

(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property

Organization

International Bureau

(43) International Publication Date

23 May 2019 (23.05.2019)



(10) International Publication Number

WO 2019/095152 A1

(51) International Patent Classification:

A61K 8/73 (2006.01)

A61Q 5/12 (2006.01)

A61K 8/40 (2006.01)

A61Q 5/02 (2006.01)

Published:

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

(21) International Application Number:

PCT/CN2017/111144

(22) International Filing Date:

15 November 2017 (15.11.2017)

(25) Filing Language:

English

(26) Publication Language:

English

(71) Applicants: **BEIERSDORF DAILY CHEMICAL**

(WUHAN) CO., LTD. [CN/CN]; No.512, Dongfeng Road, Wuhan Economic, and Technological Development Zone, Wuhan (CN). **BEIERSDORF AG** [DE/DE]; Unnastrasse 48, 20253 Hamburg (DE).

(72) Inventors: **FENG, Ji**; 1-2-603, Hingfujiayuan Community,

Xiongchu Road, Wuhan Hongshan District, Wuhan, Hubei 430070 (CN). **JIA, Zebao**; Room 201, Unit 2, Building 403, Baibuhuating, Baibutinghuayuan Road, Jiangnan District, Wuhan, Hubei 430012 (CN). **BAO, Zhaoxia**; Room 101, Unit 2, Building 3, Beihaiwan, 701 Institute, Zhangzhidong Road 268, Wuhan, Hubei 430070 (CN). **DEMITZ, Michael**; Lokstedter Steindamm 1, 22529 Hamburg (DE).

(74) Agent: **CHINA SINDA INTELLECTUAL PROPERTY**

LTD.; B11th Floor, Focus Place, 19 Financial Street, Xicheng District, Beijing 100033 (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, DJ, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IR, IS, JO, JP, KE, KG, KH, KN, KP, KR, KW, 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).

(54) Title: A TRANSPARENT HAIR CONDITIONING COMPOSITION AND ITS USE

(57) Abstract: A transparent hair conditioning composition comprising an aqueous system containing polymeric thickening components, amphoteric polymers and selected cationic surfactants. The composition may be used for providing hair with freshness without leaving it oily and/or greasy, and for providing hair which can be easily detangled and combed in a wet and dry condition.



WO 2019/095152 A1

A Transparent Hair Conditioning Composition and its Use

Technical Field

The present invention belongs to the cosmetic field, and relates to a transparent hair conditioning composition comprising an aqueous system containing polymeric thickening components, amphoteric polymers and selected cationic surfactants.

The invention also relates to use of the composition according to the invention for providing hair with freshness without leaving it oily and/or greasy. Furthermore, the invention also relates to the use of the composition according to the invention for providing hair which can be easily detangled and combed in a wet and dry condition.

Background Art

The entire human body, with the exception of the lips, the palms of the hands and the soles of the feet, is covered with hair, albeit a large part is barely visible. Because of the many nerve endings at the hair root, hair reacts sensitively to external influences such as wind or touch and is therefore a part of the sense of touch that should not be underestimated. However, nowadays, most importantly human head hair helps to create the personal appearance in a characteristic manner. Similarly to the skin, it fulfils a social function, because it *considerably contributes to interpersonal relations and to the self-esteem of an individual via its outward appearance.*

The hair consists of a hair shaft and a hair root. The hair shaft protrudes freely from the skin, and is a keratinized (dead) section of the hair. The hair shaft represents the actual visible part of the hair, which is continually renewed. The hair root, which sticks in the skin,

is the living part of the hair. The hair shaft consists of three layers: the central part, which is called medulla, is regressed in humans, often completely missing; followed by the cortex arranged around the medulla; and the cuticle as the outermost layer, comprising of up to ten horny layers.

Human hair in its freshly grown condition is virtually impossible to improve. The part of the hair near the scalp accordingly has a virtually closed horny layer. In particular, the horny layer, being the external sheath of the hair, and the inner region below the cuticle is subjected to particular stress by environmental influences.

Sunlight, mechanical stress by intensive combing or brushing, hair treatments, such as hair colorations, bleaching and permanent waving, but also repeated hair washings with compositions containing harsh surfactants, and hair-shaping using a hair dryer or other tools can cause damage to hair.

One aim of hair care is to retain the natural state of freshly grown hair over a period as long as possible and, in the case of loss of the natural state, to restore it. Generally, natural healthy hair has a silky shine look, low porosity and a pleasant, smooth feel.

Hair care compositions were developed to provide care to hair and scalp. These compositions are intended to remain in the hair (leave-on) or to be rinsed off. Compositions in form of leave-on compositions can provide further benefits as improving hair setting, volume and combability of hair, to mention only a few.

Hair care compositions generally contain conditioning components that interact with the surface of hair and scalp. Advantageously, conditioning components are selected from those components characterized by quaternary ammonium residues, protein hydrolysates, fats and oils, silicones and silicone derivatives.

Components with quaternary ammonium residues preferably are cationic surfactants or cationic polymers.

Cationic components for conditioning are amphiphilic molecules with a hydrophilic, positively charged part and a lipophilic part. The hydrophilic, positively charged part may be a quaternary ammonium residue. The lipophilic part of the molecule may interact with the lipophilic parts of the hair, located in the cuticula. The cuticula is composed of cells that are arranged in a tile-like manner. Electron microscopic pictures reveal different layers having a different chemical composition. The outmost layer is very hard and characterized by cystin-rich proteins. Furthermore, lipids are present on the surface of and inside the cuticula. Therefore, both parts, the hydrophilic and the lipophilic one, of the amphiphilic conditioning components may interact with components of the cuticula.

Compositions provided for hair care contain conditioning components that may be selected from cationic surfactants or cationic polymers, protein hydrolysates, fats, oils, and derivatives thereof, silicones and silicone derivatives. These components are used alone or in a myriad of different combinations. Said compositions are available in many different forms, for instance any form of emulsion, gel, spray etc.

Prior art discloses a huge number of compositions intended for conditioning hair. Only a few will be cited.

WO 2004/058199 A1 describes compositions containing carbamate substituted saccharides and cationic conditioners that improve the combability, volume, shine and setting of hair and prevent the electrostatic charging of hair. If said compositions are provided as foams, the foam is creamy and stable. Furthermore, electrolytes may be contained in larger amounts.

DE 102008030139 A1 discloses hair care compositions with improvements in applying the compositions to hair. Said compositions contain selected silicone emulsions.

A similar problem was solved by the invention disclosed in DE 102008030136 A1. Compositions according to said application comprise two different cationic surfactants in a specific ratio.

The application EP 1287811 A2 discloses compositions for conditioning hair comprising specific alkyl lactates. Said compositions provide improved caring qualities.

DE 102008030131 A1 describes conditioning compositions avoiding the use of silicone and silicone derivatives, because the silicone components may interact intensively with the surface of hair. In consequence, hair becomes loaded with silicone components. The look of the hair is greasy and heavy.

Patent application DE 19629951 A1 discloses hair care compositions that are transparent or translucent. Said compositions are in form of micro emulsions. Droplets sizes smaller than 10^{-2} μm in diameter result in transparent or translucent emulsions. Compositions according to the above mentioned application contain specific O/W-emulsifiers in amounts smaller than 2% by weight and selected cationic surfactants.

EP 2116225 A1 describes hair care compositions comprising cationic surfactants and two different polymers, Polyquaternium-68 and a polymer consisting of 23 to 27 % by weight vinylpyrrolidone, 45 to 49 % by weight tert-butyl acrylate, 2 to 4 % by weight methacrylic acid, 9 to 11 % by weight dimethyl aminopropyl methacrylamide and 13 to 17 % by weight methacryloyl oxyethyle dimethylethyle ammonium ethylsulfate, having a molecular weight of 80,000 to 240,000 g/mol. Compositions according to the above mentioned application are intended for damaged or fine hair and do

not load hair up. Volume, elasticity, and combability of hair is improved.

EP 2462918 A2 discloses hair-conditioning compositions. The problem to be solved by this invention was to provide products that have good caring qualities, however avoiding the use of too much caring/conditioning components. Too much of said components result in hair, which is difficult to style. The compositions of the above-mentioned application comprise dimethicone, waxes, a tackifying polymer and a film-forming polymer.

Although prior art discloses compositions, which are transparent or translucent compositions, which help to avoid greasy and heavy hair or hair difficult to style because of too much conditioning components, there is still a need for compositions, which do not leave the hair greasy or heavy but nonetheless contribute to a good gliding, good detangling and good combability of wet and dry hair. In addition, hair should be provided with freshness.

Summary of the invention

Inventors of the present invention found out that a conditioning composition comprising an aqueous system containing thickening polymers, amphoteric polymers and cationic surfactants is able to improve the physical-optical properties of hair.

In a first aspect, the present invention provides a transparent hair conditioning composition, comprising

an aqueous system containing

- at least one thickening polymer,
- at least one amphoteric polymer and
- optionally at least one cationic surfactant.

Furthermore, the composition may optionally comprise the auxiliary components as listed in the part of "detailed description of the invention", such as emulsifiers, further surfactants, ethoxylated silicones, further cationic polymers, humectants, preservatives, antioxidants, fatty alcohols and capsules.

As the composition according to the present invention contains an aqueous system, water has to be present. In addition to the components of the aqueous system and the optionally contained auxiliary components, the composition comprises a balance amount of water, so that all the components amount to 100% by weight. It is preferred that water amounts from 70 to 95 % by weight, more preferably from 75 to 90 % by weight, relative to the total weight of the composition.

In another aspect, the present invention refers to use of the composition of the present invention in conditioning and caring hair, especially providing hair with freshness without leaving it oily and/or greasy. Furthermore, the invention also relates to the use of the composition according to the invention for providing hair which can be easily detangled and combed in a wet and dry condition.

The conditioning composition of the present invention leads to improved gliding, detangling, and combability of wet and dry hair. Furthermore, after treatment with composition of the present invention, hair is provided with freshness, thereby avoiding leaving hair oily and/or greasy.

Detailed description of the invention

According to the invention, the composition contains at least one polymer, which has a thickening effect, with the proviso that polymers having one or more anionic and one or more cationic groups in the

same polymer are excluded. Thickening polymers are macromolecules which are composed of monomers arranged in a linear, partially a cross-linked way. Interactions between parts of the macromolecule and other macromolecules contribute to build a network resulting in gels or viscous solutions. Said macromolecules are water soluble or water swellable compounds. Water is bound or absorbed by said molecules, thus increasing the viscosity of a solution.

Thickening polymers are derived from chemically very different groups, characterized by their capability to dissolve or swell in water. Sufficient hydrophilic residues, being ionic, anionic or cationic ones, lead to the water solubility or swelling capability.

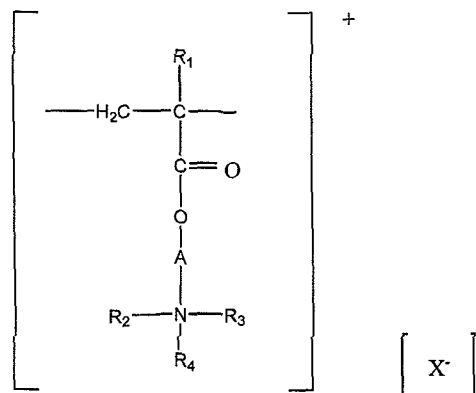
Thickening polymers frequently contained in cosmetic as well as dermatologic compositions may be categorized as follows:

- Natural, organic compounds as for instance agar, carrageenan, tragacanth, gum arabic, alginate, pectin, hemicellulose, guar-flour, locust bean gum, starch, dextrans, gelatine, casein;
- derived, organic compounds as for instance carboxymethyl cellulose and other cellulosic ether, such as hydroxyethyl- and -propyl cellulose and related compounds;
- synthetic, organic compounds as for instance polyacrylic and polymethacrylic compounds, vinyl polymers, polycarboxylic acids, polyether, and hydrophobically modified polymers;
- inorganic compounds as for instance polysilicic acids, clay minerals such as montmorillonite, and zeolites.

In a preferred embodiment according to the present invention the at least one thickening polymer is selected from the group consisting of polymers containing or consisting of (meth)acrylic derivatives comprising a quaternary ammonium group, with the proviso that no anionic monomer is contained in said polymer. Anionic monomers are characterized by the presence of acidic groups, for instance,

carboxylate, sulfate, phosphate groups. Because of the permanently positively charged quaternary ammonium groups, such polymers have thickening and film-forming qualities. As the film-forming properties result in a conditioning effect, cationic surfactants need not be contained in the compositions containing said polymers.

An example for a suitable polymer is a homopolymer comprising monomers characterized by the following formula:



where R_1 is hydrogen atom or a methyl group, R_2 , R_3 , R_4 are identical or different substituents representing alkyl substituents with 1 to 18 carbon atoms or a benzyl substituent, A represents a straight or branched alkyl chain of 1 to 6 carbon atoms or a hydroxylated alkyl chain of 1 to 4 carbon atoms, and $[\text{X}^-]$ a suitable counterion, preferably chloride, bromide or methosulfate. Polyquaterium-37 is a polymer according to the above mentioned formula and is well preferred according to the present invention. Polyquaternium-37 may be purchased as COSMEDIA Ultrigel 300 from BASF.

In further preferred embodiment of the invention the thickening effect is provided by cellulose or modified cellulose, such as ethyl cellulose, hydroxypropylcellulose, hydroxypropyl methyl cellulose, methyl ethyl cellulose and hydroxyethylcellulose. According to the

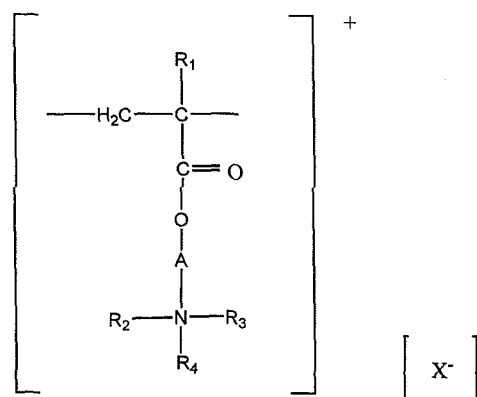
invention hydroxyethyl cellulose is most preferred and may be purchased from the company of Ashland as Natrosol 250 HHX pharm.

Advantageously, the at least one thickening polymer is contained in amounts from 0.1 to 5.0 % by weight, preferably from 0.2 to 4.5 % by weight, more preferably from 0.5 to 3.0 % by weight, relative to the total weight of the composition.

It is advantageous, if a transparent hair conditioning composition, comprising

an aqueous system contains

– at least one thickening polymer, chosen from homopolymers characterized by the formula



wherein R₁ is hydrogen atom or a methyl group, R₂, R₃, R₄ are identical or different substituents representing alkyl substituents with 1 to 18 carbon atoms or a benzyl substituent, A is a straight or branched alkyl chain of 1 to 6 carbon atoms or a hydroxylated alkyl chain of 1 to 4 carbon atoms, and [X⁻] a counterion, chosen from chloride, bromide or methosulfate,

– at least one amphoteric polymer and

– optionally at least one cationic surfactant.

It is as well advantageous, if a transparent hair conditioning composition, comprises

an aqueous system containing

- at least one thickening polymer, chosen from cellulose or modified cellulose,
- at least one amphoteric polymer, and
- at least one cationic surfactant.

According to the invention, at least one amphoteric polymer is contained. Amphoteric polymers are synthetic polymers containing residues with a cationic and an anionic function. The anionic function may be provided by monomers such as (meth-)acrylic acid.

The cationic function may be provided by monomers such as diallyl dimethyl ammonium chloride and/or methacrylamidopropyl trimethyl ammonium chloride.

Due to the cationic function, these polymers can interact with the outermost layers of hair or skin. Through these interactions, a conditioning effect may be provided.

Preferred examples for amphoteric polymers are polyquaternium-22, polyquaternium-47 and polyquaternium-53. More preferably, polyquaternium-47 is contained. Polyquaternium-22 may be purchased as Merquat 295, polyquaternium-47 as Merquat 2001 and polyquaternium-53 as Merquat 2003, all from the company of Lubrizol.

Advantageously, the at least one amphoteric polymer is contained in an amount from 0.01 to 1.0 % by weight, preferably from 0.05 to 0.8 % by weight, more preferably from 0.1 to 0.5 % by weight, relative to the total weight of the composition.

According to the invention, cationic surfactants may optionally be contained. Cationic surfactants are amphiphilic molecules containing a positively charged, hydrophilic part and a lipophilic part. Usually, a nitrogen

atom containing group confers the positively charged residue. Alkyl residues generally containing 12 to 22 carbon atoms form the lipophilic parts. Four main groups of cationic surfactants may be mentioned: alkyl amines, ethoxylated amines, quaternary ammonium salts and alkyl imidazolines. Frequently used are quaternary ammonium salts. With an increasing number and length of the long chain alkyl residues the adhesion to hair increases, but the water solubility decreases as well as the biodegradability. To circumvent these disadvantages esterquats have been developed. Esterquats are cationic surfactants where the alkyl residues are connected to hydrophilic part by ester bonds.

The cationic function may be permanent, mostly a quaternary ammonium residue. Primary, secondary or tertiary ammonium residues may be cationic dependent on the respective pH value.

According to the invention, the at least one cationic surfactant is preferably one, which contains a quaternary ammonium group. More preferably, the quaternary ammonium group contains nitrogen atoms having three methyl groups as substituents, whereas the fourth substituent is a long chain alkyl residue, which can be straight, branched, substituted or unsubstituted. It is even more preferred that the alkyl residue is a straight, unsubstituted one containing 12 to 28 carbon atoms. It is most preferred, if the alkyl residue contains 18 to 24 carbon atoms. The corresponding anion can be selected from the group consisting of chloride, bromide and methosulfate. The most preferred cationic surfactants may be selected from the group consisting of soytrimonium chloride, which may be supplied as SV 60 from AkzoNobel, steartrimonium chloride, which may be supplied from HuZhou HuXing RiHua (China), and cetrimonium chloride, which may be supplied as Varisoft 300 from Evonik.

Furthermore, quaternary fatty acid amidoamines are also preferred cationic surfactants. A more preferred example of said surfactants is palmitamidopropyl chloride, which may be purchased as Variosoft PATC from Evonik. Another more preferred example is Stearamidopropyl Dimethylamine, which may be purchased as Tego Amid S 18 from Evonik.

The at least one cationic surfactant is used preferably in a total amount of 0.1 to 7.5 % by weight, more preferably 0.3 to 3.0 % by weight, relative to the total weight of the composition.

The composition of the present invention is preferably in form of a gel. Nevertheless, emulsifiers may be contained, preferably polyethylene glycol ethers of fatty acids, such as cetareth-20, cetareth-30, and laureth-23 and ethoxylated sorbitan esterified with fatty acids, such as for instance polysorbate-60 and polysorbate-80. It is even more preferred, if cetareth-20 is contained in the composition according to the invention. Furthermore, one emulsifier or a mixture of emulsifiers may be contained in the composition according to the present invention. The total amount of one or more emulsifier(s) is from 0.1 to 5.0 % by weight, preferably from 0.2 to 4.0 % by weight, even more preferably 0.5 to 3.0 % by weight, relative to the total weight of the composition.

Additionally, further surfactants, different from the above described cationic surfactants, may be contained. Advantageously, amphoteric surfactants may be used, even more preferred are those, which contain a betaine-structure. It is most preferred, when coco-betaine is contained. One amphoteric surfactant or a mixture of amphoteric surfactants may be contained in the composition according to the present invention. The total amount of one or more amphoteric

surfactant(s) is from 0.1 to 6.0 % by weight, preferably from 0.2 to 5.0 % by weight, even more preferably 0.3 to 4.0 % by weight, relative to the total weight of the composition.

According to the invention, additional conditioning components may be optionally comprised in the composition.

One group of additional conditioning components, which are very suitable according to the present invention are ethoxylated silicones.

Silicones are synthetic polymers containing silicium atoms connected via oxygen atoms. The functional unit consisting of silicium atom and oxygen atom is called siloxane, having the general formula: $R_nSiO_{(4-n)/2}$ ($n=0, 1, 2, 3$). Derived from this formula, it becomes obvious that the siloxane unit can have four different sets of residues, illustrated by the following notation:

M (mono), M corresponding to $R_3SiO_{1/2}$,

D (di), D corresponding to $R_2SiO_{2/2}$,

T (tri), T corresponding to $RSiO_{3/2}$ and

Q (quatro), Q corresponding to $SiO_{4/2}$.

The siloxane units are connected in a variety of different ways, generally in a linear or cross-linked way or combining parts of a linear structure and parts of a cross-linked structure in one molecule. Four main groups of silicones may be differentiated:

- Cyclic polysiloxanes, built from bifunctional siloxane units, D_n .
- Linear polysiloxanes, having the structure MD_nM , respectively $R_3SiO[R_2SiO]_nSiR_3$, such as for example polydimethylsiloxane.
- Crosslinked polysiloxanes are linear or cyclic molecules, building two- or three-dimensional networks by the incorporation of tri- and tetra-functional siloxane units.

- Branched polysiloxanes contain tri- and tetra-functional siloxane units and have the formula $M_nD_mT_n$. The branching points are located in a polysiloxane chain or ring.

Furthermore, silicone may be differentiated by different substituents. A wide variety of substituents of silicones and combinations thereof have been described. According to the present invention silicone molecules, which contain linear and crosslinked parts and polyethylene glycol substituents, are preferred. It is even more preferred, when the polyethylene glycol substituents contain 10 to 20, especially 15 to 18 ethylene glycol units. PEG-17 Dimethicone is an example of this class of silicones and is the most preferred one. PEG-17 Dimethicone may be purchased as Silsoft 895 dimethicone polyol from Momentive.

In addition, silicone molecules, which contain linear arranged siloxane units and polyethylene glycol substituents are also preferred. It is even more preferred, when the polyethylene glycol substituents contain 8 to 18, especially 10 to 15 ethylene glycol units. PEG-12 Dimethicone is an example for this class of silicones and is another most preferred one. PEG-12 Dimethicone may be purchased as XIAMETER® OFX-0193 Fluid from Dow Corning.

In the composition according to the present invention one ethoxylated silicone or mixtures of ethoxylated silicones may be contained. The total amount of one or more ethoxylated silicone(s) is from 0.1 to 7.0 % by weight, preferably from 0.2 to 5.0 % by weight, even more preferably 0.5 to 3.0 % by weight, relative to the total weight of the composition.

In addition, further cationic polymers may be used as conditioning components, with the proviso that they are different from

the thickening polymers having a cationic function and different from the amphoteric polymers. The further cationic polymer may be of natural origin or synthetic origin, and may be selected from the group consisting of cationic polysaccharides, vinyl monomer containing copolymers, allyl monomer containing polymers, vinylpyrrolidone copolymers, and cation modified proteins.

The cationic polymers of natural origin may be based on the guar molecule which is modified in such a way that cationic substituents are introduced or substituents are introduced which are cationic at specific pH values, specifically at those pH values of the hair conditioning compositions. An example of the modified guar molecules is guar hydroxypropyltrimonium chloride.

Cationic polymers derived from cellulose may also be used in the present invention. Similar to the case of guar, the substituents introduced to cellulose allow the cellulose molecule to have cationic qualities. An example is polyquaternium 10 (e.g., JR 30M[®] obtained from Amerchol company), which is also called cellulose 2-(2-hydroxy-3(trimethylammonio)propoxy)ethyl ether chloride.

Further cationic polymers, which are of synthetic origin, may be contained in the composition of the present invention. An example of said polymers is polyquaternium 74. Polyquaternium 74 is an acrylic/methacrylamidepropyldimethylammonium chloride /hydroxypropyltrimethyl-ammonium copolymer.

If one or more further cationic polymer(s) is/are contained, the total amount of one or more cationic polymer(s) is/are from 0.001 to 1.5 % by weight, preferably 0.01% to 1% by weight, relative to the total weight of the composition.

The hair conditioning composition of the present invention may preferably contain humectants. Humectants are hygroscopic substances, which bind water and therefore provide moisture. The hygroscopic quality is due to hydrophilic substituents of the molecule, in many cases hydroxyl groups, but other functional groups as amine or carboxyl groups can fulfill the same function. Examples of humectants are propylene glycol, hexylene glycol, and butylene glycol, glyceryl triacetate, glycerol, sorbitol, xylitol, maltitol, polydextrose, urea, Aloe Vera gel, alpha hydroxy acids such as lactic acid, honey. More preferred humectants are glycerol and propylene glycol.

One or more humectants may be contained in the composition according to the present invention. The one or more humectant (s) is/are used preferably in an amount of 1.0 to 15.0 % by weight, more preferably 5.0 to 10.0 % by weight, relative to the total weight of the composition.

The hair conditioning composition of the present invention may comprise preservatives, which are allowed and suitable for cosmetic preparations. However, it is preferred to use Benzyl Alcohol, Methylisothiazolinone, Methylchlorisothiazolinone, Ethylparaben, Methylparaben, Phenoxyethanol, and mixtures thereof.

The preferred preservatives can be used alone or in combination. The total amount of preservative, referring as well to one single preservative as to a combination of preservatives, is from 0.0001 to 2.0 % by weight, preferably 0.0005 to 1.0 % by weight, relative to the total weight of the composition.

According to the present invention, antioxidants may be used in the composition of the present invention. In general, antioxidants are molecules which prevent other molecules from being oxidized.

Oxidation processes can release free radicals which are damaging or destroying other molecules. If these other molecules are part of living cells, these cells can be damaged. There are several molecules which are able to function as radical scavenger. These molecules are also called antioxidants. The antioxidants can be of natural origin, for example vitamin C, glutathione, lipoic acid, carotenes, vitamin E and coenzyme Q 10, or of synthetic origin, for example butylhydroanisol (BHA), butylhydroxytoluol (BHT) and pentaerythrityl tetra-di-t-butyl-hydroxyhydrocinnamate. Benzophenone 4 may also be used as an antioxidant. Benzophenone-4 normally is an UV filter, protecting the skin from damages caused by UVB and short-wave UVA ultraviolet light. According to the invention, Benzophenone-4 is preferred to be used as antioxidant of synthetic origin.

The at least one antioxidant is contained in a total amount of 0.001 to 0.1 % by weight, preferably 0.01 to 0.07 % by weight, relative to the total weight of the composition.

In addition, capsules may be contained in the composition of the present invention. These capsules may contain components, which provide care to the hair, such as oils, vitamins, plant extracts, further active ingredients, protein hydrolysates, and amino acids. Furthermore, the capsules may contain colorants, thus providing the composition according to the present invention with an attractive optical impression. It is preferred, if the composition according to the invention contain capsules comprising silicone compounds, more preferred a mixture of Dimethicone, Vinyl/Dimethicone Crosspolymer and Cyclopentasiloxane. As well more preferred are capsules containing hydrolyzed collagen. Examples of the more preferred capsules may be purchased as Capsulets-TBT-03 from Chongqing

Pellets Techniques & Trade Co., LTD or Clear Collagen Capsule from J. & C Microchem. Inc.

The capsules are contained in a total amount of 0.1 to 15 % by weight, preferably 0.5 to 10 % by weight, relative to the total weight of the composition.

In addition, further solid particles may be contained in the composition of the present invention. Said particles may be chosen from beads, mica powder, dried and crushed flowers, and natural grinded seeds, e.g. apricot seed powder.

In addition, further components suitable for cosmetic compositions may be contained in the composition of the present invention, as far as they do not interfere with the purpose of the invention.

Brief description of the Drawings

Figure 1 shows the first panel test comparing the inventive composition CLEARCON99 with two products in market; and

Figure 2 shows the second panel test comparing the inventive composition CON1 with a product in market.

Examples

The following examples should illustrate the compositions of the present invention, without, however, intending to limit the invention to these examples. The numerical values in the examples are percentages by weight relative to the total weight of the compositions, and refer to their raw material content of each ingredients.

Preparation method and Analysis of Turbidity

The composition of the present invention may be prepared by any technique known or effective to prepare a hair conditioning composition. The process to prepare the composition of the present invention comprises conventional formulating and mixing techniques. However, it is recommended to use a cold process for preparation:

- Dissolve the thickening polymer(s), preferably Polyquaternium-37 or hydroxyethylcellulose, in water, stir until the polymer(s) is/are dissolved;
- Add amphoteric polymer(s) and optionally cationic surfactant(s), stir;
- Optionally add further ingredients, such as e.g. silicone(s), perfume, emulsifier(s), preservative(s) etc.

For manufacturing the compositions of the present invention, an IKA RW20 digital or IKA Eurostar stir equipment and a stirrer, e.g. a paddle stirrer is used.

The turbidity values that are disclosed in the present specification have been determined using a turbidity measuring device (2100N TURBIDMETER from HACH), with distilled water with a value of NTU<0.1 serving as standard. The samples were undiluted. NTU is an abbreviation of Nephelometric Turbidity Unit.

Small turbidity values indicate clear compositions (values up to 30 NTU). High turbidity values are determined for compositions, which are cloudy and/or hazy (values greater than 100 NTU). The turbidity values of opaque compositions are not to be determined.

Test method

In order to show that the compositions of the present invention are improved in relation to compositions, which are already in the market, panel tests were conducted.

The test was carried out by the following procedure:

Caucasian bleached hair tresses were used. The evaluation of the hair tresses were conducted by trained panelists:

- Wet the hair with water;
- Fill a syringe with 2 ml of a composition according to the invention or a market product, evenly apply on the hair tress, and evaluate
 - richness,
 - ability of gliding and
 - other properties of the hair*;
- Wash off the product (one hand is used);
- Evaluate
 - gliding,
 - rinse ability and
 - other properties of the hair* during rinsing;
- Press out water softly;
- Finally evaluate
 - detangling,
 - combing,
 - gliding and
 - other properties of the hair*.

* To evaluate other properties of the hair the panelists had the choice between the following statements: The hair feels rough, the hair feels squeaky, the hair feels oily, the hair feels greasy, the hair feels soft, the hair feels supple, the hair feels waxy and the hair feels coated.

The evaluation was based on a score of 10 points, “0 point” corresponds to “bad”, and “10 points” corresponds to “very good” with two exceptions. The first exception refers to the property *rinsing*

completed [s]. This property refers to the time necessary to complete the rinsing. The time is counted in seconds, thus the values correspond to seconds. The next exception refers to the property *rinseability (30s)*. This property was evaluated by giving “0 point” corresponding to a rinsing that was “too slow”, and “10 points” corresponding to a rinsing that was “too quick”.

Main ingredients of the example compositions of the present invention are listed in Tables 1 and 2, and the amounts given refer to raw material content.

Table 1

Ingredient	Ex .1	Ex .2	Ex .3	Ex .4	Ex .5	Ex .6	Ex .7	Ex .8	Ex .9	Ex. 10	Ex. 11	Ex. 12	Ex. 13
Aqua	To 10 0%	To 10 0%	To 10 0%	To 10 0%	To 10 0%	To 10 0%	To 10 0%	To 10 0%	To 10 0%	To 10 0%	To 10 0%	To 10 0%	To 10 0%
Polyquaternium-37 ¹ (100% active)	2	1	3	1.4	2.5	1.5	1.7	2	-	-	-	-	-
PEG-17 Dimethicone ²	-	-	2	0.5	-	3	-	2	2	-	1	2	-
PEG-12 Dimethicone ³	2	1	-	-	0.5	-	3	-	-	1.5	-	-	2
Ceteareth-20	1	0.5	1	0.7	1.5	1	0.5	1.5	-	-	-	-	-
Polyquaternium-47 ⁴	0.2	-	0.5	-	1.5	2.0	-	-	1.5	0.5	-	3	-
Polyquaternium-53 ⁵	-	1.0	-	-	-	-	-	1.5	-	-	-	-	-
Polyquaternium-22 ⁶	-	-	-	2.0	-	-	1.5	-	-	-	0.5	-	-
Coco-Betaine	1	0.3	3.0	0.3	1.5	1	1	2	3	2	1	1.5	3
Glycerin	5	3	10	5	-	-	-	5	-	-	-	-	-
Propylene Glycol	-	-	-	-	5	3	3	-	5	2	4	10	6
Hydroxyethylcellulose ⁷	-	-	-	-	-	-	-	-	2	2	1.3	0.8	1.5
Soytrimonium chloride ⁸	-	-	-	-	-	-	-	-	2	-	-	-	-
Steartrimonium chloride ⁹	-	-	-	-	-	-	-	-	-	1	-	-	-
Cetrimonium Chloride ¹⁰	-	-	-	-	-	-	-	-	-	-	4	-	-
PEG-40 Hydrogenated	-	-	-	-	-	-	-	-	1	1	1	1	1

Castor Oil													
Palmitamidopropyltrimonium chloride ¹¹	-	-	-	-	-	-	-	-	-	-	-	2	-
Stearamidopropyl Dimethylamine ¹²	-	-	-	-	-	-	-	-	-	-	-	-	1
Perfume	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.7	0.6	0.6	0.6	0.6	0.6
Benzophenone-4	0.05	0.2	0.1	0.2	0.25	0.2	0.1	0.1	0.1	0.1	0.2	0.2	0.2
Preservatives, pH adjustment	q.s	q.s	q.s	q.s	q.s	q.s	q.s	q.s	q.s	q.s	q.s	q.s	q.s
Capsules ¹³	1	2	1	3	5	6	0.5	10	-	-	-	-	-
Turbidity (NTU)	5.25*	6.13*	5.68*	8.67*	7.01*	5.63*	8.13*	7.06*	9.76	7.63	5.14	6.27	9.81

* The turbidity of the compositions was measured before the addition of capsules.

Table 2

	INCI	TRADE NAME/ SUPPLIER
1	Polyquaternium-37	Cosmedia Ultragel 300 / BASF
2	PEG-17 Dimethicone	Silsoft 895 / Momentive
3	PEG-12 Dimethicone	Xiameter OFX-0193 Fluid / Dow Corning
4	Polyquaternium-47	Merquat 2001 Polymer / Lubrizol
5	Polyquaternium-53	Lubrizol
6	Polyquaternium-22	Lubrizol
7	Hydroxyethylcellulose	Natrosol 250 HHX pharm / Ashland
8	Soytrimonium chloride	SV 60 / AKZONOBEL
9	Steartrimonium chloride	HuZhou HuXing RiHua(China)
10	Cetrimonium Chloride	EVONIK
11	Palmitamidopropyltrimonium chloride	EVONIK
12	Stearamidopropyl Dimethylamine	Tego Amid S 18 / Evonik
13	Capsules	J&C or Pellets

The compositions CON1 and CLEARCON 99 were prepared and used in the above described panel test. The results are shown in Tables 3 and 4:

Table 3

CON 1

<i>Ingredient, INCI name</i>	<i>% by weight</i>
Aqua	To 100%
Polyquaternium-37 (100% active)	1.8
PEG-12 Dimethicone (100% active)	2.0
Ceteareth-20 (100% active)	1.0
Polyquaternium-47 (20% active)	1.0
Polysorbate 60 (100% active)	1.5
Coco-Betaine (30% active)	3.0
Glycerin (100% active)	5.0
Perfume	0.5
Benzophenone-4 (100% active)	0.05
Preservatives, pH adjustment	q.s.
The amounts given are referring to raw material content.	

Table 4

CLEARCON 99	
<i>Ingredient, INCI name</i>	<i>% by weight</i>
Aqua	84.30
Citric Acid (100% active)	0.10
Phenoxyethanol (100% active)	0.50
Benzophenone-4 (100% active)	0.10
Glycerin (100% active)	5.00
Ceteareth-20 (100% active)	1.50
Coco-Betaine (30%)	3.00
PEG-17 Dimethicone(75% active)	2.00
Perfume	0.50
Polyquaternium-37* (100% active)	2.00
Polyquaternium-47** (20% active)	1.00
* COSMEDIA ULTRAGEL_300	
** MERQUAT 2001 POLYMER	
The amounts given are referring to raw material content.	

The above mentioned compositions according to the invention were compared to products already in the market, namely L'Oréal Mythic Oil Sparkling Conditioner, NIVEA Volume Sensation Conditioner, and L'Oréal ELVIVE Fibrology Air (L'Oréal

Voluminizing Conditioner), of which the ingredients according to the INCI listing are given.

INCI list of NIVEA Volume Sensation Conditioner:

Aqua, Stearyl Alcohol, Cetyl Alcohol, Dimethicone, Stearamidopropyl Dimethylamine, Hydrolyzed Keratin, Bambusa Vulgaris Shoot Extract, Silicone Quaternium-18, Guar Hydroxypropyltrimonium Chloride, Lactic Acid, Coco Betaine, Trideceth-6, Sodium Chloride, Trideceth-12, C12-15 Pareth-3, Cocamidopropyl Betaine, Citric Acid, Propylene Glycol, Ethylhexylglycerin, Potassium Sorbate, Phenoxyethanol, Benzyl Alcohol, Citronellol, Perfume.

INCI list of L'Oréal Mythic Oil Sparkling Conditioner:

Aqua, Glycerine, PEG-40 Hydrogenated Castor Oil, Caprylyl/Capryl Glucoside, Hydroxyethylcellulose, Behentrimonium Chloride, Phenoxyethanol, Polyquaternium-10, Hydroxyethyl Oleyl dimonium Chloride, Isopropyl Myristate, Quaternium-80, Propylene Glycol, Isopropyl Alcohol, Benzyl Salicylate, Benzyl Alcohol, Argania Spinosa Kernel Oil, Mica, CI 77891 (Titanium Dioxide), CI 77491 (Iron Dioxide), Perfume, CI 160279/2.

INCI list of L'Oréal ELVIVE Fribrology Air:

Aqua, Glycerine, PEG-40 Hydrogenated Castor Oil, Caprylyl/Capryl Glucoside, Hydroxyethylcellulose, Behentrimonium Chloride, Quaternium-80, Lactic Acid, Hydroxyethyl Oleyl dimonium Chloride, Sodium Acetate, Sodium Chloride, Phenoxyethanol, Aminopropyl Trioxysilane, Polyquaternium-10, Limonene, Linalool, Benzyl Alcohol, Isopropyl Myristate, Propylene Glycol, Isopropyl Alcohol, Citonellol, Perfume, F.I.L. C185934/1.

The panel test comparing the inventive composition CLEARCON99 with two products already in the market showed that

the inventive composition performs very well, being evaluated better than market products except for only two properties, namely rinseability 30 seconds and detangling first combing (Figure 1).

In a second panel test a further composition according to the invention was also compared to a product already in the market (Figure 2). Also, in this case the inventive composition was evaluated better than the market product except for only one property, namely rinseability 30 seconds.

The examples illustrating the present invention are not intended to limit the invention in any aspect. One skilled in the art should know that, changes and modifications may be carried out to technical solutions of the present invention within the spirit and scope of the present invention.

Claims:

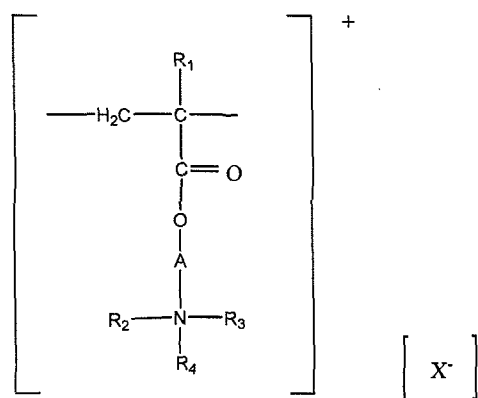
1. A transparent hair conditioning composition, comprising an aqueous system containing

- at least one thickening polymer,
- at least one amphoteric polymer, and
- optionally at least one cationic surfactant.

2. The composition according to claim 1, characterized in that the composition further comprises optionally at least one auxiliary component selected from the group consisting of emulsifiers, further surfactants, ethoxylated silicones, further cationic polymers, humectants, preservatives, antioxidants, fatty alcohols and capsules and mixtures thereof, and the composition comprises a balance amount of water, e.g., 70 to 95 % by weight, preferably 75-90 % by weight, so that all the components amount to 100% by weight.

3. The composition according to claim 1 or 2 characterized in that

- the thickening polymer is a homopolymer comprising monomers characterized by the following formula:



wherein R_1 is hydrogen atom or a methyl group,
 R_2 , R_3 , R_4 are identical or different substituents representing alkyl

substituents with 1 to 18 carbon atoms or a benzyl substituent, A represents a straight or branched alkyl chain of 1 to 6 carbon atoms or a hydroxylated alkyl chain of 1 to 4 carbon atoms and X^- is a counterion, preferably chosen from chloride, bromide or methosulfate.

4. The composition according to claim 3 characterized in that the thickening polymer is Polyquaterium-37.

5. The composition according to claim 1 or 2 characterized in that the thickening polymer is selected from the group consisting of cellulose, ethyl cellulose, hydroxypropylcellulose, hydroxypropyl methyl cellulose, methyl ethyl cellulose and hydroxyethylcellulose, and

at least one cationic surfactant is contained.

6. The composition according to claim 5 characterized in that the thickening polymer is hydroxyethyl cellulose.

7. The composition according to any of claims 1 to 6 characterized in that the at least one thickening polymer is contained in a total amount of 0.1 to 5.0 % by weight, preferably 0.2 to 4.5 % by weight, more preferably 0.5 to 3.0 % by weight, relative to the total weight of the composition.

8. The composition according to any of claims 1 to 7 characterized in that the at least one amphoteric polymer is selected from the group consisting of polyquaternium-22, polyquaternium-47 and polyquaternium-53.

9. The composition according to any of claims 1 to 8 characterized in that the at least one amphoteric polymer is contained in amounts from 0.01 to 1.0 % by weight, preferably 0.05 to 0.8 % by weight, more preferably 0.1 to 0.5 % by weight, relative to the total weight of the composition.

10. The composition according to any of claims 1 to 9 characterized in that the at least one cationic surfactant is selected from the group consisting of quaternary ammonium salts and quaternary fatty acid amidoamines.

11. The composition according to claim 10 characterized in that the at least one quaternary ammonium salt is selected from the group consisting of Soytrimonium Chloride, Steartrimonium Chloride, and Cetrimonium Chloride.

12. The composition according to claim 10 characterized in that the at least one quaternary fatty acid amidoamine is selected from the group consisting of Palmitamidopropyl Chloride and Stearamidopropyl Dimethylamine.

13. The composition according to any of claims 1 to 12 characterized in that the at least one cationic surfactant is used in an amount of 0.1 to 7.5 % by weight, preferably 0.3 to 3.0 % by weight, relative to the total weight of the composition.

14. The composition according to any of claims 1 to 13 characterized in that additionally at least one ethoxylated silicone is contained.

15. The composition according to claim 14 characterized in that the at least one ethoxylated silicone is selected from the group consisting of PEG-17 Dimethicone and PEG-12 Dimethicone.

16. The composition according to any of claims 1 to 15 characterized in that the at least one ethoxylated silicone is contained in an amount from 0.1 to 7.0 % by weight, preferably 0.2 to 5.0 % by weight, more preferably 0.5 to 3.0 % by weight, relative to the total weight of the composition.

17. The composition according to any of claims 1 to 16 characterized in that additionally capsules are contained.

18. The composition according to claim 17 characterized in that the capsules comprise hydrolyzed collagen or a mixture of Dimethicone, Vinyl/Dimethicone Crosspolymer and Cyclopentasiloxane.

19. The composition according to claim 17 or 18 characterized in that the capsules are contained in a total amount of 0.1 to 15 % by weight, preferably 0.5 to 10 % by weight, relative to the total weight of the composition.

20. Use of the composition according to any of claims 1 to 19 for providing hair with freshness without leaving it oily and/or greasy.

21. Use of the composition according to any of claims 1 to 19 for providing hair which can be easily detangled and combed in a wet and dry condition.

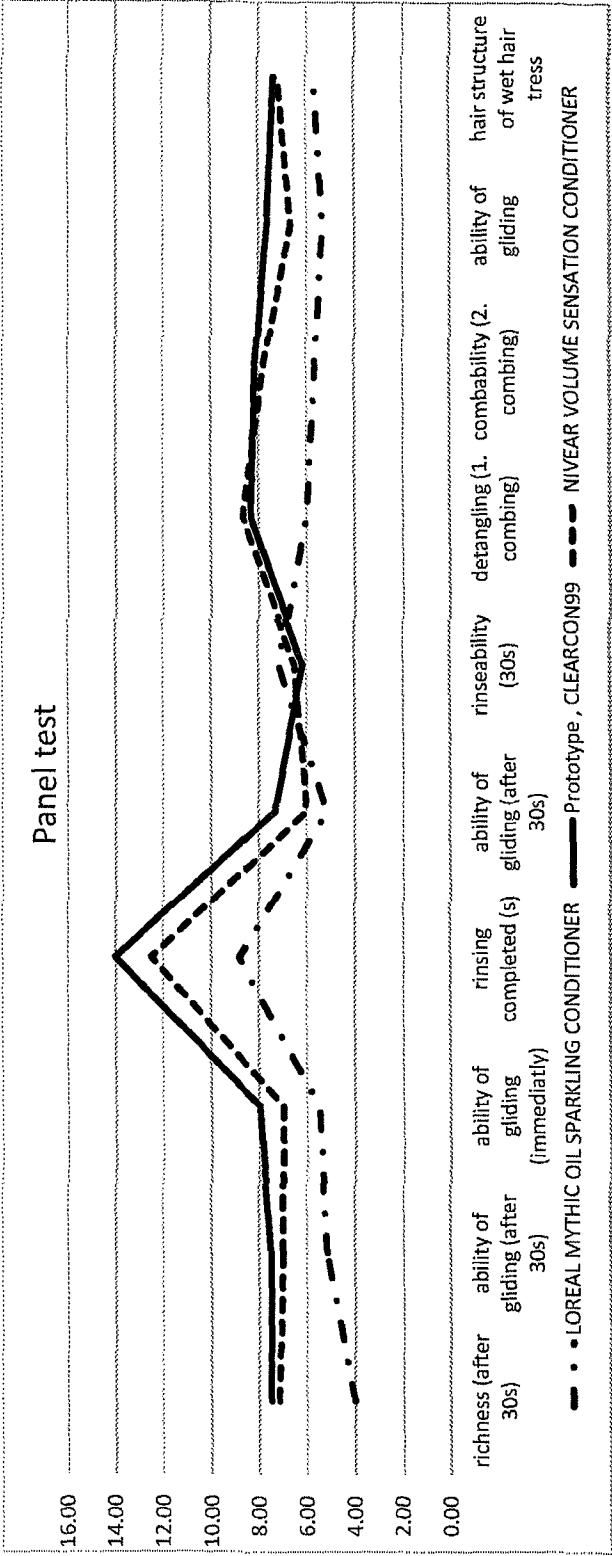


Fig. 1

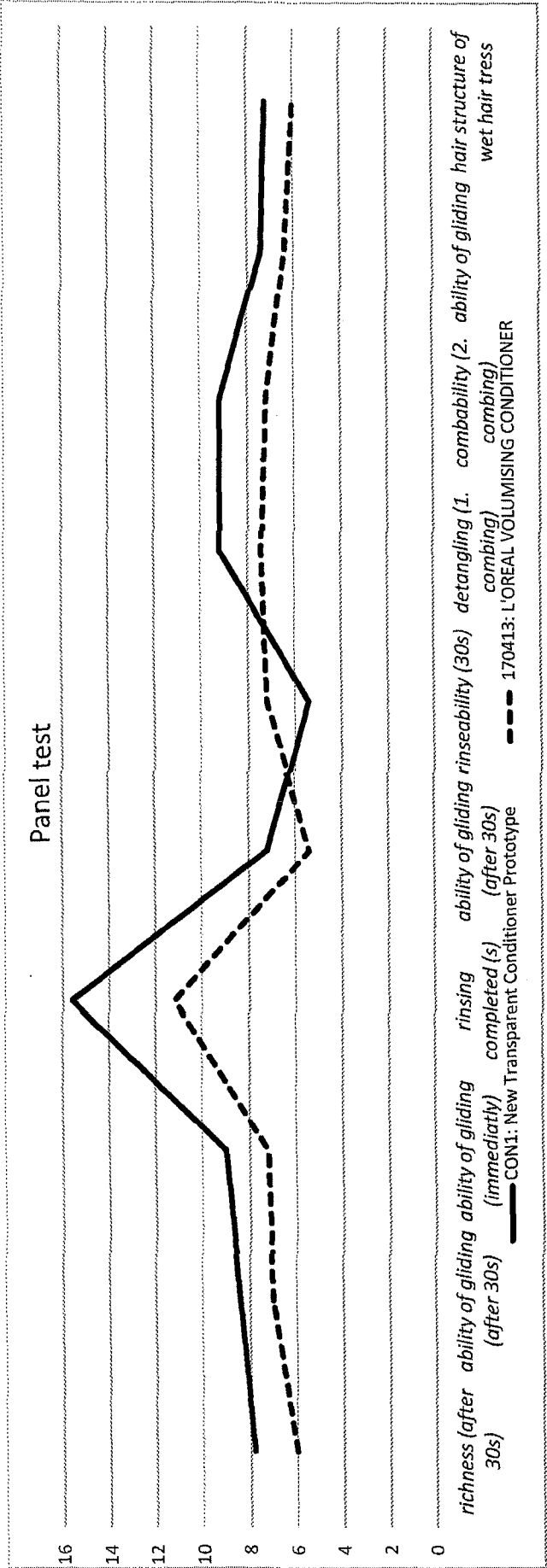


Fig. 2

INTERNATIONAL SEARCH REPORT

International application No.

PCT/CN2017/111144**A. CLASSIFICATION OF SUBJECT MATTER**

A61K 8/73(2006.01)i; A61K 8/40(2006.01)i; A61Q 5/12(2006.01)i; A61Q 5/02(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)

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)

CNABS,CNABS,CPRSABS,MOABS,TWABS,ILABS,AUABS,CNMED,DWPI,SIPOABS,CPEA,JPABS,VEN,CNTXT, EPTXT,USTXT,WOTXT,LEXTXT,CATXT,SGTXT,CNKI,CA:polyquaternium, soytrimonium, 47, 22,53, steartrimonium, transparent, cetrimonium, hair,condition,amphoteric

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	US 2004234491 A1 (KPSS KAO GMBH) 25 November 2004 (2004-11-25) abstract, example 1	1-21
Y	US 2013284198 A1 (RIZK KIROLOSET AL.) 31 October 2013 (2013-10-31) paragraphs [0057]-[0058], [0060], [0063], paragraph [0087], formulations 6, 7	1-21

☐ 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

06 August 2018

Date of mailing of the international search report

24 August 2018

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**

Facsimile No. (86-10)62019451

Authorized officer

CHEN,MaoTelephone No. **62412205**

INTERNATIONAL SEARCH REPORT
Information on patent family members

International application No.

PCT/CN2017/111144

Patent document cited in search report			Publication date (day/month/year)	Patent family member(s)			Publication date (day/month/year)
US	2004234491	A1	25 November 2004	AU	2004201563	A1	09 December 2004
				EP	1479368	A1	24 November 2004
US	2013284198	A1	31 October 2013	BR	112014024925	A2	11 July 2017
				EP	2844348	A1	11 March 2015
				US	8865147	B2	21 October 2014
				EP	2844348	A4	09 December 2015
				WO	2013165799	A1	07 November 2013