



(51) International Patent Classification:

A61K 8/97 (2006.01) A61Q 5/00 (2006.01)

A61Q 5/02 (2006.01)

(21) International Application Number:

PCT/CN2016/080201

(22) International Filing Date:

26 April 2016 (26.04.2016)

(25) Filing Language:

English

(26) Publication Language:

English

(71) Applicant (for all designated States except AL): L'OREAL
[FR/FR]; 14, Rue Royale, 75008 Paris (FR).

(72) Inventors; and

(71) Applicants (for AL only): ZHOU, Yixi [CN/CN]; 550
Jinyu Lu, Shanghai 201206 (CN). JIA, Haidong [CN/CN];
550 Jinyu Lu, Shanghai 201206 (CN). XU, Chensu
[CN/CN]; 550 Jinyu Lu, Shanghai 201206 (CN).

(74) Agent: CHINA PATENT AGENT (H.K.) LTD.; 22/F.,
Great Eagle Center, 23 Harbour Road, Wanchai, Hong
Kong (CN).

(81) Designated States (unless otherwise indicated, for every
kind of national protection available): AE, AG, AL, AM,
AO, AT, AU, AZ, BA, BB, BG, BH, BN, BR, BW, BY, BZ,
CA, CH, CL, CN, CO, CR, CU, CZ, DE, DK, DM, DO, DZ,
EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR,
HU, ID, IL, IN, IR, IS, JP, KE, KG, KN, KP, KR, KZ, LA,
LC, LK, LR, LS, LU, LY, MA, MD, ME, MG, MK, MN,
MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PA, PE,
PG, PH, PL, PT, QA, RO, RS, RU, RW, SA, SC, SD, SE,
SG, SK, SL, SM, ST, SV, SY, TH, TJ, TM, TN, TR, TT, TZ,
UA, UG, US, UZ, VC, VN, ZA, ZM, ZW.

(84) Designated States (unless otherwise indicated, for every
kind of regional protection available): ARIPO (BW, GH,
GM, KE, LR, LS, MW, MZ, NA, RW, SD, SL, ST, SZ, TZ,
UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, RU, TJ,
TM), European (AL, AT, BE, BG, CH, CY, CZ, DE, DK,
EE, ES, FI, FR, GB, GR, HR, HU, IE, IS, IT, LT, LU, LV,
MC, MK, MT, NL, NO, PL, PT, RO, RS, SE, SI, SK, SM,
TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW,
KM, ML, MR, NE, SN, TD, TG).

Published:

— with international search report (Art. 21(3))

(54) Title: COMPOSITION FOR TREATING KERATIN FIBERS

(57) Abstract: Provided is a transparent composition for treating keratin fiber, comprising at least one surfactant selected from the group consisting of anionic surfactants, amphoteric and/or zwitterionic surfactants, or a mixture thereof; at least one nonionic surfactant selected from the group consisting of alkyl(poly)glycosides, fatty acid esters of glycerol and of polyglycerol, or a mixture thereof; at least one protein extract of moringa genus plant seed; at least one cationic polymer chosen from cationic cellulose, and at least one hydrocarbon-based oil.



WO 2017/185227 A1

COMPOSITION FOR TREATING KERATIN FIBERS

FIELD OF THE INVENTION

The present invention relates to hair care cosmetic field, more specifically, it relates to new compositions having improved anti-particle deposition and good conditioning effect to keratin fibers, and meanwhile possessing a transparent esthetic property.

BACKGROUND OF THE INVENTION

Air pollution, for example the airborne dust particles, becomes a severe public concern, poses threat to the human health, and attracts consumers attention for the impact on keratin fibers, in particular the hair.

The human hair is damaged or weakened by the chemical action of environmental agents and/or of hair treatments such as permanent-waving, dyeing or bleaching. In particular, being exposed to the air, hair is damaged and weakened by air pollution.

Among different types of pollutants existing in the air, dust or fine particles such as PM 2.5, PM 10, carbon powders, gases such as CO, SO₂, NO_x, have been raising attentions of the consumers, in particular since recent years.

As used herein, the term "PM 2.5 (PM 10)", also knowns as particulate matters, or fine particles, refers to particles which pass through a size-selective inlet with a 50% efficiency cut-off at 2.5 μm (10 μm for PM 10) aerodynamic diameter, as defined in ISO 7708:1995, 7.1. The particulate matters are understood as a complex mixture comprising small particles and liquid droplets, which float in the air. Fine particles existing in the air tend to be adherent to the hair. They will deposit on the hair and stay even after washing. This deposition makes the hair dirty, lank, and greasy.

It is known to the art to use active agents for preventing the deposition of pollutants on the hair, and thus reducing the hair dirty, greasy, and lank issue faced by the consumers.

Moringa oleifera seed extract is known for its use in hair care cosmetic compositions. In particular, it is used in anti-pollution hair care products. For example, shampoos containing surfactants, Moringa oleifera seed extract, and various types of conditioning agents are known.

On the other hand, esthetic appearance of a cosmetic product plays an important role in attracting the interests of consumers. Products, especially products used for cleansing, washing, or deterging, are often favored by the consumers when they are transparent or translucent, thanks to the light, fresh, and clean feeling generated by the transparency or translucency appearance.

None of the compositions mentioned above satisfies all the needs mentioned above, in particular regarding the balance between a good conditioning of the hair, as well as an improved anti-particle deposition effect, meanwhile maintaining a transparent appearance. This is to say, it is difficult to formulate a transparent composition with an improved anti-particle deposition effect, and a good conditioning effect.

There is thus a need for new products with esthetic appearance, displaying improved balance of the properties mentioned above.

In particular, there exists a need for formulating a transparent composition which provides to keratin fibers, in particular the hair, an improved balance between conditioning effect as well as anti particle deposition effect.

The present invention is directed towards meeting these needs.

BRIEF DESCRIPTION OF THE INVENTION

The aim of the present invention is achieved by a transparent composition for treating keratin fibers, comprising at least one surfactant of anionic, amphoteric or zwitterionic type, at least one nonionic surfactant, at least one protein extract of moringa genus plant seeds, at least one cationic polymer selected from cationic cellulose, and at least one hydrocarbon-based oil.

The term "transparent" is understood to mean a composition having a turbidity of less than 250 NTU (Nephelometric Turbidity Units) at 25°C and preferably of less than 150 NTU at 25°C, even more preferably less than 100 NTU at 25°C, measured with a 2100N Turbidimeter machine from HACH, wherein the sample cells for turbidity testing are made of quartz glass with reference Cat. 2084900.

Preferably, the composition of the present invention is silicone-free.

As used herein, the term "silicone" or "silicone oil" is understood to mean any compound comprising at least one silicon atom, and preferably comprising Si-O groups.

As used herein, the term "silicone-free" means the composition of the present invention comprising no silicone or silicone oil, or comprising silicone in an amount no more than 1% by weight of silicones relative to the total composition.

Preferably, the composition may contain no more than 0.5% by weight, more preferably no more than 0.2% by weight, of silicones relative to the total weight of the composition.

More preferably, the composition of the present invention does not contain silicone.

Preferably, the composition of the present invention is a rinse-off hair shampoo.

Preferably, the "keratin fiber" according to the present invention is the hair.

The term "anti-particle deposition" as used herein refers to the reduction of particle

deposition on keratin fibers, in particular hair. The particle refers to the fine particles existing in the air.

Another aspect of the invention is a process for washing keratin fibers, especially the hair, comprising the steps of applying to said fibers the composition of the invention, and then

5 washing with water after an optional period of exposure.

One aspect of the present invention is the use of the composition as defined above in reducing the deposition of fine particles contained in the air on keratin fibers, in particular the hair.

In the description, the terms "at least a" or "at least one" are equivalent to "one or more".

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

DETAILED DESCRIPTION OF THE PRESENT INVENTION

Surfactant(s)

15 The composition according to the invention comprises at least one surfactant (or surface active agent), selected from the group consisting of anionic surfactant, amphoteric or zwitterionic surfactant, or a mixture thereof.

According to an embodiment, the composition of the present invention comprises a mixture of anionic surfactant(s) and amphoteric or zwitterionic surfactant(s).

20 According to an embodiment, the surfactant of this type is present in an amount ranging from 1% to 70% by weight, preferably from 3% to 50% by weight, more preferably from 5% to 20% by weight, relative to the total weight of the composition.

i) Anionic surfactant(s)

25 The term "anionic surfactant" is understood to mean an amphiphilic compound with a hydrophobic part and a hydrophilic part wherein the hydrophilic part carries as ionic or ionisable group only anionic group with a cationic counterion which is generally metallic (alkali metal, such as Na or K) or ammonium, capable of dissociating to give anions in aqueous solution.

30 More particularly the anionic group of the anionic surfactant is belonging to the group chosen from: C(O)OH , $-\text{C(O)O}^-$, $-\text{SO}_3\text{H}$, $-\text{S(O)}_2\text{O}^-$, $-\text{OS(O)}_2\text{OH}$, $-\text{OS(O)}_2\text{O}^-$, $-\text{P(O)OH}_2$, $-\text{P(O)}_2\text{O}^-$, $-\text{P(O)O}_2^-$, $-\text{P(OH)}_2$, $=\text{P(O)OH}$, $-\text{P(OH)O}^-$, $=\text{P(O)O}^-$, $=\text{POH}$, $=\text{PO}^-$, the cationic counter anion being usually selected from alkali metal such as sodium, or alkaline earth metal such as magnesium, or organic cationic counter anion such as ammonium salts, amine salts, or aminoalcohol salts. The surfactants may also occur in their acid forms.

Mention may be made, as anionic surfactants, of surfactants comprising carboxylate,

sulfate, sulfonate, sulfoacetate, sulfosuccinate, phosphate, isethionate, sarcosinate, glutamate, lactylate or taurate anionic groups, salts of fatty acids, salts of galactosiduronic acids, salts of ether carboxylic acids surfactants and their mixtures.

More particularly, the anionic surfactant according to the invention is chosen from:

- 5** • (C₆-C₃₀)alkyl sulfates, (C₆-C₃₀)alkyl ether sulfates, (C₆-C₃₀)alkylamido ether sulfates, alkylaryl polyether sulfates or monoglyceride sulfates; preferably for this type of anionic surfactants, (C₆-C₃₀)alkyl ether sulfates, alkylaryl polyether sulfates, or a mixture is used. Mentions may be made of sulfate of ether of lauryl alcohol and alkylene oxide, containing from 1 to 50 alkylene oxide groups.
- 10** More preferably, the anionic surfactant is chosen from sulfate of ether of lauryl alcohol and alkylene oxide containing from 1 to 4 alkylene oxide groups, especially ethylene oxide groups. For example, sodium laureth sulfate containing in average 2.2 ethylene oxide groups that are sold by the company Cognis (BASF) under the name Texapon[®] AOS 225 UP, Rhodia under the name Rhodapex[®] esb-70/fla3, Clariant under the name Genapol[®] LRO L'O,
- 15** and sodium laureth sulfate containing in average 1 ethylene oxide group that is sold by the company Zhejiang Zanyu Technology under the name SLES (N1EO).
- (C₆-C₃₀)alkyl sulfonates, (C₆-C₃₀)alkylamidesulfonates, (C₆-C₃₀)alkylaryl sulfonates, α-olefin sulfonates, paraffin sulfonates;
- (C₆-C₃₀)akyl phosphates;
- 20** • (C₆-C₃₀)alkyl sulfosuccinates, (C₆-C₃₀)alkyl ether sulfosuccinates or (C₆-C₃₀)alkylamido sulfosuccinates;
- (C₆-C₃₀)alkyl sulfoacetates;
- (C₆-C₂₄)acylsarcosinates;
- (C₆-C₂₄)acylglutamates;
- 25** • (C₆-C₃₀)alkylpolyglycoside carboxylic ethers;
- (C₆-C₃₀)alkylpolyglycoside sulfosuccinates;
- (C₆-C₃₀)alkyl sulfosuccinamates;
- (C₆-C₂₄)acyl isethionates, for example sodium lauroyl methyl isethionate, sodium cocoyl isthionate; mentions may be made of the sodium lauroyl methyl isethionate which is
- 30** sold under the trade name ISELUX[®] LQ-CLR-SB by the company Innospec Active Chemicals;
- N-[(C₆-C₂₄)acyl] taurates;
- salts of fatty acids;
- (C₈-C₂₀)acyl lactylates;

- salts of (C₆-C₃₀)alkyl-D-galactosiduronic acids;
 - salts of (C₆-C₃₀)alkyl polyoxyalkylenated ether carboxylic acids, of (C₆-C₃₀)alkylaryl polyoxyalkylenated ether carboxylic acids or of (C₆-C₃₀)alkylamido polyoxyalkylenated ether carboxylic acids;
- 5 • and their mixtures.

The alkyl or acyl radicals of these various anionic surfactants preferably comprise from 12 to 20 carbon atoms.

Furthermore, the oxyalkylenated or polyoxyalkylenated anionic surfactants preferably comprise from 1 to 50 alkylene oxide groups, more preferably from 1 to 4 alkylene oxide groups,
10 in particular ethylene oxide groups.

Advantageously, according to an embodiment, the present invention comprises at least one anionic surfactant chosen from (C₆-C₃₀)alkyl sulfates, (C₆-C₃₀)alkyl ether sulfates, (C₆-C₃₀)alkylamido ether sulfates, alkylaryl polyether sulfates, monoglyceride sulfates, (C₆-C₂₄)acyl isethionates, or a mixture thereof.

15 According to an embodiment of the present invention, the anionic surfactant is preferably chosen from sodium laureth sulfate, sodium lauroyl methyl isethionate, sodium cocoyl isethionate, or a mixture thereof.

More preferably the anionic surfactant is sodium laureth sulfate containing in average 2.2 ethylene oxide groups.

20 Advantageously, the content of anionic surfactant(s) represents from 1% to 70% by weight, preferably from 2% to 40% by weight, more preferably from 5% to 20% by weight, with respect to the weight of the composition.

ii) Amphoteric or zwitterionic surfactant(s)

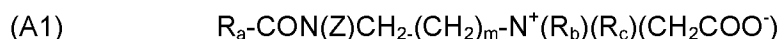
The amphoteric or zwitterionic surfactant(s) that may be used in the present invention may
25 be quaternized secondary or tertiary aliphatic amine derivatives containing at least one anionic group, for instance a carboxylate, sulfonate, sulfate, phosphate or phosphonate group, and in which the aliphatic group or at least one of the aliphatic groups is a linear or branched chain comprising from 8 to 22 carbon atoms.

Mention may be made in particular of (C₈-C₂₀)alkylbetaines, sulfobetaines, (C₈-C₂₀
30 alkyl)amido(C₂-C₈ alkyl)betaines and (C₈-C₂₀ alkyl)amido(C₂-C₈ alkyl)sulfobetaines.

Among the (C₈-C₂₀)alkylbetaines, mentions may be made of behenylbetaine, cetyl betaine, cocoylbetaine, decylbetaine. From alkylbetaines, cocoylbetaine is preferred, for example the products sold by the company Rhodia under the tradename Mirataine[®] BB/FLA.

Among the optionally quaternized secondary or tertiary aliphatic amine derivatives that

may be used, mention may also be made of the products of respective structures (A1) and (A2) below:



in which:

- 5 R_a represents a C_{10} - C_{30} alkyl or alkenyl group derived from an acid R_a-COOH preferably present in hydrolysed coconut oil, a heptyl group, a nonyl group or an undecyl group,

R_b represents a β -hydroxyethyl group,

R_c represents a carboxymethyl group;

m is equal to 0, 1 or 2,

- 10 Z represents a hydrogen atom or a hydroxyethyl or carboxymethyl group;



in which:

B represents $-CH_2CH_2OX'$, with X' representing $-CH_2-COOH$, CH_2-COOZ' , $-CH_2CH_2-COOH$, $-CH_2CH_2-COOZ'$, or a hydrogen atom,

- 15 B' represents $-(CH_2)_z-Y'$, with $z = 1$ or 2 , and Y' representing $-COOH$, $-COOZ'$, $-CH_2-CHOH-SO_3H$ or $-CH_2-CHOH-SO_3Z'$,

m' is equal to 0, 1 or 2,

Z represents a hydrogen atom or a hydroxyethyl or carboxymethyl group,

Z' represents an ion resulting from an alkali or alkaline-earth metal, such as sodium,

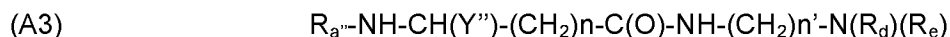
- 20 potassium or magnesium; an ammonium ion; or an ion resulting from an organic amine and in particular from an amino alcohol, such as monoethanolamine, diethanolamine and triethanolamine, monoisopropanolamine, diisopropanolamine or triisopropanolamine, 2-amino-2-methyl-1-propanol, 2-amino-2-methyl-1,3-propanediol and tris(hydroxymethyl)aminomethane,
- R_a' represents a C_{10} - C_{30} alkyl or alkenyl group of an acid $R_a'COOH$ preferably present in hydrolysed linseed oil or coconut oil, an alkyl group, in particular a C_{17} alkyl group, and its iso form, or an unsaturated C_{17} group.

The compounds corresponding to formula (A1) are preferred.

Among the compounds corresponding to formula (A1), mentions may be made of cocamidopropyl betaine, for example the product sold under the tradename Dehyton PK 45 by Cognis (BASF).

- 30

Use may also be made of the compounds of formula (A3):



in which:

- R_a'' represents a C_{10} - C_{30} alkyl or alkenyl group of an acid $R_a''-C(O)OH$ preferably present

in hydrolysed linseed oil or coconut oil;

- Y" represents the group $-C(O)OH$, $-C(O)OZ''$, $-CH_2-CH(OH)-SO_3H$ or the group $-CH_2-CH(OH)-SO_3-Z''$, with Z" representing a cationic counterion resulting from an alkali metal or alkaline-earth metal, such as sodium, an ammonium ion or an ion resulting from an organic amine;

- R_d and R_e represent, independently of each other, a C_1-C_4 alkyl or hydroxyalkyl radical; and

- n and n' denote, independently of each other, an integer ranging from 1 to 3.

Among the compounds corresponding to formula (A3), mention may in particular be made of the compound classified in the CTFA dictionary under the name sodium diethylaminopropyl cocoaspartamide, such as the one sold by the company Chimex under the name Chimexane HB.

Preferably, the amphoteric surfactants are chosen from (C_8-C_{20}) alkylbetaines, (C_8-C_{20}) alkylamido (C_1-C_6) alkylbetaines, and mixtures thereof.

More preferably, the amphoteric or zwitterionic surfactant is chosen from cocamidopropyl betaine, cocoylbetaine, or a mixture thereof.

According to a preferred embodiment, the amphoteric or zwitterionic surfactant(s) is present in an amount ranging from 1% to 70% by weight, preferably from 3% to 50% by weight, more preferably from 5% to 15% by weight, relative to the total weight of the composition.

Nonionic surfactant(s)

According to the present invention, the composition comprises at least one nonionic surfactant selected from the group consisting of alkyl(poly)glycosides, fatty acid esters of glycerol and of polyglycerol, or a mixture thereof.

Preferably, according to an embodiment, the composition comprises a mixture of nonionic surfactants of alkyl(poly)glycoside and fatty acid esters of glycerol and of polyglycerol.

i) Alkyl(poly)glycoside nonionic surfactant(s)

The term "alkyl(poly)glycoside" denotes an alkylpolyglycoside or an alkylmonoglycoside, also referred to in the present patent application as an alkylglycoside, which may be alkoxylated with one or more alkylene oxide groups, preferentially of C_2-C_4 .

The alkyl(poly)glycoside nonionic surfactant(s) used, alone or as mixtures, in accordance with the present invention may be represented by formula (IV) below:



in which:

R_1 represents a linear or branched, saturated or unsaturated alkyl group, containing from

about 8 to 24 carbon atoms, or an alkyl phenyl group in which the linear or branched alkyl radical contains from 8 to 24 carbon atoms,

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

G represents a saccharide unit containing 5 or 6 carbon atoms,

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

v denotes a value ranging from 1 to 15.

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

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

G denotes glucose, fructose or galactose, preferably glucose,

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

and R_2 and v are as defined previously.

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

The glycoside bonds between the saccharide units are 1,6- or 1,4- bonds; preferably 1,4- bonds.

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

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

30 Among all these alkyl(poly)glycoside nonionic surfactants, the decyl glucoside (INCI: Decyl glucoside) sold by Cognis under the reference Plantacare[®] 2000 UP is preferably used.

ii) Fatty acid ester(s) of glycerol and of polyglycerol

According to the invention, the composition may comprise at least one fatty acid ester of glycerol and/or of polyglycerol.

According to a preferred embodiment, the fatty acid ester(s) of polyglycerol is (are) chosen from esters resulting from the reaction of polyglycerol comprising from 2 to 12 glycerol units, preferably from 3 to 10 glycerol units, and of at least one fatty acid containing from 8 to 24 carbon atoms, preferably from 8 to 22 carbon atoms, better still from 10 to 20 carbon atoms and
 5 even better still from 10 to 18 carbon atoms. The fatty acids containing from 8 to 24 carbon atoms may be linear or branched, and saturated or unsaturated.

The fatty acids may be chosen from oleic acid, stearic acid, isostearic acid, lauric acid, palmitic acid, myristic acid, linoleic acid, capric acid and caprylic acid, or mixtures thereof.

The fatty acid esters of polyglycerol can be chosen from monoesters, diesters, triesters
 10 and tetraesters, polyesters and mixtures thereof. Use is preferably made of esters with a low degree of esterification, for instance fatty acid monoesters, diesters or triesters of polyglycerol, or a mixture. The fatty acid ester of polyglycerol can be in the form of a mixture of esters with a low degree of esterification, for instance a mixture of monoester and diester or a mixture of monoester, diester and triester.

15 According to one embodiment, the fatty acid ester of polyglycerol is chosen from esters resulting from the reaction of polyglycerol comprising from 3 to 10 glycerol units and of at least one fatty acid containing from 8 to 20 carbon atoms, preferably from 10 to 18 carbon atoms, such as oleic acid or linoleic acid.

Mention may in particular be made of polyglyceryl-2 distearate, in particular as sold by
 20 NIHON EMULSION under the name Emalex PGSA; polyglyceryl-10 decastearate, in particular as sold by TAIYO KAGAKU under the name Sunsoft Q-1810S; glyceryl oleate, in particular as sold by COGNIS under the name Monomuls 90-O 18; glyceryl stearate, in particular as sold by COGNIS under the name Cutina GMS V; polyglyceryl-5 hexastearate, in particular as sold by TAIYO KAGAKU under the name Sunsoft A-186E; polyglyceryl-10 pentaoleate, in particular as
 25 sold by TAIYO KAGAKU under the name Sunsoft Q-175S; polyglyceryl-10 pentastearate, in particular as sold by TAIYO KAGAKU under the name Sunsoft Q-185S; glyceryl caprylate/caprate, in particular as sold by STEPAN under the name Stepan Mild GCC; polyglyceryl-10 heptaoleate, in particular as sold by TAIYO KAGAKU under the name Sunsoft Q-177S; polyglyceryl-4 isostearate, in particular as sold by EVONIK GOLDSCHMIDT under the
 30 name Isolan GI 34; diisostearoyl polyglyceryl-3 dimer dilinoleate, in particular as sold by EVONIK GOLDSCHMIDT under the name Isolan PDI; glyceryl laurate, in particular as sold by COGNIS under the name Monomuls 90-L 12; polyglyceryl-5 trioleate, in particular as sold by TAIYO KAGAKU under the name Sunsoft A-173E; polyglyceryl-2 oleate, in particular as sold by TAIYO KAGAKU under the name Sunsoft Q-17B; polyglyceryl-5 trimyristate, in particular as

sold by TAIYO KAGAKU under the name Sunsoft A-143E; polyglyceryl-2 caprylate, in particular as sold by TAIYO KAGAKU under the name Sunsoft Q-81B; polyglyceryl-2 laurate, in particular as sold by TAIYO KAGAKU under the name Sunsoft Q-12D.

5 According to one particular embodiment, the fatty acid which is suitable for the reaction with the ester(s) of polyglycerol comprises at least one hydroxyl group. This is the case for ricinoleic acid. Mention may in particular be made of polyglyceryl-3 ricinoleate (and) sorbitan isostearate, in particular as sold by CRODA under the name Arlacel 1690, polyglyceryl-3 ricinoleate, in particular as sold by AARHUSKARLSHAMN under the name Akoline PGPR.

10 According to another embodiment, the fatty acid which is suitable for the reaction with the ester(s) of polyglycerol is a polyacid comprising at least one hydroxyl group.

For the purpose of the present invention, the nonionic surfactant(s) is(are) present in the composition ranging from 0.05% to 20% by weight, preferably from 0.1% to 10% by weight, more preferably 0.5% to 5% by weight, relative to the total weight of the composition.

Protein extract of Moringa genus plant seeds

15 The composition according to the present invention comprises at least one protein extract of Moringa genus plant seeds.

The genus Moringa comprises some 14 species of plants (of which particularly Moringa peregrina, M. aptera, M. concane six, M. drouhardii, M. hildebrandtii, M. longituba), among which Moringa pterygosperma (synonym: Moringa oleifera) is the best known.

20 It is a tree that grows rapidly and which adapts very well to variable conditions, spread throughout the tropics, in Asia, Africa and South America. The fruits are 30 to 50 cm long, hanging like drumsticks, from which comes the English name "drumstick tree", and its green pods are used as vegetables throughout the world.

25 The seeds of Moringa are characterized by the presence of an oil whose content varies between 21 and 53% according to the species and maturity of the seeds.

In addition to their oil content, Moringa seeds are found to comprise compounds of proteic nature (see particularly the article "Isolation and characterization of a flocculating protein from Moringa oleifera lam" by U. Gassenschmidt, K.D. Jany, B. Tausche and H.R. Niebergall, Biochimica and biophysics acta, 1243:477-481, 1995-"Active agents and mechanism of
30 coagulation of turbid waters using Moringa oleifera", of A. Ndabigengesere, K.Subba Narasiah and B.G. Talbot, Water research, 29,2:703-710, 1995).

According to a preferred embodiment, the composition of the present invention comprises at least one protein extract of the seeds of Moringa oleifera.

The extract is preferably obtained from delipidated flour of Moringa oleifera seeds, and

was then extracted in a buffered aqueous medium, and then isolated by cation exchange chromatography.

Preferably, the protein extract is obtained in an aqueous medium with a pH of greater than or equal to 3, preferably from 3 to 8.

5 The protein extract according to the present invention is also disclosed, for example, in the patent application US 6,500,470 B1.

Mentions maybe made of commercially available products, such as those sold under the name Purisoft POE LS 9726 by the company BASF.

10 Preferably, for the purpose of the present invention, the protein extract of Moringa genus plant seeds is present in the composition in an amount ranging from 0.001% to 5% by weight, preferably from 0.001% to 2% by weight, relative to the total weight of the composition.

Cationic Polymer(s)

The composition of the present invention comprises at least one cationic polymer selected from cationic cellulose.

15 It is first recalled that, for the purposes of the present invention, the term "cationic polymer" denotes any polymer containing cationic groups and/or groups that can be ionized into cationic groups.

The cationic polymers that may be used preferably have a weight-average molar mass (Mw) of between 500 and 5×10^6 approximately and preferably between 103 and 3×10^6 approximately.

The cationic celluloses may be made more particularly chosen from cellulose ether derivatives comprising quaternary ammonium groups, cationic cellulose copolymers or cellulose derivatives grafted with a water-soluble quaternary ammonium monomer, or a mixture thereof.

25 The cellulose ether derivatives comprising quaternary ammonium groups are especially described in French patent 1 492 597, and mention may be made of the polymers (INCI name polyquaternium-10) sold under the name Ucare Polymer "JR" (JR 400 LT, JR 125 and JR 30M) or "LR" (LR 400 or LR 30M) by the company Amerchol. These polymers are also defined in the CTFA dictionary as quaternary ammoniums of hydroxyethylcellulose that have reacted with an epoxide substituted with a trimethylammonium group.

30 Cationic cellulose copolymers or cellulose derivatives grafted with a water-soluble quaternary ammonium monomer are described especially in US patent 4 131 576, and mention may be made of hydroxyalkylcelluloses, for instance hydroxymethyl-, hydroxyethyl- or hydroxypropylcelluloses grafted, in particular, with a methacryloylethyltrimethylammonium, methacrylamidopropyltrimethylammonium or dimethyldiallylammonium salt. The commercial

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

Preferably, the cationic cellulose of the present invention is chosen from cellulose ether derivatives, more particularly comprising quaternary ammonium groups.

- 5 According to a preferred embodiment, the cationic polymer is present in the composition of the present invention, ranging from 0.01% to 3% by weight, preferably from 0.05% to 2% by weight, more preferably 0.1% to 1.5% by weight, relative to the total weight of the composition.

Oil(s)

The composition of the present invention comprises at least one hydrocarbon-based oil.

- 10 The term "oil" means any nonionic lipophilic compound that is insoluble in water and liquid at room temperature (25°C) and at atmospheric pressure.

For the purposes of the present invention, the term "water-insoluble" refers to a compound whose solubility at spontaneous pH in water at 25°C and at atmospheric pressure is less than 1% and preferably less than 0.5%. The oils preferably have a melting point of less than 5°C and

- 15 a viscosity of less than 500 cPs at 25°C at a shear rate of 1 s⁻¹.

The term "hydrocarbon-based oil" is understood to mean oil essentially formed and even composed, of carbon and hydrogen atoms and optionally of oxygen and nitrogen atoms which does not comprise a silicone or fluorine atom; it can comprise ester, ether, amine and amide groups.

- 20 The oil may be volatile or non-volatile.

The term "non-volatile" means an oil of which the vapor pressure at 25°C and atmospheric pressure is non-zero and is less than 0.02 mmHg (2.66 Pa) and better still less than 10⁻³ mmHg (0.13 Pa).

- 25 The term "volatile oil" means an oil of which the vapor pressure at 25°C and atmospheric pressure is from 0.13 Pa to 40.000 Pa (0.001 to 300 mmHg) and preferably from 1.3 to 1300 Pa (0.01 to 10 mm Hg).

According to a preferred embodiment, the composition of the present invention comprises at least one oil selected from the group consisting of plant oil, hydrocarbon oil, or a mixture thereof.

- 30 In particular, the term "plant oil" means an oil as defined above, obtained from a species belonging to the plant kingdom.

Hydrocarbon oils are also referred to as mineral oils. The term "hydrocarbon oils" or "mineral oils" refers to complex substances of hydrocarbons in the form of linear, branched, or cyclic, saturated or unsaturated oils. These oils are obtained from crude petroleum oils by

distillation and refining. Hydrocarbon oils, or mineral oils are a complex of alkanes, cycloalkanes, aromatic hydrocarbons, or mixtures thereof. More preferably the hydrocarbon oils contain a chain with 15-40 carbon atoms.

As examples of hydrocarbon oils or mineral oils that may be used in the present invention, mention may be made of:

- mixtures of hydrocarbon-based oils derived from petroleum (INCI name: Mineral Oil),
- volatile or non-volatile liquid paraffin,
- liquid petroleum jelly,
- polyolefins and in particular polydecenes,
- isoparaffins such as isohexadecane, isododecane and hydrogenated polyisobutylenes such as Parleam[®] oil sold by the company NOF Corporation (INCI name: Hydrogenated polyisobutene).

Among the mineral oils mentioned above, the following are preferably used:

- mixtures of hydrocarbon-based oils derived from petroleum,
- volatile or non-volatile liquid paraffin, and
- liquid petroleum jelly, and
- polyolefins and in particular polydecenes.

The term "polydecenes" means any compound of formula $C_{10n}H_{(20n)+2}$ in which n ranges from 3 to 9, corresponding to the name "polydecene" in the CTFA dictionary, 7th edition, 1997 of the Cosmetic, Toiletry and Fragrance Association, USA, and also to the same INCI name in the USA and in Europe. These are poly-1-decene hydrogenation products. Among these compounds, those for which, in the formula, n ranges from 3 to 7 are more particularly chosen according to the invention.

Examples that may be mentioned include the products sold under the name Silkflo[®] 366 NF Polydecene by the company Amoco Chemical, and those sold under the names Nexbase[®] 2002 FG, 2004 FG, 2006 FG and 2008 FG by the company Fortum.

The preferred hydrocarbon oil is mixtures of hydrocarbon-based oils derived from petroleum (INCI name: Mineral Oil), volatile or non-volatile liquid paraffin, or a mixture thereof.

Mentions may be made of the product (INCI name: mineral oil) sold under the tradename Emcaplus 70 by the company Oxiteno.

As examples of plant oils that are suitable for the present invention, mentions maybe made of:

- sweet almond oil,
- argan oil,

- avocado oil,
- peanut oil,
- camellia oil,
- safflower oil,
- 5** - calophyllum oil,
- coconut oil,
- colza oil,
- copra oil,
- coriander oil,
- 10** - cucurbit oil,
- wheatgerm oil,
- jojoba oil or jojoba liquid wax,
- linseed oil,
- macadamia oil,
- 15** - maize germ oil,
- hazelnut oil,
- walnut oil,
- vernonia oil,
- apricot kernel oil,
- 20** - olive oil,
- evening primrose oil,
- palm oil,
- passionflower oil,
- grapeseed oil,
- 25** - rose oil,
- castor oil,
- rye oil,
- sesame oil,
- rice bran oil,
- 30** - soya oil, or soybean oil, and
- sunflower oil.

Preferably, the composition of the present invention comprises at least one hydrocarbon oil.

The total amount of oil(s), when they are present in the composition, preferably ranges

from 0.01% to 20% by weight, better still from 0.05% to 10% by weight and more particularly from 0.1% to 5% by weight relative to the total weight of the final composition.

According to a preferred embodiment, the present invention relates to a composition for treating keratin fibers, comprising, by weight relative to the total weight of the composition:

- 5 a) from 5% to 20% by weight of at least one surfactant selected from the group consisting of anionic surfactants, amphoteric or zwitterionic surfactants, or a mixture thereof;
- b) from 0.1% to 10% by weight of at least one nonionic surfactant selected from alkyl(poly)glycosides, fatty acid esters of glycerol and of polyglycerol, or a mixture thereof;
- c) from 0.001% to 2% by weight of at least one protein extract of moringa genus plant
10 seed;
- d) from 0.05% to 2% by weight of at least one cationic polymer chosen from quaternary ammoniums of hydroxyethylcellulose that have reacted with an epoxide substituted with a trimethylammonium group; and
- e) from 0.05% to 10% by weight of at least one hydrocarbon-based oil selected from
15 plant oil, hydrocarbon oil, or a mixture thereof.

Galenic form

The composition according to the invention may take the form of thickened liquid, creams or gel. It is preferable that the composition according to the present invention be in the form of an nano- or micro-emulsion, more particularly oil-in-water nano- or micro-emulsion.

- 20 These emulsions can be prepared in particular by the phase inversion temperature technique (PIT emulsions), in which the average size of the globules constituting the oily phase is within given limits, namely between 0.1 and 4 μm (100 to 4000 nm). The principle of phase inversion temperature (or PIT) emulsification is, in theoretical terms, well known to those skilled in the art; it was described in 1968 by K. Shinoda (J. Chem. Soc. Jpn., 1968, 89, 435). It was
25 shown that this emulsification technique makes it possible to obtain stable fine emulsions (K. Shinoda and H. Saito, J. Colloid Interface Sci., 1969, 30, 258). This technology was applied in cosmetics as early as 1972 by Mitsui et al. ("Application of the phase-inversion-temperature method to the emulsification of cosmetics"; T. Mitsui, Y. Machida and F. Harusawa, American. Cosmet. Perfum, 1972, 87,33).

- 30 The compositions according to the invention may naturally contain, in addition, all the standard adjuvants encountered in the field of shampoos, such as, for example, perfumes, preservatives, sequestering agents, thickeners, hydrating agents, anti-dandruff or antiseborrheic agents, vitamins, sunscreen agents, suspending agents and the like.

Method and use

The present invention also relates to a process for washing keratin fibers, especially the hair, comprising the steps of applying to said fibers the composition of the invention, and then washing with water after an optional period of exposure. The process as mentioned above is preferably a process for washing and conditioning keratin fibers, in particular the hair.

- 5 Another aspect of the present invention is the use of the above composition of the invention for washing and conditioning keratin fibers, especially hair.

Preferably, the present invention further relates to the use of the above composition in reducing the deposition of fine particles contained in the air on keratin fibers, in particular the hair.

- 10 Non limiting examples illustrating the invention are given.

EXAMPLES

Three hair shampoos were prepared, one according to the invention (Invention formulas A, B) and three comparative (Comparative formula A', B' and B''):

Ingredient	Invention formula (% active by weight)		Comparative formula (% active by weight)		
	A	B	A'	B'	B''
Sodium laureth sulfate (Tensagex EOC670 LD from Tensachem, 2.2EO, 70% aqueous solution)	10.00	10.00	10.00	10.00	10.00
Cocamidopropyl betaine (Dehyton® PK 45 from Cognis (BASF))	7.00	7.00	7.00	7.00	7.00
Polyquaternium-10 (UCARE™ polymer JR 30M from DOW)	0.20	0.20	0	0.20	0.20
Polyquaternium-37(OPTASENSE	0	0	0.20	0	0

RMC70 from Croda)					
Glyceryl oleate (Monomuls 90-O from Cognis (BASF))	0.40	0.40	0.40	0.40	0
PEG-120 methyl glucoside oxyethylene (Glucamate DOE-120 from Lubrizol)	0	0	0	0	0.40
Decyl glucoside (53%, Plantacare [®] 2000UP from Cognis (BASF))	0.60	0	0.60	0	0
Moringa oleífera seed extract (Moringa oleífera seed hydroglycerin peptides, Purisoft POE LS 9726 from BASF)	0.03	0.03	0.03	0.03	0.03
Mineral oil (hydrocarbon oil, Paraffinum liquidum, Emcaplus from Oxiteno)	0.20	0.20	0.20	0	0.20
Dimethicone (Xiameter [®] PMX-200 Silicone fluid 60000cs from Dow Corning)	0	0	0	0.20	0

Salicylic acid	0.20	0.20	0.20	0.20	0.20
Sodium benzoate	0.50	0.50	0.50	0.50	0.50
Glycerin	2.00	2.00	2.00	2.00	2.00
Propylene glycol	0.50	0.50	0.50	0.50	0.50
Fragrance	0.50	0.50	0.50	0.50	0.50
Water	Qs to 100	Qs to 100	Qs to 100	Qs to 100	Qs to 100

Comparative formula **A'** corresponds to the invention formula **A** and contains a polymer other than the one claimed in the present invention; Comparative formula **B'** corresponds to the invention formula **B** and contains silicone oil instead of the oil as claimed in the present invention; Comparative formula **B''** also corresponds to the invention formula **B** and contains a nonionic surfactant other than the one claimed in the present invention.

The invention and comparative formulas were prepared according to the conventional methods for preparing shampoo formulations. The ingredients listed above were mixed until homogeneous at room temperature (20-25°C).

The invention and comparative formulas were subject to the evaluations, including the conditioning effect, anti-particle deposition effect, and transparency.

The transparency was evaluated by the turbidity, using a 2100N Turbidimeter machine from HACH.

The term "transparent" is understood to mean a composition having a turbidity of less than 250 NTU (Nephelometric Turbidity Units) at 25°C and preferably of less than 150 NTU at 25°C, even more preferably less than 100 NTU at 25°C.

The conditioning effect was evaluated by a hair dresser by using each of the invention or comparative formulas on 6 women consumers as hair shampoos, then combing the hair for 10 minutes. Finally the scores were given to the formulas, respectively:

1: very poor conditioning effect, hair is totally tangled and very dry after application, very difficult to comb;

2: poor conditioning effect, hair is tangled or dry after application, not easy to comb;

3: good conditioning effect, hair is smooth, soft, and detangled, easy to comb;

4: very good conditioning effect, hair is very smooth and supple, very easy to comb.

The formula was considered to have an expected conditioning when the average score of the formula is greater than or equal to 2.5.

Lastly, the anti-particle deposition effect of the invention and comparative formulas was evaluated following the protocol of:

1. apply the invention formula **A**, **B**, comparative formula **A'**, **B'** and **B''**, respectively, on dry hair swatch as rinse off shampoo product;

2. apply carbon powders to the hair swatch prepared from the previous step using a fan blowing the carbon powders to the swatch;

5 3. take photo of the hair swatch using SEM image analyzing equipment SEM sold by the company JOEL under the name JSM-606OLA, and analyze the carbon powder deposition on the hair swatch using image analyzing process.

The carbon powders used in the evaluation were intended to simulate the fine particles or in particular PM 2.5 contained in the air. The particle size of the carbon powder in aqueous
10 solution, when tested with Malvern Mastersizer 3000, distributed from 0.5 μm to 10 μm , which corresponds to the particle size of the fine particles in the air, including PM 2.5.

The composition of the PM 2.5, or fine particles is dependent on location and season. As an example in China, PM 2.5 comprises, but not limited to: geological materials such as paved or unpaved roads, constructions, agricultural operations, wind-blown soil; organic matters from
15 cooking, residential heating, field burning of crop residue, forest fires, and grassland fires; organic carbon such as conversion of volatile organic compounds; ammonium, sulfates, nitrates, and fugitive dust, see in "Winter and Summer PM 2.5 Chemical Compositions in Fourteen Chinese Cities" Jun-ji CAO, etc., Journal of the Air and Waste Management Association, 24th, Sep, 2012.

20 More specifically, the swatch treated with invention formula and comparative formulas were placed in a chamber equipped with carbon powders, one fan, and one particle detector, by fixing one end of the hair swatch on a horizontally positioned shelf.

The fan was placed in the center of the chamber. A watch glass with 0.1 g carbon black powder was placed under the fan, right in the center. A particle detector (Dust Trak II Model
25 8532 sold by the company TSI) was placed in the chamber and finally the chamber of the device was closed.

The fan was then turned on for 10 minutes, and then turned off. After 5 minutes, the swatches were moved out from the chamber and observed under SEM.

30 The anti-particle deposition effect of the formulas was represented by particle deposition coverage value, obtained by image analyzing tools which are conventionally available.

The lower the value of particle deposition coverage, the better the anti-particle deposition effect is.

The results of the evaluation were listed herewith.

Attributes	Invention formula		Comparative formula		
	A	B	A'	B'	B''
Conditioning effect	3	2.8	2.6	3	2.8
Anti-particle deposition (particle deposition coverage)	3.23	3.02	3.52	6.21	3.37
Transparency (turbidity (NTU))	33.1	31.9	35.7	459	157

As shown in the table listed above, comparing to the corresponding comparative formulas, invention formula **A** and **B** both have good conditioning effect on the hair, and both have improved anti-particle deposition effect, meanwhile are transparent. Whereas even though the conditioning effect is good, neither of the comparative formula **B'** or **B''** has a transparent esthetic appearance, and moreover, the anti-particle deposition effect is poor comparing to the invention formula **B**. Comparative formula **A'** possesses a transparent appearance, however it does not have a good balance of conditioning effect and anti-particle deposition effect, comparing to the invention formula **A**, i.e., both of which are worse than that of the invention formula **A**.

What is claimed is

1. A transparent composition for treating keratin fibers, comprising:
 - a) at least one surfactant selected from the group consisting of anionic surfactants, amphoteric or zwitterionic surfactants, or a mixture thereof;
 - 5 b) at least one nonionic surfactant selected from alkyl(poly)glycosides, fatty acid esters of glycerol and of polyglycerol, or a mixture thereof;
 - c) at least one protein extract of moringa genus plant seed;
 - d) at least one cationic polymer chosen from cationic cellulose; and
 - e) at least one hydrocarbon-based oil.
- 10 2. Composition of claim 1 is silicone-free, preferably the composition does not contain silicone.
3. Composition of claim 1 or 2, wherein the anionic surfactant is chosen from (C₆-C₃₀)alkyl sulfates, (C₆-C₃₀)alkyl ether sulfates, (C₆-C₃₀)alkylamido ether sulfates, alkylaryl polyether sulfates or monoglyceride sulfates, or a mixture thereof; preferably chosen from sodium
 - 15 laureth sulfate, sodium lauroyl methyl isethionate, sodium cocoyl isethionate, or a mixture thereof; more preferably chosen from sodium laureth sulfate containing 1 to 4 ethylene oxide groups.
 4. Composition of any one of the preceding claims 1 to 3, wherein the amphoteric or zwitterionic surfactant is chosen from (C₈-C₂₀)alkylbetaines, (C₈-C₂₀ alkyl)amido(C₂-C₈
 - 20 alkyl)betaines, or a mixture thereof; more preferably chosen from cocoylamidopropylbetaine, cocoylbetaine, or a mixture thereof.
 5. Composition of any one of the preceding claims 1 to 4, wherein the surfactant a) is present in an amount ranging from 1% to 70% by weight, preferably from 3% to 50% by weight, more preferably from 5% to 20% by weight, relative to the total weight of the
 - 25 composition.
 6. Composition of any one of the preceding claims 1 to 5, wherein the alkyl(poly)glycoside nonionic surfactant is chosen from, alone or as a mixture, compounds of formula (IV),

$$R_1O-(R_2O)_t-(G)_v \quad (IV)$$
 in which:
 - 30 R₁ represents a linear or branched, saturated or unsaturated alkyl group, containing from 8 to 24 carbon atoms, or an alkyl phenyl group in which the linear or branched alkyl radical contains 8 to 24 carbon atoms, preferably R₁ represents a linear or branched, saturated or unsaturated alkyl group containing from 8 to 18 carbon atoms,
 - R₂ represents an alkylene group containing from 2 to 4 carbon atoms,

G represents a saccharide unit containing 5 or 6 carbon atoms, preferably glucose, fructose or galactose, more preferably glucose, t denotes a value ranging from 0 to 10 and preferably from 0 to 4, and

v denotes a value ranging from 1 to 15, preferably 1 to 4.

- 5 7. Composition of any one of the preceding claims 1 to 6, wherein the fatty acid ester of glycerol and of polygluceryl is selected from the group consisting of esters resulting from the reaction of polyglycerol comprising from 3 to 10 glycerol units and of at least one fatty acid containing from 8 to 20 carbon atoms, preferably from 10 to 18 carbon atoms; preferably selected from glyceryl oleate.
- 10 8. Composition of any one of the preceding claims 1 to 7, wherein the nonionic surfactant is present in an amount ranging 0.05% to 20% by weight, preferably from 0.1% to 10% by weight, more preferably 0.5% to 5% by weight, relative to the total weight of the composition.
9. Composition of any one of the preceding claims 1 to 8, wherein the protein extract of Moringa genus plant seeds is a protein extract of the seeds of Moringa oleifera.
- 15 10. Composition of any one of the preceding claims 1 to 9, wherein the protein extract of Moringa genus plant seeds is present in the composition in an amount ranging from 0.001% to 5% by weight, preferably from 0.001% to 2% by weight, relative to the total weight of the composition.
11. Composition of any one of the preceding claims 1 to 10, wherein the cationic polymer is
- 20 chosen from cellulose ether derivatives comprising quaternary ammonium groups; preferably chosen from quaternary ammoniums of hydroxyethylcellulose that have reacted with an epoxide substituted with a trimethylammonium group.
12. Composition of any one of the preceding claims 1 to 11, wherein the cationic polymer is present in an amount ranging from 0.01% to 3% by weight, preferably from 0.05% to 2% by
- 25 weight, more preferably 0.1% to 1.5% by weight, relative to the total weight of the composition.
13. Composition of any one of the preceding claims 1 to 12, wherein the hydrocarbon-based oil is selected from the group consisting of plant oil, hydrocarbon oil, or a mixture thereof; preferably selected from soybean oil, coconut oil, volatile or non-volatile liquid paraffin,
- 30 petroleum, or a mixture thereof.
14. Composition of any one of the preceding claims 1 to 13, wherein the hydrocarbon-based oil is present in an amount ranging from 0.01% to 20% by weight, better still from 0.05% to 10% by weight and more particularly from 0.1% to 5% by weight, relative to the total weight of the composition.

15. Method for washing keratin fibers, especially the hair, comprising the steps of applying to said fibers the composition according to any one of the preceding claims 1 to 14, and then washing with water after an optional period of exposure.

16. Use of the composition of any one of the preceding claims 1 to 15 in reducing particle deposition on keratin fibers, in particular hair.

5

INTERNATIONAL SEARCH REPORT

International application No.

PCT/CN2016/080201

A. CLASSIFICATION OF SUBJECT MATTER

A61K 8/97(2006.01)i; A61Q 5/02(2006.01)i; A61Q 5/00(2006.01)i

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)

A61K8/-;A61Q5/-

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)

CNKI,CNPAT,WPI,EPODOC:cosmetic,hair,keratin,transparent,surfactant,anionic,nonionic,cationic,moringa,cellulose,hydrocarbon,mineral,oil,sulfate?,+betaine,+glycoside,+glycerol

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	CN 101485622 A (ZHANG JIAHENG ET AL.) 22 July 2009 (2009-07-22) description, example 1	1-16
A	WO 2006029757 A1 (HENKEL KGAA) 23 March 2006 (2006-03-23) description, pages 80-81	1-16
A	EP 1810660 A1 (HENKEL KGAA) 25 July 2007 (2007-07-25) description, paragraph [0180]	1-16
A	US 2004096417 A1 (INT FLORA TECHNOLOGIES LTD.) 20 May 2004 (2004-05-20) claims 1-25	1-16
A	CN 101940541 A (L'OREAL) 12 January 2011 (2011-01-12) description, paragraphs [0007], [0023]-[0040]	1-16
A	CN 102458355 A (PIERRE FABRE DERMO-COSMETIQUE) 16 May 2012 (2012-05-16) description, paragraphs[0013]-[0031]	1-16

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

* Special categories of cited documents:

“A” document defining the general state of the art which is not considered to be of particular relevance

“E” earlier application or patent but published on or after the international filing date

“L” document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

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

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

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

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

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

“&” document member of the same patent family

Date of the actual completion of the international search

21 December 2016

Date of mailing of the international search report

20 January 2017

Name and mailing address of the ISA/CN

STATE INTELLECTUAL PROPERTY OFFICE OF THE
P.R.CHINA
6, Xitucheng Rd., Jimen Bridge, Haidian District, Beijing
100088
China

Authorized officer

FAN,Yandi

Facsimile No. (86-10)62019451

Telephone No. (86-10)010-82246786

INTERNATIONAL SEARCH REPORT
Information on patent family members

International application No.

PCT/CN2016/080201

Patent document cited in search report			Publication date (day/month/year)	Patent family member(s)			Publication date (day/month/year)
CN	101485622	A	22 July 2009	None			
WO	2006029757	A1	23 March 2006	EP	1789010	A1	30 May 2007
				DE	102004045274	A1	23 March 2006
				ES	2392642	T3	12 December 2012
				EP	1789010	B1	29 August 2012
EP	1810660	A1	25 July 2007	DE	102006002568	A1	19 July 2007
US	2004096417	A1	20 May 2004	JP	2006509056	A	16 March 2006
				AU	2003291238	A1	03 June 2004
				AU	2003291238	A8	03 June 2004
				EP	1569601	A4	11 January 2006
				CA	2505729	A1	27 May 2004
				WO	2004043364	A2	27 May 2004
				WO	2004043364	A3	02 September 2004
				EP	1569601	A2	07 September 2005
CN	101940541	A	12 January 2011	US	2010120645	A1	13 May 2010
				EP	2177207	A2	21 April 2010
				JP	2010111669	A	20 May 2010
CN	102458355	A	16 May 2012	JP	2012530769	A	06 December 2012
				WO	2010149895	A2	29 December 2010
				MX	2011012375	A	08 December 2011
				WO	2010149895	A3	22 December 2011
				MA	33400	B1	03 July 2012
				UA	108850	C2	25 June 2015
				US	2012128607	A1	24 May 2012
				HK	1169325	A1	11 September 2015
				FR	2946879	B1	18 May 2012
				EP	2445480	A2	02 May 2012
				SG	176729	A1	30 January 2012
				RU	2012102012	A	27 July 2013
				GE	P20156293	B	10 June 2015
				FR	2946879	A1	24 December 2010
				CA	2765023	A1	29 December 2010
				JP	5937965	B2	22 June 2016
				KR	20120108916	A	05 October 2012
				CN	102458355	B	04 March 2015
				RU	2545708	C2	10 April 2015