more chemical oxidizing agents and the content of fatty substances in the composition representing, in total, at least 25% by weight, with respect to the total weight of the composition.

The present invention also relates to dyeing methods employing this composition and to a multicompartment device appropriate for the use of this composition. 

Mention may be made, among methods for dyeing human keratinous fibres, such as the hair, of oxidation dyeing or permanent dyeing. More particularly, this form of dyeing employs one or more oxidation dye precursors and usually one or more oxidation bases, optionally in combination with one or more couplers.

In general, oxidation bases are chosen from ortho- or para-phenylenediamines, ortho- or para-aminophenols and heterocyclic compounds. These oxidation bases are colourless or weakly coloured compounds which, in combination with oxidizing products, make it possible to access coloured entities by an oxidative condensation process.

Very often, the shades obtained with these oxidation bases can be varied by combining them with one or more couplers, the latter being chosen in particular from aromatic meta-diamines, meta-aminophenols, meta-diphenols and certain heterocyclic compounds, such as indole compounds.

The variety of the molecules involved as oxidation bases and couplers makes it possible to obtain a rich palette of colours.

Direct dyeing or semi-permanent dyeing is also known. The method conventionally used in direct dyeing consists in applying, to the keratinous fibres, direct dyes, which are coloured and colouring molecules having an affinity for the fibres, in leaving to stand in order to allow the molecules to penetrate, by diffusion, inside the fibre, and in then rinsing them.

The direct dyes generally employed are chosen from nitrobenzene, anthraquinone, nitropyridine, azo, methine, azomethine, xanthene, acridine, azine or triarylmethane direct dyes.

This type of method does not require the use of an oxidizing agent to develop the colouration. However, it is not excluded to use one in order to obtain, with the colouration, a lightening effect. Such a method is then referred to as direct dyeing or semi-permanent dyeing under lightening conditions.

Methods for permanent dyeing or semi-permanent dyeing under lightening conditions thus consist in employing, with the dyeing composition, an aqueous composition comprising at least one oxidizing agent, under alkaline pH conditions in the
vast majority of cases. The role of this oxidizing agent is to degrade the melanin of the
hair, which, depending on the nature of the oxidizing agent present, results in more or
less pronounced lightening of the fibres. Thus, for relatively slight lightening, the oxidizing
agent is generally hydrogen peroxide. When greater lightening is desired, peroxygenated
salts, such as persulfates, for example, are usually employed, in the presence of
hydrogen peroxide.

The dyeing methods are normally employed under alkaline conditions, the alkaline
agent making it possible both to activate the oxidizing agent and to facilitate the uptake of
the dyes by bringing about opening of the scales of the fibres. Conventionally, the
alkaline agent employed is aqueous ammonia. It is very effective but exhibits many
disadvantages due to its high volatility, to its strong offensive odour and to the risks of
intolerance (irritation, smarting) which it may occasion.

Attempts to replace ammonia in part or completely by one or more other
conventional alkaline agents have not led to compositions that are as effective in terms of
colouring results.

Recently, dye compositions rich in fatty substances have been proposed, obtained
by mixing two or three compositions and comprising inter alia a fatty substance.

These compositions make it possible to lower the content of aqueous ammonia,
indeed even to dispense with it, while retaining levels of colouration at least as high as
with conventional compositions comprising high concentrations of this alkaline agent.

However, even under these conditions, the results obtained are not optimum, in
particular in terms of intensity and/or chromaticity. This is in particular the case with
hydrophobic dyes.

One of the objectives of the present invention is to provide compositions for dyeing
human keratinous fibres, such as the hair, which do not have the disadvantages of the
existing compositions.

In particular, the composition according to the invention makes it possible to obtain
satisfactory colours, in particular satisfactory in terms of intensity and of coverage or of
uptake of the colour at the roots of the individual hairs, which makes it possible to avoid a
"root" effect of the dyeing.

In addition, it is possible to obtain colourations which are very stable towards light.

In addition, the invention makes it possible to result in high degrees of lightening
while dyeing, without using persalts or increasing the amount of chemical oxidizing agent
or of basifying agent.
These aims and others are achieved by the present invention, a subject-matter of which is thus a composition for dyeing keratinous fibres, in particular human keratinous fibres, such as the hair, comprising:

- one or more fatty substances,
- one or more surfactants,
- one or more dyes for keratinous fibres,
- one or more basifying agents,
- one or more chemical oxidizing agents,
- one or more cationic compounds of following formula (i):

\[
\begin{align*}
R_1 & \quad \text{in which:} \\
R_1, R_2, R_3 \text{ and } R_4 & \text{ radicals, which are identical or different, represent an} \\
& \text{optionally substituted } C_1-C_8 \text{ alkyl radical which is optionally interrupted by one or} \\
& \text{more heteroatoms; an optionally substituted } C_2-C_8 \text{ alkenyl radical which is} \\
& \text{optionally interrupted by one or more heteroatoms; or an optionally substituted} \\
& \text{benzyl radical;} \\
X^- & \text{represents a cosmetically acceptable anion or a mixture of cosmetically} \\
& \text{acceptable anions, providing the electrical neutrality of the formula (i)} \\
& \text{- the content of fatty substances representing, in total, at least } 25\% \text{ by weight, with} \\
& \text{respect to the total weight of the composition.}
\end{align*}
\]

Another subject-matter of the invention is a dyeing method employing the composition of the invention, and multicompartment devices which make it possible to employ the composition of the invention.

Thus, the use of the dyeing composition according to the invention results in powerful, intense, chromatic and, in addition, relatively non-selective colourations, that is to say colourations which are homogeneous along the fibre.

The invention also makes it possible to cover keratinous fibres particularly well at their roots, in particular down to three centimetres from the bases of said fibres.

Moreover, the colours obtained after treatment of the fibres remain stable, in particular towards light.

The invention also makes it possible to reduce the amounts of active agents of the invention, such as dyes and/or basifying agents and/or oxidizing agents, without loss in dyeing effectiveness of the composition.
Furthermore, the methods according to the invention make it possible to employ formulations which are less malodorous during application to the hair or during the preparation thereof.

Other characteristics and advantages of the invention will become more clearly apparent on reading the description and examples which follow.

In that which will follow and unless otherwise indicated, the limits of a range of values are included within this range.

The human keratinous fibres treated by the method according to the invention are preferably the hair.

The expression "at least one" is equivalent to the expression "one or more".

Fatty substances:

As has been mentioned, the composition of the invention comprises one or more fatty substances.

The term "fatty substance" is understood to mean an organic compound which is insoluble in water at ordinary temperature (25°C) and at atmospheric pressure (760 mmHg) (solubility of less than 5%, preferably of less than 1% and more preferably still of less than 0.1%). They exhibit, in their structure, at least one hydrocarbon chain comprising at least 6 carbon atoms or a sequence of at least two siloxane groups. In addition, fatty substances are generally soluble in organic solvents under the same temperature and pressure conditions, such as, for example, chloroform, dichloromethane, carbon tetrachloride, ethanol, benzene, toluene, tetrahydrofuran (THF), liquid petrolatum or decamethylcyclopentasiloxane.

Preferably, the fatty substances of the invention do not comprise salified or unsalified carboxylic acid groups (COOH or COO⁻). In particular, the fatty substances of the invention are neither polyoxyalkylated nor polyglycerolated.

The term "o/T" is understood to mean a "fatty substance" which is liquid at ambient temperature (25°C) and at atmospheric pressure (760 mmHg).

The term "non-silicone o/T" is understood to mean an oil not comprising a silicon (Si) atom and the term "silicone o/T" is understood to mean an oil comprising at least one silicon atom.

More particularly, the fatty substances are chosen from C₆-H₁₂ hydrocarbons, hydrocarbons comprising more than 16 carbon atoms, non-silicone oils of animal origin, vegetable oils of triglyceride type, synthetic triglycerides, fluorinated oils, fatty alcohols, fatty acid and/or fatty alcohol esters other than the triglycerides and vegetable waxes, non-silicone waxes or silicones.
It should be remembered that, within the meaning of the invention, fatty alcohols, esters and acids more particularly exhibit at least one saturated or unsaturated and linear or branched hydrocarbon group which comprises from 6 to 30 carbon atoms and which is optionally substituted, in particular by one or more hydroxyl groups (in particular 1 to 4). If they are unsaturated, these compounds can comprise from one to three conjugated or non-conjugated carbon-carbon double bonds.

As regards the C_{6}-C_{16} hydrocarbons, they are linear, branched or optionally cyclic, and are preferably alkanes. Mention may be made, by way of example, of hexane, dodecane or isoparaffins, such as isohexadecane or isodecane.

Mention may be made, as hydrocarbon oils of animal origin, of perhydrosqualene.

The triglyceride oils of vegetable or synthetic origin are preferably chosen from liquid triglycerides of fatty acids comprising from 6 to 30 carbon atoms, such as heptanoic or octanoic acid triglycerides, or alternatively, for example, sunflower oil, maize oil, soybean oil, cucumber oil, grape seed oil, sesame oil, hazelnut oil, apricot oil, macadamia oil, arara oil, castor oil, avocado oil, caprylic/capric acid triglycerides, such as those sold by Stearineries Dubois or those sold under the names Miglyol® 810, 812 and 818 by Dynamit Nobel, jojoba oil or shea butter oil.

The linear or branched hydrocarbons of mineral or synthetic origin having more than 16 carbon atoms are preferably chosen from liquid paraffins, petrolatum, liquid petrolatum, polydecenes or hydrogenated polyisobutene, such as Parleam®.

The fluorinated oils can be chosen from perfluoromethylcyclopentane and perfluoro-1,3-dimethylcyclohexane, sold under the names Flutec® PC1 and Flutec® PC3 by BNFL Fluorochemicals; perfluoro-1,2-dimethyloctane; perfluoroalkanes, such as dodecafluoropentane and tetradecafluorohexane, sold under the names PF 5050® and PF 5060® by 3M, or bromoperfluoroctyl, sold under the name Foralkyl® by Atochem; nonafluoromethoxybutane and nonafluoroethoxyisobutane; or perfluoromorpholine derivatives, such as 4-(trifluoromethyl)perfluoromorpholine, sold under the name PF 5052® by 3M.

The fatty alcohols which are suitable for the implementation of the invention are more particularly chosen from saturated or unsaturated and linear or branched alcohols comprising from 6 to 30 carbon atoms and preferably from 8 to 30 carbon atoms. Mention may be made, for example, of cetyl alcohol, stearyl alcohol and their mixture (cetearyl alcohol), octyldecanol, 2-butyloctanol, 2-hexyldecanol, 2-undecylpentadecanol, oleyl alcohol or linoleyl alcohol.

As regards the fatty acid and/or fatty alcohol esters advantageously other than the triglycerides mentioned above, mention may in particular be made of esters of saturated
or unsaturated and linear or branched C\textsubscript{1}-C\textsubscript{6} aliphatic monoacids or polyacids and of saturated or unsaturated and linear or branched C\textsubscript{1}-C\textsubscript{6} aliphatic monoalcohols or polyalcohols, the total carbon number of the esters being greater than or equal to 6 and more advantageously greater than or equal to 10.

Among the monoesters, mention may be made of dihydroabietyl behenate; octylidodecyl behenate; isocetyl behenate; cetyl lactate; C\textsubscript{12}-C\textsubscript{15} alkyl lactate; isostearyl lactate; lauryl lactate; linoleyl lactate; oleyl lactate; (iso)stearyl octanoate; isocetyl octanoate; octyl octanoate; cetyl octanoate; decyl oleate; isocetyl isostearate; isocetyl laurate; isocetyl stearate; isodecyl octanoate; isodecyl oleate; isononyl isononanoate; isostearyl palmitate; methyl acetyl ricinoleate; myristyl stearate; octyl isononanoate; 2-ethylhexyl isononanoate; octyl palmitate; octyl pelargonate; octyl stearate; octyldodecyl erucate; oleyl erucate; ethyl and isopropyl palmitates; 2-ethylhexyl palmitate; 2-octyldecyldicaprate; alkyl myristates, such as isopropyl, butyl, cetyl, 2-octyldecanol, myristyl or stearyl myristate; hexyl stearate; butyl stearate; isobutyl stearate; dioctyl malate; hexyl laurate or 2-hexyldecanol laurate.

Still within the context of this alternative form, use may also be made of esters of C\textsubscript{4}-C\textsubscript{22} di- or tricarboxylic acids and of C\textsubscript{1}-C\textsubscript{22} alcohols and esters of mono-, di- or tricarboxylic acids and of di-, tri-, tetra- or pentahydroxy C\textsubscript{2}-C\textsubscript{5} alcohols.

Mention may in particular be made of: diethyl sebacate; diisopropyl sebacate; diisopropyl adipate; di(n-propyl) adipate; dioctyl adipate; diisostearyl adipate; dioctyl maleate; glyceryl undecylenate; octylidodecyl stearyl stearate; pentaerythritol monoricinoleate; pentaerythritol tetraisosponanoate; pentaerythritol tetrapelargonate; pentaerythritol tetraisostearate; pentaerythritol tetradecanoate; propylene glycol dicaprylate; propylene glycol dicaprate; tridecyl erucate; triisopropyl citrate; triisostearyl citrate; glycercyl trilactate; glyceryl trioctanoate; trioctyldecanol citrate; trioleyl citrate; propylene glycol dioctanoate; neopentyl glycol diheptanoate; diethylene glycol diisononanoate; and polyethylene glycol distearates.

Among the esters mentioned above, use is preferably made of ethyl, isopropyl, myristyl, cetyl or stearyl palmitate, 2-ethylhexyl palmitate, 2-octyldecanol palmitate, alkyl myristates, such as isopropyl, butyl, cetyl or 2-octyldecanol myristate, hexyl stearate, butyl stearate, isobutyl stearate, dioctyl malate, hexyl laurate, 2-hexyldecanol laurate, isononyl isononanoate or cetyl octanoate.

The composition can also comprise, as fatty ester, sugar esters and diesters of C\textsubscript{6}-C\textsubscript{30} and preferably C\textsubscript{12}-C\textsubscript{22} fatty acids. It should be remembered that the term "sugar" is understood to mean oxygen-comprising hydrocarbon compounds which have several alcohol functional groups, with or without aldehyde or ketone functional groups, and
which comprise at least 4 carbon atoms. These sugars can be monosaccharides, oligosaccharides or polysaccharides. Mention may be made, as suitable sugars, for example, of sucrose (or saccharose), glucose, galactose, ribose, fucose, maltose, fructose, mannose, arabinose, xylose, lactose and their derivatives, in particular alkyl derivatives, such as methyl derivatives, for example methylglucose.

The esters of sugars and of fatty acids can be chosen in particular from the group consisting of the esters or mixtures of esters of sugars described above and of saturated or unsaturated and linear or branched C₆-C₉ and preferably C₁₂-C22 fatty acids. If they are unsaturated, these compounds can comprise from one to three conjugated or non-conjugated carbon-carbon double bonds.

The esters according to this alternative form can also be chosen from mono-, di-, tri- and tetraesters, polyesters and their mixtures.

These esters can, for example, be oleates, laurates, palmitates, myristates, behenates, cocoates, stearates, linoleates, linolenates, caprates, arachidonates or their mixtures, such as, in particular, oleate/palmitate, oleate/stearate or palmitate/stearate mixed esters.

More particularly, use is made of mono- and diesters and in particular mono- or dioleate, -stearate, -behenate, -oleate/palmitate, -linoleate, -linolenate or -oleate/stearate of sucrose, glucose or methylglucose.

Mention may be made, by way of example, of the product sold under the name Glucate® DO by Amerchol, which is a methylglucose dioleate. Mention may also be made, by way of examples of esters or mixtures of esters of sugar and of fatty acid, of:

- the products sold under the names F160, F140, F110, F90, F70 and SL40 by Crodesta, respectively denoting sucrose palmitate/stearates formed of 73% monoester and 27% di- and triester, of 61% monoester and 39% di-, tri- and tetraester, of 52% monoester and 48% di-, tri- and tetraester, of 45% monoester and 55% di-, tri- and tetraester, and of 39% monoester and 61% di-, tri- and tetraester, and sucrose monolaurate;
- the products sold under the name Ryoto Sugar Esters, for example referenced B370 and corresponding to sucrose behenate formed of 20% monoester and 80% diester, triester and polyester;
- the sucrose monopalmitate/stearate-dipalmitate/stearate sold by Goldschmidt under the name Tegosoft® PSE.
The non-silicone wax(es) are chosen in particular from carnauba wax, candelilla wax, esparto wax, paraffin wax, ozokerite, vegetable waxes, such as olive tree wax, rice wax, hydrogenated jojoba wax or absolute flower waxes, such as the blackcurrant blossom essential wax sold by Bertin (France), or animal waxes, such as beeswaxes or modified beeswaxes (cerabellina); other waxes or waxy starting materials which can be used according to the invention are in particular marine waxes, such as that sold by Sophim under the reference M82, polyethylene waxes or polyolefin waxes in general.

The silicones which can be used in the cosmetic compositions of the present invention are volatile or non-volatile and cyclic, linear or branched silicones, which are unmodified or modified by organic groups, having a viscosity from $5 \times 10^{-6}$ to 2.5 m²/s at 25°C and preferably from $1 \times 10^{-5}$ to 1 m²/s.

The silicones which can be used in accordance with the invention can be provided in the form of oils, waxes, resins or gums.

Preferably, the silicone is chosen from polydialkylsiloxanes, in particular polydimethylsiloxanes (PDMSs), and organomodified polysiloxanes comprising at least one functional group chosen from amino groups and alkoxy groups.

Organopolysiloxanes are defined in more detail in Walter Noll's "Chemistry and Technology of Silicones" (1968), Academic Press. They can be volatile or non-volatile.

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

(i) cyclic polydialkylsiloxanes comprising from 3 to 7 and preferably from 4 to 5 silicon atoms. They are, for example, octamethylcyclotetrasiloxane, sold in particular under the name Volatile Silicone® 7207 by Union Carbide or Silbione® 70045 V2 by Rhodia, decamethylcyclopentasiloxane, sold under the name Volatile Silicone® 7158 by Union Carbide and Silbione® 70045 V5 by Rhodia, and their mixtures.

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

\[
\begin{align*}
&\text{CH}_3 \quad \text{D}^+ \quad \text{D}^+ \quad \text{D}^+ \quad \text{D}^+ \\
&\text{Si} - \text{O} - \\
&\text{CH}_3 \quad \text{C}_3\text{H}_{17}
\end{align*}
\]

With $D^+$, $D^+$, $D^+$ and $D^+$, and $Si - O - C_3H_{17}$

Mention may also be made of mixtures of cyclic polydialkylsiloxanes with organic compounds derived from silicon, such as the mixture of octamethylcyclotetrasiloxane and
tetra(trimethylsilyl)pentaerythritol (50/50) and the mixture of octamethylcyclotetrasiloxane and oxy-1.1'-bis(2,2',2',3,3'-hexatrimethyilsilyloxy)neopentane;

(ii) volatile linear polydialkylsiloxanes having from 2 to 9 silicon atoms and exhibiting a viscosity of less than or equal to 5x10^-6 m²/s at 25°C. An example is decamethyltetrasiloxane, sold in particular under the name SH 200 by Toray Silicone. Silicones coming within this category are also described in the paper published in Cosmetics and Toiletries, Vol. 91, Jan. 76, pp. 27-32, Todd & Byers, “Volatile Silicone Fluids for Cosmetics”.

Use is preferably made of non-volatile polydialkylsiloxanes, of polydialkylsiloxane gums and resins, of polyorganosiloxanes modified by the above organofunctional groups, and of their mixtures.

These silicones are more particularly chosen from polydialkylsiloxanes, among which mention may be made mainly of polydimethylsiloxanes having trimethylsilyl end groups. The viscosity of the silicones is measured at 25°C according to Standard ASTM 445 Appendix C.

Mention may be made, among these polydialkylsiloxanes, without implied limitation, of the following commercial products:
- the Silbione® oils of the 47 and 70 047 series or the Mirasil® oils sold by Rhodia, such as, for example, the oil 70 047 V 500 000;
- the oils of the Mirasil® series sold by Rhodia;
- the oils of the 200 series from Dow Corning, such as DC200 having a viscosity of 60 000 mm²/s;
- the Viscasil® oils from General Electric and certain oils of the SF series (SF 96, SF 18) from General Electric.

Mention may also be made of polydimethylsiloxanes having dimethylsilanol end groups known under the name of dimethiconol (CTFA), such as the oils of the 48 series from Rhodia.

Mention may also be made, in this category of polydialkylsiloxanes, of the products sold under the names Abil Wax® 9800 and 9801 by Goldschmidt, which are polydi(Cr C₂₀)alkylsiloxanes.

The silicone gums which can be used in accordance with the invention are in particular polydialkylsiloxanes and preferably polydimethylsiloxanes having high number-average molecular weights of between 200 000 and 1 000 000, used alone or as a mixture in a solvent. This solvent can be chosen from volatile silicones, polydimethylsiloxane (PDMS) oils, polyphenylmethyilsiloxane (PPMS) oils, isoparaffins, polyisobutylenes, methylene chloride, pentane, dodecane, tridecane or their mixtures.
Products which can be used more particularly in accordance with the invention are mixtures, such as:
- the mixtures formed from a polydimethylsiloxane hydroxylated at the chain end, or dimethiconol (CTFA), and from a cyclic polydimethylsiloxane, also known as cyclomethicone (CTFA), such as the product Q2 1401 sold by Dow Corning;
- the mixtures of a polydimethylsiloxane gum and of a cyclic silicone, such as the product SF 1214 Silicone Fluid from General Electric; this product is an SF 30 gum corresponding to a dimethicone, having a number-average molecular weight of 500 000, dissolved in the oil SF 1202 Silicone Fluid corresponding to decamethylcyclopentasiloxane;
- the mixtures of two PDMSs with different viscosities, and more particularly of a PDMS gum and a PDMS oil, such as the product SF 1236 from General Electric. The product SF 1236 is the mixture of a gum SE 30 defined above having a viscosity of 20 m²/s and of an oil SF 96 with a viscosity of 5x10⁻⁶ m²/s. This product preferably comprises 15% of gum SE 30 and 85% of an oil SF 96.

The organopolysiloxane resins which can be used in accordance with the invention are crosslinked siloxane systems including the following units:

\[ R_2SiO_{\frac{n}{2}}, R_3SiO_{\frac{3}{2}}/2, \text{ and } SiO_{\frac{4}{2}} \]

in which \( R \) represents an alkyl having from 1 to 16 carbon atoms. Among these products, those which are particularly preferred are those in which \( R \) denotes a lower \( C_1 \)-\( C_4 \) alkyl group, more particularly methyl.

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

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

The organomodified silicones which can be used in accordance with the invention are silicones as defined above comprising, in their structure, one or more organofunctional groups attached via a hydrocarbon group.

In addition to the silicones described above, the organomodified silicones can be polydiarylsiloxanes, in particular polydiphenylsiloxanes, and polyalkylarylsiloxanes functionalized by the abovementioned organofunctional groups.

The polyalkylarylsiloxanes are chosen in particular from linear and/or branched polydimethyl/methylphenylsiloxanes and polydimethyl/diphenylsiloxanes with a viscosity ranging from \( 1\times10^{-5} \) to \( 5\times10^{-2} \) m²/s at 25°C.
Mention may be made, among these polyalkylarylsiloxanes, by way of example, of
the products sold under the following names:

- the Silbione® oils of the 70 641 series from Rhodia;
- the oils of the Rhodorsil® 70 633 and 763 series from Rhodia;
- the oil Dow Corning 556 Cosmetic Grade Fluid from Dow Corning;
- the silicones of the PK series from Bayer, such as the product PK20;
- the silicones of the PN and PH series from Bayer, such as the products PN1000
  and PH1000;
- certain oils of the SF series from General Electric, such as SF 1023, SF 1154, SF
  1250 and SF 1265.

Mention may be made, among the organomodified silicones, of
polyorganosiloxanes comprising:

- substituted or unsubstituted amino groups, such as the products sold under the
  names GP 4 Silicone Fluid and GP 7100 by Genesee or the products sold under the
  names Q2 8220 and Dow Corning 929 or 939 by Dow Corning. The substituted amino
  groups are in particular Ci-C₄ aminoalkyl groups;
- alkoxylated groups, such as the product sold under the name Silicone
  Copolymer F-755 by SWS Silicones, and Abil Wax® 2428, 2434 and 2440 by
  Goldschmidt.

More particularly, the fatty substances are chosen from compounds which are liquid
or pasty at ambient temperature (25°C) and at atmospheric pressure.

Preferably, the fatty substance is a compound which is liquid at the temperature of
25°C and at atmospheric pressure.

The fatty substances are advantageously chosen from C₆-C₁₆ hydrocarbons,
hydrocarbons having more than 16 carbon atoms, triglycerides, fatty alcohols, fatty acid
and/or fatty alcohol esters other than the triglycerides, silicones or their mixtures.

Preferably, the fatty substance is chosen from liquid petrolatum, C₆-C₁₆ alkanes,
polydecenes, liquid fatty acid and/or fatty alcohol esters, liquid fatty alcohols or their
mixtures.

Better still, the fatty substance is chosen from liquid petrolatum, C₆-C₁₆ alkanes or
polydecenes.

The composition according to the invention comprises at least 25% by weight of
fatty substances.

The composition according to the invention more particularly exhibits a fatty
substance content ranging from 25% to 80% by weight, preferably from 30% to 70% by
weight and more advantageously still from 30% to 60% by weight, with respect to the weight of the composition.

**Surfactants:**

The composition of the invention also comprises one or more surfactants.

In particular, the surfactant(s) are chosen from anionic surfactants, amphoteric surfactants, zwitterionic surfactants, cationic surfactants other than the compounds of formula (i) or non-ionic surfactants, and preferably non-ionic surfactants.

The term "anionic surfactant" is understood to mean a surfactant comprising, as ionic or ionizable groups, only anionic groups. These anionic groups are preferably chosen from the -C(0)OH, -C(0)0 - , -SO₃H, -S(0)₂O -, -OS(0)₂OH, -OS(0)₂O -, -P(0)OH₂, -P(0)₂O -, -P(0)₀₂ -, -P(OH)₂, =P(0)OH, -P(OH)O -, =P(0)₀ -, =POH, =PO⁻ groups, the anionic parts comprising a cationic counterion, such as an alkali metal, an alkaline earth metal or an ammonium.

Mention may be made, as examples of anionic surfactants which can be used in the composition according to the invention, of alkyl sulfates, alkyl ether sulfates, alkylamido ether sulfates, alkylaryl polyether sulfates, monoglyceride sulfates, alkylsulfonates, alkylamidesulfonates, alkylaryl sulfonates, oolefin sulfonates, paraffinsulfonates, alkyl sulfosuccinates, alkyl ether sulfosuccinates, alkylamid sulfosuccinates, alkyl sulfoacetates, acyl sarcosinates, acyl glutamates, alkyl sulfosuccinamates, acyl isethionates and N-acyl taurates, salts of alkyl monoesters of polyglycoside-polycarboxylic acids, acyl lactylates, salts of D-galactosideuronic acids, salts of alkyl ether carboxylic acids, salts of alkylaryl ether carboxylic acids, salts of alkylamido ether carboxylic acids, and the corresponding non-salified forms of all these compounds, the alkyl and acyl groups of all these compounds comprising from 6 to 24 carbon atoms and the aryl group denoting a phenyl group.

These compounds can be oxyethylated and then preferably comprise from 1 to 50 ethylene oxide units.

The salts of C₆-C₂₄ alkyl monoesters of polyglycoside-polycarboxylic acids can be chosen from C₆-C₂₄ alkyl polyglycoside-citrates, C₆-C₂₄ alkyl polyglycoside-tartrates and C₆-C₂₄ alkyl polyglycoside-sulfosuccinates.

When the anionic surfactant(s) are in the salt form, it (they) can be chosen from alkali metal salts, such as the sodium or potassium salt and preferably the sodium salt, ammonium salts, amine salts and in particular aminoalcohol salts, or alkaline earth metal salts, such as the magnesium salts.
Mention may in particular be made, as example of aminoalcohol salts, of monoethanolamine, diethanolamine and triethanolamine salts, monoisopropanolamine, diisopropanolamine or triisopropanolamine salts, 2-amino-2-methyl-1-propanol salts, 2-amino-2-methyl-1,3-propanediol salts and tris(hydroxymethyl)aminomethane salts.

Use is preferably made of alkali metal or alkaline earth metal salts and in particular of sodium or magnesium salts.

Use is preferably made, among the anionic surfactants mentioned, of (C₆-C₄)alkyl sulfates, (C₆-C₄)alkyl ether sulfates comprising from 2 to 50 ethylene oxide units, in particular in the form of alkali metal, ammonium, aminoalcohol and alkaline earth metal salts, or a mixture of these compounds.

In particular, it is preferable to use (C₁₂-C₂₀)alkyl sulfates, (C₁₂-C₂₀)alkyl ether sulfates comprising from 2 to 20 ethylene oxide units, in particular in the form of alkali metal, ammonium, aminoalcohol and alkaline earth metal salts, or a mixture of these compounds. Better still, it is preferable to use sodium lauryl ether sulfate comprising 2.2 mol of ethylene oxide.

The amphoteric or zwitterionic surfactant(s), which is (are) preferably (a) non-silicone surfactant(s), which can be used in the present invention can in particular be derivatives of optionally quaternized secondary or tertiary aliphatic amines, in which derivatives the aliphatic group is a linear or branched chain comprising from 8 to 22 carbon atoms, said amine derivatives comprising at least one anionic group, such as, for example, a carboxylate, sulfonate, sulfate, phosphate or phosphonate group. Mention may in particular be made of (C₈-C₂₀)alkyl betaines, sulfobetaines, (C₈-C₂₀)alkylamido(C₃-C₈)alkyl betaines and (C₆-C₂₀)alkylamido(C₆-C₈)alkyl sulfobetaines.

Mention may also be made, among the optionally quaternized secondary or tertiary aliphatic amine derivatives which can be used, as defined above, of the compounds having the following respective structures (A1) and (A2):

\[
Rₐ-C(0)-\text{NH-CH₂-CH₂-N⁺}(Rₐ)(Rₐ)-\text{CH₂-C(0)}0- M⁺X⁻ \quad (A1)
\]

in which formula (A1):

- \(Rₐ\) represents a C₁₀-C₂₀ alkyl or alkenyl group derived from an acid \(Rₐ\text{COOH}\) preferably present in hydrolysed coconut oil, or a heptyl, nonyl or undecyl group;
- \(Rₐ\) represents a \(\beta\)-hydroxyethyl group; and
- \(Rₐ\) represents a carboxymethyl group;
- \(M⁺\) represents a cationic counterion resulting from an alkali metal or alkaline earth metal, such as sodium, an ammonium ion or an ion resulting from an organic amine, and
• \(X^-'\) represents an organic or inorganic anionic counterion, such as that chosen from halides, acetates, phosphates, nitrates, \((\text{CrC}_4)\)alkyl sulfates, \((\text{C}_1-\text{C}_4)\)alkyl- or \((\text{C}_4)\)alkylarylsulfonates, in particular methyl sulfate and ethyl sulfate; or alternatively \(M^+\) and \(X^-\) are absent;

\[R_a^-\text{ClO}_2\text{NHNH}_2\text{CHzCHzNiBJIB}^+ \quad (A2)\]

in which formula \((A2)\):

- \(B\) represents the group \(-\text{CH}_2\text{CH}_2\text{O}-\); 
- \(B'\) represents the group \(-\text{CH}_2\text{CH}_2\text{O}^-\), with \(z = 1\) or \(2\); 
- \(X'\) represents the group \(-\text{CH}_2\text{C}(0)\text{OH}, \text{-CH}_2\text{C}(0)\text{OZ}^-\) or \(-\text{CH}_2\text{CH}_2\text{C}(0)\text{OH}\) or \(-\text{CH}_2\text{CH}_2\text{C}(0)\text{OZ}^-\), or a hydrogen atom; 
- \(Y'\) represents the group \(-\text{C}(0)\text{OH}, \text{-C}(0)\text{OZ}^-\) or \(-\text{CH}_2\text{CH}(0)\text{OH}-\text{SO}_2\text{H}\) or the group \(-\text{CH}_2\text{CH}(0)\text{OH}-\text{SO}_3\text{Z}^-\); 
- \(Z'\) represents a cationic counterion resulting from an alkali metal or alkaline earth metal, such as sodium, an ammonium ion or an ion resulting from an organic amine;
- \(R_a^-\) represents a \(\text{C}_{10}\text{C}_3\) alkyl or alkenyl group of an acid \(R_a^-\text{C}(0)\text{OH}\) preferably present in hydrolysed linseed oil or coconut oil, an alkyl group, in particular a \(\text{C}_{17}\) alkyl group, and its iso form, or an unsaturated \(\text{C}_{17}\) group.

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

Mention may be made, by way of example, of the cocoamphodiacetate sold by Rhodia under the trade name Miranol® C2M Concentrate.

Use is preferably made, among the abovementioned amphoteric or zwitterionic surfactants, of \((\text{C}_8-\text{C}_{20})\)alkyl betaines, such as coco betaine, or \((\text{C}_8-\text{C}_{20})\)alkylamido(\(\text{C}_3\text{-C}_8\))alkyl betaines, such as cocamidopropyl betaine, and their mixtures. More preferably, the amphoteric or zwitterionic surfactant(s) are chosen from cocamidopropyl betaine and coco betaine.

The cationic surfactant(s) which can be used in the composition according to the invention comprise, for example, salts of optionally polyoxyalkylenated primary, secondary or tertiary fatty amines, quaternary ammonium salts, and their mixtures.

Mention may in particular be made, as quaternary ammonium salts, for example, of:
those corresponding to the following general formula (A3), and which are different from
the surfactants of formula (i):

$$\begin{array}{c}
\text{R}_8 \\
\text{R}_9 \\
\text{R}_{10} \\
\text{R}_{11}
\end{array} + X^-$$

(A3)

in which formula (A3):

- $\text{R}_8$ to $\text{R}_{11}$, which are identical or different, represent a linear or branched aliphatic
  group comprising from 1 to 30 carbon atoms, or an aromatic group, such as aryl
  or alkylaryl, it being understood that at least one of the groups $\text{R}_8$ to $\text{R}_{11}$
  comprises from 8 to 30 carbon atoms and preferably from 12 to 24 carbon atoms;
  and

- $X^-$ represents an organic or inorganic anionic counterion, such as that chosen
  from halides, acetates, phosphates, nitrates, (CrC$_4$)alkyl sulfates, (Cl-C$_4$)alkyl- or
  (Cl-C$_4$)alkylarylsulfonates, in particular methyl sulfate and ethyl sulfate.

The aliphatic groups of $\text{R}_8$ to $\text{R}_{11}$ can additionally comprise heteroatoms, such as in particular oxygen, nitrogen, sulfur and halogens.

The aliphatic groups of $\text{R}_8$ to $\text{R}_{11}$ are chosen, for example, from $\text{C}_1$-$\text{C}_{30}$ alkyl, $\text{C}_1$-$\text{C}_{30}$ alkoxy, polyoxy($\text{C}_2$-$\text{C}_6$)alkylene, $\text{C}_1$-$\text{C}_{30}$ alkylamide, ($\text{Cl}_2$-$\text{C}_{42}$)alkylamido ($\text{C}_2$-$\text{C}_6$)alkyl, ($\text{C}_{12}$-$\text{C}_{24}$)alkyl acetate and hydroxy (CrC$_3$-$\text{O}$)alkyl groups, and $X^-$ is an anionic counterion chosen from halides, phosphates, acetates, lactates, (Cl-C$_4$)alkyl sulfates, or (Cl-C$_4$)alkyl- or (C$_1$-$\text{C}_4$)alkylarylsulfonates.

Preference is given, among the quaternary ammonium salts of formula (A3), first to
tetraalkylammonium chlorides, such as, for example, dialkyldimethylammonium or
alkyltrimethylammonium chlorides in which the alkyl group comprises approximately from
12 to 22 carbon atoms, in particular behenyltrimethylammonium chloride,
distearyldimethylammonium chloride, cetyltrimethylammonium chloride or
benzyldimethylstearylammonium chloride, or else, secondly,
distearoylethylhydroxyethyltrimethylammonium methosulfate,
dipalmitoylethylhydroxyethylammonium methosulfate or
distearylethylhydroxyethylammonium methosulfate, or else, lastly,
palmitylamidopropyltrimethylammonium chloride or stearamidopropyl(dimethyl(myristyl
acetate)ammonium chloride, sold under the name Ceraphyl® 70 by Van Dyk;
- quaternary ammonium salts of imidazoline, such as, for example, those of formula (A4)
below:
in which formula (A4):

- $R_{12}$ represents an alkenyl or alkyl group comprising from 8 to 30 carbon atoms, for example tallow fatty acid derivatives;
- $R_{13}$ represents a hydrogen atom, a C1-C4 alkyl group or an alkenyl or alkyl group comprising from 8 to 30 carbon atoms;
- $R_{14}$ represents a C1-C4 alkyl group;
- $R_{15}$ represents a hydrogen atom or a C1-C4 alkyl group;
- $X^-$ represents an organic or inorganic anionic counterion, such as that chosen from halides, phosphates, acetates, lactates, (CrC$_4$)alkyl sulfates, or (CrC$_4$)alkyl- or (CrC$_4$)alkylarylsulfonates.

$R_{12}$ and $R_{13}$ preferably denote a mixture of alkenyl or alkyl groups comprising from 12 to 21 carbon atoms, for example tallow fatty acid derivatives, $R_{14}$ denotes a methyl group and $R_{15}$ denotes a hydrogen atom. Such a product is sold, for example, under the name Rewoquat® W 75 by Rewo.

- di- or triquaternary ammonium salts, in particular of following formula (A5):

in which formula (A5):

- $R_{16}$ denotes an alkyl group comprising approximately from 16 to 30 carbon atoms, which is optionally hydroxylated and/or interrupted by one or more oxygen atoms;
- $R_{17}$ is chosen from hydrogen, an alkyl group comprising from 1 to 4 carbon atoms or a -(CH$_2$)$_2$-$N^+$(R$_{16a}$)(R$_{17a}$)(R$_{18a}$)X$^-$ group;
- $R_{16a}$, $R_{17a}$, $R_{18a}$, $R_{18}$, $R_{19}$, $R_{20}$ and $R_{21}$, which are identical or different, are chosen from hydrogen and an alkyl group comprising from 1 to 4 carbon atoms; and
- $X^-$, which are identical or different, represent an organic or inorganic anionic counterion, such as that chosen from halides, acetates, phosphates, nitrates, (C$_1$-C$_4$)alkyl sulfates, or (CrC$_4$)alkyl- or (CrC$_4$)alkylarylsulfonates, in particular methyl sulfate and ethyl sulfate.
Such compounds are, for example, Finquat CT-P, provided by Finetex (Quaternium 89), or Finquat CT, provided by Finetex (Quaternium 75);
- quaternary ammonium salts comprising one or more ester functional groups, such as those of following formula (A6):

\[
\begin{align*}
\text{X}^{-}, & (\text{C}_{6}\text{H}_{5})\text{R}_{25} \\
R_{24} & \left[ \text{O} - \text{C}_{12}\text{H}_{25}(\text{OH})_{17-y} \right]_{y} \\
& \text{N} - \left[ \text{C}_{12}\text{H}_{25}(\text{OH})_{17} - \text{O} \right]_{y} \\
& R_{23}
\end{align*}
\]

(A6)

in which formula (A6):
- \( R_{22} \) is chosen from \( \text{C}_{6} \text{R}_{6} \) alkyl groups and \( \text{C}_{6} \text{R}_{6} \) hydroxyalkyl or dihydroxyalkyl groups,
- \( R_{23} \) is chosen from:
  - the \( \text{R}_{22}-\text{C} \) group,
  - saturated or unsaturated and linear or branched \( \text{C}_{1}-\text{C}_{22} \) hydrocarbon groups \( R_{27} \),
  - a hydrogen atom,
- \( R_{25} \) is chosen from:
  - the group \( \text{R}_{23}-\text{C} \),
  - saturated or unsaturated and linear or branched \( \text{C}_{1}-\text{C}_{6} \) hydrocarbon groups \( R_{29} \),
  - a hydrogen atom,
- \( R_{24}, R_{26} \) and \( R_{2e} \), which are identical or different, are chosen from saturated or unsaturated and linear or branched \( \text{C}_{7-\text{C}_{21}} \) hydrocarbon groups;
- \( r, s \) and \( t \), which are identical or different, are integers having values from 2 to 6,
- \( r1 \) and \( t1 \), which are identical or different, have the value 0 or 1, with \( r2+r1 = 2r \) and \( t1+t2 = 2t \),
- \( y \) is an integer having a value from 1 to 10,
- \( x \) and \( z \), which are identical or different, are integers having values from 0 to 10,
- \( X^{-} \) represents an organic or inorganic anionic counterion,
  with the proviso that the sum \( x + y + z \) has a value from 1 to 15, that, when \( x \) has the value 0, then \( R_{23} \) denotes \( R_{27} \) and that, when \( z \) has the value 0, then \( R_{25} \) denotes \( R_{2g} \).
  The alkyl groups \( R_{22} \) can be linear or branched and more particularly linear.

Preferably, \( R_{22} \) denotes a methyl, ethyl, hydroxyethyl or dihydroxypropyl group and more particularly a methyl or ethyl group.
Advantageously, the sum $x + y + z$ has a value from 1 to 10.

When $R_{13}$ is a hydrocarbon group $R_{27}$, it can be long and have from 12 to 22 carbon atoms or can be short and have from 1 to 3 carbon atoms.

When $R_{28}$ is a hydrocarbon group $R_{29}$, it preferably has from 1 to 3 carbon atoms.

Advantageously, $R_{24}$, $R_{26}$ and $R_{28}$, which are identical or different, are chosen from saturated or unsaturated and linear or branched C$_{13}$-C$_{17}$ hydrocarbon groups and more particularly from saturated or unsaturated and linear or branched C$_{13}$-alkyl and alkenyl groups.

Preferably, $x$ and $z$, which are identical or different, have the value 0 or 1.

Advantageously, $y$ is equal to 1.

Preferably, $r$, $s$ and $t$, which are identical or different, have the value 2 or 3 and more particularly still are equal to 2.

The anionic counterion $X^-$ is preferably a halide, such as chloride, bromide or iodide; a (CrC$_4$)$_n$alkyl sulfate; or a (CrC$_4$)$_n$alkyl- or (Cr-C$_4$)$_n$alkylarylsulfonate. However, it is possible to use methanesulfonate, phosphate, nitrate, tosylate, an anion derived from an organic acid, such as acetate or lactate, or any other anion compatible with the ammonium comprising an ester functional group.

The anionic counterion $X^-$ is more particularly still chloride, methyl sulfate or ethyl sulfate.

Use is more particularly made, in the composition according to the invention, of the ammonium salts of formula (A6), in which:

- $R_{22}$ denotes a methyl or ethyl group,
- $x$ and $y$ are equal to 1,
- $z$ is equal to 0 or 1,
- $r$, $s$ and $t$ are equal to 2,
- $R_{23}$ is chosen from:
  - the group $R_{26}$
  - methyl, ethyl or C$_{14}$-C$_{22}$ hydrocarbon groups,
  - a hydrogen atom,

- $R_{25}$ is chosen from:
  - the group $R_{28}$
  - a hydrogen atom,

- $R_{24}$, $R_{26}$ and $R_{28}$, which are identical or different, are chosen from saturated or unsaturated and linear or branched C$_{13}$-C$_{17}$ hydrocarbon groups and
preferably from saturated or unsaturated and linear or branched C13-C17 alkyl and alkenyl groups.

Advantageously, the hydrocarbon radicals are linear.

Mention may be made, for example, among the compounds of formula (A6), of the salts, in particular the chloride or methyl sulfate, of diacyloxyethyltrimethylammonium, diacyloxyethylhydroxyethylmethylammonium, monoacyloxyethyl dihydroxyethylmethylammonium, triacyloxyethylmethylammonium or monoacyloxyethylhydroxyethyltrimethylammonium, and their mixtures. The acyl groups preferably have from 14 to 18 carbon atoms and originate more particularly from a vegetable oil, such as palm oil or sunflower oil. When the compound comprises several acyl groups, the latter can be identical or different.

These products are obtained, for example, by direct esterification of triethanolamine, triisopropanolamine, an alkyl diethanolamine or an alkyldiisopropanolamine, which are optionally oxyalkylenated, with fatty acids or with mixtures of fatty acids of vegetable or animal origin, or by transesterification of their methyl esters. This esterification is followed by a quaternization by means of an alkylating agent, such as an alkyl halide, preferably methyl or ethyl halide, a dialkyl sulfate, preferably dimethyl or diethyl sulfate, methyl methanesulfonate, methyl para-toluenesulfonate, glycol chlorohydrin or glycerol chlorohydrin.

Such compounds are sold, for example, under the names Dehyquart® by Henkel, Stepanquat® by Stepan, Noxamium® by Ceca or Rewoquat® WE 18 by Rewo-Witco.

The composition according to the invention can comprise, for example, a mixture of quaternary ammonium mono-, di- and triester salts with a predominance by weight of diester salts.

It is also possible to use the ammonium salts comprising at least one ester functional group described in Patents US-A-4 874 554 and US-A-4 137 180.

Use may be made of behenoylhydroxypropyltrimethylammonium chloride, provided by Kao under the name Quatarmin BTC 131.

Preferably, the ammonium salts comprising at least one ester functional group comprise two ester functional groups.

The choice is more preferably made, among the cationic surfactants which can be present in the composition according to the invention, of cetyltrimethylammonium, behenyltrimethylammonium and dipalmitoylethylhydroxyethylmethylammonium salts, and their mixtures, and more particularly of behenyltrimethylammonium chloride, cetyltrimethylammonium chloride and dipalmitoylethylhydroxyethylammonium methosulfate, and their mixtures.
Examples of nonionic surfactants which can be used in the composition used according to the invention are described, for example, in the "Handbook of Surfactants" by M.R. Porter, published by Blackie & Son (Glasgow and London), 1991, pp. 116-178. They are chosen in particular from alcohols, a-diols or (CrC₂₅₀)alkylenated alcohols comprising from 1 to 100 mol of ethylene oxide; and polyoxyethylenated esters of saturated or unsaturated fatty acids, sucrose fatty acid esters, polyoxyalkylenated fatty acid esters, optionally oxyalkylenated alkyl polyglycosides, alkyl glucoside esters, derivatives of N-alkylglucamine and of N-acylmethylglucamine, aldobionamides and amine oxides.

The non-ionic surfactants are chosen more particularly from mono- or polyoxyalkylenated or mono- or polyglycerolated non-ionic surfactants. The oxyalkylene units are more particularly oxyethylene or oxypropylene units, or their combination, preferably oxyethylene units.

Mention may also be made of copolymers of ethylene oxide and propylene oxide, optionally oxyethylated sorbitan fatty acid esters, sucrose fatty acid esters, polyoxyalkylenated fatty acid esters, optionally oxyalkylenated alkyl polyglycosides, alkyl glucoside esters, derivatives of N-alkylglucamine and of N-acylmethylglucamine, aldobionamides and amine oxides.

The surfactants exhibit a number of moles of ethylene oxide and/or of propylene oxide of between 1 and 100, preferably between 2 and 50 and preferably between 2 and 30. Advantageously, the non-ionic surfactants do not comprise oxypropylene units.

In accordance with a preferred embodiment of the invention, the oxyalkylenated non-ionic surfactants are chosen from oxyethylated C₆-C₃₀ alcohols comprising from 1 to 100 mol of ethylene oxide; and polyoxyethylated esters of saturated or unsaturated...
and linear or branched C₆₋C₃₀ acids and of sorbitol comprising from 1 to 100 mol of ethylene oxide.

Use is preferably made, as examples of mono- or polyglycerolated non-ionic surfactants, of mono- or polyglycerolated C₆₋C₄₀ alcohols.

In particular, the mono- or polyglycerolated C₆₋C₄₀ alcohols correspond to the following formula (A7):

\[ R_{29}\text{O-}[\text{CH2-CH(CH}_2\text{OH)}\text{]-0}_{m}\text{-H} \quad (A7) \]

in which formula (A7):

- \( R_{29} \) represents a linear or branched C₆₋C₄₀ and preferably C₆₋C₃₀ alkyl or alkenyl radical; and

- \( m \) represents a number ranging from 1 to 30 and preferably from 1 to 10.

Mention may be made, as examples of compounds of formula (A7) suitable in the context of the invention, of lauryl alcohol comprising 4 mol of glycerol (INCI name: Polyglyceryl-4 Lauryl Ether), lauryl alcohol comprising 1.5 mol of glycerol, oleyl alcohol comprising 4 mol of glycerol (INCI name: Polyglyceryl-4 Oleyl Ether), oleyl alcohol comprising 2 mol of glycerol (INCI name: Polyglyceryl-2 Oleyl Ether), cetearyl alcohol comprising 2 mol of glycerol, cetearyl alcohol comprising 6 mol of glycerol, oleocetyl alcohol comprising 6 mol of glycerol, and octadecanol comprising 6 mol of glycerol.

The alcohol of formula (A7) can represent a mixture of alcohols in the same way that the value of \( m \) represents a statistical value, which means that, in a commercial product, several kinds of polyglycerolated fatty alcohols can coexist in the form of a mixture.

The use is more particularly preferred, among the mono- or polyglycerolated alcohols, of the C₆/C₁₀ alcohol comprising 1 mol of glycerol, the C₉/C₁₂ alcohol comprising 1 mol of glycerol and the C₁₂ alcohol comprising 1.5 mol of glycerol.

Preferably, the surfactant employed in the method of the invention in the composition is a mono- or polyoxyalkylated, particularly mono- or polyoxyethyleneated or mono- or polyoxypropylated, non-ionic surfactant, or their combination, more particularly mono- or polyoxyethyleneated.

Preferably, the surfactant(s) is (are) chosen from non-ionic surfactants or from anionic surfactants. More particularly, the surfactant(s) present in the composition is (are) chosen from non-ionic surfactants.

More preferably still, the non-ionic surfactants are chosen from polyoxyethylated sorbitol esters, polyoxyethyleneated fatty alcohols and their mixtures.
In the composition of the invention, the amount of the surfactant(s) in the composition preferably varies from 0.1% to 50% by weight and better still from 0.5% to 20% by weight, with respect to the total weight of the composition.

5 **Hair dyes:**

The composition of the invention comprises one or more dyes for keratinous fibres. These dye(s) for keratinous fibres can be chosen from synthetic or natural dyes.

The synthetic dyes can be chosen from synthetic oxidation dyes and synthetic direct dyes.

10 The synthetic oxidation dyes can be chosen from oxidation bases and couplers.

The oxidation bases can be chosen from heterocyclic bases, benzene bases and their salts.

The benzene oxidation bases according to the invention are chosen in particular from para-phenylenediamines, bis(phenyl)alkylenediamines, para-aminophenols, ortho-aminophenols and their addition salts.


Preference is particularly given, among the abovementioned para-phenylenediamines, to para-phenylenediamine, para-toluylenediamine, 2-isopropyl-para-phenylenediamine, 2-(P-hydroxyethyl)-para-phenylenediamine, 2-(P-hydroxyethoxy)-para-phenylenediamine, 2,6-dimethyl-para-phenylenediamine, 2,6-diethyl-para-
phenylenediamine, 2,3-dimethyl-para-phenylenediamine, N,N-bis (P-hydroxyethyl)-para-phenylenediamine, 2-chloro-para-phenylenediamine, 2-(P-acetylaminoethoxy)-para-phenylenediamine and their addition salts with an acid.

Mention may be made, among bis(phenyl)alkylenediamines, by way of example, of N,N′-bis (P-hydroxyethyl)-N,N′-bis(4′-aminophenyl)-1,3-diaminopropanol, N,N′-bis (β-hydroxyethyl)-N,N′-bis(4′-aminophenylethylenediamine, N,N′-bis(4-aminophenyl)tetramethylenediamine, N,N′-bis (P-hydroxyethyl)-N,N′-bis(4-aminophenyl)tetramethylenediamine, N,N′-bis(4-methylaminophenyl)tetramethylenediamine, N,N′-bis(ethyl)-N,N′-bis(4′-amino-3′-methylphenyl)ethylenediamine, 1,8-bis(2,5-diaminophenoxy)-3,6-dioxaoctane and their addition salts.

Mention may be made, among para-aminophenols, by way of example, of para-aminophenol, 4-amino-3-methylphenol, 4-amino-3-fluorophenol, 4-amino-3-chlorophenol, 4-amino-3-(hydroxymethyl)phenol, 4-amino-2-methylphenol, 4-amino-2-(hydroxymethyl)phenol, 4-amino-2-(methoxymethyl)phenol, 4-amino-2-(aminomethyl)phenol, 4-amino-2-[(P-hydroxyethyl)aminomethyl]phenol, 4-amino-2-fluorophenol and their addition salts with an acid.

Mention may be made, among ortho-aminophenols, by way of example, of 2-aminophenol, 2-amino-5-methylphenol, 2-amino-6-methylphenol, 5-acetamido-2-aminophenol and their addition salts.

The heterocyclic bases according to the invention are more particularly chosen from pyridine derivatives, pyrimidine derivatives and pyrazole derivatives, and their addition salts.

Mention may be made, among pyridine derivatives, of the compounds described, for example, in Patents GB 1 026 978 and GB 1 153 196, such as 2,5-diaminopyridine, 2-(4-methoxyphenyl)amino-3-aminopyridine, 3,4-diaminopyridine and their addition salts.

Other pyridine oxidation bases of use in the dyeing method according to the invention are the 3-aminopyrazolo[1,5-a]pyridine oxidation bases or their addition salts described, for example, in Patent Application FR 2 801 308. Mention may be made, by way of example, of pyrazolo[1,5-a]pyrid-3-ylamine, 2-(acetylamino)pyrazolo[1,5-a]pyrid-3-ylamine, 2-(morpholin-4-yl)pyrazolo[1,5-a]pyrid-3-ylamine, 3-aminopyrazolo[1,5-a]pyridine-2-carboxylic acid, 2-methoxy pyrazolo[1,5-a]pyrid-3-ylamine, (3-aminopyrazolo[1,5-a]pyrid-7-yl)methanol, 2-(3-aminopyrazolo[1,5-a]pyrid-5-yl)ethanol, 2-(3-aminopyrazolo[1,5-a]pyrid-7-yl)ethanol, (3-aminopyrazolo[1,5-a]pyrid-2-yl)methanol, 3,6-diaminopyrazolo[1,5-a]pyridine, 3,4-diaminopyrazolo[1,5-a]pyridine, pyrazolo[1,5-a]pyridine-3,7-diamine, 7-(morpholin-4-yl)pyrazolo[1,5-a]pyrid-3-ylamine, pyrazolo[1,5-a]pyridine-3,7-diamine, 7-(morpholin-4-yl)pyrazolo[1,5-a]pyrid-3-ylamine, pyrazolo[1,5-a]pyridine-3,7-diamine, 7-(morpholin-4-yl)pyrazolo[1,5-a]pyrid-3-ylamine, pyrazolo[1,5-a]pyridine-3,7-diamine, 7-(morpholin-4-yl)pyrazolo[1,5-a]pyrid-3-ylamine, pyrazolo[1,5-a]pyridine-3,7-diamine, 7-(morpholin-4-yl)pyrazolo[1,5-a]pyrid-3-ylamine, pyrazolo[1,5-a]pyridine-3,7-diamine, 7-(morpholin-4-yl)pyrazolo[1,5-a]pyrid-3-ylamine, pyrazolo[1,5-a]pyridine-3,7-diamine, 7-(morpholin-4-yl)pyrazolo[1,5-a]pyrid-3-ylamine, pyrazolo[1,5-a]pyridine-3,7-diamine, 7-(morpholin-4-yl)pyrazolo[1,5-a]pyrid-3-ylamine, pyrazolo[1,5-a]pyridine-3,7-diamine, 7-(morpholin-4-yl)pyrazolo[1,5-a]pyrid-3-ylamine, pyrazolo[1,5-a]pyridine-3,7-diamine, 7-(morpholin-4-yl)pyrazolo[1,5-a]pyrid-3-ylamine, pyrazolo[1,5-a]pyridine-3,7-diamine, 7-(morpholin-4-yl)pyrazolo[1,5-a]pyrid-3-ylamine, pyrazolo[1,5-a]pyridine-3,7-diamine, 7-(morpholin-4-yl)pyrazolo[1,5-a]pyrid-3-ylamine, pyrazolo[1,5-a]pyridine-3,7-diamine, 7-(morpholin-4-yl)pyrazolo[1,5-a]pyrid-3-ylamine, pyrazolo[1,5-a]pyridine-3,7-diamine, 7-(morpholin-4-yl)pyrazolo[1,5-a]pyrid-3-ylamine, pyrazolo[1,5-a]pyridine-3,7-diamine, 7-(morpholin-4-yl)pyrazolo[1,5-a]pyrid-3-ylamine, pyrazolo[1,5-a]pyridine-3,7-diamine, 7-(morpholin-4-yl)pyrazolo[1,5-a]pyrid-3-ylamine, pyrazolo[1,5-a]pyridine-3,7-diamine, 7-(morpholin-4-yl)pyrazolo[1,5-a]pyrid-3-ylamine, pyrazolo[1,5-a]pyridine-3,7-diamine, 7-(morpholin-4-yl)pyrazolo[1,5-a]pyrid-3-ylamine, pyrazolo[1,5-a]pyridine-3,7-di
a) pyridine-3,5-diamine, 5-(morpholin-4-yl)pyrazolo[1,5-a]pyrid-3-ylamine, 2-[(3-aminopyrazolo[1,5-a]pyrid-5-yl)(2-hydroxyethyl)amino]ethanol, 2-[(3-aminopyrazolo[1,5-a]pyrid-7-yl)(2-hydroxyethyl)amino]ethanol, 3-aminopyrazolo[1,5-a]pyridin-5-ol, 3-aminopyrazolo[1,5-a]pyridin-4-ol, 3-aminopyrazolo[1,5-a]pyridin-6-ol, 3-aminopyrazolo[1,5-a]pyridin-7-ol and their addition salts.

Mention may be made, among pyrimidine derivatives, of the compounds described, for example, in Patents DE 2359399, JP 88-169571, JP 05-63124 and EP 0 770 375 or Patent Application WO 96/15765, such as 2,4,5,6-tetraaminopyrimidine, 4-hydroxy-2,5,6-triaminopyrimidine, 2,4-dihydroxy-5,6-diaminopyrimidine, 2,5,6-triaminopyrimidine and their addition salts.

Use may also be made, among pyrazole derivatives, of the compounds described in Patents DE 3843892 and DE 4133957 and Patent Applications WO 94/08969, WO 94/08970, FR-A-2 733 749 and DE 195 43 988, such as 4,5-diamino-1-methylpyrazole, 4,5-diamino-1-(4'-chlorobenzyl)pyrazole, 4,5-diamino-1-3-dimethylpyrazole, 4,5-diamino-3-methyl-1-phenylpyrazole, 4,5-diamino-1-methyl-3-phenylpyrazole, 4-amino-1,3-dimethyl-5-hydrazinopyrazole, 1-benzyl-4,5-diamino-3-methylpyrazole, 4,5-diamino-3-(4'-methoxyphenyl)pyrazole, 4,5-diamino-3-(4'-chlorobenzyl)pyrazole, 4,5-diamino-3-(4'-methoxyphenyl)pyrazole, 4,5-diamino-3-hydroxymethyl-1-isopropylpyrazole, 4,5-diamino-3-hydroxymethyl-1-methylpyrazole, 4,5-diamino-3-hydroxymethyl-1-ethylpyrazole, 4,5-diamino-1,3-dimethylpyrazole, 4,5-diamino-1,3-dimethyl-1,3-dihydropyrazol-3-one, 4,5-diamino-1,3-dimethyl-1,3-dihydropyrazol-4-one, 4,5-diamino-1,3-dimethyl-1,3-dihydropyrazol-5-one, 4,5-diamino-1,3-dimethyl-1,3-dihydropyrazol-6-one, 4,5-diamino-1,3-dimethyl-1,3-dihydropyrazol-7-one and their addition salts.

Use may also be made, as pyrazole derivatives, of diamino-N,N-dihydropyrazolopyrazolones and in particular those described in Application FR-A-2 886 136, such as the following compounds and their addition salts: 2,3-diamino-6,7-dihydro-1H,5H-pyrazolo[1,2-a]pyrazol-1-one, 2-amino-3-ethylamino-6,7-dihydro-1H,5H-pyrazolo[1,2-a]pyrazol-1-one, 2-amino-3-isopropylamino-6,7-dihydro-1H,5H-pyrazolo[1,2-a]pyrazol-1-one, 2-amino-3-(pyrrolidin-1-yl)-6,7-dihydro-1H,5H-pyrazolo[1,2-a]pyrazol-1-one, 4,5-diamino-1,3-dimethyl-1,3-dihydropyrazol-3-one, 4,5-diamino-1,3-dimethyl-1,3-dihydropyrazol-4-one, 4,5-diamino-1,3-dimethyl-1,3-dihydropyrazol-5-one, 4,5-diamino-1,3-dimethyl-1,3-dihydropyrazol-6-one, 4,5-diamino-1,3-dimethyl-1,3-dihydropyrazol-7-one and/or one of its salts.
dihydropyrazol-3-one, 4,5-diamino-1,2-di(2-hydroxyethyl)-1,2-dihydropyrazol-3-one, 2-amino-3-(2-hydroxyethyl)amino-6,7-dihydro-1 H,5H-pyrazolo[1,2-a]pyrazol-1-one, 2-amino-3-dimethylamino-6,7-dihydro-1 H,5H-pyrazolo[1,2-a]pyrazol-1-one, 2,3-diamino-5,6,7,8-tetrahydro-1 H,6H-pyridazino[1,2-a]pyrazol-1-one, 4-amino-1,2-diethyl-5-(pyrrolidin-1-yl)-1,2-dihydropyrazol-3-one, 4-amino-5-[3-(dimethylamino)pyrrolidin-1-yl]-1,2-diethyl-1,2-dihydropyrazol-3-one or 2,3-diamino-6-hydroxy-6,7-dihydro-1 H,5H-pyrazolo[1,2-a]pyrazol-1-one.

Use will preferably be made of 2,3-diamino-6,7-dihydro-1 H,5H-pyrazolo[1,2-a]pyrazol-1-one and/or one of its salts.

Use will preferably be made, as heterocyclic bases, of 4,5-diamino-1-(P-hydroxyethyl)pyrazole and/or 2,3-diamino-6,7-dihydro-1 H,5H-pyrazolo[1,2-a]pyrazol-1-one and/or one of their salts.

The oxidation base(s) according to the invention each advantageously represent from 0.0001% to 10% by weight, with respect to the total weight of the composition, and preferably from 0.005% to 5% by weight, with respect to the total weight of the composition.

The composition of the invention can optionally comprise one or more couplers.

Mention may in particular be made, among these couplers, of meta-phenylenediamines, meta-aminophenols, meta-diphenols, naphthalene couplers, heterocyclic couplers and their addition salts.

Mention may be made, for example, of 1,3-dihydroxybenzene, 1,3-dihydroxy-2-methylbenzene, 4-chloro-1,3-dihydroxybenzene, 2,4-diamino-1-(3-hydroxyethyl oxy)benzene, 2-amino-4-(3-hydroxyethylamino)-1-methoxybenzene, 1,3-diaminobenzene, 1,3-bis(2,4-diaminophenoxy)propane, 3-ureidoaniline, 3-ureido-1(dimethylamino)benzene, sesamol, 1-(3-hydroxyethylamino)-3,4-methylene dioxybenzene, oc-naphthol, 2-methyl-1-naphthol, 6-hydroxyindole, 4-hydroxyindole, 4-hydroxy-N-methylindole, 2-amino-3-hydroxypyridine, 6-hydroxybenzomorpholine, 3,5-diamino-2,6-dimethoxy pyridine, 1-N-(β-hydroxyethyl)amino-3,4-methylenedioxy benzene, 2,6-bis(3-hydroxyethylamino)toluene, 6-hydroxyindoline, 2,6-dihydroxy-4-methylpyridine, 1H-3-methylpyrazol-5-one, 1-phenyl-3-methylpyrazol-5-one, 2,6-dimethylpyrazol[1,5-b][1,2,4]triazole, 2,6-dimethyl[3,2-c][1,2,4]triazole, 6-methylpyrazolo[1,5-a]benzimidazole, their addition salts with an acid, and their mixtures.
The coupler(s) each advantageously represent from 0.0001% to 10% by weight, with respect to the total weight of the composition, and preferably from 0.005% to 5% by weight, with respect to the total weight of the composition of the invention.

In general, the addition salts of the oxidation bases and couplers which can be used in the context of the invention are chosen in particular from the addition salts with an acid, such as the hydrochlorides, hydrobromides, sulfates, citrates, succinates, tartrates, lactates, tosylates, benzenesulfonates, phosphates and acetates.

The composition of the invention can additionally comprise one or more synthetic direct dyes.

The latter are more particularly chosen from ionic or non-ionic entities, preferably cationic or non-ionic entities. Mention may be made, as examples of suitable synthetic direct dyes, of the following direct dyes: azo dyes; methine dyes; carbonyl dyes; azine dyes; nitro(hetero)aryl dyes; tri(hetero)arylmethane dyes; porphyrin dyes or phthalocyanine dyes, alone or as mixtures.

More particularly, the azo dyes comprise an -N=N- functional group, the two nitrogen atoms of which are not simultaneously participants in a ring. However, it is not excluded for one of the two nitrogen atoms of the sequence -N=N- to be a participant in a ring.

The dyes of the family of the methines are more particularly compounds comprising at least one sequence chosen from >C=C< and -N=C<, the two atoms of which are not simultaneously participants in a ring. However, it is specified that one of the nitrogen or carbon atoms of the sequences can be a participant in a ring. More particularly, the dyes of this family result from compounds of the following types: methines, azomethines, mono- and diarylmethanes, indoamines (or diphenylamines), indophenols, indoanilines, carbocyanines, azacarbocyanines and their isomers, diazacarbocyanines and their isomers, tetraazacarbocyanines or hemicyanines.

As regards the dyes of the family of the carbonyls, mention may be made, for example, of dyes chosen from acridone, benzoquinone, anthraquinone, naphthoquinone, benzanthrone, anthranthrene, pyranthrene, pyrazoloanthrone, pyrimidinoanthrone, flavanthrone, idanthrone, flavone, (iso)violanthrone, isoindolinone, benzimidazolone, isoquinolinone, anthrapyridone, pyrazoloquinazolone, perinone, quinacridone, quinophthalone, indigoid, thioindigo, naphthalimide, anthrapyrimidine, diketopyrrolopyrrole or coumarin.
As regards the dyes of the family of the cyclic azines, mention may in particular be made of azine, xanthene, thioxanthene, fluorindine, acridine, (di)oxazine, (di)thiazine or pyronine dyes.

The nitro(hetero)aromatic dyes are more particularly nitrobenzene or nitropyridine direct dyes.

As regards the dyes of porphyrin or phthalocyanine type, use may be made of cationic or non-cationic compounds optionally comprising one or more metals or metal ions, such as, for example, alkali and alkaline earth metals, zinc and silicon.

Mention may be made, as examples of direct dyes which are particularly suitable, of nitrobenzene dyes, azo, azomethine or methine direct dyes, azacarbocyanines, such as tetraazacarbocyanines (tetraazapentamethines), quinone and in particular anthraquinone, naphthoquinone or benzoquinone direct dyes, azine, xanthene, triarylmethane, indoamine or indigoid direct dyes, phthalocyanines or porphyrins, alone or as mixtures. When they are present, the synthetic direct dye(s) more particularly represent from 0.0001% to 10% by weight and preferably from 0.005% to 5% by weight of the total weight of the composition.

The composition can also comprise one or more natural dyes. Mention may be made, among natural dyes which can be used according to the invention, of lawsone, juglone, alizarin, purpurin, carminic acid, kermesic acid, purpurogallin, protocatechualdehyde, indigo, isatin, curcumin, spinulosin, apigenidin, orceins, brazilin, brazilein, haematoxylin or haematein. Use may also be made of extracts or decoctions comprising these natural dyes and in particular henna-based cataplasms or extracts.

When they are present, the natural dye(s) more particularly represent from 0.0001% to 10% by weight and preferably from 0.005% to 5% by weight of the total weight of the composition.

Preferably, the dye(s) for keratinous fibres of the composition of the invention have a logP of greater than or equal to 1.5. More preferably still, the dye(s) for keratinous fibres of the composition of the invention have a logP of greater than or equal to 2.

The logP value conventionally represents the partition coefficient of the dye between octanol and water. The logP can be calculated according to the method described in the paper by Meylan and Howard "Atom/fragment contribution method for estimating octanol-water partition coefficient", J. Pharm. Sci., 84, 83-92 (1995). This value can also be calculated by means of numerous software packages available on the market which determine the logP as a function of the structure of a molecule. Mention may be
made, by way of example, of the Epiwin software from the United States Environmental Protection Agency.

**Basifying agents:**

The composition according to the invention also comprises one or more basifying agents.

The basifying agent(s) can be inorganic or organic or hybrid.

The inorganic basifying agent(s) are preferably chosen from aqueous ammonia, alkali metal carbonates or bicarbonates, such as sodium carbonate, potassium carbonate, sodium bicarbonate or potassium bicarbonate, sodium hydroxide, potassium hydroxide, or their mixtures.

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

The organic basifying agent(s) are chosen, for example, from alkanolamines, oxyethylenated and/or oxypropylenated ethylenediamines, amino acids and the compounds of following formula (I):

\[
\begin{array}{c}
\text{N} - \text{W} - \text{N} \\
\text{R}_x \\
\text{R}_y \\
\text{R}_z \\
(\text{I})
\end{array}
\]

in which formula (I) W is a CrC_6 divalent alkylene radical optionally substituted by one or more hydroxyl groups or a CrC_6 alkyl radical and/or optionally interrupted by one or more heteroatoms, such as O or NR_y, and R_x, R_y, R_z, R_1, R_2, and R_3, which can be identical or different, represent a hydrogen atom or a Ci-C_6 alkyl, Ci-C_6 hydroxyalkyl or CrC_6 aminoalkyl radical.

Mention may be made, as examples of amines of formula (I), of 1,3-diaminopropane, 1,3-diamino-2-propanol, spermine or spermidine.

The term "alkanolamine" is understood to mean an organic amine comprising a primary, secondary or tertiary amine functional group and one or more linear or branched Ci-C_6 alkyl groups carrying one or more hydroxyl radicals.

Organic amines chosen from alkanolamines, such as mono-, di- or trialkanolamines, comprising from one to three identical or different CrC_4 hydroxyalkyl radicals, are suitable in particular for the implementation of the invention.
Mention may be made, among compounds of this type, of monoethanolamine (MEA), diethanolamine, triethanolamine, monoisopropanolamine, diisopropanolamine, \( \text{N,N-dimethylethanolamine} \), 2-amino-2-methyl-1-propanol, triisopropanolamine, 2-amino-2-methyl-1,3-propanediol, 3-amino-1,2-propanediol, 3-dimethylamino-1,2-propanediol or tris(hydroxymethyl)aminomethane.

More particularly, the amino acids which can be used are of natural or synthetic origin, in their \( \text{L, D or racemic form} \), and comprise at least one acid functional group chosen more particularly from carboxylic acid, sulfonic acid, phosphonic acid or phosphoric acid functional groups. The amino acids can be in the neutral or ionic form.

Mention may in particular be made, as amino acids which can be used in the present invention, of aspartic acid, glutamic acid, alanine, arginine, ornithine, citrulline, asparagine, carnitine, cysteine, glutamine, histidine, lysine, isoleucine, leucine, methionine, N-phenylalanine, proline, serine, taurine, threonine, tryptophan, tyrosine and valine.

Advantageously, the amino acids are basic amino acids comprising an additional amine functional group optionally included in a ring or in a ureido functional group.

Such basic amino acids are preferably chosen from those corresponding to the following formula (II), and also their salts:

\[
R^\text{NH}_2 - \text{CH}_2 - \text{CH}_2 - \text{CO}_2\text{H} \quad (\text{II})
\]

\[
\begin{align*}
\text{N} & \quad -\text{(CH}_2\text{)}_3\text{NH}_2 \\
\text{NH} & \quad -\text{(CH}_2\text{)}_2\text{NH} \\
\text{NH} & \quad -\text{(CH}_2\text{)}_2\text{NH} \\
\text{NH} & \quad -\text{(CH}_2\text{)}_2\text{NH} \quad \text{and}
\end{align*}
\]

The compounds corresponding to the formula (II) are histidine, lysine, arginine, ornithine and citrulline.

The organic amine can also be chosen from organic amines of heterocyclic type. Mention may in particular be made, in addition to histidine, already mentioned in the amino acids, of pyridine, piperidine, imidazole, triazole, tetrazole or benzimidazole.

The organic amine can also be chosen from amino acid dipeptides. Mention may in particular be made, as amino acid dipeptides which can be used in the present invention, of carnosine, anserine and balenine.
The organic amine can also be chosen from compounds comprising a guanidine functional group. Mention may in particular be made, as amines of this type which can be used in the present invention, in addition to arginine, already mentioned as an amino acid, of creatine, creatinine, 1,1-dimethylguanidine, 1,1-diethylguanidine, glycocynamine, metformin, agmatine, N-amidinoalanine, 3-guanidinopropionic acid, 4-guanidinobutyric acid and 2-[(amino(imino)methyl)amino]ethane-1-sulfonic acid.

Mention may be made, as hybrid compounds, of the salts of the abovementioned amines with acids, such as carbonic acid or hydrochloric acid.

Use may in particular be made of guanidine carbonate or monoethanolamine hydrochloride.

Preferably, the basifying agent(s) present in the composition of the invention are chosen from alkanolamines and amino acids in the neutral or ionic form, in particular basic amino acids, preferably corresponding to those of formula (II). More preferably still, the basifying agent(s) are chosen from monoethanolamine (MEA) and basic amino acids in the neutral or ionic form. Better still, the basifying agent(s) are chosen from alkanolamines, such as monoethanolamine.

Advantageously, the composition according to the invention exhibits a content of basifying agent(s) ranging from 0.01% to 30% by weight and preferably from 0.1% to 20% by weight, with respect to the weight of the composition.

According to a first specific embodiment, the composition according to the invention or else the method according to the invention does not employ aqueous ammonia or one of its salts as basifying agent.

According to a second embodiment, if the composition or if the method according to the invention employs aqueous ammonia or one of its salts as basifying agent, its content will advantageously not exceed 0.03% by weight (expressed as NH₃). Preferably will not exceed 0.01% by weight, with respect to the weight of the composition of the invention.

Preferably, if the composition comprises aqueous ammonia or one of its salts, then the amount of basifying agent(s) other than the aqueous ammonia is greater than that of the aqueous ammonia (expressed as NH₃).

**Chemical oxidizing agent**

The composition of the invention comprises one or more chemical oxidizing agents. The term "chemical oxidizing agent" is understood to mean an oxidizing agent other than atmospheric oxygen. More particularly, the chemical oxidizing agent(s) are chosen from hydrogen peroxide, urea hydrogen peroxide, alkali metal bromates, peroxygenated
salts, such as, for example, persulfates or perborates, peracids and their precursors and alkali metal or alkaline earth metal percarbonates.

This oxidizing agent is advantageously formed of hydrogen peroxide and in particular in aqueous solution (aqueous hydrogen peroxide solution), the concentration of which can range more particularly from 0.1% to 50% by weight, more preferably still from 0.5% to 20% by weight and better still from 1% to 15% by weight, with respect to the weight of the composition.

Preferably, the composition of the invention does not comprise peroxygenated salts.

**Cationic compounds of formula (i):**

The composition of the invention comprises one or more cationic compounds of following formula (i):

\[ \text{R}_2 - \text{R}_4 - \text{R}_3 - \text{N}^+ - \text{R}_1 \]

in which:
the radicals \( \text{R}_1, \text{R}_2, \text{R}_3 \) and \( \text{R}_4 \), which are identical or different, represent an optionally substituted \( \text{C}_1-\text{C}_8 \) alkyl radical optionally interrupted by one or more heteroatoms, more particularly chosen from oxygen, or interrupted by an amino group comprising a hydrogen atom or a \( \text{C}_1-\text{C}_2 \) alkyl group; an optionally substituted \( \text{C}_2-\text{C}_8 \) alkenyl radical optionally interrupted by one or more heteroatoms, more particularly chosen from oxygen, or interrupted by an amino group comprising a hydrogen atom or a \( \text{C}_1-\text{C}_2 \) alkyl group; or an optionally substituted benzyl radical;
\( \text{X}^- \) represents a cosmetically acceptable anion or mixture of cosmetically acceptable anions, providing the electrical neutrality of the formula (i).

Preferably, the alkyl or alkenyl radicals respectively comprise from 1 to 6 and from 2 to 6 carbon atoms.

The optional substituent(s) of the alkyl or alkenyl radicals can be chosen from halogen atoms, the hydroxyl group, amino or mono- or di(\( \text{C}_1-\text{C}_4 \))alkylamino groups, the optionally substituted phenyl group, \( \text{C}_1-\text{C}_4 \) alkoxy groups, \( \text{C}_2-\text{C}_4 \) alkenyloxy groups, the \( \text{SO}_3\text{H} \) group and its salts, or the \( \text{C}_0\text{H}_2 \) group and its salts.

The optional substituent(s) of the phenyl or benzyl groups can be chosen from halogen atoms, \( \text{C}_1-\text{C}_4 \) alkyl groups, \( \text{C}_2-\text{C}_4 \) alkleny groups, the hydroxyl group, amino or mono- or di(\( \text{C}_1-\text{C}_4 \))alkylamino groups, \( \text{C}_1-\text{C}_4 \) alkoxy groups, \( \text{C}_2-\text{C}_4 \) alkenyloxy groups, the \( \text{SO}_3\text{H} \) group and its salts, or the \( \text{C}_0\text{H}_2 \) group and its salts.
More preferably still, at least 3 of the $R_1$ to $R_4$ radicals denote a methyl or ethyl radical.

The anion or the mixture of anions is advantageously chosen from hydroxide, halide, phosphate, sulfate, carbonate, hydrogen carbonate, bisulfate, acetate, lactate, $(C_1$–$C_4$) alkyl sulfate, or $(C_1$–$C_4$) alkyl- or $(C_1$–$C_4$) alkylaryl sulfonate anions.

Mention may in particular be made, as compounds of formula (i), of tetaethylammonium, tetrabutylammonium, benzyltriethylammonium, benzyltrimethylammonium, benzyltributylammonium or tributylmethylammonium salts; the salts being chosen from hydroxides, bromides, fluorides, chlorides, sulfates, alkyl sulfates (methyl or ethyl sulfates), hydrogen sulfates, monobasic phosphates, acetates, paratoluensulfonates or their mixtures.

The content of compound(s) of formula (i) in the composition represents from 0.05% to 30% by weight, preferably from 0.1% to 25% by weight, better still from 0.5% to 20% by weight and even better still from 1% to 15% by weight, with respect to the total weight of the composition.

**Solvent:**

The composition according to the invention can also comprise one or more organic solvents.

Mention may be made, by way of organic solvent, for example, of linear or branched $C_2$–$C_4$ alkanols, such as ethanol and isopropanol; glycerol; polyols and polyl ethers, such as 2-butoxyethanol, propylene glycol, dipropylene glycol, propylene glycol monomethyl ether, diethylene glycol monoethyl ether and diethylene glycol monomethyl ether; and also aromatic alcohols or ethers, such as benzyl alcohol or phenoxyethanol, and their mixtures.

The solvent(s), if they are present, represent a content usually ranging from 1% to 40% by weight and preferably from 5% to 30% by weight, with respect to the weight of the composition.

**Other additives:**

The composition according to the invention can also include various adjuvants conventionally used in hair dyeing compositions, such as anionic, cationic, non-ionic, amphoteric or zwitterionic polymers or their mixtures; inorganic thickening agents, in particular fillers, such as clays or talc; organic thickening agents with, in particular, anionic, cationic, non-ionic and amphoteric polymeric associative thickening agents;
antioxidants; penetrating agents; sequestering agents; fragrances; dispersing agents; film-forming agents; ceramides; preservatives; or opacifying agents.

The above adjuvants are generally present in an amount for each of them of between 0.01% and 20% by weight, with respect to the weight of the composition.

The composition can in particular comprise one or more inorganic thickening agents chosen from organophilic clays, fumed silicas or their mixtures.

The organophilic clay can be chosen from montmorillonite, bentonite, hectorite, attapulgite, sepiolite and their mixtures. The clay is preferably a bentonite or a hectorite.

These clays can be modified with a chemical compound chosen from quaternary ammoniums, tertiary amines, amine acetates, imidazolines, amine soaps, fatty sulfates, alkylaryl sulfonates, amine oxides and their mixtures.

Mention may be made, as organophilic clays, of quaternium-18 bentonites, such as those sold under the names Bentone 3, Bentone 38 and Bentone 38V by Rheox, Tixogel VP by United Catalyst and Claytone 34, Claytone 40 and Claytone XL by Southern Clay; stearalkonium bentonites, such as those sold under the names Bentone 27 by Rheox, Tixogel LG by United Catalyst and Claytone AF and Claytone APA by Southern Clay; and quaternium-18/benzalkonium bentonites, such as those sold under the names Claytone HT and Claytone PS by Southern Clay.

The fumed silicas can be obtained by high-temperature pyrolysis of a volatile silicon compound in an oxyhydrogen flame, producing a finely divided silica. This process makes it possible in particular to obtain hydrophilic silicas which exhibit a large number of silanol groups at their surface. Such hydrophilic silicas are sold, for example, under the names Aerosil 130®, Aerosil 200®, Aerosil 255®, Aerosil 300® and Aerosil 380® by Degussa and Cab-O-Sil HS-5®, Cab-O-Sil EH-5®, Cab-O-Sil LM-130®, Cab-O-Sil MS-55® and Cab-O-Sil M-5® by Cabot.

It is possible to chemically modify the surface of the silica by chemical reaction for the purpose of reducing the number of silanol groups. It is possible in particular to replace silanol groups with hydrophobic groups: a hydrophobic silica is then obtained.

The hydrophobic groups can be:
- trimethysiloxy groups, which are obtained in particular by treating fumed silica in the presence of hexamethyldisilazane. Silicas thus treated are known as "Silica silylate" according to the CTFA (6th Edition, 1995). They are sold, for example, under the references Aerosil R812® by Degussa and Cab-O-Sil TS-530® by Cabot.
- dimethysilyloxy or polydimethysiloxane groups, which are obtained in particular by treating fumed silica in the presence of polydimethysiloxane or dimethyldichlorosilane. Silicas thus treated are known as "Silica dimethyl silylate" according to the CTFA (6th
Edition, 1995). They are sold, for example, under the references Aerosil R972® and Aerosil R974® by Degussa and Cab-O-Sil TS-610® and Cab-O-Sil TS-720® by Cabot. The fumed silica preferably exhibits a particle size which can be nanometric to micrometric, for example ranging from approximately 5 to 200 nm.

Preferably, the composition comprises a hectorite, an organomodified bentonite or an optionally modified fumed silica.

When it is present, the inorganic thickening agent represents from 1% to 30% by weight, with respect to the weight of the composition.

The composition can also comprise one or more organic thickening agents.

These thickening agents can be chosen from fatty acid amides (coconut acid diethanolamide or monoethanolamide, oxethylenated alkyl ether carboxylic acid monoethanolamide), polymeric thickeners, such as cellulose thickeners (hydroxyethylcellulose, hydroxypropylcellulose, carboxymethylcellulose), guar gum and its derivatives (hydroxypropyl guar), gums of microbial origin (xanthan gum, scleroglucan gum), crosslinked homopolymers of acrylic acid or of acrylamidopropanesulfonic acid and associative polymers (polymers comprising hydrophilic regions and hydrophobic regions having a fatty chain (alkyl or alkenyl chain comprising at least 10 carbon atoms) which are capable, in an aqueous medium, of reversibly associating with one another or with other molecules).

According to a specific embodiment, the organic thickener is chosen from cellulose thickeners (hydroxyethylcellulose, hydroxypropylcellulose, carboxymethylcellulose), guar gum and its derivatives (hydroxypropyl guar), gums of microbial origin (xanthan gum, scleroglucan gum) and crosslinked homopolymers of acrylic acid or of acrylamidopropanesulfonic acid, and preferably from cellulose thickeners with in particular hydroxyethylcellulose.

The content of organic thickening agent(s), if they are present, usually varies from 0.01% to 20% by weight and preferably from 0.1% to 5% by weight, with respect to the weight of the composition.

The composition of the invention can be provided in various forms, such as, for example, a solution, an emulsion (milk or cream) or a gel.

**Processes of the invention:**

The composition according to the invention is applied to wet or dry keratinous fibres.

It is usually left in place on the fibres for a time generally of from 1 minute to 1 hour and preferably from 5 minutes to 30 minutes.
The temperature during the dyeing process is conventionally between ambient temperature (between 15°C and 25°C) and 80°C and preferably between ambient temperature and 60°C.

On conclusion of the treatment, the human keratinous fibres are advantageously rinsed with water. They can optionally be washed with a shampoo, followed by rinsing with water, before being dried or left to dry.

The composition according to the invention is generally prepared by mixing at least two compositions, preferably two or three compositions.

In a first alternative form of the invention, the composition according to the invention results from the mixing of two compositions:

In particular, a composition (A) comprising at least one dye for keratinous fibres and at least one basifying agent and a composition (B) comprising at least one chemical oxidizing agent are mixed; at least one of compositions (A) and (B) comprising at least one fatty substance, at least one surfactant and at least one compound of formula (i), the fatty substance content of the composition according to the invention, resulting from the mixing of compositions (A) and (B), being at least 25% by weight of fatty substances.

At least one of compositions (A) and (B) is advantageously aqueous.

The term "aqueous composition" is understood to mean a composition comprising at least 5% by weight of water, with respect to the weight of this composition.

Preferably, an aqueous composition comprises more than 10% by weight of water and more advantageously still more than 20% by weight of water.

Preferably, composition (A) is aqueous. Preferably, composition (B) is also aqueous.

In this alternative form, composition (A) preferably comprises at least 50% by weight of fatty substances and more preferably still at least 50% by weight of fatty substances which are liquid at ambient temperature (25°C), with respect to the weight of this composition (A).

Preferably, composition (A) is a direct emulsion (oil-in-water: O/W) or an inverse emulsion (water-in-oil: W/O), and preferably a direct emulsion (O/W).

In this alternative form, compositions (A) and (B) are preferably mixed in an (A)/(B) ratio by weight ranging from 0.2 to 10 and better still from 0.5 to 2.
In a second alternative form of the invention, the composition according to the invention results from the mixing of three compositions. In particular, the three compositions are aqueous or alternatively at least one of them is anhydrous.

More particularly, within the meaning of the invention, the term "anhydrous cosmetic composition" is understood to mean a cosmetic composition exhibiting a water content of less than 5% by weight, preferably of less than 2% by weight and more preferably still of less than 1% by weight, with respect to the weight of the said composition. It should be noted that the water present in the composition is more particularly "bound water", such as the water of crystallization of the salts or traces of water absorbed by the starting materials used in the preparation of the compositions according to the invention.

Use is preferably made of two aqueous compositions (B') and (C) and of one anhydrous composition (A').

The anhydrous composition (A') then preferably comprises at least one fatty substance and more preferably at least one liquid fatty substance.

Composition (B') then preferably comprises at least one dye for keratinous fibres.

Composition (C) then preferably comprises at least one chemical oxidizing agent.

According to this preferred embodiment of the second alternative form, the basifying agent(s) are included in compositions (A') and/or (B') and preferably only in composition (B'). As regards the surfactant(s) and the compound(s) of formula (i), one at least of each of these is included in at least one of the compositions (A'), (B') and (C).

According to this preferred embodiment, the composition according to the invention, that is to say resulting from the mixing of the three compositions (A'), (B') and (C), exhibits a fatty substance content of at least 25% by weight of fatty substance, with respect to the weight of the composition resulting from the mixing of the three abovementioned compositions.

In this alternative form, compositions (A'), (B') and (C) are preferably mixed in an [(A')+(B')]/(C) ratio by weight ranging from 0.2 to 10 and more particularly from 0.5 to 2 and in an (A')/(B') ratio by weight ranging from 0.5 to 10 and preferably from 1 to 5.

**Devices:**

Finally, the invention relates to a first multicompartiment device comprising a first compartment including composition (A) as described above and at least a second compartment including composition (B) as described above; compositions (A) and (B) of the compartments being intended to be mixed before application to give a composition according to the invention; the amount of fatty substance of which represents at least
25% by weight, with respect to the weight of the formulation resulting from the mixing of compositions (A) and (B).

The invention also relates to a second multicompartment device comprising a first compartment including composition (A') as described above and a second compartment including a cosmetic composition (B') as described above and at least a third compartment comprising composition (C) as described above, the compositions of the compartments being intended to be mixed before application to give the composition according to the invention; the amount of fatty substance in the composition representing at least 25% by weight, with respect to the weight of the composition according to the invention, that is to say resulting from the mixing of compositions (A'), (B') and (C).

The examples which follow serve to illustrate the invention without, however, exhibiting a limiting nature.

**EXAMPLE 1**

The following compositions are prepared in which the amounts are expressed in grams of product as is.

<table>
<thead>
<tr>
<th>Composition A</th>
<th>Composition B1</th>
<th>Composition B2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Liquid petrolatum</td>
<td>64.5</td>
<td></td>
</tr>
<tr>
<td>2-Octyldodecanol</td>
<td>11.5</td>
<td></td>
</tr>
<tr>
<td>Distearlyldimethylammonium-modified hectorite</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Propylene carbonate</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Oxyethylenated sorbitan monolaurate (4 EO)</td>
<td>11</td>
<td></td>
</tr>
<tr>
<td>Glycol distearate</td>
<td>8</td>
<td></td>
</tr>
<tr>
<td>Oxyethylated lauryl alcohol (2 EO)</td>
<td>1</td>
<td></td>
</tr>
</tbody>
</table>

<p>| Propylene glycol        | 6.2            | 6.2            |
| Ethyl alcohol           | 8.25           | 8.25           |
| Hexylene glycol (2-methyl-2,4-pentanediol) | 3 | 3 |
| Dipropylene glycol      | 3              | 3              |
| Monoethanolamine        | 14.5           | 14.5           |</p>
<table>
<thead>
<tr>
<th>Ingredient</th>
<th>Amount 1</th>
<th>Amount 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sodium metabisulfite</td>
<td>0.7</td>
<td>0.7</td>
</tr>
<tr>
<td>Vitamin C: L-ascorbic acid</td>
<td>0.25</td>
<td>0.25</td>
</tr>
<tr>
<td>Diethylenetriaminepentaacetic acid, pentasodium salt, as a 40% aqueous solution</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Hydroxyethylcellulose (Natrosol 250 HHR, Aqualon)</td>
<td>3.5</td>
<td>3.5</td>
</tr>
<tr>
<td>2-[(3-Aminopyrazolo[1,5-a]pyrid-2-yl)oxy]ethanol hydrochloride</td>
<td>2 × 10⁻² mol</td>
<td>2 × 10⁻² mol</td>
</tr>
<tr>
<td>(thymol)</td>
<td>2 × 10⁻² mol</td>
<td>2 × 10⁻² mol</td>
</tr>
<tr>
<td>Tetrabutylammonium sulfate</td>
<td>25</td>
<td></td>
</tr>
<tr>
<td>Water</td>
<td>q.s. for 100 g</td>
<td>q.s. for 100 g</td>
</tr>
</tbody>
</table>

**Composition C (oxidizing agent)**

<table>
<thead>
<tr>
<th>Ingredient</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cetearyl alcohol (Nafo1 1618F)</td>
<td>8</td>
</tr>
<tr>
<td>Glycerol</td>
<td>0.5</td>
</tr>
<tr>
<td>Liquid petrolatum</td>
<td>20</td>
</tr>
<tr>
<td>Oxyethylenated cetearyl alcohol (33 EO)</td>
<td>3</td>
</tr>
<tr>
<td>Oxyethylenated rapeseed acid amide (4 EO)</td>
<td>1.2</td>
</tr>
<tr>
<td>Tetrasodium pyrophosphate</td>
<td>0.03</td>
</tr>
<tr>
<td>Diethylenetriaminepentaacetic acid, pentasodium salt, as a 40% aqueous solution</td>
<td>0.15</td>
</tr>
<tr>
<td>Phosphoric acid</td>
<td>0.1</td>
</tr>
<tr>
<td>Tetramethylhexamethylenediamine/1,3-dichloropropane polycondensate (40% aqueous solution)</td>
<td>0.1</td>
</tr>
<tr>
<td>Polydimethylidiallylammonium chloride (40% aqueous solution)</td>
<td>0.2</td>
</tr>
<tr>
<td>50% Aqueous hydrogen peroxide solution</td>
<td>6</td>
</tr>
<tr>
<td>Sodium stannate</td>
<td>0.04</td>
</tr>
<tr>
<td>Vitamin E</td>
<td>0.1</td>
</tr>
<tr>
<td>Phosphoric acid</td>
<td>q.s. pH 2.2</td>
</tr>
<tr>
<td>Water</td>
<td>q.s. for 100 g</td>
</tr>
</tbody>
</table>

At the time of use, the following are mixed (by weight):
- 10 parts of composition A
- 4 parts of composition B1 or of composition B2
- 16 parts of composition C

The mixture obtained is subsequently applied to locks of natural hair comprising 90% natural grey hairs.

The "mixture/lock" bath ratio is respectively 10/1 (g/g).
The leave-on time is 30 minutes at 27°C.
At the end of this time, the locks are rinsed, then washed with shampoo and dried.

The uptake of the colouration (AE_{Lab}*) was evaluated in the CIE L*, a*, b* system. In this L*, a*, b* system, L* represents the intensity of the colour, a* indicates the green/red colour axis and b* indicates the blue/yellow colour axis. The lower the value of L*, the darker or more intense the colour.

The value of ΔE* was calculated from the values of L*a*b* according to the following equation (i):

$$\Delta E^* = \sqrt{(L^* - L_{0}^*)^2 + (a^* - a_{0}^*)^2 + (b^* - b_{0}^*)^2}$$ (i)

The uptake of the colouration (AE_{Lab}*) was calculated with regard to locks of untreated hair (L_{0}^*, a_{0}^* and b_{0}^*) and with regard to locks of dyed hair (L*, a* and b*). The greater the value of AE_{Lab}*, the better the uptake.

### Results

<table>
<thead>
<tr>
<th>Composition</th>
<th>L*</th>
<th>a*</th>
<th>b*</th>
<th>ΔE*</th>
<th>Gain in ΔE*</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>57.93</td>
<td>0.76</td>
<td>14.32</td>
<td>-----</td>
<td>-------------</td>
</tr>
<tr>
<td>B1</td>
<td>32.48</td>
<td>14.21</td>
<td>7.68</td>
<td>29.54</td>
<td>7.1</td>
</tr>
<tr>
<td>B2</td>
<td>39.75</td>
<td>13.19</td>
<td>10.03</td>
<td>22.44</td>
<td></td>
</tr>
</tbody>
</table>

It is observed that, in the presence of the compound of formula (i) according to the invention, the uptake of the colouration with regard to the lock is significantly improved.

### EXAMPLE 2

The following compositions are prepared in which the amounts are expressed in grams of active materials.
### Composition A

<table>
<thead>
<tr>
<th>Ingredient</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Liquid petrolatum</td>
<td>64.5</td>
</tr>
<tr>
<td>2-Octylundecanol</td>
<td>11.5</td>
</tr>
<tr>
<td>Distearlyldimethylammonium-modified hectorite</td>
<td>3</td>
</tr>
<tr>
<td>Propylene carbonate</td>
<td>1</td>
</tr>
<tr>
<td>Oxyethylenated sorbitan monolaurate (4 EO)</td>
<td>11</td>
</tr>
<tr>
<td>Glycol distearate</td>
<td>8</td>
</tr>
<tr>
<td>Oxyethylenated lauril alcohol (2 EO)</td>
<td>1</td>
</tr>
</tbody>
</table>

### Composition B1

<table>
<thead>
<tr>
<th>Ingredient</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Propylene glycol</td>
<td>6.2</td>
</tr>
<tr>
<td>Ethyl alcohol</td>
<td>8.25</td>
</tr>
<tr>
<td>Hexylene glycol (2-methyl-2,4-pentanediol)</td>
<td>3</td>
</tr>
<tr>
<td>Dipropylene glycol</td>
<td>3</td>
</tr>
<tr>
<td>Monoethanolamine</td>
<td>14.5</td>
</tr>
<tr>
<td>Sodium metabisulfite</td>
<td>0.7</td>
</tr>
<tr>
<td>Vitamin C: L-ascorbic acid</td>
<td>0.25</td>
</tr>
<tr>
<td>Diethylenetriaminepentaacetic acid, pentasodium salt, as a 40% aqueous solution</td>
<td>1</td>
</tr>
</tbody>
</table>

### Composition B2

<table>
<thead>
<tr>
<th>Ingredient</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Propylene glycol</td>
<td>6.2</td>
</tr>
<tr>
<td>Ethyl alcohol</td>
<td>8.25</td>
</tr>
<tr>
<td>Hexylene glycol (2-methyl-2,4-pentanediol)</td>
<td>3</td>
</tr>
<tr>
<td>Dipropylene glycol</td>
<td>3</td>
</tr>
<tr>
<td>Monoethanolamine</td>
<td>14.5</td>
</tr>
<tr>
<td>Sodium metabisulfite</td>
<td>0.7</td>
</tr>
<tr>
<td>Vitamin C: L-ascorbic acid</td>
<td>0.25</td>
</tr>
<tr>
<td>Diethylenetriaminepentaacetic acid, pentasodium salt, as a 40% aqueous solution</td>
<td>1</td>
</tr>
</tbody>
</table>

### Composition C (oxidizing agent)

<table>
<thead>
<tr>
<th>Ingredient</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cetearyl alcohol (Nafol 1618F)</td>
<td>8</td>
</tr>
<tr>
<td>Glycerol</td>
<td>0.5</td>
</tr>
<tr>
<td>Liquid petrolatum</td>
<td>20</td>
</tr>
<tr>
<td>Oxyethylenated cetearyl alcohol (33 EO)</td>
<td>3</td>
</tr>
<tr>
<td>Oxyethylenated rapeseed acid amide (4 EO)</td>
<td>1.2</td>
</tr>
<tr>
<td>Tetrasodium pyrophosphate</td>
<td>0.03</td>
</tr>
<tr>
<td>Diethylenetriaminepentaacetic acid, pentasodium salt, as a 40% aqueous solution</td>
<td>0.15</td>
</tr>
</tbody>
</table>
### Chemical Ingredients

<table>
<thead>
<tr>
<th>Chemical</th>
<th>Concentration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Phosphoric acid</td>
<td>0.1</td>
</tr>
<tr>
<td>Tetramethylhexamethylenediamine/1,3-dichloropropane polycondensate (40% aqueous solution)</td>
<td>0.1</td>
</tr>
<tr>
<td>Polydimethylallylammonium chloride (40% aqueous solution)</td>
<td>0.2</td>
</tr>
<tr>
<td>50% Aqueous hydrogen peroxide solution</td>
<td>6</td>
</tr>
<tr>
<td>Sodium stannate</td>
<td>0.04</td>
</tr>
<tr>
<td>Vitamin E</td>
<td>0.1</td>
</tr>
<tr>
<td>Phosphoric acid</td>
<td>q.s. pH 2.2</td>
</tr>
<tr>
<td>Water</td>
<td>q.s. for 100 g</td>
</tr>
</tbody>
</table>

At the time of use, the following are mixed (by weight):

- 10 parts of composition A
- 4 parts of composition B1 or of composition B2
- 16 parts of composition C

The mixture obtained is subsequently applied to locks of natural hair comprising 90% natural grey hairs.

The “mixture/lock” bath ratio is respectively 10/1 (g/g).

The leave-on time is 30 minutes at 27°C.

After this time, the locks are rinsed, and then washed with shampoo and dried.

The uptake of the colouration ($\Delta E_{\text{Lab}}^*$) was evaluated in the CIE $L^*$, $a^*$, $b^*$ system. In this $L^*$, $a^*$, $b^*$ system, $L^*$ represents the intensity of the colour, $a^*$ indicates the green/red colour axis and $b^*$ indicates the blue/yellow colour axis. The lower the value of $L^*$, the darker or more intense the colour.

The value of $\Delta E^*$ was calculated from the values of $L^*$, $a^*$, $b^*$ according to the following equation (i):

$$\Delta E^* = \sqrt{(L^* - L_{0}^*)^2 + (a^* - a_{0}^*)^2 + (b^* - b_{0}^*)^2}$$ (i)

The uptake of the colouration ($\Delta E_{\text{Lab}}^*$) was calculated with regard to locks of untreated hair ($L_{0}, a_{0}^*, b_{0}^*$) and with regard to locks of dyed hair ($L^*, a^*, b^*$).

The greater the value of $\Delta E_{\text{Lab}}^*$, the better the uptake.
**Results**

<table>
<thead>
<tr>
<th>Composition</th>
<th>$L^*$</th>
<th>$a^*$</th>
<th>$b^*$</th>
<th>$\Delta E^*$</th>
<th>Gain in $\Delta E^*$</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>57.93</td>
<td>0.76</td>
<td>14.32</td>
<td>-----</td>
<td>-----</td>
</tr>
<tr>
<td>B1</td>
<td>51.09</td>
<td>22.86</td>
<td>5.38</td>
<td>24.81</td>
<td>8.74</td>
</tr>
<tr>
<td>B2</td>
<td>57.16</td>
<td>15.89</td>
<td>8.99</td>
<td>16.07</td>
<td></td>
</tr>
</tbody>
</table>

It is observed that, in the presence of the compound of formula (i) according to the invention, the uptake of the colouration with regard to the lock is significantly improved.
CLAIMS

1. Composition for dyeing keratinous fibres, in particular human keratinous fibres, comprising:
   - one or more fatty substances,
   - one or more surfactants,
   - one or more dyes for keratinous fibres,
   - one or more basifying agents,
   - one or more chemical oxidizing agents,
   - one or more cationic compounds of following formula (i):
     \[ R_1^+ N^+ R_3^- X^- \]
     in which the \( R_1, R_2, R_3 \) and \( R_4 \) radicals, which are identical or different, represent an optionally substituted \( C_{1-8} \) alkyl radical which is optionally interrupted by one or more heteroatoms; an optionally substituted \( C_{2-8} \) alkenyl radical which is optionally interrupted by one or more heteroatoms; or an optionally substituted benzyl radical;
     \( X^- \) represents a cosmetically acceptable anion or a mixture of cosmetically acceptable anions, providing the electrical neutrality of the formula (i).
   - the content of fatty substances representing, in total, at least 25% by weight, with respect to the total weight of the composition.

2. Composition according to the preceding claim, characterized in that the fatty substance(s) are chosen from \( C_6-C_{16} \) hydrocarbons, hydrocarbons comprising more than 16 carbon atoms, non-silicone oils of animal origin, vegetable oils of triglyceride type, synthetic triglycerides, fluorinated oils, fatty alcohols, fatty acid and/or fatty alcohol esters other than the triglycerides and vegetable waxes, non-silicone waxes or silicones.

3. Composition according to either one of the preceding claims, characterized in that the fatty substance(s) are liquid at ambient temperature and at atmospheric pressure.

4. Composition according to any one of the preceding claims, characterized in that the fatty substance(s) are chosen from liquid petrolatum, \( C_6-C_{16} \) alkanes, polydecenes, fatty acid or fatty alcohol esters, which are liquid, or their mixtures.

5. Composition according to any one of the preceding claims, characterized in that the concentration of fatty substances ranges from 25% to 80% by weight, preferably...
from 30% to 70% by weight and more advantageously still from 30% to 60% by weight, with respect to the total weight of the composition.

6. Composition according to any one of the preceding claims, characterized in that the surfactant(s) are chosen from non-ionic surfactants, preferably mono- or polyoxyalkylenated and mono- or polyglycerolated non-ionic surfactants.

7. Composition according to any one of the preceding claims, characterized in that the dye(s) for keratinous fibres are chosen from synthetic direct dyes.

8. Composition according to any one of Claims 1 to 6, characterized in that the dye(s) for keratinous fibres are chosen from oxidation bases and couplers.

9. Composition according to the preceding claim, characterized in that the oxidation base(s) are chosen from para-phenylenediamines, bis(phenyl)alkylenediamines, para-aminophenols, ortho-aminophenols, heterocyclic bases and their addition salts.

10. Composition according to any one of Claims 1 to 6, characterized in that the dye(s) for keratinous fibres are chosen from natural dyes.

11. Composition according to any one of the preceding claims, characterized in that the dye(s) for keratinous fibres have a logP of greater than or equal to 1.5 and preferably of greater than or equal to 2.

12. Composition according to any one of the preceding claims, characterized in that the compound(s) of formula (i) are chosen from tetrabutylammonium, tetrabutylammonium, benzyltriethylammonium, benzyltrimethylammonium, benzyltributylammonium or tributylmethyldiammonium salts; the salts being chosen from hydroxides, bromides, fluorides, chlorides, sulfates, alkyl sulfates (methyl or ethyl sulfates), hydrogensulfates, monobasic phosphates, acetates, para-toluenesulfonates or their mixtures.

13. Composition according to any one of the preceding claims, characterized in that the basifying agent(s) are inorganic, organic or hybrid and are preferably chosen from aqueous ammonia, alkali metal carbonates or bicarbonates, such as sodium carbonate, potassium carbonate, sodium bicarbonate or potassium bicarbonate, sodium hydroxide, potassium hydroxide, organic amines chosen from alkanolamines, oxyethylenated and/or oxypropylenated ethylenediamines, amino acids and the compounds of formula (I) or their mixtures:
in which formula (I) W is a CrC₆ divalent alkyene radical optionally substituted by one or more hydroxyl groups or a CrC₆ alkyl radical and/or optionally interrupted by one or more heteroatoms, such as O or NRₓ, and Rₓ, Rᵧ, Rₙ, Rᵣ and Rᵧ, which can be identical or different, represent a hydrogen atom or a C₁-C₆ alkyl, C₁-C₆ hydroxyalkyl or CrC₆ aminoalkyl radical.

14. Composition according to the preceding claim, in which the basifying agent(s) are chosen from alkanolamines or amino acids in the neutral or ionic form and preferably from alkanolamines.

15. Composition according to any one of the preceding claims, characterized in that the chemical oxidizing agent is hydrogen peroxide.

16. Method for dyeing keratinous fibres, in particular human keratinous fibres, which consists in applying, to the said fibres, a composition according to any one of Claims 1 to 15.

17. Method according to the preceding claim, characterized in that the composition results from the mixing of two compositions; preferably of a composition (A) comprising at least one dye for keratinous fibres and at least one basifying agent and of a composition (B) comprising at least one chemical oxidizing agent; at least one of compositions (A) and (B) comprising at least one fatty substance, at least one surfactant and at least one compound of formula (i), the fatty substance content of the composition resulting from the mixing of compositions (A) and (B) being at least 25% by weight of fatty substances.

18. Method according to Claim 16, characterized in that the composition results from the mixing of three compositions, preferably of two aqueous compositions (B') and (C) and of one anhydrous composition (Λ'), the anhydrous composition (Λ') comprising at least one fatty substance, composition (B') comprising at least one dye for keratinous substances and composition (C) comprising at least one chemical oxidizing agent, one or more basifying agents being included in compositions (Λ') and/or (B') and preferably only in composition (B') and one or more surfactant(s) and at least one compound of formula (i) being included in at least one of compositions (Λ'), (B') and (C), the fatty substance content of the composition resulting from the mixing of the three compositions (Λ'), (B') and (C) being at least 25% by weight of fatty substances.

19. Multicompartment device comprising a first compartment including composition (A) as described in Claim 17 and at least a second compartment including composition (B) as described in Claim 17, the compositions of the compartments being intended to be mixed before application, provided that the amount of fatty substance
represents at least 25% by weight, with respect to the weight of the composition resulting from the mixing of (A) and (B).

20. Multicompartment device comprising a first compartment including composition (A') as described in Claim 18 and a second compartment including a cosmetic composition (B') as described in Claim 18 and at least a third compartment comprising composition (C) as described in Claim 18, the compositions of the compartments being intended to be mixed before application, provided that the amount of fatty substance represents at least 25% by weight, with respect to the weight of the composition resulting from the mixing of (A'), (B') and (C).
### A. CLASSIFICATION OF SUBJECT MATTER


### B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

- A61Q  A61K

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

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

- EPO-Internal, WPI Data, PAJ

### C. DOCUMENTS CONSIDERED TO BE RELEVANT

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[X] Further documents are listed in the continuation of Box C.  
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Date of the actual completion of the international search: 7 January 2013

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Name and mailing address of the ISA:

European Patent Office, P.B. 5818 Patentlaan 2  
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