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(54) Title: COSMETIC COMPOSITION FOR LIGHTENING OR DYEING THE HAIR, COMPRISING TWO BASIC AGENTS, AN ACID AND AN OXIDIZING AGENT

(57) Abstract: The present invention relates to a cosmetic composition for lightening or dyeing keratin fibres, in particular human keratin fibres such as the hair, comprising (a) one or more organic alkaline agents with a molecular weight of less than or equal to 300 $g.mol^{-1}$, (b) one or more mineral alkaline agents, (c) one or more organic or mineral acids, (d) one or more fatty substances and (e) one or more oxidizing agents; the pH of the composition being greater than or equal to 7. The invention also relates to lightening or dyeing processes using the said composition and also to a multi-compartment device that is suitable for using the said cosmetic composition.

Cosmetic composition for lightening or dyeing the hair, comprising two basic agents, an acid and an oxidizing agent

The present invention relates to a cosmetic composition for lightening or dyeing keratin fibres, in particular human keratin fibres such as the hair, comprising (a) one or more organic bases or salts thereof, these compounds having a molecular weight of less than or equal to 300 $g.mol^{-1}$, (b) one or more mineral bases, (c) one or more organic or mineral acids, (d) one or more fatty substances and (e) one or more oxidizing agents; the pH of the composition being greater than or equal to 7.

The invention also relates to lightening or dyeing processes using the said composition and also to a multi-compartment device that is suitable for using the said lightening or dye composition.

The present invention relates to the fields of the lightening or dyeing of keratin fibres and more particularly to the fields of lightening or dyeing the hair.

Many people have sought for a long time to modify the colour of their hair and in particular to mask their grey hair, by dyeing or lightening it.

The type of dyeing most commonly used is permanent dyeing or oxidation dyeing, which uses dye compositions containing oxidation dye precursors, generally known as oxidation bases. These oxidation bases are colourless or weakly coloured compounds, which, when combined with oxidizing products, may give rise to coloured compounds via a process of oxidative condensation.

It is also known that the shades obtained with these oxidation bases may be varied by combining them with couplers or coloration modifiers, the latter being chosen especially from aromatic meta-diamines, meta-aminophenols, meta-diphenols and certain heterocyclic compounds such as indole compounds. The variety of the molecules used as oxidation bases and couplers allows a rich palette of colours to be obtained.

The permanent dyeing process thus consists in using, with the dye composition, an aqueous composition comprising at least one oxidizing agent, under alkaline pH conditions in the vast majority of cases.

When it is desired to lighten human keratin fibres, the lightening processes consist in using an aqueous composition comprising at least one oxidizing agent, under alkaline pH conditions in the vast majority of cases.

The role of the oxidizing agent used in permanent or lightening dyeing processes is, at least partly, to degrade the melanin of the hair, which, depending on the nature of the oxidizing agent present, leads to more or less pronounced lightening of the fibres. Thus, for relatively weak lightening, the oxidizing agent is generally hydrogen peroxide. When more pronounced lightening is desired, peroxygenated salts, for instance persulfates, are usually used in the presence of hydrogen peroxide.

One of the difficulties arises from the fact that these processes are performed under alkaline conditions and the alkaline agent most commonly used is aqueous ammonia. The use of aqueous ammonia is particularly advantageous in processes of this type. Specifically, it makes it possible to adjust the pH of the composition to an alkaline pH to enable activation of the oxidizing agent. However, this alkaline agent also causes swelling of the keratin fibre, with opening of the scales, which promotes the penetration of the oxidizing agent, and also of the oxidation dyes, into the fibre, and thus increases the efficacy of the reaction.

However, this basifying agent is very volatile, which users find disagreeable due to the characteristic strong, rather unpleasant odour of ammonia that is given off during the process.

Moreover, the amount of ammonia given off requires the use of levels which are greater than those necessary, in order to compensate for this loss. This is not without consequences for the user, who not only remains inconvenienced by the odour, but may also be confronted

with greater risks of intolerance, for instance irritation of the scalp, which is reflected especially by stinging.

It has also been proposed to replace all or some of the aqueous ammonia with one or more other standard basifying agents, but the solutions proposed hitherto do not result in compositions that are as effective as those based on aqueous ammonia, especially since these basifying agents do not provide sufficient lightening of the pigmented fibres or sufficient build-up of the coloration induced by the oxidation dyes, in the presence of the oxidizing agent.

Thus, one of the objectives of the present invention is to propose compositions for lightening or dyeing human keratin fibres such as the hair, which do not have the drawbacks mentioned above, i.e. which are capable of providing very good lightening or dyeing performance qualities while at the same time having working qualities that are superior to those of the existing compositions, especially while having a less disagreeable odour during their application to the fibres or during their preparation.

These aims and others are achieved by the present invention, one subject of which is thus a cosmetic composition for lightening or dyeing keratin fibres, in particular human keratin fibres such as the hair, comprising:

(a) one or more organic bases or salts thereof, these compounds having a molecular weight of less than or equal to 300 $g.mol^{-1}$,

(b) one or more mineral bases,

(c) one or more organic or mineral acids in a content of greater than or equal to 0.2% by weight relative to the total weight of the composition,

(d) one or more fatty substances in a content of greater than or equal to 10% by weight relative to the total weight of the composition,

(e) one or more oxidizing agents, and

(f) optionally, one or more oxidation dyes when the composition is a dyeing composition;

the pH of the composition being greater than or equal to 7.

According to a first embodiment, the cosmetic composition is a dye composition.

According to a second embodiment, the cosmetic composition is a lightening composition.

According to an embodiment, the composition is a composition for simultaneously dyeing and lightening keratin fibres.

A subject of the present invention is also processes for lightening or dyeing keratin fibres, in particular human keratin fibres such as the hair, in which the cosmetic composition according to the invention is applied to the said fibres.

The invention also relates to a multi-compartment device for using the composition according to the invention.

The compositions according to the invention thus provide very good performance qualities in terms of lightening keratin fibres.

When it is used with oxidation dyes, a dye composition is obtained which has the additional advantage of providing powerful, intense, chromatic and/or sparingly selective colorations, i.e. colorations that are uniform along the fibre.

These compositions also give particularly good coverage of depigmented keratin fibres such as grey hair.

Moreover, the lightening or dyeing processes according to the invention also allow the use of compositions that are less malodorous during their application to keratin fibres or during their preparation.

In addition, for equivalent efficacy, the compositions according to the invention have a substantially lower pH than the existing lightening or dye compositions, which induces better comfort for the scalp.

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

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

The human keratin fibres treated via the process according to the invention are preferably the hair.

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

(a) Organic bases

The composition according to the invention contains one or more organic bases or salts thereof, these compounds having a molecular weight of less than or equal to 300 $g.mol^{-1}$.

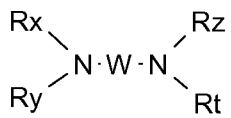
The organic bases or salts thereof used in the composition according to the invention are more particularly chosen from amines and preferably from organic amines with a pK_b at 25°C of less than 12, preferably less than 10 and even more advantageously less than 6. It should be noted that it is the pK_b corresponding to the functional group of highest basicity.

According to a first variant of the invention, the organic base comprises a primary, secondary or tertiary amine function and one or more linear or branched C_1-C_8 alkyl groups bearing one or more hydroxyl radicals.

Organic bases chosen from alkanolamines such as monoalkanolamines, dialkanolamines or trialkanolamines comprising one to three identical or different C_1-C_4 hydroxyalkyl radicals are in particular suitable for use.

Among 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.

Also suitable for use are the organic bases of the following formula:



in which W is a C_1-C_6 alkylene residue optionally substituted with a hydroxyl group or a C_1-C_6 alkyl radical; Rx, Ry, Rz and Rt, which may be identical or different, represent a hydrogen atom or a C_1-C_6 alkyl, C_1-C_6 hydroxyalkyl or C_1-C_6 aminoalkyl radical.

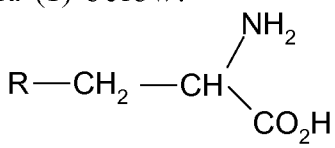
Examples of such amines that may be mentioned include 1,3-diaminopropane, 1,3-diamino-2-propanol, spermine and spermidine.

According to a second variant of the invention, the organic base is chosen from amino acids.

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 chosen more particularly from carboxylic acid, sulfonic acid, phosphonic acid or phosphoric acid functions. The amino acids may be in neutral or ionic form.

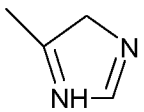
Advantageously, the amino acids are basic amino acids comprising an additional amine function optionally included in a ring or in a ureido function.

Such basic amino acids are preferably chosen from those corresponding to formula (I) below:



(I)

in which R denotes a group chosen from:

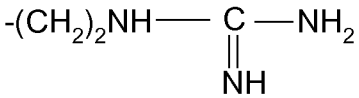


;

$-(CH_2)_3NH_2$;

$-(CH_2)_2NH_2$;

$-(CH_2)_2NHCONH_2$.



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

As amino acids that can be used in the present invention, mention may be made especially 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.

The amino acids that are particularly preferred are arginine, lysine and histidine, or mixtures thereof.

According to a third variant of the invention, the organic base is chosen from organic amines of heterocyclic type. Besides histidine that has already been mentioned in the amino acids, mention may in particular be made of pyridine, piperidine, imidazole, triazole, tetrazole and benzimidazole.

According to a fourth variant of the invention, the organic base is chosen from amino acid dipeptides. As amino acid dipeptides that may be used in the present invention, mention may in particular be made of carnosine, anserine and balenine.

According to a fifth variant of the invention, the organic base is chosen from compounds comprising a guanidine function. Thus, the organic amine may be chosen from guanidine, arginine that has already been mentioned as an amino acid, 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.

As regards the abovementioned amine salts, they may be organic or mineral.

More particularly, the organic salts are chosen from organic acid salts such as citrates, lactates, glycolates, gluconates, acetates, propionates, fumarates, oxalates and tartrates.

Even more particularly, the mineral salts are chosen from hydrohalides (for example hydrochlorides), carbonates, hydrogen carbonates, sulfates, hydrogen phosphates and phosphates.

Preferably, the organic base is an alkanolamine. More particularly, the organic base is chosen from 2-amino-2-methyl-1-

propanol and monoethanolamine, or mixtures thereof. Even more preferentially, the organic base is monoethanolamine.

The organic base(s) or salts thereof may be present in the lightening composition according to the invention in a content ranging from 0.1% to 10% by weight, preferably in a content ranging from 1% to 4% by weight and more preferentially in a content ranging from 1.5% to 2.5% by weight relative to the total weight of the composition.

(b) Mineral bases

The composition according to the invention also contains one or more mineral bases.

For the purposes of the present invention, the term "mineral base" means aqueous ammonia or any compound bearing in its structure one or more elements from groups 1 to 13 of the Periodic Table of the Elements other than hydrogen.

Preferably, the mineral bases used in the dye composition do not comprise in their structure one or more nitrogen atoms.

According to one embodiment, the mineral base(s) contain one or more elements from groups 1 and 2 of the Periodic Table of the Elements other than hydrogen.

In a preferred variant, the mineral base(s) have the following structure (T):

$(Z_1^{x-})_m(Z_2^{y+})_n$ (T)

in which:

Z_2 denotes a metal from columns 1 to 13 and preferably 1 or 2 of the Periodic Table of the Elements, such as sodium or potassium;

Z_1^{x-} denotes an anion chosen from the ions CO_3^{2-}, OH^-, HCO_3^{2-}, SiO_3^{2-}, HPO_4^{2-}, PO_4^{3-} and $B_4O_7^{2-}$, and preferably from the ions CO_3^{2-}, OH^- and SiO_3^{2-};

x denotes 1, 2 or 3;

y denotes 1, 2, 3 or 4;

m and n denote, independently of each other, 1, 2, 3 or 4;

with n.y = m.x.

Preferably, the mineral base corresponds to the following formula $(Z_1^{x-})_m(Z_2^{y+})_n$, in which Z_2 denotes a metal from columns 1 and 2 of the Periodic Table of the Elements; Z_1^{x-} denotes an anion chosen from the ions CO_3^{2-}, OH^-, HCO_3^{2-} and SiO_3^{2-}, x is 1, y denotes 1 or 2, and m and n denote, independently of each other, 1 or 2 with n.y = m.x.

As mineral base (T) that may be used according to the invention, mention may be made of sodium carbonate, potassium carbonate, sodium bicarbonate, sodium hydroxide, potassium hydroxide, sodium metasilicate and potassium metasilicate.

Preferably, the mineral base is an alkali metal carbonate or bicarbonate.

The mineral base(s) may be present in the lightening composition according to the invention in a content ranging from 0.1% to 20% by weight, preferably in a content ranging from 1% to 10% by weight and more preferentially in a content ranging from 2% to 6% by weight relative to the total weight of the composition.

(c) Organic or mineral acids

The composition according to the invention contains one or more organic or mineral acids in a content of greater than or equal to 0.2% by weight relative to the total weight of the composition.

For the purposes of the present invention, the term "organic or mineral acid" means an organic or mineral acid and/or the associated bases thereof with a pKa of less than or equal to 7, preferably less than or equal to 6, especially ranging from 1 to 6 and preferably from 2 to 5.

In a first variant, the acids used in the dye composition according to the invention are chosen from organic acids, especially carboxylic and/or sulfonic acids.

More preferentially, the organic acids are chosen from saturated or unsaturated carboxylic acids, in particular propanoic acid,

butanoic acid, acetic acid, lactic acid, citric acid, maleic acid, glycolic acid, salicylic acid, malic acid and tartaric acid.

Preferably, the carboxylic acids are hydroxy acids.

Preferably, the acids used in the dye composition are chosen from tartaric acid, lactic acid and citric acid, or mixtures thereof.

In a second variant, the acids used in the dye composition according to the invention are chosen from mineral acids and in particular from hydrochloric acid, sulfuric acid, nitric acid and phosphoric acid, in particular from hydrochloric acid and phosphoric acid.

Preferably, the mineral acid (or inorganic acid) is phosphoric acid.

The organic or mineral acid(s) may be present in the dye composition according to the invention in a content ranging from 0.2% to 10% by weight, preferably in a content ranging from 0.2% to 2% by weight and more preferentially in a content ranging from 0.2% to 1% by weight relative to the total weight of the composition.

(d) Fatty substances

The composition according to the invention contains one or more fatty substances in a content of greater than or equal to 10% by weight relative to the total weight of the composition,

The term "*fatty substance*" means 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 of less than 1% and more preferably still of less than 0.1%). They have 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, dichloromethane, carbon tetrachloride, ethanol, benzene, toluene, tetrahydrofuran (THF), liquid petroleum jelly or decamethylcyclopentasiloxane.

Preferably, the fatty substances of the invention do not contain any salified or unsalified carboxylic acid groups (-C(O)OH or $-C(O)O^-$). Particularly, the fatty substances of the invention are neither polyoxyalkylenated nor polyglycerolated.

Preferably, the fatty substances that may be used in the composition according to the invention are oils, preferably non-silicone oils.

The term "*oil*" means a "*fatty substance*" that is liquid at room temperature (25°C) and at atmospheric pressure (760 mmHg).

The term "*non-silicone oil*" means an oil not containing any silicon atoms (Si) and the term "*silicone oil*" means an oil containing at least one silicon atom.

More particularly, the fatty substances are chosen from C_6-C_{16} hydrocarbons, hydrocarbons containing more than 16 carbon atoms, non-silicone oils of animal origin, plant oils of triglyceride type, synthetic triglycerides, fluoro oils, fatty alcohols, esters of fatty acids and/or of fatty alcohols other than triglycerides, and plant waxes, non-silicone waxes and silicones.

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

As regards the C_6-C_{16} hydrocarbons, they are linear or branched, and possibly cyclic, and are preferably alkanes. Examples that may be mentioned include hexane, dodecane and isoparaffins such as isohexadecane and isodecane.

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

The triglyceride oils of plant or synthetic origin are preferably chosen from liquid fatty acid triglycerides containing from 6 to 30

carbon atoms, for instance heptanoic or octanoic acid triglycerides, or alternatively, for example, 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, caprylic/capric acid triglycerides, for instance those sold by the company Stéarineries Dubois or those sold under the names Miglyol® 810, 812 and 818 by the company Dynamit Nobel, jojoba oil and shea butter oil.

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

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 may be used in the composition according to the invention are saturated or unsaturated, and linear or branched, and comprise from 6 to 30 carbon atoms and more particularly from 8 to 18 carbon atoms. Mention may be made, for example, of cetyl alcohol, stearyl alcohol and a mixture thereof (cetearyl alcohol), octyldodecanol, 2-butyloctanol, 2-hexyldecanol, 2-undecylpentadecanol, oleyl alcohol or linoleyl alcohol.

The wax(es) that may be used in the composition according to the invention are chosen especially from carnauba wax, candelilla wax, esparto grass wax, paraffin wax, ozokerite, plant waxes, for instance olive wax, rice wax, hydrogenated jojoba wax or the absolute waxes of flowers such as the essential wax of blackcurrant blossom

sold by the company Bertin (France), animal waxes, for instance beeswaxes, or modified beeswaxes (cerabellina); other waxes or waxy starting materials that may be used according to the invention are especially marine waxes such as the product sold by the company Sophim under the reference M82, and polyethylene waxes or polyolefin waxes in general.

As regards the esters of a fatty acid and/or of a fatty alcohol, which are advantageously different than the triglycerides mentioned above, mention may be made especially of esters of saturated or unsaturated, linear or branched C_1-C_{26} aliphatic mono- or polyacids and of saturated or unsaturated, linear or branched C_1-C_{26} aliphatic mono- or polyalcohols, the total carbon number of the esters more particularly being greater than or equal to 10.

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

Still within the context of this variant, esters of C_4-C_{22} dicarboxylic or tricarboxylic acids and of C_1-C_{22} alcohols and esters of monocarboxylic, dicarboxylic or tricarboxylic acids and of C_2-C_{26} dihydroxy, trihydroxy, tetrahydroxy or pentahydroxy alcohols may also be used.

Mention may be made especially of: diethyl sebacate; diisopropyl sebacate; diisopropyl adipate; di-n-propyl adipate; dioctyl

adipate; diisostearyl adipate; dioctyl maleate; glyceryl undecylenate; octyldodecyl stearoyl stearate; pentaerythrityl monoricinoleate; pentaerythrityl tetraisononanoate; pentaerythrityl tetrapelargonate; pentaerythrityl tetraisostearate; pentaerythrityl tetraoctanoate; propylene glycol dicaprylate; propylene glycol dicaprate; tridecyl erucate; triisopropyl citrate; triisostearyl citrate; glyceryl trilactate; glyceryl trioctanoate; trioctyldodecyl citrate; trioleyl citrate; propylene glycol dioctanoate; neopentyl glycol diheptanoate; diethylene glycol diisononanoate; and polyethylene glycol distearates.

Among the esters mentioned above, it is preferred to use ethyl, isopropyl, myristyl, cetyl or stearyl palmitate, 2-ethylhexyl palmitate, 2-octyldecyl palmitate, alkyl myristates such as isopropyl, butyl, cetyl or 2-octyldodecyl myristate, hexyl stearate, butyl stearate, isobutyl stearate; dioctyl malate, hexyl laurate, 2-hexyldecyl laurate, isononyl isononanoate or cetyl octanoate.

The composition may also comprise, as fatty ester, sugar esters and diesters of C_6-C_{30} and preferably C_{12}-C_{22} fatty acids. It is recalled that the term "sugar" means 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 especially from the group comprising the esters or mixtures of esters of sugars described previously and of linear or branched, saturated or unsaturated C_6-C_{30}, and preferably C_{12}-C_{22} fatty acids. If they are unsaturated, these compounds may comprise one to three conjugated or non-conjugated 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 and arachidonates, or mixtures thereof such as, especially, oleopalmitate, oleostearate and palmitostearate mixed esters.

More particularly, use is made of monoesters and diesters and in particular mono- or di-oleate, -stearate, -behenate, -oleopalmitate, -linoleate, -linolenate or -oleostearate 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 and 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-polyester;
- the sucrose monopalmitostearate-dipalmitostearate sold by the company Goldschmidt under the name Tegosoft® PSE.

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

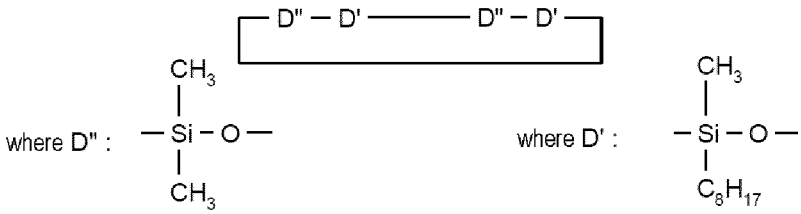
polysiloxanes comprising at least one functional group chosen from amino groups, aryl groups and alkoxy groups.

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

When they are volatile, the silicones are more particularly chosen from those having 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 from 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/methylalkylsiloxane type, such as Volatile Silicone® FZ 3109 sold by the company Union Carbide, of formula:



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

(ii) linear volatile polydialkylsiloxanes containing 2 to 9 silicon atoms and having a viscosity of less than or equal to 5×10^{-6} m^2/s at 25°C. An example is decamethyltetrasiloxane sold in particular under the name SH 200 by the company Toray Silicone.

Silicones belonging to this category are also described in the article published in Cosmetics and Toiletries, Vol. 91, Jan. 76, pp. 27-32, Todd & Byers, *Volatile Silicone Fluids for Cosmetics*.

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

These silicones are more particularly chosen from polydialkylsiloxanes, among which mention may be made mainly of polydimethylsiloxanes having trimethylsilyl end groups. The viscosity of the silicones is measured at 25°C according to ASTM Standard 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 mm^2/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 containing 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(C_1-C_{20})dialkylsiloxanes.

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, polyphenylmethylsiloxane (PPMS) oils, isoparaffins, polyisobutylenes, methylene chloride, pentane, dodecane and tridecane, or mixtures thereof.

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

- the mixtures formed from a hydroxy-terminated polydimethylsiloxane, or dimethiconol (CTFA), and from a cyclic polydimethylsiloxane, also known as cyclomethicone (CTFA), such as the product Q2 1401 sold by 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 m^2/s and of an oil SF 96 with a viscosity of 5×10^{-6} m^2/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, those that are particularly preferred are those in which R denotes a lower C_1-C_4 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 trimethyl siloxysilicate type resins sold especially 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.

The organomodified silicones may be polydiarylsiloxanes, in particular polydiphenylsiloxanes, and polyalkylarylsiloxanes functionalized with the organofunctional groups mentioned previously.

The polyalkylarylsiloxanes are chosen particularly from linear and/or branched polydimethyl/methylphenylsiloxanes and polydimethyl/diphenylsiloxanes with a viscosity of from 1×10^{-5} to 5×10^{-2} m^2/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.

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

- substituted or unsubstituted amine 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 amine groups are, in particular, C_1-C_4 aminoalkyl groups;
- alkoxy 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.

Preferably, the fatty substances that may be used in the lightening composition according to the invention are non-silicone fatty substances.

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

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

Even more preferentially, as indicated previously, the fatty substances used in the lightening composition according to the invention are liquid and non-silicone.

The fatty substances are advantageously chosen from C_6-C_{16} hydrocarbons, hydrocarbons containing more than 16 carbon atoms, triglycerides, fatty alcohols, esters of a fatty acid and/or of a fatty alcohol other than triglycerides, or mixtures thereof.

Preferably, the fatty substance(s) are chosen from liquid petroleum jelly, polydecenes, liquid fatty alcohols and liquid esters of a fatty acid and/or of a fatty alcohol, or mixtures thereof.

Even more preferentially, the fatty substances are chosen from liquid petroleum jelly and octyldodecanol.

The composition according to the invention has a content of fatty substances, which are preferably non-silicone, in particular of oils, preferably non-silicone oils, of greater than or equal to 15% by weight, preferably of greater than or equal to 20% by weight, better still of greater than or equal to 25% by weight relative to the total weight of the composition.

More particularly, the composition according to the invention has a content of fatty substances, which are preferably non-silicone, in particular of oils, preferably non-silicone oils, ranging from 10% to 80% by weight, preferably from 15% to 80% by weight, more preferably from 25% to 75% by weight, better still from 30% to 70% by weight and even more advantageously from 30% to 60% by weight relative to the weight of the composition.

(e) Oxidizing agent

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

More particularly, the oxidizing agent(s) are chosen from hydrogen peroxide, urea peroxide, alkali metal bromates or ferricyanides, peroxygenated salts, for instance persulfates, perborates, peracids and precursors thereof and percarbonates of alkali metals or alkaline-earth metals.

Preferably, this oxidizing agent is hydrogen peroxide optionally combined with one or more peroxygenated salts.

This oxidizing agent advantageously consists of hydrogen peroxide, in particular in aqueous solution (aqueous hydrogen peroxide solution), the concentration of which may range more particularly from 0.1% to 50% by weight, even more preferentially from 0.5% to 20% by weight and better still from 1% to 15% by weight relative to the dye composition.

Depending on the desired degree of lightening, the oxidizing agent may also comprise an oxidizing agent preferably chosen from peroxygenated salts.

(f) Oxidation dyes

The composition according to the invention optionally comprises one or more oxidation dyes when the composition is a dye composition.

The oxidation dyes are generally chosen from 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 para-phenylenediamines, examples that may be mentioned include para-phenylenediamine, para-tolylenediamine, 2-

chloro-para-phenylenediamine, 2,3-dimethyl-para-phenylenediamine, 2,6-dimethyl-para-phenylenediamine, 2,6-diethyl-para-phenylenediamine, 2,5-dimethyl-para-phenylenediamine, N,N-dimethyl-para-phenylenediamine, N,N-diethyl-para-phenylenediamine, N,N-dipropyl-para-phenylenediamine, 4-amino-N,N-diethyl-3-methylaniline, N,N-bis(β-hydroxyethyl)-para-phenylenediamine, 4-N,N-bis(β-hydroxyethyl)amino-2-methylaniline, 4-N,N–bis(β-hydroxyethyl)amino-2-chloroaniline, 2-β-hydroxyethyl-para-phenylenediamine, 2-fluoro-para-phenylenediamine, 2-isopropyl-para-phenylenediamine, N-(β-hydroxypropyl)-para-phenylenediamine, 2-hydroxymethyl-para-phenylenediamine, N,N-dimethyl-3-methyl-para-phenylenediamine, N,N-(ethyl-β-hydroxyethyl)-para-phenylenediamine, N-(β,γ-dihydroxypropyl)-para-phenylenediamine, N-(4'-aminophenyl)-para-phenylenediamine, N-phenyl-para-phenylenediamine, 2-β-hydroxyethyloxy-para-phenylenediamine, 2-β-acetylaminoethyloxy-para-phenylenediamine, N-(β-methoxyethyl)-para-phenylenediamine, 4-aminophenylpyrrolidine, 2-thienyl-para-phenylenediamine, 2-β-hydroxyethylamino-5-aminotoluene and 3-hydroxy-1-(4'-aminophenyl)pyrrolidine, and the addition salts thereof with an acid.

Among the para-phenylenediamines mentioned above, para-phenylenediamine, para-tolylenediamine, 2-isopropyl-para-phenylenediamine, 2-β-hydroxyethyl-para-phenylenediamine, 2-β-hydroxyethyloxy-para-phenylenediamine, 2,6-dimethyl-para-phenylenediamine, 2,6-diethyl-para-phenylenediamine, 2,3-dimethyl-para-phenylenediamine, N,N-bis(β-hydroxyethyl)-para-phenylenediamine, 2-chloro-para-phenylenediamine and 2-β-acetylaminoethyloxy-para-phenylenediamine, and the addition salts thereof with an acid, are particularly preferred.

Among the bis(phenyl)alkylenediamines, examples that may be mentioned include N,N'-bis(β-hydroxyethyl)-N,N'-bis(4'-aminophenyl)1,3-diaminopropanol, N,N'-bis(β-hydroxyethyl)-N,N'-bis(4'-aminophenyl)ethylenediamine, N,N'-bis(4-aminophenyl)tetramethylenediamine, N,N'-bis(β-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-fluorophenol, 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-(β-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-amino-5-methylphenol, 2-amino-6-methylphenol and 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, examples that may be mentioned include the compounds described in patents GB 1 026 978 and GB 1 153 196, 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-acetylaminopyrazolo[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-methoxypyrazolo[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, 2-(3-aminopyrazolo[1,5-

a]pyridin-2-yloxy)ethanol, (3-aminopyrazolo[1,5-a]pyrid-2-yl)methanol, 3,6-diaminopyrazolo[1,5-a]pyridine, 3,4-diaminopyrazolo[1,5-a]pyridine, pyrazolo[1,5-a]pyridine-3,7-diamine, 7-(morpholin-4-yl)pyrazolo[1,5-a]pyrid-3-ylamine, pyrazolo[1,5-a]pyridine-3,5-diamine, 5-(morpholin-4-yl)pyrazolo[1,5-a]pyrid-3-ylamine, 2-[(3-aminopyrazolo[1,5-a]pyrid-5-yl)(2-hydroxyethyl)amino]ethanol, 2-[(3-aminopyrazolo[1,5-a]pyrid-7-yl)(2-hydroxyethyl)amino]ethanol, 3-aminopyrazolo[1,5-a]pyridin-5-ol, 3-aminopyrazolo[1,5-a]pyridin-4-ol, 3-aminopyrazolo[1,5-a]pyridin-6-ol 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 88169571, JP 05-63124 and EP 0 770 375 or patent application WO 96/15765, such as 2,4,5,6-tetraaminopyrimidine, 4-hydroxy-2,5,6-triaminopyrimidine, 2-hydroxy-4,5,6-triaminopyrimidine, 2,4-dihydroxy-5,6-diaminopyrimidine, 2,5,6-triaminopyrimidine 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 the 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-(β-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-amino-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-(β-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-triaminopyrazole, 1-methyl-3,4,5-triaminopyrazole, 3,5-diamino-1-methyl-4-methylaminopyrazole, 3,5-diamino-4-(β-hydroxyethyl)amino-1-methylpyrazole, and the addition salts thereof. 4,5-Diamino-1-(β-methoxyethyl)pyrazole may also be used.

A 4,5-diaminopyrazole will preferably be used, and even more preferentially 4,5-diamino-1-(β-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, 4,5-diamino-1,2-dimethyl-1,2-dihydropyrazol-3-one, 4,5-diamino-1,2-diethyl-1,2-dihydropyrazol-3-one, 4,5-diamino-1,2-di(2-hydroxyethyl)-1,2-dihydropyrazol-3-one, 2-amino-3-(2-hydroxyethyl)amino-6,7-dihydro-1H,5H-pyrazolo[1,2-a]pyrazol-1-one, 2-amino-3-dimethylamino-6,7-dihydro-1H,5H-pyrazolo[1,2-a]pyrazol-1-one, 2,3-diamino-5,6,7,8-tetrahydro-1H,6H-pyridazino[1,2-a]pyrazol-1-one, 4-amino-1,2-diethyl-5-(pyrrolidin-1-yl)-1,2-dihydropyrazol-3-one, 4-amino-5-(3-dimethylaminopyrrolidin-1-yl)-1,2-diethyl-1,2-dihydropyrazol-3-one, 2,3-diamino-6-hydroxy-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-(β-hydroxyethyl)pyrazole and/or 2,3-diamino-6,7-dihydro-1H,5H-pyrazolo[1,2-a]pyrazol-1-one and/or a salt thereof.

The composition according to the invention may optionally comprise one or more couplers advantageously chosen from those conventionally used in the dyeing of keratin fibres.

Among these couplers, mention may be made especially 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-(β-hydroxyethyloxy)benzene, 2-amino-4-(β-hydroxyethylamino)-1-methoxybenzene, 1,3-diaminobenzene, 1,3-bis(2,4-diaminophenoxy)propane, 3-ureidoaniline, 3-ureido-1-dimethylaminobenzene, sesamol, 1-β-hydroxyethylamino-3,4-methylenedioxybenzene, α-naphthol, 2-methyl-1-naphthol, 6-hydroxyindole, 4-hydroxyindole, 4-hydroxy-N-methylindole, 2-amino-3-hydroxypyridine, 6-hydroxybenzomorpholine, 3,5-diamino-2,6-dimethoxypyridine, 1-N-(β-hydroxyethyl)amino-3,4-methylenedioxybenzene, 2,6-bis(β-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 couplers that may be used in the context of the invention are especially chosen from the addition salts with an acid such as the hydrochlorides, hydrobromides, sulfates, citrates, succinates, tartrates, lactates, tosylates, benzenesulfonates, phosphates and acetates.

When they are used, the oxidation base(s) each advantageously represent from 0.0001% to 10% by weight relative to the total weight of the composition, and preferably from 0.005% to 5% by weight relative to the total weight of the composition.

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

pH of the composition

The composition according to the invention has a pH greater than or equal to 7. Preferably, the pH of the dye composition ranges from 7 to 11, more preferentially from 8 to 10 and more preferentially from 8.5 to 9.5.

According to an advantageous embodiment, the lightening or dye composition according to the invention comprises:

(a) one or more organic bases with a molecular weight of less than or equal to 300 $g.mol^{-1}$, chosen from alkanolamines, in particular monoethanolamine,

(b) one or more mineral bases chosen from mineral bases containing one or more elements from columns 1 and 2 of the Periodic Table of the Elements other than hydrogen, in particular alkali metal carbonates or bicarbonates,

(c) one or more organic or mineral acids in a content of greater than or equal to 0.2% by weight relative to the total weight of the composition,

(d) one or more fatty substances in a content of greater than or equal to 10% by weight relative to the total weight of the composition,

(e) one or more oxidizing agents, and

(f) optionally, one or more oxidation dyes when the composition is a dye composition;

the pH of the said composition being greater than or equal to 7.

Preferably, in accordance with this embodiment, the pH of the composition ranges from 7 to 9.5 and more preferentially from 8 to 9.

Surfactants

The composition according to the invention may also contain one or more surfactants.

Preferably, the surfactant(s) are chosen from nonionic and anionic surfactants.

The term "*anionic surfactant*" means a surfactant comprising, as ionic or ionizable groups, only anionic groups. These anionic groups are preferably chosen from the following groups:

-C(O)OH, –C(O)O$^-$, -SO_3H, -S(O)$_2$O$^-$, -OS(O)$_2$OH, -OS(O)$_2$O$^-$, -P(O)OH_2, -P(O)$_2$O$^-$, -P(O)O_2^-, -P$(OH)_2$, =P(O)OH, -P(OH)O$^-$, =P(O)O$^-$, =POH, =PO$^-$, the anionic parts comprising a cationic counterion such as an alkali metal, an alkaline-earth metal or an ammonium.

As examples of anionic surfactants that may be used in the composition according to the invention, mention may be made of alkyl sulfates, alkyl ether sulfates, alkylamido ether sulfates, alkylaryl polyether sulfates, monoglyceride sulfates, alkylsulfonates, alkylamidesulfonates, alkylarylsulfonates, α-olefin sulfonates, paraffin sulfonates, alkyl sulfosuccinates, alkyl ether sulfosuccinates, alkylamide sulfosuccinates, alkyl sulfoacetates, acylsarcosinates, acylglutamates, alkyl sulfosuccinamates, acylisethionates and N-acyltaurates, polyglycoside polycarboxylic acid and alkyl monoester salts, acyl lactylates, salts of D-galactoside uronic acids, salts of alkyl ether carboxylic acids, salts of alkylaryl ether carboxylic acids, salts of alkylamido ether carboxylic acids; and the corresponding non-salified forms of all these compounds; the alkyl and acyl groups of all these compounds comprising from 6 to 24 carbon atoms and the aryl group denoting a phenyl group.

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

The salts of C_6-C_{24} alkyl monoesters of polyglycoside-polycarboxylic acids can be chosen from C_6-C_{24} alkyl polyglycoside-citrates, C_6-C_{24} alkyl polyglycoside-tartrates and C_6-C_{24} alkyl polyglycoside-sulfosuccinates.

When the anionic surfactant(s) are in salt form, they may be chosen from alkali metal salts such as the sodium or potassium salt and preferably the sodium salt, ammonium salts, amine salts and in particular amino alcohol salts or alkaline-earth metal salts such as the magnesium salts.

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

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

Among the anionic surfactants mentioned, use is preferably made of (C_6-C_{24})alkyl sulfates, (C_6-C_{24})alkyl ether sulfates comprising from 2 to 50 ethylene oxide units, especially in the form of alkali metal, ammonium, amino alcohol and alkaline-earth metal salts, or a mixture of these compounds.

In particular, it is preferred to use (C_{12}-C_{20})alkyl sulfates, (C_{12}-C_{20})alkyl ether sulfates comprising from 2 to 20 ethylene oxide units, especially in the form of alkali metal, ammonium, amino alcohol and alkaline-earth metal salts, or a mixture of these compounds. Better still, it is preferred to use sodium lauryl ether sulfate containing 2.2 mol of ethylene oxide.

The additional nonionic surfactants are more particularly chosen from monooxyalkylenated or polyoxyalkylenated, monoglycerolated or polyglycerolated nonionic surfactants. The oxyalkylene units are more particularly oxyethylene or oxypropylene units, or a combination thereof, preferably oxyethylene units.

Examples of oxyalkylenated nonionic surfactants that may be mentioned include:

- oxyalkylenated (C_8-C_{24})alkylphenols;
- saturated or unsaturated and linear or branched oxyalkylenated C_8-C_{30} alcohols;

- saturated or unsaturated and linear or branched oxyalkylenated C_8-C_{30} amides;
- esters of saturated or unsaturated and linear or branched C_8-C_{30} acids and of polyethylene glycols;
- saturated or unsaturated, oxyethylenated plant oils;
- condensates of ethylene oxide and/or of propylene oxide, inter alia, alone or as mixtures.
- oxyethylenated and/or oxypropylenated silicones,
- alkyl(poly)glucosides.

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

In accordance with a preferred embodiment of the invention, the additional nonionic surfactants are chosen from oxyalkylenated nonionic surfactants, in particular oxyethylenated C_8-C_{30} alcohols comprising from 1 to 100 mol of ethylene oxide, and alkylpolyglucosides.

As examples of monoglycerolated or polyglycerolated nonionic surfactants, monoglycerolated or polyglycerolated C_8-C_{40} alcohols are preferably used.

In particular, the monoglycerolated or polyglycerolated C_8-C_{40} alcohols correspond to formula (II) below:

$$R_{29}O\text{-}[CH_2\text{-}CH(CH_2OH)\text{-}O]_m\text{-}H \quad (II)$$

in which formula (II):

- R_{29} represents a linear or branched C_8-C_{40} and preferably C_8-C_{30} alkyl or alkenyl radical; and
- m represents a number ranging from 1 to 30 and preferably from 1 to 10.

As examples of compounds of formula (II) that are suitable within the context of the invention, mention may be made of lauryl alcohol containing 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 of formula (II) 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 C_8-C_{10} alcohol containing 1 mol of glycerol, the C_{10}-C_{12} alcohol containing 1 mol of glycerol and the C_{12} alcohol containing 1.5 mol of glycerol.

Preferably, the additional surfactant used in the process of the invention in the composition is a monooxyalkylenated or polyoxyalkylenated, particularly monooxyethylenated or polyoxyethylenated, or monooxypropylenated or polyoxypropylenated, nonionic surfactant, or a combination thereof, more particularly monooxyethylenated or polyoxyethylenated.

The alkyl(poly)glycoside nonionic surfactant(s) may be represented by formula (III) below:

$$R_1O\text{-}(R_2O)_t\,(G)_v \qquad \text{(III)}$$

in which:

R_1 represents a saturated or unsaturated, linear or branched alkyl group comprising from about 8 to 24 carbon atoms, or an alkylphenyl group in which the linear or branched alkyl group comprises from 8 to 24 carbon atoms,

R_2 represents an alkylene group comprising from about 2 to 4 carbon atoms,

G represents a saccharide unit comprising from 5 to 6 carbon atoms,

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

v denotes a value ranging from 1 to 15.

Preferably, the alkyl(poly)glycoside nonionic surfactant(s) correspond to formula (III) in which:

R_1 denotes a linear or branched, saturated or unsaturated alkyl group containing from 8 to 18 carbon atoms,

G denotes glucose, fructose or galactose, preferably glucose,

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

and R_2 and v are as defined previously.

The degree of polymerization of the alkyl(poly)glycoside nonionic surfactant(s) as represented, for example, by the index v in formula (III) ranges on average from 1 to 15 and preferably from 1 to 4. This degree of polymerization more particularly ranges from 1 to 2 and better still from 1.1 to 1.5, on average.

The glycoside bonds between the saccharide units are of 1-6 or 1-4 type and preferably of 1-4 type.

Compounds of formula (III) that may be used in the present invention are especially represented by the products sold by the company Cognis under the names Plantaren® (600 CS/U, 1200 and 2000) or Plantacare® (818, 1200 and 2000). It is also possible to use the products sold by the company SEPPIC under the names Triton CG 110 (or Oramix CG 110) and Triton CG 312 (or Oramix® NS 10), the products sold by the company BASF under the name Lutensol GD 70, or those sold by the company Chem Y under the name AG10 LK.

It is also possible, for example, to use the 1,4- (C_8-C_{16})alkylpolyglucoside as an aqueous solution at 53% by weight relative to the total weight of the solution, sold by Cognis under the reference Plantacare® 818 UP.

The nonionic surfactant that may be used in the composition according to the invention is the (C_8-C_{10})alkylglucoside sold under the name Oramix CG 110 by the company SEPPIC.

Solvent

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

Examples of organic solvents that may be mentioned include linear or branched C_2-C_4 alkanols, such as ethanol and isopropanol; glycerol; polyols and polyol ethers, for instance 2-butoxyethanol, propylene glycol, dipropylene glycol, propylene glycol monomethyl ether, diethylene glycol monoethyl ether and diethylene glycol monomethyl ether; and also aromatic alcohols or ethers, for instance benzyl alcohol or phenoxyethanol, and mixtures thereof.

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

Additional dyes

When the composition of the invention is a dye composition, it may also comprise one or more additional direct dyes. The latter dyes are more particularly chosen from ionic or nonionic species, preferably cationic or nonionic species. These direct dyes may be synthetic or of natural origin.

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.

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

The dyes of the methine family are more particularly compounds comprising at least one sequence chosen from >C=C< and –N=C< in which the two atoms are not simultaneously engaged in a ring. However, it is pointed out that one of the nitrogen or carbon atoms of the sequences may be engaged in a ring. More particularly,

the dyes of this family are derived from compounds of the type such as methines, azomethines, monoarylmethanes and diarylmethanes, indoamines (or diphenylamines), indophenols, indoanilines, carbocyanines, azacarbocyanines and isomers thereof, diazacarbocyanines and isomers thereof, tetraazacarbocyanines and hemicyanines.

As regards the dyes of the carbonyl family, examples that may be mentioned include dyes chosen from acridone, benzoquinone, anthraquinone, naphthoquinone, benzanthrone, anthranthrone, pyranthrone, pyrazolanthrone, pyrimidinoanthrone, flavanthrone, idanthrone, flavone, (iso)violanthrone, isoindolinone, benzimidazolone, isoquinolinone, anthrapyridone, pyrazoloquinazolone, perinone, quinacridone, quinophthalone, indigoid, thioindigo, naphthalimide, anthrapyrimidine, diketopyrrolopyrrole and coumarin.

As regards the dyes of the cyclic azine family, mention may be made especially of azine, xanthene, thioxanthene, fluorindine, acridine, (di)oxazine, (di)thiazine and pyronin.

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

As regards the dyes of porphyrin or phthalocyanine type, it is possible to use cationic or non-cationic compounds, optionally comprising one or more metals or metal ions, for instance alkali metals, alkaline-earth metals, zinc and silicon.

Examples of particularly suitable direct dyes that may be mentioned include nitrobenzene dyes; azo direct dyes; azomethine direct dyes; methine direct dyes; azacarbocyanine direct dyes, for instance tetraazacarbocyanines (tetraazapentamethines); quinone and in particular anthraquinone, naphthoquinone or benzoquinone direct dyes; azine direct dyes; xanthene direct dyes; triarylmethane direct dyes; indoamine direct dyes; indigoid direct dyes; phthalocyanine direct dyes, porphyrin direct dyes and natural direct dyes, alone or as mixtures.

Among the natural 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, haematin, haematoxylin, brasilin, brasilein and orceins. Use may also be made of extracts or decoctions comprising these natural dyes and especially henna-based poultices or extracts.

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

Other additives

The composition according to the invention may also contain various adjuvants conventionally used in compositions for lightening or dyeing the hair, such as anionic, cationic, nonionic, amphoteric or zwitterionic polymers or mixtures thereof; mineral thickeners, and in particular fillers such as clays or talc; organic thickeners with, in particular, anionic, cationic, nonionic and amphoteric polymeric associative thickeners; antioxidants; penetrants; sequestrants; fragrances; dispersants; film-forming agents; ceramides; preserving agents; opacifiers.

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 the composition.

The composition may especially comprise one or more mineral thickeners chosen from organophilic clays and fumed silicas, or mixtures thereof.

The organophilic clay may be chosen from montmorillonite, bentonite, hectorite, attapulgite and 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.

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

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 especially 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 the company 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 the company Cabot.

It is possible to chemically modify the surface of the silica via chemical reaction in order to reduce 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 the company Degussa and Cab-O-Sil TS-530® by the company Cabot.

- dimethylsilyloxyl or polydimethylsiloxane groups, which are obtained in particular by treating fumed silica in the presence of polydimethylsiloxane or dimethyldichlorosilane. Silicas thus treated are known as "Silica dimethyl silylate" according to the CTFA (6th

Edition, 1995). They are sold, for example, under the references Aerosil R972® and Aerosil R974® by 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 mineral thickener represents from 1% to 30% by weight relative to the weight of the composition.

The composition may also comprise one or more organic thickeners.

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, hydroxypropylcel-lulose 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 a specific embodiment, the organic thickener is chosen from cellulose-based thickeners (hydroxyethylcellulose, hydroxypropylcellulose, 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 with in particular 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 the composition.

The composition of the invention may be in various forms, for instance a solution, an emulsion (milk or cream) or a gel, preferably in the form of an emulsion and particularly of a direct emulsion.

Preferably, the lightening or dyeing composition according to the invention comprises:

(a) one or more organic bases with a molecular weight of less than or equal to 300 $g.mol^{-1}$, chosen from alkanolamines, in particular monoethanolamine,

(b) one or more mineral bases chosen from mineral bases containing one or more elements from columns 1 and 2 of the Periodic Table of the Elements other than hydrogen, in particular alkali metal carbonates or bicarbonates,

(c) one or more organic or mineral acids in a content of greater than or equal to 0.2% by weight relative to the total weight of the composition,

(d) one or more fatty substances chosen from non-silicone oils, in a content of greater than or equal to 10% by weight relative to the total weight of the composition,

(e) one or more oxidizing agents, and

(f) optionally, one or more oxidation dyes when the composition is a dye composition;

the pH of the said composition being greater than or equal to 7.

More preferentially, the lightening or dye composition according to the invention comprises:

(a) one or more organic bases with a molecular weight of less than or equal to 300 $g.mol^{-1}$, chosen from alkanolamines, in particular monoethanolamine,

(b) one or more mineral bases chosen from mineral bases containing one or more elements from columns 1 and 2 of the Periodic Table of the Elements other than hydrogen, in particular alkali metal carbonates or bicarbonates,

(c) one or more organic or mineral acids in a content of greater than or equal to 0.2% by weight relative to the total weight of the composition,

(d) one or more fatty substances chosen from non-silicone oils present in a content ranging from 15% to 80% by weight, preferably from 25% to 75% by weight, better still from 30% to 70% by weight and even more advantageously from 30% to 60% by weight relative to the weight of the composition,

(e) one or more oxidizing agents, and

(f) optionally, one or more oxidation dyes when the composition is a dye composition;

the pH of the composition ranges from 7 to 9.5 and more preferentially from 8 to 9.

Processes of the invention

A subject of the present invention is also a process for lightening or dyeing keratin fibres, in particular human keratin fibres such as the hair, in which the lightening or dye composition as defined previously is applied to the said fibres.

The lightening process according to the invention consists in applying the composition comprising at least ingredients (a) to (e) as defined previously to wet or dry keratin fibres.

The dyeing process according to the invention consists in applying the composition comprising at least ingredients (a) to (f) as defined previously to wet or dry keratin fibres.

The compositions are left in place on the fibres for a time generally of from 1 minute to 1 hour and preferably from 5 minutes to 30 minutes.

The temperature during the lightening or dyeing process is conventionally between room temperature (between 15°C and 25°C) and 80°C and preferably between room temperature and 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 composition according to the invention is preferably prepared by mixing at least two compositions.

In a first variant of the invention, the lightening or dye composition according to the invention comprising, respectively, at least ingredients (a) to (e) or (a) to (f) as defined previously results from the mixing of two compositions:

- a composition (A) comprising (c) one or more organic or mineral acids and (e) one or more oxidizing agents, and
- a composition (B) comprising (a) one or more organic bases or salts thereof with a molecular weight of less than or equal to 300 $g.mol^{-1}$ as defined previously, and (b) one or more mineral bases as defined previously;

at least one of the compositions (A) or (B) comprising (d) one or more fatty substances, and composition (B) optionally comprising (f) one or more oxidation dyes when the composition is a dye composition;

such that the content of organic or mineral acids (c) in the composition according to the invention resulting from the mixing of compositions (A) + (B) is greater than or equal to 0.2% by weight relative to the total weight of the composition, such that the content of fatty substances (d) in the composition according to the invention resulting from the mixing of compositions (A) + (B) is greater than or equal to 10% by weight relative to the total weight of the composition and such that the pH of the composition according to the invention resulting from the mixing of compositions (A) + (B) is greater than or equal to 7.

Preferentially, at least one of the compositions (A) or (B) is aqueous.

Even more preferentially, both the compositions (A) and (B) are aqueous.

The term "*aqueous composition*" means a composition comprising at least 5% water. Preferably, an aqueous composition comprises more than 10% by weight of water and even more advantageously more than 20% by weight of water.

Preferably, composition (A) is aqueous.

Preferentially, composition (A) comprises at least 10% by weight of fatty substances and even more preferentially at least 10% by weight of non-silicone fatty substances that are liquid at room temperature (25°C).

Better still, composition (A) comprises at least 20% by weight of fatty substances and even more preferentially at least 20% by weight of non-silicone fatty substances that are liquid at room temperature (25°C).

Even better still, composition (A) comprises at least 30% by weight of fatty substances and even more preferentially at least 30% by weight of non-silicone fatty substances that are liquid at room temperature (25°C).

Preferably, composition (A) is a direct or inverse emulsion and preferably a direct (O/W) emulsion.

More preferentially, composition (A) comprises at least 10% by weight of fatty substances, in particular 10% by weight of non-silicone fatty substances that are liquid at room temperature (25°C) and composition (B) comprises at least 10% by weight of fatty substances, especially of non-silicone fatty substances that are liquid at room temperature (25°C).

Better still, composition (A) comprises at least 20% by weight of fatty substances, in particular 10% by weight of non-silicone fatty substances that are liquid at room temperature (25°C) and composition (B) comprises at least 20% by weight of fatty substances, especially of non-silicone fatty substances that are liquid at room temperature (25°C).

Even better still, composition (A) comprises at least 30% by weight of fatty substances, in particular 10% by weight of non-silicone fatty substances that are liquid at room temperature (25°C) and composition (B) comprises at least 30% by weight of fatty substances, especially of non-silicone fatty substances that are liquid at room temperature (25°C).

Compositions (A) and (B) are preferably mixed in a weight ratio (A)/(B) ranging from 0.2 to 10 and better still from 0.5 to 2.

In accordance with this embodiment, the lightening or dyeing process thus consists in applying to the keratin fibres the composition derived from the mixing of compositions (A) and (B) mentioned above.

In a second variant of the invention, the lightening or dye composition according to the invention comprising, respectively, at least ingredients (a) to (e) or (a) to (f) as defined previously results from the mixing of three compositions:

- a composition (A) comprising (c) one or more organic or mineral acids and (e) one or more oxidizing agents, and
- a composition (B) comprising (a) one or more organic bases or salts thereof with a molecular weight of less than or equal to 300 $g.mol^{-1}$ as defined previously, and (b) one or more mineral bases as defined previously; and
- a composition (C) comprising (d) one or more fatty substances as defined previously;

composition (B) optionally comprising (f) one or more oxidation dyes when the composition is a dye composition;

such that the content of organic or mineral acids (c) in the composition according to the invention resulting from the mixing of compositions (A) + (B) + (C) is greater than or equal to 0.2% by weight relative to the total weight of the composition, such that the content of fatty substances (d) in the composition according to the invention resulting from the mixing of compositions (A) + (B) + (C) is greater than or equal to 10% by weight relative to the total weight of the composition and such that the pH of the composition according to the invention resulting from the mixing of compositions (A) + (B) + (C) is greater than or equal to 7.

Preferably, composition (C) comprises (d) one or more fatty substances chosen from the oils as defined previously.

Device

Finally, the invention relates to a multi-compartment device comprising a first compartment containing composition (A) as

described above and at least a second compartment containing composition (B) as described above, and optionally a third compartment containing composition (C) as described previously, the compositions in the compartments being intended to be mixed together before application, to give the formulation after mixing according to the invention, on condition that the content of organic or mineral acid is greater than or equal to 0.2% by weight relative to the weight of the formulation derived from the mixing of (A) + (B) or (A) + (B) + (C), such that the content of fatty substance is greater than or equal to 10% by weight relative to the weight of the formulation derived from the mixing of (A) + (B) or (A) + (B) + (C) and such that the pH of the formulation derived from the mixing of (A) + (B) or (A) + (B) + (C) is greater than or equal to 7.

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

In these examples, the colour of the locks was evaluated in the CIE L* a* b* system, using a Minolta Spectrophotometer CM2600D colorimeter.

In this L* a* b* system, the three parameters denote, respectively, the colour intensity (L*), the green/red colour axis (a*) and the blue/yellow colour axis (b*). The higher the value of L*, the lighter the colour. The higher the value of a*, the redder the colour and the higher the value of b*, the yellower the colour.

The variation or extent of the lightening between locks of untreated natural grey (NG) hair and locks of hair after treatment is defined by the parameter DE* and is calculated according to the following equation:

$$DE^* = \sqrt{(L^* - L_0^*)^2 + (a^* - a_0^*)^2 + (b^* - b_0^*)^2} \quad \text{(i)}$$

In this equation, the parameters L*, a* and b* represent the values measured on locks of grey hair after lightening and the parameters L_0^*, a_0^* and b_0^* represent the values measured on locks of

untreated grey hair. The greater the value of ΔE_{ab}*, the better the lightening of the keratin fibres.

EXAMPLES

I. Lightening compositions

a. Compositions

The oxidizing compositions A1, A2 and A3, on the one hand, and compositions B1 and B2, on the other hand, in which the amounts are expressed as weight percentages of active material, are prepared.

	Composition A1	Composition A2	Composition A3
Hydrogen peroxide as an aqueous solution at 50% by weight	12 (6 of active material)	12 (6 of active material)	12 (6 of active material)
Phosphoric acid	-	0.1	4
Etidronic acid, tetrasodium salt, as a 30% aqueous solution	0.2 (0.06 of active material)	0.2 (0.06 of active material)	0.2 (0.06 of active material)
Tetrasodium pyrophosphate decahydrate	0.04	0.04	0.04
Citric acid	3	-	3
Sodium salicylate	0.035	0.035	0.035
Liquid petroleum jelly	50	50	50
Acrylamide/sodium acrylamido-2-methylpropanesulfonate copolymer	2	2	2
Vitamin E: DL-alpha-tocopherol	0.1	0.1	0.1
Water	qs 100	qs 100	qs 100

	Composition B1	Composition B2
Monoethanolamine	4	4
(50/50 C_8/C_{10})Alkyl polyglucoside as an aqueous solution at 60% by weight	2 (1.2 of active material)	2 (1.2 of active material)
Liquid petroleum jelly	60	60
Sodium bicarbonate	10	-
Xanthan gum	1	1
Water	qs 100	qs 100

b. Procedure

At the time of use, the following are mixed together:

- 1 part by weight of composition (A1) and 1 part by weight of composition (B1) (invention) (pH of the mixture = 8.3)
- 1 part by weight of composition (A1) and 1 part by weight of composition (B2) (comparative) (pH of the mixture = 9.2)
- 1 part by weight of composition (A2) and 1 part by weight of composition (B1) (comparative) (pH of the mixture = 9.2)
- 1 part by weight of composition (A2) and 1 part by weight of composition (B2) (comparative) (pH of the mixture = 10.1)
- 1 part by weight of composition (A3) and 1 part by weight of composition (B1) (comparative) (pH of the mixture = 5).

Each mixture is applied to a lock of chestnut-brown pigmented natural Caucasian hair (HT4). The "mixture/lock" bath ratio is, respectively, 10/1 (g/g).

The leave-on time is 30 minutes on a hotplate set at 27°C. After this time, the locks are rinsed and then washed with iNOA POST shampoo (pH = 5.3 ± 0.3). Finally, the locks are dried under a hood at 40°C.

The colour of the locks was evaluated in the CIE L* a* b* system, using a Minolta Spectrophotometer CM2600D colorimeter.

c. Results

The results on the locks of chestnut-brown pigmented Caucasian hair (HT4) are given in the table below:

	Reference HT4	Hair dyed with A1+ B1 (Inv)	Hair dyed with A1+B2 (Comp)	Hair dyed with A2+B1 (Comp)	Hair dyed with A2+B2 (Comp)	Hair dyed with A3+ B1 (Comp)
L*	24.3	37.5	28.76	30.61	30.91	25.82
a*	2.9	8.9	7.27	8.75	8.72	4.09
b*	3.7	17.1	9.72	12.55	12.91	5.2
DE*	-	19.6	8.6	12.3	12.7	2.4
Standard deviation	-	0.9	0.7	0.8	1.2	0.6

It is noted that the lightening obtained with the mixture A1+B1 according to the invention is more pronounced.

A similar result would be obtained by replacing in composition A1 the citric acid with phosphoric acid in order to obtain in the end the same mixture pH (8.3).

II. Dye compositions

a. Compositions

The oxidizing compositions A1 and A3, on the one hand, and compositions B1 and B2, on the other hand, in which the amounts are expressed as weight percentages of active material, are prepared.

	Composition A1	Composition A3
Hydrogen peroxide as an aqueous solution at 50% by weight	12 (6 of active material)	12 (6 of active material)
Phosphoric acid	-	4
Etidronic acid, tetrasodium salt, as a 30% aqueous solution	0.2 (0.06 of active material)	0.2 (0.06 of active material)
Tetrasodium pyrophosphate decahydrate	0.04	0.04
Citric acid	3	3
Sodium salicylate	0.035	0.035
Liquid petroleum jelly	50	50
Acrylamide/sodium acrylamido-2-methylpropanesulfonate copolymer	2	2
Vitamin E: DL-alpha-Tocopherol	0.1	0.1
Water	qs 100	qs 100

	Composition B1	Composition B2
Monoethanolamine	4	4
(50/50 C_8/C_{10})Alkyl polyglucoside as an aqueous solution at 60% by weight	2 (1.2 of active material)	2 (1.2 of active material)
Liquid petroleum jelly	60	60
Sodium bicarbonate	10	-
Xanthan gum	1	1
para-Phenylenediamine	0.432	0.432
2,4-Diaminophenoxyethanol	0.964	0.964
Water	qs 100	qs 100

b. Procedure

At the time of use, the following are mixed together:

- 1 part by weight of composition (A1) and 1 part by weight of composition (B1) (invention) (pH of the mixture = 8.3)
- 1 part by weight of composition (A1) and 1 part by weight of composition (B2) (comparative) (pH of the mixture = 9.2)
- 1 part by weight of composition (A3) and 1 part by weight of composition (B1) (comparative) (pH of the mixture = 5)

Each mixture is applied to a lock of chestnut-brown pigmented natural Caucasian hair (HT4) and to Caucasian hair containing 90% white hairs. The "mixture/lock" bath ratio is respectively 10/1 (g/g).

The leave-on time is 30 minutes on a hotplate set at 27°C. After this time, the locks are rinsed and then washed with iNOA POST shampoo (pH = 5.3 ± 0.3). Finally, the locks are dried under a hood at 40°C.

The colour of the locks was evaluated visually.

c. Results

The results of the coloration on the locks of Caucasian hair containing 90% white hairs are given in the table below:

	Reference	Hair dyed with A1+ B1 (Inv)	Hair dyed with A1+B2 (Comp.)	Hair dyed with A3+ B1 (Comp.)
General colour	90% white	Black	Dark blue	Blue

It is noted that the colour obtained with the mixture A1+B1 according to the invention is darker.

A similar result would be obtained by replacing in composition A1 the citric acid with phosphoric acid in order to obtain in the end the same mixture pH (8.3).

CLAIMS

1. Cosmetic composition for lightening or dyeing keratin fibres, in particular human keratin fibres such as the hair, comprising:

(a) one or more organic bases or salts thereof, these compounds having a molecular weight of less than or equal to 300 $g.mol^{-1}$,

(b) one or more mineral bases,

(c) one or more organic or mineral acids in a content of greater than or equal to 0.2% by weight relative to the total weight of the composition,

(d) one or more fatty substances in a content of greater than or equal to 10% by weight relative to the total weight of the composition,

(e) one or more oxidizing agents, and

(f) optionally, one or more oxidation dyes when the composition is a dye composition;

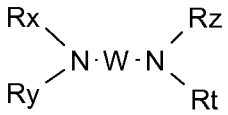
the pH of the composition being greater than or equal to 7.

2. Composition according to Claim 1, characterized in that the organic base(s) are chosen from amines and preferably from organic amines with a pK_b at 25°C of less than 12, preferably less than 10 and even more advantageously less than 6.

3. Composition according to Claim 1 or 2, characterized in that the organic base(s) comprise a primary, secondary or tertiary amine function and one or more linear or branched C_1-C_8 alkyl groups bearing one or more hydroxyl radicals.

4. Composition according to any one of the preceding claims, characterized in that the organic base(s) are chosen from:

- alkanolamines such as monoalkanolamines, dialkanolamines or trialkanolamines comprising from one to three identical or different C_1-C_4 hydroxyalkyl radicals,
- the organic bases of the following formula:



in which W is a C_1-C_6 alkylene residue optionally substituted with a hydroxyl group or a C_1-C_6 alkyl radical; Rx, Ry, Rz and Rt, which may be identical or different, represent a hydrogen atom or a C_1-C_6 alkyl, C_1-C_6 hydroxyalkyl or C_1-C_6 aminoalkyl radical,

- amino acids,
- organic amines of heterocyclic type,
- amino acid dipeptides,
- compounds comprising a guanidine function.

5. Composition according to any one of the preceding claims, characterized in that the mineral base(s) are chosen from aqueous ammonia or any compound bearing in its structure one or more elements from columns 1 to 13 of the Periodic Table of the Elements other than hydrogen.

6. Composition according to any one of the preceding claims, characterized in that the mineral base(s) have the following structure (T):

$(Z_1^{x-})_m(Z_2^{y+})_n$ (T)

in which:

Z_2 denotes a metal from columns 1 to 13 and preferably 1 or 2 of the Periodic Table of the Elements, such as sodium or potassium;

Z_1^{x-} denotes an anion chosen from the following ions: CO_3^{2-}, OH^-, HCO_3^{2-}, SiO_3^{2-}, HPO_4^{2-}, PO_4^{3-}, $B_4O_7^{2-}$, preferably from the ions CO_3^{2-}, OH^-, SiO_3^{2-};

x denotes 1, 2 or 3;

y denotes 1, 2, 3 or 4;

m and n denote, independently of each other, 1, 2, 3 or 4;

with n.y = m.x.

7. Composition according to any one of the preceding claims, characterized in that the mineral base(s) are chosen from sodium carbonate, potassium carbonate, sodium bicarbonate, sodium hydroxide, potassium hydroxide, sodium metasilicate and potassium metasilicate.

8. Composition according to any one of the preceding claims, characterized in that the acid(s) are chosen from organic acids.

9. Composition according to any one of the preceding claims, characterized in that the organic acid(s) are chosen from carboxylic acids, in particular propanoic acid, butanoic acid, acetic acid, lactic acid, citric acid, maleic acid, glycolic acid, salicylic acid, malic acid and tartaric acid, and mixtures thereof.

10. Composition according to any one of Claims 1 to 7, characterized in that the acid(s) are chosen from mineral acids.

11. Composition according to one of Claims 1 to 7 and 10, characterized in that the mineral acid(s) are chosen from hydrochloric acid, sulfuric acid, nitric acid and phosphoric acid and in particular from hydrochloric acid and phosphoric acid.

12. Composition according to one of Claims 1 to 7, 10 and 11, characterized in that the mineral acid is phosphoric acid.

13. Composition according to any one of the preceding claims, characterized in that the acid(s) represent from 0.2% to 10% by weight, preferably from 0.2% to 2% by weight and more preferentially from 0.2% to 1% by weight, relative to the total weight of the composition.

14. Composition according to any one of the preceding claims, characterized in that the fatty substance(s) are chosen from oils, preferably non-silicone oils.

15. Composition according to any one of the preceding claims, characterized in that the fatty substance(s) are chosen from liquid petroleum jelly, polydecenes, liquid fatty alcohols, and liquid esters of fatty acids and/or of fatty alcohols, or mixtures thereof, and more preferentially from liquid petroleum jelly and octyldodecanol.

16. Composition according to any one of the preceding claims, characterized in that the fatty substance(s), which are preferably non-silicone, are present in a content ranging from 10 to 80% by weight, preferably from 15 to 80% by weight, more preferably from 25 to 75% by weight, better still from 30% to 70% by weight and even more

advantageously from 30% to 60% by weight, relative to the total weight of the dye composition.

17. Composition according to any one of the preceding claims, characterized in that the oxidizing agent(s) are chosen from hydrogen peroxide, urea peroxide, alkali metal bromates or ferricyanides, peroxygenated salts such as persulfates, perborates, peracids and precursors thereof, and alkali metal or alkaline-earth metal percarbonates.

18. Composition according to any one of the preceding claims, characterized in that the oxidizing agent is hydrogen peroxide optionally combined with one or more peroxygenated salts.

19. Composition according to any one of the preceding claims, characterized in that the oxidation dye(s) are chosen from oxidation bases, optionally combined with one or more couplers.

20. Composition according to Claim 19, characterized in that the oxidation dye(s) are chosen from para-phenylenediamines, bis(phenyl)alkylenediamines, para-aminophenols, ortho-aminophenols and heterocyclic bases, and the addition salts thereof.

21. Composition according to any one of the preceding claims, characterized in that the pH ranges from 7 to 9.5 and more preferentially from 8 to 9.

22. Process for lightening or dyeing keratin fibres, in particular human keratin fibres such as the hair, in which the composition as defined according to any one of the preceding claims is applied to the said fibres.

23. Lightening or dyeing process according to Claim 22, characterized in that the composition as defined according to any one of Claims 1 to 21 is derived from the mixing of at least two compositions and in particular of two compositions:

- a composition (A) comprising (c) one or more organic or mineral acids as defined in Claims 1 and 8 to 13 and (e) one or more oxidizing agents as defined in Claims 1, 17 and 18, and
- a composition (B) comprising (a) one or more organic bases or salts thereof, these compounds having a molecular weight of less

than or equal to 300 $g.mol^{-1}$ as defined according to Claims 1 to 4, and (b) one or more mineral bases as defined according to Claims 1 and 5 to 7;

at least one of the compositions (A) or (B) comprising (d) one or more fatty substances, and composition (B) optionally comprising one or more oxidation dyes when the composition is a dye composition;

such that the content of organic or mineral acids (c) in the composition resulting from the mixing of compositions (A) + (B) is greater than or equal to 0.2% by weight relative to the total weight of the composition, such that the content of fatty substances (d) in the composition resulting from the mixing of compositions (A) + (B) is greater than or equal to 10% by weight relative to the total weight of the composition and such that the pH of the composition resulting from the mixing of compositions (A) + (B) is greater than or equal to 7.

24. Multi-compartment device comprising a first compartment containing composition (A) as defined in Claim 23 and at least a second compartment containing composition (B) as defined in Claim 23, the compositions in the compartments being intended to be mixed together before application, to give the formulation after mixing, on condition that the content of organic or mineral acid is greater than or equal to 0.2% by weight relative to the weight of the formulation derived from the mixing of (A) + (B), that the content of fatty substance is greater than or equal to 10% by weight relative to the weight of the formulation derived from the mixing of (A) + (B) and that the pH of the formulation derived from the mixing of (A) + (B) is greater than or equal to 7.

INTERNATIONAL SEARCH REPORT

International application No
PCT/EP2014/063505

A. CLASSIFICATION OF SUBJECT MATTER
INV. A61K8/19 A61K8/365 A61K8/41 A61K8/44 A61K8/43
A61K8/49 A61Q5/10 A61Q5/08 A61K8/31 A61K8/92
ADD.
According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
A61K A61Q

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

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)
EPO-Internal, WPI Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 2002/189034 A1 (KITABATA YASUHIKO [JP] ET AL) 19 December 2002 (2002-12-19) paragraphs [0007], [0011], [0013] - [0024], [0028], [0043], [0050], [0051] examples 4,6,7,8 -----	1-24
X	EP 2 198 831 A1 (OREAL [FR]) 23 June 2010 (2010-06-23) paragraph [0001] examples 1,2 paragraph [0222] -----	1-24

☐ Further documents are listed in the continuation of Box C.

☒ See patent family annex.

* Special categories of cited documents :

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"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
27 October 2014	05/11/2014

Name and mailing address of the ISA/	Authorized officer
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INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No
PCT/EP2014/063505

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 2002189034 A1	19-12-2002	JP 2002363048 A	18-12-2002
		US 2002189034 A1	19-12-2002
EP 2198831 A1	23-06-2010	BR PI0907074 A2	07-05-2013
		CN 101744746 A	23-06-2010
		EP 2198831 A1	23-06-2010
		JP 2010143926 A	01-07-2010
		US 2010175705 A1	15-07-2010