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(54) Title: COMPOSITION COMPRISING A PARTICULAR POLYCARBOXYLIC ACID OR A SALT THEREOF, A (BI)CARBONATE IN A PARTICULAR CONTENT, AN ADDITIONAL ALKALINE AGENT, A FATTY SUBSTANCE AND A DYE

(57) Abstract: The invention relates to a composition comprising at least one particular carboxylic acid or a salt thereof, a (bi)carbonate in a particular content, an additional alkaline agent, a fatty substance and a dye.



WO 2025/003368 A1

## Description

### **Title of Invention: COMPOSITION COMPRISING A PARTICULAR POLYCARBOXYLIC ACID OR A SALT THEREOF, A (BI)CARBONATE IN A PARTICULAR CONTENT, AN ADDITIONAL ALKALINE AGENT, A FATTY SUBSTANCE AND A DYE**

- [0001] The invention relates to a composition comprising a particular carboxylic acid or a salt thereof, at least one (bi)carbonate in a particular content, at least one additional alkaline agent, at least one fatty substance and at least one dye.
- [0002] The invention also relates to a process for dyeing keratin fibres, notably the hair, using this composition.
- [0003] Finally, the invention relates to the use of such a composition for dyeing keratin fibres, and notably the hair.
- [0004] Many people have sought for a long time to modify the colour of their hair and in particular to mask their grey hair.
- [0005] In the field of dyeing hair keratin fibres, in particular human keratin fibres, it is already known practice to dye hair keratin fibres via various techniques using direct dyes or pigments for non-permanent dyeing, or dye precursors for permanent dyeing.
- [0006] There are essentially three types of process for dyeing the hair:
- [0007] a) “permanent” dyeing, the function of which is to afford a substantial modification to the natural colour and which uses oxidation dyes which penetrate into the hair fibre and form the dye via an oxidative condensation process;
- [0008] b) non-permanent, semi-permanent or direct dyeing, which does not use the oxidative condensation process and withstands four or five shampoo washes; it consists in dyeing keratin fibres with dye compositions containing direct dyes;
- [0009] c) temporary dyeing, which gives rise to a modification of the natural colour of the hair that remains from one shampoo wash to the next, and which serves to enhance or correct a shade that has already been obtained. It may also be likened to a “makeup” process.
- [0010] It is thus known practice to dye keratin fibres, in particular human keratin fibres such as the hair, to obtain “permanent” dyeing with dye compositions containing oxidation dye precursors, notably oxidation bases, such as ortho- or para-phenylenediamines, ortho- or para-aminophenols, or heterocyclic compounds such as pyrazoles, pyrazolinones or pyrazolopyridines. These oxidation bases are colourless or weakly

coloured compounds which, when combined with oxidizing products, can give rise to coloured compounds via a process of oxidative condensation.

- [0011] It is also possible to vary the shades obtained with these oxidation bases by combining them with couplers or colour modifiers. The variety of molecules used as oxidation bases and couplers allows a wide range of colours to be obtained.
- [0012] However, the use of these dye compositions may entail a certain number of drawbacks.
- [0013] Specifically, after application to keratin fibres, the dyeing power obtained may not be entirely satisfactory, or may even be weak, and lead to a limited range of colours.
- [0014] The colourings may also be insufficiently fast with respect to external agents such as light, shampoo washing or perspiration, and may also be too selective, i.e. the difference in colouring is too great along the same keratin fibre that is differently sensitized between its end and its root.
- [0015] Consumers are moreover in search of dyeing products that are more environmentally friendly, notably based on ingredients of natural origin, and which have good application qualities, are easy to use and give good dyeing properties.
- [0016] The formulation of environmentally-friendly cosmetic products, i.e. products whose design and development take account of environmental issues, is becoming a major preoccupation for contributing towards meeting the global challenges.
- [0017] It thus proves essential to propose more sustainable compositions, thereby enabling these environmental challenges to be met.
- [0018] Thus, there is a real need to provide a composition for dyeing keratin fibres, in particular human keratin fibres such as the hair, which is more environmentally friendly and which is capable of producing good colour build-up, intensity and chromaticity, while at the same time having low selectivity and good fastness, notably good resistance to shampoo washing, and which is capable of delivering good dyeing performance, even after a period of storage, while at the same time having good application qualities and retaining good sensory performance notably in terms of sheen, smoothness, suppleness, straightening and disentangling of keratin fibres such as the hair.
- [0019] These aims and others are achieved by the present invention, one subject of which is thus a composition comprising:
- [0020] 1) at least one polycarboxylic acid of formula (I) below, salts thereof, optical isomers thereof, geometrical isomers thereof, and/or solvates thereof:
- [0021]  $R_1-N-(CH(R_2)COOH)_2$  (I) in which
- [0022]  $R_1$  represents a hydrogen atom or a group  $-CH(COOH)-(CH_2)_2-COOH$ ,  $-CH_2CH_2OH$ ,  $-CH(CH_3)COOH$ ,  $-(CH_2)_2N(COR_3)-CH_2-COOH$  or  $-CH(COOH)-CH_2-COOH$ ; and

- [0023] R<sub>2</sub> represents a CH<sub>2</sub>COOH group when R<sub>1</sub> represents a hydrogen atom, or R<sub>2</sub> represents a hydrogen atom when R<sub>1</sub> is other than a hydrogen atom; and
- [0024] R<sub>3</sub> represents a linear or branched alkyl group including from 1 to 4 carbon atoms or a cyclic alkyl group including from 3 to 30 carbon atoms;
- [0025] 2) at least one (bi)carbonate, the total (bi)carbonate content being greater than or equal to 1% by weight relative to the total weight of the composition;
- [0026] 3) at least one additional alkaline agent;
- [0027] 4) at least one fatty substance; and
- [0028] 5) at least one dye.
- [0029] According to a preferred embodiment, the composition according to the invention is a composition for dyeing keratin fibres, notably the hair.
- [0030] The composition according to the invention may notably lead to chromatic, powerful, intense and sparingly selective colourings, i.e. colourings that are uniform along the length of the fibre.
- [0031] The composition according to the invention has improved resistance to shampoo washing and also good stability over time, notably little or no change in its viscosity during storage.
- [0032] The composition according to the invention has good application qualities, notably in terms of texture, ease of application, adhesion to the hair and lengthening.
- [0033] The composition according to the invention can also afford good cosmetic qualities, notably in terms of sheen, smoothness and suppleness, and a more natural feel, while at the same time preserving the integrity of the fibre.
- [0034] The composition according to the invention can also provide keratin fibres with cosmetic compositions which do not have a strong ammonia odour.
- [0035] A subject of the invention is also a process for dyeing the hair using the composition of the invention.
- [0036] A subject of the invention is also a kit comprising, in a first compartment, a composition as defined previously and, in a second compartment, an oxidizing composition comprising at least one chemical oxidizing agent.
- [0037] According to the invention, the term “*chemical oxidizing agent*” means an oxidizing agent other than atmospheric oxygen.
- [0038] Other subjects, features, aspects and advantages of the invention will emerge even more clearly on reading the description and the examples that follow.
- [0039] In the text hereinbelow, unless otherwise indicated, the limits of a range of values are included in that range, notably in the expressions “between” and “ranging from ... to ...”.
- [0040] Moreover, the expression “*at least one*” used in the present description is equivalent to the expression “*one or more*”.

### Particular polycarboxylic acid

- [0041] The composition according to the invention comprises at least one polycarboxylic acid of formula (I) below, salts thereof, optical isomers thereof, geometrical isomers thereof, and/or solvates thereof 1):
- [0042]  $R_1-N-(CH(R_2)COOH)_2$  (I) in which
- [0043]  $R_1$  represents a hydrogen atom or a group  $-CH(COOH)-(CH_2)_2-COOH$ ,  $-CH_2CH_2OH$ ,  $-CH(CH_3)COOH$ ,  $-(CH_2)_2N(COR_3)-CH_2-COOH$  or  $-CH(COOH)-CH_2-COOH$ ; and
- [0044]  $R_2$  represents a  $CH_2COOH$  group when  $R_1$  represents a hydrogen atom, or  $R_2$  represents a hydrogen atom when  $R_1$  is other than a hydrogen atom; and
- [0045]  $R_3$  represents a linear or branched alkyl group including from 1 to 4 carbon atoms or a cyclic alkyl group including from 3 to 30 carbon atoms.
- [0046] More precisely, the carboxylic acids of formula (I) correspond to:
- [0047] - compounds comprising four carboxylic acid functions, when  $R_1$  represents a hydrogen atom and  $R_2$  represents a  $-CH_2-COOH$  group, or when  $R_1$  represents a  $-CH(COOH)-(CH_2)_2-COOH$  group and  $R_2$  represents a hydrogen atom, or when  $R_1$  represents a  $-CH(COOH)-CH_2-COOH$  group and  $R_2$  represents a hydrogen atom;
- [0048] - compounds comprising three carboxylic acid functions, when  $R_1$  represents a  $-CH(CH_3)-COOH$  group and  $R_2$  represents a hydrogen atom, or when  $R_1$  represents a group  $-(CH_2)_2-N(COR_3)-CH_2-COOH$  and  $R_2$  represents a hydrogen atom; and to
- [0049] - compounds comprising two carboxylic acid functions, when  $R_1$  represents a  $-CH_2CH_2OH$  group and  $R_2$  represents a hydrogen atom.
- [0050] Preferably,  $R_1$  represents a  $-CH(COOH)-(CH_2)_2-COOH$  group and  $R_2$  represents a hydrogen atom.
- [0051] The carboxylic acids of formula (I) may be in the form of pure enantiomers, preferably of L configuration, or in the form of mixtures, notably racemic mixtures.
- [0052] The salts of the carboxylic acid(s) of formula (I) are preferably chosen from alkali metal salts, alkaline-earth metal salts, transition metal salts, organic amine salts, the ammonium and substituted ammonium salts thereof, and mixtures thereof.
- [0053] As examples of alkali metal salts, mention may notably be made of the sodium ( $Na^+$ ) and potassium ( $K^+$ ) salts, whereas as examples of alkaline-earth metal salts, mention may notably be made of the calcium ( $Ca^{2+}$ ) and magnesium ( $Mg^{2+}$ ) salts.
- [0054] For the purposes of the present invention, the term "transition metal" means a metal having an incomplete d sub-shell, more particularly in oxidation state II, such as cobalt ( $Co^{2+}$ ), iron ( $Fe^{2+}$ ), manganese ( $Mn^{2+}$ ), zinc ( $Zn^{2+}$ ) and copper ( $Cu^{2+}$ ).
- [0055] As regards the salts of organic amines, mention may be made of the salts of primary, secondary or tertiary amines, or alternatively of alkanolamines. Said amines contain

one or more identical or different radicals, of linear or branched C1 to C20 alkyl type, optionally comprising a heteroatom such as oxygen.

[0056] Among the salts of these compounds, the alkali metal salts and notably the sodium or potassium salts are preferred.

[0057] Preferably, said carboxylic acid(s) of formula (I) used in the context of the present invention are chosen from methylglycinediacetic acid, N-lauroyl-N,N',N'-triacetic acid ethylenediamine, N,N-dicarboxymethylglutamic acid, iminodisuccinic acid, N,N-bis(carboxymethyl)aspartic acid, alkali metal salts thereof, alkaline-earth metal salts thereof, transition metal salts thereof, organic amine salts thereof, ammonium salts thereof, optical isomers thereof, geometrical isomers thereof, solvates thereof and mixtures thereof, and more preferentially from N,N-dicarboxymethylglutamic acid, N,N-bis(carboxymethyl)aspartic acid, alkali metal salts thereof, alkaline-earth metal salts thereof, transition metal salts thereof, organic amine salts thereof, ammonium salts thereof, optical isomers thereof, geometrical isomers thereof, solvates thereof and mixtures thereof.

[0058] Better still, the carboxylic acid(s) of formula (I) are chosen from N,N-dicarboxymethylglutamic acid, N,N-bis(carboxymethyl)aspartic acid, alkali metal salts thereof, alkaline-earth metal salts thereof, transition metal salts thereof, organic amine salts thereof, ammonium salts thereof, optical isomers thereof, geometrical isomers thereof, solvates thereof and mixtures thereof.

[0059] Preferably, the carboxylic acid of formula (I) used according to the present invention is chosen from N,N-dicarboxymethylglutamic acid, alkali metal salts thereof, optical isomers thereof, and/or geometrical isomers thereof, preferentially from N,N-dicarboxymethylglutamic acid, tetrasodium N,N-bis(carboxymethyl)glutamate, optical isomers thereof and/or geometrical isomers thereof, better still from N,N-dicarboxymethyl-L-glutamic acid and/or tetrasodium N,N-bis(carboxymethyl)-L-glutamate.

[0060] Preferably, the compound having the INCI name Tetrasodium glutamate diacetate is used, such as Dissolvine GL38 or 47S sold by the company AkzoNobel.

[0061] According to this embodiment, the total content of the carboxylic acid(s) of formula (I), salts thereof, optical isomers thereof, geometrical isomers thereof, and/or solvates thereof as defined previously, ranges from 0.001% to 15% by weight, preferentially from 0.005% to 10% by weight, more preferentially from 0.01% to 8% by weight, better still from 0.05% to 5% by weight, even better still from 0.1% to 2% by weight relative to the total weight of the composition.

[0062] According to a particular embodiment, the carboxylic acid(s) of formula (I) are chosen from N,N-dicarboxymethyl-L-glutamic acid and/or tetrasodium N,N-bis(carboxymethyl)-L-glutamate, which may be present in a total content ranging

from 0.001% to 15% by weight, preferentially from 0.005% to 10% by weight, more preferentially from 0.01% to 8% by weight, better still from 0.05% to 5% by weight and even better still from 0.1% to 2% by weight relative to the total weight of the composition

### **(Bi)carbonate**

- [0063] The composition according to the invention comprises at least one (bi)carbonate, the total (bi)carbonate content being greater than or equal to 1% by weight relative to the total weight of the composition.
- [0064] The term "(bi)carbonate" means carbonate, a carbonate-generating system, bicarbonate, a bicarbonate-generating system, and mixtures thereof.
- [0065] The term "carbonate-generating system" means a system which generates carbonate *in situ*, for instance carbon dioxide in water or percarbonate in water.
- [0066] The term "bicarbonate-generating system" means a system which generates bicarbonate *in situ*, for instance carbon dioxide in water or by buffering a carbonate with a mineral or organic acid.
- [0067] The (bi)carbonate(s) are preferably chosen from:
- [0068] - carbonate(s) preferably chosen from:
- [0069] a) carbonates of alkali metals ( $\text{Met}^{2+}$ ,  $\text{CO}_3^{2-}$ ), of alkaline-earth metals ( $\text{Met}'^{2+}$ ,  $\text{CO}_3^{2-}$ ) of ammonium  $\text{NH}_4^+$  or of phosphonium  $(\text{R}''_4\text{P}^+)_2\text{CO}_3^{2-}$  with  $\text{Met}'$  representing an alkaline-earth metal and  $\text{Met}$  representing an alkali metal, and  $\text{R}''$ , which may be identical or different, represent a hydrogen atom or an optionally substituted ( $\text{C}_1$ - $\text{C}_6$ )alkyl group such as hydroxyethyl; and mixtures thereof;
- [0070] - bicarbonate(s) preferably chosen from:
- [0071] b) the compounds of the following formulae:
- [0072] #  $\text{R}'^+$ ,  $\text{HCO}_3^-$  with  $\text{R}'$  representing a hydrogen atom, an alkali metal, an ammonium group  $\text{NH}_4^+$  or a phosphonium group  $\text{R}''_4\text{P}^+$  where  $\text{R}''$ , which may be identical or different, represent a hydrogen atom or an optionally substituted ( $\text{C}_1$ - $\text{C}_6$ )alkyl group, such as hydroxyethyl, and, when  $\text{R}'$  represents a hydrogen atom, the hydrogen carbonate is then known as dihydrogen carbonate ( $\text{CO}_2$ ,  $\text{H}_2\text{O}$ ); and
- [0073] #  $\text{Met}'^{2+}(\text{HCO}_3^-)_2$  with  $\text{Met}'$  representing an alkaline-earth metal;
- [0074] and mixtures thereof.
- [0075] More particularly, the (bi)carbonate(s) are chosen from alkali metal, alkaline-earth metal and ammonium (bi)carbonates; preferentially alkali metal (bi)carbonates, ammonium (bi)carbonates and mixtures thereof, more preferentially alkali metal bicarbonates, ammonium bicarbonate and mixtures thereof.
- [0076] By way of example, they are chosen from Na, K, Mg and Ca (bi)carbonates, ammonium (bi)carbonates and mixtures thereof. Preferably, the (bi)carbonate(s) are

chosen from Na (bi)carbonate, K (bi)carbonate, ammonium (bi)carbonate and mixtures thereof, preferentially Na bicarbonate, K bicarbonate, ammonium bicarbonate and mixtures thereof, better still ammonium bicarbonate.

[0077] According to one embodiment, the compound(s) are chosen from bicarbonates, bicarbonate-generating systems and mixtures thereof, preferably from bicarbonates.

[0078] According to a preferred embodiment, the (bi)carbonate is ammonium bicarbonate.

[0079] These bicarbonates may be derived from natural water, for example spring water from the Vichy basin, from La Roche Posay or from Badoit, which are known for their content of bicarbonate of soda or sodium bicarbonate  $[144-55-8] = \text{NaHCO}_3$  and of calcium bicarbonate  $= \text{Ca}(\text{HCO}_3)_2$ .

[0080] The (bi)carbonate(s) may be present in a total content ranging from 1% to 20% by weight, preferably from 1.2% to 15% by weight, more preferentially from 1.5% to 10% by weight, better still from 1.8% to 5% by weight and even better still from 2 to 4% by weight relative to the total weight of the composition.

[0081] According to a preferred embodiment, the bicarbonate is ammonium bicarbonate, which may be present in a content ranging from 1% to 20% by weight, preferably from 1.2% to 15% by weight, more preferentially from 1.5% to 10% by weight, better still from 1.8% to 5% by weight and even better still from 2% to 4% by weight relative to the total weight of the composition.

#### **Additional alkaline agent**

[0082] The composition according to the invention comprises one (or more) alkaline agent(s) 3) in addition to the (bi)carbonates.

[0083] Preferably, the additional alkaline agent(s) may be chosen from organic alkaline agents and inorganic alkaline agents.

[0084] Preferably, the organic alkaline agent(s) are chosen from organic amines, the  $pK_b$  of which at 25°C is less than 12, more preferentially less than 10 and even more advantageously less than 6. It should be noted that it is the  $pK_b$  corresponding to the function which has the highest basicity. In addition, the organic amines do not comprise any alkyl or alkenyl fatty chains comprising more than ten carbon atoms.

[0085] The organic alkaline agent(s) are preferably chosen from alkanolamines, in particular mono-, di- or tri-hydroxy(C1-C6)alkylamines, such as 2-amino-2-methylpropanol, monoethanolamine, oxyethylenated and/or oxypropylenated ethylenediamines, amino acids, polyamines, and mixtures thereof.

[0086] The term "alkanolamine" means an organic amine comprising a primary, secondary or tertiary amine function, and one or more linear or branched C1-C8 alkyl groups bearing one or more hydroxyl radicals.

- [0087] Among the compounds of this type, mention may be made of monoethanolamine (MEA), diethanolamine, triethanolamine, monoisopropanolamine, diisopropanolamine, N,N-dimethylethanolamine, 2-amino-2-methyl-1-propanol, triisopropanolamine, 2-amino-2-methyl-1,3-propanediol, 3-amino-1,2-propanediol, 3-dimethylamino-1,2-propanediol and tris(hydroxymethylamino)methane.
- [0088] More particularly, the amino acids that may be used are of natural or synthetic origin, in their L, D or racemic form, and include at least one acid function chosen more particularly from carboxylic acid, sulfonic acid, phosphonic acid and phosphoric acid functions. The amino acids may be in neutral or ionic form.
- [0089] As amino acids that may be used in the present invention, mention may notably be made 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.
- [0090] Among the inorganic alkaline agents that may be used in the composition according to the invention, mention may be made of ammonium hydroxide (also known as aqueous ammonia), mineral hydroxides, silicates, metasilicates, phosphates or hydrogen phosphates, and in particular ammonium hydroxide, alkali metal silicates or metasilicates, notably sodium silicate and sodium metasilicate.
- [0091] Among the mineral hydroxides, sodium hydroxide is preferred.
- [0092] Preferably, the additional alkaline agent(s) are chosen from ammonium hydroxide, alkanolamines, alkali metal silicates and metasilicates, mineral hydroxides and mixtures thereof, more preferentially chosen from ammonium hydroxide, alkanolamines and mixtures thereof, better still chosen from ammonium hydroxide, monoethanolamine and mixtures thereof.
- [0093] Even more preferentially, the additional alkaline agent is ammonium hydroxide.
- [0094] Advantageously, the total content of the additional alkaline agent(s) ranges from 0.01% to 20% by weight, preferably from 0.1% to 15% by weight, more preferentially from 0.5% to 10% by weight and even more preferentially from 1% to 7% by weight, relative to the total weight of the composition.

### **Fatty substance**

- [0095] The composition according to the invention comprises one or more fatty substances 4).
- [0096] The term “*fatty substance*” means an organic compound that is insoluble in water at 25°C and at atmospheric pressure ( $1.013 \times 10^5$  Pa) (solubility of less than 5% by weight, preferably less than 1% by weight, even more preferentially less than 0.1% by weight). They bear in their structure at least one hydrocarbon-based chain

including at least 6 carbon atoms and/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.

[0097] Advantageously, the fatty substances that may be used in the present invention are neither (poly)oxyalkylenated nor (poly)glycerolated.

[0098] Preferably, the fatty substances that are useful according to the invention are non-silicone fatty substances.

[0099] The term “non-silicone fatty substance” refers to a fatty substance not containing any Si-O bonds and the term “silicone fatty substance” refers to a fatty substance containing at least one Si-O bond.

[0100] The fatty substances that are useful according to the invention may be liquid fatty substances (or oils) and/or solid fatty substances. The term “liquid fatty substance” means a fatty substance having a melting point of less than or equal to 25°C at atmospheric pressure ( $1.013 \times 10^5$  Pa). The term “solid fatty substance” means a fatty substance having a melting point of greater than 25°C at atmospheric pressure ( $1.013 \times 10^5$  Pa).

[0101] For the purposes of the present invention, the melting point corresponds to the temperature of the most endothermic peak observed on thermal analysis (differential scanning calorimetry or DSC) as described in the standard ISO 11357-3; 1999. The melting point may be measured using a differential scanning calorimeter (DSC), for example the calorimeter sold under the name MDSC 2920 by the company TA Instruments. In the present patent application, all the melting points are determined at atmospheric pressure ( $1.013 \times 10^5$  Pa).

[0102] More particularly, the liquid fatty substance(s) according to the invention are chosen from liquid hydrocarbons comprising more than 6 carbon atoms, non-silicone oils of animal origin, oils of triglyceride type of plant or synthetic origin, fluoro oils, liquid fatty alcohols, liquid fatty acid and/or fatty alcohol esters other than triglycerides, and silicone oils, and mixtures thereof.

[0103] It is recalled that the fatty alcohols, esters and acids more particularly contain at least one saturated or unsaturated, linear or branched hydrocarbon-based group comprising from 6 to 40 and better still from 8 to 30 carbon atoms, which is optionally substituted, in particular with one or more hydroxyl groups (in particular 1 to 4). If they are unsaturated, these compounds may comprise one to three conjugated or unconjugated carbon-carbon double bonds.

- [0104] By way of example, the liquid hydrocarbons including more than 6 carbon atoms may be chosen from C<sub>6</sub> to C<sub>16</sub> liquid hydrocarbons, which may be linear, branched, optionally cyclic, and preferably saturated. Mention may be made of hexane, cyclohexane, undecane, dodecane, isododecane, tridecane or isoparaffins, such as isohexadecane or isodecane, and mixtures thereof.
- [0105] The liquid hydrocarbons comprising more than 6 carbon atoms may also be chosen from linear or branched liquid hydrocarbons of more than 16 carbon atoms, which are of mineral or synthetic origin, and are preferably chosen from liquid paraffins or liquid petroleum jelly (INCI name: mineral oil or *paraffinum liquidum*), polydecenes, hydrogenated polyisobutene such as Parleam®, and mixtures thereof.
- [0106] The liquid hydrocarbons comprising more than 6 carbon atoms may also be chosen from mixtures of alkanes containing from 8 to 28 carbon atoms, more particularly from 15 to 28 carbon atoms; mention may be made of mixtures having, for example, the following INCI names: C15-19 Alkane, C18-C21 Alkane, C21-C28 Alkane, for instance the products Gemseal 40, Gemseal 60 and Gemseal 120 sold by Total, Emogreen L19 sold by SEPPIC and Emogreen L15 sold by SEPPIC, more particularly Emogreen L19 sold by SEPPIC.
- [0107] A hydrocarbon-based oil of animal origin that may be mentioned is perhydrosqualene.
- [0108] The triglyceride oils of plant or synthetic origin are preferably chosen from liquid fatty acid triglycerides including 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 Stéarinerie Dubois or those sold under the names Miglyol® 810, 812 and 818 by the company Dynamit Nobel, jojoba oil and shea butter oil, and mixtures thereof.
- [0109] The liquid fatty alcohols that are suitable for use in the invention are more particularly chosen from linear or branched, saturated or unsaturated alcohols, preferably unsaturated or branched alcohols, including from 6 to 40 carbon atoms and preferably from 8 to 30 carbon atoms. Examples that may be mentioned include octyldodecanol, 2-butyloctanol, 2-hexyldecanol, 2-undecylpentadecanol, isostearyl alcohol, oleyl alcohol, linolenyl alcohol, ricinoleyl alcohol, undecylenyl alcohol and linoleyl alcohol, and mixtures thereof.
- [0110] As regards the liquid fatty acid and/or fatty alcohol esters, other than the triglycerides mentioned previously, mention may be made notably of esters of saturated or unsaturated, linear C1 to C26 or branched C3 to C26 aliphatic mono- or polyacids and of saturated or unsaturated, linear C1 to C26 or branched C3 to C26 aliphatic mono- or

polyalcohols, the total carbon number of the esters being greater than or equal to 6 and more advantageously greater than or equal to 10.

- [0111] Preferably, for the esters of monoalcohols, at least one from among the alcohol and the acid from which the esters of the invention are derived is branched.
- [0112] Among the monoesters, mention may be made of dihydroabietyl behenate; octyldodecyl behenate; isocetyl behenate; isostearyl lactate; lauryl lactate; linoleyl lactate; oleyl lactate; isostearyl octanoate; isocetyl octanoate; octyl octanoate; decyl oleate; isocetyl isostearate; isocetyl laurate; isocetyl stearate; isodecyl octanoate; isodecyl oleate; isononyl isononanoate; isostearyl palmitate; methyl acetyl ricinoleate; octyl isononanoate; 2-ethylhexyl isononanoate; octyldodecyl erucate; oleyl erucate; ethyl palmitate, isopropyl palmitate, 2-ethylhexyl palmitate, 2-octyldecyl palmitate, alkyl myristates such as isopropyl myristate, isobutyl stearate; 2-hexyldecyl laurate, and mixtures thereof.
- [0113] Esters of C4 to C22 dicarboxylic or tricarboxylic acids and of C1 to C22 alcohols and esters of monocarboxylic, dicarboxylic or tricarboxylic acids and of C2 to C26 dihydroxy, trihydroxy, tetrahydroxy or pentahydroxy alcohols may also be used.
- [0114] Mention may notably be made of: diethyl sebacate; diisopropyl sebacate; diisopropyl adipate; di-n-propyl adipate; dioctyl adipate; diisostearyl adipate; dioctyl maleate; glyceryl undecylenate; octyldodecyl stearyl stearate; pentaerythrityl monoricinoleate; pentaerythrityl tetraisononanoate; pentaerythrityl tetrapelargonate; pentaerythrityl tetraisostearate; pentaerythrityl tetraoctanoate; propylene glycol dicaprylate; propylene glycol dicaprinate; 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, and mixtures thereof.
- [0115] The composition may also comprise, as fatty ester, sugar esters and diesters of C6 to C30 and preferably C12 to C22 fatty acids. It is recalled that the term "sugar" refers to oxygen-bearing hydrocarbon-based compounds bearing several alcohol functions, with or without aldehyde or ketone functions, and which include at least 4 carbon atoms. These sugars may be monosaccharides, oligosaccharides or polysaccharides.
- [0116] Examples of suitable sugars that may be mentioned include sucrose, glucose, galactose, ribose, fucose, maltose, fructose, mannose, arabinose, xylose and lactose, and derivatives thereof, notably alkyl derivatives, such as methyl derivatives, for instance methylglucose.
- [0117] The sugar esters of fatty acids may be chosen notably from the group comprising the esters or mixtures of esters of sugars described above and of linear or branched, saturated or unsaturated C6 to C30 and preferably C12 to C22 fatty acids. If they are

unsaturated, these compounds may comprise one to three conjugated or unconjugated carbon-carbon double bonds.

- [0118] The esters according to this variant may also be chosen from mono-, di-, tri- and tetraesters, polyesters, and mixtures thereof.
- [0119] These esters may be, for example, oleates, laurates, palmitates, myristates, behenates, cocoates, stearates, linoleates, linolenates, caprates, arachidonates or mixtures thereof notably such as the mixed oleo-palmitate, oleo-stearate and palmito-stearate esters.
- [0120] More particularly, use is made of monoesters and diesters and notably sucrose, glucose or methylglucose mono- or di-oleates, -stearates, -behenates, -oleopalmitates, -linoleates, -linolenates and -oleostearates, and mixtures thereof.
- [0121] An example that may be mentioned is the product sold under the name Glucate® DO by the company Amerchol, which is a methylglucose dioleate.
- [0122] Preferably, use will be made of a liquid ester of a monoacid and of a monoalcohol.
- [0123] Preferentially, the liquid fatty substance(s) are chosen from mixtures of alkanes containing from 8 to 28 carbon atoms, more particularly from 15 to 28 carbon atoms, better still mixtures having the INCI name C15-19 Alkane.
- [0124] According to one embodiment, the fatty substances are chosen from liquid fatty substances, preferably from liquid hydrocarbons comprising more than 6 carbon atoms, plant oils, liquid fatty alcohols and liquid fatty esters, and mixtures thereof, more preferentially from liquid hydrocarbons comprising more than 6 carbon atoms, better still from mixtures of alkanes containing from 8 to 28 carbon atoms, more particularly from 15 to 28 carbon atoms, and mixtures thereof.
- [0125] Preferentially, the liquid fatty substance(s) are chosen from mixtures of alkanes containing from 8 to 28 carbon atoms, more particularly from 15 to 28 carbon atoms, better still mixtures having the INCI name C15-19 Alkane.
- [0126] The solid fatty substances according to the invention preferably have a viscosity of greater than 2 Pa.s, measured at 25°C and at a shear rate of 1 s<sup>-1</sup>.
- [0127] The solid fatty substance(s) are preferably chosen from solid fatty acids, solid fatty alcohols, solid fatty acid and/or fatty alcohol esters, waxes, ceramides and mixtures thereof.
- [0128] The term “fatty acid” means a long-chain carboxylic acid comprising from 6 to 40 carbon atoms, preferably from 8 to 30 carbon atoms. The solid fatty acids according to the invention preferentially comprise from 10 to 30 carbon atoms and better still from 14 to 22 carbon atoms. They may optionally be hydroxylated.
- [0129] These solid fatty acids are neither oxyalkylenated nor glycerolated.
- [0130] The solid fatty acids that may be used in the present invention are notably chosen from myristic acid, cetylic acid, stearyl acid, palmitic acid, arachidic acid, stearic acid, lauric acid, behenic acid, 12-hydroxystearic acid, and mixtures thereof.

- [0131] Particularly preferably, the solid fatty acid(s) are chosen from stearic acid, myristic acid, palmitic acid and mixtures thereof.
- [0132] In a preferred embodiment, when the composition according to the invention comprises one or more solid fatty acids, the total content of the solid fatty acid(s) ranges from 0.01% to 10% by weight, preferably from 0.05% to 5% by weight, preferentially from 0.1% to 1% by weight, better still from 0.2% to 0.5% by weight relative to the total weight of the composition.
- [0133] The term “fatty alcohol” means a long-chain aliphatic alcohol comprising from 6 to 40 carbon atoms, preferably from 8 to 30 carbon atoms, and comprising at least one hydroxyl group OH. These fatty alcohols are neither oxyalkylenated nor glycerolated.
- [0134] The solid fatty alcohols may be saturated or unsaturated, and linear or branched, and include from 8 to 40 carbon atoms, preferably from 10 to 30 carbon atoms. Preferably, the solid fatty alcohols have the structure R-OH with R denoting a linear alkyl group, optionally substituted with one or more hydroxyl groups, comprising from 8 to 40, preferentially from 10 to 30 carbon atoms, better still from 10 to 30, or even from 12 to 24 atoms and even better still from 14 to 22 carbon atoms.
- [0135] The solid fatty alcohols that may be used are preferably chosen from saturated or unsaturated, linear or branched, preferably linear and saturated, (mono)alcohols including from 8 to 40 carbon atoms, better still from 10 to 30, or even from 12 to 24 and even better still from 14 to 22 carbon atoms.
- [0136] The solid fatty alcohols that may be used may be chosen, alone or as a mixture, from: myristyl alcohol (or 1-tetradecanol); cetyl alcohol (or 1-hexadecanol); stearyl alcohol (or 1-octadecanol); arachidyl alcohol (or 1-eicosanol); behenyl alcohol (or 1-docosanol); lignoceryl alcohol (or 1-tetracosanol); ceryl alcohol (or 1-hexacosanol); montanyl alcohol (or 1-octacosanol); myricyl alcohol (or 1-triacontanol).
- [0137] Preferentially, the solid fatty alcohol is chosen from cetyl alcohol, stearyl alcohol, behenyl alcohol, myristyl alcohol, arachidyl alcohol, and mixtures thereof, such as cetylstearyl alcohol or cetearyl alcohol. Particularly preferably, the solid fatty alcohol is chosen from cetyl alcohol, stearyl alcohol and mixtures thereof such as cetylstearyl alcohol or cetearyl alcohol.
- [0138] The solid esters of a fatty acid and/or of a fatty alcohol that may be used are preferably chosen from esters derived from a C9-C26 carboxylic fatty acid and/or from a C9-C26 fatty alcohol.
- [0139] Mention may notably be made of octyldodecyl behenate, isocetyl behenate, cetyl lactate, stearyl octanoate, octyl octanoate, cetyl octanoate, decyl oleate, hexyl stearate, octyl stearate, myristyl stearate, cetyl stearate, stearyl stearate, octyl pelargonate, cetyl myristate, myristyl myristate, stearyl myristate, diethyl sebacate, diisopropyl sebacate, diisopropyl adipate, di-n-propyl adipate, dioctyl adipate, dioctyl maleate,

octyl palmitate, myristyl palmitate, cetyl palmitate, stearyl palmitate, and mixtures thereof.

- [0140] For the purposes of the present invention, a wax is a lipophilic compound, which is solid at 25°C and atmospheric pressure, with a reversible solid/liquid change of state, having a melting point greater than about 40°C, which may be up to 200°C, and having in the solid state anisotropic crystal organization. In general, the size of the wax crystals is such that the crystals diffract and/or scatter light, giving the composition that comprises them a more or less opaque cloudy appearance. By bringing the wax to its melting point, it is possible to make it miscible with oils and to form a microscopically homogeneous mixture, but on returning the temperature of the mixture to room temperature, recrystallization of the wax, which is microscopically and macroscopically detectable (opalescence), is obtained.
- [0141] In particular, the waxes that are suitable for use in the invention may be chosen from waxes of animal, plant or mineral origin, non-silicone synthetic waxes, and mixtures thereof.
- [0142] Mention may be made notably of hydrocarbon-based waxes, for instance beeswax, notably of organic origin, lanolin wax and Chinese insect waxes; rice bran wax, carnauba wax, candelilla wax, ouricury wax, esparto grass wax, berry wax, shellac wax, Japan wax and sumac wax; montan wax, orange wax and lemon wax, microcrystalline waxes, paraffins and ozokerite; polyethylene waxes, the waxes obtained by Fischer-Tropsch synthesis and waxy copolymers, and also esters thereof.
- [0143] Mention may also be made of C20 to C60 microcrystalline waxes, such as Microwax HW.
- [0144] Mention may also be made of the MW 500 polyethylene wax sold under the reference Permalen 50-L Polyethylene.
- [0145] Mention may also be made of the waxes obtained by catalytic hydrogenation of animal or plant oils containing linear or branched C8-C32 fatty chains. Among these waxes, mention may notably be made of isomerized jojoba oil such as trans-isomerized partially hydrogenated jojoba oil, notably the product manufactured or sold by the company Desert Whale under the commercial reference Iso-Jojoba-50®, hydrogenated sunflower oil, hydrogenated castor oil, hydrogenated coconut kernel oil, hydrogenated lanolin oil and bis(1,1,1-trimethylolpropane) tetrastearate, notably the product sold under the name Hest 2T-4S® by the company Heterene.
- [0146] The waxes obtained by hydrogenation of castor oil esterified with cetyl alcohol, such as those sold under the names Phytowax Castor 16L64® and 22L73® by the company Sophim, may also be used.
- [0147] A wax that may also be used is a C20 to C40 alkyl (hydroxystearyloxy)stearate (the alkyl group comprising from 20 to 40 carbon atoms), alone or as a mixture. Such a wax

is notably sold under the names Kester Wax K 82 P®, Hydroxypolyester K 82 P® and Kester Wax K 80 P® by the company Koster Keunen.

[0148] It is also possible to use microwaxes in the compositions of the invention; mention may notably be made of carnauba microwaxes, such as the product sold under the name MicroCare 350® by the company Micro Powders, synthetic-wax microwaxes, such as the product sold under the name MicroEase 114S® by the company Micro Powders, microwaxes constituted of a mixture of carnauba wax and polyethylene wax, such as the products sold under the names Micro Care 300® and 310® by the company Micro Powders, microwaxes constituted of a mixture of carnauba wax and of synthetic wax, such as the product sold under the name Micro Care 325® by the company Micro Powders, polyethylene microwaxes, such as the products sold under the names Micropoly 200®, 220®, 220L® and 250S® by the company Micro Powders, and polytetrafluoroethylene microwaxes, such as the products sold under the names Microslip 519® and 519 L® by the company Micro Powders.

[0149] The waxes are preferably chosen from mineral waxes, for instance paraffin wax, petroleum jelly wax, lignite wax or ozokerite; plant waxes, for instance cocoa butter or cork fibre or sugar cane waxes, olive tree wax, rice wax, hydrogenated jojoba wax, ouricury wax, carnauba wax, candelilla wax, esparto grass wax, or absolute waxes of flowers, such as the essential wax of blackcurrant blossom sold by the company Bertin (France); waxes of animal origin, for instance beeswaxes or modified beeswaxes (cera bellina), spermaceti, lanolin wax and lanolin derivatives; microcrystalline waxes; and mixtures thereof, preferentially plant waxes such as carnauba wax and candelilla wax, and more preferentially candelilla wax (INCI name: *Euphorbia cerifera* wax).

[0150] The solid fatty substances are preferably chosen from solid fatty acids, solid fatty alcohols, waxes and mixtures thereof.

[0151] According to a preferred embodiment, the fatty substances present in the composition are chosen from liquid fatty substances, preferentially chosen from liquid hydrocarbons comprising more than 6 carbon atoms, plant oils, liquid fatty alcohols, liquid fatty esters and mixtures thereof, preferably chosen from liquid hydrocarbons comprising more than 6 carbon atoms, better still from mixtures of alkanes containing from 8 to 28 carbon atoms, more particularly from 15 to 28 carbon atoms.

[0152] According to another preferred embodiment, the fatty substance(s) present in the composition are chosen from solid fatty substances, preferentially chosen from solid fatty alcohols, waxes, solid fatty acids and mixtures thereof.

[0153] According to another preferred embodiment, the composition according to the invention comprises at least one liquid fatty substance chosen from liquid hydrocarbons comprising more than 6 carbon atoms, and at least one solid fatty substance, preferentially at least one wax and/or at least one solid fatty alcohol.

- [0154] According to another preferred embodiment, the composition comprises at least one fatty substance other than solid fatty acids.
- [0155] According to another preferred embodiment, the composition comprises at least one solid fatty acid and at least one fatty substance other than solid fatty acids.
- [0156] According to a preferred embodiment, the fatty substance(s) are chosen from liquid hydrocarbons comprising more than 6 carbon atoms, plant oils, fatty alcohols, liquid fatty esters, solid fatty acids, waxes and mixtures thereof, more preferentially from solid fatty alcohols, mixtures of alkanes containing from 8 to 28 carbon atoms, waxes, solid fatty acids and mixtures thereof, better still chosen from C15-19 Alkane (INCI name), cetearyl alcohol, waxes, solid fatty acids and mixtures thereof.
- [0157] Preferably, the total content of the fatty substance(s) in the composition according to the invention ranges from 5% to 35% by weight, preferably from 7% to 30% by weight, preferentially from 8% to 25% by weight relative to the total weight of the composition.
- [0158] Preferably, the total content of the solid fatty substance(s) in the composition according to the invention ranges from 5% to 30% by weight, preferably from 6% to 25% by weight, more preferentially from 7% to 20% by weight relative to the total weight of the composition.
- [0159] In another particular embodiment, the composition according to the invention comprises one or more hydrocarbons comprising more than 6 carbon atoms, the total content of the hydrocarbon(s) comprising more than 6 carbon atoms preferably ranging from 0.01% to 15% by weight, more preferentially from 0.05% to 10% by weight, better still from 0.1% to 5% by weight, and even better still from 0.5% to 4% by weight relative to the total weight of the composition.

### **Dye**

- [0160] The composition according to the invention comprises one or more dyes chosen from oxidation dyes, direct dyes and mixtures thereof 5).
- [0161] Preferably, the composition comprises one (or more) oxidation dye(s).
- [0162] The oxidation dyes are generally chosen from one or more oxidation bases, optionally in combination with one or more couplers.
- [0163] Oxidation base
- [0164] The oxidation bases may be present in the form of salts, solvates and/or solvates of salts.
- [0165] The addition salts of the oxidation bases present in the composition according to the invention are notably chosen from the addition salts with an acid, such as the hydrochlorides, hydrobromides, sulfates, citrates, succinates, tartrates, lactates, tosylates, benzenesulfonates, methanesulfonates, phosphates and acetates, and the

addition salts with a base such as sodium hydroxide, potassium hydroxide, aqueous ammonia, amines or alkanolamines.

- [0166] Moreover, the solvates of the oxidation bases more particularly represent the hydrates of said oxidation bases and/or the combination of said oxidation bases with a linear or branched C<sub>1</sub> to C<sub>4</sub> alcohol such as methanol, ethanol, isopropanol or n-propanol. Preferably, the solvates are hydrates.
- [0167] By way of example, the oxidation bases are chosen from para-phenylenediamines, bis(phenyl)alkylenediamines, para-aminophenols ortho-aminophenols and heterocyclic bases, and the corresponding addition salts.
- [0168] Among the para-phenylenediamines that may be mentioned are, for example, para-phenylenediamine, para-toluenediamine, 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-methoxymethyl-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-ethyl-N-(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 corresponding addition salts with an acid.
- [0169] Among the para-phenylenediamines mentioned above, para-phenylenediamine, para-toluenediamine, 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 corresponding addition salts with an acid, are particularly preferred.
- [0170] Among the bis(phenyl)alkylenediamines that may be mentioned, for example, are 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 and 1,8-bis(2,5-diaminophenoxy)-3,6-dioxaoctane, and the corresponding addition salts.

- [0171] Among the para-aminophenols that are mentioned are, for example, 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-( $\beta$ -hydroxyethylaminomethyl)phenol and 4-amino-2-fluorophenol, and the corresponding addition salts with an acid.
- [0172] Among the ortho-aminophenols that may be mentioned, for example, are 2-aminophenol, 2-amino-5-methylphenol, 2-amino-6-methylphenol and 5-acetamido-2-aminophenol, and the corresponding addition salts.
- [0173] Among the heterocyclic bases that may be mentioned, for example, are pyridine, pyrimidine and pyrazole derivatives.
- [0174] Among the pyridine derivatives that may be mentioned are the compounds described, for example, in patents GB 1 026 978 and GB 1 153 196, for example 2,5-diaminopyridine, 2-(4-methoxyphenyl)amino-3-aminopyridine and 3,4-diaminopyridine, and the corresponding addition salts.
- [0175] Other pyridine oxidation bases that are useful in the present invention are the 3-aminopyrazolo[1,5-a]pyridine oxidation bases or the corresponding addition salts 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, (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, 3-aminopyrazolo[1,5-a]pyridin-7-ol, 2- $\beta$ -hydroxyethoxy-3-aminopyrazolo[1,5-a]pyridine and 2-(4-dimethylpiperazinium-1-yl)-3-aminopyrazolo[1,5-a]pyridine; and the corresponding addition salts.

[0176] More particularly, the oxidation bases that are useful in the present invention are chosen from 3-aminopyrazolo[1,5-a]pyridines preferably substituted on carbon atom 2 with:

[0177] a) a (di)(C<sub>1</sub>-C<sub>6</sub>)(alkyl)amino group, said alkyl group possibly being substituted with at least one hydroxyl, amino or imidazolium group;

[0178] b) an optionally cationic 5- to 7-membered heterocycloalkyl group comprising from 1 to 3 heteroatoms, optionally substituted with one or more (C<sub>1</sub>-C<sub>6</sub>)alkyl groups such as a di(C<sub>1</sub>-C<sub>4</sub>)alkylpiperazinium group; or

[0179] c) a (C<sub>1</sub>-C<sub>6</sub>)alkoxy group optionally substituted with one or more hydroxyl groups, such as a β-hydroxyalkoxy group, and the corresponding addition salts.

[0180] Among the pyrimidine derivatives that may be mentioned are the compounds described, for example, in patents DE 2359399; JP 88-169571; JP 05-63124; EP 0770375 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.

[0181] Among the pyrazole derivatives that may be mentioned are the compounds described in patents DE 3843892 and DE 4133957 and patent applications WO 94/08969, WO 94/08970, FR-A-2 733 749 and DE 195 43 988, for instance 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 and 3,5-diamino-4-(β-hydroxyethyl)amino-1-methylpyrazole, and the corresponding addition salts. Use may also be made of 4,5-diamino-1-(β-methoxyethyl)pyrazole.

[0182] A 4,5-diaminopyrazole will preferably be used and even more preferentially 4,5-diamino-1-(β-hydroxyethyl)pyrazole and/or a corresponding salt.

[0183] The pyrazole derivatives that may also be mentioned comprise diamino-N,N-dihydropyrazolopyrazolones and in particular those described in patent application FR-

A-2 886 136, such as the following compounds and the corresponding addition salts: 2,3-diamino-6,7-dihydro-1H,5H-pyrazolo[1,2-a]pyrazol-1-one, 2-amino-3-ethylamino-6,7-dihydro-1H,5H-pyrazolo[1,2-a]pyrazol-1-one, 2-amino-3-isopropylamino-6,7-dihydro-1H,5H-pyrazolo[1,2-a]pyrazol-1-one, 2-amino-3-(pyrrolidin-1-yl)-6,7-dihydro-1H,5H-pyrazolo[1,2-a]pyrazol-1-one, 4,5-diamino-1,2-dimethyl-1,2-dihydropyrazol-3-one, 4,5-diamino-1,2-diethyl-1,2-dihydropyrazol-3-one, 4,5-diamino-1,2-bis(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 and 2,3-diamino-6-hydroxy-6,7-dihydro-1H,5H-pyrazolo[1,2-a]pyrazol-1-one.

- [0184] Use will preferably be made of 2,3-diamino-6,7-dihydro-1H,5H-pyrazolo[1,2-a]pyrazol-1-one and/or a corresponding salt.
- [0185] Heterocyclic bases that will preferably be used are 4,5-diamino-1-( $\beta$ -hydroxyethyl)pyrazole and/or 2,3-diamino-6,7-dihydro-1H,5H-pyrazolo[1,2-a]pyrazol-1-one and/or a corresponding salt.
- [0186] Preferably, the oxidation base(s) are chosen from para-phenylenediamines, bis(phenyl)alkylenediamines, para-aminophenols, ortho-aminophenols, heterocyclic bases, and the corresponding addition salts, the solvates thereof and/or the solvates of the salts thereof, and mixtures thereof; more preferentially from 2-methoxymethyl-para-phenylenediamine, 2- $\beta$ -hydroxyethyl-para-phenylenediamine, 2- $\gamma$ -hydroxypropyl-para-phenylenediamine, and the addition salts thereof, the solvates thereof and/or the solvates of the salts thereof, and mixtures thereof.
- [0187] When the composition comprises at least one oxidation base, the oxidation base(s) are preferably present in a total content ranging from 0.001% to 20% by weight, preferably from 0.005% to 15% by weight, more preferentially from 0.01% to 10% by weight, better still from 0.05% to 5%, even better still from 0.1% to 3% by weight, relative to the weight of the composition.
- [0188] Oxidation coupler
- [0189] The composition according to the invention may comprise one or more couplers advantageously chosen from those conventionally used in the dyeing of keratin fibres.
- [0190] Preferably, the composition according to the invention comprises one or more couplers.
- [0191] Among these couplers, mention may be made in particular of meta-phenylenediamines, meta-aminophenols, meta-diphenols, naphthalene-based coupling agents and heterocyclic coupling agents, and also the corresponding addition salts.

- [0192] Mention may be made, for example, of 6-hydroxybenzomorpholine, hydroxyethyl-3,4-methylenedioxyaniline, 2-amino-5-ethylphenol, 1,3-dihydroxybenzene, 1,3-dihydroxy-2-methylbenzene, 4-chloro-1,3-dihydroxybenzene, 2,4-diamino-1-( $\beta$ -hydroxyethoxy)benzene, 2-amino-4-( $\beta$ -hydroxyethylamino)-1-methoxybenzene, 1,3-diaminobenzene, 1,3-bis(2,4-diaminophenoxy)propane, 3-ureidoaniline, 3-ureido-1-dimethylaminobenzene, sesamol, 1- $\beta$ -hydroxyethylamino-3,4-methylenedioxybenzene,  $\alpha$ -naphthol, 2-methyl-1-naphthol, 6-hydroxyindole, 4-hydroxyindole, 4-hydroxy-N-methylindole, 2-amino-3-hydroxypyridine, 3,5-diamino-2,6-dimethoxypyridine, 1-N-( $\beta$ -hydroxyethyl)amino-3,4-methylenedioxybenzene, 2,6-bis( $\beta$ -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, 2-methyl-5-aminophenol, 5-N-( $\beta$ -hydroxyethyl)amino-2-methylphenol, 3-aminophenol and 3-amino-2-chloro-6-methylphenol, the corresponding addition salts with an acid and the corresponding mixtures.
- [0193] In general, the addition salts of the couplers that may be used in the context of the invention are chosen in particular from addition salts with an acid, such as hydrochlorides, hydrobromides, sulfates, citrates, succinates, tartrates, lactates, tosylates, benzenesulfonates, phosphates and acetates, and the addition salts with a base such as sodium hydroxide, potassium hydroxide, aqueous ammonia, amines or alkanolamines.
- [0194] Moreover, the solvates more particularly represent the hydrates of these couplers and/or the combination of these couplers with a linear or branched C1 to C4 alcohol such as methanol, ethanol, isopropanol or n-propanol. Preferably, the solvates are hydrates.
- [0195] In a preferred embodiment, the composition according to the invention is free of oxidation couplers chosen from resorcinol, 2-methylresorcinol, 4-chlororesorcinol, addition salts thereof, solvates thereof and the solvates of the salts thereof.
- [0196] When the composition comprises one or more oxidation couplers, the total content of the coupler(s) present in the composition according to the invention ranges from 0.001% to 20% by weight, more preferentially from 0.005% to 15% by weight, better still from 0.01% to 10% by weight, even better still from 0.05% to 5% by weight, and even better still from 0.1% to 3% by weight, relative to the total weight of the composition.
- [0197] When they are present, the total content of the oxidation dyes preferably ranges from 0.001% to 20% by weight, more preferentially from 0.005% to 15% by weight, better still from 0.01% to 10% by weight, even better still from 0.05% to 5% by weight,

and even better still from 0.1% to 3% by weight, relative to the total weight of the composition.

[0198] The composition according to the invention may optionally comprise one or more synthetic or natural direct dyes, chosen from anionic and nonionic species, preferably cationic or nonionic species, either as sole dyes or in addition to the oxidation dye(s).

[0199] Examples of suitable direct dyes that may be mentioned include azo direct dyes; (poly)methine dyes such as cyanines, hemicyanines and styryls; carbonyl dyes; azine dyes; nitro(hetero)aryl dyes; tri(hetero)arylmethane dyes; porphyrin dyes; phthalocyanine dyes and natural direct dyes, alone or in the form of mixtures.

[0200] When they are present, the direct dye(s) more particularly represent from 0.001% to 10% by weight and preferably from 0.005% to 5% by weight relative to the total weight of the composition.

[0201] According to a preferred embodiment of the invention, the composition and similarly the ready-to-use composition contain at least one dye and preferably at least one oxidation dye as defined previously.

#### **Additional surfactants**

[0202] The composition according to the present invention may comprise one (or more) additional surfactant(s).

[0203] According to a preferred embodiment, the composition comprises one (or more) additional surfactant(s).

[0204] These may be chosen from anionic surfactants other than fatty acids, nonionic surfactants, cationic surfactants, amphoteric surfactants and/or mixtures thereof.

[0205] According to a preferred embodiment, the surfactants are nonionic surfactants.

[0206] Examples of nonionic surfactants that may be mentioned include the following nonionic surfactants:

[0207] - oxyalkylenated (C8-C24)alkylphenols;

[0208] - saturated or unsaturated, linear or branched, oxyalkylenated or glycerolated, preferably oxyalkylenated, C8 to C40 alcohols, preferably including one or two fatty chains;

[0209] - saturated or unsaturated, linear or branched, oxyalkylenated C8 to C30 fatty acid amides;

[0210] - esters of saturated or unsaturated, linear or branched, C8 to C30 acids and of polyethylene glycols;

[0211] - preferably oxyethylenated esters of saturated or unsaturated, linear or branched, C8 to C30 acids and of sorbitol;

[0212] - fatty acid esters of sucrose;

- [0213] - (C8-C30)alkyl(poly)glucosides and (C8-C30)alkenyl(poly)glucosides, which are optionally oxyalkylenated (0 to 10 oxyethylene units) and comprising from 1 to 15 glucose units, (C8-C30)alkyl(poly)glucoside esters;
- [0214] - saturated or unsaturated oxyethylenated plant oils;
- [0215] - condensates of ethylene oxide and/or of propylene oxide;
- [0216] - N-(C8-C30)alkylglucamine and N-(C8-C30)acylmethylglucamine derivatives;
- [0217] - aldobionamides;
- [0218] - amine oxides;
- [0219] - oxyethylenated and/or oxypropylenated silicones;
- [0220] - and mixtures thereof.
- [0221] The oxyethylene units are more particularly oxyethylene or oxypropylene units, or a combination thereof, preferably oxyethylene units.
- [0222] The number of moles of ethylene oxide and/or propylene oxide preferably ranges from 1 to 250, more particularly from 2 to 100, better still from 2 to 50 and even better still from 2 to 40; the number of moles of glycerol ranges notably from 1 to 50 and better still from 1 to 10.
- [0223] As examples of glycerolated nonionic surfactants, use is preferably made of monoglycerolated or polyglycerolated C8 to C40 alcohols, comprising from 1 to 50 mol of glycerol and preferably from 1 to 10 mol of glycerol.
- [0224] Examples of compounds of this type that may be mentioned include 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.
- [0225] Among the glycerolated alcohols, it is more particularly preferred to use a C8 to C10 alcohol containing 1 mol of glycerol, a C10 to C12 alcohol containing 1 mol of glycerol, and a C12 alcohol containing 1.5 mol of glycerol.
- [0226] More preferentially, the nonionic surfactant(s) used in the composition according to the invention are chosen from:
- [0227] - saturated or unsaturated, linear or branched, oxyethylenated or oxypropylenated or glycerolated, preferably oxyethylenated or oxypropylenated, C8-C40, preferably C10-C32, more preferentially C12-C28 alcohols;
- [0228] - (C8-C30)alkyl(poly)glucosides, optionally oxyalkylenated and comprising from 1 to 15 glucose units;
- [0229] - and a mixture thereof.

- [0230] According to a preferred embodiment, the additional surfactants are chosen from nonionic surfactants, more preferentially chosen from saturated or unsaturated, linear or branched, oxyethylenated or oxypropylenated, C8 to C40 alcohols comprising from 1 to 100 mol of ethylene or propylene oxide, preferably from 2 to 50, more particularly from 2 to 40 mol, and including at least one C8-C20 alkyl chain.
- [0231] Preferably, the additional surfactant(s) represent from 0.01% to 20% by weight, preferentially from 0.1% to 15% by weight, more preferentially from 0.5% to 10% by weight and better still from 1% to 6% by weight relative to the total weight of the composition.
- [0232] According to a particular embodiment, the composition according to the invention comprises:
- [0233] - at least one polycarboxylic acid of formula (I), optical isomers thereof, geometrical isomers thereof, salts thereof and/or solvates thereof;
- [0234] - at least one (bi)carbonate, the total content of (bi)carbonate(s) being greater than or equal to 1% by weight relative to the total weight of the composition;
- [0235] - at least one additional alkaline agent;
- [0236] - at least one fatty substance;
- [0237] - at least one dye, preferably at least one oxidation dye; and
- [0238] - at least one additional surfactant, preferably chosen from nonionic surfactants, more preferentially chosen from saturated or unsaturated, linear or branched, oxyethylenated or oxypropylenated, C8 to C40 alcohols comprising from 1 to 100 mol of ethylene or propylene oxide, preferably from 2 to 50, more particularly from 2 to 40 mol, and including at least one C8-C20 alkyl chain.

### **Solvents**

- [0239] The composition according to the invention may also comprise at least one organic solvent.
- [0240] Examples of organic solvents that may be mentioned include linear or branched C<sub>2</sub>-C<sub>4</sub> alkanols, such as ethanol, propanol and isopropanol; polyols and polyol ethers, for instance 2-butoxyethanol, propylene glycol, glycerol, 1,3-propanediol, dipropylene glycol, propylene glycol monomethyl ether, diethylene glycol monomethyl ether and monoethyl ether, and also aromatic alcohols or ethers, for instance benzyl alcohol or phenoxyethanol, and mixtures thereof.
- [0241] Preferably, the organic solvent(s) are chosen from polyols, more preferentially chosen from propylene glycol, glycerol, propane-1,3-diol, and mixtures thereof.
- [0242] The organic solvent(s) may be present in a total amount ranging from 0.01% to 30% by weight, preferably from 0.1% to 25% by weight, better still from 0.5% to 20% by

weight, even better still from 1% to 15% by weight relative to the total weight of the composition.

[0243] In addition, the composition according to the invention is preferably an aqueous composition. The composition preferably comprises water in an amount of greater than or equal to 5% by weight, preferably greater than or equal to 10% by weight, and better still greater than or equal to 15% by weight, relative to the total weight of the composition.

[0244] The composition according to the invention may also comprise one or more nonionic polyoxyalkylenated fatty alcohol ethers of formula (i) below:

[0245]  $R-(O-Alk)_n-OR'$  (i),

[0246] in which:

[0247] R denotes a linear or branched, saturated or unsaturated C10-C30 hydrocarbon-based radical,

[0248] R' denotes a linear or branched, saturated or unsaturated C10-C30 hydrocarbon-based radical, which may be substituted with a hydroxyl radical, said hydroxyl preferably being beta to the ether function,

[0249] n is an integer between 1 and 100 inclusive, and

[0250] Alk represents a linear or branched, preferably linear, (C1-C6)alkylene group such as ethylene or propylene, preferably ethylene.

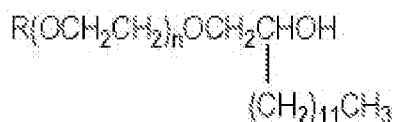
[0251] According to a particularly advantageous embodiment of the invention, the radical Alk of formula (i) represents a  $-CH_2-CH_2-$  group.

[0252] More particularly, the nonionic ether of a polyoxyalkylenated fatty alcohol of formula (i) is such that R and R', independently of each other, denote a linear or branched, preferably linear, saturated or unsaturated, preferably saturated, C12-C20 and preferably C14-C18 hydrocarbon-based radical; R' possibly being substituted with at least one hydroxyl radical, said hydroxyl radical preferably being beta to the ether function, and n denotes an integer greater than or equal to 20, for example ranging from 20 to 100 and preferably from 40 to 80.

[0253] Preferably, R and R' denote an alkyl radical.

[0254] According to a more preferred embodiment, the nonionic ether of a polyoxyalkylenated fatty alcohol of formula (i) is such that: R denotes a C16-C18 alkyl radical, which is preferably linear, and R' denotes a C14 alkyl radical, which is preferably linear, substituted with an OH group, said hydroxyl radical preferably being beta to the ether function, and n is equal to 60.

[0255] Preferably, the nonionic compound of formula (i) has the following formula



- [0256] with R being a cetyl or stearyl group with  $n = 60$ .
- [0257] Such a compound is known, for example, in the CTFA dictionary under the name Cetareth 60 myristyl glycol or Hydrogenated talloweth 60 myristyl glycol. A cetareth 60 myristyl glycol is sold, for example, by the company Akzo under the trade name Elfacos GT 282 S.
- [0258] When present, the nonionic polyoxyalkylenated fatty alcohol ether(s) (i) are preferably present in a content ranging from 0.001% to 10% by weight, preferably from 0.005% to 5% by weight, preferentially from 0.075% to 2% by weight, better still from 0.01% to 1% by weight relative to the total weight of the composition.

### **Additives**

- [0259] The composition according to the invention may optionally comprise one or more additives, other than the compounds described previously, and among which mention may be made of cationic, anionic, nonionic or amphoteric polymers or mixtures thereof, vitamins and provitamins including panthenol, sunscreens, mineral or organic pigments, plasticizers, solubilizers, opacifiers or nacreous agents, antioxidants, hydroxy acids, and fragrances.
- [0260] The above additives may generally be present in an amount, for each of them, of between 0 and 20% by weight relative to the total weight of the ready-to-use composition.
- [0261] The composition according to the invention may also comprise one or more chemical oxidizing agents as described below.
- [0262] Preferably, the composition according to the invention does not comprise any cationic polymers.
- [0263] According to one embodiment, the composition according to the invention also comprises one or more chemical oxidizing agents as described below. According to this embodiment, the composition is a ready-to-use composition.
- [0264] This ready-to-use composition may comprise one or more ingredients among those described previously.
- [0265] Preferably, the pH of the ready-to-use composition is between 8 and 11 and preferentially between 9 and 10.5.
- [0266] According to another embodiment, the composition according to the invention does not comprise any chemical oxidizing agents. According to this embodiment, the composition is intended for mixing with one or more chemical oxidizing agents.
- [0267] Preferably, the pH of the composition not containing any chemical oxidizing agents is between 8 and 13, preferentially between 9 and 12.
- [0268] According to another particular embodiment, the pH of the composition not containing any chemical oxidizing agents is between 7 and 10 and the pH of the ready-to-use composition is between 6 and 9.

## Process

- [0269] The present invention also relates to a process for dyeing keratin fibres, preferably the hair, which comprises the application to said keratin fibres of an effective amount of a composition as defined previously, in the presence of an oxidizing agent.
- [0270] The composition may be applied to wet or dry keratin fibres. On conclusion of the treatment, the keratin fibres are optionally rinsed with water, optionally washed with a shampoo and then rinsed with water, before being dried or left to dry.
- [0271] Preferably, the process according to the invention comprises a step of mixing the previously described composition, which does not comprise any chemical oxidizing agents, with an oxidizing composition comprising at least one chemical oxidizing agent. This mixing step is preferably performed at the time of use, just before applying to the hair the composition resulting from the mixing.
- [0272] According to this embodiment, the ready-to-use composition results from the mixing of at least two compositions:
- [0273] a composition comprising:
- [0274] - at least one polycarboxylic acid of formula (I), optical isomers thereof, geometrical isomers thereof, salts thereof and/or solvates thereof 1):
- [0275] - at least one (bi)carbonate 2), the total content of (bi)carbonate(s) being greater than or equal to 1% by weight relative to the total weight of the composition;
- [0276] - at least one additional alkaline agent 3);
- [0277] - at least one fatty substance 4); and
- [0278] - at least one dye 5), preferably at least one oxidation dye; and
- [0279] an oxidizing composition comprising one or more chemical oxidizing agents, preferably hydrogen peroxide.
- [0280] In a preferred embodiment, the process for dyeing keratin fibres, preferably the hair, according to the invention, comprises the step of applying to the keratin fibres a composition resulting from the mixing, at the time of use, of at least two compositions:
- [0281] **a)** a composition comprising:
- [0282] - at least one polycarboxylic acid of formula (I), optical isomers thereof, geometrical isomers thereof, salts thereof and/or solvates thereof 1):
- [0283] - at least one (bi)carbonate 2), the total content of (bi)carbonate(s) being greater than or equal to 1% by weight relative to the total weight of the composition;
- [0284] - at least one additional alkaline agent 3);
- [0285] - at least one fatty substance 4); and
- [0286] - at least one dye, preferably at least one oxidation dye 5);
- [0287] - at least one additional surfactant;
- [0288] **b)** an oxidizing composition comprising one or more chemical oxidizing agents.

- [0289] More particularly, the chemical 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, and mixtures thereof. The oxidizing agent is preferably chosen from hydrogen peroxide.
- [0290] The oxidizing composition is preferably an aqueous composition. In particular, it comprises more than 5% by weight of water, preferably more than 10% by weight of water and even more advantageously more than 20% by weight of water relative to the total weight of the oxidizing composition.
- [0291] It may also comprise one or more organic solvents chosen from those listed previously; these solvents more particularly representing, when they are present, from 1% to 40% by weight and preferably from 5% to 30% by weight relative to the weight of the oxidizing composition. The oxidizing composition also preferably comprises one or more acidifying agents. Among the acidifying agents, examples that may be mentioned include mineral or organic acids, for instance hydrochloric acid, orthophosphoric acid, sulfuric acid, carboxylic acids, for instance acetic acid, tartaric acid, citric acid or lactic acid, and sulfonic acids.
- [0292] The oxidizing composition may also comprise fatty substances such as those described previously, preferably chosen from fatty alcohols, liquid hydrocarbons comprising more than 6 carbon atoms and mixtures thereof, surfactants and polymers.
- [0293] Usually, the pH of the oxidizing composition, when it is aqueous, is less than 7, preferably ranging from 1.5 to 4.
- [0294] Preferably, the oxidizing composition comprises hydrogen peroxide as oxidizing agent, in aqueous solution, the concentration of which ranges, more particularly, from 0.1% to 50%, more particularly between 0.5% and 20% and even more preferentially between 1% and 15% by weight, relative to the weight of the oxidizing composition.

### **Kit**

- [0295] Another subject of the invention is a multi-compartment device, preferably comprising two compartments, for dyeing keratin fibres, preferably the hair, comprising at least a first compartment containing the dye composition according to the invention and at least a second compartment containing an oxidizing composition as described above.
- [0296] The compositions of the device according to the invention are packaged in separate compartments, optionally accompanied by suitable application means, which may be identical or different, such as fine brushes, coarse brushes or sponges.
- [0297] The device mentioned above may also be equipped with a means for dispensing the desired mixture onto the hair, for instance the devices described in patent FR 2 586 913.

[0298] Finally, the present invention relates to the use of a composition as described above, for dyeing keratin fibres, and in particular the hair.

[0299] The examples that follow serve to illustrate the invention without, however, being limiting in nature.

### Examples

[0300] In the examples that follow, all the amounts are given as mass percentages of active material (AM) relative to the total weight of the composition (unless otherwise mentioned).

[0301] Example 1

### Compositions

[0302] The dye compositions **A** and **B** were prepared from the ingredients whose contents are indicated in the table below (% active material):

[0303] Dye compositions

[0304] [Table 1]

INCI NAME	A (invention)	B (comparative)
Ammonium bicarbonate	2.50	2.50
Ammonium hydroxide	3.29	3.29
Nonionic surfactant	2.45	2.45
Antioxidant	1.00	1.00
Solvent	2.00	2.00
Tetrasodium glutamate diacetate	0.24	-
EDTA	-	0.24
Fatty acid(s)*	0.30	0.30
m-Aminophenol	0.10	0.10
C15-19 alkane	2.00	2.00
Cetearyl alcohol	16.00	16.00
Candelilla wax	0.10	0.10
N,N-Bis(2-hydroxyethyl)-p-phenyldiamine sulfate	0.16	0.16
Hydroxyethyl-3,4-methylenedioxyaniline HCl	0.18	0.18
2-Amino-3-hydroxypyridine	0.04	0.04

Hydroxybenzomorpholine	0.43	0.43
Toluene-2,5-diamine	0.53	0.53
Water	qs100	qs100

[0305] \* INCI Name: Stearic acid

[0306] At the time of use, each of the dye compositions **A** and **B** is mixed with 1.5 times its weight of oxidizing agent **O**. Each of the mixtures is then applied to locks of permanent-waved grey (PWG) hair and moderately sensitized hair (AS20), containing 90% white hairs, at a rate of 5 g of mixture/g of hair.

[0307] After a leave-on time of 35 minutes at 27°C, the hair is rinsed, washed with a standard shampoo and dried.

### Results

[0308] The colorimetric measurements were performed using a Konica Minolta 3600 spectrophotometer (illuminant D65, angle 10°, specular component included) in the CIELab system.

[0309] The dyeing selectivity is the variation of the colour between the dyed permanent-waved (PWG) hair and the dyed moderately sensitized hair (AS20). The selectivity enables evaluation of the colour homogeneity along the entire length of the hair fibre.

[0310] The selectivity is measured by:

[0311]  $\Delta E$ , which is the variation in colour between the permanent-waved hair and the moderately sensitized hair (AS20), is obtained from the formula:

$$\Delta E = \sqrt{(L^* - L_0^*)^2 + (a^* - a_0^*)^2 + (b^* - b_0^*)^2}$$

[0312] in which  $L^*$  represents the intensity and  $a^*$  and  $b^*$  represent the chromaticity of the dyed permanent-waved hair, and  $L_0^*$  represents the intensity and  $a_0^*$  and  $b_0^*$  represent the chromaticity of the dyed moderately sensitized hair. The lower the value of  $\Delta E$ , the lower the selectivity and the more uniform the colouring along the hair strands.

[0313] [Table 2]

	Type of hair	$L^*$	$a^*$	$b^*$	$\Delta E$
A+O (invention)	PWG	19.0	1.8	2.9	<b>0.6</b>
	AS20	18.6	1.8	2.4	
B + O (comparative)	PWG	20.3	2.0	3.5	<b>3.1</b>
	AS20	17.7	1.8	1.7	

[0314] The locks of hair treated with the mixture A+O according to the invention have a much lower  $\Delta E$  value than those treated with the comparative mixture B+O.

[0315] In other words, the mixture A+O according to the invention affords locks of hair with better selectivity than those treated with the comparative mixture B+O.

[0316] In addition, the mixture A+O according to the invention affords good sensory performance.

[0317] Example 2

### Compositions

[0318] The dye compositions **A** and **B** were prepared from the ingredients whose contents are indicated in the table below (% active material):

[0319] Dye compositions

[0320] [Table 1]

	<b>A (invention)</b>	<b>B (comparative)</b>
<b>AMMONIUM CARBONATE</b>	<b>2,5</b>	-
<b>Ethanol amine</b>	-	<b>2,5</b>
<b>AMMONIUM HYDROXIDE</b>	<b>3,29</b>	<b>3,29</b>
NON IONIQUE SURFACTANT	2,45	2,45
ANTIOXYDANT	0,5	0,5
SOLVENT	2,00	2,00
GLDA	0,24	0,24
FATTY ACIDE(S)*	0,30	0,30
m-AMINOPHENOL	0,10	0,10
C15-19 ALKANE	2,00	2,00
CETEARYL ALCOHOL	16,00	16,00
CANDELILLA WAX	0,10	0,10
N,N-BIS(2-HYDROXYETHYL)-p-PHENYLENEDIAMINE SULFATE	0,16	0,16
HYDROXYETHYL-3,4-METHYLENE DIOXYANILINE HCL	0,18	0,18
2-AMINO-3-HYDROXYPYRIDINE	0,04	0,04
HYDROXYBENZOMORPHOLINE	0,43	0,43
TOLUENE-2,5-DIAMINE	0,53	0,53
WATER	QS100	QS100

[0321] \* INCI Name : STEARIC ACID

[0322] At the time of use, each of the dye compositions **A** and **B** is mixed with 1.5 times its weight of oxidizing agent **O** (comprising hydrogen 6% by weight of hydrogen peroxide relative to the total weight of the oxidizing agent). Each of the mixtures is then applied to locks of natural grey (NG) hair containing 90% white hairs, at a rate of 5 g of mixture/g of hair.

[0323] After a leave-on time of 35 minutes at 27°C, the hair is rinsed, washed with a standard shampoo and dried.

### Results

[0324] The colorimetric measurements were performed using a Konica Minolta 3600 spectrophotometer (illuminant D65, angle 10°, specular component included) in the CIELab system.

[0325] In this system, L\* represents the power: the lower the value of L\*, the darker and more powerful the coloring obtained.

[0326] Below is the result:

[0327]

[0328]

	L*
<b>A + O</b> (invention)	22,2
<b>B+ O</b> (comparative)	24,8

[0329]

[0330]

[0331] The A+O mixture according to the invention leads to a lower L\* value, therefore to a more powerful coloring than that provided by the comparative mixture B+O.

## Claims

- [Claim 1] Composition comprising:
- at least one polycarboxylic acid of formula (I) below, salts thereof, optical isomers thereof, geometrical isomers thereof, and/or solvates thereof:
- R1-N-(CH(R2)COOH)<sub>2</sub> (I) in which
- R1 represents a hydrogen atom or a group -CH(COOH)-(CH<sub>2</sub>)<sub>2</sub>-COOH, -CH<sub>2</sub>CH<sub>2</sub>OH, -CH(CH<sub>3</sub>)COOH, -(CH<sub>2</sub>)<sub>2</sub>N(COR<sub>3</sub>)-CH<sub>2</sub>-COOH or -CH(COOH)-CH<sub>2</sub>-COOH; and
- R2 represents a CH<sub>2</sub>COOH group when R1 represents a hydrogen atom, or R2 represents a hydrogen atom when R1 is other than a hydrogen atom; and
- R3 represents a linear or branched alkyl group including from 1 to 4 carbon atoms or a cyclic alkyl group including from 3 to 30 carbon atoms;
- at least one (bi)carbonate 2), the total content of (bi)carbonate(s) being greater than or equal to 1% by weight relative to the total weight of the composition;
  - at least one additional alkaline agent 3);
  - at least one fatty substance 4); and
  - at least one dye 5).
- [Claim 2] Composition according to Claim 1, in which the carboxylic acid(s) of formula (I) are chosen from N,N-dicarboxymethylglutamic acid, N,N-bis(carboxymethyl)aspartic acid, alkali metal salts thereof, alkaline-earth metal salts thereof, transition metal salts thereof, organic amine salts thereof, ammonium salts thereof, optical isomers thereof, geometrical isomers thereof, solvates thereof and mixtures thereof, preferably chosen from N,N-dicarboxymethylglutamic acid, tetrasodium N,N-bis(carboxymethyl)glutamate, optical isomers thereof, geometrical isomers thereof, and mixtures thereof, preferentially N,N-dicarboxymethyl-L-glutamic acid and/or tetrasodium N,N-bis(carboxymethyl)-L-glutamate, more preferentially tetrasodium glutamate diacetate (INCI name).
- [Claim 3] Composition according to either of the preceding claims, in which the total content of the carboxylic acid(s) of formula (I), salts thereof, optical isomers thereof, geometrical isomers thereof, salts thereof and/or solvates thereof, ranges from 0.001% to 15% by weight,

preferentially from 0.005% to 10% by weight, more preferentially from 0.01% to 8% by weight, better still from 0.05% to 5% by weight, even better still from 0.1% to 2% by weight relative to the total weight of the composition.

[Claim 4] Composition according to any one of the preceding claims, in which the (bi)carbonate(s) are chosen from alkali metal (bi)carbonates, alkaline-earth metal (bi)carbonates and ammonium (bi)carbonates, preferentially alkali metal (bi)carbonates, ammonium (bi)carbonates and mixtures thereof, more preferentially chosen from Na, K, Mg and Ca (bi)carbonates, ammonium (bi)carbonates and mixtures thereof, better still chosen from Na (bi)carbonate, K (bi)carbonate, ammonium (bi)carbonate and mixtures thereof, preferentially Na bicarbonate, K bicarbonate, ammonium bicarbonate and mixtures thereof, even better still ammonium bicarbonate.

[Claim 5] Composition according to any one of the preceding claims, in which the total content of the (bi)carbonate(s) ranges from 1% to 20% by weight, preferentially from 1.2% to 15% by weight, more preferentially from 1.5% to 10% by weight, better still from 1.8% to 5% by weight, and even better still from 2% to 4% by weight, relative to the total weight of the composition.

[Claim 6] Composition according to any one of the preceding claims, in which the additional alkaline agent(s) are chosen from ammonium hydroxide, alkanolamines, alkali metal silicates and metasilicates, mineral hydroxides and mixtures thereof, more preferentially chosen from ammonium hydroxide, alkanolamines and mixtures thereof, better still chosen from ammonium hydroxide, monoethanolamine and mixtures thereof.

[Claim 7] Composition according to any one of the preceding claims, in which the fatty substance(s) are chosen from liquid hydrocarbons comprising more than 6 carbon atoms, plant oils, fatty alcohols, liquid fatty esters, solid fatty acids, waxes and mixtures thereof, more preferentially from solid fatty alcohols, mixtures of alkanes containing from 8 to 28 carbon atoms, waxes, solid fatty acids and mixtures thereof, better still chosen from C15-19 Alkane (INCI name), cetearyl alcohol, waxes, solid fatty acids and mixtures thereof.

[Claim 8] Composition according to any one of the preceding claims, in which the total content of the fatty substance(s) ranges from 5% to 35% by

- weight, preferably from 7% to 30% by weight and preferentially from 8% to 25% by weight, relative to the total weight of the composition.
- [Claim 9] Composition according to any one of the preceding claims, in which the dye(s) are chosen from oxidation dyes, direct dyes and mixtures thereof, preferably chosen from oxidation dyes, preferentially from oxidation bases optionally associated with one or more couplers.
- [Claim 10] Composition according to any one of the preceding claims, comprising at least one additional surfactant, the additional surfactant(s) preferably being chosen from nonionic surfactants, more preferentially chosen from saturated or unsaturated, linear or branched, oxyethylenated or oxypropylenated, C8 to C40 alcohols comprising from 1 to 100 mol of ethylene or propylene oxide, preferably from 2 to 50, more particularly from 2 to 40 mol, and including at least one C8-C20 alkyl chain.
- [Claim 11] Composition according to any one of the preceding claims, not comprising any chemical oxidizing agent.
- [Claim 12] Composition according to any one of Claims 1 to 10, comprising at least one chemical oxidizing agent, preferably hydrogen peroxide.
- [Claim 13] Process for dyeing keratin fibres, preferably the hair, comprising the application to the keratin fibres of the composition as defined according to Claim 12.
- [Claim 14] Process according to Claim 13, comprising the application to the fibres of a mixture of:
- a) a composition according to any one of Claims 1 to 11,
  - b) an oxidizing composition comprising one or more chemical oxidizing agents, preferably hydrogen peroxide.
- [Claim 15] Multi-compartment device, preferably a two-compartment device, for dyeing keratin fibres, preferably the hair, comprising at least a first compartment containing a composition as defined according to any one of Claims 1 to 11 and at least a second compartment containing an oxidizing composition comprising one or more chemical oxidizing agents, preferably hydrogen peroxide.

# INTERNATIONAL SEARCH REPORT

International application No PCT/EP2024/068192
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<b>A. CLASSIFICATION OF SUBJECT MATTER</b>		
INV. A61K8/19	A61K8/31	A61K8/34
A61K8/44	A61K8/92	A61Q5/10
ADD.		
According to International Patent Classification (IPC) or to both national classification and IPC		
<b>B. FIELDS SEARCHED</b>		
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, CHEM ABS Data		
<b>C. DOCUMENTS CONSIDERED TO BE RELEVANT</b>		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	WO 2023/275206 A1 (OREAL [FR]) 5 January 2023 (2023-01-05) page 2, line 11 - line 28 page 3, lines 9-26 page 4, lines 17-33 page 10, line 30 - page 11, line 6 page 12, lines 3-11 example A2	1 - 15
Y	US 2022/031592 A1 (HODES JING [DE] ET AL) 3 February 2022 (2022-02-03) page 1, paragraph 8-14 page 2, paragraphs 23,27 page 3, paragraph 31-32 example	1 - 15
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<input checked="" type="checkbox"/> Further documents are listed in the continuation of Box C. <span style="margin-left: 200px;"><input checked="" type="checkbox"/> See patent family annex.</span>		
* Special categories of cited documents : "A" document defining the general state of the art which is not considered to be of particular relevance "E" earlier application or patent but published on or after the international filing date "L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified) "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
8 November 2024		14/11/2024
Name and mailing address of the ISA/ European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Fax: (+31-70) 340-3016		Authorized officer  Ruckebusch, Virginie

# INTERNATIONAL SEARCH REPORT

International application No  
PCT/EP2024/068192

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	FR 3 130 151 A1 (OREAL [FR]) 16 June 2023 (2023-06-16) composition A; example page 2, paragraph 10-14 page 40, paragraph 269-271 -----	1 - 15

# INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

PCT/EP2024/068192

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
WO 2023275206 A1	05-01-2023	CN 117425465 A	19-01-2024
		EP 4362894 A1	08-05-2024
		FR 3124715 A1	06-01-2023
		WO 2023275206 A1	05-01-2023
		ZA 202311248 B	28-08-2024
-----			
US 2022031592 A1	03-02-2022	CN 112739310 A	30-04-2021
		DE 102018123507 A1	26-03-2020
		EP 3856126 A1	04-08-2021
		JP 7579786 B2	08-11-2024
		JP 2022502502 A	11-01-2022
		US 2022031592 A1	03-02-2022
		WO 2020064268 A1	02-04-2020
-----			
FR 3130151 A1	16-06-2023	EP 4444258 A1	16-10-2024
		FR 3130151 A1	16-06-2023
		WO 2023105015 A1	15-06-2023
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