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(54) Title: PRETREATMENT COMPOSITION OF A PROCESS FOR DYEING OR BLEACHING KERATIN FIBERS

(57) Abstract: The present invention relates to a pretreatment composition of a process for dyeing or bleaching keratin fibers, comprising at least 5% by weight of one or more particular amino acids and at least 5% by weight of one or more monoalcohols, and also to a dyeing or bleaching process using the pretreatment composition.



PRETREATMENT COMPOSITION OF A PROCESS FOR DYEING OR BLEACHING KERATIN FIBERS

FIELD OF THE INVENTION

5 The present invention relates to a pretreatment composition of a process for dyeing or bleaching keratin fibers, comprising at least 5% by weight of one or more particular amino acids and at least 5% by weight of one or more monoalcohols, and also to a dyeing or bleaching process using the pretreatment composition.

10 BACKGROUND OF THE INVENTION

It is known practice to perform hair dyeing or bleaching processes to modify the color of natural hair. These processes generally consist in applying to the keratin fibers hair compositions comprising chemical oxidizing agents and optionally direct dyes and/or oxidation dyes.

15 These dyeing or bleaching hair compositions do, admittedly, have dyeing or bleaching power, but they may occasionally be responsible for degradation of the quality of the fiber, the constituent proteins of the hair possibly being denatured, thus giving rise to labile proteins. The higher the content of labile proteins, the more the hair is damaged. This degradation of the fiber quality may result in substantial breakage during combing of the
20 hair, notably when these compositions are applied to sensitized hair. Thus, it is common practice to resort to care compositions involving conditioning agents in order to limit the degradation or to improve the cosmetic properties of the hair. However, these care compositions may, in certain cases, impair the dyeing or bleaching of the keratin fibers thus treated.

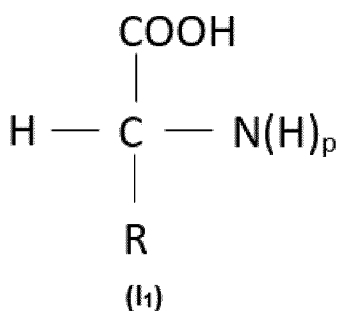
25 There is thus a real need to develop a composition that can be used as a pretreatment composition for a dyeing or bleaching process, which makes it possible to conserve or even to improve the quality of the keratin fibers and notably to reduce the breakage that may be observed during the dyeing or bleaching process, while at the same time avoiding impairment of the dyeing or bleaching of the keratin fibers thus treated. Such a
30 composition must also be easy to use, notably easy to apply and stable, making it possible to maintain or even to improve the cosmetic properties of the keratin fibers thus treated, for example as regards the sheen, the soft feel, the suppleness, the appearance or the disentangling. Furthermore, such a composition will ideally need to be compatible with any type of dyeing or bleaching composition that is commercially available.

The Applicant has discovered, surprisingly, that all of these objectives can be achieved by means of the composition according to the present invention.

SUMMARY OF THE INVENTION

5 According to a first aspect, a subject of the present invention is a composition **(A)** comprising:

i) at least 5% by weight, relative to the total weight of composition **(A)**, of one or more amino acids chosen from the compounds of formula **(I₁)**, salts thereof and mixtures thereof:



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in which formula **(I₁)**:

- **p** is an integer equal to 1 or 2;
 - when **p** = 1, **R** forms with the nitrogen atom a saturated 5- to 8-membered, preferably 5-membered, heterocycle, this ring possibly being optionally substituted with at least one
- 15 group chosen from hydroxyl or (C₁-C₄)alkyl;
- when **p** = 2, **R** represents:
 - a hydrogen atom; or
 - a (C₁-C₁₂)alkyl group, preferably a (C₁-C₄)alkyl group, interrupted with at least one
- 20 one group chosen from hydroxyl, amino or -NH-C(NH)-NH₂; and
- ii) at least 5% by weight, relative to the total weight of composition **(A)**, of one or more monoalcohols.

25 According to a second aspect, a subject of the present invention is a process for dyeing or bleaching keratin fibers, comprising the following successive steps:

- i) applying to the keratin fibers a composition **(A)** as defined previously;
- ii) applying to the keratin fibres a dyeing or bleaching composition.

According to a third aspect, a subject of the present invention is the use of a composition (A) as defined previously, as a pretreatment composition of a dyeing or bleaching process.

- 5 According to a fourth aspect, a subject of the present invention is the use of a composition (A) as defined previously, for protecting keratin fibers, preferably for protecting them against breakage, during a dyeing or bleaching treatment.

10 According to a fifth aspect, a subject of the present invention is a multi-compartment device comprising:

- a first compartment containing a composition (A) as defined previously; and
 - a second compartment containing a composition comprising at least one chemical oxidizing agent; and
 - optionally a third compartment containing a composition comprising at least one coloring agent chosen from oxidation dyes, direct dyes and mixtures thereof.
- 15

DETAILED DESCRIPTION OF THE INVENTION

For the purposes of the present invention and unless otherwise indicated:

- the term “keratin fibers” means fibers of human or animal origin, such as head hair, bodily hair, the eyelashes, the eyebrows, wool, angora, cashmere or fur. According to the present invention, the keratin fibers are preferably human keratin fibers, more preferentially the hair.
 - the term “successive steps” means steps performed in the indicated order.
 - the term “dye composition” means a composition comprising at least one coloring agent.
 - the term “bleaching composition” means a composition comprising at least one chemical oxidizing agent.
 - the term “alkyl group” means a linear or branched, saturated hydrocarbon-based radical.
 - the term “(C_x-C_y)alkyl group” means an alkyl group comprising from x to y carbon atoms.
 - the term “coloring agent” means an oxidation dye, a direct dye or a pigment.
 - the term “oxidation dye” means an oxidation dye precursor chosen from oxidation bases and couplers. Oxidation bases and couplers are colorless or sparingly colored
- 20
- 25
- 30

compounds, which, via a condensation reaction in the presence of an oxidizing agent, give a colored species.

- the term “direct dye” means a natural and/or synthetic dye, including in the form of an extract or extracts, other than oxidation dyes. These are colored compounds that will spread superficially on the fiber. They may be ionic or nonionic, i.e. anionic, cationic, neutral or nonionic.
- the term “reducing agent” means an agent that is capable of reducing the disulfide bonds of the hair, such as compounds chosen from thiols, alkaline sulfites, hydrides and phosphines.
- the term “chemical oxidizing agent” means an oxidizing agent other than atmospheric oxygen.

Unless otherwise indicated, when compounds are mentioned in the present patent application, this also includes the optical isomers thereof, the geometrical isomers thereof, the tautomers thereof, the salts thereof or the solvates thereof, alone or as a mixture.

The expressions “at least one” and “one or more” are synonymous and may be used interchangeably.

Composition (A)

According to a first aspect, a subject of the present invention is a composition **(A)** as defined previously. The Applicant has found, surprisingly, that composition **(A)** according to the invention can be used as a pretreatment composition for a dyeing or bleaching process, which makes it possible to conserve or even to improve the quality of the keratin fibers and to reduce the breakage that may be observed during the dyeing or bleaching process, while at the same time avoiding impairment of the dyeing or bleaching. Furthermore, composition **(A)** according to the invention is compatible with any type of dyeing or bleaching composition that is commercially available.

Amino acids

Composition **(A)** comprises one or more amino acids chosen from the compounds of formula **(I₁)** as defined previously, salts thereof and mixtures thereof, preferably chosen from the compounds of formula **(I₁)**.

The salts of compounds of formula (I₁) comprise the salts with organic or mineral bases, for example the salts of alkali metals, for instance the lithium, sodium or potassium salts; the salts of alkaline-earth metals, for instance the magnesium or calcium salts, and the zinc salts.

5

The compounds of formula (I₁) may be in the form of an optical isomer of L, D or DL configuration, preferably of L configuration.

As examples according to the present invention of compounds of formula (I₁) in the form of an optical isomer of L configuration, mention may be made of L-proline, L-methionine, L-serine, L-arginine and L-lysine.

Preferably, the amino acid(s) included in composition (A) are chosen from glycine, proline, methionine, serine, arginine, lysine, salts thereof and mixtures thereof.

15

More preferentially, the amino acid(s) included in composition (A) are chosen from glycine, proline, methionine, serine, salts thereof and mixtures thereof.

Even more preferentially, the amino acid included in composition (A) is chosen from glycine, salts thereof and mixtures thereof.

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As examples of glycine salts that may be used in the present invention mention may be made of sodium glycinate, zinc glycinate, calcium glycinate, magnesium glycinate, manganese glycinate and potassium glycinate, preferably sodium glycinate or potassium glycinate.

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Particularly preferably, the amino acid included in composition (A) is glycine.

The amino acid(s) chosen from the compounds of formula (I₁), salts thereof and mixtures thereof are present in composition (A) in a total content of at least 5% by weight, preferably of at least 8% by weight, relative to the total weight of composition (A).

30

The amino acid(s) chosen from the compounds of formula (I₁), salts thereof and mixtures thereof may be present in composition (A) in a total content ranging from 5% to 20% by

weight, preferably ranging from 5% to 15% by weight, more preferentially ranging from 8% to 12% by weight, relative to the total weight of composition **(A)**.

Composition **(A)** may preferably comprise at least 5% by weight, more preferentially at least 8% by weight, of glycine, salts thereof and mixtures thereof relative to the total weight of composition **(A)**.

Preferably, composition **(A)** comprises from 5% to 20% by weight, preferably from 5% to 15% by weight and more preferentially from 8% to 12% by weight of glycine, salts thereof and mixtures thereof relative to the total weight of composition **(A)**.

10

According to a preferred embodiment, composition **(A)** comprises one or more amino acids chosen from the compounds of formula **(I₁)** as defined previously.

According to this preferred embodiment, the amino acid(s) included in composition **(A)** are preferably chosen from glycine, proline, methionine, serine, arginine, lysine and mixtures thereof, more preferentially from glycine, proline, methionine, serine and mixtures thereof, and, even more preferentially, the amino acid included in composition **(A)** is glycine.

According to this preferred embodiment, the amino acid(s) chosen from the compounds of formula **(I₁)** are present in composition **(A)** in a total content of at least 5% by weight, preferably of at least 8% by weight, relative to the total weight of composition **(A)**.

According to this preferred embodiment, the amino acid(s) chosen from the compounds of formula **(I₁)** are present in composition **(A)** in a total content preferably ranging from 5% to 20% by weight, more preferentially ranging from 5% to 15% by weight, even more preferentially ranging from 8% to 12% by weight, relative to the total weight of composition **(A)**.

According to this preferred embodiment, composition **(A)** may preferably comprise at least 5% by weight, more preferentially at least 8% by weight, of glycine relative to the total weight of composition **(A)**.

According to this preferred embodiment, composition **(A)** preferably comprises from 5% to 20% by weight, more preferentially from 5% to 15% by weight and even more

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preferentially from 8% to 12% by weight of glycine relative to the total weight of composition (A).

pH

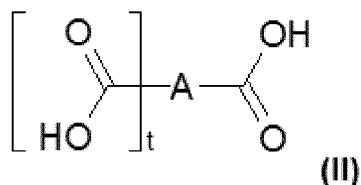
5 Composition (A) may have a pH ranging from 2 to 11. Preferably, the pH of composition (A) ranges from 4 to 10. More preferentially, the pH of composition (A) ranges from 8 to 10.

By way of example, the pH of composition (A) may be equal to 9.

The pH of composition (A) may be adjusted with at least one organic or mineral acid, or
10 with at least one alkaline agent chosen from mineral or organic or hybrid alkaline agents and mixtures thereof.

The term "organic acid" means an acid, i.e. a compound that is capable of releasing a cation or proton H^+ or H_3O^+ , in aqueous medium, which includes at least one optionally unsaturated, linear or branched C_1 - C_{20} hydrocarbon-based chain, a (hetero)cycloalkyl or
15 (hetero)aryl group and at least one acidic chemical function chosen in particular from carboxyl $C(O)OH$, sulfonic SO_3H , sulfinic SO_2H , phosphonic PO_3H and phosphinic PO_2H_2 .

More particularly, the organic or mineral acid used is chosen from hydrochloric acid HCl , hydrobromic acid HBr , sulfuric acid H_2SO_4 , alkylsulfonic acids: $(C_1-C_6)Alk-S(O)_2OH$ such
20 as methylsulfonic acid and ethylsulfonic acid; arylsulfonic acids: $Ar-S(O)_2OH$ such as benzenesulfonic acid and toluenesulfonic acid; (C_1-C_6) alkoxysulfinic acids: $Alk-O-S(O)OH$ such as methoxysulfinic acid and ethoxysulfinic acid; aryloxysulfinic acids such as tolueneoxysulfinic acid and phenoxyulfinic acid; phosphoric acid H_3PO_4 ; triflic acid CF_3SO_3H and tetrafluoroboric acid HF_4 , and carboxylic acid(s) of formula (II) below and
25 the salts thereof:



in which formula (II):

A represents a saturated or unsaturated, cyclic or noncyclic, aromatic or nonaromatic hydrocarbon-based group, which is monovalent when t is 0 or polyvalent when t is
30 greater than or equal to 1, comprising from 1 to 50 carbon atoms, which is optionally

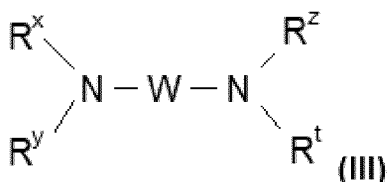
interrupted with one or more heteroatoms and/or optionally substituted, notably with one or more hydroxyl groups; preferably, A represents a monovalent (C₁-C₆)alkyl group or a polyvalent (C₁-C₆)alkylene group optionally substituted with one or more hydroxyl groups.

- 5 In particular, the acid used is chosen from the carboxylic acids of formula (II) as defined previously. Preferably, the acid used is an α-hydroxy acid such as lactic acid, glycolic acid, tartaric acid or citric acid.

- 10 The mineral alkaline agents are preferably chosen from aqueous ammonia, alkaline carbonates or bicarbonates such as sodium or potassium carbonates and sodium or potassium bicarbonates, sodium hydroxide or potassium hydroxide, and mixtures thereof.

The organic alkaline agents are preferably chosen from organic amines, i.e. they contain at least one substituted or unsubstituted amino group.

- 15 The organic alkaline agents are more preferentially chosen from organic amines with a pK_b at 25°C of less than 12, preferably of less than 10 and even more advantageously of less than 6. It should be noted that it is the pK_b corresponding to the function which has the highest basicity.
- 20 The organic alkaline agents are chosen, for example, from alkanolamines, oxyethylenated and/or oxypropylenated ethylenediamines and the compounds of formula (III) below:



in which formula (III):

- 25 • W is a divalent C₁-C₆ alkylene group optionally substituted with a hydroxyl group or a (C₁-C₆)alkyl group, and/or optionally interrupted with one or more heteroatoms such as oxygen or NR^u;
- R^x, R^y, R^z, R^t and R^u, which may be identical or different, represent a hydrogen atom or a group chosen from (C₁-C₆)alkyl, C₁-C₆ hydroxyalkyl or C₁-C₆ aminoalkyl.
- 30 Preferably, the alkanolamine is ethanolamine (or monoethanolamine).

In one variant of the invention, composition (A) comprises, as alkaline agent, one or more alkanolamines (preferably ethanolamine) and aqueous ammonia. In this variant, the alkanolamine(s) are present in a predominant amount relative to the aqueous ammonia.

- 5 Hybrid alkaline agents that may be mentioned include the salts of the amines mentioned previously with acids such as carbonic acid or hydrochloric acid.

Cationic polymers

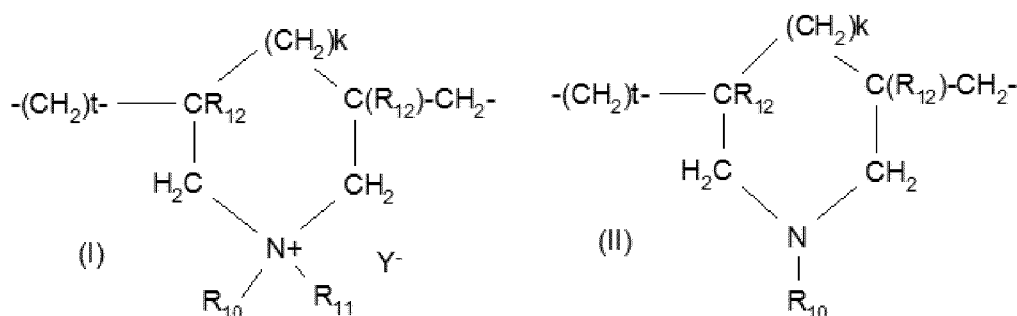
Composition (A) may comprise one or more cationic polymers.

- 10 The term “cationic polymer” means any polymer comprising cationic groups and/or groups that can be ionized into cationic groups and not comprising any anionic groups and/or groups that can be ionized into anionic groups. Preferably, the cationic polymer is hydrophilic or amphiphilic.

The preferred cationic polymers are chosen from those that contain units including
15 primary, secondary, tertiary and/or quaternary amine groups that may either form part of the main polymer chain or may be borne by a side substituent directly connected thereto.

The cationic polymers that may be used preferably have a weight-average molar mass (Mw) ranging from 500 to 5×10^6 g/mol and preferably ranging from 10^3 to 3×10^6 g/mol.

- 20 Preferably, composition (A) comprises one or more cationic polymers chosen from homopolymers or copolymers including in their structure one or more units corresponding to formula (I) or (II):



in which:

- k and t are equal to 0 or 1, the sum k + t being equal to 1;
- 25 • R₁₂ denotes a hydrogen atom or a methyl group;
- R₁₀ and R₁₁, independently of each other, denote a (C₁-C₆)alkyl group, a C₁-C₅ hydroxyalkyl group, a C₁-C₄ amidoalkyl group; or alternatively R₁₀ and R₁₁ denote, together with the nitrogen atom to which they are attached, a heterocyclic group such as

piperidyl or morpholinyl; preferably, R_{10} and R_{11} , independently of each other, denote a (C₁-C₄)alkyl group;

• Y^- is an anion preferably chosen from bromide, chloride, acetate, borate, citrate, tartrate, bisulfate, bisulfite, sulfate and phosphate.

5

More preferentially, composition **(A)** comprises one or more cationic polymers chosen from homopolymers or copolymers including in their structure one or more units corresponding to formula **(I)** as defined previously.

Even more preferentially, composition **(A)** comprises one or more cationic polymers chosen from homopolymers of diallyldimethylammonium salts and copolymers of diallyldimethylammonium salts and of acrylamide.

Particularly preferably, composition **(A)** comprises one or more cationic polymers chosen from copolymers of diallyldimethylammonium salts and of acrylamide.

15 Mention may be made more particularly of the homopolymer of dimethyldiallylammonium salts (for example chloride) for example sold under the name Merquat 100 by the company Nalco and the copolymers of diallyldimethylammonium salts (for example chloride) and of acrylamide, notably sold under the name Merquat 550 or Merquat 7SPR. The cationic polymer(s) may be present composition **(A)** in a total content ranging from 20 0.00001% to 5% by weight, preferably ranging from 0.00005% to 1% by weight and more preferentially ranging from 0.00007% to 0.5% by weight, relative to the total weight of composition **(A)**.

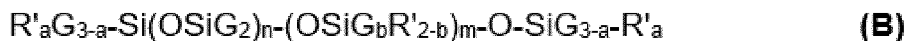
Amino silicones

25 Composition **(A)** may comprise one or more silicones, preferably chosen from amino silicones.

The term "amino silicone" means any silicone including at least one primary, secondary or tertiary amine function.

The weight-average molecular masses of these amino silicones may be measured by 30 gel permeation chromatography (GPC) at room temperature (25°C), as polystyrene equivalent. The columns used are μ styragel columns. The eluent is THF and the flow rate is 1 ml/min. 200 μ l of a 0.5% by weight solution of silicone in THF are injected. Detection is performed by refractometry and UV-metry.

Preferably, the amino silicones are chosen from the amino silicones of formula (B) below:



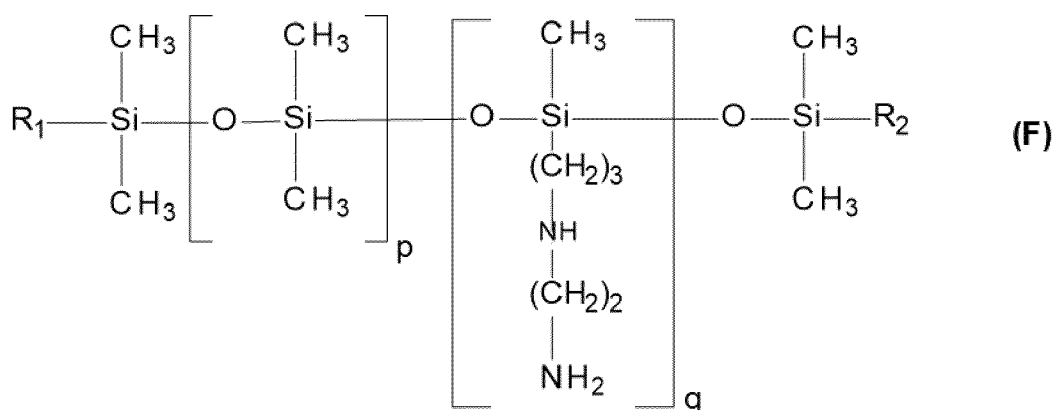
in which:

- G, which may be identical or different, denotes a hydrogen atom or a group from among phenyl, OH, C₁-C₈ alkyl, for example methyl, or C₁-C₈ alkoxy, for example methoxy,
- a, which may be identical or different, denotes 0 or an integer from 1 to 3, in particular 0,
- b denotes 0 or 1, in particular 1,
- m and n are numbers such that the sum (n + m) ranges from 1 to 2000 and in particular from 50 to 150, n possibly denoting a number from 0 to 1999 and notably from 49 to 149, and m possibly denoting a number from 1 to 2000 and notably from 1 to 10,
- R', which may be identical or different, denotes a monovalent radical of formula -C_qH_{2q}L in which q is a number ranging from 2 to 8 and L is an optionally quaternized amine group chosen from the following groups:

- N(R'')₂; -N⁺(R'')₃ A⁻; -NR''-Q-N(R'')₂ and -NR''-Q-N⁺(R'')₃ A⁻,

in which R'', which may be identical or different, denotes hydrogen, phenyl, benzyl, or a saturated monovalent hydrocarbon-based radical, for example a C₁-C₂₀ alkyl radical; Q denotes a linear or branched group of formula C_rH_{2r}, r being an integer ranging from 2 to 6, preferably from 2 to 4; and A⁻ represents a cosmetically acceptable anion, notably a halide such as fluoride, chloride, bromide or iodide.

More preferentially, the amino silicones are chosen from the amino silicones of formula (F) below:



in which:

- p and q are numbers such that the sum (p + q) ranges from 1 to 1000, in particular from 50 to 350 and more particularly from 150 to 250; p possibly denoting a number from 0 to 999, notably from 49 to 349 and more particularly from 159 to 239, and q possibly denoting a number from 1 to 1000, notably from 1 to 10 and more particularly from 1 to 5;

- R₁ and R₂, which are different, represent a hydroxyl or C₁-C₄ alkoxy radical, at least one of the radicals R₁ or R₂ denoting an alkoxy radical.

Preferably, the alkoxy radical is a methoxy radical.

The hydroxy/alkoxy mole ratio generally ranges from 1:0.8 to 1:1.1 and preferably from 1:0.9 to 1:1 and more particularly is equal to 1:0.95.

The weight-average molecular mass (M_w) of the silicone preferably ranges from 2000 to 200 000, even more particularly from 5000 to 100 000 and more particularly from 10 000 to 50 000.

The commercial products comprising silicones of structure **(F)** may include in their composition one or more other amino silicones whose structure is different from that of formula **(F)**.

A product containing amino silicones of structure **(F)** is sold by Wacker under the name Fluid WR 1300®.

Among the amino silicones of formula **(F)**, mention may also be made of the product Belsil ADM Log 1 from Wacker.

When these amino silicones are used, one particularly advantageous embodiment consists in using them in the form of an oil-in-water emulsion. The oil-in-water emulsion may comprise one or more surfactants. The surfactants may be of any nature but are preferably cationic and/or nonionic. The number-average size of the silicone particles in the emulsion generally ranges from 3 nm to 500 nanometers.

The silicone(s) may be present in composition **(A)** in a total content ranging from 0.001% to 10% by weight, preferably ranging from 0.01% to 5% by weight, more preferentially ranging from 0.02% to 1% by weight, even more preferentially ranging from 0.05% to 0.5% by weight relative to the total weight of composition **(A)**.

The amino silicone(s) may be present composition **(A)** in a total content ranging from 0.001% to 10% by weight, preferably ranging from 0.01% to 5% by weight, more

preferentially ranging from 0.02% to 1% by weight and even more preferentially ranging from 0.05% to 0.5% by weight, relative to the total weight of composition **(A)**.

5 Composition **(A)** preferably comprises a total content of coloring agents and/or reducing agents of less than 0.1% by weight, more preferentially less than 0.01% by weight, even more preferentially less than 0.001% by weight, relative to the total weight of composition **(A)**.

10 According to a particularly preferred embodiment, composition **(A)** is free of coloring agents and/or reducing agents.

15 Composition **(A)** preferably comprises a total content of chemical oxidizing agents of less than 0.1% by weight, more preferentially less than 0.01% by weight, even more preferentially less than 0.001% by weight, relative to the total weight of composition **(A)**.

Surfactants

20 Composition **(A)** preferably comprises less than 5% by weight, more preferentially less than 2% by weight and even more preferentially less than 1% by weight of surfactants relative to the total weight of composition **(A)**.

In particular, composition **(A)** may comprise a total content of anionic surfactants of less than 0.1% by weight, preferably less than 0.01% by weight, more preferentially less than 0.001% by weight, relative to the total weight of composition **(A)**.

25 According to a particularly preferred embodiment, composition **(A)** is free of anionic surfactants.

30 Composition **(A)** may comprise a total content of nonionic surfactants of less than 0.5% by weight relative to the total weight of composition **(A)**.

Monoalcohols

Composition **(A)** may comprise at least 5% by weight and preferably at least 8% by weight, relative to the total weight of composition **(A)**, of one or more monoalcohols. The monoalcohols may be linear or branched.

The monoalcohol(s) are preferably chosen from C₂ to C₆ monoalcohols, more preferentially from C₂ to C₄ monoalcohols, even more preferentially from ethanol, isopropanol, tert-butanol, n-butanol and mixtures thereof.

- 5 According to a particularly preferred embodiment, the monoalcohol is ethanol.

The monoalcohol(s) may be present in composition (A) in a total content ranging from 5% to 20% by weight, preferably ranging from 5% to 15% by weight, more preferentially ranging from 8% to 12% by weight, relative to the total weight of composition (A).

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Organic solvents

Composition (A) may comprise, in addition to the monoalcohol(s), at least one organic solvent chosen from polyols, polyol ethers and mixtures thereof.

- 15 The polyols are preferably chosen from propylene glycol, dipropylene glycol, glycerol and mixtures thereof.

The polyol ethers are preferably chosen from propylene glycol monomethyl ether, diethylene glycol monomethyl ether and monoethyl ether and mixtures thereof.

20

Composition (A) may comprise a total content of organic solvents other than monoalcohols ranging from 1% to 40% by weight, preferably ranging from 5% to 30% by weight, more preferentially ranging from 8% to 15% by weight, relative to the total weight of composition (A).

25

Water

Composition (A) may comprise a total content of water ranging from 1% to 90% by weight, preferably ranging from 20% to 90%, more preferentially ranging from 40% to 90% by weight and even more preferentially ranging from 60% to 85% by weight, relative to the total weight of composition (A).

30

Dyeing or bleaching process

According to a second aspect, a subject of the present invention is a process for dyeing or bleaching keratin fibers, comprising the following successive steps:

- i) applying to the keratin fibres a composition (A) as defined previously;
- ii) applying to the keratin fibres a dyeing or bleaching composition.

5

In the process according to the present invention, it is essential for steps i) and ii) to be successive, i.e. for step ii) to be performed after step i).

The process may comprise one or more additional steps between steps i) and ii), but, even in such an embodiment, step ii) is always performed after step i).

10

Dyeing or bleaching composition

Chemical oxidizing agent

The dyeing or bleaching composition applied to the keratin fibers during step ii) of the process may comprise at least one chemical oxidizing agent.

15

Preferably, the chemical oxidizing agent is chosen from hydrogen peroxide, urea peroxide, alkali metal bromates, peroxygenated salts, peracids and precursors thereof, and mixtures thereof.

20 More preferentially, the chemical oxidizing agent is chosen from hydrogen peroxide, peroxygenated salts, and mixtures thereof.

Even more preferentially, the chemical oxidizing agent is chosen from hydrogen peroxide, persulfates, perborates or percarbonates of alkali metals or alkaline-earth metals or of ammonium, and mixtures thereof.

25 A chemical oxidizing agent that is particularly preferred is hydrogen peroxide.

Examples of peroxygenated salts that may be mentioned include sodium, potassium or ammonium persulfates and mixtures thereof.

When the composition is a bleaching composition, it may preferably comprise hydrogen peroxide and a peroxygenated salt.

30

The dyeing or bleaching composition may comprise a total content of chemical oxidizing agents ranging from 0.5% to 60% by weight, preferably ranging from 0.5% to 40% by weight, more preferentially ranging from 1% to 30% by weight, relative to the total weight of the dyeing or bleaching composition.

Liquid fatty substances

The dyeing or bleaching composition may also comprise one or more fatty substances that are liquid at room temperature (25°C) and at atmospheric pressure (1.013×10⁵ Pa),
5 other than salified fatty acids.

The term “fatty substance” means an organic compound that is insoluble in water at room temperature (25°C) and at atmospheric pressure (1.013×10⁵ Pa) (solubility of less than 5% by weight, preferably less than 1% by weight and even more preferentially less than 0.1% by weight). They bear in their structure at least one hydrocarbon-based chain
10 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.

15 The term “oil” means a “fatty substance” that is liquid at room temperature (25°C) and at atmospheric pressure (1.013×10⁵ Pa).

The term “nonsilicone 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.

20 The liquid fatty substances that may be used in the dyeing or bleaching composition are different from salified fatty acids, i.e. they can be present in the composition in the form of free fatty acids. In other words, these fatty substances do not contain any salified carboxylic acid groups (-C(O)O-). In particular, these fatty substances are neither polyoxyethylenated nor polyglycerolated.

25 Preferably, the fatty substances are different from non-salified fatty acids.

More particularly, the liquid fatty substances according to the invention are chosen from C₆ to C₁₆ liquid hydrocarbons, liquid hydrocarbons comprising more than 16 carbon atoms, nonsilicone 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
30 triglycerides, and silicone oils, and mixtures thereof.

It is recalled that the fatty alcohols and esters more particularly contain at least one saturated or unsaturated, linear or branched hydrocarbon-based group, comprising 6 to 30 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.

As regards the C₆ to C₁₆ liquid hydrocarbons, they are linear, branched or optionally cyclic, and are preferably alkanes. Examples that may be mentioned include hexane, cyclohexane, undecane, dodecane, isododecane, tridecane or isoparaffins, such as
5 isohexadecane or isodecane, and mixtures thereof.

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

A hydrocarbon-based oil of animal origin that may be mentioned is perhydrosqualene. The triglyceride oils of plant or synthetic origin are preferably chosen from liquid fatty acid triglycerides 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
15 oil, sunflower 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.

As regards the fluoro oils, they may be chosen from perfluoromethylcyclopentane and perfluoro-1,3-dimethylcyclohexane, sold under the names Flutec® PC1 and Flutec® PC3 by the company BNFL Fluorochemicals; perfluoro-1,2-dimethylcyclobutane; perfluoroalkanes such as dodecafluoropentane and tetradecafluorohexane, sold under the names PF 5050® and PF 5060® by the company 3M, or bromoperfluorooctyl sold
25 under the name

Foralkyl® by the company Atochem; nonafluoromethoxybutane and nonafluoroethoxyisobutane; perfluoromorpholine derivatives such as 4-trifluoromethylperfluoromorpholine sold under the name PF 5052® by the company 3M.

The liquid fatty alcohols may more particularly be chosen from linear or branched, saturated or unsaturated alcohols, preferably unsaturated or branched alcohols, including from 6 to 30 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.

As regards the liquid esters of fatty acids and/or of fatty alcohols other than the triglycerides mentioned above, mention may be made notably of esters of saturated or
5 unsaturated, linear C_1 to C_{26} or branched C_3 to C_{26} aliphatic monoacids or polyacids and of saturated or unsaturated, linear C_1 to C_{26} or branched C_3 to C_{26} aliphatic monoalcohols or polyalcohols, the total carbon number of the esters being greater than or equal to 6 and more advantageously greater than or equal to 10.

Preferably, for the esters of monoalcohols, at least one from among the alcohol and the
10 acid from which the esters of the invention are derived is branched.

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;
15 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 2-octyldodecyl myristate, isobutyl stearate; 2-hexyldecyl laurate, and mixtures thereof.

20 Preferably, among the monoesters of monoacids and of monoalcohols, use will be made of ethyl palmitate, isopropyl palmitate, alkyl myristates such as isopropyl myristate or ethyl myristate, isocetyl stearate, 2-ethylhexyl isononanoate, isodecyl neopentanoate and isostearyl neopentanoate, and mixtures thereof.

25 Still within the context of this variant, use may also be made of esters of C_4 to C_{22} dicarboxylic or tricarboxylic acids and of C_1 to C_{22} alcohols and esters of mono-, di- or tricarboxylic acids and of C_2 to C_{26} di-, tri-, tetra- or pentahydroxy alcohols.

Mention may notably be made of: diethyl sebacate; diisopropyl sebacate; diisopropyl adipate; di-n-propyl adipate; dioctyl adipate; diisostearyl adipate; dioctyl maleate;
30 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; trioyleyl citrate; propylene glycol

dioctanoate; neopentyl glycol diheptanoate; diethylene glycol diisononanoate; and polyethylene glycol distearates, and mixtures thereof.

The dyeing or bleaching 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
5 "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.

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

The sugar esters of fatty acids may be chosen notably from the group comprising the esters or mixtures of esters of sugars described previously and of linear or branched,
15 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.

The esters according to this variant may also be chosen from mono-, di-, tri- and tetraesters, polyesters, and mixtures thereof.

20 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
More particularly, use is made of monoesters and diesters and notably sucrose, glucose or methylglucose mono- or di- oleates, stearates, behenates, oleopalmitates, linoleates,
25 linolenates and oleostearates, and mixtures thereof.

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

Preferably, use will be made of a liquid ester of a monoacid and of a monoalcohol.

The silicone oils that may be used in the dyeing or bleaching composition may be volatile
30 or nonvolatile, cyclic, linear or branched silicone oils, which are unmodified or modified with organic groups, and preferably have a viscosity from 5×10⁻⁶ to 2.5 m²/s at 25°C, and preferably 1×10⁻⁵ to 1 m²/s.

Preferably, the silicone oils are chosen from polydialkylsiloxanes, notably polydimethylsiloxanes (PDMS), and liquid polyorganosiloxanes including at least one aryl group.

These silicone oils may also be organomodified. The organomodified silicone oil(s) that
5 may be used in the dyeing or bleaching composition are preferably liquid silicones as defined previously and including in their structure one or more organofunctional groups attached via a hydrocarbon-based group, chosen, for example, from amine groups and alkoxy groups.

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

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

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

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

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

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

Nonvolatile polydialkylsiloxanes are preferably used.

These silicone oils are more particularly chosen from polydialkylsiloxanes, among which mention may be made mainly of polydimethylsiloxanes bearing trimethylsilyl end groups.

The viscosity of the silicones is measured at 25°C according to ASTM standard 445 Appendix C.

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

- 5 - the Silbione® oils of the 47 and 70 047 series or the Mirasil® oils sold by Rhodia, for instance the oil 70 047 V 500 000;
- the oils of the Mirasil® series sold by the company Rhodia;
- the oils of the 200 series from the company Dow Corning, such as DC200 with a viscosity of 60 000 mm²/s;
- 10 - the Viscasil® oils from General Electric and certain oils of the SF series (SF 96, SF 18) from General Electric.

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

- 15 The organomodified silicones that may be used in the dyeing or bleaching composition are silicones as defined previously and including in their structure one or more organofunctional groups attached via a hydrocarbon-based group.

- As regards the liquid polyorganosiloxanes including at least one aryl group, they may notably be polydiphenylsiloxanes, and polyalkylarylsiloxanes functionalized with the organofunctional groups mentioned previously.
- 20

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

- Among these polyalkylarylsiloxanes, examples that may be mentioned include the products sold under the following names:
- 25

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

Among the organomodified silicones, mention may be made of polyorganosiloxanes including:

- substituted or unsubstituted amine groups, such as the products sold under the names GP 4 Silicone Fluid and GP 7100 by the company Genesee or the products sold under the names Q2 8220 and Dow Corning 929 or 939 by the company Dow Corning. The substituted amine groups are, in particular, C₁ to C₄ aminoalkyl groups;
- alkoxy groups;
- hydroxyl groups.

The liquid fatty substance(s) are preferentially chosen from liquid hydrocarbons containing more than 16 carbon atoms, plant oils, liquid fatty alcohols and liquid fatty esters, silicone oils and mixtures thereof.

Preferentially, the liquid fatty substance(s) are chosen from liquid hydrocarbons comprising more than 16 carbon atoms, in particular liquid petroleum jelly.

In a particular embodiment, the total content of liquid fatty substance(s) included in the dyeing or bleaching composition is greater than or equal to 20% by weight, preferably greater than or equal to 30% by weight, more preferentially greater than or equal to 35% by weight, relative to the total weight of the dyeing or bleaching composition.

More preferentially, the total content of liquid fatty substance(s) included in the dyeing or bleaching composition ranges from 20% to 80% by weight, and preferably from 30% to 70% by weight, relative to the total weight of the dyeing or bleaching composition.

Alkaline agents

The dyeing or bleaching composition may optionally also comprise one or more alkaline agents.

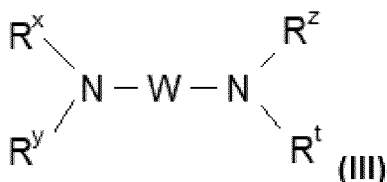
Preferably, the dyeing or bleaching composition comprises one or more organic or mineral alkaline agents.

The mineral alkaline agent(s) are preferably chosen from aqueous ammonia, alkali metal carbonates or bicarbonates such as sodium or potassium carbonates and sodium or potassium bicarbonates, sodium or potassium hydroxide, alkali metal silicates or metasilicates such as sodium or potassium silicates or metasilicates, or mixtures thereof.

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

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



in which formula (III):

- **W** is a divalent C₁-C₆ alkylene group optionally substituted with a hydroxyl group or a (C₁-C₆)alkyl group, and/or optionally interrupted with one or more heteroatoms such as oxygen or NR^u;
- **R^x, R^y, R^z, R^t and R^u**, which may be identical or different, represent a hydrogen atom or a group chosen from (C₁-C₆)alkyl, C₁-C₆ hydroxyalkyl or C₁-C₆ aminoalkyl.

Examples of amines of formula (III) that may be mentioned include 1,3-diaminopropane,
15 1,3-diamino-2-propanol, spermine and spermidine.

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

Organic amines chosen from alkanolamines such as monoalkanolamines, dialkanolamines or trialkanolamines comprising one to three identical or different C₁ to C₄ hydroxyalkyl radicals are in particular suitable for performing the invention.

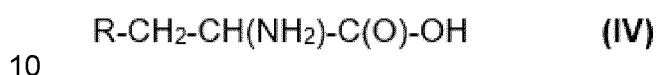
Among the compounds of this type, mention may be made of monoethanolamine (MEA), diethanolamine, triethanolamine, monoisopropanolamine, diisopropanolamine, N,N-dimethylethanolamine, 2-amino-2-methyl-1-propanol, triisopropanolamine, 2-amino-2-methyl-1,3-propanediol, 3-amino-1,2-propanediol, 3-dimethylamino-1,2-propanediol and tris(hydroxymethyl)aminomethane.
25

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
30 amino acids may be in neutral or ionic form.

As amino acids that may be used in the dyeing or bleaching composition, 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
5 valine.

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

Such basic amino acids are preferably chosen from those corresponding to formula (IV) below, and also salts thereof:



in which R represents a group chosen from imidazolyl, preferably imidazolyl-4-yl; aminopropyl; aminoethyl; $-(\text{CH}_2)_2\text{N(H)-C(O)-NH}_2$; and $-(\text{CH}_2)_2\text{-N(H)-C(NH)-NH}_2$.

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

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

The organic amine may also be chosen from amino acid dipeptides. As amino acid
20 dipeptides that may be used in the present invention, mention may notably be made of carnosine, anserine and balenine.

The organic amine may also be chosen from compounds including a guanidine function. As amines of this type that may be used in the present invention, besides arginine, which has already been mentioned as an amino acid, mention may be made notably of
25 creatine, creatinine, 1,1-dimethylguanidine, 1,1-diethylguanidine, glycoamine, metformin, agmatine, n-amidinoalanine, 3-guanidinopropionic acid, 4-guanidinobutyric acid and 2-([amino(imino)methyl]amino)ethane-1-sulfonic acid.

Hybrid compounds that may be mentioned include the salts of the amines mentioned previously with acids such as carbonic acid or hydrochloric acid.

30 Guanidine carbonate or monoethanolamine hydrochloride may be used in particular. Preferably, the alkaline agent(s) present in the dyeing or bleaching composition are chosen from aqueous ammonia, alkanolamines, alkali metal silicates, alkali metal metasilicates and mixtures thereof.

More preferentially, the alkaline agent present in the dyeing composition is monoethanolamine.

More preferentially, the alkaline agent present in the bleaching composition is chosen from sodium silicate, sodium metasilicate and mixtures thereof.

5

The total content of alkaline agents included in the dyeing or bleaching composition may range from 0.01% to 30% by weight, and preferably from 0.1% to 20% by weight, relative to the total weight of the dyeing or bleaching composition.

10 Solvents

The dyeing or bleaching composition may optionally also comprise one or more organic solvents.

Examples of organic solvents that may be mentioned include linear or branched C₂ to C₄ alkanols, such as ethanol and isopropanol; glycerol; polyols and polyol ethers, for instance 2-butoxyethanol, propylene glycol, hexylene glycol, dipropylene glycol, propylene glycol monomethyl ether, diethylene glycol monomethyl ether and monoethyl ether, and also aromatic alcohols or ethers, such as benzyl alcohol or phenoxyethanol, and mixtures thereof.

The organic solvent(s) may be present in the dyeing or bleaching composition in a content ranging from 0.01% to 30% by weight, preferably ranging from 2% to 25% by weight, relative to the total weight of the dyeing or bleaching composition.

Dye composition

According to a particular embodiment of the invention, the composition applied to the keratin fibers during step ii) of the process is a dye composition.

The dye composition may comprise at least one coloring agent chosen from oxidation dyes, direct dyes, and mixtures thereof, preferably from oxidation dyes.

30 Oxidation dyes

The oxidation dyes are generally chosen from one or more oxidation bases optionally combined with one or more coupling agents (also known as couplers).

Oxidation bases

The dye composition may optionally comprise one or more oxidation bases advantageously chosen from those conventionally used in the dyeing of keratin fibers.

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.

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.

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.

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.

5 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-(β -hydroxyethylaminomethyl)phenol and 4-amino-2-fluorophenol, and the corresponding
10 addition salts with an acid.

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.

15 Among the heterocyclic bases that may be mentioned, for example, are pyridine, pyrimidine and pyrazole derivatives.

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.

20 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- β -hydroxyethoxy-3-aminopyrazolo[1,5-a]pyridine and 2-(4-dimethylpiperazinium-1-yl)-3-aminopyrazolo[1,5-a]pyridine, and the corresponding addition salts.

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

a) a (di)(C₁-C₆)(alkyl)amino group, said alkyl group possibly being substituted with at least one hydroxyl, amino or imidazolium group;

b) an optionally cationic 5- to 7-membered heterocycloalkyl group comprising from 1 to 3 heteroatoms, optionally substituted with one or more (C₁-C₆)alkyl groups such as a
10 di(C₁-C₄)alkylpiperazinium group; or

c) a (C₁-C₆)alkoxy group optionally substituted with one or more hydroxyl groups, such as a β -hydroxyalkoxy group, and the corresponding addition salts.

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
15 application WO 96/15765, such as 2,4,5,6-tetraaminopyrimidine, 4-hydroxy-2,5,6-triaminopyrimidine, 2-hydroxy-4,5,6-triaminopyrimidine, 2,4-dihydroxy-5,6-diaminopyrimidine, 2,5,6-triaminopyrimidine and the addition salts thereof and the tautomeric forms thereof, when a tautomeric equilibrium exists.

Among the pyrazole derivatives that may be mentioned are the compounds described in
20 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-
25 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-
30 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.

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

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:

5 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,

10 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,

15 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.

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.

Heterocyclic bases that will preferably be used are 4,5-diamino-1-(β -hydroxyethyl)pyrazole and/or 2,3-diamino-6,7-dihydro-1H,5H-pyrazolo[1,2-a]pyrazol-1-one and/or a corresponding salt.

20

Coupling agents

The dye composition may optionally comprise one or more coupling agents advantageously chosen from those conventionally used in the dyeing of keratin fibers.

25

Among these coupling agents, 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.

Mention may be made, for example, of 1,3-dihydroxybenzene, 1,3-dihydroxy-2-methylbenzene, 4-chloro-1,3-dihydroxybenzene, 2,4-diamino-1-(β -hydroxyethoxy)benzene, 2-amino-4-(β -hydroxyethylamino)-1-methoxybenzene, 1,3-diaminobenzene, 1,3-bis(2,4-diaminophenoxy)propane, 3-ureidoaniline, 3-ureido-1-dimethylaminobenzene, sesamol, 1- β -hydroxyethylamino-3,4-methylenedioxybenzene, α -naphthol, 2-methyl-1-naphthol, 6-hydroxyindole, 4-hydroxyindole, 4-hydroxy-N-

30

methylinidole, 2-amino-3-hydroxypyridine, 6-hydroxybenzomorpholine, 3,5-diamino-2,6-dimethoxypyridine, 1-N-(β -hydroxyethyl)amino-3,4-methylenedioxybenzene, 2,6-bis(β -hydroxyethylamino)toluene, 6-hydroxyindoline, 2,6-dihydroxy-4-methylpyridine, 1-H-3-methylpyrazol-5-one, 1-phenyl-3-methylpyrazol-5-one, 2,6-dimethylpyrazolo[1,5-b]-
 5 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-(β -hydroxyethyl)amino-2-methylphenol, 3-aminophenol and 3-amino-2-chloro-6-methylphenol, the corresponding addition salts with an acid and the corresponding mixtures.

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

The oxidation base(s) each advantageously represent from 0.001% to 10% by weight relative to the total weight of the dye composition, and preferably from 0.005% to 5% by
 15 weight relative to the total weight of the dye composition.

The coupling agent(s), if they are present, each advantageously represent from 0.001% to 10% by weight relative to the total weight of the dye composition, and preferably from 0.005% to 5% by weight relative to the total weight of the dye composition.

Direct dyes

20 The dye composition may optionally comprise one or more direct dyes.

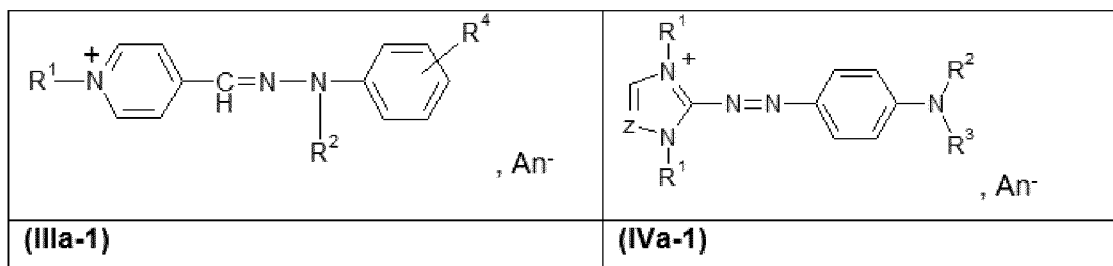
Examples of suitable direct dyes that may be mentioned include azo direct dyes; (poly)methine dyes such as cyanines, hemicyanines and styryls; carbonyl dyes; azine dyes; nitro(hetero)aryl dyes; tri(hetero)arylmethane dyes; porphyrin dyes; phthalocyanine dyes and natural direct dyes, alone or in the form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

25 The direct dyes are preferably cationic direct dyes. Mention may be made of the hydrazone cationic dyes of formulae (IIIa) and (III'a), the azo cationic dyes (IVa) and (IV'a) and the diazo cationic dyes (Va) below:

Het⁺-C(R^a)=N-N(R^b)-Ar, An⁻ (IIIa)	Het⁺-N(R^a)-N=C(R^b)-Ar, An⁻ (III'a)	Het⁺-N=N-Ar, An⁻ (IVa)
Ar⁺-N=N-Ar'', An⁻ (IV'a)	and	Het⁺-N=N-Ar'-N=N-Ar, An⁻ (Va)

in which formulae (IIIa), (III'a), (IVa), (IV'a) and (Va):

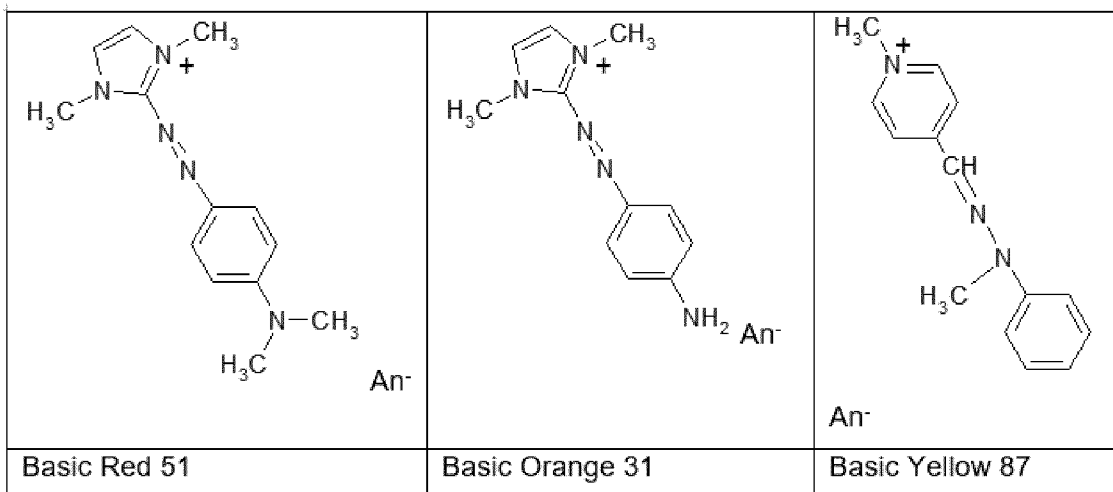
- **Het⁺** represents a cationic heteroaryl radical, preferably bearing an endocyclic cationic charge, such as imidazolium, indolium or pyridinium, which is optionally substituted, preferably with one or more (C₁-C₈)alkyl groups such as methyl;
 - 5 • **Ar⁺** represents an aryl radical, such as phenyl or naphthyl, bearing an exocyclic cationic charge, preferably ammonium, particularly tri(C₁-C₈)alkylammonium such as trimethylammonium;
 - **Ar** represents an aryl group, in particular phenyl, which is optionally substituted, preferably with one or more electron-donating groups such as i) optionally substituted
10 (C₁-C₈)alkyl, ii) optionally substituted (C₁-C₈)alkoxy, iii) (di)(C₁-C₈)(alkyl)amino optionally substituted on the alkyl group(s) with a hydroxyl group, iv) aryl(C₁-C₈)alkylamino, v) optionally substituted N-(C₁-C₈)alkyl-N-aryl(C₁-C₈)alkylamino or, as a variant, **Ar** represents a julolidine group;
 - **Ar'** represents an optionally substituted divalent (hetero)arylene group such as
15 phenylene, particularly para-phenylene, or naphthalene, which are optionally substituted, preferably with one or more (C₁-C₈)alkyl, hydroxyl or (C₁-C₈)alkoxy groups;
 - **Ar''** represents an optionally substituted (hetero)aryl group such as phenyl or pyrazolyl, which are optionally substituted, preferably with one or more (C₁-C₈)alkyl, hydroxyl, (di)(C₁-C₈)(alkyl)amino, (C₁-C₈)alkoxy or phenyl groups;
 - 20 • **R^a** and **R^b**, which may be identical or different, represent a hydrogen atom or a (C₁-C₈)alkyl group, which is optionally substituted, preferably with a hydroxyl group; or, as a variant, the substituent **R^a** with a substituent of **Het⁺** and/or **R^b** with a substituent of **Ar** and/or **R^a** with **R^b** form, together with the atoms that bear them, a (hetero)cycloalkyl; in particular, **R^a** and **R^b** represent a hydrogen atom or a (C₁-C₄)alkyl group, which is
25 optionally substituted with a hydroxyl group;
 - **An⁻** represents an anionic counterion, such as mesylate or halide.
- Mention may be made in particular of the azo and hydrazono cationic dyes bearing an endocyclic cationic charge of formulae (IIIa), (III'a) and (IVa) as defined previously. More particularly those of formulae (IIIa), (III'a) and (IVa) derived from the dyes described in
30 patent applications WO 95/15144, WO 95/01772 and EP-714954.
- Preferably, the cationic part is derived from the following derivatives:



formulae **(IIIa-1)** and **(IVa-1)** with:

- **R¹** representing a (C₁-C₄)alkyl group such as methyl;
- **R²** and **R³**, which may be identical or different, represent a hydrogen atom or a (C₁-C₄)alkyl group, such as methyl; and
- **R⁴** represents a hydrogen atom or an electron-donating group such as an optionally substituted (C₁-C₈)alkyl, optionally substituted (C₁-C₈)alkoxy, or (di)(C₁-C₈)(alkyl)amino group optionally substituted on the alkyl group(s) with a hydroxyl group; in particular, **R⁴** represents a hydrogen atom;
- **Z** represents a CH group or a nitrogen atom, preferentially CH;
- **An⁻** represents an anionic counterion, such as mesylate or halide.

In particular, the dye of formulae **(IIIa-1)** and **(IVa-1)** is chosen from Basic Red 51, Basic Yellow 87 and Basic Orange 31 or corresponding derivatives:



- 15 Among the natural direct dyes that may be used according to the invention, mention may be made of hennotannic acid, juglone, alizarin, purpurin, carminic acid, kermesic acid, purpurogallin, protocatechaldehyde, indigo, isatin, curcumin, spinulosin, apigenidin and orcein. Extracts or decoctions containing these natural dyes and in particular henna-based poultices or extracts may also be used.

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 dye composition.

- 5 The dyeing or bleaching composition may also optionally comprise one or more additives, different from the compounds described previously, among which mention may be made of cationic, anionic, nonionic or amphoteric polymers or mixtures thereof, antidandruff agents, antiseborrhea agents, agents for preventing hair loss and/or for promoting hair regrowth, vitamins and provitamins including panthenol, sunscreens,
- 10 mineral or organic pigments, sequestrants, plasticizers, solubilizers, acidifying agents, mineral or organic thickeners, notably polymeric thickeners, opacifiers or nacreous agents, antioxidants, hydroxy acids, fragrances, preserving agents, pigments and ceramides.

15

Additional features regarding the process

Composition **(A)** may be applied to wet or dry keratin fibers.

Bath ratio

- 20 Composition **(A)** or the dyeing or bleaching composition may advantageously be applied to the keratin fibers in an amount ranging from 0.1 g to 10 g of composition **(A)** or of dyeing or bleaching composition per gram of keratin fibers.
- Preferably, composition **(A)** may be applied to the keratin fibers in an amount ranging from 0.2 g to 5 g of composition **(A)** per gram of keratin fibers.

25

Leave-on time step

- The process preferably also comprises, between steps i) and ii), a step i') consisting in leaving composition **(A)** to stand on the keratin fibers for a time ranging from 1 min to 60 min, more preferentially ranging from 3 min to 40 min and even more preferentially
- 30 ranging from 3 min to 20 min.

The leave-on time step may take place at a temperature ranging from 15°C to 45°C, preferably at room temperature (25°C). The leave-on time may take place under an occlusive system. A nonlimiting example of an occlusive system that may be mentioned

is an occlusive system of envelope type made of aluminum or plastic film or a hair cap with or without holes.

Rinsing and/or drying step

The process may also comprise, after step i) or i') and before step ii), a step of rinsing
5 and/or drying the keratin fibers, preferably a drying step.

The term "rinsing step" means a step of rinsing with water.

The drying step may be performed using absorbent paper, a hairdryer or a styling hood
10 or by drying naturally.

According to a preferred embodiment, the process does not comprise a rinsing step between step i) or i') and step ii).

15 According to a particularly preferred embodiment, the process does not comprise a rinsing step between step i) or i') and step ii), and comprises a drying step between step i) or i') and step ii), preferably a step of drying naturally.

Uses

20 According to a third aspect, a subject of the present invention is the use of a composition (A) as defined previously, as a pretreatment composition of a dyeing or bleaching process.

According to a fourth aspect, a subject of the present invention is the use of a
25 composition (A) as defined previously, for protecting keratin fibers, preferably for protecting them against breakage, during a dyeing or bleaching treatment.

Multi-compartment device (kit)

According to a fifth aspect, a subject of the present invention is a multi-compartment
30 device (kit) comprising:

- a first compartment containing a composition (A) as defined previously; and
- a second compartment containing a composition comprising at least one chemical oxidizing agent; and

- optionally a third compartment containing a composition comprising at least one coloring agent chosen from oxidation dyes, direct dyes and mixtures thereof.

The optional technical features described previously concerning the chemical oxidizing agent and the coloring agent also apply to the compositions included in the second and third compartment.

Examples

The examples that follow allow the invention to be understood more clearly, without, however, being limiting in nature. In the examples that follow, unless otherwise indicated, all the amounts are shown as mass percentages relative to the total weight of the composition.

In the text that follows, the term “alkaline solubility (AS)” means the loss of mass of a sample of 100 mg of keratin fibers under the action of a decinormal sodium hydroxide solution for 30 minutes at 65°C.

Example 1: Measurement of the hair integrity - Analysis of the labile proteins

The following compositions were prepared:

Pretreatment composition

[Table 1]

Ingredients	A1
Glycine	10
Denatured absolute ethyl alcohol	10
50/50 dimethyldiallylammonium chloride/acrylamide copolymer as an aqueous solution (Merquat™ 550PR Polymer sold by the company Lubrizol)	0.001 (0.00009 AM)
Oxyethylenated (40 OE) hydrogenated castor oil	0.30

Polydimethylsiloxane bearing aminoethyl iminopropyl group as a stored nonionic microemulsion (Belsil ADM LOG 1 sold by the company Wacker)	0.50 (0.074 AM)
Sodium hydroxide (100% pure sodium hydroxide reference concentration)	qs pH = 9
Water	qs 100

AM: Active Material

Alkaline composition

5 [Table 2]

Ingredients	B1
Mineral oil	60
Oxyethylenated (5 OE) decyl alcohol	1.2
Cetyl palmitate	2
Mixture of linear C18-24 fatty alcohols (Nafol 2022 EN sold by the company Sasol)	2
Oxyethylenated (60 OE) (C16/C18) cetylstearyl alcohol myristyl glycol ether	0.01
Oxyethylenated (20 OE) oleyl alcohol	4
Oxyethylenated (10 OE) oleyl alcohol	1
Carboxyvinyl polymer synthesized in an ethyl acetate/cyclohexane mixture (Carbopol® 980 Polymer sold by the company Lubrizol)	0.1
Glycerol	5
Non-stabilized polydimethyldiallylammonium chloride at 40% in water	0.96 (0.384 AM)

(Merquat™ 100 Polymer sold by the company Lubrizol)	
Poly[(dimethyliminio)-1,3-propanediyl(dimethyliminio)-1,6-hexanediyl dichloride] as an aqueous 60% solution (Mexomer PO sold by the company Noveal)	0.48 (0.288 AM)
Vitamin C: Ascorbic acid	0.12
Ethylenediaminetetraacetic acid	0.2
Powdered sodium metabisulfite	0.22
Pure monoethanolamine	6.27
Water	qs 100

AM: Active Material

Coloring cream

5 [Table 3]

Ingredients	B2
Mineral oil	60
Oxyethylenated (5 OE) decyl alcohol	1.2
Cetyl palmitate	2
Mixture of linear C18-24 fatty alcohols (Nafol 2022 EN sold by the company Sasol)	4.6
Oxyethylenated (20 OE) oleyl alcohol	4
Oxyethylenated (10 OE) oleyl alcohol	1
Oxyethylenated (60 OE) (C16/C18) cetylstearyl alcohol myristyl glycol ether	0.01
Carboxyvinyl polymer synthesized in an ethyl acetate/cyclohexane mixture (Carbopol® 980 Polymer sold by the company Lubrizol)	0.1

Glycerol	5
Vitamin C: Ascorbic acid	0.12
Ethylenediaminetetraacetic acid	0.2
Powdered sodium metabisulfite	0.22
Pure monoethanolamine	4.26
1-Methyl-2,5-diaminobenzene	0.21
1-Hydroxy-4-aminobenzene	0.052
1,3-Dihydroxybenzene (resorcinol)	0.19
1-Hydroxy-3-aminobenzene	0.046
1- β -Hydroxyethoxy-2,4-diaminobenzene dihydrochloride	0.015
Water	qs 100

Oxidizing compositions

[Table 4]

Ingredients	D1
Cetylstearyl alcohol (30/70 C16/C18)	6
Oxyethylenated (20 OE) stearyl alcohol	5
Mineral oil	50
Oxyethylenated (4 OE) rapeseed acid amide	1.3
Vitamin E: DL- α -Tocopherol	0.1
Glycerol	0.5
Tetrasodium pyrophosphate decahydrate	0.04
Phosphoric acid	qs pH 2.2
Hydrogen peroxide as a 50% solution (200 vol. aqueous hydrogen peroxide solution)	24
Etidronic acid, tetrasodium salt, as a 30% aqueous solution	0.2
Sodium salicylate	0.035
Water	qs 100

[Table 5]

Ingredients	D2
Cetylstearyl alcohol (30/70 C16/C18)	6
Oxyethylenated (20 OE) stearyl alcohol	5
Mineral oil	20
Oxyethylenated (4 OE) rapeseed acid amide	1.3
Vitamin E: DL- α -Tocopherol	0.1
Glycerol	0.5
Poly[(dimethyliminio)-1,3-propanediyl(dimethyliminio)-1,6-hexanediyl dichloride] as an aqueous 60% solution (Mexomer PO sold by the company Noveal)	0.25
Tetrasodium pyrophosphate decahydrate	0.04
Phosphoric acid	qs pH 2.2
Hydrogen peroxide as a 50% solution (200 vol. aqueous hydrogen peroxide solution)	12
Etidronic acid, tetrasodium salt, as a 30% aqueous solution	0.2
Sodium salicylate	0.035
Non-stabilized polydimethyldiallylammonium chloride at 40% in water (Merquat™ 100 Polymer sold by the company Lubrizol)	0.5
Water	qs 100

Sixteen identical locks of moderately sensitized hair (AS 20) were used in this example.

Among these sixteen locks, eight locks were enriched with 200 ppm of copper using a copper(II) sulfate pentahydrate $\text{CuSO}_4 \cdot 5\text{H}_2\text{O}$ solution (minimum purity of 99%) from Prolabo®.

- 5 Certain heavy metals present in tap water, such as copper, can accumulate over time on the hair during successive washes and lead to degradation of the constituent proteins of the hair. This degradation takes place in particular during dyeing or bleaching treatments using a chemical oxidizing agent such as hydrogen peroxide. The presence of copper on the hair may lead to the formation of hydroxyl radicals which may be responsible for
- 10 the denaturing of the constituent proteins of the hair. The higher the content of labile proteins, the more the hair is damaged.

Among the eight locks that are not enriched with copper:

- 15 - locks 1A and 1B underwent a pretreatment using composition **A1** according to the pretreatment protocol described below followed by a bleaching treatment according to the bleaching protocol described below;
- locks 2A and 2B underwent only a bleaching treatment according to the bleaching protocol described below;
- 20 - locks 3A and 3B underwent a pretreatment using composition **A1** according to the pretreatment protocol described below followed by a dyeing treatment according to the protocol described below;
- locks 4A and 4B underwent only a dyeing treatment according to the dyeing protocol described below.

25 Among the eight locks enriched with copper:

- locks 1C and 1D underwent a pretreatment using composition **A1** according to the pretreatment protocol described below followed by a bleaching treatment according to the bleaching protocol described below;
- 30 - locks 2C and 2D underwent only a bleaching treatment according to the bleaching protocol described below;
- locks 3C and 3D underwent a pretreatment using composition **A1** according to the pretreatment protocol described below followed by a dyeing treatment according to the protocol described below;

- locks 4C and 4D underwent only a dyeing treatment according to the dyeing protocol described below.

Pretreatment protocol

- 5 The lock is combed with a comb according to the following routine: 10 strokes with the coarse-toothed end, followed by 10 strokes with the fine-toothed end. This makes it possible to remove the hair strands that are not attached.

The lock is placed on a hotplate thermostatically regulated at 33°C.

- 10 The pretreatment composition A1 is applied to the lock. The bath ratio is 0.25 g of composition per 1 g of hair.

After a leave-on time of 5 minutes, the lock is blotted dry using a Kimtech 7505 absorbent paper towel.

Bleaching protocol

- 15 A bleaching composition was prepared by mixing 1 part by weight of composition B1 with 2 parts by weight of composition D1 and was then applied to the lock. The bath ratio is 10 g of composition per 1 g of hair.

The lock is placed on a hotplate thermostatically regulated at 33°C.

After a leave-on time of 50 minutes, the lock is rinsed and washed with DOP shampoo.

- 20 The locks are dried in an oven regulated at 60°C for 30 minutes.

On exiting the oven, the lock is combed: 10 strokes with the coarse-toothed end and 10 strokes with the fine-toothed end.

Dyeing protocol

- 25 A dye composition was prepared by mixing 1 part by weight of composition B2 with 1 part by weight of composition D2 and was then applied to the lock. The bath ratio is 10 g of composition per 1 g of hair.

The lock is placed on a hotplate thermostatically regulated at 33°C.

After a leave-on time of 50 minutes, the lock is rinsed and washed with DOP shampoo.

- 30 The locks are dried in an oven regulated at 60°C for 30 minutes.

On exiting the oven, the lock is combed: 10 strokes with the coarse-toothed end and 10 strokes with the fine-toothed end.

The content of labile proteins was evaluated for each of the locks tested.

The labile proteins are extracted over 16 hours into a mercaptoethanol reductive solution and the extracted proteins are then hydrolyzed for 16 hours in hydrochloric acid solution.

The hydrolyzate thus obtained is analyzed by HPLC/UV.

The mean content of labile proteins is calculated for two locks which have undergone the same treatment.

10 Results

[Table 6]

Type of lock	Doping with 200 ppm of copper	Pretreatment	Dyeing or bleaching treatment	Mean content of labile proteins (in g/100 g of hair)
Locks 1A and 1B Invention	No	Yes	Bleaching	7.4
Locks 2A and 2B Comparative	No	No	Bleaching	16.9
Locks 3A and 3B Invention	No	Yes	Dyeing	5.8
Locks 4A and 4B Comparative	No	No	Dyeing	8.5
Locks 1C and 1D Invention	Yes	Yes	Bleaching	12.6
Locks 2C and 2D Comparative	Yes	No	Bleaching	21.0

Locks 3C and 3D Invention	Yes	Yes	Dyeing	10.7
Locks 4C and 4D Comparative	Yes	No	Dyeing	13.9

The locks doped with copper have a higher content of labile proteins than that of the locks not doped with copper, which reflects greater damage of the fiber. This confirms that the presence of heavy metals in the hair is a factor which aggravates its damage.

5

Whether on hair that is or is not doped with copper, the content of labile proteins is lower when a pretreatment composition according to the present invention is applied, relative to the same dyeing or bleaching process without a pretreatment step. The pretreatment enables a reduction in the content of labile proteins, reflecting better protection of the integrity of the hair fiber during the dyeing or bleaching process.

10

Example 2: Measurement of the breakage on combing

The following compositions were prepared:

15

Pretreatment composition

[Table 7]

Ingredients	A1
Glycine	10
Denatured absolute ethyl alcohol	10
50/50 dimethyldiallylammonium chloride/acrylamide copolymer as a stored aqueous solution (Merquat™ 550PR Polymer sold by the company Lubrizol)	0.001 (0.00009 AM)
Oxyethylenated (40 OE) hydrogenated castor oil	0.30

Polydimethylsiloxane bearing aminoethyl iminopropyl group as a stored nonionic microemulsion (Belsil ADM LOG 1 sold by the company Wacker)	0.50 (0.074 AM)
Sodium hydroxide (100% pure sodium hydroxide reference concentration)	qs pH = 9
Water	qs 100

AM: Active Material

Alkaline composition

5 [Table 8]

Ingredients	B1
Mineral oil	60
Oxyethylenated (5 OE) decyl alcohol	1.2
Cetyl palmitate	2
Mixture of linear C18-24 fatty alcohols (Nafol 2022 EN sold by the company Sasol)	2
Oxyethylenated (60 OE) (C16/C18) cetylstearyl alcohol myristyl glycol ether	0.01
Oxyethylenated (20 OE) oleyl alcohol	4
Oxyethylenated (10 OE) oleyl alcohol	1
Carboxyvinyl polymer synthesized in an ethyl acetate/cyclohexane mixture (Carbopol® 980 Polymer sold by the company Lubrizol)	0.1
Glycerol	5
Non-stabilized polydimethyldiallylammonium chloride at 40% in water	0.96 (0.384 AM)

(Merquat™ 100 Polymer sold by the company Lubrizol)	
Poly[(dimethyliminio)-1,3-propanediyl(dimethyliminio)-1,6-hexanediyl dichloride] as an aqueous 60% solution (Mexomer PO sold by the company Noveal)	0.48 (0.288 AM)
Vitamin C: Ascorbic acid	0.12
Ethylenediaminetetraacetic acid	0.2
Powdered sodium metabisulfite	0.22
Pure monoethanolamine	6.27
Water	qs 100

AM: Active Material

Coloring cream

5 [Table 9]

Ingredients	B3
Oleic acid	2.7
Pure monoethanolamine	0.63
Cetylstearyl alcohol (50/50 C16/C18)	16.2
Oleyl alcohol	2.7
Poly[(dimethyliminio)-1,3-propanediyl(dimethyliminio)-1,6-hexanediyl dichloride] as an aqueous 60% solution (Mexomer PO sold by the company Noveal)	5 (3 AM)
Oxyethylenated (30 OE) oleocetyl alcohol	3.6
Ethylenediaminetetraacetic acid	0.2

Titanium oxide (untreated anatase) coated with polydimethylsiloxane (98/2) (CI: 77891)	0.18
N-Oleyldihydrosphingosine	0.01
Fragrance	0.75
Ammonium thiolactate as a 58% aqueous solution (50% thiolactic acid)	0.8
Pigment	0.11
1-Methyl-2,5-diaminobenzene	0.06
1-Hydroxy-4-aminobenzene	0.0085
N,N-Bis(2-hydroxyethyl)-p- phenylenediamine sulfate monohydrate	0.01
1,3-Dihydroxybenzene (resorcinol)	0.07
1-Hydroxy-3-aminobenzene	0.006
1- β -Hydroxyethoxy-2,4- diaminobenzene dihydrochloride	0.003
Aqueous ammonia	8.1477
Water	qs 100

Oxidizing compositions

[Table 10]

Ingredients	D1
Cetylstearyl alcohol (30/70 C16/C18)	6
Oxyethylenated (20 OE) stearyl alcohol	5
Mineral oil	50
Oxyethylenated (4 OE) rapeseed acid amide	1.3
Vitamin E: DL- α -Tocopherol	0.1
Glycerol	0.5
Tetrasodium pyrophosphate decahydrate	0.04
Phosphoric acid	qs pH 2.2

Hydrogen peroxide as a 50% solution (200 vol. aqueous hydrogen peroxide solution)	24
Etidronic acid, tetrasodium salt, as a 30% aqueous solution	0.2
Sodium salicylate	0.035
Water	qs 100

[Table 11]

Ingredients	D3
Mixture of cetylstearyl alcohol/oxyethylenated (30 OE) cetylstearyl alcohol	2.85
(50% linear 70/30 C13/C15)alkyl ether carboxylic acid monoethanolamide (2 OE)	0.85
Glycerol	0.5
Tetrasodium pyrophosphate decahydrate	0.04
Sodium salicylate	0.035
Etidronic acid, tetrasodium salt, as a 30% aqueous solution	0.2
Hydrogen peroxide as a 50% solution (200 vol. aqueous hydrogen peroxide solution)	23.5
Water	qs 100

Eight identical locks of moderately sensitized hair (AS 20) were used in this example.

- 5 The eight locks were enriched with 10 000 ppm of copper using a copper(II) sulfate pentahydrate $\text{CuSO}_4 \cdot 5\text{H}_2\text{O}$ solution (minimum purity of 99%) from Prolabo®.

Among the eight locks enriched with copper:

- locks 5A and 5B underwent a pretreatment using composition A1 according to the pretreatment protocol described below followed by a bleaching treatment according to the bleaching protocol described below;
- locks 6A and 6B underwent only a bleaching treatment according to the bleaching
5 protocol described below;
- locks 7A and 7B underwent a pretreatment using composition A1 according to the pretreatment protocol described below followed by a dyeing treatment according to the protocol described below;
- locks 8A and 8B underwent only a dyeing treatment according to the dyeing protocol
10 described below.

Pretreatment protocol:

The lock is combed with a comb according to the following routine: 10 strokes with the coarse-toothed end, followed by 10 strokes with the fine-toothed end. This makes it
15 possible to remove the hair strands that are not attached.

The lock is placed on a hotplate thermostatically regulated at 33°C.

The pretreatment composition A1 is applied to the lock. The bath ratio is 0.25 g of composition per 1 g of hair.

After a leave-on time of 5 minutes, the lock is blotted dry using a Kimtech 7505 absorbent
20 paper towel.

Bleaching protocol

A bleaching composition was prepared by mixing 1 part by weight of composition B1 with 2 parts by weight of composition D1 and was then applied to the lock. The bath ratio is 10 g of composition per 1 g of hair.

25 The lock is placed on a hotplate thermostatically regulated at 33°C.

After a leave-on time of 50 minutes, the lock is rinsed and washed with DOP shampoo.

The locks are dried in an oven regulated at 60°C for 30 minutes.

On exiting the oven, the lock is combed: 10 strokes with the coarse-toothed end and 10
30 strokes with the fine-toothed end.

Dyeing protocol

A dyeing composition was prepared by mixing 1 part by weight of composition B3 with 2 parts by weight of composition D3 and was then applied to the lock. The bath ratio is 10 g of composition per 1 g of hair.

- 5 The lock is placed on a hotplate thermostatically regulated at 33°C.

After a leave-on time of 50 minutes, the lock is rinsed and washed with DOP shampoo.

The locks are dried in an oven regulated at 60°C for 30 minutes.

- 10 On exiting the oven, the lock is combed: 10 strokes with the coarse-toothed end and 10 strokes with the fine-toothed end.

Evaluation of the breakage of the hair

The percentage of breakage of each of the locks is expressed by means of the following equation:

$$\% \text{ breakage} = 100 - \frac{m_1}{m_0} * 100$$

- 15 with:

m_0 : initial mass of the lock before any treatment

m_1 : mass recorded after total treatment.

The mean percentage of breakage is calculated for two locks which have undergone the same treatment.

- 20

Results

[Table 12]

Type of lock	Pretreatment	Dyeing or bleaching treatment	Mean percentage of breakage
Locks 5A and 5B Invention	Yes	Bleaching	5.5

Locks 6A and 6B Comparative	No	Bleaching	73
Locks 7A and 7B Invention	Yes	Dyeing	1.5
Locks 8A and 8B Comparative	No	Dyeing	9.5

The results show that pretreatment with a composition according to the present invention efficiently protects against the breakage of hair comprising high contents of copper.

5 Example 3: Optimization of the pretreatment composition

The following pretreatment compositions were prepared:

[Table 13]

Ingredients	A2	A3	A4
Glycine	10	10	10
Ethanol	0	10	10
Polyquaternium-7	0	0	0.00009
Amodimethicone	0	0	0.07
Sodium hydroxide	qs pH = 9	qs pH = 9	qs pH = 9
Water	qs 100	qs 100	qs 100

- 10 The various compositions A2 to A4 were applied to malleable heads. The compositions are applied per half-head, i.e. on the right or left side of the head of hair separated by a parting in the middle. 7.5 g of pretreatment composition are sprayed on per half-head, while ensuring the homogeneity of the product. The half-head comparison makes it possible to compare two compositions.

15

Results

After five minutes of application of composition A3, the hair is dry, whereas the hair is still wet after application of composition A2. The addition of ethanol to the formula makes it possible to reduce the drying time.

The addition of a cationic polymer such as Polyquaternium-7 combined with an amino
5 silicone makes it possible to obtain an acceptable natural feel.

Example 4:

The following compositions were prepared:

10

Pretreatment compositions

[Table 14]

Ingredients	A2	A3	A4
Serine	8	-	-
Proline	-	15	-
Arginine	-	-	10
Denaturated absolute ethyl alcohol	18	15	5
PEG-40 Hydrogenated Castor Oil	0.30	0.30	0.30
Citric Acid	-	-	2.2
Sodium hydroxide (100% pure sodium hydroxide reference concentration)	3	0.7	-
Water	qs 100	qs 100	qs 100
pH	9	9.2	9.1

Four identical locks of moderately sensitized hair (AS 20) were used in this example.

15 The four locks were enriched with 10 000 ppm of copper using a copper(II) sulfate pentahydrate $\text{CuSO}_4 \cdot 5\text{H}_2\text{O}$ solution (minimum purity of 99%) from Prolabo®.

Among the four locks enriched with copper:

- locks M0 underwent only a bleaching treatment according to the bleaching protocol
20 described in example 2;

- locks M2 underwent a pretreatment using composition A2 according to the pretreatment protocol described in example 2 wherein composition A1 is replaced by composition A2

followed by a bleaching treatment according to the bleaching protocol described in example 2;

- locks M3 underwent a pretreatment using composition A3 according to the pretreatment protocol described in example 2 wherein composition A1 is replaced by composition A3

5 followed by a bleaching treatment according to the bleaching protocol described in example 2;

- locks M4 underwent a pretreatment using composition A4 according to the pretreatment protocol described in example 2 wherein composition A1 is replaced with composition

10 A4 followed by a bleaching treatment according to the bleaching protocol described in example 2.

Evaluation of the breakage of the hair

The percentage of breakage of each of the locks is expressed by means of the following equation:

$$\% \text{ breakage} = 100 - \frac{m_1}{m_0} * 100$$

15

with:

m_0 : initial mass of the lock before any treatment

m_1 : mass recorded after total treatment.

20 Results

[Table 15]

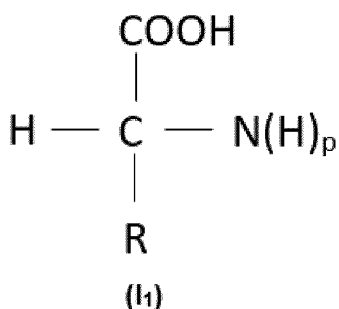
Type of lock	Pretreatment	Percentage of breakage
Lock M0	No	41.5
Lock M2	Yes	21.8
Lock M3	Yes	23.6
Lock M4	Yes	22.8

The results show that pretreatment with a composition according to the present invention efficiently reduces the breakage of hair comprising high contents of copper.

CLAIMS

1. A composition **(A)** comprising:

- 5 i) at least 5% by weight, relative to the total weight of composition **(A)**, of one or more amino acids chosen from the compounds of formula **(I₁)**, salts thereof and mixtures thereof:



in which formula **(I₁)**:

- **p** is an integer equal to 1 or 2;
- 10 ▪ when **p** = 1, **R** forms with the nitrogen atom a saturated 5- to 8-membered, preferably 5-membered, heterocycle, this ring possibly being optionally substituted with at least one group chosen from hydroxyl or (C₁-C₄)alkyl;
- when **p** = 2, **R** represents:
 - a hydrogen atom; or
 - 15 - a (C₁-C₁₂)alkyl group, preferably a (C₁-C₄)alkyl group, interrupted with at least one heteroatom or group chosen from -S-, -NH- or -C(NH)- and/or substituted with at least one group chosen from hydroxyl, amino or -NH-C(NH)-NH₂; and
- ii) at least 5% by weight, relative to the total weight of composition **(A)**, of one or more monoalcohols.

20

2. The composition **(A)** as claimed in claim 1, in which the amino acid(s) are chosen from glycine, proline, methionine, serine, arginine, lysine, salts thereof and mixtures thereof, preferably from glycine, proline, methionine, serine, salts thereof and mixtures thereof, more preferentially from glycine, salts thereof and mixtures thereof; even more
25 preferentially, the amino acid is glycine.

3. The composition **(A)** as claimed in claim 1 or 2, in which the amino acid(s) are present in composition **(A)** in a total content ranging from 5% to 20% by weight, preferably

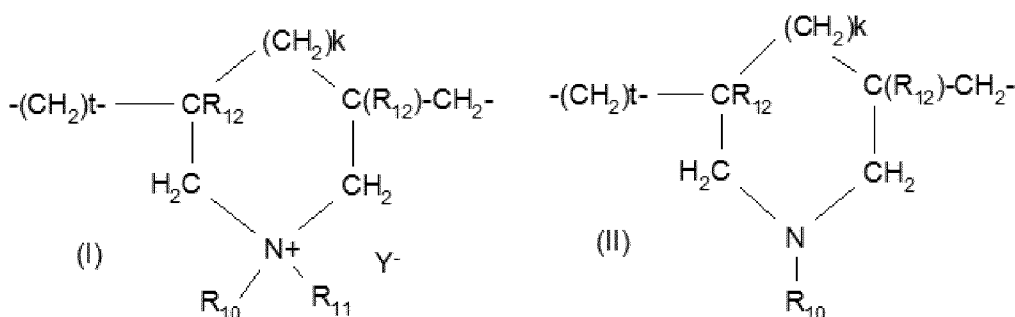
ranging from 5% to 15% by weight and more preferentially ranging from 8% to 12% by weight, relative to the total weight of composition (A).

4. The composition (A) as claimed in any one of the preceding claims, in which the monoalcohol(s) are chosen from C₂ to C₆ monoalcohols, preferably from C₂ to C₄ monoalcohols, more preferentially from ethanol, isopropanol, tert-butyl, n-butanol and mixtures thereof; even more preferentially, the monoalcohol is ethanol.

5. The composition (A) as claimed in any one of the preceding claims, in which the monoalcohol(s) are present in composition (A) in a total content ranging from 5% to 20% by weight, preferably ranging from 5% to 15% by weight and more preferentially ranging from 8% to 12% by weight, relative to the total weight of composition (A).

6. The composition (A) as claimed in any one of the preceding claims, in which the pH of composition (A) is from 2 to 11, preferably from 4 to 10 and more preferentially from 8 to 10.

7. The composition (A) as claimed in any one of the preceding claims, in which composition (A) comprises one or more cationic polymers, preferably chosen from homopolymers or copolymers including in their structure one or more units corresponding to formula (I) or (II):



in which:

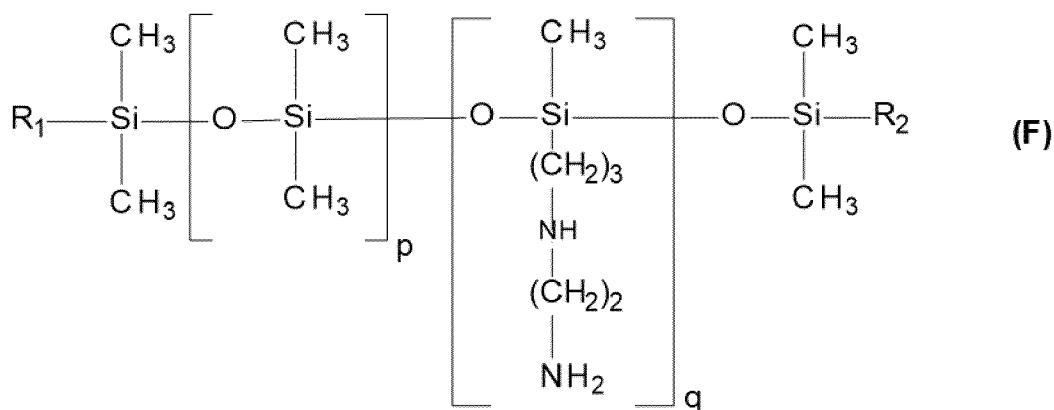
- k and t are equal to 0 or 1, the sum k + t being equal to 1;
- R₁₂ denotes a hydrogen atom or a methyl group;
- R₁₀ and R₁₁, independently of each other, denote a (C₁-C₆)alkyl group, a C₁-C₅ hydroxyalkyl group, a C₁-C₄ amidoalkyl group; or alternatively R₁₀ and R₁₁ denote,

together with the nitrogen atom to which they are attached, a heterocyclic group such as piperidyl or morpholiny; preferably, R_{10} and R_{11} , independently of each other, denote a (C₁-C₄)alkyl group;

5 \bullet Y⁻ is an anion preferably chosen from bromide, chloride, acetate, borate, citrate, tartrate, bisulfate, bisulfite, sulfate and phosphate; more preferentially, the cationic polymer(s) being chosen from homopolymers or copolymers including in their structure one or more units corresponding to formula (I) as defined previously; even more preferentially, the cationic polymer(s) being chosen from homopolymers of diallyldimethylammonium salts and copolymers of diallyldimethylammonium salts and of acrylamide; most preferentially, the cationic polymer(s) being chosen from copolymers of diallyldimethylammonium salts and of acrylamide.

8. The composition (A) as claimed in the preceding claim, in which the cationic polymer(s) are present in composition (A) in a total content ranging from 0.00001% to 15 5% by weight, preferably ranging from 0.00005% to 1% by weight and more preferentially ranging from 0.00007% to 0.5% by weight, relative to the total weight of composition (A).

9. The composition (A) as claimed in any one of the preceding claims, in which composition (A) comprises one or silicones, preferably chosen from amino silicones, 20 more preferentially chosen from the amino silicones of formula (F) below:



in which:

25 \bullet p and q are numbers such that the sum (p+q) ranges from 1 to 1000, in particular from 50 to 350 and more particularly from 150 to 250; p possibly denoting a number from 0 to 999, notably from 49 to 349 and more particularly from 159 to 239, and q possibly

denoting a number from 1 to 1000, notably from 1 to 10 and more particularly from 1 to 5;

• R_1 and R_2 , which are different, represent a hydroxyl or C_1 - C_4 alkoxy radical, at least one of the radicals R_1 or R_2 denoting an alkoxy radical.

5

10. The composition **(A)** as claimed in the preceding claim, in which the silicone(s) are present in composition **(A)** in a total content ranging from 0.001% to 10% by weight, preferably ranging from 0.01% to 5% by weight, more preferentially from 0.02% to 1% by weight and better still from 0.05% to 0.5% by weight relative to the total weight of composition **(A)**.

11. The composition **(A)** as claimed in any one of the preceding claims, in which composition **(A)** comprises a total content of coloring agents and/or reducing agents of less than 0.1% by weight, preferably less than 0.01% by weight, more preferentially less than 0.001% by weight relative to the total weight of composition **(A)**; even more preferentially, composition **(A)** is free of coloring agents and/or reducing agents.

12. The composition **(A)** as claimed in any one of the preceding claims, in which composition **(A)** comprises a total content of anionic surfactants of less than 0.1% by weight, preferably less than 0.01% by weight, more preferentially less than 0.001% by weight relative to the total weight of composition **(A)**; even more preferentially, composition **(A)** is free of anionic surfactants.

13. A process for dyeing or bleaching keratin fibers, comprising the following successive steps:

- i) applying to the keratin fibers a composition **(A)** as defined in any one of claims 1 to 12;
- ii) applying to the keratin fibers a dyeing or bleaching composition.

14. The process as claimed in the preceding claim, in which the dyeing or bleaching composition comprises at least one chemical oxidizing agent, preferably chosen from hydrogen peroxide, urea peroxide, alkali metal bromates, peroxygenated salts, peracids and precursors thereof, and mixtures thereof, more preferentially from hydrogen peroxide, peroxygenated salts and mixtures thereof, even more preferentially from hydrogen peroxide, persulfates, perborates or percarbonates of alkali metals or alkaline-

earth metals or of ammonium and mixtures thereof, most preferentially hydrogen peroxide.

15 15. The process as claimed in claim 13 or 14, in which the composition applied during step ii) is a dye composition comprising at least one coloring agent chosen from oxidation dyes, direct dyes and mixtures thereof, preferably from oxidation dyes.

10 16. The process as claimed in any one of claims 13 to 15, also comprising, between steps i) and ii), a step i') consisting in leaving composition **(A)** to stand on the keratin fibers for a time ranging from 1 min to 60 min, preferably ranging from 3 min to 40 min and more preferentially ranging from 3 min to 20 min.

15 17. The process as claimed in any one of claims 13 to 16, also comprising, after step i) or i') and before step ii), a step of rinsing and/or drying the keratin fibers, preferably a step of drying the keratin fibers.

18. The process as claimed in any one of claims 13 to 17, in which the process does not comprise a rinsing step between step i) or i') and step ii).

20 19. The use of a composition **(A)** as defined in any one of claims 1 to 12, as a pretreatment composition for a dyeing or bleaching process.

25 20. The use of a composition **(A)** as defined in any one of claims 1 to 12, for protecting keratin fibers, preferably for protecting them from breakage, during a dyeing or bleaching treatment.

21. A multi-compartment device comprising:

- a first compartment containing a composition **(A)** as defined in any one of claims 1 to 12; and
- 30 ▪ a second compartment containing a composition comprising at least one chemical oxidizing agent; and
- optionally a third compartment containing a composition comprising at least one coloring agent chosen from oxidation dyes, direct dyes and mixtures thereof.

INTERNATIONAL SEARCH REPORT

International application No
PCT/EP2021/068033

A. CLASSIFICATION OF SUBJECT MATTER					
INV.	A61K8/34	A61K8/41	A61K8/64	A61K8/891	A61K8/898
	A61Q5/00	A61Q5/08	A61Q5/10	A61Q5/12	
ADD.					
According to International Patent Classification (IPC) or to both national classification and IPC					

B. FIELDS SEARCHED
Minimum documentation searched (classification system followed by classification symbols) A61K A61Q

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

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

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO 2019/012219 A1 (DI VISCO [FR]) 17 January 2019 (2019-01-17) page 1, line 3 - line 5 page 3, line 12 - line 14 page 3, line 16 - page 4, line 36 page 5, line 34 - line 35 page 6, line 3 - line 6; claims; examples -----	1-21
X	DE 10 2009 027360 A1 (HENKEL AG & CO KGAA [DE]) 5 January 2011 (2011-01-05) paragraphs [0001], [0002], [0010], [0011], [0031], [0032], [0153]; claims; examples -----	1-21
X	DE 10 2017 223063 A1 (HENKEL AG & CO KGAA [DE]) 19 June 2019 (2019-06-19) paragraphs [0001], [0013], [0017] - [0019]; claims; examples -----	1-21
	-/--	

Further documents are listed in the continuation of Box C. See patent family annex.

* Special categories of cited documents :

<p>"A" document defining the general state of the art which is not considered to be of particular relevance</p> <p>"E" earlier application or patent but published on or after the international filing date</p> <p>"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)</p> <p>"O" document referring to an oral disclosure, use, exhibition or other means</p> <p>"P" document published prior to the international filing date but later than the priority date claimed</p>	<p>"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</p> <p>"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</p> <p>"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</p> <p>"&" document member of the same patent family</p>
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Date of the actual completion of the international search 10 August 2021	Date of mailing of the international search report 27/08/2021
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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 Heller, Dorothee
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INTERNATIONAL SEARCH REPORT

International application No
PCT/EP2021/068033

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	<p>WO 2018/068947 A2 (BASF SE [DE]) 19 April 2018 (2018-04-19) page 1, line 6 - line 8 page 4, line 15 - line 24; claims; examples</p> <p style="text-align: center;">-----</p>	1-21
Y	<p>JP 2009 107959 A (HOYU KK) 21 May 2009 (2009-05-21) paragraphs [0001], [0052], [0064]; claims</p> <p style="text-align: center;">-----</p>	1-21
Y	<p>DATABASE Treatment [Online]</p> <p>1 March 2020 (2020-03-01), Kosé Manufacturer ET AL: "Product Details Company Kosé, Japan Brand Kosé Cosmeport Je l'Aime Amino Supreme Satin Sleek Category Hair Products > Hair Treatments Market Taiwan, China IMPORTED PRODUCT Company & Source Details", XP055784739, Database accession no. 7462129 the whole document</p> <p style="text-align: center;">-----</p>	1-21
Y	<p>DATABASE Conditioner [Online]</p> <p>1 September 2015 (2015-09-01), Kosé Manufacturer ET AL: "Product Details Company Kosé, Japan Brand Stephen Knoll Premium Sleek Shine Repair Silky Smooth Category Hair Products > Conditioner Market Japan NOT IMPORTED Company & Source Details Store Name Cocokarafine Store Address Suginami Tokyo Japan 167-0043 Store Type Drug Store/Pharmacy Product source Sh", XP055784742, Database accession no. 3489415 the whole document</p> <p style="text-align: center;">-----</p> <p style="text-align: center;">-/--</p>	1-21

INTERNATIONAL SEARCH REPORT

International application No
PCT/EP2021/068033

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	<p>DATABASE Infinite Strength Shampoo [Online]</p> <p>1 August 2017 (2017-08-01), Saint Algue - Saf: "1/03/2021 GNPD -Infinite Strength Shampoo Infinite Strength Shampoo Product Details Company Saint Algue -SAF, France Brand Saint Algue Professionnel Respect Fibre & Densité PRIVATE LABEL Company & Source Details Store Name Saint Algue Store Address Roissy Aéroport CDG France 95700 Store Type Salon P", XP055784745, Database accession no. 5012531 the whole document</p> <p style="text-align: center;">-----</p>	1-21
Y	<p>DATABASE Treatment Mask [Online]</p> <p>1 January 2018 (2018-01-01), Manufacturer Kosé ET AL: "1/03/2021 GNPD -Treatment Mask Treatment Mask Product Details Company Kosé Cosmeport, Japan Brand Kosé Cosmeport Je l'aime Amino Amazing Sleek Deep Moist Category Hair Products > Hair Treatments Market Japan NOT IMPORTED Company & Source Details Store Name Cocokarafine Store Address Suginami Tokyo J", XP055784752, Database accession no. 54122235 the whole document</p> <p style="text-align: center;">-----</p>	1-21

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No PCT/EP2021/068033

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
WO 2019012219 A1	17-01-2019	BR 112020000365 A2 CA 3067899 A1 CN 111148500 A EP 3651730 A1 JP 2020527600 A KR 20200056380 A US 2020163867 A1 WO 2019012219 A1	21-07-2020 17-01-2019 12-05-2020 20-05-2020 10-09-2020 22-05-2020 28-05-2020 17-01-2019

DE 102009027360 A1	05-01-2011	DE 102009027360 A1 WO 2011000648 A2	05-01-2011 06-01-2011

DE 102017223063 A1	19-06-2019	DE 102017223063 A1 FR 3076716 A1 GB 2571603 A US 2019184209 A1	19-06-2019 19-07-2019 04-09-2019 20-06-2019

WO 2018068947 A2	19-04-2018	BR 112019004023 A2 CN 109689021 A EP 3512489 A2 ES 2773799 T3 JP 2019532044 A KR 20190050815 A US 2019216709 A1 WO 2018068947 A2	21-05-2019 26-04-2019 24-07-2019 14-07-2020 07-11-2019 13-05-2019 18-07-2019 19-04-2018

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