A subject of the present invention is a composition for dyeing keratin fibres, comprising: - at least one fatty substance, - at least one oxyethyleneated (OE) non-ionic surfactant comprising a number of OE units ranging from 1 to 9, - at least one oxyethyleneated (OE) non-ionic surfactant comprising at least 100E units, - at least one alkaline agent, - at least one cationic polymer and - at least one oxidation dye, the total amount of fatty substances in the composition being greater than or equal to 70% by weight relative to the total weight of said composition. A subject of the invention is also a process for dyeing keratin fibres using this composition, and also a device.
DYING COMPOSITION RICH IN FATTY SUBSTANCES COMPRISING A MIXTURE OF OXYETHYLENATED SURFACTANTS

The subject of the present invention is a composition for dyeing human keratin fibres, comprising a high content of fatty substances, a mixture of specific oxyethylenated non-ionic surfactants, a cationic polymer, an alkaline agent and an oxidation dye. The invention also relates to a dyeing process using said composition, and to multi-compartment devices.

Among the methods for dyeing human keratin fibres, such as the hair, mention may be made of oxidation dyeing or permanent dyeing. More particularly, this form of dyeing uses one or more oxidation dyes, usually one or more oxidation bases optionally combined 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, when combined with oxidizing products, can give access to coloured entities. The shades obtained with these oxidation bases are often varied by combining them with one or more couplers, these couplers being chosen in particular from aromatic meia-diamines, meia-aminophenols, meia-diphenols and certain heterocyclic compounds. The variety of molecules used as oxidation bases and couplers allows a wide range of colours to be obtained.

It is also possible to add to these compositions direct dyes, which are coloured and colouring molecules having an affinity for the fibres. The direct dyes generally used are chosen from nitrobenzene, anthraquinone, nitropyridine, azo, methine, azomethine, xanthene, acridine, azine and triarylmethane direct dyes. The presence of such compounds enables the colouration obtained to be further enriched with tints or enables the chromaticity of the colouration obtained to be increased.

Oxidation dyeing methods thus consist in using, with these dyeing compositions, a composition comprising at least one oxidizing agent, generally hydrogen peroxide, under alkaline pH conditions in the vast majority of cases. The role of this oxidizing agent is, inter alia, to reveal the colouration, via an oxidative condensation reaction between the oxidation dyes.

Oxidation dyeing must moreover satisfy a certain number of requirements. Thus, it must be free of toxicological drawbacks, it must enable shades to be obtained in the
desired intensity and it must show a good wear property in the face of external attacking factors such as light, bad weather, washing, permanent waving, perspiration and rubbing.

The dyes must also be able to cover grey hair and, finally, they must be as unselective as possible, i.e. they must produce the smallest possible colour differences along the same keratin fibre, which generally comprises areas that are differently sensitized (i.e. damaged) from its end to its root.

The compositions obtained must also have good mixing and application properties, and in particular good rheological properties so as not to run down the face, onto the scalp or beyond the areas that it is proposed to dye, when they are applied.

Finally, the colourations must, as far as is possible, respect the integrity of the keratin fibres and give said fibres the best possible cosmetic properties.

Many attempts have been made in the field of hair dyeing in order to improve the dyeing properties, for example using adjuvants. However, the choice of these adjuvants is difficult in so far as they must improve the dyeing properties of dye compositions without harming the other properties of these compositions. In particular, these adjuvants must not harm the stability of the compositions, the keratin fibre lightening properties, the application properties of the colouration or the cosmetic properties of the dyed fibres.

The aim of the present invention is to obtain novel compositions for the dyeing of keratin fibres which do not have the drawbacks of the prior art. More particularly, the aim of the present invention is to obtain novel dyeing compositions which are very effective in terms of colouration, in particular in terms of coverage of white hairs, of level of power or strength of colouration, of selectivity, and of quality of the uniformity of the dyeing, and are easy to mix and to apply, which limits the olfactory problems on application while at the same time detrimentally modifying the keratin fibres as little as possible.

These aims and others are achieved by the present invention, one subject of which is thus a composition for dyeing keratin fibres, comprising:

- at least one fatty substance,
- at least one oxyethylenated (OE) non-ionic surfactant comprising a number of OE units ranging from 1 to 9,
- at least one oxyethylenated (OE) non-ionic surfactant comprising at least 10 OE units,
A subject of the invention is likewise a two-compartment device comprising:
in one, a composition (A) comprising:
- at least one fatty substance,
- at least one oxyethylenated (OE) non-ionic surfactant comprising a number of OE units ranging from 1 to 9,
- at least one oxyethylenated (OE) non-ionic surfactant comprising at least 10 OE units,
- at least one alkaline agent,
- at least one cationic polymer and
- at least one oxidation dye,

the total amount of fatty substances in the composition (A) being greater than or equal to 70% by weight relative to the total weight of said composition, and

in the other, a composition (B) comprising at least one chemical oxidizing agent, preferably hydrogen peroxide.

The term "chemical oxidizing agent" according to the invention is intended to mean an oxidizing agent other than atmospheric oxygen.

The invention also relates to a process for dyeing human keratin fibres, consisting in applying to said fibres a mixture derived from:
- a composition (A) comprising:
  - at least one fatty substance,
  - at least one oxyethylenated (OE) non-ionic surfactant comprising a number of OE units ranging from 1 to 9,
  - at least one oxyethylenated (OE) non-ionic surfactant comprising at least 10 OE units,
  - at least one alkaline agent,
  - at least one cationic polymer and
  - at least one oxidation dye,
the total amount of fatty substances in the composition being greater than or equal to 70% by weight relative to the total weight of said composition, and
- a composition (B) comprising at least one chemical oxidizing agent, preferably hydrogen peroxide.

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

In the text which follows, and unless otherwise indicated, the limits of a range of values are included within that range.

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

The human keratin fibres treated by means of the process according to the invention are preferably the hair.

The dyeing may be accompanied by a simultaneous lightening of the keratin fibres.

**Fatty substances**

As previously indicated, the composition according to the invention comprises one or more fatty substances, the total amount of fatty substances representing at least 70% by weight, preferably at least 75% by weight and better still at least 80% by weight, relative to the weight of the composition.

The term "fatty substance" is intended to mean an organic compound that is insoluble in water at ordinary temperature (25°C) and at atmospheric pressure (760 mmHg) (solubility of less than 5%, preferably less than 1% and even more preferentially less than 0.1%). They bear in their structure at least one hydrocarbon-based chain comprising at least 6 carbon atoms or a sequence of at least two siloxane groups. In addition, the fatty substances are generally soluble in organic solvents under the same temperature and pressure conditions, for instance chloroform, ethanol, benzene, liquid petroleum jelly or decamethylcyclopentasiloxane.

The term "o/T is intended to mean a "fatty substance" that is liquid at ambient temperature (25°C) and at atmospheric pressure (760 mmHg or 1.013 × 10^5 Pa).

The term "non-silicone o/T is intended to mean an oil not containing any silicon atoms (Si) and the term "silicone o/T is intended to mean an oil containing at least one silicon atom.
More particularly, the fatty substances are chosen from C₆-C₁₆ hydrocarbons, hydrocarbons containing more than 16 carbon atoms, non-silicone oils of animal origin, triglycerides of plant or synthetic origin, fluoro oils, fatty alcohols, non-salified fatty acids, esters of fatty acids and/or of fatty alcohols other than triglycerides, non-silicone waxes other than solid fatty alcohols and than solid synthetic esters, and silicones, and mixtures thereof.

It is recalled that, for the purposes of the invention, fatty alcohols, esters and acids more particularly have at least one linear or branched, saturated or unsaturated hydrocarbon-based group comprising 6 to 30 carbon atoms, which is optionally substituted, in particular with one or more hydroxy groups (in particular 1 to 4). If they are unsaturated, these compounds may comprise one to three conjugated or unconjugated carbon-carbon double bonds.

The linear or branched hydrocarbons of inorganic or synthetic origin containing more than 16 carbon atoms are preferably chosen from liquid paraffins or liquid petroleum jelly, petroleum jelly, polydecenes and hydrogenated polyisobutene such as Parleam®, and mixtures thereof.

As regards the C₆-C₁₆ lower alkanes, they are linear or branched, or possibly cyclic.

Examples that may be mentioned include hexane, cyclohexane, undecane, dodecane, tridecane or isoparaffins, such as isohexadecane, isodecane or isododecane, and mixtures thereof.

A hydrocarbon-based oil of animal origin that may be mentioned is perhydrosqualene.

The triglycerides of plant or synthetic origin are preferably chosen from liquid fatty acid triglycerides comprising from 6 to 30 carbon atoms, for instance heptanoic or octanoic acid triglycerides, or alternatively, more particularly from those present in plant oils, for instance sunflower oil, corn oil, soybean oil, marrow oil, grapeseed oil, sesame seed oil, hazelnut oil, apricot oil, macadamia oil, arara oil, castor oil, avocado oil, jojoba oil, shea butter oil or synthetic caprylic/capric acid triglycerides, for instance those sold by the company Stearineries Dubois or those sold under the names Miglyol® 810, 812 and 818 by the company Dynamit Nobel, and mixtures thereof.

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

The fatty alcohols that are suitable for use in the invention are more particularly chosen from linear or branched, saturated or unsaturated alcohols containing from 8 to 30 carbon atoms. Examples that may be mentioned include cetyl alcohol, stearyl alcohol and a mixture thereof (cetylstearyl alcohol), octyldodecanol, 2-butyloctanol, 2-hexyldecanol, 2-undecylpentadecanol, oleyl alcohol, linolenyl alcohol, ricinoleyl alcohol, undecylenyl alcohol and linoleyl alcohol, and mixtures thereof.

The fatty acids that may be used in the context of the invention are more particularly chosen from saturated or unsaturated carboxylic acids containing from 6 to 30 carbon atoms and in particular from 9 to 30 carbon atoms. They are advantageously chosen from myristic acid, palmitic acid, stearic acid, behenic acid, oleic acid, linoleic acid, linolenic acid and isostearic acid. These fatty acids are, in the composition, not salified with organic or inorganic bases, so as not to give rise to soaps.

As regards the esters of fatty acids and/or of fatty alcohols other than the triglycerides mentioned above and plant waxes, mention may be made in particular of esters of saturated or unsaturated, linear \( \text{Ci-C}_{16} \) or branched \( \text{C}_3\text{C}_{16} \) aliphatic monoacids or polyacids and of saturated or unsaturated, linear \( \text{Ci-C}_{16} \) or branched \( \text{C}_3\text{C}_{16} \) 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; octyldodecyl behenate; isocetyl behenate; cetyl lactate; \( \text{C}_{12}\text{Cl}_{5} \) 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; methylacetyl ricinoleate; myristyl stearate; octyl isononanoate; 2-ethylhexyl isononate; octyl palmitate; octyl pelargonate; octyl stearate; octyldodecyl erucate; oleyl erucate; ethyl and isopropyl palmitates, 2-ethylhexyl palmitate, 2-octyldodecyl palmitate, alkyl myristates such as isopropyl, butyl, cetyl, 2-octyldodecyl, myristyl or stearyl myristate, hexyl stearate, butyl stearate,
isobutyl stearate; dioctyl maleate, hexyl laurate, 2-hexyloctyl laurate, and mixtures thereof, and mixtures thereof.

Still within the context of this variant, esters of C4-C22 dicarboxylic or tricarboxylic acids and of C1-C22 alcohols and esters of mono-, di- or tricarboxylic acids and of C2- C6 di-, tri-, tetra- or pentahydroxy alcohols may also be used.

Mention may be made in particular of: diethyl sebacate; diisopropyl sebacate; diisopropyl adipate; di-n-propyl adipate; diocetyl adipate; dioctyl adipate; dioctyl maleate; glycercy undecylenate; octyldodecyl stearoyl stearate; pentaerythrityl monoricinoleate; pentaerythrityl tetraisononanoate; pentaerythrityl tetrapelargonate; pentaerythrityl tetraisostearate; pentaerythrityl tetraoctanoate; propylene glycol dicaprylate; propylene glycol dicaprate; tridecyl erucate; trisopropyl citrate; triisostearyl citrate; glycercyl trilactate; glycercyl trioctanoate; triocytldodecyl citrate; trioleyl citrate; propylene glycol dioctanoate; neopentyl glycol diheptanoate; diethylene glycol diisononanoate; and polyethylene glycol distearates, and mixtures thereof.

Among the esters mentioned above, it is preferred to use ethyl, isopropyl, myristyl, cetyl or stearyl palmitate, 2-ethylhexyl palmitate, 2-octyldodecyl palmitate, alkyl myristates such as isopropyl, butyl, cetyl or 2-octyldodecyl myristate, hexyl stearate, butyl stearate, isobutyl stearate, dioctyl maleate, hexyl laurate, 2-hexyldecy l laurate, isononyl isononanoate or cetyl octanoate, and mixtures thereof.

The composition may also comprise, as fatty ester, sugar esters and diesters of C6-C30 and preferably C12-C22 fatty acids. It is recalled that the term “sugar” is intended to mean oxygen-bearing hydrocarbon-based compounds containing several alcohol functions, with or without aldehyde or ketone functions, and which comprise at least 4 carbon atoms. These sugars may be monosaccharides, oligosaccharides or polysaccharides.

Examples of suitable sugars that may be mentioned include sucrose (or saccharose), glucose, galactose, ribose, fucose, maltose, fructose, mannose, arabinose, xylose and lactose, and derivatives thereof, in particular alkyl derivatives, such as methyl derivatives, for instance methylglucose.

The sugar esters of fatty acids may be chosen in particular from the group comprising the esters or mixtures of esters of sugars described previously and of linear or branched, saturated or unsaturated C6-C30 and preferably C12-C22 fatty acids. If they are unsaturated, these compounds may comprise one to three conjugated or unconjugated carbon-carbon double bonds.

The esters according to this variant may also be chosen from monoesters, diesters, triesters, tetraesters and polyesters, and mixtures thereof.
These esters may be, for example, oleates, laurates, palmitates, myristates, behenates, cocoates, stearates, linoleates, linolenates, caprates or arachidonates, or mixtures thereof such as, in particular, oleate/palmitate, oleate/stearate or palmitate/stearate mixed esters.

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

An example that may be mentioned is the product sold under the name Glucate® DO by the company Amerchol, which is a methylglucose dioleate.

Examples of esters or mixtures of esters of sugar of fatty acid that may also be mentioned include:

- the products sold under the names F160, F140, F110, F90, F70 and SL40 by the company Crodesta, respectively denoting sucrose palmitostearates formed from 73% monoester and 27% diester and triester, from 61% monoester and 39% diester, triester and tetraester, from 52% monoester and 48% diester, triester and tetraester, from 45% monoester and 55% diester, triester and tetraester, from 39% monoester and 61% diester, triester and tetraester, and sucrose monolaurate;
- the products sold under the name Ryoto Sugar Esters, for example referenced B370 and corresponding to sucrose behenate formed from 20% monoester and 80% diester, triester and polyester;
- the sucrose monodipalmitostearate sold by the company Goldschmidt under the name Tegosoft® PSE.

The non-silicone wax(es) other than solid fatty alcohols and solid synthetic esters are chosen in particular from carnauba wax, candelilla wax, esparto wax, paraffin wax, ozokerite, plant waxes, such as olive tree wax, rice wax, hydrogenated jojoba wax or absolute flower waxes, such as the blackcurrant blossom essential wax sold by the company Bertin (France), or animal waxes, such as beeswaxes or modified beeswaxes (cerabellina); other waxes or waxy raw materials that may be used according to the invention are in particular marine waxes, such as the product sold by the company Sophim under the reference M82, polyethylene waxes or polyolefin waxes in general.

The silicones that may be used in the cosmetic compositions of the present invention are volatile or non-volatile, cyclic, linear or branched silicones, which are unmodified or modified with organic groups, having a viscosity of $5 \times 10^{-5}$ to $2.5 \text{ m}^2/\text{s}$ at $25^\circ\text{C}$, and preferably $1 \times 10^{-5}$ to $1 \text{ m}^2/\text{s}$.
The silicones that may be used in accordance with the invention may be 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 poly(oxyalkylene) groups, amino groups and alkoxy groups.

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

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

(i) cyclic polydialkylsiloxanes comprising from 3 to 7 and preferably 4 to 5 silicon atoms. These 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 mixtures thereof.

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

\[
\begin{array}{c}
\text{CH}_3 \\
D'-D' \\
\text{CH}_3
\end{array}
\]

with \(D'\): \(\text{Si} - \text{O} - \)

with \(D'\): \(\text{Si} - \text{O} - \)

Mention may also be made of mixtures of cyclic polydialkylsiloxanes with organosilicon compounds, such as the mixture of octamethylcyclotetrasiloxane and tetra(trimethylsilyl)pent theorem (50/50) and the mixture of octamethylcyclotetrasiloxane and oxy-1,1'-bis(2,2',2',3,3') hexatri.methylsilyloxy)neopentane;

(ii) linear volatile polydialkylsiloxanes containing 2 to 9 silicon atoms and having a viscosity of less than or equal to \(5 \times 10^{-6}\) m²/s at 25°C. An example is decamethyltetrasiloxane sold in particular under the name SH 200 by the company Toray Silicone. Silicones belonging to this category are also described in the article published in Cosmetics and Toiletries, Vol. 91, Jan. 76, P. 27-32 - Todd & Byers "Volatile Silicone fluids for cosmetics".

Use is preferably made of non-volatile polydialkylsiloxanes, polydialkylsiloxane gums and resins, polyorganosiloxanes modified by the organofunctional groups above, and mixtures thereof.
These silicones are more particularly chosen from polydialkylsiloxanes, among which mention may be made mainly of polydimethylsiloxanes bearing trimethylsilyl end groups. The viscosity of the silicones is measured at 25°C according to Standard ASTM 445 Appendix C.

Among these polydialkylsiloxanes, mention may be made, in a nonlimiting manner, of the following commercial products:

- the Silbione® oils of the 47 and 70 047 series or the Mirasil® oils sold by Rhodia, for instance the oil 70 047 V 500 000;
- the oils of the Mirasil® series sold by the company Rhodia;
- the oils of the 200 series from the company Dow Corning, such as DC200 with 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 bearing dimethylsilanol end groups known under the name dimethiconol (CTFA), such as the oils of the 48 series from the company Rhodia.

In this category of polydialkylsiloxanes, mention may also be made of the products sold under the names Abil Wax® 9800 and 9801 by the company Goldschmidt, which are poly(CrC₆O)₈dialkylsiloxanes.

The silicone gums that may be used in accordance with the invention are in particular polydialkylsiloxanes and preferably polydimethylsiloxanes with 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, polyphenylmethyisiloxane (PPMS) oils, isoparaffins, polyisobutylenes, methylene chloride, pentane, dodecane and tridecane, or mixtures thereof.

Products that may be used more particularly in accordance with the invention are mixtures such as:

- the mixtures formed from a hydroxy-terminated polydimethylsiloxane or dimethiconol (CTFA) chain, and from a cyclic polydimethylsiloxane, also known as cyclomethicone (CTFA), such as the product Q2 1401 sold by the company Dow Corning;
- mixtures of a polydimethylsiloxane gum and a cyclic silicone, such as the product SF 1214 Silicone Fluid from the company 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;
mixtures of two PDMSs with different viscosities, and more particularly of a PDMS gum and of a PDMS oil, such as the product SF 1236 from the company General Electric. The product SF 1236 is a mixture of a gum SE 30 defined above, with a viscosity of 20 m²/s and of an oil SF 96 with a viscosity of 5×10⁻⁶ m²/s. This product preferably comprises 15% of gum SE 30 and 85% of an oil SF 96.

The organopolysiloxane resins that may be used in accordance with the invention are crosslinked siloxane systems containing the following units:

$$R_2SiO_{2/2}, R_3SiO_{1/2}, RSiO_{3/2}$$ and $$SiO_{4/2},$$

in which R represents an alkyl containing 1 to 16 carbon atoms. Among these products, the ones that are particularly preferred are those in which R denotes a C₁-C₄ lower alkyl group, more particularly methyl.

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

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

The organomodified silicones that may be used in accordance with the invention are silicones as defined previously and comprising in their structure one or more organofunctional groups attached via a hydrocarbon-based group.

Besides the silicones described above, the organomodified silicones may be polydiarylsiloxanes, in particular polydiphenylsiloxanes, and polyalkylarylsiloxanes functionalized by the organofunctional groups mentioned previously.

The polyalkylarylsiloxanes are particularly chosen from linear and/or branched polydimethyl/methylphenylsiloxanes and polydimethyl/diphenylsiloxanes with a viscosity ranging from 1×10⁻⁵ to 5×10⁻² m²/s at 25°C.

Among these polyalkylarylsiloxanes, examples that may be mentioned include 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.
Among the organomodified silicones, mention may be made of polyorganosiloxanes comprising:

- polyethylenoxy and/or polypropyleneoxy groups optionally comprising C$_6$-$C_{24}$ alkyl groups, such as the products known as dimethicone copolyol sold by the company Dow Corning under the name DC 1248 or the oils Silwet® L 722, L 7500, L 77 and L 711 by the company Union Carbide, and the (Cl$_2$)alkylmethicone copolyol sold by the company Dow Corning under the name Q2 5200;

- substituted or unsubstituted amino groups, such as the products sold under the names GP 4 Silicone Fluid and GP 7100 by the company Genesee or the products sold under the names Q2 8220 and Dow Corning 929 or 939 by the company Dow Corning. The substituted amino groups are, in particular, C$_1$-C$_4$ 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 the company Goldschmidt.

The fatty substance(s) does (do) not comprise any C$_2$-C$_3$ oxyalkylene units. Preferably, they do not contain any glycerolated units. More particularly, the fatty substances are other than fatty acids.

More particularly, the fatty substances are chosen from compounds that are liquid or pasty at ambient temperature and at atmospheric pressure.

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

According to one preferred variant, the fatty substances are not silicone-based.

The fatty substances are preferably chosen from C$_6$-Cl$_6$ hydrocarbons, hydrocarbons comprising more than 16 carbon atoms, non-silicone oils of animal origin, triglycerides of plant or synthetic origin, fatty alcohols, fatty acid and/or fatty alcohol esters, or mixtures thereof.

Preferably, the fatty substance is chosen from liquid petroleum jelly, liquid paraffin, polydecenes, fatty acid and/or fatty alcohol esters that are liquid at ambient temperature and at ambient pressure, fatty alcohols that are liquid at ambient temperature and at ambient pressure, or mixtures thereof.
The composition according to the invention comprises at least 70% of fatty substances and preferably at least 70% of oils. The composition according to the invention more particularly has a fatty substance content ranging from 70% to 90% by weight, even better still from 75% to 85% by weight, relative to the weight of the composition, and quite particularly an oil content ranging from 70% to 90% by weight, even better still from 75% to 85% by weight, relative to the weight of the composition.

Oxyethylenated surfactants

The composition according to the invention comprises at least one oxyethylenated (OE) non-ionic surfactant comprising a number of OE units ranging from 1 to 9 and at least one oxyethylenated (OE) non-ionic surfactant comprising at least 10 OE units. According to one advantageous embodiment, the weight ratio of the amount of oxyethylenated non-ionic surfactant(s) comprising at least 10 OE units to the amount of oxyethylenated non-ionic surfactant(s) comprising a number of OE units ranging from 1 to 9, is greater than or equal to 1, preferably greater than or equal to 2. This weight ratio can range, for example, from 1 to 25, better still from 2 to 15 and even better still from 3 to 10.

The oxyethylenated non-ionic surfactants comprising a number of OE units ranging from 1 to 9 and the oxyethylenated (OE) non-ionic surfactants comprising at least 10 OE units can be chosen from the following categories:

- oxyethylenated \((C_8-C_{24})\)alkyphenols,
- saturated or unsaturated, linear or branched, oxyethylenated, \(C_8-C_{30}\) and preferably \(C_{12}-C_{22}\) fatty alcohols,
- saturated or unsaturated, linear or branched, oxyethylenated \(C_8-C_{30}\) amides,
- esters of saturated or unsaturated, linear or branched, \(C_8-C_{30}\) acids and of polyethylene glycols,
- polyoxyethylenated esters of saturated or unsaturated, linear or branched, \(C_8-C_{30}\) acids and of sorbitol,
- saturated or unsaturated, oxyethylenated plant oils, and mixtures thereof.

Preferably, the oxyethylenated non-ionic surfactant comprising at least 10 OE units and the oxyethylenated non-ionic surfactant comprising from 1 to 9 OE units are chosen from oxyethylenated derivatives of saturated or unsaturated, linear or branched, preferably linear, \(C_8-C_{30}\), preferably \(C_{12}-C_{22}\), fatty alcohols, for instance
cetyl alcohol, oleyl alcohol, oleocetyl alcohol, lauryl alcohol, behenyl alcohol, cetearyl alcohol, stearyl alcohol and isostearyl alcohol, and mixtures thereof.

As oxyethylenated non-ionic surfactant comprising from 1 to 9 OE units, use is preferably made of oxyethylenated non-ionic surfactants comprising from 2 to 8 and preferably from 3 to 6 OE units, for instance the products of addition of ethylene oxide and lauryl alcohol, for instance lauryl alcohol 2 OE (CTFA name: laureth-2), the products of addition of ethylene oxide and decyl alcohol, for instance decyl alcohol 3 OE (CTFA name: deceth-3), decyl alcohol 5 OE (CTFA name: deceth-5), the products of addition of ethylene oxide and oleocetyl alcohol, for instance oleocetyl alcohol 5 OE (CTFA name: oleoceteth-5), and mixtures thereof.

Mention may in particular be made of the following commercial products:

Mergital LM2 (Cognis) [lauryl alcohol 2 OE];
Empilan KA 2.5/90FL (Albright & Wilson) and Emulgin BL309 (Cognis)
[decyl alcohol 3 OE];
Empilan KA 5/90 FL (Albright & Wilson) and Emulgin BL589 (Cognis)
[decyl alcohol 5 OE];
Emulgin 05 (Cognis) [oleocetyl alcohol 5 OE].

The content of oxyethylenated non-ionic surfactant(s) comprising from 1 to 9 OE units in the composition (A) according to the invention may range from 0.01% to 10% by weight, preferably from 0.1% to 5% by weight and better still from 0.5% to 2% by weight relative to the total weight of the composition (A).

The oxyethylenated non-ionic surfactants comprising at least 10 OE units used in the invention may in particular have a number of oxyethylene groups ranging from 10 to 50, preferably from 15 to 30.

According to one embodiment, the oxyethylenated non-ionic surfactants comprising at least 10 OE units used in the invention comprise at least 15 oxyethylene groups.

As oxyethylenated non-ionic surfactant comprising at least 10 OE units, mention may be made, for example, of the products of addition of ethylene oxide with lauryl alcohol, in particular those comprising from 10 to 50 oxyethylene groups and more particularly those comprising from 10 to 30 oxyethylene groups (CTFA names: Laureth-10 to Laureth-30); the products of addition of ethylene oxide with behenyl alcohol, in particular those comprising from 10 to 50 oxyethylene groups (CTFA names: Beheneth-9 to Beheneth-50); the products of addition of ethylene oxide with
cetearyl alcohol (mixture of cetyl alcohol and stearyl alcohol), in particular those comprising from 10 to 30 oxyethylene groups (CTFA names: Ceteareth-10 to Ceteareth-30); the products of addition of ethylene oxide with cetyl alcohol, in particular those comprising from 10 to 30 oxyethylene groups (CTFA names: Ceteth-10 to Ceteth-30); the products of addition of ethylene oxide with stearyl alcohol, in particular those comprising from 10 to 30 oxyethylene groups (CTFA names: Steareth-10 to Steareth-30); the products of addition of ethylene oxide with isostearyl alcohol, in particular those comprising from 10 to 50 oxyethylene groups (CTFA names: Isosteareth-10 to Isosteareth-50); the products of addition of ethylene oxide with oleyl alcohol, in particular those comprising from 10 to 30 oxyethylene groups (CTFA names: Oleth-10 to Oleth-30) and mixtures thereof.

According to one embodiment, use is in particular made of the products of addition of ethylene oxide with oleyl alcohol, in particular those comprising from 10 to 20 oxyethylene groups, for instance the products sold under the references Brij 96V (Oleth-10) and Brij 98V (Oleth-20) by the company Croda.

The content of oxyethylenated non-ionic surfactants comprising at least 10 oxyalkylene groups in the composition according to the invention may range from 0.1% to 20% by weight, preferably from 0.5% to 10% by weight, better still from 1% to 10% by weight and even better still from 1% to 6% by weight relative to the total weight of the composition.

Preferably, the weight ratio in the composition of the invention of the amount of oxyethylenated non-ionic surfactant(s) comprising at least 10 OE units to the amount of oxyethylenated non-ionic surfactant(s) comprising a number of OE units ranging from 1 to 9, is greater than or equal to 1, preferably greater than or equal to 2.

This weight ratio can preferably range, for example, from 1 to 25, better still from 2 to 15 and even better still from 3 to 10.

According to one preferred embodiment, the total amount of oxyethylenated non-ionic surfactants in the composition is preferably less than or equal to 10% by weight relative to the total weight of the composition. It can range from 0.1% to 10% by weight and preferably from 1% to 7% by weight.

**Basing agents**
The composition according to the invention advantageously comprises one or more basifying agents.

The basifying agent may be inorganic or organic or hybrid.

The inorganic basifying agent(s) is (are) preferably chosen from aqueous ammonia, alkali metal carbonates or bicarbonates, sodium hydroxide and potassium hydroxide, and mixtures thereof.

The organic basifying agent(s) is (are) preferably chosen from organic amines with a pKb at 25°C of less than 12, preferably less than 10 and even more advantageously less than 6. It should be noted that it is the pKb corresponding to the function of highest basicity.

The organic basifying agent(s) is (are) chosen, for example, from alkanolamines, oxyethylenated and/or oxypropylenated ethylenediamines, amino acids and the compounds of formula (A1) below:

\[
\begin{align*}
\text{Rx} & \quad \text{Ry} \\
\text{N} & \quad \text{W} \\
\text{Rz} & \quad \text{Rt}
\end{align*}
\]

(A1)

in which W is a C1-C6 alkylene residue optionally substituted with a hydroxyl group or a C1-C6 alkyl radical; Rx, Ry, Rz and Rt, which may be identical or different, represent a hydrogen atom or a C1-C6 alkyl, C6 hydroxyalkyl or C6 aminoalkyl radical.

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

The term "alkanolamine" is intended to mean an organic amine comprising a primary, secondary or tertiary amine function, and one or more linear or branched C4 alkyl groups bearing one or more hydroxyl radicals.

Alkanolamines such as monoalkanolamines, dialkanolamines or trialkanolamines comprising from one to three identical or different C4 hydroxyalkyl radicals are in particular suitable for performing the invention.

Among the compounds of this type, mention may be made of monoethanolamine, diethanolamine, triethanolamine, monoisopropanolamine, diisopropanolamine, N-dimethylaminoethanolamine, 2-amino-2-methyl-1-propanol, triisopropanolamine, 2-amino-2-methyl-1,3-propanediol, 3-amino-1,2-propanediol, 3-dimethylamino-1,2-propanediol and tris(hydroxymethylamino)methane.
More particularly, the amino acids that may be used are of natural or synthetic origin, in their L, D or racemic form, and comprise at least one acid function more particularly chosen from carboxylic acid, sulfonic acid, phosphonic acid and phosphoric acid functions. The amino acids may be in neutral or ionic form.

As amino acids that can be used in the present invention, mention may be made in particular of aspartic acid, glutamic acid, alanine, arginine, ornithine, citrulline, asparagine, carnitine, cysteine, glutamine, glycine, 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 function optionally included in a ring or in a ureido function. Such basic amino acids are preferably chosen from those corresponding to formula (A2) below:

\[
R - \text{CH}_2 - \text{CH}_2^\infty \text{NH}_2^{(A2)}
\]

in which \( R \) denotes a group chosen from:

- \(-(\text{CH}_2)_3\text{NH}_2;\)
- \(-(\text{CH}_2)_2\text{NH}_2;\)
- \(-(\text{CH}_2)_2\text{NHCONH}_2;\)
- \(-(\text{CH}_2)_2\text{NH} = \text{C} - \text{NH}_2;\)

The compounds corresponding to formula (A2) are histidine, lysine, arginine, ornithine and citrulline.

The organic amine may also be chosen from organic amines of heterocyclic type. Besides histidine that has already been mentioned in the amino acids, mention may be made in particular of pyridine, piperidine, imidazole, triazole, tetrazole and benzimidazole.

The organic amine may also be chosen from amino acid dipeptides. As amino acid dipeptides that may be used in the present invention, mention may be made in particular of carnosine, anserine and balenine.
The organic amine may also be chosen from compounds comprising a guanidine function. As amines of this type that may be used in the present invention, besides arginine, which has already been mentioned as an amino acid, mention may be made in particular of creatine, creatinine, 1,1-dimethylguanidine, 1,1-diethylguanidine, glycocyamine, metformin, agmatine, N-amidinoalanine, 3-guanidinopropionic acid, 4-guanidinobutyric acid and 2-((amino(imino)methyl)amino)ethane-1-sulfonic acid.

Preferably, the organic amine present in the dyeing and/or lightening agent of the invention is an alkanolamine.

More preferentially still, the organic amine is monoethanolamine.

Hybrid compounds that may be mentioned include the salts of the amines mentioned previously with acids such as carbonic acid or hydrochloric acid. Guanidine carbonate or monoethanolamine hydrochloride may in particular be used.

Advantageously, the content of basifying agent(s) ranges from 0.01% to 30% by weight and preferably from 0.1% to 20% by weight relative to the total weight of the composition(s) containing same and preferably relative to the total weight of the composition of the invention.

The composition of the invention preferably contains one or more alkanolamines and/or one or more basic amino acids.

Preferably, the composition comprises monoethanolamine.

In a first variant of the invention, if the composition comprises aqueous ammonia or a salt thereof and other basifying agents, then the amount of basifying agent(s) other than the aqueous ammonia is greater than that of aqueous ammonia (expressed as $\text{NH}_3$).

In a second variant of the invention, the composition does not comprise aqueous ammonia.

**Cationic polymer**

It is recalled that, for the purposes of the present invention, the term "cationic polymer" denotes any polymer containing cationic groups and/or groups that can be ionized into cationic groups.
Preferably, the cationic polymer present in the composition according to the invention is a linear, random, graft or block homopolymer or copolymer and comprises at least one cationic group and/or group that can be ionized into a cationic group chosen from primary, secondary, tertiary and/or quaternary amine groups that form part of the main polymer chain or that are borne by a side substituent directly connected thereto.

Preferably, the cationic charge density of the cationic polymers according to the invention is greater than 1 meq/g, better still greater than or equal to 4 meq/g.

This charge density is determined by the Kjeldahl method. It may also be calculated from the chemical nature of the polymer.

The cationic polymers used generally have a number-average molecular weight of between 500 and $5 \times 10^6$ approximately and preferably between $10^3$ and $3 \times 10^6$.

Among the cationic polymers, mention may more particularly be made of polymers of the polyamine, polyaminoamide and polyquaternary ammonium type.

These are known products and are in particular described in patents FR 2505348 or FR 2542997.

Among the cationic polymers that can be used in the context of the invention, mention may be made of the following polymers, alone or as a blend:

(1) Homopolymers or copolymers derived from acrylic or methacrylic esters or amides and comprising at least one of the units of formula (I), (II), (III) or (IV) below:

![Diagram of polymer structures (I) to (IV)]

in which

$R_3$, which may be identical or different, denote a hydrogen atom or a CH$_3$ radical;

$A$, which may be identical or different, represent a linear or branched C$_2$-C$_6$ and preferably C$_2$-C$_3$ alkyl group or a C$_2$-C$_4$ hydroxyalkyl group;

$R_4$, $R_5$ and $R_6$, which may be identical or different, represent a C$_1$-C$_6$ alkyl group or a benzyl radical, and preferably a C$_1$-C$_6$ alkyl group;

$R_1$ and $R_2$, which may be identical or different, represent hydrogen or a C$_1$-C$_6$ alkyl group, and preferably methyl or ethyl;

$X$ denotes an anion derived from an inorganic or organic acid, such as a methosulfate anion or a halide such as chloride or bromide.
The polymers of family (1) can also contain one or more units derived from comonomers which may be chosen from the family of acrylamides, methacrylamides, diacetone acrylamides, acrylamides and methacrylamides substituted on the nitrogen with lower (C\(_4\)) alkyls, acrylic or methacrylic acids or esters thereof, vinyl lactams such as vinylpyrrolidone or vinylcaprolactam, and vinyl esters.

Thus, among these polymers of family (1), mention may be made of:

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

- the copolymers of acrylamide and of methacryloyloxyethyl-trimethylammonium chloride described, for example, in EP 80 976 and sold under the name Bina Quat P 100 by the company Ciba Geigy,

- the copolymer of acrylamide and of methacryloyloxyethyltrimethylammonium methosulfate sold under the name Reten by the company Hercules,

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

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

- vinylpyrrolidone/methacrylamidopropyl(dimethylaminoethyl methacrylate copolymers sold in particular under the name Styleze CC 10 by ISP,

- quaternized vinylpyrrolidone/dimethylaminopropylmethacrylamide copolymers such as the product sold under the name Gafquat HS 100 by the company ISP,

- the crosslinked polymers of methacryloyloxy(Ci-C\(_4\))alkyl tri(Ci-C\(_4\))alkyammonium salts, such as the polymers obtained by homopolymerization of dimethylaminoethyl methacrylate quaternized with methyl chloride, or by copolymerization of acrylamide with dimethylaminoethyl methacrylate quaternized with methyl chloride, the homo- or copolymerization being followed by crosslinking with an olefinically unsaturated compound, more particularly methylenebisacrylamide. Use may be made more particularly of a crosslinked acrylamide/methacryloyloxyethyltrimethylammonium chloride copolymer (20/80 by weight) in the form of a dispersion containing 50% by weight of said copolymer in mineral oil. This dispersion is sold under the name Salcare® SC 92 by the company Ciba. Use may also be made of a crosslinked homopolymer of methacryloyloxyethyltrimethylammonium chloride comprising approximately 50% by weight of the homopolymer in mineral oil or in a liquid ester.
These dispersions are sold under the names of Salcare® SC 95 and Salcare® SC 96 by the company Ciba.

(2) Cationic cellulose derivatives such as cellulose copolymers or cellulose derivatives grafted with a water-soluble quaternary ammonium monomer, and disclosed in particular in US 4 131 576, such as hydroxyalkyi celluloses, for instance hydroxymethyl, hydroxyethyl or hydroxypropyl celluloses grafted in particular with a methacryloylethyltrimethylammonium, methacrylamidopropyltrimethylammonium or dimethylidiallylammonium salt.

The commercial products corresponding to this definition are more particularly the products sold under the names Celquat L 200 and Celquat H 100 by the company National Starch.

(3) Cationic guar gums described more particularly in US 3 589 578 and US 4 031 307, such as guar gums containing trialkylammonium cationic groups. Use is made, for example, of guar gums modified with a 2,3-epoxypropyltrimethylammonium salt (for example, chloride).

Such products are sold in particular under the trade names Jaguar C13S, Jaguar C15, Jaguar C17 and Jaguar C162 by the company Meyhall.

(4) Polymers consisting of piperazinyl units and of divalent alkylene or hydroxyalkylene radicals containing straight or branched chains, optionally interrupted by oxygen, sulfur or nitrogen atoms or by aromatic or heterocyclic rings, and also the oxidation and/or quaternization products of these polymers. Such polymers are described, in particular, in FR 2 162 025 and FR 2 280 361.

(5) Water-soluble polyaminoamides prepared in particular by polycondensation of an acidic compound with a polyamine; these polyaminoamides can be crosslinked with an epihalohydrin, a diepoxide, a dianhydride, an unsaturated dianhydride, a bis-unsaturated derivative, a bis-halohydrin, a bis-azetidinium, a bis-haloacyldiamine, a bis-alkyl halide or alternatively with an oligomer resulting from the reaction of a difunctional compound which is reactive with a bis-halohydrin, a bis-azetidinium, a bis-haloacyldiamine, a bis-alkyl halide, an epihalohydrin, a diepoxide or a bis-unsaturated derivative; the crosslinking agent being used in proportions ranging from 0.025 to 0.35 mol per amine group of the polyaminoamide; these polyaminoamides may be alkylated or, if they contain one or more tertiary amine functions, they may be quaternized. Such polymers are described, in particular, in FR 2 252 840 and FR 2 368 508.

Polyaminoamide derivatives resulting from the condensation of polyalkylene polyamines with polycarboxylic acids followed by alkylation with difunctional agents. Mention may be made, for example, of adipic acid/dialkylaminoxyalkyl-
dialkylenetriamine polymers in which the alkyl radical is \( \text{C}_1-\text{C}_4 \) and preferably denotes methyl, ethyl or propyl. Such polymers are described in particular in FR 1 583 363.

Among these derivatives, mention may be made more particularly of the dimethyldiallylammonium chloride homopolymer sold under the name Cartarine F, F4 or F8 by the company Sandoz.

(6) Polymers obtained by reaction of a polyalkylene polyamine containing two primary amine groups and at least one secondary amine group with a dicarboxylic acid chosen from diglycolic acid and saturated \( \text{C}_3-\text{C}_8 \) aliphatic dicarboxylic acids. The mole ratio between the polyalkylene polyamine and the dicarboxylic acid is between 0.8: 1 and 1.4: 1; the polyaminoamide resulting therefrom is reacted with epichlorohydrin in a mole ratio of epichlorohydrin relative to the secondary amine group of the polyaminoamide of between 0.5: 1 and 1.8: 1. Such polymers are described in particular in US 3 227 615 and US 2 961 347.

Polymers of this type are sold in particular under the name Hercosett 57, PD 170 or Delsette 101 by the company Hercules.

(7) Cycopolymers of alkylidiallylamino or of dialkyldiallylammonium, such as the homopolymers or copolymers containing, as main constituent of the chain, units corresponding to formula (V) or (VI):

![Chemical structure](image)

in which formulae \( k \) and \( t \) are equal to 0 or 1, the sum \( k + t \) being equal to 1; \( R_9 \) denotes a hydrogen atom or a methyl radical; \( R_7 \) and \( R_8 \), independently of each other, denote a \( \text{C}_1-\text{C}_8 \) alkyl group, a hydroxyalkyl group in which the alkyl group is \( \text{C}_1-\text{C}_5 \); an amidoalkyl group in which the alkyl is \( \text{C}_1-\text{C}_4 \); \( R_7 \) and \( R_8 \) can also denote, together with the nitrogen atom to which they are attached, a heterocyclic group such as piperidyl or morpholinyl; \( R_7 \) and \( R_8 \), independently of each other, preferably denote a \( \text{C}_1-\text{C}_4 \) alkyl group; \( Y^- \) is an organic or inorganic anion such as bromide, chloride, acetate, borate, citrate, tartrate, bisulfate, bisulfite, sulfate or phosphate. These polymers are described in particular in FR 2 080 759 and FR 2 190 406.

The cycopolymers preferably comprise at least one unit of formula (V).

As regards the copolymers, they also comprise an acrylamide monomer.

Among the polymers defined above, mention may be made more particularly of the dimethyldiallylammonium chloride homopolymer sold under the name...
Merquat I by the company Nalco (and its homologues of low weight-average molecular weight) and the copolymers of diallyldimethylammonium chloride and of acrylamide, sold under the name Merquat 550.

(8) The quaternary diammonium polymer containing repeating units corresponding to the formula:

\[
\begin{array}{c}
\text{R}^{\text{IO}} \quad \text{N}^+ \quad \text{A} \quad \text{N}^+ \quad \text{B} \quad \text{R}^{\text{12}} \\
\text{Xi} \\
\text{R}^{\text{11}} \quad \text{X}^- \\
\end{array}
\]

(7)

in which formula:

RIO, RII, R12 and R13, which may be identical or different, represent C1-C20 aliphatic, alicyclic or arylaliphatic radicals or hydroxyalkylaliphatic radicals in which the alkyl radical is C1-C4, or alternatively RIO, RII, R12 and R13, together or separately, constitute, with the nitrogen atoms to which they are attached, heterocycles optionally containing a second heteroatom other than nitrogen, or alternatively R10, R11, R12 and R13 represent a linear or branched C1-C6 alkyl radical substituted with a nitrile, ester, acyl or amide group or a group CO-O-R14-D or CO-N-H-R14-D where R14 is an alkylene and D is a quaternary ammonium group;

A1 and B1 represent C2-C20 polymethylene groups which may be linear or branched, saturated or unsaturated, and which may contain, linked to or intercalated in the main chain, one or more aromatic rings or one or more oxygen or sulfur atoms or sulfoxide, sulfone, disulfide, amino, alkylamino, hydroxyl, quaternary ammonium, ureido, amide or ester groups, and

X- denotes an anion derived from an inorganic or organic acid,

A1, R10 and R12 can form, with the two nitrogen atoms to which they are attached, a piperazine ring;

in addition, if A1 denotes a linear or branched, saturated or unsaturated alkylene or hydroxyalkylene radical, B1 can also denote a group -(CH2)n-CO-D-OC-(CH2)n in which n is between 1 and 100 and preferably between 1 and 50, and D denotes:

a) a glycol residue of formula: -O-Z-O-, where Z denotes a linear or branched hydrocarbon-based radical or a group corresponding to one of the following formulae: -(CH2)n-CO-D-OC-(CH2)n and -(CH2)n-CH(CH3)i-CO-D-OC-(CH2)n where n is an integer from 1 to 4, representing a defined and unique degree of polymerization or any number from 1 to 4 representing an average degree of polymerization;

b) a bis-secondary diamine residue such as a piperazine derivative;
c) a bis-primary diamine residue of formula: \(-\text{NH-Y-NH}\), where \(Y\) denotes a linear or branched hydrocarbon-based radical, or alternatively the radical \(-\text{CH}_2\text{CH}_2\text{S-S-CH}_2\text{CH}_2\);  
d) a ureylene group of formula: \(-\text{NH-CO-NH}\).

Preferably, \(X^-\) is an anion such as chloride or bromide.

These polymers have a number-average molecular weight generally of between 1000 and 100 000.


It is more particularly possible to use polymers that consist of repeating units corresponding to the following formula (VIII):

\[
\begin{array}{cccc}
R_{10} & R_{12} & N^+ (\text{CH}_2)_n & N^+ (\text{CH}_2)_p \\
R_{11} & R_{13} & X^- & X^- \\
\end{array}
\]

(VIII)

in which \(R_{10}, R_n, R_{12}\) and \(R_{13}\), which may be identical or different, denote a C1-C4 alkyl or hydroxyalkyl radical, \(n\) and \(p\) are integers ranging from 2 to 20 approximately, and \(X^-\) is an anion derived from an inorganic or organic acid.

(9) Polyquaternary ammonium polymers consisting of repeating units of formula (IX):

\[
\begin{array}{cccc}
\text{CH}_3 & X^- & \text{CH}_3 & X^- \\
\text{N}^- (\text{CH}_2)_n \text{NH-CO-D-NH}^- & \text{CH}_3 & \text{N}^- (\text{CH}_2)_p & \text{O}^- (\text{CH}_2)_2 \\
\text{CH}_3 & & \text{CH}_3 & \\
\end{array}
\]

(IX)

in which \(p\) denotes an integer ranging from 1 to 6 approximately, \(D\) may be zero or may represent a group \(-(\text{CH}_2)_r\text{CO}\) in which \(r\) denotes a number equal to 4 or 7, and \(X^-\) is an anion.

Such polymers may be prepared according to the processes described in US 4 157 388, US 4 702 906 and US 4 719 282. They are in particular described in patent application EP 122 324.

Among these polymers, examples that may be mentioned include the products Mirapol A 15, Mirapol AD1, Mirapol AZ1 and Mirapol 175 sold by the company Miranol.
Quaternary polymers of vinylpyrrolidone and of vinylimidazole, for instance the products sold under the names Luviquat FC 905, FC 550 and FC 370 by the company BASF.

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

Other cationic polymers that may be used in the context of the invention are polyalkyleneimines, in particular polyethyleneimines, polymers containing vinylpyridine or vinylpyridinium units, condensates of polyamines and of epichlorohydrin, polyquaternary ureylene and chitin derivatives.

Among all the cationic polymers that may be used in the context of the present invention, it is preferred to use, alone or as blends, polymers of families (1), (7), (8) and (9). In accordance with one more particular embodiment of the invention, it is preferred to use polymers of families (7), (8) and (9).

According to one even more advantageous embodiment of the invention, use is made of polymers of families (7) and (8) alone or as blends, and even more preferentially of polymers having repeating units of formulae (W) and (U) below:

\[
\text{CH}_3 \quad \text{CH}_3 \\
- \left[ N_{\text{Cl}}^+ \text{(CH}_2)_3 \cdot N_{\text{Cl}}^+ \text{(CH}_2)_6 \right] \quad (W)
\]

\[
\text{CH}_3 \quad \text{C}_2\text{H}_5 \\
- \left[ N_{\text{Br}}^+ \text{(CH}_2)_3 \cdot N_{\text{Br}}^+ \text{(CH}_2)_3 \right] \quad (U)
\]

and in particular those of which the molecular weight, determined by gel permeation chromatography, is between 9500 and 9900;

\[
\text{CH}_3 \quad \text{C}_2\text{H}_5 \\
- \left[ N_{\text{Br}}^+ \text{(CH}_2)_3 \cdot N_{\text{Br}}^+ \text{(CH}_2)_3 \right] \quad (U)
\]

and in particular those of which the molecular weight, determined by gel permeation chromatography, is about 1200.

Preferably, the cationic polymer present in the composition according to the invention is chosen from polymers of families (7) and (8).

Better still, the cationic polymer present in the composition according to the invention is chosen from polymers of family (7), preferably dimethyldiallylammonium chloride.
homopolymers, polymers of formula (VIII) above, in particular polymers of formula (U) or (W), and blends thereof.

The composition according to the invention and/or the oxidizing composition may advantageously comprise from 0.01% to 10% by weight, more particularly from 0.05% to 6% by weight, even better still from 0.1% to 5% by weight of dry matter of cationic polymer(s) relative to the weight of the composition containing same.

**Dyes**

The composition according to the invention comprises one or more oxidation dyes.

The oxidation dyes are generally chosen from one or more oxidation bases optionally combined with one or more couplers.

By way of example, the oxidation bases are chosen from para-phenylenediamines, bis(phenyl)alkylenediamines, para-aminophenols, ortho-aminophenols and heterocyclic bases, and the addition salts thereof.


Among the bis(phenyl)alkylenediamines, examples that may be mentioned include N,N'-bis(p-hydroxyethyl)-N,N'-bis(4'-aminophenyl)-1,3-diaminopropanol, N,N'-bis(p-hydroxyethyl)-N,N'-bis(4'-aminophenyl)ethylenediamine, N,N'-bis(p-hydroxyethyl)-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 the addition salts thereof.

Among the para-aminophenols, examples that may be mentioned include para-aminophenol, 4-amino-3-methylphenol, 4-amino-3-chlorophenol, 4-amino-3-hydroxymethylphenol, 4-amino-2-methylphenol, 4-amino-2-hydroxymethylphenol, 4-amino-2-methoxymethylphenol, 4-amino-2-aminomethylphenol, 4-amino-2-(p-hydroxyethylaminomethyl)phenol and 4-amino-2-fluorophenol, and the addition salts thereof with an acid.

Among the ortho-aminophenols, examples that may be mentioned include 2-aminophenol, 2-aminophenyl, 2-aminophenol, 5-acetamido-2-aminophenol and the addition salts thereof.

Among the heterocyclic bases, examples that may be mentioned include pyridine derivatives, pyrimidine derivatives and pyrazole derivatives.

Among the pyridine derivatives, mention may be made of the compounds described, for example, in patents GB 1026 978 and GB 1153 196, for instance 2,5-diaminopyridine, 2-(4-methoxyphenyl)amino-3-aminopyridine and 3,4-diaminopyridine, and the addition salts thereof.
Other pyridine oxidation bases that are useful in the present invention are the 3-aminopyrazolo[1,5-a]pyridine oxidation bases or the addition salts thereof, described, for example, in patent application FR 2 801 308. Examples that may be mentioned include 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, 2-(3-aminopyrazolo[1,5-a]pyridin-2-yloxy)ethanol, 7-(morpholin-4-yl)pyrazolo[1,5-a]pyrid-3-ylamine, pyrazolo[1,5-a]pyridine-3,5-diamine, 5-(morpholin-4-yl)pyrazolo[1,5-a]pyrid-3-ylamine, 2-[(3-aminopyrazolo[1,5-a]pyridin-2-yloxy)ethanol, 2-[(3-aminopyrazolo[1,5-a]pyridin-7-yloxy)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 and 3-aminopyrazolo[1,5-a]pyridin-7-ol, and the addition salts thereof. Salts of 2-(3-aminopyrazolo[1,5-a]pyridin-2-yloxy)ethanol are particularly appreciated.

Among the pyrimidine derivatives, mention may be made 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-tetra-amino-pyrimidine, 4-hydroxy-2,5,6-triamino-pyrimidine, 2-hydroxy-4,5,6-triamino-pyrimidine, 2,4-dihydroxy-5,6-diamino-pyrimidine, 2,5,6-triamino-pyrimidine and the addition salts thereof, and the tautomeric forms thereof, when a tautomeric equilibrium exists.

Among the pyrazole derivatives, mention may be made of the compounds described in patents DE 3843892, 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-(p-hydroxyethyl)pyrazole, 3,4-diaminopyrazole, 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-amin-1,3-dimethyl-5-hydrazinopyrazole, 1-benzyl-4,5-diamino-3-methylpyrazole, 4,5-diamino-3-tert-butyl-1-methylpyrazole, 4,5-diamino-1-tert-butyl-3-methylpyrazole, 4,5-diamino-1-(p-hydroxyethyl)-3-methylpyrazole, 4,5-diamino-1-ethyl-3-methylpyrazole, 4,5-diamino-1-ethyl-3-(4'-methoxyphenyl)pyrazole, 4,5-diamino-1-ethyl-3-hydroxymethylpyrazole, 4,5-diamino-3-hydroxymethyl-1-methylpyrazole, 4,5-diamino-
3-hydroxymethyl-1-isopropylpyrazole, 4,5-diamino-3-methyl-1-isopropylpyrazole, 4-amino-5-(2'-aminoethyl)amino-1,3-dimethylpyrazole, 3,4,5-triamino-pyrazole, 1-methyl-3,4,5-triaminopyrazole, 3,5-diamino-1-methyl-4-methylaminopyrazole, 3,5-diamino-4-(p-hydroxyethyl)amino-1-methylpyrazole, and the addition salts thereof. Use may also be made of 4,5-diamino-1-(p-methoxyethyl)pyrazole. Use will preferably be made of a 4,5-diaminopyrazole and more preferably still of 4,5-diamino-1-(p-hydroxyethyl)pyrazole and/or a salt thereof. Pyrazole derivatives that may also be mentioned include diamino-N,N-dihydropyrazolopyrazolones and in particular those described in application FR-A-2 886 136, such as the following compounds and the addition salts thereof: 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, 2,3-diamino-6,7-dihydro-1H,5H-pyrazolo[1,2-a]pyrazol-1-one, 2-amino-3-(2-hydroxyethyl)amino-6,7-dihydro-1H,5H-pyrazolo[1,2-a]pyrazol-1-one, 2,3-diamino-5,6,7,8-tetrahydro-1H,5H-pyrazolo[1,2-a]pyrazol-1-one, 4-amino-1,2-diethyl-5-(pyrrolidin-1-yl)-1,2-dihydro-1H,5H-pyrazolo[1,2-a]pyrazol-1-one, 2,3-diamino-6-hydroxy-6,7-dihydro-1H,5H-pyrazolo[1,2-a]pyrazol-1-one or 2,3-diamino-6-hydroxy-6,7-dihydro-1H,5H-pyrazolo[1,2-a]pyrazol-1-one and/or a salt thereof. Heterocyclic bases that will preferentially be used include 4,5-diamino-1-(p-hydroxyethyl)pyrazolone and/or 2,3-diamino-6,7-dihydro-1H,5H-pyrazolo[1,2-a]pyrazol-1-one and/or 2-(3-amino-6,7-dihydro-1H,5H-pyrazolo[1,2-a]pyrazol-1-one. Use will preferably be made of 2,3-diamino-6,7-dihydro-1H,5H-pyrazolo[1,2-a]pyrazol-1-one and/or a salt thereof. Heterocyclic bases that will preferentially be used include 4,5-diamino-1-(p-hydroxyethyl)pyrazolone and/or 2,3-diamino-6,7-dihydro-1H,5H-pyrazolo[1,2-a]pyrazol-1-one and/or 2-(3-amino-6,7-dihydro-1H,5H-pyrazolo[1,2-a]pyrazol-1-one. Among these couplers, mention may be made in particular of meta-phenylenediamines, meta-aminophenols, meta-diphenols, naphthalene-based couplers and heterocyclic couplers, and also the addition salts thereof. Examples that may be mentioned include 1,3-dihydroxybenzene, 1,3-dihydroxy-2-methylbenzene, 4-chloro-1,3-dihydroxybenzene, 2,4-diamino-1-(3-
hydroxyethyloxy)benzene, 2-amino-4-(3-hydroxyethylamino)-1-methoxybenzene, 1,3-diaminobenzene, 1,3-bis(2,4-diaminophenoxy)propane, 3-ureidoaniline, 3-ureido-1-dimethylanobenzene, 2-methyl-5-amino phenol, 5-N-(p-hydroxyethyl)amino-2-methylphenol, 3-aminophenol, sesamol, 1,3-dihydroxyethylamino-3,4-methylenedioxy benzene, a-naphthol, 2-methyl-1-naphthol, 6-hydroxyindole, 4-hydroxyindole, 4-hydroxy-N-methylindole, 2-amino-3-hydroxypyridine, 6-hydroxy benzomorpholine, 3,5-diamino-2,6-dimethoxypyridine, 1-N-(β-hydroxyethyl)amino-3,4-methylenedioxy benzene, 2,6-bis(3-hydroxyethylamino)toluene, 6-hydroxyindoline, 2,6-dihydroxy-4-methylpyridine, 1-H-3-methylpyrazol-5-one, 1-phenyl-3-methylpyrazol-5-one, 2,6-dimethylpyrazolo[1,5-b]-1,2,4-triazole, 2,6-dimethyl[3,2-c]-1,2,4-triazole and 6-methylpyrazolo[1,5-a]benzimidazole, the addition salts thereof with an acid, and mixtures thereof.

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

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

The content of coupler(s), if it (they) is (are) present, each advantageously represent from 0.0001% to 10% by weight and preferably from 0.005% to 5% by weight relative to the total weight of the composition of the invention.

Preferably, the composition of the invention comprises at least one oxidation base and at least one coupler.

The composition according to the invention may optionally comprise, in addition to the oxidation dye(s) and preferably in addition to the oxidation dye(s), one or more synthetic or natural direct dyes, chosen from ionic and non-ionic species, preferably cationic or non-ionic species.

Examples of suitable direct dyes that may be mentioned include azo direct dyes; methine direct dyes; carbonyl direct dyes; azine direct dyes; nitro(hetero)aryl direct dyes; tri(hetero)arylmethane direct dyes; porphyrin direct dyes; phthalocyanine direct dyes, and natural direct dyes, alone or as mixtures.
Among the natural direct dyes that may be used according to the invention, mention may be made of lawsone, juglone, alizarin, purpurin, carminic acid, kermesic acid, purpurogallin, protocatechaldehyde, indigo, isatin, curcumin, spinulosin, apigenidin and orceins. Use may also be made of extracts or decoctions comprising these natural dyes and in particular henna-based poultices or extracts. When they are present, the direct dye(s) represent more particularly from 0.0001% to 10% by weight and preferably from 0.005% to 5% by weight relative to the total weight of the composition of the invention.

The composition of the invention may comprise water. According to one embodiment, the composition has a water content of less than or equal to 15% by weight, preferably less than or equal to 10% by weight and even more particularly less than 6% by weight, relative to the weight of said composition. The composition of the invention may also comprise one or more organic water-soluble solvents. The term "water-soluble" is intended to mean an organic solvent which has a solubility in water greater than or equal to 5% by weight at ordinary temperature (25°C) and at atmospheric pressure (760 mmHg).

Examples of organic solvents that may be mentioned include linear or branched and preferably saturated monoaucohols or diols, containing 2 to 10 carbon atoms, such as ethyl alcohol, isopropyl alcohol, hexylene glycol (2-methyl-2,4-pentanediol), neopentyl glycol and 3-methyl-1,5-pentanediol; aromatic alcohols such as phenylethyl alcohol; glycerol; polyols or polyol ethers, for instance ethylene glycol monomethyl, monoethyl and monobutyl ethers, 2-butoxyethanol, propylene glycol or ethers thereof, for instance propylene glycol, butylene glycol or dipropylene glycol monomethyl ether; and also diethylene glycol alkyl ethers, in particular of C1-C4, for instance diethylene glycol monoethyl ether or monobutyl ether, alone or as a mixture. The water-soluble organic solvents, when they are present, generally represent between 1% and 40% by weight relative to the total weight of the dye composition, and preferably between 5% and 30% by weight relative to the total weight of the composition of the invention.

According to one embodiment, the composition according to the invention is anhydrous. It should be noted that the water can also be in the form of bound water, such as the water of crystallization of salts, or traces of water absorbed by the raw materials used in the production of the compositions according to the invention.
A subject of the invention is also a two-compartment device comprising:
in one, a composition (A) comprising:
- at least one fatty substance,
- at least one oxyethylenated (OE) non-ionic surfactant comprising a
  number of OE units ranging from 1 to 9,
- at least one oxyethylenated (OE) non-ionic surfactant comprising at
  least 10 OE units,
- at least one alkaline agent,
- at least one cationic polymer and
- at least one oxidation dye,
the total amount of fatty substances in the composition (A) being greater
than or equal to 70% by weight relative to the total weight of said
composition, and
in the other, a composition (B) comprising at least one chemical oxidizing
agent, preferably hydrogen peroxide.

The oxidizing composition (B) comprises at least one chemical oxidizing agent.
The term "chemical oxidizing agent" is intended to mean an oxidant other than
atmospheric oxygen.
More particularly, the chemical oxidizing agent(s) are chosen from hydrogen
peroxide, urea peroxide, alkali metal bromates or ferricyanides, peroxygenated salts,
for instance alkali metal or alkaline-earth metal persulfates, perborates and
percarbonates, and also peracids and precursors thereof.
Preferably, the oxidizing agent is not chosen from peroxygenated salts.
Advantageously, the chemical oxidizing agent is hydrogen peroxide.
The content of chemical oxidizing agent(s) more particularly represents from 1% to
30% by weight and preferably from 5% to 15% by weight relative to the weight of the
composition containing same.
The oxidizing composition also preferably comprises one or more acidifying agents.
Among the acidifying agents, examples that may be mentioned include inorganic or
organic acids, for instance hydrochloric acid, orthophosphoric acid, sulfuric acid,
carboxylic acids, for instance acetic acid, tartaric acid, citric acid or lactic acid, and
sulfonic acids.
Usually, the pH of the oxidizing composition, when it is aqueous, is less than 8.5 and
preferably less than 7.
Preferably, the oxidizing composition comprises hydrogen peroxide as oxidizing agent, in aqueous solution, the concentration of which ranges, more particularly, from 0.1% to 50% by weight, preferably between 0.5% and 20% by weight and even more preferentially between 1% and 15% by weight relative to the weight of the oxidizing composition.

The oxidizing composition can also comprise an oxyethylenated surfactant chosen from oxyethylenated (OE) non-ionic surfactants comprising a number of OE units ranging from 1 to 9 and oxyethylenated (OE) non-ionic surfactants comprising at least 10 OE units described above, in the contents indicated.

The composition (B) can also comprise at least one fatty substance chosen from those previously described. According to one embodiment, the composition (B) comprises at least one fatty substance, preferably an oil, preferably chosen from liquid petroleum jelly, liquid paraffin, polydecenes, fatty acid and/or fatty alcohol esters that are liquid at ambient temperature and at atmospheric pressure, fatty alcohols that are liquid at ambient temperature and at atmospheric pressure, or mixtures thereof, in a content preferably greater than or equal to 10% by weight relative to the weight of the oxidizing composition.

According to one embodiment, the oxidizing composition comprises at least one fatty substance in a total content of fatty substances and preferably of oils of at least 30% by weight, preferably at least 35% by weight, better still at least 40% by weight and even better still at least 45% by weight relative to the weight of the oxidizing composition.

Preferably, the oxidizing composition contains water. Advantageously, the water concentration may range from 10% to 70% by weight and preferably from 20% to 55% by weight relative to the total weight of the oxidizing composition.

It may also comprise one or more water-soluble organic solvents such as those previously mentioned.

According to one preferred variant, the oxidizing composition of the invention comprises one or more optionally oxyalkylenated C₈₋₃₀ fatty acid amides. These amides may be present in a content ranging from 0.1% to 10% by weight, even more preferentially from 0.5% to 8% by weight and better still from 1% to 5% of the total weight of the composition.

The composition according to the invention and the oxidizing composition may also each contain various adjuvants conventionally used in hair dye compositions, such as...
anionic, non-ionic, amphoteric or zwitterionic polymers or blends thereof; antioxidants; penetrants; sequestrants; fragrances; dispersants; film-forming agents; preserving agents; opacifiers; "additional" surfactants different from the oxyethylenated surfactants described above.

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

The additional surfactants may in particular be chosen from anionic surfactants, non-ionic surfactants different from the oxyethylenated non-ionic surfactants described above, cationic surfactants, amphoteric surfactants or zwitterionic surfactants. Preferably, the surfactant(s) is (are) chosen from non-ionic surfactants or from anionic surfactants.

The term "anionic surfactant" is intended to mean a surfactant comprising, as ionic or ionizable groups, only anionic groups. These anionic groups are preferably chosen from the groups -CO$_2$H, -CO$_2$-, -SO$_3$H, -SO$_3$-, -OSO$_3$H, -OSO$_3$-, -H$_2$PO$_3$, -HP0$_3$-, -PO$_3$$_2^-$, -H$_2$PO$_2$, =HP0 _2, =HP0$_2$-, =P0$_2$-, =POH, =PO\.

As examples of anionic surfactants that may be used in the composition according to the invention, mention may be made of alkyi sulfates, alkyi ether sulfates, alkylamido ether sulfates, alkylarylpolyether sulfates, monoglyceride sulfates, alkylsulfonates, alkylamidesulfonates, alkyllarylsulfonates, oolefin sulfonates, paraffin sulfonates, alkylsulfosuccinaties, alkylether sulfosuccinates, alkylamide sulfosuccinates, alkylsulfoacetates, acylsarcosinates, acylglutamaties, alkylsulfosuccinamates, acylisethionates and N-acytlaursates, salts of alkyi monoesters of polyglycoside-polycarboxylic acids, acyllactylates, D-galactoside uronic acid salts, alkyi ether carboxylic acid salts, alkylaryl ether carboxylic acid salts, alkylamido ether carboxylic acid salts; and the corresponding non-salified forms of all these compounds; the alkyi 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 oxyethylenated and then preferably comprise from 1 to 50 ethylene oxide units.

The salts of C$_6$C$_{24}$ alkyi monoesters of polyglycoside-polycarboxylic acids may be chosen from C$_6$C$_{24}$ alkyi polyglycoside-citrates, C$_6$C$_{24}$ alkyi polyglycoside-tartrates and C$_6$C$_{24}$ alkyi polyglycoside-sulfosuccinates.

When the anionic surfactant(s) is (are) in salt form, it (they) may be chosen from alkali metal salts such as the sodium or potassium salt and preferably the sodium salt, the ammonium salts, the amine salts and in particular the amino alcohol salts or the alkaline-earth metal salts such as the magnesium salt.
Mention may in particular be made, as examples of aminoalcohol salts, of mono-, di- and triethanolamine salts, mono-, di- or trisopropanolamine 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 sodium or magnesium salts.

The anionic surfactants that may be present may be mild anionic surfactants, i.e. anionic surfactants without a sulfate function.

Mention may in particular be made, as regards the mild anionic surfactants, of the following compounds and their salts, and also mixtures thereof:

- Polyoxalkylenated alkyl ether carboxylic acids,
- Polyoxalkylenated alkylaryl ether carboxylic acids,
- Polyoxalkylenated alkylamido ether carboxylic acids, in particular those comprising from 2 to 50 ethylene oxide groups,
- Alkyl-D-galactosideuronic acids,
- Acyl sarcosinates, acyl glutamates, and alkylpolyglycoside carboxylic esters.

Use may be made most particularly of polyoxalkylenated carboxylic acid alkyl ethers, for instance carboxylic acid lauryl ether (4.5 OE) sold, for example, under the name Akypo RLM 45 CA from Kao.

By way of example of surfactants different from the oxyethenlated non-ionic surfactants described above, mention may be made of alkylpolyglycosides and monoglycerolated or polyglycerolated non-ionic surfactants. Monoglycerolated or polyglycerolated C₈₋C₄₀ alcohols are preferably used.

In particular, the monoglycerolated or polyglycerolated C₈₋C₄₀ alcohols correspond to the following formula:

\[ \text{RO-}\{\text{CH}_2\text{CH(CH}_3\text{OH)}\}_n\text{H} \]

in which \( R \) represents a linear or branched C₈₋C₄₀ and preferably C₈₋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 which are suitable in the context of the invention, of lauryl alcohol comprising 4 mol of glycerol (INCI name: Polyglyceryl-4 Lauryl Ether), lauryl alcohol containing 1.5 mol of glycerol, oleyl alcohol containing 4 mol of glycerol (INCI name: Polyglyceryl-4 Oleyl Ether), oleyl alcohol containing 2 mol of glycerol (INCI name: Polyglyceryl-2 Oleyl Ether), cetearyl alcohol containing 2 mol of glycerol, cetearyl alcohol containing 6 mol of glycerol, oleocetyl alcohol containing 6 mol of glycerol, and octadecanol containing 6 mol of glycerol.
The alcohol may 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 species of polyglycerolated fatty alcohols may coexist in the form of a mixture.

Among the monoglycerolated or polyglycerolated alcohols, it is more particularly preferred to use the \( \text{C}_6\text{C}_1 \) alcohol containing 1 mol of glycerol, the \( \text{C}_{10}\text{C}_2 \) alcohol containing 1 mol of glycerol and the \( \text{C}_{12} \) alcohol containing 1.5 mol of glycerol.

The content of additional surfactants in each composition more particularly represents from 0.01% to 20% by weight and preferably from 0.05% to 10% by weight relative to the weight of each composition.

The compositions of the invention may also comprise one or more inorganic thickeners chosen from organophilic clays and fumed silicas, or mixtures thereof. The organophilic clay can be chosen from montmorillonite, bentonite, hectorite, attapulgite or sepiolite, and mixtures thereof. The clay is preferably a bentonite or a hectorite.

These clays may be modified with a chemical compound chosen from quaternary amines, tertiary amines, amine acetates, imidazolines, amine soaps, fatty sulfates, alkylarylsulfonates and amine oxides, and mixtures thereof.

Organophilic clays that may be mentioned include quaternium-18 bentonites such as those sold under the names Bentone 3, Bentone 38 and Bentone 38V by the company Rheox, Tixogel VP by the company United Catalyst, Claytone 34, Claytone 40 and Claytone XL by the company Southern Clay; stearalkonium bentonites such as those sold under the names Bentone 27 by the company Rheox, Tixogel LG by the company United Catalyst and Claytone AF and Claytone APA by the company Southern Clay; quaternium-18/benzalkonium bentonites such as those sold under the names Claytone HT and Claytone PS by the company Southern Clay; quaternium-18/benzalkonium bentonites such as the products sold under the names Claytone HT and Claytone PS by the company Southern Clay, quaternium-18 hectorites such as those sold under the names Bentone Gel DOA, Bentone Gel EC05, Bentone Gel EUG, Bentone Gel IPP, Bentone Gel ISD, Bentone Gel SS71, Bentone Gel VS8 and Bentone Gel VS38 by the company Rheox, and Simagel M and Simagel S1 345 by the company Biophil.

The fumed silicas may be obtained by high-temperature hydrolysis 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 bear 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 may be:

- trimethylsiloxyl 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.

- dimethylsilyloxyl or polydimethylsiloxane groups, which are obtained in particular by treating fumed silica in the presence of polydimethylsiloxane or dimethyl dichlorosilane. 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 the company Degussa, and Cab-O-Sil TS-610® and Cab-O-Sil TS-720® by the company Cabot.

The fumed silica preferably has a particle size that may be nanometric to micrometric, for example ranging from about 5 to 200 nm.

When it is present, the inorganic thickener represents from 0.1% to 30% by weight relative to the weight of each composition.

The composition according to the invention and/or the oxidizing composition may also each comprise one or more polymeric organic thickener(s).

These thickeners may be chosen from fatty acid amides (coconut monoethanolamide or diethanolamide, oxyethylenated carboxylic acid monoethanolamide alkyl ether), polymeric thickeners such as cellulose-based thickeners (hydroxyethylcellulose, hydroxypropylcellulose or carboxymethylcellulose), guar gum and derivatives thereof (hydroxypropyl guar), gums of microbial origin (xanthan gum, scleroglucan gum), acrylic acid or acrylamidopropanesulfonic acid crosslinked homopolymers and associative polymers (polymers comprising hydrophilic regions and fatty-chain hydrophobic regions (alkyl or alkenyl containing at least 10 carbon atoms) that are capable, in an aqueous medium, of reversibly combining with each other or with other molecules).
According to one particular embodiment, the organic thickener is chosen from cellulose-based thickeners (hydroxyethylcellulose, hydroxypropylcellulose or carboxymethylcellulose), guar gum and derivatives thereof (hydroxypropyl guar), gums of microbial origin (xanthan gum, scleroglucan gum) and crosslinked homopolymers of acrylic acid or of acrylamidopropanesulfonic acid, and preferably from cellulose-based thickeners in particular with hydroxyethylcellulose.

The content of organic thickener(s), if they are present, usually ranges from 0.01% to 20% by weight and preferably from 0.1% to 5% by weight, relative to the weight of each composition.

The composition according to the invention may be in various forms, such as in the form of liquids, creams or gels, or in any other form that is suitable for dyeing keratin fibres, and in particular human hair.

Advantageously, the composition according to the invention is in the form of a gel or a cream.

The pH of the composition according to the invention is advantageously between 3 and 12, preferably between 5 and 11 and preferentially between 7 and 11, limits inclusive.

It may be adjusted to the desired value by means of acidifying or basifying agents customarily used in the dyeing of keratin fibres, or alternatively using standard buffer systems.

The alkaline and acidifying agents are, for example, those described previously.

The invention also relates to a process for dyeing human keratin fibres, consisting in applying to said fibres:

- a composition (A) comprising:
  - at least one fatty substance,
  - at least one oxyethylenated (OE) non-ionic surfactant comprising a number of OE units ranging from 1 to 9,
  - at least one oxyethylenated (OE) non-ionic surfactant comprising at least 10 OE units,
  - at least one alkaline agent,
  - at least one cationic polymer and
  - at least one oxidation dye,
the total amount of fatty substances in the composition (A) being greater than or equal to 70% by weight relative to the total weight of said composition, and a composition (B) comprising at least one chemical oxidizing agent, preferably hydrogen peroxide. Preferably, the weight ratio in the composition (A) of the amount of oxyethylenated non-ionic surfactant(s) comprising at least 10 OE units to the amount of oxyethylenated non-ionic surfactant(s) comprising a number of OE units ranging from 1 to 9, is greater than or equal to 1, preferably greater than or equal to 2.

- This weight ratio can preferably range, for example, from 1 to 25, better still from 2 to 15 and even better still from 3 to 10.

In a first variant, the compositions (A) and (B) are applied sequentially to dry or wet keratin fibres, with or without intermediate rinsing and preferably without intermediate rinsing, and in any order.

In a second variant, the mixture, produced at the time of use, of the compositions (A) and (B) is applied to said dry or wet fibres. The weight ratio of mixture of the compositions (A) and (B) then ranges from 0.1 to 10 and preferably from 0.5 to 5.

The total amount of fatty substances in the composition applied to keratin fibres after mixing of the compositions (A) and (B) is advantageously greater than or equal to 40% by weight of the weight of the agent, preferably greater than or equal to 45% by weight, better still greater than or equal to 50% by weight and even better still greater than or equal to 55% by weight. It may range from 40% to 70% by weight, better still from 45% to 65% by weight and even better still from 50% to 60% by weight.

The mixture composition or the compositions (A) and (B) is or are then left in place for a time usually ranging from one minute to one hour and preferably from 5 minutes to 30 minutes.

The temperature during the process conventionally ranges from ambient temperature (between 15°C and 25°C) to 80°C and preferably from ambient temperature to 60°C. After the treatment, the human keratin fibres are optionally rinsed with water, optionally washed with a shampoo and then rinsed with water, before being dried or left to dry.
The example that follows serves to illustrate the invention without, however, being limiting in nature.

**Example 1**

The following compositions are prepared (unless otherwise mentioned, the amounts are expressed in g% of product per se):

**Composition (A)**

<table>
<thead>
<tr>
<th>Ingredient</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Monoethanolamine</td>
<td>6.19</td>
</tr>
<tr>
<td>Tetramethyl hexamethylenediamine/1,3-dichloropropylene polycondensate (aqueous 60% solution; Hexadimethrine chloride) (Mexomere PO from Chimex)</td>
<td>0.3 AM</td>
</tr>
<tr>
<td>Polydimethyldiallylammonium chloride (non-stabilized aqueous 33% solution, Polyquaternium-6) (Merquat 106 from Nalco)</td>
<td>0.4 AM</td>
</tr>
<tr>
<td>2,5-Toluenediamine</td>
<td>0.066</td>
</tr>
<tr>
<td>2,4-Diaminophenoxyethanol hydrochloride</td>
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</tr>
<tr>
<td>2-Methyl-5-hydroxyethylaminophenol</td>
<td>0.02</td>
</tr>
<tr>
<td>N,N-Bis(2-hydroxyethyl)-p-phenylenediamine sulfate</td>
<td>0.015</td>
</tr>
<tr>
<td>Resorcinol</td>
<td>0.038</td>
</tr>
<tr>
<td>m-Aminophenol</td>
<td>0.023</td>
</tr>
<tr>
<td>Liquid petroleum jelly</td>
<td>80</td>
</tr>
<tr>
<td>Deceth-5 (Eumulgin BL 589 from Cognis)</td>
<td>0.9</td>
</tr>
<tr>
<td>Oleth-10 (Brij 96V from Croda)</td>
<td>0.9</td>
</tr>
<tr>
<td>Oleth-20 (Brij 98V from Croda)</td>
<td>3.6</td>
</tr>
<tr>
<td>Sodium metabisulfite</td>
<td>0.22</td>
</tr>
<tr>
<td>EDTA</td>
<td>0.2</td>
</tr>
<tr>
<td>Ascorbic acid</td>
<td>0.12</td>
</tr>
<tr>
<td>Water</td>
<td>q.s. for 100</td>
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</table>

**Composition (B)**
The compositions obtained are stable.

**Mode of application**

Compositions (A) and (B) are mixed at the time of use in the following proportions: 10 g of composition 1 and 20 g of composition 2.

The resulting mixture is then applied to locks of chestnut hair, at a rate of 10 g of mixture per 1 g of hair.

The mixture is left in at ambient temperature for 50 minutes.

The hair is then rinsed, washed with a standard shampoo and dried.

The lightening and the dyeing are of a very good level with good uniformity. Very light blonde locks are obtained (visual evaluation).
CLAIMS

1. Composition for dyeing keratin fibres, comprising:
   - at least one fatty substance,
   - at least one oxyethylenated (OE) non-ionic surfactant comprising a number of OE units ranging from 1 to 9,
   - at least one oxyethylenated (OE) non-ionic surfactant comprising at least 10 OE units,
   - at least one alkaline agent,
   - at least one cationic polymer and
   - at least one oxidation dye,

   the total amount of fatty substances in the composition being greater than or equal to 70% by weight relative to the total weight of said composition.

2. Composition according to the preceding claim, characterized in that the fatty substance(s) is (are) chosen from \( \text{C}_6\text{C}_{16} \) hydrocarbons, hydrocarbons containing more than 16 carbon atoms, non-silicone oils of animal origin, triglycerides of plant or synthetic origin, fluoro oils, fatty alcohols, non-salified fatty acids, esters of fatty acids and/or of fatty alcohols other than triglycerides, non-silicone waxes other than solid fatty alcohols and than solid synthetic esters, and silicones, and mixtures thereof.

3. Composition according to either one of Claims 1 and 2, characterized in that the fatty substance(s) is (are) chosen from compounds that are liquid or pasty at ambient temperature and at atmospheric pressure and preferably liquid at ambient temperature and at atmospheric pressure.

4. Composition according to any one of the preceding claims, characterized in that the fatty substance is chosen from liquid petroleum jelly, liquid paraffin, polydecenes, fatty acid and/or fatty alcohol esters that are liquid at ambient temperature and at ambient pressure, fatty alcohols that are liquid at ambient temperature and at ambient pressure, or mixtures thereof.
5. Composition according to any one of the preceding claims, characterized in that the total amount of fatty substances in the composition is greater than or equal to 75% by weight and preferably greater than or equal to 80% by weight relative to the total weight of said composition.

6. Composition according to any one of the preceding claims, characterized in that it has a content of fatty substances, preferably of oils, ranging from 70% to 90% by weight and even better from 75% to 85% by weight, relative to the weight of the composition.

7. Composition according to any one of the preceding claims, characterized in that the oxyethylenated non-ionic surfactant(s) comprising at least 10 OE units and the oxyethylenated non-ionic surfactant(s) comprising from 1 to 9 OE units are chosen from saturated or unsaturated, linear or branched, preferably linear, C₈-C₂₀, oxyethylenated fatty alcohols.

8. Composition according to any one of the preceding claims, characterized in that the oxyethylenated non-ionic surfactant(s) comprising from 1 to 9 OE units is (are) chosen from the products of addition of ethylene oxide and lauryl alcohol, for instance lauryl alcohol 2 OE (CTFA name: laureth-2), the products of addition of ethylene oxide and decyl alcohol, for instance decyl alcohol 3 OE (CTFA name: deceth-3), decyl alcohol 5 OE (CTFA name: deceth-5), the products of addition of ethylene oxide and oleocetyl alcohol, for instance oleocetyl alcohol 5 OE (CTFA name: oleoceteth-5), and mixtures thereof.

9. Composition according to any one of the preceding claims, characterized in that the content of oxyethylenated non-ionic surfactant(s) comprising from 1 to 9 OE units ranges from 0.1% to 10% by weight, preferably from 0.5% to 5% by weight and better still from 0.5% to 2% by weight relative to the total weight of the composition.

10. Composition according to any one of the preceding claims, characterized in that the oxyethylenated non-ionic surfactant(s)
comprising at least 10 OE units is (are) chosen from the products of addition of ethylene oxide with lauryl alcohol, in particular those comprising from 10 to 50 oxyethylene groups and more particularly those comprising from 10 to 30 oxyethylene groups (CTFA names: Laureth-10 to Laureth-30); the products of addition of ethylene oxide with behenyl alcohol, in particular those comprising from 10 to 50 oxyethylene groups (CTFA names: Beheneth-9 to Beheneth-50); the products of addition of ethylene oxide with cetearyl alcohol (mixture of cetyl alcohol and stearyl alcohol), in particular those comprising from 10 to 30 oxyethylene groups (CTFA names: Ceteareth-10 to Ceteareth-30); the products of addition of ethylene oxide with cetyl alcohol, in particular those comprising from 10 to 30 oxyethylene groups (CTFA names: Ceteth-10 to Ceteth-30); the products of addition of ethylene oxide with stearyl alcohol, in particular those comprising from 10 to 30 oxyethylene groups (CTFA names: Steareth-10 to Steareth-30); the products of addition of ethylene oxide with isostearyl alcohol, in particular those comprising from 10 to 50 oxyethylene groups (CTFA names: Isosteareth-10 to Isosteareth-50); the products of addition of ethylene oxide with decyl alcohol, in particular those comprising from 10 to 30 oxyethylene groups (CTFA names: Ceteth-10 to Ceteth-30) and mixtures thereof.

11. Composition according to any one of the preceding claims, characterized in that the content of oxyethylenated non-ionic surfactant(s) comprising at least 10 OE units ranges from 0.1% to 20% by weight, preferably from 0.5% to 10% by weight and better still from 1% to 6% by weight relative to the total weight of the composition.

12. Composition according to any one of the preceding claims, characterized in that the total content of oxyethylenated non-ionic surfactant(s) is less than or equal to 10% by weight relative to the total weight of the composition.

13. Composition according to any one of the preceding claims, characterized in that the cationic polymer(s) is (are) chosen from the following polymers, alone or as blends:
1 Homopolymers or copolymers derived from acrylic or methacrylic esters or amides and comprising at least one of the units of formula (I), (II), (III) or (IV) below:

\[
\begin{align*}
&\text{(I)} \quad \begin{array}{c}
\text{O} \\
\text{R}_1 \text{N} \text{R}_2
\end{array} \\
&\text{(II)} \quad \begin{array}{c}
\text{O} \\
\text{A} \text{R}_3
\end{array} \\
&\text{(III)} \quad \begin{array}{c}
\text{NH} \\
\text{A} \text{R}_4 \text{N}^+ \text{R}_5 \\
\text{R}_6
\end{array} \\
&\text{(IV)} \quad \begin{array}{c}
\text{NH} \\
\text{A} \text{R}_7 \text{N}^+ \text{R}_8 \\
\text{R}_9
\end{array}
\end{align*}
\]

in which:

- $R_3$, which may be identical or different, denote a hydrogen atom or a $\text{CH}_3$ radical;
- $A$, which may be identical or different, represent a linear or branched $\text{C}_1-\text{C}_6$ alkyl group or a hydroxyalkyl group of which the alkyl is $\text{C}_1-\text{C}_4$;
- $R_4$, $R_5$, and $R_6$, which may be identical or different, represent a $\text{C}_1-\text{C}_8$ alkyl group or a benzyl radical;
- $R_1$ and $R_2$, which may be identical or different, represent hydrogen or a $\text{C}_1-\text{C}_6$ alkyl group;

2 (2) cationic cellulose derivatives;

3 (3) cationic guar gums;

4 (4) polymers consisting of piperazinyl units and linear or branched divalent alkyl or hydroxyalkyl radicals, optionally interrupted with oxygen, sulfur or nitrogen atoms or with aromatic or heterocyclic rings, and also the oxidation and/or quaternization products of these polymers;

5 (5) water-soluble polyaminoamides which are optionally cross-linked;

6 (6) polymers obtained by reaction of a polyalkylene polyamine containing two primary amine groups and at least one secondary amine group with a dicarboxylic acid;

7 (7) cyclopolymer of alkyldiallylamine or of dialkyldiallylammonium, in the form of homopolymers or copolymers containing, as main constituent of the chain, units corresponding to formula (V) or (VI):

\[
\begin{align*}
&(\text{CH}_2)_t \text{R}_9 \begin{array}{c}
\text{N} \\
\text{Y} \\
\text{R}_7 \text{N}^+ \text{R}_8
\end{array} (\text{CH}_2)_k \text{C(R}_9 \text{)-CH}_2^- \\
&\text{(V)} \\
&(\text{CH}_2)_t \text{R}_9 \begin{array}{c}
\text{N} \\
\text{Y} \\
\text{R}_7 \text{N}^+ \text{R}_8
\end{array} (\text{CH}_2)_k \text{C(R}_9 \text{)-CH}_2^- \\
&\text{(VI)}
\end{align*}
\]

in which formulae $k$ and $t$ are equal to 0 or 1, the sum $k + t$ being equal to 1; $R_9$ denotes a hydrogen atom or a methyl radical; $R_7$ and $R_8$, independently of
each other, denote a \( \text{Ci-C}_8 \) alkyl group, a hydroxyalkyl group in which the alkyl group is \( \text{C}_1-\text{C}_5 \), an amidoalkyl group in which the alkyl is \( \text{Ci-C}_4 \); \( R_7 \) and \( R_8 \) can also denote, together with the nitrogen atom to which they are attached, a heterocyclic group; \( Y \) is an organic or inorganic anion;

(8) quaternary diammonium polymers containing repeating units corresponding to the formula:

\[
\begin{align*}
&\begin{array}{c}
R_{10} \\
\downarrow \\
N^+ A_1 \\
\downarrow \\
R_{11} X^- \\
\end{array}
\quad
\begin{array}{c}
R_{12} \\
\downarrow \\
N^+ B_1 \\
\downarrow \\
R_{13} X^- \\
\end{array}
\end{align*}
\]

(IX) in which formula (VII):

\( R_{10}, R_{11}, R_{12} \) and \( R_{13} \), which may be identical or different, represent saturated, unsaturated or aromatic, linear, branched or cyclic, \( \text{Ci-C}_6 \) hydrocarbon-based radicals, linear or branched hydroxyalkyl radicals of which the alkyl part is \( \text{C}_1-\text{C}_4 \), linear or branched \( \text{Ci-C}_6 \) alkyl radicals, substituted with a nitrile, ester, acyl or amide group or a group \( \text{-CO-0-R}_7 \) or \( \text{-CO-N-R}_8 \) with \( R_{14} \) representing an alkyl radical and \( D \) a quaternary ammonium group, or form together or separately, with the nitrogen atoms to which they are attached, heterocycles optionally containing a second heteroatom other than nitrogen;

\( A_1 \) and \( B_1 \) represent \( \text{C}_2-\text{C}_5 \) radicals which may be linear or branched, saturated or unsaturated, optionally substituted or interrupted with one or more aromatic rings, oxygen or sulfur atoms or groups bearing at least one of these atoms;

\( X^- \) denotes an organic or inorganic anion;

\( A_1, R_{10} \) and \( R_{12} \) can form, with the two nitrogen atoms to which they are attached, a piperazine ring; in addition, if \( A_1 \) denotes a linear or branched, saturated or unsaturated alkylene or hydroxyalkylene radical, \( B_1 \) can also denote a group \( \text{-(CH}_2)_n\text{CO-D-OC-} \) \( \text{-(CH}_2)_n \) in which \( n \) is between 1 and 100, and \( D \) denotes a glycol, bis-secondary diamine, bis-primary diamine or ureylene residue;

(9) polyquaternary ammonium polymers consisting of repeating units of formula (IX):

\[
\begin{array}{c}
\text{CH}_3 \\
\uparrow \\
N \quad \text{X}^- \\
\downarrow \\
\text{CH}_3 \\
\end{array}
\quad
\begin{array}{c}
\text{CH}_3 \\
\uparrow \\
\text{X}^- \\
\downarrow \\
\text{CH}_3 \\
\end{array}
\quad
\begin{array}{c}
\text{CH}_3 \\
\uparrow \\
\text{X}^- \\
\downarrow \\
\text{CH}_3 \\
\end{array}
\quad
\begin{array}{c}
\text{CH}_3 \\
\uparrow \\
\text{X}^- \\
\downarrow \\
\text{CH}_3 \\
\end{array}
\]

(IX) in which \( p \) denotes an integer ranging from 1 to 6, \( D \) may be zero or may represent a group \( \text{-(CH}_2)_r\text{-CO-} \) in which \( r \) denotes a number equal to 4 or 7, and \( X^- \) is an organic or inorganic anion;

(10) quaternary polymers of vinylpyrrolidone and of vinylimidazole;
14. Composition according to Claim 13, characterized in that the cationic polymer(s) is (are) chosen from the polymers (1), (7), (8) and (9), preferably (7), (8) and (9), alone or as blends.

15. Composition according to any one of the preceding claims, characterized in that the content of cationic polymer(s) represents from 0.01% to 10% by weight, more particularly from 0.05% to 6% by weight and even more preferentially between 0.1% and 5% by weight, relative to the weight of the composition.

16. Composition according to one of the preceding claims, characterized in that the basifying agent is chosen from organic amines, in particular an alkanolamine, preferably monoethanolamine.

17. Composition according to one of the preceding claims, characterized in that the weight ratio of the amount of oxyethylenated non-ionic surfactant(s) comprising at least 10 OE units to the amount of oxyethylenated non-ionic surfactant(s) comprising a number of OE units from 1 to 9, is greater than or equal to 1, preferably greater than or equal to 2.

18. Process for dyeing keratin fibres, consisting in applying to said fibres:
- a composition (A) comprising:
  - at least one fatty substance,
  - at least one oxyethylenated (OE) non-ionic surfactant comprising a number of OE units ranging from 1 to 9,
  - at least one oxyethylenated (OE) non-ionic surfactant comprising at least 10 OE units,
  - at least one alkaline agent,
  - at least one oxidation dye,
  - at least one cationic polymer,

the total amount of fatty substances in the composition being greater than or equal to 70% by weight relative to the total weight of said composition, and
- a composition (B) comprising at least one chemical oxidizing agent, preferably hydrogen peroxide.

19. Process according to Claim 18, characterized in that the total amount of fatty substances in the mixture of the compositions (A) and (B) is greater than or equal to 40% by weight of the weight of the mixture, preferably greater than or equal to 45% by weight, better still greater than or equal to 50% by weight and even better still greater than or equal to 55% by weight, relative to the total weight of the mixture.

20. Two-compartment device, comprising:
in one, a composition (A) comprising:
- at least one fatty substance,
- at least one oxyethylenated (OE) non-ionic surfactant comprising a number of OE units ranging from 1 to 9,
- at least one oxyethylenated (OE) non-ionic surfactant comprising at least 10 OE units,
- at least one alkaline agent,
- at least one oxidation dye,
- at least one cationic polymer,
the total amount of fatty substances in the composition (A) being greater than or equal to 70% by weight relative to the total weight of said composition, and
in the other, a composition (B) comprising at least one chemical oxidizing agent, preferably hydrogen peroxide.
**INTERNATIONAL SEARCH REPORT**

**International application No**

PCT/EP2014/077722

### A. CLASSIFICATION OF SUBJECT MATTER

INV. A61K8/31 A61K8/39 A61Q5/10 A61K8/86

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

### B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

A61K A61Q

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

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

EPO-Internal, WPI Data

### C. DOCUMENTS CONSIDERED TO BE RELEVANT

<table>
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<tr>
<th>Category</th>
<th>Citation of document, with indication, where appropriate, of the relevant passages</th>
<th>Relevant to claim No.</th>
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<tbody>
<tr>
<td>Y</td>
<td>FR 2 977 482 AI (OREAL [FR]) 11 January 2013 (2013-01-11) claims 1,10,14,15,18,25 example; pages 40-41</td>
<td>1-20</td>
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<td>Y</td>
<td>FR 2 970 176 AI (OREAL [FR]) 13 July 2012 (2012-07-13) claims 1,2,5,10,13 pages 8-9 example; page 44</td>
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<td>FR 2 984 116 AI (OREAL [FR]) 21 June 2013 (2013-06-21) claims 1,12 example; page 53</td>
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Further documents are listed in the continuation of Box C. See patent family annex.

* Special categories of cited documents:
  
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Date of the actual completion of the international search

5 March 2015

Date of mailing of the international search report

16/03/2015

Name and mailing address of the ISA/

European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk

Tel. (+31-70) 340-2040, Fax: (+31-70) 340-3016

Authorized officer

Grenouillet, N

Form PCT/ISA2/10 (second sheet) (April 2003)
### DOCUMENTS CONSIDERED TO BE RELEVANT

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<td>FR 2 979 233 Al (OREAL [FR])&lt;br&gt;1 March 2013 (2013-03-01)&lt;br&gt;claims 1,5,17&lt;br&gt;examples;&lt;br&gt;pages 34-38</td>
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